SPECIFICATIONS
SFA Project No. 2869

BUILDING 9 RESTROOM REMODEL
COLLEGE OF SAN MATEO

San Mateo County Community College District
San Mateo, California

Sugimura Finney Architects
2155 S. Bascom Ave
Campbell, California 95008
(408) 879-0600

SPECIFICATIONS
SFA Project No. 2869

DSA File No. 41-C1
DSA Application No. 01-110504

BUILDING 9 RESTROOM REMODEL
COLLEGE OF SAN MATEO

San Mateo County Community College District
San Mateo, California

Sugimura Finney Architects
2155 S. Bascom Ave
Campbell, California 95008
(408) 268-6100

Division of the State Architect
Office of Regulation Services

REGISTERED PROFESSIONAL ENGINEER
DANIEL G. LEWIN
No. S 3272
EXP 03-31-11
STRUCTURAL
STATE OF CALIFORNIA

Dan Lewin, Structural Engineer
Hohbach Lewin

LICENSED ARCHITECT
GENE M. SUGIMURA
C 007104
REN. 3-31-11
STATE OF CALIFORNIA

Gene Sugimura, Architect
Sugimura Finney Architects

REGISTERED PROFESSIONAL ENGINEER
JASON LAU
E 16806
Exp. 9/30/10
ELECTRICAL
STATE OF CALIFORNIA

Jason Lau, Electrical Engineer
Interface Engineering

REGISTERED PROFESSIONAL ENGINEER
OMAR J. HAWIT
No. 33981
12-31-09
MECHANICAL
STATE OF CALIFORNIA

Omar J. Hawit, Mechanical/Plumbing Engineer
Interface Engineering

File NO. 41-C1
IDENTIFICATION STAMP
DIVISION OF THE STATE ARCHITECT
APPL 01 1 1 0 5 0 4
AC KP19 FLS SS
DATE JUL 07 2009

INDEX

CONTRACTOR NOTE; THIS SPECIFICATION IS ISSUED USING CONSTRUCTION SPECIFICATIONS INSTITUTE MASTER FORMAT 2004

MASTERFORMAT 2004 has changed the numbering system and location of many systems. Pay special attention to location of Subgroups, Divisions and Sections.

NOT USED FOR GEN. REQ. TABLE OF CONTEN. SEE 00110

DIVISION 6 – WOOD, P'.ASTICS, AND COMPOSITES

NONE

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07920	JOINT SEALANTS

DIVISION 8 - OPENINGS

NONE

DIVISION 9 - FINISHES

09110	NON-LOAD BEARING WALL FRAMING SYSTEM
09210	GYPSUM PLASTER
09250	GYPSUM BOARD
09300	CERAMIC TILE
09900	INTERIOR PAINTING

DIVISION 10 - SPECIALTIES

10170	TOILET PARTITIONS
10800	TOILET ACCESSORIES

DIVISION 11 - EQUIPMENT

NONE

DIVISION 12 - FURNISHINGS

NONE

DIVISION 13 - SPECIAL CONSTRUCTION

NONE

DIVISION 14 - CONVEYING SYSTEMS

NONE

DIVISION 15 - MECHANICAL

15010	Basic Mechanical Requirements
15040	Acceptance Testing and Documentation
15050	Basic Materials and Methods
15060	Pipes and Pipe Fittings
15100	Valves

15140	Supports and Anchors
15170	Motors
15190	Mechanical Identification
15240	Mechanical Equipment Sound, Vibration and Seismic Control
15250	Insulation
15400	Plumbing
15420	Plumbing Piping Systems
15440	Plumbing Fixtures
15500	Heating, Ventilating and Air Conditioning
15860	Fans
15890	Ductwork
15910	Ductwork Accessories
15940	Air Outlets and Inlets
15990	Testing, Adjusting and Balancing

DIVISION 16 – ELECTRICAL

16010	Basic Electrical Requirements
16040	Building Lighting Acceptance Testing and Documentation
16050	Basic Materials and Methods
16500	Lighting
16721	Analog Addressable Fire Alarm and Detection System
16906	Occupancy Sensors

DOCUMENT 00 01 01

PROJECT MANUAL

FOR THE

CAÑADA COLLEGE CONCESSION STAND PROJECT

[Volume 1] Division 0-1 Specifications
Bid Number XXXXX

SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT

3401 CSM DRIVE
SAN MATEO, CALIFORNIA 94402

«ARCHITECT»
«ENGINEER»

DOCUMENT 00 01 07

SEALS PAGE

[_____], P. E.
Civil Engineer No. [_____]
Expires [_____]

[_____], P. E.
Civil Engineer No. [_____]
Expires [_____]

[_____], P. E.
Electrical Engineer No. [_____]
Expires [_____]

[_____], P. E.
Structural Engineer No. [_____]
Expires [_____]

END OF DOCUMENT

DOCUMENT 00 01 10

TABLE OF CONTENTS

CONDITIONS OF THE CONTRACT

SPECIFICATIONS

Division 1 - General Requirements

NOT USED

~~DIVISION 2 – EXISTING CONDITIONS~~

NOT USED

DIVISION 3 – CONCRETE

03320 CONCRETE FLOOR TOPPINGS
03542 CEMENT-BASED UNDERLAYMENT

DIVISION 4 - MASONRY

NONE

DIVISION 5 – METALS

05500 METAL FABRICATIONS

DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES

NONE

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07920 JOINT SEALANTS

DIVISION 8 - OPENINGS

08110 HOLLOW METAL DOOR FRAMES
08210 WOOD DOORS
08710 DOOR HARDWARE

DIVISION 9 - FINISHES

09110 NON-LOAD BEARING WALL FRAMING SYSTEMS
09210 GYPSUM PLASTER
09250 GYPSUM BOARD
09261 GYPSUM BOARD ASSEMBLIES
09300 TILING
09900 PAINTING

DIVISION 10 - SPECIALTIES

10170 SOLID COLOR REINFORCED COMPOSITE TOILET PARTITIONS-INSTITUTIONAL HARDWARE
10440 SIGNAGE
10800 TOILET ACCESSORIES

DIVISION 11 - EQUIPMENT

NONE

DIVISION 12 - FURNISHINGS

NONE

DIVISION 13 - SPECIAL CONSTRUCTION

NONE

DIVISION 14 - CONVEYING SYSTEMS

NONE

NOT USED

DIVISION 15 - MECHANICAL

15010	Basic Mechanical Requirements
15040	Acceptance Testing and Documentation
15050	Basic Materials and Methods
15060	Pipes and Pipe Fittings
15100	Valves
15140	Supports and Anchors
15170	Motors
15190	Mechanical Identification
15240	Mechanical Equipment Sound, Vibration and Seismic Control
15250	Insulation
15400	Plumbing
15420	Plumbing Piping Systems
15440	Plumbing Fixtures
15500	Heating, Ventilating and Air Conditioning
15860	Fans
15890	Ductwork
15910	Ductwork Accessories
15940	Air Outlets and Inlets
15990	Testing, Adjusting and Balancing

DIVISION 16 – ELECTRICAL

16010	Basic Electrical Requirements
16040	Building Lighting Acceptance Testing and Documentation
16050	Basic Materials and Methods
16500	Lighting
16721	Analog Addressable Fire Alarm and Detection System
16906	Occupancy Sensors

23 08 00	Commissioning Requirements

END OF DOCUMENT

DOCUMENT 00 01 15

LIST OF DRAWINGS

All project drawings included in the set dated [____] by [A/E firm name]. [Note to PM: Do not list all the drawings here. The reference to the drawings with the date should be adequate, assuming the drawing set's title page lists all the drawings in the set. We want to avoid double-listing and having errors in this document, when there is no reason to duplicate the list already contained on the drawing set's title page.]

END OF DOCUMENT

DOCUMENT 00 11 13

ADVERTISEMENT FOR BIDS

[PM- UPDATE ON PROJECT BY PROJECT BASIS
NOTE- THIS IS A LEGAL DOCUMENT & NO OTHER VERSION OF SECTION 00 11 13 MAY BE USED]

NOTICE IS HEREBY GIVEN that the San Mateo County Community College District ("**District**") of San Mateo, California, acting through its Governing Board, hereinafter referred to as the District, will accept sealed bids for the award of the contract for the following public work:

BID NUMBER XXXXX
[insert name of PROJECT]
[Insert name of COLLEGE]
[city], CALIFORNIA

Each bid must conform to and be responsive to the contract documents and be submitted on a form furnished by the District. Bids can only be submitted by those [license type] contractors who have been pre-qualified with the District, as reflected on the District's website: Prequalified Construction Contractors - 2008, and listed here: [PMs- Since the web list does not specify prequal max. budget values it may be a benefit for your project to list the exact prequaled contractors here. Either way, please provide your PC with a list of the prequal'd contractors.]

DESCRIPTION OF THE WORK. The Work generally consists of [Description]. Bidding documents contain the full description of the Work.

BIDS DUE: Sealed Bids will be received by Swinerton Management & Consulting at their office located at [location] **no later than** [time], on [date]. Main contact for this project is [contact person], telephone [_____], facsimile [_____], and email: [_____].

THIS IS A LABOR AGREEMENT PROJECT: [Include if subject to PLA, PMs (see Section 01 35 27 for project list), otherwise delete.] This project is subject to the terms of the Program Stabilization Agreement (PLA) Executed between the San Mateo County Community College District and the San Mateo County Buildings and Trades Council. Copies of the PLA are available on the Web at: http://www.smccd.net/accounts/facilities/planconstruct/Downloads/PROJ%20STABILIZATION%20AGMNT%20SIGNED%20081503%20FINAL.pdf

LABOR COMPLIANCE: This is a construction project in accordance with Section 1771.5 of the California Labor Code. **[PMs use this for projects supported by State Capital Outlay funding Propositions 47 or 55 (see Section 01 35 28 for project list), otherwise delete.]**

PREVAILING WAGE: The successful bidder shall be required to pay its workers on this project a sum not less than the general prevailing wage rate of per diem wages and not less than the general prevailing rate for holiday and overtime work for work of a similar character in the locality in which the project is performed as provided under California Labor Code section 1770 et sec. The District has determined the prevailing rate of per diem wages and the general prevailing rate for holidays and overtime work in the locality in which this project is to be performed for each craft, classification or type of work needed to execute the work.

Contractor shall be required to post, at each job site, a copy of such prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations.

SUBSTITUTION OF SECURITIES. District will permit successful Bidder to substitute securities for retention monies withheld to ensure performance of Contract, as set forth in Document 00 43 45 (Escrow Agreement for Security Deposits in Lieu of Retention), in accordance with California Public Contract Code, Section 22300. By this reference, Document 00 43 45 (Escrow Agreement for Security Deposits in Lieu of Retention) is incorporated in full in this Document 00 11 13.

RESTRICTIONS ON SUBSTITUTIONS AND SOLE SOURCE ITEMS. As a limitation on Bidder's privilege to substitute "or equal" items, District has found that certain items are designated as District standards and certain items are designated to match existing items in use on a particular public improvement either completed or in the course of completion or are available from one source. As to such items, District will not permit substitution. Such items are described in the Bidding Documents.

PROCUREMENT OF BIDDING DOCUMENTS: Bidders may obtain copies of bid documents upon payment of a non-refundable fee to [printing company - Elite Reprographics] starting [time and date] by calling [printer's phone number – 415.957.1234 *Elite*] or through their internet website at [http address - http://www.eliterepro.com/public.htm *Elite*]. Request "[project name]" documents for printing. [Each pre-qualified contractor may obtain two complete sets of bid documents free of charge from [printing company – Elite Reprographics]. [– **PMs update this on a per project basis, there may be no need to give any away**.] Bidders may access bid documents through the project web site, http://www.smccd.edu/accounts/smccd/departments/facilities/CAN_UtilUpgradeChilledWater_01.shtml Documents will also be available in the following Bay Area plan rooms:

Company	Phone
Peninsula Builders Exchange	650-591-4486
Santa Clara Builders Exchange	408-727-4000
San Francisco Builders Exchange	415-282-8220
Contra Costa Builders Exchange	925-685-8630
Dublin Dodge Plan Room	925-833-9750
Alameda County Builders Exchange	510-483-8880
Reed Construction Data	800-424-3996

TWO MANDATORY PRE-BID CONFERENCES WILL BE HELD at **[time] on [day, date] at [venue], and at [time] on [day, date] at [venue].** [PM may choose to hold fewer or more pre-bid conferences.] Attendance of one conference is mandatory. Prospective subcontractors and vendors are encouraged to attend. Interested parties are advised to arrive early in order to park and obtain a parking pass from [staff at the pre-bid conference location; parking permit machines; other options]. Doors will be locked 15 minutes after the start time of each conference. [PM may choose to make this a non-mandatory conference. If so, delete reference to locked doors.]

The San Mateo County Community College District is an equal opportunity employer.

Board of Trustees
San Mateo County Community College District
Patricia Miljanich, Vice President-Clerk

Published: [Date]
[Date]

END OF DOCUMENT

DOCUMENT 00 11 19
[PM UPDATE PER PROJECT. NOTE SPECIFICALLY UPDATE 14.D PER YOUR PROJECT SPECS.]

INSTRUCTIONS TO BIDDERS

Bids are requested for a general construction contract, or work described in general, as follows:

THE [_____] PROJECT

1. **RECEIPT OF BIDS.** Sealed Bids will be received by the District at their office (see paragraph 2 below) **no later than** [time], on [_____], [_____] 200X. **District will receive Bids from pre-qualified contractors in a sealed envelope that is clearly labeled with the name and number of the bid. All Bids will be time stamped to reflect their submittal time. District will reject all Bids received after the specified time and will return such Bids to Bidders unopened. Bidders must submit Bids in accordance with this DOCUMENT 00 11 19.**

2. **CONTACT INFORMATION:**

   Bid Submittal and Mailing address:
   San Mateo County Community College District
   c/o [Construction Planning Department]
   1700 West Hillsdale Blvd., Building 6
   San Mateo, CA 94402

   Contact Name:
   [_____]

   Telephone:
   (650) [_____]

   Fax:
   (650) [_____]

   Email (acceptable for informal communication, but not legal notice): [_____]

3. **BID SUBMISSION.** Bidder should mark its Bid envelope as BID FOR THE DISTRICT, BID NUMBER [_____], [_____] PROJECT. Bids shall be deemed to include the written responses of the Bidder to any questions or requests for information of District made as part of Bid prior to submission of Bid. Bidder's failure to submit all required documents strictly as required entitles District to reject the Bid as non-responsive.

4. Not used.

5. Not used.

6. **REQUIRED BID FORMS.** All Bidders must submit Bids using, where applicable, documents supplied in this Project Manual, including without limitation Document 00 41 00 (Bid Form), Document 00 43 10 (Indemnity and Release Agreement), 00 43 13 (Bond Accompanying Bid), Document 00 43 36 (Subcontractors List), Document 00 43 33 (Schedule of Major Equipment and Material Suppliers), Document 00 45 00 (Bidder Certifications), Document 00 45 14 (Key Personnel), Document 00 45 19 (Non-collusion Affidavit) and Document 00 73 17 (OCIP Qualification Form). District will reject as non-responsive any Bid not submitted on the required forms. Bids must be full and complete. Bidders must complete all Bid items and supply all information required by Bidding Sections. District reserves the right in its sole discretion to reject any Bid as non-responsive as a result of any error or omission in the Bid. Bidders may not modify the Bid Form or qualify

their Bids. Bidders must submit clearly and distinctly written Bids. Bidders must clearly make any changes in their Bids by crossing out original entries, entering new entries, and initialing new entries. District reserves the right to reject any Bid not clearly written.

7. **REQUIRED BID SECURITY.** Bidders must submit with their Bids either cash, a cashier's check, or certified check from a responsible bank in the United States, or corporate surety bond furnished by a surety authorized to do business in the State of California, of not less than ten percent of [amount of total Bid, including Owner's Allowance], payable to District. All Bidders choosing to submit a surety bond must submit it on the required form, Document 00 43 13 (Bond Accompanying Bid). District will reject as non-responsive any Bid submitted without the necessary Bid security.

   The District may retain Bid securities and Bid bonds of other than the Apparent Low Bidder for a period of ninety (90) Days after award or full execution of the Contract, whichever first occurs. Upon full execution of the Contract, and upon request by Bidder, District will return to the respective unsuccessful Bidders their Bid securities and Bid bonds.

8. **REQUIRED SUBCONTRACTORS LIST.** All Bidders must submit with their Bids the required information on all Subcontractors in Document 00 43 36 (Subcontractors List) for those Subcontractors who will perform any portion of the Work, including labor, rendering of service, or specially fabricating and installing a portion of the Work or improvement according to detailed drawings confined in the plans and specifications, in excess of one half of one percent of total Bid. Violation of this requirement may result in Bid being deemed non-responsive and not being considered.

9. Not used.

10. **MANDATORY PRE-BID SITE VISIT.** District will conduct a Mandatory Pre-Bid Site Visit at [____] a.m. on [_____], [_____], 200X at the Project Site, [_____]. District reserves the right to schedule and organize the Site Visit to minimize congestion and disruption to existing facilities and congestion. Bidders are encouraged to submit written questions in connection with the Site Visit. District will transmit to all parties recorded as having received Bidding documents such Addenda as District in its discretion considers necessary in response to written questions. Bidders shall not rely on oral statements. Oral statements will not be binding or legally effective. Other Pre-Bid Site visits may be scheduled at District's sole discretion, depending on staff availability.

11. **OTHER REQUIREMENTS PRIOR TO BIDDING.** Submission of Bid signifies Bidder's careful examination of Bidding Documents and complete understanding of the nature, extent, and location of Work to be performed. As a condition to Bidding, Bidder must complete tasks listed in Document 00 52 00 (Agreement), Article 5. Submission of Bid shall constitute Bidder's express representation to the District that Bidder has fully completed these tasks.

12. **EXISTING DRAWINGS AND GEOTECHNICAL DATA.** Bidders may examine any available existing conditions information (e.g., record documents, specifications, studies, drawings of previous work) by giving District reasonable advance notice, as well as applicable environmental assessment information (if any) regarding the Project. Document 00 31 19 (Reports, Surveys and Existing Conditions) Reports, Surveys and Existing Conditions) applies to all supplied existing conditions information and geotechnical reports and all other information supplied regarding existing conditions either above ground or below ground. Documents are available for onsite review at the Swinerton Management & Consulting project field office, [address], or may be purchased at [Reproduction Company- Elite Reprographics by contacting them at 415.957.1234 or online at http://www.eliterepro.com/public.htm].

13. **ADDENDA.** Bidders must direct all questions about the meaning or intent of Bidding Documents to District Representative in writing. Interpretations or clarifications considered necessary by District in response to such questions will be issued by Addenda mailed, faxed, or delivered to all parties recorded by District as having received Bidding Documents. Addenda will be written and will be issued to each bidder to the address or fax number supplied District by Bidder. District may not answer questions received less than [ten- PM update based on project by project basis] Days prior to the date for opening Bids. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

A. Addenda may also be issued to modify the Bidding Documents as deemed advisable by District.
B. Addenda shall be acknowledged by number with signature in Document 00 41 00 (Bid Form) and shall be part of the Contract Documents. A complete listing of Addenda may be secured from District.

14. SUBSTITUTIONS. Bidders must base Bids on products and systems specified in Contract Documents or listed by name in Addenda.

A. Except as provided in paragraph 15.c below, District will consider substitution requests on for "or equal items." Bidders wanting to use "or equal" item(s) may submit Document 00 43 25 (Substitution Request Forms) items no later than thirty (30) days after the date of the Notice to Proceed. After that date, the District will not accept "or equal" substitution requests. To assess "or equal" acceptability of product or system, submittals of substitutions shall contain the information required in Document 00 43 25 (Substitution Request Forms) and set forth in Section 01 60 00 (Product Requirements). Insufficient information will be grounds for rejection of substitution. District shall, within a reasonable period of time after having received a request for substitution, issue in writing its decision as to whether the proposed substitute item is an "or equal" item. District's decision shall be conclusive on all Bidders.
B. Approved substitutions shall be listed in Addenda and become part of contact Documents.
C. Substitutions may be requested after submitting Bids and Award of contract only in accordance with requirements specified in Section 01 60 00 (Product Requirements).
D. As further limitation on Bidder's privilege to substitute items, District has found that certain items are designated as District standards and certain items are designated to match existing items in use on a particular public improvement, either completed or in the course of completion, and/or are only available from one source. As to such items, District will not permit substitution. District will not permit substitutions for the following items:

[PMs ADD/DELETE/CLARIFY PER PROJECT. DO NOT LEAVE THESE DESCRIPTIONS GENERIC (HIGHLIGHTED IN YELLOW). DO NOT HESITATE TO CONTACT THE CM OR Linda da Silva FOR LATEST UPDATE.]

1. **Door Closers**	LCN
2. **Door locksets**	Schlage
3. **Panic door hardware**	Von Duprin
4. **Window shades**	Mechoshades
5. **Top set base**	Burke
6. **Carpet**	Collins & Aikman
7. **Resilient Flooring**	Johnsonsite, Altro Maxis
8. **Suspended Acoustical Tile**	USG
9. **Ceramic Tile**	Dal-Tile
10. **Paint**	Kelly Moore Paint Company
11. **Controls**	T.A.C. Controls
12. **Fire Alarm**	Siemens MXL fire alarm systems, supplied and installed by the local Siemens Building Technologies, Inc., Hayward direct branch office
13. **Irrigation**	Hunter **(Skyline)**
14. **Toilet accessories**	Bobrick
15. **Toilet Partitions**	Bobrick Sierra
16. Security	Group 4 Technologies AMAG

15. WAGE RATES. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the contract, as determined by Director of the State of California Department of Industrial Relations, are available through the Department of Industrial Relations and are deemed included in the Bidding Documents. See http://www.dir.ca.gov/dirdatabases.html. Upon request, District will make available copies to any interested party In addition, Contractor shall post the applicable prevailing wage rates at the Site.

16. EQUAL EMPLOYMENT OPPORTUNITY. Contractor shall comply with all applicable federal, state, and local laws, rules, and regulations in regard to nondiscrimination in employment because of race, color, ancestry, national origin, religion, sex, marital status, age, medical conditions, disability, or any other reason.

17. **BID OPENING.** District will open all bidders' envelopes, initially evaluate them for responsiveness, and determine an Apparent Low Bidder as specified herein.

18. **DETERMINATION OF APPARENT LOW BIDDER.** [**PM update per project-** Apparent Low Bid will be based solely on the total amount of all Bid items (including any alternates)] based on assumptions contained in Document 00 41 00 (Bid Form). All Bidders are required to submit Bids on all Bid items (including any alternates).

19. Not used.

20. **BID EVALUATION.** District may reject any or all Bids and waive any informalities or minor irregularities in the Bids. District also reserves the right, in its discretion, to reject any or all Bids and to re-bid the Project. District reserves the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional Bids, and to reject the Bid of any Bidder if District believes that it would not be in the best interest of Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by District. For purposes of this paragraph, an "unbalanced Bid" is one having nominal prices for some work items and enhanced prices for other work items.
    A. In evaluating Bids, District will consider Bidders' qualifications, whether or not the Bids comply with the prescribed requirements, omit prices and other data, as may be requested in Document 00 41 00 (Bid Forms) or prior to the Notice of Award.
    B. District may conduct reasonable investigations and reference checks of Bidder, proposed Subcontractors, suppliers and other persons and organizations as District deems necessary to assist in the evaluation of any Bid; ability qualifications, financial ability proposed Subcontractors, suppliers, and to establish Bidder's responsibility, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to District's satisfaction within the prescribed time. Submission of a Bid constitutes Bidder's consent to the foregoing. District shall have the right to consider information provided by sources other than Bidder. District shall also have the right to communicate directly with Bidder's surety regarding Bidder's bonds.
    C. Discrepancies between the multiplication of units of Work and limit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between written words and figures will be resolved in favor of the words.
    D. Quantities stated in the Bidding Documents are approximate only and are subject to correction upon final measurement of the Work, and are subject further to the rights reserved by the District to increase or diminish the amount of work under any classification as advantages to design or construction needs require.
    E. District may determine whether a Bidder is qualified in its sole discretionary judgment.

21. **AWARD.** If the contract is to be awarded, it will be awarded to the lowest responsible responsive Bidder. Following completion of all required District procedures and receipt of all District approvals, District will issue Document 00 51 00 (Notice of Award) to successful Bidder.

22. **BID PROTEST.** Any Bid protest must be submitted in writing to the District's offices, before 4:00 p.m. of the fifth (5) day following opening of Bidder's Envelopes.
    A. The initial protest document must contain a complete statement of the basis for the protest.
    B. The protest must refer to the specific portion of the document that forms the basis for the protest.
    C. The protest must include the name, address, and telephone number of the person representing the protesting party.
    D. Only Bidders who the District otherwise determines are responsive and responsible are eligible to protest a Bid; protests from any other Bidder will not be considered. In order to determine whether a protesting Bidder is responsive and responsible, District may conduct the same investigation and evaluation as District is entitled to take regarding an Apparent Low Bidder.
    E. The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest. Such parties shall include all other Bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.
    F. The procedure and time limits set forth in this paragraph are mandatory and are Bidder's sole and exclusive

remedy in the event of Bid protest. Bidder's failure to comply with these procedures shall constitute a waiver of any right to further pursue the Bid protest, including filing a Government Code Claim or legal proceedings. A Bidder may not rely on a protest submitted by another Bidder, but must timely pursue its own protest.

G. Bid protests shall be submitted directly to the district at their offices located at:

San Mateo County Community College District
c/o José D. Nuñez, Vice Chancellor, Facilities Planning, Maintenance & Operations
3401 CSM Drive
San Mateo, CA 94402

* a copy of this protest shall be sent to [_____], [Project Manager], Swinerton Management & Consulting

23. POST-NOTICE OF AWARD REQUIREMENTS. After Notice of Award, the successful Bidder must execute and submit the following documents as indicated below.

A. Submit the following documents to District by 4:00 p.m. of the tenth (10) day following Notice of Award. Execution of Contract by District depends upon approval of these documents:
   1) Document 00 52 00 (Agreement): To be executed by successful Bidder. Submit two originals, each bearing an original signature.
   2) Document 00 61 00 (Construction Performance Bond): To be executed by successful Bidder and surety, in the amount set forth in Document 00 61 00 (Construction Performance Bond). Submit one original.
   3) Document 00 62 00 (Construction Labor and Material Payment Bond): To be executed by successful Bidder and surety, in the amount set forth in Document 00 62 00 (Construction Labor and Material Payment Bond). Submit one original.
   4) Insurance certificates and endorsements required by Section 00 71 00 (General Conditions) Article 4. Submit one original set.
   5) The Guaranty in the form set forth in Document 00 65 36 (Guaranty). Submit one original, bearing an original signature.
   6) OCIP Insurance Enrollment Forms as set forth in Section 00 73 17 (Insurance). Submit one original.
   7) Project Stabilization Agreement Letter of Assent as set forth in Section 01 35 27 (Project Labor Agreement). Submit one original. [PM delete this requirement if not a PLA project.]

B. District shall have the right to communicate directly with Apparent Low Bidder's proposed performance bond surety, to confirm the performance bond. District may elect to extend the time to receive performance and labor and material payment bonds.

C. Successful Bidder's failure to submit the documents required herein, in a proper and timely manner, entitles District to rescind its award, and to cause Bidder's Bid security to be forfeited as provided herein.

24. FAILURE TO EXECUTE AND DELIVER DOCUMENTS. If Bidder to whom contact is awarded shall, within the period described in paragraph 23A of this Document 00 11 19, fail or neglect to execute and deliver all required Contract Documents and file all required bonds, insurance certificates, and other documents, District may, in its sole discretion, foreclose on Bidder's deposit surety bond, or deposit Bidder's cashier's check or certified check for collection, and retain the proceeds thereof as liquidated damages for Bidder's failure to enter into the Contract Documents. Bidder agrees that calculating the damages District may suffer as a result of Bidder's failure to execute and deliver all required Contract Documents would be extremely difficult and impractical and that the amount of Bidder's required Bid security shall be the agreed and presumed amount of District's damages. In addition, upon such failure District may determine the next Apparent Low Bidder and proceed accordingly.

25. MODIFICATION OF COMMENCEMENT OF WORK. District expressly reserves the right to modify the date for the Commencement of Work under the Contact and to independently perform and complete work related to the Project.

26. WITHDRAWAL OF BIDS. Bidders may withdraw their Bids at any time prior to the Bid opening time fixed in this Document 00 11 19, only by written request for the withdrawal of Bid filed with the District's representative. Bidder or its duly authorized representative shall execute request to withdraw Bid. The submission of a Bid does not commit the District to award a contract for the Project, to pay costs incurred in the preparation of a Bid, or to procure or contract for any goods or services.

27. PUBLIC RECORDS ACT REQUESTS.

A. Per the Public Records Act, District will make available to the public all correspondence and written questions submitted during the Bid period, all Bid submissions opened in accordance with the procedures of this Document 00 11 19, and all subsequent Bid evaluation information. All submissions not opened will remain sealed and eventually be returned to the submitter. Except as otherwise required by law, District will not disclose trade secrets or proprietary financial information submitted that has been designated confidential by Bidder. Any such trade secrets or proprietary financial information that a Bidder believes should be exempted from disclosure shall be specifically identified and identified as such. Blanket-type identification by designating whole pages or section shall not be permitted and shall be invalid. The specific information must be clearly identified as such.

B. Upon a request for records regarding this Bid, District shall notify Bidder involved within ten (10) Days from receipt of the request of a specific date when the records will be made available for inspection. If the Bidder timely identifies any impropriety, trade secret, or confidential commercial or financial information that Bidder determines is not subject to public discloses and requests District to refuse to comply with the records request, Bidder shall take all appropriate legal action and defend District's refusal to produce the information in all forums; otherwise, District will make such information available to the extent required by applicable law, without restriction.

C. Information disclosed to the District and the attendant submissions are the property of District unless Bidder makes specific reference to data that is considered proprietary. Subject to the requirements in the Public Records Act, reasonable efforts will be made to prevent the disclosure of information except on a need-to-know basis during the evaluation process.

28. CONFORMED CONSTRUCTION DOCUMENTS. Following Award of Contract, District will prepare a conformed set of Contract Documents reflecting Addenda issued during bidding, which will, failing objection, constitute the approved set of Contract Documents.

29. DEFINITIONS. All abbreviations and definitions of terms used in this Document 00 11 19 are set forth in Section 01 42 00 (References and Definitions).

END OF DOCUMENT

DOCUMENT 00 21 14

BID SUBMITTAL VICINITY MAP

[INSERT MAP HERE]

DOCUMENT 00 21 15

PROJECT SITE CAMPUS MAP

[PM INSERT CAMPUS MAP]

DOCUMENT 00 31 19

REPORTS, SURVEYS AND EXISTING CONDITIONS

1. REPORT AND INFORMATION

1.1 **Existence of Reports and utility surveys:** San Mateo County Community College District, its consultants, and prior contractors may have collected documents providing a general description of the Site and conditions of the Work. These documents may consist of geotechnical reports for and around the Site, contracts, contract specifications, tenant improvement contracts, as-built drawings, utility drawings, and information regarding Underground Facilities. These reports, documents and other information are not part of the Contract Documents and do not show new work to be constructed, rather, show existing conditions that Contractor will have to address as part of its construction planning and operations.

1.2 **Inspection of Reports:** Contractor may inspect geotechnical reports and information regarding existing conditions at the Site. These documents are available for review at the District Office located at _____ and copies may be obtained for the cost of reproduction and handling upon Contractor's payment for the costs. These reports, documents and other information, are not part of the Contract Documents. Nevertheless, by submitting a Proposal, Contractor accepts full responsibility for reviewing, knowing and understanding the contents of all of these materials.

1.3 **Inclusion in Project Manual:** Geotechnical reports may be included in the Project Manual and information regarding existing conditions may also be included in the Project Manual, but neither shall be considered part of the Contract Documents, but rather "for information only."

1.4 **Available Documentation:** The following documentation is available for review through District for Contract Number **[Insert Number]**:

A. [vicinity map]
[location]
[prepared by]
[date prepared]

B. [name of report or data]
[location]
[prepared by]
[date prepared]

2. USE OF INFORMATION ON EXISTING CONDITIONS AND REQUIRED PRE-PROPOSAL INVESTIGATIONS

2.1 Contractor's attention is directed to Document 00 71 00 (General Conditions) including but not limited to, its Article 2 "Proposal Period Investigations" and Article 14 "Modifications of Contract Documents" [Paragraph G "Differing Site Conditions" and Paragraph H "Change Orders Related to Underground Conditions"].

3. ACCESS TO SITE FOR INVESTIGATIONS

3.1 During the Pre-Proposal Site Visit(s), District will provide each Contractor access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Contractor deems necessary for submission of a Proposal. Contractor must fill all holes and clean up and restore the Site to its former conditions upon completion of such explorations, investigations, tests, and studies. Such investigations may be performed only under the provisions of Document 00 11 13 (Advertisement for Bids) and Document 00 71 00 (General Conditions) including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such investigation work. Each Contractor shall supply all equipment

required to perform any investigations as each Contractor deems necessary. District has the right to limit the number of pieces of machinery operating at one time due to safety concerns.

END OF DOCUMENT

DOCUMENT 00 41 00

BID FORM
TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID

To be submitted as part of bid by the time and date specified in Section 00 11 19 (Instructions to Bidders), paragraph 1.

TO THE HONORABLE BOARD OF TRUSTEES OF THE SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT

THIS BID IS SUBMITTED BY:

_____
(Firm/Company Name)

Re: BID NUMBER [ ], THE [ ] PROJECT

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with the San Mateo County Community College District ("District") in the form included in the Contract Documents, Section 00 52 00 (Agreement), to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Sum and within the Contract Time indicated in this Bid and in accordance with all other terms and conditions of the Contract Documents.

2. Bidder accepts all of the terms and conditions of the Contract Documents, Section 00 11 13 (Advertisement for Bids), and Section 00 11 19 (Instructions to Bidders), including, without limitation, those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for [sixty (60)] Days after the day of Bid opening.

3. In submitting this Bid, Bidder represents:

   (a) Bidder has examined all of the Contract Documents and the following Addenda (receipt of all of which is hereby acknowledged).

Addendum No.	Addendum Date	Signature of Bidder

   (b) Bidder has visited the Site and performed tasks, reviews, examinations, and analysis and given notices, regarding the Project and the Site, as set forth in Section 00 52 00 (Agreement), Article 5.

   (c) Bidder has received and examined copies of the following technical specifications on District-provided, Contractor-installed equipment.
   - [PM list the specific equipment here.]

   (d) Bidder has given District prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and as-built drawings and actual conditions and the written resolution thereof through Addenda issued by District is acceptable to Contractor.

4. In submitting this Bid, Bidder represents that the value of its bid for the Work of the Contractor Documents reflects a credit for insurance coverage provided by the Owner Controlled Insurance Program.

	Signature of Bidder
Bidder's signature represents acknowledgement of OCIP credit in Bidder's bid	

5. Based on the foregoing, Bidder proposes and agrees to fully perform the Work within the time stated and in strict accordance with the Contract Documents for the following sums of money listed in the following Schedule of Bid Prices:

SCHEDULE OF BID

All Bid items must be filled in completely. Section 01 10 00 (Summary of Work) describes the scope of work to be performed under this contract. Quote in figures only, unless words are specifically requested.

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL
1.	All Work of Contract Documents other than Work separately provided for under other Bid items	XXXXXX	**[Lump Sum]**	XXXXX	$
2.	[Owner's Allowance]	XXXXXX	**10%**	Item #1	$[_____]
3.	Alternate Item No. 1 – [____] **(Recommend no more than 3 alternates AND recommend the combined total for all Alternates should not exceed 10% of the District's estimated construction cost.)**				
4.	Alternate Item No. 2 – [____] **(Recommend no more than 3 alternates AND recommend the combined total for all Alternates should not exceed 10% of the District's estimated construction cost.)**	XXXXXX	**[Lump Sum]**	XXXXX	$
5.	**Total Bid Amount** (Sum of Items 1 – 4)			LUMP SUM	$

Total Bid Price (in words): _____

5. [PM TO UPDATE- The low bidder will be determined by the sum of Bid Items #1 through 4.

6. Subcontractors for work included in all Bid items are listed on the attached Document 00 43 36 (Subcontractors List).

7. The undersigned Bidder understands that District reserves the right to reject this Bid.

8. If written notice of the acceptance of this Bid, hereinafter referred to as Notice of Award, is mailed or delivered to the undersigned Bidder within the time described in paragraph 2 of this Section 00 41 00 or at any other time thereafter before it is withdrawn, the undersigned Bidder will execute and deliver the documents required by Section 00 11 19 (Instructions to Bidders) within the times specified therein. These documents include, but are not limited to, Section 00 52 00 (Agreement), Section 00 61 00 (Construction Performance Bond), and Section 00 62 00 (Construction Labor and Material Payment Bond).

9. Notice of Award or request for additional information may be addressed to the undersigned Bidder at the address set forth below.

10. The undersigned Bidder herewith encloses cash, a cashier's check, or certified check of or on a responsible bank in the United States, or a corporate surety bond furnished by a surety authorized to do a surety business in the State of California, in form specified in Section 00 11 19 (Instructions to Bidders), in the amount of ten percent (10%) of the total of [PM TO UPDATE- example "Bid items 1 through 4"] and made payable to "San Mateo County Community College District".

11. The undersigned Bidder agrees to commence Work under the Contract Documents on the date established in Section 00 71 00 (General Conditions) and to complete all work within the time specified in Section 00 52 00 (Agreement). The undersigned Bidder acknowledges that District has reserved the right to delay or modify the commencement date. The undersigned Bidder further acknowledges District has reserved the right to perform independent work at the Site, the extent of such work may not be determined until after the opening of the Bids, and that the undersigned Bidder will be required to cooperate with such other work in accordance with the requirements of the Contract Documents.

12. The undersigned Bidder agrees that, in accordance with Section 00 71 00 (General Conditions), liquidated damages for failure to complete all Work in the Contract within the time specified shall be as set forth in Section 00 52 00 (Agreement).

13. The names of all persons interested in the foregoing Bid as principals are:

(IMPORTANT NOTICE: If Bidder or other interested person is a corporation, give the legal name of corporation, state where incorporated, and names of president and secretary thereof; if a partnership, give name of the firm and names of all individual co-partners composing the firm; if Bidder or other interested person is an individual, give first and last names in full).

NAME OF BIDDER: _____
licensed in accordance with the act for the registration of Contractors, and with
License Number: _____
Expiration: _____

_____ _____
Where incorporated, if applicable

_____

_____
Principals

I certify (or declare) under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

_____
Signature of Bidder

NOTE: If Bidder is a corporation, set forth the legal name of the corporation together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If Bidder is a partnership, set forth the name of the firm together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership.

Business Address: _____

_____

_____

Officers authorized to sign contracts: _____

_____

_____

Telephone Number(s): _____

Fax Number(s): _____

_____

E-Mail address: _____

Federal ID Number: _____

Date of Bid: _____

END OF DOCUMENT

DOCUMENT 00 43 10

INDEMNITY AND RELEASE AGREEMENT

Dated _____

POTENTIAL BIDDER: _____

DISTRICT: SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT

SITE: [_____]

PROJECT: [NAME OF PROJECT]

In consideration of the above-referenced District's permitting the undersigned potential bidder ("Bidder") to have access to, and to conduct investigations, tests and/or inspections on, the Site, Bidder hereby agrees as follows:

1. To the greatest extent permitted by law, Bidder hereby releases, and shall defend, indemnify and hold harmless District, and its officers, employees, consultants (including without limitation Consulting Architect/Engineer), representatives, and District's Representatives, and all other parties having any other interest in the Site, against any claim or liability, including attorney's fees, arising from or relating to any Site-related access, investigation, test, inspection and/or other activity conducted by Bidder or any of Bidder's officers, employees, consultants, representatives, and/or agents, regardless of whether claim or liability is caused in part by the negligence of District or by any released and indemnified party.
2. Bidder hereby waives the provisions of California Civil Code Section 1542 which provides as follows: A general release does not extend to claims that the creditor does not now or suspect to exist in his favor at the time of executing the release, which if down by him, must have materially affected his settlement with the debtor.
3. Bidder shall repair any damage to the Site or adjacent property resulting from activities authorized hereunder, and comply with and be subject to all other requirements and obligations described or referenced in Document 00 31 19 (Reports, Surveys and Existing Conditions)
4. Attached hereto (or to be delivered separately before Bidder's visit to the Site) is a certificate for comprehensive general liability insurance satisfying the requirements of Section 00 71 00 (General Conditions)
5. Although this Indemnity and Release Agreement is not a Contract document (see Document 00 52 00, Agreement), it shall be fully effective and binding regardless of whether Bidder submits a Bid for the subject Project, is awarded a contract for the Project or otherwise.

_____
Name of Bidder

By: _____
Signature

Its: _____
Title (If Corporation: Chairman, President or Vice President)

By: _____
Signature

Its: _____
Title (If Corporation: Secretary, Assistant Secretary, Chief Financial Officer or Assistant Treasurer)

END OF DOCUMENT

DOCUMENT 00 43 13

BOND ACCOMPANYING BID

KNOW ALL BY THESE PRESENTS:

That the undersigned _____ as Principal and the undersigned as Surety are held and firmly bound unto the SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT ("District"), as obligee, in the penal sum of _____ Dollars ($_____) lawful money of the United States of America being at least ten percent (10%) of the aggregate amount of said Principal _____'s base Bid, for the payment of which, well and truly to be made, we bind ourselves, our successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal is submitting a Bid for District Bid Number XXXXX, NAME OF PROJECT.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Bid submitted by the said Principal be accepted and the Contract be awarded to said Principal and said Principal shall within the required periods enter into the Contract so awarded and provide the required Construction Performance Bond, Construction Labor and Material Payment Bond, insurance certificates, and all other endorsements, forms, and documents required under Section 00 11 19 (Instructions to Bidders), then this obligation for the Bid Bond shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument this _____ day of _____, 200__.

(Corporate Seal)

By

_____
Principal

_____
Surety

(Corporate Seal)

By

_____
Attorney in Fact

END OF DOCUMENT

DOCUMENT 00 43 25

SUBSTITUTION REQUEST FORM

To: San Mateo County Community College District

Project: NAME OF PROJECT

Contractor:_____

Subcontractor/Supplier:_____

Drawing Sheet Reference/Detail No:_____

The undersigned Bidder submits for consideration the following equipment instead of the specified item for the above project:

Section	Paragraph	Specified Item
_____	_____	_____
_____	_____	_____

Proposed Substitution:_____

_____

The undersigned encloses the information required herein. If this Document 00 43 25 is being submitted by a Bidder wishing to use "or equal" item(s) as provided in Document 00 11 19 (Instructions to Bidders), the undersigned Bidder must also enclose the technical information (other than cost) otherwise required for a post-Award of Contract Request for Substitution ("RFS") under Section 01 60 00 (Product Requirements). However, if this Document 00 43 25 is being submitted under provisions of Contract Documents after Award of Contract, the undersigned Contractor must include all information required under Section 01 60 00 (Product Requirements).

The undersigned has (a) attached manufacturer's literature, including complete technical data and laboratory test results, if applicable, (b) attached an explanation of why proposed substitution is a true equivalent to specified item, (c) included complete information on changes to Drawings and Specifications that the proposed substitution will require for its proper installation, and (d) filled in the blanks below:

A. Does the substitution affect dimensions shown on Drawings?

_____

B. Are the manufacturer's guarantees and warranties on the proposed substitution items identical to those on the specified items? If there are differences, please specify each and every difference in detail.

_____

C. What effect does the substitution have on other contractors, trades, or suppliers?

_____

D. What are the differences between the proposed substitution and the specified item? If proposed substitution has a color or pattern, provide a color board showing proposed substitution in relation to the other adjacent colors and patterns.

_____

E. Will granting the requested substitution cause any schedule delay? (If yes, please explain)

_____

The undersigned Bidder certifies that the function, appearance, and quality of the proposed substitution are equivalent or superior to those of the specified item. The contractor shall be responsible for all engineering, permitting, coordination, construction, and costs to all subcontractors associated with the acceptance of the substitution regardless of when those additional costs are identified.

Submitted by:

_____
Bidder/Contractor
[note applicable]

_____
Signature

_____
Name

_____
Address

_____
City/State/Zip

Telephone: _____

Date: _____

For Use by District:

_____ Accepted _____Accepted as Noted

_____ Not Accepted _____Received Too Late

By: _____
District's Representative

Date: _____

Remarks: _____

_____

_____

_____

END OF DOCUMENT

DOCUMENT 00 43 33

SCHEDULE OF MAJOR EQUIPMENT AND MATERIAL SUPPLIERS TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID

The undersigned Bidder represents that, if awarded the Contract, the items of major equipment and materials specified below will be supplied by the manufacturers or suppliers specified below. By so indicating, bidder warrants that the equipment and materials manufacturer and/or supplied by the named manufacturer or supplier will be provided on the Project.

Firm/Company:_____

Item	Manufacturer or Supplier
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
12. _____	_____

Bidder: _____

_____
SIGNATURE

_____
DATE

END OF DOCUMENT

DOCUMENT 00 43 36

SUBCONTRACTORS LIST
TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID

Bidder submits the following information as to the subcontractors Bidder intends to employ if awarded the Contract.

Full Name of Subcontractor and Address	Description of Work: Reference To Bid Items	Subcontractor's License No.

(Bidder to attach additional sheets if necessary)

END OF DOCUMENT

DOCUMENT 00 43 45

ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

P.C.C. §22300

THIS ESCROW AGREEMENT ("Escrow Agreement") is made and entered into this _____ day of _____, 200[_], by and between the SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT (hereinafter called the "District"), whose address is 3401 CSM Drive, San Mateo, California 94402; _____ ("Contractor"), whose place of business is located at _____; and **[District, as escrow agent ...OR... [_____]**, a state or federally chartered bank in the State of California, whose place of business is located at _____] ("Escrow Agent").

For the consideration hereinafter set forth, District, Contractor and Escrow Agent agree as follows:

1. Pursuant to Section 22300 of Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by District pursuant to Contract Number [____] entered into between District and Contractor for THE [_____] PROJECT in the amount of [_____] dated [_____] (the "Contract"). Alternatively, on written request of Contractor, District shall make payments of the retention earnings directly to Escrow Agent. When Contractor deposits the securities as a substitute for Contract earnings, Escrow Agent shall notify District within ten (10) Days of the deposit. The market value of the securities at the time of substitution shall be at least equal to the cash amount then required to be withheld as retention under terms of Contract between District and Contractor. Securities shall be held in name of _____, and shall designate Contractor as the beneficial owner.

2. District shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified in paragraph 1 of this Document 00 43 45.

3. When District makes payment(s) of retention earned directly to Escrow Agent, Escrow Agent shall hold said payment(s) for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when District pays Escrow Agent directly.

4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account, and all expenses of District. Such expenses and payment terms shall be determined by District, Contractor, and Escrow Agent.

5. Interest earned on securities or money market accounts held in escrow and all interest earned on that interest shall be for sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to District.

6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from District to Escrow Agent that District consents to withdrawal of amount sought to be withdrawn by Contractor.

7. District shall have the right to draw upon the securities in event of default by Contractor. Upon seven (7) Days written notice to Escrow Agent from District of the default, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by District.

8. Upon receipt of written notification from District certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The

escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.

9. Escrow Agent shall rely on written notifications from District and Contractor pursuant to paragraphs 5 through 8, inclusive, of this Document 00 43 45 and District and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth.

10. Names of persons who are authorized to give written notice or to receive written notice on behalf of District and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of District:

James W. Keller
Executive Vice Chancellor
or
Kathy Blackwood
Chief Financial Officer

3401 CSM Drive
San Mateo, CA 94402

On behalf of Contractor:

Signature

Name

Title

Address

City/State/Zip

On behalf of Escrow Agent:

Title

Name

Signature

Address

City/State/Zip

At the time the Escrow Account is opened, District and Contractor shall deliver to Escrow Agent a fully executed counterpart of this Document 00 43 45.

IN WITNESS WHEREOF, the parties have executed this Escrow Agreement by their proper officers on the date first set forth above.

District:

James W. Keller
Executive Vice Chancellor
or
Kathy Blackwood
Chief Financial Officer

_____
Signature

3401 CSM Drive
San Mateo, CA 94402

Contractor:

_____
Title

_____
Name

_____
Signature

_____
Address

_____
City/State/Zip

Escrow Agent:

_____
Title

_____
Name

_____
Signature

_____
Address

_____
City/State/Zip

END OF DOCUMENT

DOCUMENT 00 45 00

BIDDER CERTIFICATIONS
TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID

The undersigned Bidder certifies to the San Mateo Community College District ("District"), as set forth in sections 1 through 7 below.

1. CERTIFICATE OF NON-DISCRIMINATION

By my signature hereunder, on behalf of the Bidder making this Bid, the undersigned certifies that there will be no discrimination in employment with regard to race, color, religion, gender, sexual orientation, or national origin; that all federal, state, and local directives and executive orders regarding non-discrimination in employment will be complied with; and that the principle of equal opportunity in employment will be demonstrated positively and aggressively.

2. STATEMENT OF CONVICTIONS

By my signature hereunder, I hereby swear, under penalty of perjury, that no more than 1 final, unappealable finding of contempt of court by a Federal Court has been issued against Bidder within the past 2 years because of failure to comply with an order of a Federal Court or to comply with an order of the National Labor Relations Board.

3. PREVIOUS DISQUALIFICATIONS

By my signature hereunder, I hereby swear, under penalty of perjury, that the below indicated Bidder, any officer of such Bidder, or any employee of such Bidder who has a proprietary interest in such Bidder, has never been disqualified, removed or otherwise prevented from bidding on, or completing a Federal, State, or local government project because of a violation of law or a safety regulation except as indicated on the separate sheet attached hereto entitled "Previous Disqualifications." If such exceptions are attached, please explain the circumstances.

4. CERTIFICATION OF WORKER'S COMPENSATION INSURANCE

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract.

5. CERTIFICATION OF PREVAILING WAGE RATES AND RECORDS

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Section 1773 of the Labor Code, which requires the payment of prevailing wage on public projects. Also, that the Contractor and any subcontractors under the Contractor shall comply with Section 1776, regarding wage records, and with Section 1777.5, regarding the employment and training of apprentices, of the Labor Code. It is the Contractor's responsibility to ensure compliance by any and all subcontractors performing work under this Contract.

6. CERTIFICATION OF ADEQUACY OF CONTRACT AMOUNT

By my signature hereunder, as the Contractor, pursuant to Labor Code Section 2810(a), I certify that, if awarded the Contract based on the undersigned's Bid, the Contract will include funds sufficient to allow the Contractor to comply with all applicable local, state, and federal laws or regulations governing the labor or services to be provided. I understand that the District will be relying on this certification if it awards the Contract to the undersigned.

7. CERTIFICATION OF STATEMENT OF QUALIFICATIONS

Check and complete one:

_____ There are changes to my Statement of Qualifications submitted to the District on _____, 20__ , which are set forth on Attachment 7, attached hereto.

_____ There are no changes to any items in my Statement of Qualifications submitted to the District on _____, 20__ .

Bidder: _____
[Name of Bidder]

By: _____
[Signature]

Name: _____
[Printed Name]

Its: _____
[Title]

Dated: _____

END OF DOCUMENT

Attachment 7

Changes to Statement of Qualifications

[insert, if applicable]

DOCUMENT 00 45 14

KEY PERSONNEL
TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID

The Contractor for the Project has committed the following personnel to the Project. All of these personnel were prequalified with the Contractor (in Contractor's Statement of Qualifications, upon which the Contractor's status of "Prequalified to Bid on Projects with San Mateo County Community College District" is based) except as otherwise indicated. Resumes are attached for all non-prequalified personnel. All non-prequalified personnel are subject to approval from the District. Also, the Contractor acknowledges that any changes from the committed personnel are subject to pre-approval from the District. Contractor understands that Notice to Proceed may not be issued until all applicable personnel have been approved.

Project Manager: _____
(Please print)

Superintendent: _____
(Please print)

END OF DOCUMENT

DOCUMENT 00 45 19

NON-COLLUSION AFFIDAVIT
TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID
PUBLIC CONTRACT CODE §7106

NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

STATE OF CALIFORNIA)
) ss.
COUNTY OF _____)

[_____], being first duly sworn, deposes and says that he or she is _____ **[Office of Affiant]** of _____ **[Name of Bidder]**, the party making the foregoing Bid, that the Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the Bid is genuine and not collusive or sham; that Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham Bid, and has not directly or indirectly colluded, conspired, connived or agreed with any bidder or anyone else to put in a sham Bid, or that anyone shall refrain from bidding, and that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the Bid price of Bidder or any other bidder, or to fix any overhead, profit or cost element of the Bid price, or of that of any other bidder, or to secure any advantage against the San Mateo Community College District, or anyone interested in the proposed contract; that all statements contained in the Bid are true; and further, that Bidder has not, directly or indirectly, submitted its Bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, Bid depository, or to any member or agent thereof to effectuate a collusive or sham Bid.

Executed under penalty of perjury under the laws of the State of California:

_____
(Name of Bidder)

_____
(Signature of Principal)

Subscribed and sworn before me _____

This _____ day of _____, 20___

Notary Public of the State of _____
In and for the County of_____
My Commission expires_____ (Seal)

(If Bidder is a partnership or a joint venture, this affidavit must be signed and sworn to by every member of the partnership or venture.)

(If Bidder [including any partner or venturer of a partnership or joint venture] is a corporation, this affidavit must be signed by the Chairman, President, or Vice President and by the Secretary, Assistant Secretary, Chief Financial Officer, or Assistant Treasurer.)

(If Bidder's affidavit on this form is made outside the State of California, the official position of the person taking such affidavit shall be certified according to law.)

END OF DOCUMENT

DOCUMENT 00 50 00

NOTICE TO PROCEED

Dated: _____, 20__

To: _____
(Contractor)

Address: _____

_____

CONTRACT FOR:

BID NUMBER [___]
THE [_____] PROJECT

You are notified that the Contract Time under the above Contract will commence to start on _____ 20___. Contractor shall achieve Substantial Completion of the entire Work within [___] days from the date when the Contract Time commences. Contractor shall achieve Final Completion within **45** days from the date of acceptance of Substantial Completion.

Before you may start any Work at the Site, you must:

1. Submit certified Safety Program and related information, and comply with all requests of/by **José Nuñez**, the District's safety officer.
2. Submit copies of applicable permits.
3. Submit approved fire protection plan, as required. (Required for all modernization and remodel projects.)
4. Attend preconstruction conference. The preconstruction conference shall be arranged by the Construction Manager.
5. **[add more conditions, if any]**

SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT

By : _____
Project Manager Name
Title

END OF DOCUMENT

DOCUMENT 00 51 00

NOTICE OF AWARD

[PMs UPDATE PARAGRAPHS 1 & 2 ON A PROJECT BY PROJECT BASIS.]

Dated _____

TO: _____

ADDRESS: _____

CONTRACT NO.: _____

CONTRACT FOR:

THE_____PROJECT

The Contract Sum of your contract is _____ Dollars ($_____).

1. Three copies of each of the proposed Contract Documents (except Specifications and Drawings) accompany this Notice of Award. Three sets of Specifications and Drawings will be delivered separately or otherwise made available to you immediately.

2. You must comply with the following conditions by 4:00 p.m. on **[___day_____], [____date____]**.

   a. Deliver to District two fully executed counterparts of Section 00 52 00 (Agreement).
   b. Deliver to District one original Section 00 61 00 (Construction Performance Bond), executed by you and your surety.
   c. Deliver to District one original Section 00 62 00 (Construction Labor and Material Payment Bond), executed by you and your surety.
   d. Deliver to District one original set of the insurance certificates with endorsements required under Section 00 71 00 (General Conditions) and Section 00 73 17 (Insurance), along with one original copy of the OCIP Contractor Enrollment Form.
   e. Deliver to District two original copies of Section 00 65 36 (Guaranty), each executed by you.
   f. Project Stabilization Agreement Letter of Assent as set forth in Section 01 35 27 (Project Labor Agreement). Submit one original.

3. Failure to comply with these conditions within the time specified will entitle District to consider your Bid abandoned, to annul this Notice of Award, and to declare your Bid security forfeited.

4. Within ten (10) Days after you comply with the conditions in paragraph 2 of this Section 00 51 00, District will return to you one fully signed counterpart of Section 00 52 00 (Agreement) with the Contract Documents.

5. Upon commencement of the Work, you and each of your Subcontractors shall certify and make available for inspection payroll records on forms provided by the Division of Labor Standards Enforcement, in accordance with Section 1776 of the California Labor Code.

6. Send all of the required above listed items to [insert address], to the attention of [insert point of contact].

SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT ("District")

BY: _____

Project Manager Name

Construction Planning Department

END OF DOCUMENT

DOCUMENT 00 51 01

NOTICE OF INTENT TO AWARD FOR CONSTRUCTION

DATE POSTED: _____

BID NUMBER: _____-__

PROJECT TITLE: [_ _____] **PROJECT**

Ron Galatolo, the Chancellor of the San Mateo County Community College District, intends to recommend to the Board of Trustees of the San Mateo County Community College District on [date __] the award of the above-referenced project to (Name of Contractor)[_____].

If approved, a formal Notice of Award will be issued.

SIGNATURE _____ DATE _____

[_____]
[Name]

[_____]
[Title]

SWINERTON MANAGEMENT & CONSULTING

END OF DOCUMENT

DOCUMENT 00 52 00

AGREEMENT

THIS AGREEMENT, dated this _____ day of _____, 20____ , by and between _____ **[Name of Contractor]** whose place of business is located at _____, _____ **[Address of Contractor]** ("Contractor"), and the SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT ("District") acting under and by virtue of the authority vested in the District by the laws of the State of California.

WHEREAS, District, by action of its Board of Trustees on the _____day of _____, 200X awarded to Contractor the following contract:

BID NUMBER [___]
THE [_____] PROJECT

NOW, THEREFORE, in consideration of the mutual covenants hereinafter set forth, Contractor and District agree as follows:

Article 1. Work

1.1 Contractor shall complete all Work specified in the Contract Documents, in accordance with the Specifications, Drawings, and all other terms and conditions of the Contract Documents.

Article 2. District's Representative, Architect/Engineer and Construction Manager

2.1 District has designated [editable] to act as District's Representative(s), who will represent District in performing District's duties and responsibilities and exercising District's rights and authorities in Contract Documents. District may change the individual(s) acting as District's Representative(s), or delegate one or more specific functions to one or more specific District's Representatives, including without limitation engineering, architectural, inspection and general administrative functions, at any time with notice and without liability to Contractor. Each District's Representative is the beneficiary of all Contractor obligations to District, including without limitation, all releases and indemnities.

2.2 District has designated [editable] to act as Construction Manager. District may assign all or part of the District Representative's rights, responsibilities and duties to Construction Manager. District may change the identity of the Construction Manager at any time with notice and without liability to Contractor.

2.3 District has designated [editable] to act as Architect/Engineer. District may change the identity of the Architect/Engineer at any time with notice and without liability to Contractor. All notices or demands to District under the Contract Documents shall be submitted to the District's Representative at:

[Name of Department, Outsourced Firm] – Construction Manager

[Name of Project, Campus, Bldg, Room, Description]

1700 W. Hillsdale Blvd, Building 6

San Mateo, CA 94402

or to such other person(s) and address(es) as District shall provide to Contractor.

Article 3. Contract Time and Liquidated Damages

3.1 Contract Time.

Contractor shall commence Work at the Site on the date established in the Notice to Proceed. District reserves the right to modify or alter the Commencement Date of the Work.

[PM- Consider interim milestones and add here if possible.]

Contractor shall achieve Substantial Completion of the entire Work within [___] days from the date when the Contract Time commences to run as provided in Section 00 71 00 (General Conditions). Contractor shall achieve Final Completion of the entire Work and be ready for Final Payment in accordance with Section 01 77 00 (Contract Closeout) within [45] days from the date of acceptance of Substantial Completion to run as provided in Section 00 71 00 (General Conditions).

3.2 Liquidated Damages.

District and Contractor recognize that time is of the essence of this Agreement and that District will suffer financial loss in the form of contract administration expenses (such as project management and consultant expenses), if all or any part of the Work is not completed including consequential loss of use and disruption of normal operations within the times specified above, plus any extensions thereof allowed in accordance with the Contract Documents. Consistent with Article 15 of Section 00 71 00 (General Conditions), Contractor and District agree that because of the nature of the Project, it would be impractical or extremely difficult to fix the amount of actual damages incurred by District because of a delay in completion of all or any part of the Work. Accordingly, District and Contractor agree that as liquidated damages for delay Contractor shall pay District:

3.2.1 **[$1000 – PM TO ADJUST PER PROJECT]** for each Day that expires after the time specified herein for Contractor to achieve Substantial Completion of the entire Work, until achieved.

3.2.2 **[$500– PM TO ADJUST PER PROJECT]** for each Day that expires after the time specified herein for Contractor to achieve Final Completion of the entire Work, until achieved.

[PM- Include LDs for interim milestones listed in 3.1 to the work as appropriate to the contract.]

These measures of liquidated damages shall apply cumulatively and except as provided below, shall be presumed to be the damages suffered by District resulting from delay in completion of the Work.

3.3 Liquidated damages for delay shall only cover administrative, overhead, interest on bonds, and general loss of public use damages suffered by District as a result of delay or costs of substitute facilities. Liquidated damages shall not cover the cost of completion of the Work, damages resulting from defective Work, lost revenues or damages suffered by others who then seek to recover their damages from District (for example, delay claims of other contractors, subcontractors, tenants, or other third-parties), and defense costs thereof.

Article 4. Contract Sum

4.1 District shall pay Contractor the Contract Sum for completion of Work in accordance with Contract Documents as follows:

[PM- WILL ENTER FINAL CONTRACT AWARD PRICE HERE]

Article 5. Contractor's Representations

In order to induce District to enter into this Agreement, Contractor makes the following representations and warranties:

5.1 Contractor has visited the Site and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as-built conditions, and all local conditions, and federal, State and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto.

5.2 Contractor has examined thoroughly and understood all reports of exploration and tests of subsurface conditions, as-built drawings, drawings, products specifications or reports, available for Bidding purposes, of physical conditions, including Underground Facilities, which are identified in Document 00 31 19 (Reports, Surveys and Existing Conditions), or which may appear in the Drawings. Contractor accepts the determination set forth in these Sections and Section 00 71 00 (General Conditions) of the extent of the information contained in such materials upon which Contractor may be entitled to rely.

5.3 Contractor has correlated its knowledge and its review of those items with the terms and conditions of the Contract Documents.

5.4 Contractor has given District prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and the written resolution thereof through Addenda issued by District is acceptable to Contractor.

5.5 Contractor is duly organized, existing and in good standing under applicable state law, and is duly qualified to conduct business in the State of California.

5.6 Contractor has duly authorized the execution, delivery and performance of this Agreement, the other Contract Documents and the Work to be performed herein. The Contract Documents do not violate or create a default under any instrument, agreement, order or decree binding on Contractor.

5.7 Contractor has listed the following Subcontractors pursuant to the Subcontractor Listing Law, California Public Contracting Code §4100 et seq.

[PM- TYPE IN SUBCONTRACTOR LIST USING TABLE BELOW]

Name of Subcontractor and Location of Mill or Shop	Description of Work: Reference To Bid Items	Subcontractor's License No.

Article 6. Contract Documents

6.1 Contract Documents consist of the following Sections, including all changes, addenda, and modifications thereto:

Document 00 51 00	Notice of Award
Document 00 52 00	Agreement
Document 00 50 00	Notice to Proceed
Document 00 61 00	Construction Performance Bond
Document 00 62 00	Construction Labor and Material Payment Bond
Document 00 65 36	Guaranty
Document 00 65 73	Agreement and Release of Any and All Claims
Document 00 43 25	Substitution Request Form
Document 00 43 45	Escrow Agreement for Security Deposit in Lieu of Retention
Section 00 71 00	General Conditions
Section 00 73 00	Supplementary Conditions
Section 00 73 04	Supplementary Conditions – Naturally Occurring Asbestos (if included)
Section 00 73 05	Supplementary Conditions – Hazardous Materials (if included)
Section 00 73 17	Insurance
Section 00 73 37	Apprenticeship Program
Section 00 91 00	Addenda
Section 01 32 16	Progress Schedules and Reports

Document 00 01 15 Drawings as listed and referenced
Divisions 01- [PM IF NECESSARY ENTER ADDITIONAL SECTIONS HERE. THIS CHANGE IS RARELY ALLOWED AND IS NOT RECOMMENDED. IF YOU THINK THIS IS NECESSARY PLEASE EXPLAIN REASONING TO EXECUTIVE DIR. OF CONSTRUCTION PLANNING

6.2 There are no Contract Documents other than those listed in this Document 00 52 00, Article 6. Document 00 31 19 (Reports, Surveys and Existing Conditions), and the information supplied therein, are not Contract Documents. The Contract Documents may only be amended, modified or supplemented as provided in Section 00 71 00 (General Conditions).

Article 7. Miscellaneous

7.1 Terms used in this Agreement are defined in Section 00 71 00 (General Conditions) and Section 01 42 00 (References and Definitions) and will have the meaning indicated therein.

7.2 It is understood and agreed that in no instance are the persons signing this Agreement for or on behalf of District or acting as an employee, agent, or representative of District, liable on this Agreement or any of the Contract Documents, or upon any warranty of authority, or otherwise, and it is further understood and agreed that liability of the District is limited and confined to such liability as authorized or imposed by the Contract Documents or applicable law.

7.3 Contractor shall not assign any portion of the Contract Documents, and may subcontract portions of the Contract Documents only in compliance with the Subcontractor Listing Law, California Public Contracting Code §4100 *et seq*.

7.4 In entering into a public works contract or a subcontract to supply goods, services or materials pursuant to a public works contract, Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. §15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time District tenders final payment to Contractor, without further acknowledgment by the parties.

7.5 Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are available through the Department of Industrial Relations and are deemed included in the Contract Documents by reference. See http://www.dir.ca.gov/dirdatabases.html Upon request, District will make available copies to any interested party. Pursuant to Section 1861 of the Labor Code, Contractor represents that it is aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor shall comply with such provisions before commencing the performance of the Work of the Contract Documents. In addition, Contractor shall post the applicable prevailing wage rates at the Site.

7.6 Contractor and each of Contractor's subcontractors agrees to complete and verify construction reports on a form prescribed by the Division of the State Architect and to file the reports no less than quarterly during construction as required by Title 24; at the completion of the Work; at the suspension of work for a period of more than one month; whenever the services of Contractor or any of Contractor's subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect.

7.7 Should any part, term or provision of this Agreement or any of the Contract Documents, or any document required herein or therein to be executed or delivered, be declared invalid, void or unenforceable, all

remaining parts, terms and provisions shall remain in full force and effect and shall in no way be invalidated, impaired or affected thereby. If the provisions of any law causing such invalidity, illegality or unenforceability may be waived, they are hereby waived to the end that this Agreement and the Contract Documents may be deemed valid and binding agreements, enforceable in accordance with their terms to the greatest extent permitted by applicable law. In the event any provision not otherwise included in the Contract Documents is required to be included by any applicable law, that provision is deemed included herein by this reference (or, if such provision is required to be included in any particular portion of the Contract Documents, that provision is deemed included in that portion).

7.8 This Agreement and the Contract Documents shall be deemed to have been entered into in the County of San Mateo, State of California, and governed in all respects by California law (excluding choice of law rules). The exclusive venue for all disputes or litigation hereunder shall be in San Mateo County. Contractor accepts the Claims Procedure in Section 00 71 00, Article 12, established under the California Government Code, Title 1, Division 3.6, Part 3, Chapter 5.

IN WITNESS WHEREOF the parties have executed this Agreement in duplicate the day and year first above written.

DISTRICT:

SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT

By: _____
James W. Keller
Executive Vice Chancellor

CONTRACTOR:

_____
[Contractor's name]

By: _____
Signature

END OF DOCUMENT

DOCUMENT 00 61 00

CONSTRUCTION PERFORMANCE BOND

THIS CONSTRUCTION PERFORMANCE BOND ("Bond") is dated _____, is in the penal sum of _____ _____ [which is one hundred percent of the Contract Price], and is entered into by and between the parties listed below to ensure the faithful performance of the Construction Contract listed below. This Bond consists of this page and the Bond Terms and Conditions, paragraphs 1 through 12, attached to this page. Any singular reference to _____ ("Contractor"), _____ ("Surety"), San Mateo County Community College District ("District") or other party shall be considered plural where applicable.

CONTRACTOR:

_____
Name

_____
Address

_____
City/State/Zip

SURETY:

_____
Name

_____
Principal Place of Business

_____
City/State/Zip

CONSTRUCTION CONTRACT:

THE [_____] PROJECT
BID NUMBER [___]

at San Mateo, California.

DATED _____, 20____ in the Amount of $_____ (the "Penal Sum")

CONTRACTOR AS PRINCIPAL
Company: (Corp. Seal)

Signature:_____

Name and Title: _____
_____

SURETY
Company: (Corp. Seal)

Signature: _____

Name and Title:_____
_____

BOND TERMS AND CONDITIONS

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to District for the complete and proper performance of the Construction Contract, which is incorporated herein by reference.

2. If Contractor completely and properly performs all of its obligations under the Construction Contract, Surety and Contractor shall have no obligation under this Bond.

3. If there is no District Default, Surety's obligation under this Bond shall arise after:

   3.1 District has declared a Contractor Default under the Construction Contract pursuant to the terms of the Construction Contract; and

   3.2 District has agreed to pay the Balance of the Contract Sum:

3.2.1 To Surety in accordance with the terms of this Bond and the Construction Contract; or

3.2.2 To a contractor selected to perform the Construction Contract in accordance with the terms of this Bond and the Construction Contract.

4. When District has satisfied the conditions of paragraph 3, Surety shall promptly (within 30 days) and at Surety's expense elect to take one of the following actions:

4.1 Arrange for Contractor, with consent of District, to perform and complete the Construction Contract (but District may withhold consent, in which case the Surety must elect an option described in paragraphs 4.2, 4.3 or 4.4, below); or

4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; provided, that Surety may not select Contractor as its agent or independent contractor without District's consent; or

4.3 Undertake to perform and complete the Construction Contract by obtaining bids from qualified contractors acceptable to District for a contract for performance and completion of the Construction Contract, and, upon determination by District of the lowest responsible bidder, arrange for a contract to be prepared for execution by District and the contractor selected with District's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract; and, if Surety's obligations defined in paragraph 6, below, exceed the Balance of the Contract Sum, then Surety shall pay to District the amount of such excess; or

4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances, and, after investigation and consultation with District, determine in good faith its monetary obligation to District under paragraph 6, below, for the performance and completion of the Construction Contract and, as soon as practicable after the amount is determined, tender payment therefore to District with full explanation of the payment's calculation. If District accepts Surety's tender under this paragraph 4.4, District may still hold Surety liable for future damages then unknown or unliquidated resulting from the Contractor Default. If District disputes the amount of Surety's tender under this paragraph 4.4, District may exercise all remedies available to it at law to enforce Surety's liability under paragraph 6, below.

5. If Surety does not proceed as provided in paragraph 4, above, then Surety shall be deemed to be in default on this Bond ten (10) days after receipt of an additional written notice from District to Surety demanding that Surety perform its obligations under this Bond. At all times District shall be entitled to enforce any remedy available to District at law or under the Construction Contract including, without limitation, and by way of example only, rights to perform work, protect work, mitigate damages, advance critical work to mitigate schedule delay, or coordinate work with other consultants or contractors.

6. Surety's monetary obligation under this Bond is limited by the Amount of this Bond identified herein as the Penal Sum. This monetary obligation shall augment the Balance of the Contract Sum. Subject to these limits, Surety's obligations under this Bond are commensurate with the obligations of Contractor under the Construction Contract. Surety's obligations shall include, but are not limited to:

6.1 The responsibilities of Contractor under the Construction Contract for completion of the Construction Contract and correction of defective work;

6.2 The responsibilities of Contractor under the Construction Contract to pay liquidated damages, and for damages for which no liquidated damages are specified in the Construction Contract, actual damages caused by non-performance of the Construction Contract including, but not limited to, all valid and proper back charges, offsets, payments, indemnities, or other damages;

6.3 Additional legal, design professional and delay costs resulting from Contractor Default or resulting from the actions or failure to act of the Surety under paragraph 4, above (but excluding attorney's fees incurred to enforce this Bond).

7. No right of action shall accrue on this Bond to any person or entity other than District or its successors or assigns.

8. Surety hereby waives notice of any change, alteration or addition to the Construction Contract or to related subcontracts, purchase orders and other obligations, including changes of time. Surety consents to all terms of the Construction Contract, including provisions on changes to the Contract. No extension of time, change, alteration, modification, deletion, or addition to the Contract Documents, or of the work required there under, shall release or exonerate Surety on this Bond or in any way affect the obligations of Surety on this Bond.

9. Any proceeding, legal or equitable, under this Bond shall be instituted in any court of competent jurisdiction where a proceeding is pending between District and Contractor regarding the Construction Contract, or in the courts of the County of San Mateo, or in a court of competent jurisdiction in the location in which the work is located. Communications from District to Surety under paragraph 3.1 of this Bond shall be deemed to include the necessary agreements under paragraph 3.2 of this Bond unless expressly stated otherwise.

10. All notices to Surety or Contractor shall be mailed or delivered (at the address set forth on the signature page of this Bond), and all notices to District shall be mailed or delivered as provided in Document 00 52 00 (Agreement). Actual receipt of notice by Surety, District or Contractor, however accomplished, shall be sufficient compliance as of the date received at the foregoing addresses.

11. Any provision in this Bond conflicting with any statutory or regulatory requirement shall be deemed deleted here from and provisions conforming to such statutory requirement shall be deemed incorporated herein.

12. Definitions.

12.1 Balance of the Contract Sum: The total amount payable by District to Contractor pursuant to the terms of the Construction Contract after all proper adjustments have been made under the Construction Contract, for example, deductions for progress payments made, and increases/decreases for approved modifications to the Construction Contract.

12.2 Construction Contract: The agreement between District and Contractor identified on the signature page of this Bond, including all Contract Documents and changes thereto.

12.3 Contractor Default: Material failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract including, but not limited to, "default" or any other condition allowing a termination for cause as provided in Section 00 71 00 (General Conditions).

12.4 District Default: Material failure of District, which has neither been remedied nor waived, to pay Contractor progress payments due under the Construction Contract or to perform other material terms of the Construction Contract, if such failure is the cause of the asserted Contractor Default and is sufficient to justify Contractor termination of the Construction Contract.

END OF DOCUMENT

DOCUMENT 00 62 00

CONSTRUCTION LABOR AND MATERIAL PAYMENT BOND

THIS CONSTRUCTION LABOR AND MATERIAL PAYMENT BOND ("Bond") is dated _____, is in the penal sum of

_____ [one hundred percent of the Contract Price], and is entered into by and between the parties listed below to ensure the payment of claimants under the Construction Contract listed below. This Bond consists of this page and the Bond Terms and Conditions, paragraphs 1 through 13, attached to this page. Any singular reference to _____ ("Contractor"), _____ ("Surety"), the San Mateo County Community College District ("District") or other party shall be considered plural where applicable.

CONTRACTOR:	SURETY:
_____	_____
Name	Name
_____	_____
Address	Principal Place of Business
_____	_____
City/State/Zip	City/State/Zip

CONSTRUCTION CONTRACT:

THE [_____] PROJECT
BID NUMBER [___]

at San Mateo, California.

DATED _____, 20____ in the Amount of $_____(the "Penal Sum")

CONTRACTOR AS PRINCIPAL	SURETY
Company: (Corp. Seal)	Company: (Corp. Seal)
Signature:_____	Signature: _____
Name and Title: _____	Name and Title:_____
_____	_____

BOND TERMS AND CONDITIONS

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to District and to Claimants, to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.

2. With respect to District, this obligation shall be null and void if Contractor:

   2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants; and

   2.2 Defends, indemnifies and holds harmless District from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Construction Contact, provided District has promptly notified Contractor and Surety (at the address set forth on the signature page of this Bond) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to Contractor and Surety, and provided there is no District Default.

3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly through its Subcontractors, for all sums due Claimants. If Contractor or its Subcontractors, however, fail to pay any of the persons named in Section 3181 of the California Civil Code, or amounts due under the Unemployment Insurance Code with respect to Work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of Contractor or Subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such Work and labor, then Surety shall pay for the same, and also, in case suit is brought upon this Bond, a reasonable attorney's fee, to be fixed by the court.

4. Consistent with the California Mechanic's Lien Law, Civil Code §3082, *et seq.*, Surety shall have no obligation to Claimants under this Bond unless the Claimant has satisfied all applicable notice requirements.

5. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety under this Bond.

6. Amounts due Contractor under the Construction Contract shall be applied first to satisfy claims, if any, under any Construction Performance Bond and second, to satisfy obligations of Contractor and Surety under this Bond.

7. District shall not be liable for payment of any costs, expenses, or attorney's fees of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

8. Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations. Surety further hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Construction Contract, or to the Work to be performed there under, or materials or equipment to be furnished there under or the Specifications accompanying the same, shall in any way affect its obligations under this Bond, and it does hereby waive any requirement of notice or any such change, extension of time, alteration or addition to the terms of the Construction Contract or to the Work or to the Specifications or any other changes.

9. Suit against Surety on this Bond may be brought by any Claimant, or its assigns, at any time after the Claimant has furnished the last of the labor or materials, or both, but, per Civil Code §3249, must be commenced before the expiration of six months after the period in which stop notices may be filed as provided in Civil Code §3184.

10. All notices to Surety or Contractor shall be mailed or delivered (at the address set forth on the signature page of this Bond), and all notices to District shall be mailed or delivered as provided in Document 00 52 00 (Agreement). Actual receipt of notice by Surety, District or Contractor, however accomplished, shall be sufficient compliance as of the date received at the foregoing addresses.

11. This Bond has been furnished to comply with the California Mechanic's Lien Law including, but not limited to, Civil Code §§3247, 3248, *et seq.* Any provision in this Bond conflicting with said statutory requirements shall be deemed deleted here from and provisions conforming to such statutory or other legal requirements shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

13. Definitions.

    13.1 Claimant: An individual or entity having a direct contract with Contractor or with a Subcontractor of Contractor to furnish labor, materials or equipment for use in the performance of the Contract,

as further defined in California Civil Code §3181. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's Subcontractors, and all other items for which a stop notice might be asserted. The term Claimant shall also include the Unemployment Development Department as referred to in Civil Code §3248(b).

13.2 Construction Contract: The agreement between District and Contractor identified on the signature page of this Bond, including all Contract Documents and changes thereto.

13.3 District Default: Material failure of District, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract, provided that failure is the cause of the failure of Contractor to pay the Claimants and is sufficient to justify termination of the Construction Contract.

END OF DOCUMENT

DOCUMENT 00 65 36

GUARANTY

TO THE SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT for construction of

THE [_____] PROJECT

SAN MATEO, CALIFORNIA.

The undersigned guarantees all construction performed on this Project and also guarantees all material and equipment incorporated therein.

Contractor hereby grants to District for a period of one year following the date of Notice of Completion, or such longer period specified in the Contract Documents, its unconditional warranty of the quality and adequacy of all of the Work including, without limitation, all labor, materials and equipment provided by Contractor and its Subcontractors of all tiers in connection with the Work.

Neither final payment nor use or occupancy of the Work performed by the Contractor shall constitute an acceptance of Work not done in accordance with this Guaranty or relieve Contractor of liability in respect to any express warranties or responsibilities for faulty materials or workmanship. Contractor shall remedy any defects in the Work and pay for any damage resulting therefrom, which shall appear within one year, or longer if specified, from the date of Final Completion.

If within one year after the date of Final Completion, or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents, any Work is found to be defective, Contractor shall promptly, without cost to District and in accordance with District's written instructions, correct such defective Work. Contractor shall remove any defective Work rejected by District and replace it with Work that is not defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, District may have the defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct defective Work, or defects are discovered outside the correction period, District shall have all rights and remedies granted by law.

Inspection of the Work shall not relieve Contractor of any of its obligations under the Contract Documents. Even though equipment, materials, or Work required to be provided under the Contract Documents have been inspected, accepted, and estimated for payment, Contractor shall, at its own expense, replace or repair any such equipment, material, or Work found to be defective or otherwise not to comply with the requirements of the Contract Documents up to the end of the guaranty period.

All abbreviations and definitions of terms used in this Agreement shall have the meanings set forth in the Contract Documents, including, without means of limitation, Section 01 42 00 (References and Definitions). The foregoing Guaranty is in addition to any other warranties of Contractor contained in the Contract Documents, and not in lieu of, any and all other liability imposed on Contractor under the Contract Documents and at law with respect to Contractor's duties, obligations, and performance under the Contract Documents. In the event of any conflict or inconsistency between the terms of this Guaranty and any warranty or obligation of the Contractor under the Contract Documents or at law, such inconsistency or conflict shall be resolved in favor of the higher level of obligation of the Contractor.

_____	_____
Firm/Company	Address
_____	_____
Signature	City/State/Zip
_____	_____
Name and Title	Date

END OF DOCUMENT

WARRANTY REPORTING LOG FOLLOWS ON NEXT PAGE

EXHIBIT A

WARRANTY REPORTING LOG

[__] **PROJECT**
Contract Number [__]

To: The San Mateo County Community College District
Attention: [Point of Contact]
[Insert POC address]
Telephone: (650) [_____] **Fax:** (650) [_____]

From: _____
_____
_____

ITEM	WARRANTY LENGTH	WARRANTY START DATE	WARRANTY END DATE	WARRANTY GRANTOR	WARRANTY GRANTOR CONTACT INFORMATION

- Complete this log for all work completed as part of contract. The data shall be summarized by warranty grantor and shall be submitted to the District's Representative as part of the contract closeout.

DOCUMENT 00 65 73

AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS

THIS AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS ("Agreement and Release"), made and entered into this [_____] day of [_____], 200_, by and between the SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT ("District"), and _____("Contractor"), whose place of business is at _____.

RECITALS

A. District and Contractor entered into Contract Number [___] (the "Contract").

B. The Work under the Contract has been completed.

Now, therefore, it is mutually agreed between District and Contractor as follows:

AGREEMENT

1. Contractor will not be assessed liquidated damages except as detailed below:

Original Contract Sum	$ _____
Modified Contract Sum	$ _____
Payment to Date	$ _____
Liquidated Damages	$ _____
Payment Due Contractor	$ _____

2. Subject to the provisions of this Agreement and Release, District will forthwith pay to Contractor the sum of $_____ Dollars and _____ Cents ($_____) under the Contract, less any amounts withheld under the Contract or represented by any Notice to Withhold Funds on file with District as of the date of such payment.

3. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against District arising from the Contract, except for the claims described in paragraph 4 of this DOCUMENT 00 65 73. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against District, District's Representative and all if its agents, employees, consultants (including without limitation Consulting Engineer), inspectors, representatives, assignees and transferees except for the Disputed Claims set forth in paragraph 4 of this Document 00 65 73. Nothing in this Agreement and Release shall limit or modify Contractor's continuing obligations described in paragraph 6 of this Document 00 65 73.

4. The following claims are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Agreement and Release:

Claim No.	Date Submitted	Description of Claim	Amount of Claim

[Insert information, including attachment if necessary]

5. Consistent with California Public Contract Code Section 7100, Contractor hereby agrees that, in consideration of the payment set forth in paragraph 2 of this Document 00 65 73, Contractor hereby releases and forever discharges District, District's Representative, and all of its agents, employees, consultants, inspectors, assignees and transferees from any and all liability, claims, demands, actions or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract

6. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, shall remain in full force and effect as specified in the Contract Documents.

7. Contractor shall immediately defend, indemnify and hold harmless the San Mateo County Community College District, District's Representative, any of its Representatives, Architects/Engineers, and all of their agents, employees, consultants, inspectors, assignees and transferees, from any and all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities that may be asserted against them by any of Contractor's suppliers and/or Subcontractors of any tier and/or any suppliers to them for any and all labor, materials, supplies and equipment used, or contemplated to be used in the performance of the Contract, except for the Disputed Claims set forth in paragraph 4 of this Document 00 65 73.

8. Contractor hereby waives the provisions of California Civil Code Section 1542, which provides as follows:

> A general release does not extend to claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him, must have materially affected his settlement with the debtor.

9. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable, and if any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, county, municipal or other law, ruling, or regulation, then such provision, or part thereof shall remain in force and effect only to the extent permitted by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.

10. Contractor represents and warrants that it is the true and lawful owner of all claims and other matters released pursuant to this Agreement and Release, and that it has full right, title and authority to enter into this instrument. Each party represents and warrants that it has been represented by counsel of its own choosing in connection with this Agreement and Release.

11. All rights of District shall survive completion of the Work or termination of the Contract, and execution of this Agreement and Release.

* * * CAUTION: THIS IS A RELEASE - READ BEFORE EXECUTING * * *

SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT

By: _____
James W. Keller

Its: Executive Vice Chancellor

[CONTRACTOR]

By: _____

Name: _____

Its: _____

END OF DOCUMENT

DOCUMENT 00 71 00

GENERAL CONDITIONS

TABLE OF CONTENTS

GENERAL CONDITIONS

1. GENERAL

A. Documents

Contract Documents are complementary; what is called for by one is as binding as if called for by all. Contract Documents shall not be construed to create a contractual relationship of any kind between (1) Architect/Engineer or any District Representative and Contractor; (2) District and/or its representatives and (except as provided in Article 13 below) a Subcontractor, sub-Subcontractor, or supplier of any Project labor, materials, or equipment; or (3) between any persons or entities other than District and Contractor.

B. Exercise of Contract Responsibilities

In exercising its responsibilities and authorities under the Contract Documents, District does not assume any duties or responsibilities to any Subcontractor or supplier and does not assume any duty of care to Contractor, Contractor's Subcontractors or suppliers. Except as expressly set forth in the Contract Documents, in exercising their respective responsibilities and authorities under the Contract Documents, neither Architect/Engineer nor any District Representative assume any duties or responsibilities to any Subcontractor, sub-Subcontractor or supplier nor assume any duty of care to Contractor or any Subcontractor, sub-Subcontractor or suppliers.

C. Defined Terms

Administration of construction shall include the following delineations of responsibilities pursuant to Part 1, Title 24, California Code of Regulations. Contractor shall perform as required under Section 4-343, including, but not limited to verified reports per sections 4-336 and 4-343. All abbreviations and definitions of terms used and not otherwise defined in this Document 00 71 00 are set forth in Section 01 42 00 (References and Definitions). This Document 00 71 00 subdivides at first level into Articles, then into paragraphs, and then into subparagraphs.

D. Description Of Work

1. Contractor shall provide a complete, operable and maintainable Project in accordance with the Contract Documents, including providing, furnishing, and performing all Services and providing and furnishing all necessary supplies, housing, materials and equipment, and all necessary supervision, labor, and services required for the engineering, design, procurement, quality assurance and inspection, construction, installation, startup, checkout, testing, site cleanup and for the training of District's personnel, all in conformity with the requirements, legal requirements, criteria, performance guarantees, and warranties set forth in the Contract Documents, for a complete and fully operable Project in full conformance with Contract requirements.

E. All-Inclusive Contractor Obligation

1. Without limiting the generality of paragraph 1.D hereof, Contractor shall provide, at a minimum, the following Services and materials and equipment as further specified and described in Section 01 10 00 (Summary of Work) provided, however, that these sections shall not be construed in any way to limit Contractor's obligations hereunder to furnish, construct, checkout, startup, and (except as otherwise provided in the Contract Documents) test a complete, operable and maintainable Project in accordance with the provisions of the Contract Documents.
2. Contractor shall provide all equipment and materials and furnish the services of all supervision, buyers, inspectors, expeditors, and other personnel necessary to procure all materials and equipment for the construction of the Project. Contractor shall provide, install, complete and pay for all labor, materials and equipment, tools, supplies, construction equipment and machinery, construction utilities (including all water, power and sanitary facilities), transportation (including road or other infrastructure and improvements on and off the Site), customs clearance, quality assurance, and other facilities and services (including any temporary or consumable materials, water, fuels, and electricity necessary for the proper execution and completion of the Work, including any of the utilities, as required). Contractor shall maintain all materials and equipment in accordance with manufacturer's requirements while such materials and equipment are in transit or care and custody of the Contractor. Without limiting the generality of the foregoing, Contractor shall provide any and all construction required for the temporary upgrading of any public or private road which is inadequate for the performance of the

Work, temporarily relocate any interference in public or private roadways necessary for the transportation of equipment and materials, and repair all excessive damage to, or deterioration (other than fair wear and tear) of, any public or private road which arises out of the performance of the Work.

3. Contractor shall supervise and direct the Work, and shall furnish the services of all supervisors, foremen, skilled and unskilled labor, and all other personnel in sufficient quantities and with sufficient skills necessary to perform the Services in accordance with the Contract Documents. At District's request, Contractor shall replace, at Contractor's expense, any individual if it is determined by District and Contractor that such individual's continued presence would jeopardize the quality or timely completion of the Work.

4. Contractor shall be responsible for all labor relations matters relative to the Work on the Site and shall at all times use all reasonable efforts to maintain harmony among all workers employed in connection with the Work on the Site. Contractor shall adopt and implement reasonable policies and practices designed to avoid work stoppage, slow downs, disputes and strikes.

5. Contractor shall be solely responsible for all construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under the Contract Documents, and District shall not be responsible for or exercise any control over the actions or omissions of Contractor, any supplier, or any of their employees or agents performing any of the Work or Contractor's warranty obligations. Contractor shall prosecute the Work continuously and diligently and complete the Work in accordance with all requirements of the Contract Documents.

6. Contractor shall coordinate ingress and egress to and from the Site so as to minimize disruption to the Work and to traffic in the vicinity of the Site.

7. Contractor shall be responsible for the layout of the Work and shall perform all necessary surveying during the construction of the Projects. The accuracy of all grades, elevations, alignments, and plumbing of any structures and the location of all facilities described in the final plans and specifications shall be the responsibility of the Contractor. Contractor shall preserve all permanent survey construction monuments and benchmarks. Prior to the final completion date, Contractor shall accurately correct all Project documents to as-built conditions and deliver to District these as-built documents in accordance with the Contract Documents. Such documents shall show the location of the Project and shall show all related easements, improvement, utilities and rights of way above and below ground, on and off the Site, as of the date of delivery of such documents. Such documents shall also show the dimensions and the distances to the nearest benchmarks.

8. Contractor shall provide appropriate installation and startup representatives from suppliers of major equipment and control systems, all necessary supervising personnel, all equipment, tools, construction and temporary material, and all labor for checkout, startup and testing. Contractor shall be responsible for checkout, startup and testing of the Project and shall carry out those activities in accordance with all applicable codes and legal requirements, startup and checkout requirements and procedures as set forth in the Contract Documents.

9. Except for safety and warning signs, Contractor shall not install any signs on the Site without the express written consent of District.

10. Contractor shall be responsible for Site security until Final Completion, or termination of the Work. Such security shall include, to the extent reasonably necessary, barriers, lighting, controlled access, and other measures required to prevent vandalism, theft, and danger to personnel, the Project, materials and equipment.

11. Contractor shall prepare or cause to be prepared and shall furnish to District all drawing logs, drawings, manufacturer's drawings and data, supplier manuals and operating manuals in accordance with the Contract Documents.

12. Contractor shall ensure that District and its representatives shall, at all times, have access to the Project for all purposes. In order to allow District and its representatives to be present, Contractor shall give District at least three (3) days advance notice of any system or equipment checkout or testing. If District desires access to any places where work is being performed or from which materials and equipment are being obtained, Contractor shall provide or arrange reasonable access thereto and shall provide District reasonable advanced notice of any factory tests or other off site tests. Contractor shall maintain the Site in a safe condition to permit District and any person authorized in writing by District to inspect and review all field work during working hours, including materials and equipment, installation, calibration, startup and testing.

13. As part of the procurement of equipment, Contractor shall provide to District a list of recommended operating spare parts, which list shall include all relevant costs and ordering lead time information with terms and conditions. If requested, Contractor shall procure such operating spare parts from Suppliers, as requested by District, on behalf of District. The cost of such operating spare parts shall be covered by change order.

14. When any equipment or portion of the Work is damaged, Contractor shall inform District as soon as possible and provide District a damage report detailing such occurrence, any required repairs, and the estimated duration of such repairs.

15. Contractor shall provide to District all tests and measurements, laboratory analyses, and reports made or prepared in connection with the Work.

2. BID PERIOD INVESTIGATIONS AND SUBCONTRACTORS

A. Investigation Prior To Bidding

1. Prior to submitting its Bid, Contractor must investigate fully the Work of the Contract. Contractor must visit the Site, examine thoroughly and understand fully the nature and extent of the Contract Documents, Work, Site, locality, actual conditions and as-built conditions, and all other information made available for preparing Bids. Contractor's investigation shall include, but is not limited to, a thorough examination of all reports of exploration and tests of subsurface conditions, as-built drawings, drawings, product specification(s) or reports, available for Bidding purposes, of physical conditions, including Underground Facilities and information identified in Document 00 31 19 (Reports, Surveys and Existing Conditions) or which may appear in the Contract Documents, and all local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto. Contractor shall completely and thoroughly correlate all such information and consider such information fully, prior to and as a condition of submitting its Bid. Contractor shall make inquiry as required in Document 00 31 19 (Reports, Surveys and Existing Conditions).

2. Prior to submitting its Bid, Contractor shall take care to note the existence and potential existence of Underground Facilities, in particular, above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, chemical, hot water, and other similar items and utilities. Contractor shall carefully consider all supplied information, request additional information Contractor may deem necessary, and visually inspect the Site for above ground indications of Underground Facilities (such as, for example not by way of limitation, the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site.)

3. Prior to submitting its Bid, Contractor must correlate its experience, knowledge and the results of its required investigation with the terms and conditions of the Contract Documents, and must give District prompt written notice of all conflicts, errors, ambiguities, or discrepancies of any type, that it may discover in or among the Contract Documents, as-built drawings (if any) and/or actual conditions. Contractor shall give this notice during the Bid period and submission of a Bid indicates Contractor's agreement that District responded to the notice through Addenda issued by District which is acceptable to Contractor.

4. Prior to submitting its Bid, Contractor must consider fully the fact that information supplied regarding existing Underground Facilities at or contiguous to the Site is in many cases based on information furnished to District by others (e.g., the builders of such Underground Facilities or others), and that due to their age or their chain of custody since preparation, may not meet current industry standards for accuracy. Contractor must also consider local underground conditions and typical practices for Underground Facilities, either through its own direct knowledge or through its subcontractors, and fully consider this knowledge in assessing the existing information and the reasonableness of its reliance.

5. Prior to submitting its Bid, Contractor shall conduct (or request that District have conducted) any such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which may affect cost, progress, performance or furnishing of Work or which relate to

any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto or which Contractor deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of Contract Documents.

6. Prior to submitting its Bid, Contractor may rely on District supplied information regarding existing conditions only where such conditions are underground and not subject to reasonable verification. If existing information supplied by District indicates a discrepancy or a substantial risk of inaccuracy or omission, then Contractor must request specific additional information. Contractor shall advise District in writing during the Bid period of any questions, suppositions, inferences or deductions Contractor may have, for District's review and response by Addenda, and may not assert any such matters later that were not brought forth during the Bid period.

7. During performance of the Contract, Contractor will be charged with knowledge of all information that it should have learned in performing this required pre-Bid investigation, and shall not be entitled to change orders (time or compensation) due to information or conditions that Contractor should have known as a part of this pre-Bid investigation.

B. Supplied Information on Underground Existing Conditions

1. Regarding Underground Facilities shown in the Contract Documents or supplied through Document 00 31 19, District has compiled this information in good faith, relying on its records and third party records. Because of the nature and location of District and the Project, the existence of Underground Facilities is deemed inherent in the Work of the Contract, as is the fact that Underground Facilities are not always accurately shown or completely shown on as-built records, both as to their depth and location. In Article 14 of this Document 00 71 00, this Contract establishes a heightened standard for claims involving Underground Facilities. Contractor shall consider this fact in its Bid and in its planning and execution of the Work involving Underground Facilities.

2. Regarding subsurface conditions other than Underground Facilities, shown on the Contract Documents or supplied in Document 00 31 19 (Existing Conditions), Contractor may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated in the Contract Documents. District is not responsible for the completeness of any subsurface condition information for preparing its Bid, Contractor's conclusions or opinions drawn from any subsurface condition information, or subsurface conditions that are not specifically shown. (For example, District is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown.)

C. Supplied Information on Above Ground Existing Conditions

1. Regarding aboveground and as-built conditions shown on the Contract Documents or supplied through Document 00 31 19 (Reports, Surveys and Existing Conditions), such information has been compiled in good faith, however, Contractor must independently verify such information. District does not expressly or impliedly warrant or represent that information as to aboveground conditions or as-built conditions indicated in the Contract Documents or Document 00 31 19, is correctly shown or indicated, or otherwise complete for construction purposes.

2. As a condition to submitting its Bid, Contractor shall verify by independent investigation all such aboveground and as-built conditions, and bring any discrepancies to District's attention through written question. In submitting its Bid, Contractor shall rely on the results of its own independent investigation and shall not rely on District-supplied information regarding aboveground conditions and as-built conditions, and Contractor shall accept full responsibility for its verification work sufficient to complete the Work as intended.

D. Subcontractors

1. Consistent with Public Contract Code Sections 4101 *et seq.*, Contractor shall not substitute any other person or firm in place of any Subcontractor listed in the Bid. Subcontractors shall not assign or transfer their subcontracts or permit them to be performed by any other contractor without District's written approval. At District's request, Contractor shall provide District with a complete copy of all executed subcontracts or final commercial agreements with Subcontractors and/or suppliers.

2. Subcontract agreements shall preserve and protect the rights of District under the Contract Documents so that subcontracting will not prejudice such rights. To the extent of the Work to be performed by a Subcontractor, Contractor shall require the Subcontractor's written agreement (1) to

be bound to the terms of Contract Documents and (2) to assume vis-à-vis Contractor all the obligations and responsibilities that Contractor assumes toward District under the Contract Documents. (These agreements include for example, and not by way of limitation, all warranties, claims procedures and rules governing submittals of all types to which Contractor is subject under the Contract Documents.)

3. Contractor shall provide for the assignment to District of all rights any Subcontractor may have against any manufacturer, supplier, or distributor for breach of warranties and guarantees relating to the Work performed by the Subcontractor under the Contract Documents.

4. District shall be deemed to be an intended third-party beneficiary of all Subcontracts (of any tier) for the provision of labor, services, supplies or material to the Project, and each such agreement shall so provide.

3. CONTRACT AWARD AND COMMENCEMENT OF THE WORK

A. Award of Contract

District will make the Award of Contract by issuing a Notice of Award. As a condition to District signing Section 00 52 00 (Agreement), however, Contractor shall deliver to District the executed agreements, forms, bonds and insurance documents required by Section 00 11 19 (Instructions to Bidders) in the required quantities and within the required times.

B. Commencement of Work

The Contract Time will commence upon issuance of a Notice to Proceed, on the date indicated in the Notice to Proceed. Contractor shall not do any Work at the Site prior to Contract commencement.

4. BONDS AND INSURANCE

A. Bonds

1. At or before the date indicated in Section 00 11 19 (Instructions to Bidders), Contractor shall file with District the following bonds:
   a. Corporate surety bond, in the form of Document 00 61 00 (Construction Performance Bond), in the penal sum of 100% of the Contractor's Bid as accepted, to guaranty faithful performance of the Work; and
   b. Corporate surety bond, in the form of Document 00 62 00 (Construction Labor and Material Payment Bond), in the penal sum of 100% of the Contractor's Bid as accepted, to guaranty payment of wages for services engaged and of bills contracted for materials, supplies, and equipment used in performance of Contract Documents.
2. Sureties shall be satisfactory to District. Corporate sureties on these bonds and on bonds accompanying Bids shall be duly licensed to do business in the State of California and shall have an A.M. Best Company financial rating of A-IX or better.

B. Insurance

Insurance 00 73 17 (Insurance) incorporated herein by this reference.

5. DRAWINGS AND SPECIFICATIONS

A. Intent

1. Drawings and Specifications are intended to describe a functionally complete and operable Project (and all parts thereof) to be constructed in accordance with the requirements of Contract Documents. Contractor shall perform any work, provide services and furnish any materials or equipment that may reasonably be inferred from the requirements of Contract Documents or from prevailing custom or trade usage as being required to produce this intended result. Contractor shall interpret words or phrases used to describe work (including services), materials or equipment that have well-known technical or construction industry or trade meaning in accordance with that meaning. Drawings' intent specifically includes the intent to depict construction that complies with all applicable laws, codes and standards, including without limitation Title 24 of the California Code of Regulations. The Division and Sections of the Specifications and the identification on any Drawings shall not

control the Contractor in dividing the Work among Subcontractors or suppliers or delineating the Work to be performed by any specific trade.

2. As part of the "Work," Contractor shall provide all labor, materials, equipment, machinery, tools, facilities, services, employee training and testing, hoisting facilities, shop drawings, storage, testing, security, transportation, disposal, the securing of all necessary or required field dimensions, the cutting or patching of existing materials, notices, permits, documents, reports, agreements and any other items required or necessary to timely and fully complete Work described and the results intended by Contract Documents and, in particular, Drawings and Specifications. Divisions and Specification Sections and the identification on any Drawings shall not control Contractor in dividing Work among Subcontractors or suppliers or delineating the Work to be performed by any specific trade.

3. Contractor shall perform reasonably implied parts of Work as "incidental work" although absent from Drawings and Specifications. Incidental work includes any work not shown on Drawings or described in Specifications that is necessary or normally or customarily required as a part of the Work shown on Drawings or described in Specifications. Incidental work includes any Work necessary or required to make each installation satisfactory, legally operable, functional, and consistent with the intent of Drawings and Specifications or the requirements of Contract Documents including required tasks to be performed under Division 1 of Specifications. Contractor shall perform incidental work without extra cost to District. Incidental work shall be treated as if fully described in Specifications and shown on Drawings, and the expense of incidental work shall be included in price Bid and Contract Sum.

B. Drawing Details and Specification Descriptions

A typical or representative detail on Drawings shall constitute the standard for workmanship and material throughout corresponding parts of Work. Where necessary, and where reasonably inferable from Drawings, Contractor shall adapt such representative detail for application to such corresponding parts of Work. The details of such adaptation shall be subject to prior approval by District. Repetitive features shown in outline on Drawings shall be in exact accordance with corresponding features completely shown.

C. Interpretation of Drawings and Specifications

Should any discrepancy appear or any misunderstanding arise as to the import of anything contained in the Drawings and Specifications prepared by the Architect/Engineer, the matter shall be referred to the Architect/Engineer in writing, with a copy to the Inspector and Project Manager. Architect/Engineer shall issue with reasonable promptness such written clarifications or interpretations of the requirements of the Drawings and Specifications as Architect/Engineer may determine necessary, which shall be consistent with the intent of and be reasonably inferable from Contract Documents. Such written clarifications or interpretations shall be binding upon Contractor. If Contractor believes that a written response, clarification or interpretation justifies an adjustment in the Contract Sum or Contract Time, Contractor shall give District prompt written notice as provided in Section 01 26 00 (Modification Procedures). If the parties are unable to agree to the amount or extent of the adjustment, if any, then Contractor shall perform the Work in conformance with District's response, clarification, or interpretation and may make a written claim for the adjustment as provided in Article 12 of this Document 00 71 00.

D. Checking of Drawings

Before undertaking each part of Work, Contractor shall carefully study and compare Contract Documents and check and verify pertinent figures shown in the Contract Documents and all applicable field measurements. Contractor shall be responsible for any errors that might have been avoided by such comparison. Figures shown on Drawings shall be followed; Contractor shall not scale measurements. Contractor shall promptly report to District, with copies to the Inspector, in writing, any conflict, error, ambiguity or discrepancy that Contractor may discover. Contractor shall obtain a written interpretation or clarification from District before proceeding with any Work affected thereby. Contractor shall provide District and Inspector with a follow-up correspondence every ten days until it receives a satisfactory interpretation or clarification.

E. Standards to Apply Where Specifications are not Furnished

It is provided that the Contractor shall furnish materials or manufactured articles or shall do Work for which no detailed specifications are set forth by supplying materials or manufactured articles of the best grade, in quality and workmanship, obtainable in the market from firms of established good reputation. If not ordinarily carried

in stock, the materials or manufactured articles shall conform to industry standards for first-class materials or articles of the kind required, with due consideration of the use to which they are to be put. Work shall conform to the usual standards or codes, such as those cited in Section 01 42 00 (References and Definitions), for first-class work of the kind required. The Contractor shall specify in writing to District the materials to be used or Work to be performed under this paragraph E no later than ten (10) work days prior to furnishing such materials or performance of such Work.

F. Deviation from Specifications and Drawings

1. As set forth in Part 1, Title 24, California Code of Regulations, no modification or deviation from the Contract Documents will be permitted. Contractor must perform Work in strict accordance with Contract Documents. No order for any alteration, modification or extra which shall increase or decrease the cost of Work shall be valid unless the resulting increase or decrease in price shall have been agreed upon in writing, and the order signed by the Contractor, and certified by the authorized officer representing District. As appropriate, Change Orders changing the approved drawings and technical specifications are subject to approval by the Division of the State Architect (DSA) under the procedures prescribed in Section 4-338, Part 1, Title 24, California Code of Regulations.
2. District and/or Architect/Engineer may order that locations, lines and grades for Work vary from those shown on Drawings. Changes may be made in location, lines or grades for Work under any item of Contract. No extra payment in addition to unit price fixed in Contract for Work under respective items will be allowed on account of variations from Drawings in unit price items. In lump sum contracts, or where there are no unit price items covering Work affected by variations of locations, lines or grades, all changes in the Contract Documents will be made in accordance with Article 14 of this Document 00 71 00.

G. Deviation from Specifications and Drawings

1. Contractor shall perform Work in accordance with the approved Drawings and Specifications. Contractor may deviate from Drawings or the dimensions given in the Drawings, and may deviate from the Specifications, only upon District's advance written approval of the proposed deviation.
2. District may order that locations, lines and grades for Work vary from those shown on Drawings. Changes may be made in locations, lines or grades for Work under any item of Contract Documents. No payment in addition to unit price fixed in the Contract Documents for Work under respective items will be allowed on account of variations from Drawings in unit price items. In lump sum contracts, or where there are no unit price items covering Work affected by variations of locations, lines or grades, all changes in the Contract Documents will be made as set forth in Article 14 of this Document 00 71 00.

H. Precedence of Documents

1. In the case of discrepancy or ambiguity in the Contract Documents, the following order of precedence shall prevail:
   a. Modifications in inverse chronological order (i.e., most recent first), and in the same order as specific portions they are modifying;
   b. Document 00 52 00 (Agreement), and terms and conditions referenced therein;
   c. Document 00 73 00 (Supplementary Conditions) and any other Supplementary Conditions;
   d. Document 00 71 00 (General Conditions);
   e. Division 1 Specifications;
   f. Division 2 through 60 Specifications;
   g. Drawings;
   h. Written numbers over figures, unless obviously incorrect;
   i. Figured dimensions over scaled dimensions;
   j. Large-scale Drawings over small-scale Drawings.

2. Any conflict between Drawings and Division 2 through 60 Specifications will be resolved in favor of the document of the latest date (i.e., the most recent document), and if the dates are the same or not determinable, then in favor of Specifications.

3. Any conflict between a bill or list of materials shown in the Contract Documents and the actual quantities required to complete Work required by Contract Documents, will be resolved in favor of the actual quantities.

4. In the event the Specifications include divisions above Division 60 (e.g., Division 60 and above), then such divisions shall be included within the Contract Documents unless identified otherwise.

I. Ownership and Use of Drawings, Specifications and Contract Documents

1. Drawings and Specifications prepared under this Contract were prepared for use for Work of Contract Documents only. No part of the Contractor's drawings and specifications or of any other Contract Documents shall be used for any other construction or for any other purpose except with the written consent of District.

2. Any unauthorized use of said documents is prohibited. Consistent with Education Code Section 17316, any interest (including copyright interests) of Contractor or its contractors or sub-consultants (together, "Sub-consultants"), in studies, reports, memoranda, computational sheets, drawings, plans or any other documents (including electronic media) prepared by Contractor or its Sub-consultants in connection with the Services, shall become the property of District. To the extent permitted by Title 17 of the United States Code, work product produced under the Contract Documents shall be deemed works for hire and all copyrights in such works shall be the property of District. In the event that it is ever determined that any works created by Contractor or its Sub-consultants under this Agreement are not works for hire under U.S. law, Contractor hereby assigns to District all copyrights to such works. With District's prior written approval, Contractor may retain and use copies of such works for reference and as documentation of experience and capabilities. Contractor shall, however, retain the copyright in its standard details, and grants District an unlimited license to use such details for the purposes stated in the Contract Documents. Should District desire to reuse any of the items specified above and not use the services of Contractor, then the District agrees to assume any and all obligations for their reuse and, if applicable, process the same through the DSA, and District releases Contractor and its Sub-consultants from liability associated with the reuse.

6. CONSTRUCTION BY DISTRICT OR BY SEPARATE CONTRACTORS

A. District's Right To Perform Construction And To Award Separate Contracts

District may perform with its own forces, construction or operations related to the Project. District may also award separate contracts in connection with other portions of the Project or other construction or operations, on the Site or areas contiguous to the Site, under conditions similar to these Contract Documents, or may have utility owners perform other work. When separate contracts are awarded for different portions of the Project or other construction or operations on the Site, the term "Contractor" in these Contract Documents shall mean the Contractor herein.

B. Mutual Responsibility

1. Contractor shall afford all other contractors, utility owners and District (if District is performing work with its own forces), proper and safe access to the Site, and reasonable opportunity for the installation and storage of their materials. Contractor shall ensure that the execution of its Work properly connects and coordinates with others' work, and shall cooperate with them to facilitate the progress of the Work.

2. Contractor shall coordinate its Work with the work of other separate contractors, District, and utility owners. Contractor shall hold coordination meetings with other contractors, District and its representatives, and utility owners as required by Section 01 31 19 (Project Meetings).

3. Unless otherwise provided in the Contract Documents, Contractor shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. Contractor shall not endanger any work of other separate contractors, District or utility owners by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of District and the others whose work will be affected.

4. Contractor's duties and responsibilities under Article 6 of this Document 00 71 00 are for the benefit of District and also for the benefit of such other contractors and utility owners working at the Site to the extent that there are comparable provisions for the benefit of Contractor in the direct contracts between District and such other contractors and utility owners.

5. To the extent that any part of Contractor's Work is to interface with work performed or installed by other contractors or utility owners, Contractor shall inspect and measure the in-place work. Contractor shall promptly report to District in writing any defect in in-place work that will impede or increase the cost of Contractor's interface unless corrected. District will require the contractor responsible for the Defective Work to make corrections so as to conform to its contract requirements, or, if the defect is the result of an error or omission in the Contract Documents, issue a Change Order. If Contractor fails to measure, inspect and/or report to District in writing defects that are reasonably discoverable, Contractor shall bear all costs of accomplishing the interface acceptable to District. This provision shall be included in any and all other contracts or subcontracts for Work to be performed where such a conflict could exist.

C. District Authority Over Coordination

1. District will have authority over coordination of the activities of multiple contractors in cases where District performs work with its own forces or contracts with others for the performance of other work on the Project, or utilities work on the Site. District may at any time and in its sole discretion, designate a person or entity other than District to have authority over the coordination of the activities among the various contractors. District's authority with respect to coordination of the activities of multiple contractors and utility owners shall not relieve Contractor of its obligation to other contractors and utility owners to coordinate its Work with other contractors and utility owners as specified in paragraph 6.B of this Document 00 71 00. Contractor shall promptly notify District in writing when another Contractor on the Project fails to coordinate its work with the Work of Contract Documents.

2. Contractor shall suspend any part of the Work or carry on the same in such manner as directed by District when such suspension or prosecution is necessary to facilitate the work of other contractors or workers. No damages or claims by Contractor will be allowed if the suspension or Work change is due in whole or in part to Contractor's failure to perform its obligation to coordinate its Work with other contractors and utility owners. Damages or claims will be allowed only to the extent of fault by District if the suspension or Work change is due in whole or in part to another Contractor's failure to coordinate its work with Contractor, other contractors, and utility owners. District reserves the right to back charge Contractor for any damages or claims incurred by other contractors as a result of Contractor's failure to perform its obligations to coordinate with other contractors and utility owners. District may deposit the funds retained with a Court of competent jurisdiction pursuant to applicable interpleader procedures and Contractor releases District of further liability regarding such funds.

7. DISTRICT AND PAYMENT

A. District Representative(s)

District Representative(s) will have limited authority to act on behalf of District as set forth in the Contract Documents. Except as otherwise provided in these Contract Documents or subsequently identified in writing by District, District will issue all communications to Contractor through District Representative, and Contractor shall issue all communications to District through District Representative in a written document delivered to District. Should any direct communications between Contractor and District's consultants, architects or Architect/Engineers not identified in Article 2 of Document 00 52 00 (Agreement) occur during field visits or by telephone, Contractor shall immediately confirm them in a written document copied to District.

B. Means and Methods of Construction

Subject to those rights specifically reserved in the Contract Documents, District will not supervise, or direct, or have control over, or be responsible for, Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or Contractor's failure to comply with laws and regulations applicable to the furnishing or performance of Work. District will not be responsible for Contractor's failure to perform or furnish the Work in accordance with Contract Documents.

C. Receipt and Processing of Applications for Payment

As required by Section 01 29 00 (Measurement and Payment), Contractor shall prepare the schedules, submit Applications for Payment and warrant title to all Work covered by each Application for Payment. District will review Contractor's Applications for Payment and make payment thereon, and Contractor shall make payments to Subcontractors, suppliers and others, as required by Section 01 29 00.

8. CONTROL OF THE WORK

A. Subcontractors

Contractor is fully responsible for Contractor's own acts and omissions. Contractor is responsible for all acts and omissions of its Subcontractors, suppliers, and other persons and organizations performing or furnishing any of the Work, labor, materials, or equipment under a direct or indirect contract with Contractor.

B. Supervision of Work by Contractor

1. During construction, reconstruction, repair, alteration of or addition to any school building, the DSA, as provided by the Field Act, sections 39140 -39159 and sections 81130 - 81147 of the Education Code, shall make such inspection as in its judgment is necessary or proper for enforcement of the Act, and the protection of the safety of pupils, teachers and the public. If at any time as the Work progresses, prior to the issuance of the certificate of compliance, it shall be found that modifications or changes are necessary to secure safety or to comply with code requirements, District or DSA may provide notice of the necessity for such modifications or changes, and Contractor shall perform all necessary modifications and changes. Additionally, if District or DSA finds that any construction work is being performed in a manner contrary to the provisions of Title 24, California Code of Regulations that would compromise the structural integrity of any building, and issues a stop work order, Contractor shall comply with the stop work order as required by law. Refer to sections 4-334 and 4-334.1, Part 1, Title 24, California Code of Regulations.
2. Contractor shall supervise, inspect, and direct Work competently and efficiently, devoting the attention and applying such personal skills and expertise as may be required and necessary to perform Work in accordance with Contract Documents. Contractor shall be solely responsible for and have control and charge of construction means, methods, techniques, sequences and procedures, safety precautions and programs in connection with the Work. Contractor shall be responsible to see that the completed Work complies accurately with Contract Documents.
3. Contractor shall designate and keep on the Site at all times during Work progress a competent resident Superintendent or Project Manager, who, once designated, shall not be replaced without District's express written consent. The Superintendent or Project Manager shall be Contractor's representative at the Site and shall have complete authority to act on behalf of Contractor. All communications to and from the Superintendent or Project Manager shall be as binding as if given to or by Contractor.

C. Observation of Work by District's Representative and Architect/Engineer

1. Work shall be performed under District's Representative's general observation and administration. Contractor shall comply with District's Representative's directions and instructions in accordance with the terms of Contract Documents, but nothing contained in these General Conditions shall be taken to relieve Contractor of any obligations or liabilities under the Contract Documents. District's Representative's failure to review or, upon review, failure to object to any aspect of Work reviewed, shall not be deemed a waiver or approval of any non-conforming aspect of Work.
2. District's Representative will provide administration of Contract and observation of the Work as hereinafter described.
3. District's Representative will advise and consult with Architect/Engineer and consult with District. District's Representative will have authority to act on behalf of District only to extent provided in the Contract Documents or as set forth in writing by District.
4. District's Representative will visit the Site at intervals appropriate to stage of construction to become familiar generally with the progress and quality of Work and to determine in general if Work is proceeding in accordance with Contract Documents. However, neither the District's Representative nor Architect/Engineer will be required to make exhaustive or continuous on-site inspections to check quality or quantity of Work. On the basis of on-site observations, the District's Representative

and the Architect/Engineer will be informed of progress of Work, and will keep District informed of the Work's progress.

5. Neither the District's Representative nor Architect/Engineer will be responsible for or have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work.

6. Neither the District's Representative nor Architect/Engineer will be responsible for or have control over the acts or omissions of Contractor, Subcontractors or their agents or employees, or any other persons performing Work.

7. Architect/Engineer will review Contractor's submittals, such as Shop Drawings, Product Data, and Samples, but only for conformance with design concept of Work and with information given in the Contract Documents as set forth in this Section 00700. Such action will be taken within fourteen (14) days.

8. The District's Representative and the Architect/Engineer will observe to recommend to District the dates that Contractor has achieved Substantial Completion and Final Completion, and will receive and forward to District for review written warranties and related documents required by Contract Documents and assembled by Contractor.

9. Architect/Engineer will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings and Specifications or otherwise) as Architect/Engineer may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on the Contractor, unless District in its discretion directs otherwise.

10. Based on its observations, Architect/Engineer may recommend to District that it disapprove or reject Work that Architect/Engineer believes to be defective or will not produce a complete Project that conforms to Contract Documents or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. District will also have authority to require special inspection or testing of Work, whether or not the Work is fabricated, installed or completed.

D. Access To Work

1. During performance of Work, District and its agents, officers, consultants, and employees may at any time enter upon Work, shops or studios where any part of the Work may be in preparation, or factories where any materials for use in Work are being or are to be manufactured, and Contractor shall provide proper and safe facilities for this purpose, and shall make arrangements with manufacturers to facilitate inspection of their processes and products to such extent as District's interests may require. Other contractors performing work for District may also enter upon Work for all purposes required by their respective contracts. Subject to the rights reserved in the Contract Documents, Contractor shall have sole care, custody, and control of the Site and its Work areas.

2. District may, at any time, and from time to time, during the performance of the Work, enter the Work Site for the for the purpose of installing any necessary work by District labor or other contracts, and for any other purpose in connection with the installation of facilities. In doing so, District shall endeavor not to interfere with Contractor and Contractor shall not interfere with other work being done by or on behalf of District.

3. If, prior to completion and final acceptance of all the Work, District takes possession of any structure or facility (whether completed or otherwise) comprising a portion of the Work with the intent to retain possession thereof (as distinguished from temporary possession contemplating return to Contractor), then, while District is in possession of the same, Contractor shall be relieved of liability for loss or damage to such structure other than that resulting from the Contractor's fault or negligence. Such taking of possession by District shall not relieve the Contractor from any provisions of the Contract respecting such structure, other than to the extent specified in the preceding sentence, nor constitute a final acceptance of such structure or facility. See also Section 01 10 00 (Summary of Work).

4. Not used.

5. If, following installation of any equipment or facilities furnished by Contractor, defects requiring correction by Contractor are found, District shall have the right to operate such unsatisfactory

equipment or facilities and make reasonable use thereof until the equipment or facilities can be shut down for correction of defects without injury to District.

9. CONTRACTOR'S WARRANTY, GUARANTY, AND INSPECTION OF WORK

A. Warranty And Guaranty

1. General Representations and Warranties: Contractor represents and warrants that it is and will be at all times fully qualified and capable of performing every Phase of the Work and to complete Work in accordance with section 4-341, 4-343 and 4-344 of Part 1, Title 24, California Code of Regulations and terms of Contract Documents. Contractor warrants that all construction services shall be performed in accordance with generally accepted professional standards of good and sound construction practices and all requirements of Contract Documents. Contractor warrants that Work, including but not limited to each item of materials and equipment incorporated therein, shall be new, of suitable grade of its respective kind for its intended use, and free from defects in design, engineering, materials, construction and workmanship. Contractor warrants that Work shall conform in all respects with all applicable requirements of federal, state and local laws, applicable construction codes and standards, licenses, and permits, Drawings and Specifications and all descriptions set forth therein, and all other requirements of Contract Documents. Contractor shall not be responsible, however, for the negligence of others in the specification of specific equipment, materials, design parameters and means or methods of construction where that is specifically shown and expressly required by Contract Documents.

2. Extended Guarantees: Any guaranty exceeding one year provided by the supplier or manufacturer of any equipment or materials used in the Project shall be extended for such term. Contractor expressly agrees to act as co-guarantor of such equipment and materials and shall supply District with all warranty and guaranty documents relative to equipment and materials incorporated in the Project and guaranteed by their suppliers or manufacturers.

3. Environmental and Toxics Warranty: The covenants, warranties and representations contained in this subparagraph are effective continuously during Contractor's Work on the Project and following cessation of labor for any reason including, but not limited to, Project completion. Contractor covenants, warrants and represents to District that:

   a. To Contractor's knowledge after due inquiry, no lead or asbestos-containing materials were installed or discovered in the Project at any time during Contractor's construction thereof. If any lead or asbestos-containing materials were discovered, Contractor made immediate written disclosure to District.
   b. To Contractor's knowledge after due inquiry, no electrical transformers, light fixtures with ballasts or other equipment containing PCBs are or were located on the Project at any time during Contractor's construction thereof.
   c. To Contractor's knowledge after due inquiry, no storage tanks for gasoline or any other toxic substance are or were located on the Project at any time during Contractor's construction thereof. If any such materials were discovered, Contractor made immediate written disclosure to District.
   d. Contractor's operations concerning the Project are and were not in violation of any applicable environmental federal, state, or local statute, law or regulation dealing with hazardous materials substances or toxic substances and no notice from any governmental body has been served upon Contractor claiming any violation of any such law, ordinance, code or regulation, or requiring or calling attention to the need for any work, repairs, construction, alteration, or installation on or in connection with the Project in order to comply with any such laws, ordinances, codes, or regulations, with which Contractor has not complied. If there are any such notices with which Contractor has complied, Contractor shall provide District with copies thereof.

B. Inspection Of Work

1. Contractor acknowledges DSA inspection requirements, frequency, protocols and practices, applicable to this Project, and shall schedule, coordinate, plan and execute the Work consistent with all such practices.

2. All materials, equipment, and workmanship used in Work shall be subject to inspection and testing at all times during construction and/or manufacture in accordance with the terms of Contract Documents. Work and materials, and manufacture and preparation of materials, from beginning of

construction until final completion and acceptance of Work, shall be subject to inspection and rejection by District, its agents, representatives or independent contractors retained by District to perform inspection services, or governmental agencies with jurisdictional interests. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and program so that they may comply therewith as applicable. Upon request or where specified, District shall be afforded access for inspection at the source of supply, manufacture or assembly of any item of material or equipment, with reasonable accommodations supplied for making such inspections.

3. Contractor shall give District a minimum of two business days notice of readiness of Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

4. District will hire through separate contract, a DSA-certified Inspector of Record for this Project, and a Special Inspection and Materials Testing Laboratory. Upon advance notice per subparagraph 9.B.2 above, District will endeavor to schedule required inspections, but if resources are not available, Contractor may need to reschedule the Work at no additional cost to the District.

5. In the event that a scheduled inspection is canceled in less than 24 hours notice by Contractor and the District incurs costs associated with the cancellation, Contractor will reimburse District for the actual costs of the canceled inspections. The amount will be deducted from payment owed Contractor.

6. If applicable laws or regulations of any public body (other than DSA) having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, and furnish District with the required certificates of inspection, or approval. District will pay the cost of initial testing and Contractor shall pay all costs in connection with any follow-up or additional testing. Contractor shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for the acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

7. If Contractor covers any Work, or the work of others, prior to any required inspection, test or approval without written approval of District, Contractor shall uncover the Work at District's request. Contractor shall bear the expense of uncovering Work and replacing Work.

8. In any case where Contractor covers Work contrary to District's request, Contractor shall uncover Work for District's observation or inspection at District's request. Contractor shall bear the cost of uncovering Work.

9. Whenever required by District, Contractor shall furnish tools, labor and materials necessary to make examination of Work that may be completed or in progress, even to extent of uncovering or taking down portions of finished Work. Should Work be found unsatisfactory, cost of making examination and of reconstruction shall be borne by Contractor. If Work is found to be satisfactory, District, in manner herein prescribed for paying for alterations, modifications, and extra Work, except as otherwise herein specified, will pay for examination.

10. District shall select testing agencies approved by DSA to conduct required tests and inspections for the Project. A list of required structural tests and inspections prepared by the Architect/Engineer and approved by the DSA shall be provided to the designated testing agency, District's representative and Inspector prior to the start of construction. Refer to section 4-335(a), Part 1, Title 24, California Code of Regulations, provided that notwithstanding section 4-335(a) Contractor may not waive any tests without District consent.

11. The testing agency shall forward the test results to DSA, Contractor, District and the Project Inspector within fourteen (14) days of the date of the test. The testing agency shall forward to the Division of the State Architect a verified report covering all the tests required to be made by that agency during the progress of the Project.

12. Inspection of the Work by or on behalf of District, or District's failure to do so, shall not under any circumstances be deemed a waiver or approval of any non-conforming aspect of the Work. Contractor shall have an absolute duty, in the absence of a written Change Order signed by District, to perform Work in conformance with the Contract Documents.

13. Any inspection, evaluation, or test performed by or on behalf of District relating to the Work is solely for the benefit of District, and shall not be relied upon by Contractor. Contractor shall not be

relieved of the obligation to perform Work in accordance with the Contract Documents, nor relieved of any guaranty, warranty, or other obligation, as a result of any inspections, evaluations, or tests performed by District, whether or not such inspections, evaluations, or tests are permitted or required under the Contract Documents. Contractor shall be solely responsible for testing and inspecting Work already performed to determine whether such Work is in proper condition to receive later Work.

C. Correction Of Defective Work

1. Contractor shall correct Defective Work promptly upon knowledge of it. If Contractor fails to supply sufficient skilled workers, suitable materials or equipment, or to furnish or perform the Work in such a way that the completed Work will conform to Contract Documents, District may order Contractor to replace any Defective Work, or stop any portion of Work to permit District (at Contractor's expense) to replace such Defective Work. These District rights are entirely discretionary on the part of District, and shall not give rise to any duty on the part of District to exercise the rights for the benefit of Contractor or any other party.

2. District may direct Contractor to correct any Defective Work or remove it from the Site and replace it with Work that is not defective and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting from the correction or removal. Contractor shall be responsible for any and all claims, costs, losses and damages caused by or resulting from such correction or removal. A Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, District may decide the proper amount or, in its discretion may elect to leave the Contract Sum unchanged and deduct from moneys due Contractor, all such claims, costs, losses and damages caused by or resulting from the correction or removal. If Contractor disagrees with District's calculations, it may make a claim as provided in Article 12 of this Document 00 71 00. (District's exercise of its rights under this paragraph 9.C shall be entirely discretionary and, like all other District rights and remedies under the Contract Documents, in addition to any other rights and remedies it may have under the Contract Documents or by law.

3. Correction Period:

   a. With respect to equipment and machinery supplied by Contractor and incorporated into the Work, if within one year after the date of Final Completion of the portion of the Work incorporating the equipment and/or machinery (or, to the extent expressed by Change Order or Certificate of Final Completion, one year after District's written acceptance of such equipment), or such longer period as may be prescribed by laws or regulations, or by the terms of the Contract Documents, any equipment or machinery is found to be defective, Contractor shall promptly, without cost to District and in accordance with District's written instructions, correct such Defective Work.

   b. With respect to structures within the scope of Work, if within one year after the date of Final Acceptance of the Work, or the portion or Phase of the Work as provided in these Contract Documents, or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents, any Work is found to be defective, Contractor shall promptly, without cost to District and in accordance with District's written instructions, correct such Defective Work.

   c. Contractor shall remove any Defective Work rejected by District and replace it with Work that is not defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, District may have the Defective Work corrected or the rejected Work removed and replaced.

   d. Contractor shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, District shall have all rights and remedies granted by law.

4. Additionally, in special circumstances where a part of the Work is occupied or a particular item of equipment is placed in continuous service before Final Acceptance of all the Work, the correction

period for that part of Work or that item may start to run from an earlier date if so provided by Change Order or as provided by elsewhere in these Contract Documents.

5. Where Defective Work or rejected Work (and damage to other Work resulting therefrom) has been removed and replaced under this provision after the commencement of the correction period, the correction period hereunder with respect to such Work shall be extended for an additional period of one year after such removal and replacement has been satisfactorily completed.

6. If following installation of any equipment, machinery, or facilities furnished by Contractor, defects requiring correction by Contractor are found, District shall have the right to operate such defective equipment or facilities and make reasonable use thereof until the equipment, machinery, or facilities can be shut down for correction of defects without causing injury to District.

D. Acceptance And Correction Of Defective Work By District

1. District may accept Defective Work. Contractor shall pay all claims, costs, losses and damages attributable to District's evaluation of and determination to accept such Defective Work. If District accepts any Defective Work prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, District may deduct from moneys due Contractor, all claims, costs, losses, damages, expenses and liabilities attributable to the Defective Work. If Contractor disagrees with District's calculations, Contractor may make a claim as provided in Article 12 of this Document 00 71 00. If District accepts any Defective Work after final payment, Contractor shall pay to District, an appropriate amount as determined by District.

2. District may correct and remedy deficiency if, after fifteen (15) Days' written notice to Contractor (or lesser notice if the deficiency poses a direct danger to persons or property at or about the Site or if required to comply with any DSA requirement), Contractor fails to correct Defective Work or to remove and replace rejected Work in accordance with paragraph 9.C of this Document 00 71 00; or provide a plan for correction of Defective Work acceptable to District; or perform Work in accordance with Contract Documents. In connection with such corrective and remedial action, District may, to the extent reasonably necessary: exclude Contractor from, and take possession of, all or part of the Site and Work and suspend Contractor's Work related thereto; take possession of all or part of Contractor's tools, appliances, construction equipment and machinery at the Site; and incorporate in Work any materials and equipment stored at the Site or for which District has paid Contractor but which are stored elsewhere. Contractor shall allow District, its representatives, agents, employees, and other contractors and District's consultants access to the Site to enable District to exercise the rights and remedies under this paragraph. Contractor shall be responsible for all claims, costs, losses, damages, expenses and liabilities incurred or sustained by District in exercising such rights and remedies. A Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, District may deduct from moneys due Contractor, all claims, costs, losses and damages caused by or resulting from the correction or removal. If Contractor disagrees with District's calculations, Contractor may make a claim as provided in Article 12 of this Document 00 71 00.

3. District's decisions to accept Defective Work or correct Defective Work are subject to approval of DSA, and all other requirements of Title 24, California Code of Regulations.

E. Rights Upon Inspection Or Correction

1. Contractor shall not be allowed an extension of Contract Time because of any delay in the performance of Work attributable to the exercise by District of its rights and remedies under this Article 9. Where District exercises its rights under this Article 9, it retains all other rights it has by law or under the Contract Documents including, but not limited to, the right to terminate Contractor's right to proceed with the Work under the Contract Documents and/or make a claim or back charge where a Change Order cannot be agreed upon.

2. Inspection by District shall not relieve Contractor of its obligation to have furnished material and workmanship in accordance with Contract Documents. Payment for Work completed through periodic progress payments or otherwise shall not operate to waive District's right to require full compliance with Contract Documents and shall in no way be deemed as acceptance of the Work paid

therefor. Contractor's obligation to complete the Work in accordance with Contract Documents shall be absolute, unless District agrees otherwise in writing.

F. Samples And Tests Of Materials And Work

1. Contractor shall furnish, in such quantities and sizes as may be required for proper examination and tests, samples or test specimens of all materials to be used or offered for use in connection with Work. Contractor shall prepare samples or test specimens at its expense and furnish them to District. Contractor shall submit all samples in ample time to enable District to make any necessary tests, examinations, or analyses before the time it is desired to incorporate the material into the Work.

2. Test samples or specimens of material for testing shall be taken by the Architect/Engineer, his or her representative, Project Inspector or representative of the testing agency. In no case shall Contractor or vendor select the sample. Refer to section 4-335, Part 1, Title 24, California Code of Regulations.

G. Proof Of Compliance Of Contract Provisions

In order that District may determine whether Contractor has complied or is complying with requirements of Contract Documents not readily enforceable through inspection and tests of Work and materials, Contractor shall at any time, when requested, submit to District properly authenticated documents or other satisfactory proofs of compliance with all applicable requirements.

H. Acceptance

Inspection by District or its authorized agents or representatives, any order or certificate for the payment of money, any payment, acceptance of the whole or any part of Work by District, any extension of time, any verbal statements on behalf of District or its authorized agents or representatives shall not operate as a waiver or modification of any provision of the Contract Documents, or of any power reserved to District herein or therein or any right to damages provided in the Contract Documents. Any waiver of any breach of the Contract Documents shall not be held to be a waiver of any other subsequent breach.

10. CONTRACTOR'S ORGANIZATION AND EQUIPMENT

A. Contractor's Legal Address

Address and facsimile number given in Contractor's Bid are hereby designated as Contractor's legal address and facsimile number. Contractor may change its legal address and facsimile number by notice in writing, delivered to District, which in conspicuous language advises District of a change in legal address or facsimile number, and which District accepts in writing. Delivery to Contractor's legal address or depositing in any post office or post office box regularly maintained by the United States Postal Service, in a wrapper with postage affixed, directed to Contractor at legal address, or of any drawings, notice, letter or other communication, shall be deemed legal and sufficient service thereof upon Contractor. Facsimile to Contractor's designated facsimile number of any letter, memorandum, or other communication on standard or legal sized paper, with proof of facsimile transmission, shall be deemed legal and sufficient service thereof upon Contractor.

B. Contractor's Office At The Work Site

Contractor shall maintain an office at the Site, which office shall be headquarters of a Contractor representative authorized to transmit to and receive from District, communications, instructions or Drawings. Communications, instructions, or Drawings given to Contractor's representative or delivered at the Site office in representative's absence shall be deemed to have been given to Contractor.

C. Contractor's Superintendents Or Forepersons

Contractor shall at all times be represented on Site by one or more superintendents, project managers or forepersons authorized and competent to receive and carry out any instructions that District may give, and shall be liable for faithful observance of instructions delivered to Contractor or to authorized representative or representatives on Site.

D. Proficiency In English

Supervisors, security guards, safety personnel and employees who have unescorted access to the Site shall possess proficiency in the English language in order to understand, receive and carry out oral and written communications or instructions relating to their job functions, including safety and security requirements.

E. Site Decorum: Contractor's And Subcontractors' Employees

1. Contractor shall employ, and shall permit its Subcontractors to employ, only competent and skillful personnel to do Work. If District notifies Contractor that any of its employees, or any of its Subcontractors' employees on Work is incompetent, unfaithful, disorderly, disruptive or profane, or fails to observe customary standards of conduct or refuses to carry out any provision of the Contract Documents, or uses threatening or abusive language to any person on Work representing District, or violates sanitary rules, or is otherwise unsatisfactory, and if District requests that such person be discharged from Work, then Contractor or its Subcontractor shall immediately discharge such person from Work and the discharged person shall not be re-employed on the Work except with consent of District.
2. Contractor shall control the conduct of its employees and subcontractors so as to prevent unwarranted interaction initiated by Contractor's employees or subcontractors with individuals, (except those associated with the Project) at the college campus. Without limitation, unwarranted interaction by Contractor's employees or subcontractors would include includes whistling at or initiating conversation with passers -by. In the event that any employee or subcontractor of the Contractor initiates such any unwarranted interaction, Contractor shall, either upon request of District's Representative or on its own initiative, replace said employee or subcontractor employee with another of equivalent technical skill at no cost to the District.
3. There shall be no smoking outside of the construction site or within any of the District's buildings, including those buildings under construction by the Contractor.
4. The playing of radios, televisions and other portable audio or video players on the Project Site is prohibited at all times.

F. Contractor To List Trades Working

Contractor shall list the trades working on the Site and their scheduled activities on a daily basis, and provide a copy of that list to District

G. Contractor's Use Of The Site

Contractor shall not make any arrangements with any person to permit occupancy or use of any land, structure or building within the limits of the Work, for any purpose whatsoever, either with or without compensation, in conflict with any agreement between District and any owner, former owner or tenant of such land, structure or buildings. Contractor may not occupy District-owned property outside the limit of the Work as indicated on the Drawings unless it obtains prior written approval from District.

11. PROSECUTION AND PROGRESS OF THE WORK

A. Contractor to Submit Required Schedules

1. Contractor shall submit schedules and reports, Shop Drawings and Submittals in the appropriate quantity and within the required time, arrange conferences and meetings and proceed with the Work in accordance with Contract Documents, including Sections 01 31 19 (Project Meetings), 01 32 16 (Progress Schedules and Reports), and 01 32 19 (Submittal Procedures).
2. Contractor shall submit to District for review and discussion at the Preconstruction Conference documentation described in Section 01 31 19 (Project Meetings):
   a. Progress schedules and reports as required by Sections 01 32 16 (Progress Schedules and Reports), and 01 32 19 (Submittal Procedures). Contractor shall utilize Progress Schedule in planning, scheduling, coordinating, performing and controlling Work (including all activities of Subcontractors, assigned contractors, equipment vendors and suppliers). Contractor shall update Progress Schedule on a monthly basis to depict accurately the actual progress of Work and for evaluating and preparing Contractor's monthly progress payments. Contractor's failure to submit and maintain an acceptable progress schedule may, in District's discretion, and without

limiting the materiality of Contractor's other obligations under the Contract Documents, constitute grounds to declare Contractor in material breach of the Contract Documents

b. Prior to receiving a Notice to Proceed with Construction, a preliminary Schedule of Submittals that shall list each required submittal and the times for submitting, reviewing and processing such submittal, as required by Section 01 32 19 (Submittal Procedures). If no such schedule is agreed upon, then all Shop Drawings, Samples and product data submittals shall be completed and submitted within 30 Days after receipt of Notice to Proceed with Construction from District.

c. Within 60 Days after issuance of Notice of Award, a preliminary Schedule of Values for all the Work, including detailed breakdown of all design phases to serve as the basis for progress payments during design. At least 30 Days before commencing construction, Contractor shall submit an updated Schedule of Values including additional detail regarding construction activities, as provided in Section 01 29 00 (Measurement and Payment), paragraph 1.7. The updated Schedule of Values shall include quantities and prices of items aggregating the Contract Sum and shall subdivide into component activities in sufficient detail to serve as the basis for progress payments during construction. Each Schedule of Values shall include an appropriate amount of overhead and profit applicable to each item of Work, a line item for Project Record Documents, and a line item for Project scheduling, and shall conform to Section 01 29 00.

3. Unless otherwise provided in the Contract Documents, at least 15 Days before submission of the first application for payment, a conference attended by Contractor, District, and others as appropriate, will be held to review for acceptability the schedules submitted in accordance with subparagraph 11.A.2 of this Document 00 71 00 and first reviewed at the Preconstruction Conference. Contractor shall have an additional seven Days to make corrections and adjustments and to complete and resubmit the schedules. Schedules shall be updated and completed as required by Sections 01 29 00 (Measurement and Payment), 01 32 16 (Progress Schedules and Reports) and 01 32 19 (Submittal Procedures). No progress payment shall be due or owing to Contractor until the schedules are submitted to and acceptable to District and/or Architect/Engineer as meeting the requirements of the Contract Documents, including Sections 01 29 00 (Measurement and Payment), 01 32 16 (Progress Schedules and Reports) and 01 32 19 (Submittal Procedures). District's acceptance of Contractor's schedules will not create any duty of care or impose on District any responsibility for the sequencing, scheduling or progress of Work nor will it interfere with or relieve Contractor from Contractor's full responsibility therefor.

4. Before commencing any phase of Work, Contractor shall inform District in writing as to time and place at which Contractor wishes to commence Work, and nature of Work to be done, in order that proper adjustments to College operations and notices to occupants may be made, proper provision for inspection of Work may occur, and to assure measurements necessary for record and payment. Information shall be given to District a reasonable time in advance of time at which Contractor proposes to begin Work, so that District may complete necessary preliminary work without inconvenience or delay to Contractor.

B. Contractor to Submit Submittals and Shop Drawings

1. Contractor shall submit submittals and shop drawings to District (or Architect/Engineer if District so designates) for review in strict accordance with Section 01 32 19 (Submittal Procedures). Submission of a Shop Drawing shall constitute Contractor's representation that all requirements of Section 01 32 19 (Submittal Procedures) have been complied with. All submittals will be identified as District may require and in the number of copies specified in Section 01 32 19 (Submittal Procedures).

2. Contractor shall not perform Work that requires submission of a Shop Drawing or Sample or other submittal prior to submission and favorable review of the Shop Drawing or Sample or submittal. Where a Shop Drawing or Sample or other submittal is required by Contract Documents or the final Schedule of Submittals accepted by District, any related Work performed prior to District's approval of the pertinent submittal shall be at the sole expense, responsibility and risk of Contractor.

3. District's review of shop drawings, samples and submittals shall not relieve Contractor of its responsibility for a complete design complying with the requirements of the Contract Documents; but rather, such review shall be in furtherance of District's monitoring and accepting the design as developed and issued by the Contractor, consistent with these Contract Documents.

C. Cost Data

1. Contractor shall maintain full and correct information as to the number of workers employed in connection with each subdivision of Work, the classification and rate of pay of each worker in form of certified payrolls, the cost to Contractor of each class of materials, tools and appliances used by Contractor in Work, and the amount of each class of materials used in each subdivision of Work. Contractor shall provide District with monthly summaries of this information. If Contractor maintains or is capable of generating summaries or reports comparing actual Project costs with Bid estimates or budgets, and if the actual cost comparisons become necessary (in District's sole judgment) in connection with claims or Contract Modifications, Contractor shall provide District with a copy of such report upon District's request.

2. Contractor shall maintain daily job reports recording all significant activity on the job, including the number of workers on Site, Work activities, problems encountered and delays. Contractor shall provide District with copies for each Day Contractor works on the Project, to be delivered to District either the same Day or the following morning before starting work at the Site. Contractor shall take monthly progress photographs of all areas of the Work. Contractor shall maintain copies of all correspondence with Subcontractors and records of meetings with Subcontractors.

3. District shall have the right to audit and copy Contractor's books and records of any type, nature or description relating to the Project (including but not limited to financial records reflecting in any way costs claimed on the Project), and to inspect the Site, including Contractor's trailer, or other job Site office, and this requirement shall be contained in the subcontracts of Subcontractors working on Site. By way of example, District shall have the right to inspect and obtain copies of all Contract Documents, planning and design documents, Bid and negotiation documents records and job cost variance reports, design modification proposals, value engineering or other cost reduction proposals, revisions made to the original design, job progress reports, photographs, and as-built drawings maintained by Contractor. District and any other applicable governmental entity shall have the right to inspect all information and documents maintained under this paragraph 11.C at any time during the Project and for a period of five years following Final Completion. This right of inspection shall not relieve Contractor of its duties and obligations under the Contract Documents. This right of inspection shall be specifically enforceable in a court of law, either independently or in conjunction with enforcement of any other rights in the Contract Documents.

4. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Contract Modifications, Change Orders, Work Directives, Force Account orders, and written interpretations and clarifications in good order and annotated to show all changes made during construction. These Project Record Documents, together with all approved Samples and a counterpart of all approved Shop Drawings, shall be maintained and available to District for reference. Upon completion of the Work, Contractor shall deliver to District, the Project Record Documents, Samples and Shop Drawings and as-built drawings.

D. Contractor To Supply Sufficient Workers And Materials

1. Unless otherwise required by District under the terms of Contract Documents, Contractor shall at all times keep on the Site materials and employ qualified workers sufficient to prosecute Work at a rate and in a sequence and manner necessary to complete Work within the Contract Time. This obligation shall remain in full force and effect notwithstanding disputes or claims of any type.

2. At any time during progress of Work should Contractor directly or indirectly (through Subcontractors) refuse, neglect, or be unable to supply sufficient materials or employ qualified workers to prosecute the Work as required, then District may require Contractor to accelerate the Work and/or furnish additional qualified workers or materials as District may consider necessary, at no cost to District. If Contractor does not comply with the notice within three (3) Business Days of date of service thereof, District shall have the right (but not a duty) to provide materials and qualified workers to finish the Work or any affected portion of Work, as District may elect. District may, at its discretion, exclude Contractor from the Site, or portions of the Site or separate work elements during the time period that District exercises this right. District will deduct from moneys due or which may thereafter become due under the Contract Documents, the sums necessary to meet expenses thereby incurred and paid to persons supplying materials and doing Work. District will deduct from funds or appropriations set aside for purposes of Contract Documents the amount of such payments and

charge them to Contractor as if paid to Contractor. Contractor shall remain liable for resulting delay, including liquidated damages and indemnification of District from claims of others.

3. Exercise by District of the rights conferred upon District in this subparagraph is entirely discretionary on the part of District. District shall have no duty or obligation to exercise the rights referred to in this subparagraph and its failure to exercise such rights shall not be deemed an approval of existing Work progress or a waiver or limitation of District's right to exercise such rights in other concurrent or future similar circumstances. (The rights conferred upon District under this subparagraph are, like all other such rights, cumulative to District's other rights under any provision of the Contract Documents.)

E. Contractor to Locate Underground Facilities.

1. During construction, Contractor shall comply with Government Code Sections 4216 to 4216.9, and in particular Section 4216.2 which provides, in part: "Except in an emergency, every person planning to conduct any excavation shall contact the appropriate regional notification center at least two *working* days, but no more than 14 *calendar* days, prior to commencing that excavation, if the excavation will be conducted in an area which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the excavator, and, if practical, the excavator shall delineate with white paint or other suitable markings the area to be excavated. The regional notification center shall provide an inquiry identification number to the person who contacts the center and shall notify any member, if known, who has a subsurface installation in the area of the proposed excavation."

2. Contractor shall contact USA, and schedule the Work to allow ample time for the center to notify its members and, if necessary, for any member to field locate and mark its facilities. Contractor is charged with knowledge of all subsurface conditions reflected in USA records. Prior to commencing excavation or trenching work, Contractor shall provide District with copies of all USA records secured by Contractor. Contractor shall advise District of any conflict between information provided in Document 00 31 19 (Reports, Surveys and Existing Conditions), Drawings and that provided by USA records. Contractor's excavation shall be subject to and comply with the Contract Documents, including without limitation Articles 2 and 8 of this Document 00 71 00.

3. Contractor shall also investigate the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site, even if not shown or indicated in Document 00 31 19 (Reports, Surveys and Existing Conditions), the Drawings or that provided by USA records. Contractor shall immediately secure all such available information and notify District and the utility owner, in writing, of its discovery.

F. Contractor to Protect Underground Facilities.

1. At all times during construction, all operating Underground Facilities shall remain in operation, unless the Contract Documents expressly indicate otherwise. Contractor shall maintain such Underground Facilities in service where appropriate; shall repair any damage to them caused by the Work; and shall incorporate them into the Work, including reasonable adjustments to the design location (including minor relocations) of the existing or new installations. Contractor shall take immediate action to restore any in service installations damaged by Contractor's operations.

2. Prior to performing Work at the Site, Contractor shall lay out the locations of Underground Facilities that are to remain in service and other significant known underground installations indicated by the Underground Facilities Data. Contractor shall further locate, by carefully excavating with small equipment, potholing and principally by hand, all such utilities or installations that are to remain and that are subject to damage. If additional utilities whose locations are unknown are discovered, Contractor shall immediately report to District for disposition of the same. Additional compensation or extension of time on account of utilities not shown or otherwise brought to Contractor's attention, including reasonable action taken to protect or repair damage, shall be determined as provided in this Document 00 71 00.

3. The cost of all of the following will be included in the Contract Sum and Contractor shall have full responsibility for (a) reviewing and checking all available information and data including, but not limited to, Document 00 31 19 (Reports, Surveys and Existing Conditions) and information on file at USA; (b) locating all Underground Facilities shown or indicated in the Contract Documents, available information, or indicated by visual observation including, but not limited to, and by way of

example only, engaging qualified locating services and all necessary backhoeing and potholing; (c) coordination of the Work with the owners of such Underground Facilities during construction; and (d) the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

G. Contractor to Not Disrupt District Operation.

1. Contractor shall schedule and execute all Work in a manner that does not interfere with or disrupt District operations, including but not limited to, parking, utilities (electricity, gas, water), noise, access by students, faculty, other employees and administration, access by vendors and any other person or entity using District facilities or doing business with District. Contractor shall produce and supply coordination plans and requests to District, following District procedures, for all necessary interference of construction with District, which District will reasonably cooperate with.
2. Academic Calendar/Events: Without limiting the foregoing, the academic dates/events are furnished for Contractor's information. Construction activities which may be disrupted due to these events are to be accounted for in all applicable Schedules, and Contract Time shall not be extended thereby. Contractor is advised to consult District's website for any updates to the academic calendar. Refer to Section 01 10 00 Summary of Work for additional information.

12. CLAIMS BY CONTRACTOR/NON-JUDICIAL SETTLEMENT PROCEDURE

A. Scope

1. The claim notice and documentation procedure described in this Article 12 applies to all claims and disputes arising under the Contract Documents, including without limitation any claim or dispute by any Subcontractor or material supplier, and any claims arising under tort law as well as contract law. All Subcontractor and supplier claims of any type shall be brought only through Contractor as provided in this Article 12. Under no circumstances shall any Subcontractor or supplier make any direct claim against District.
2. "Claim" means a written demand or written assertion by Contractor seeking, as a matter of right, the payment of money, the adjustment or interpretation of Contract Documents terms, or other relief arising under or relating to Contract Documents. In order to qualify as a "claim," the written demand must state that it is a claim submitted under this Article 12. A voucher, invoice, proposed change, Application for Payment, cost proposal, RFI, change order request, or other routine or authorized form of request for payment is not a claim under the Contract Documents. If such request is disputed as to liability or amount, then the disputed portion of the submission may be converted to a claim under the Contract Documents by submitting a separate notice and claim in compliance with claim submission requirements herein.
3. The provisions of this Article 12 constitute a non-judicial claim settlement procedure, and also step one of a two step claim presentment procedure by agreement under Section 930.2 of the California Government Code. Specifically, step one is compliance with this contract claims procedure and filing/administering timely contract claims in accordance with the Contract Documents. Step two is filing a timely Government Code Section 910 claim in accordance with the California Government Code. Any Government Code Section 910 claims shall be presented in accordance with the Government Code and shall affirmatively indicate Contractor's prior compliance with the claims procedure herein and previous dispositions under this Article.
4. The provisions of this Article 12 shall survive termination, breach or completion of the Contract Documents. Contractor shall bear all costs incurred in the preparation and submission of a claim.

B. Procedure

1. Disputed Work. Should any clarification, determination, action or inaction by District or Architect/Engineer, Work, third party, or any other event whatsoever, in the opinion of Contractor, exceed the requirements of or not comply with Contract Documents in any way, or otherwise result in Contractor seeking additional compensation in time or money or damages for any reason (collectively "Disputed Work"), then Contractor shall so notify District. Contractor and District shall make good faith attempts to resolve informally any and all such issues, claims and/or disputes.
2. Duty to Work During Disputes. Notwithstanding any dispute or Disputed Work, Contractor shall continue to prosecute the Work and the Disputed Work in accordance with the determinations of

District. Contractor's sole remedy for Disputed Work is to pursue the remedies in this Article 12 and follow the determinations of District.

3. Timely Notice of Disputed Work Required. Before commencing any Disputed Work, or within ten (10) Days after Contractor's first knowledge of the Disputed Work, whichever is earlier, Contractor shall file a written notice and preliminary cost proposal for the Disputed Work with District stating clearly and in detail its objection and reasons for contending the Disputed Work is outside or in breach of the requirements of Contract Documents. The written notice must identify the subcontractors, vendors, suppliers effected, if any, sufficient for District to visit the site to inspect the work and/or conduct a telephonic interview of the persons involved, and/or to photograph the work in question; and Contractor is encouraged to supply digital photographs by email if possible. The preliminary cost proposal must provide a good faith preliminary estimate of the labor (workers, crews), equipment and/or materials involved, and a corresponding good faith preliminary estimate of cost. If a written notice and preliminary cost proposal for Disputed Work is not issued within this time period, or if Contractor proceeds with the Disputed Work without first having given the notice of the Disputed Work, Contractor shall waive its rights to further claim on the specific issue.

4. Timely Notice of Potential Claims Required. District will review Contractor's timely notice and preliminary cost proposal for Disputed Work and provide a decision. If, after receiving the decision, Contractor disagrees with it or still considers the Work required of it to be outside of the requirements of Contract Documents, then Contractor shall so notify District, in writing, within ten (10) Days after receiving the decision, by submitting a notice of potential claim, stating that a formal claim will be issued. (If District should fail to provide a decision on a notice and preliminary cost proposal within thirty (30) days, then Contractor shall submit a notice of potential claim within ten days following the thirtieth (30th) day, i.e., or by the 40th day following the notice and preliminary cost proposal.) Contractor shall continue to prosecute the Disputed Work to completion.

5. Quarterly Claims Required. At the end of each calendar year quarter (March 31, June 30, September 30 and December 31) of each year, for each and every notice of potential claim that Contractor may have submitted in that quarter, Contractor shall submit a formal claim in the form specified herein. Contractor may file a single consolidated claim each quarter, or may file separate claims each quarter, as Contractor sees fit, provided Contractor complies with the requirements below. (Contractor may defer until the next reporting period the filing of a formal claim for any notices of potential claim timely issued within the last 15 days of the prior quarter.) The formal claim(s) shall include all arguments, justification, cost or estimates, schedule analysis, and detailed documentation supporting the Contractor's position, for each notice of potential claim that Contractor intends to pursue as a formal claim (further described below).

6. Claim Updates Required. If Disputed Work persists longer than a single calendar quarter, then Contractor shall, every quarter until the Disputed Work ceases, submit to District a document titled "Claim Update" that shall update and quantify all elements of the claim as completely as possible. Contractor's failure to submit a Claim Update or to quantify costs every quarter shall result in waiver of the claim for that period. Claims or Claim Updates stating that damages, total damages (direct and indirect), schedule impact and/or any time extension will be determined at a later date shall not comply with this subparagraph and shall result in Contractor waiving its claim(s). Contractor shall also maintain a continuing "claims log" that shall list all outstanding claims and their value, and provide such log to District quarterly.

7. Claim Negotiations Required. Upon receipt of Contractor's formal claim(s) including all arguments, justifications, cost or estimates, schedule analysis, and documentation supporting its position as required herein, District or its designee will review the issue and render a final determination. Contractor and District may mutually agree upon a claims resolution protocol, a neutral facilitator or mediator, or other alternative dispute resolution procedures, as appropriate. District may in its discretion conduct an administrative hearing on Contractor's claim, in which case Contractor shall appear, participate, answer questions and inquiries, and present any further document, schedules or analysis requested by District to evaluate and decide Contractor's claim.

C. Claim Format

1. Contractor shall submit the formal claim(s) with a cover letter and certification of the accuracy of the formal claim.

2. The formal claim(s) shall list separately each notice of potential claim that Contractor intends to pursue as a formal claim(s), and for each such item separately, Contractor shall provide the following:
   a. Summary of the claim, including underlying facts, entitlement, schedule analysis, quantum calculations, contract provisions supporting relief;
   b. List of documents relating to claim including Specifications, Drawings, clarifications/requests for information, schedules, notices of delay, and any others;
   c. Chronology of events and correspondence;
   d. Analysis of claim merit;
   e. Analysis of claim cost; and
   f. Attach supporting cost and schedule documents as required in this Article and elsewhere in the Contract Documents (e.g., Section 01 32 16).
3. For each notice of potential claim that Contractor intends to pursue as a formal claim, Contractor shall establish in the formal claim a direct causal link between the separate item of cost/time requested, the separate notices of potential claim timely issued, and the specific changed Work asserted. Total cost claims shall not be allowed.
4. Claims shall be calculated in the same manner as Change Orders per Section 01 26 00 (Modification Procedures). EXCEPT WHERE PROVIDED BY LAW, OR ELSEWHERE IN THESE CONTRACT DOCUMENTS (IF APPLICABLE), DISTRICT SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES, AND CONTRACTOR SHALL NOT INCLUDE THEM IN ITS CLAIMS. CONTRACTOR SHALL BE LIMITED IN ITS RECOVERY ON CLAIMS TO THE CHANGE ORDER CALCULATIONS SET FORTH IN SECTION 01 26 00 (MODIFICATION PROCEDURES).

D. Mediation

1. If Contractor's claims submitted in accordance with this Article 12 at Project completion total less than $375,000, then claims resolution shall first proceed in the manner prescribed by Article 1.5, Chapter 1, Part 3 of Division 2 of the California Public Contract Code, found in Section 01 41 00 (Regulatory Requirements).
2. If Contractor's claims submitted in accordance with this Article 12 at Project completion exceed $375,000, then, as a condition precedent to litigation (or if otherwise permitted by the Contract Documents, arbitration) thereon, such claims must first be mediated. Mediation shall be non-binding and utilize the services of a mediator mutually acceptable to the parties and, if the parties cannot agree, a mediator selected by the American Arbitration Association from its panel of approved mediators trained in construction industry mediation, having a minimum of twenty (20) years experience in the construction industry. All statutes of limitation shall be tolled from the date of the demand for mediation until a date two weeks following the mediation's conclusion. All unresolved Contractor claims shall be submitted to the same mediator. The cost of mediation shall be equally shared.

E. Subcontractor Claims

1. Contractor shall present as its claims all Subcontractor, sub-Subcontractor and supplier claims of any type, and prove them under the terms of the Contract Documents. District shall not be directly liable to any Subcontractor, any supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages or extra costs of any type arising out of or resulting from the Project.

F. Waiver.

1. If Contractor fails to comply with this Article 12 as to any claim, then Contractor shall waive its rights to such claim.
2. All claim(s), Disputed Work items or issue(s) not raised in a timely notice, timely notice of potential claim and then timely claim submitted under this Article 12, may not be asserted in any subsequent Government Code section 910 claim, litigation or legal action.
3. Contractor may request an extension of time to comply with the claims procedure herein, but must do so in advance of time periods expiring and District must give its approval in writing (which approval may be withheld in District discretion.) As to any other feature of the claim procedure herein (and its

claims waiver feature), it may not be waived or altered absent a written change order signed by both parties and approved as to form by their legal counsel.

4. District shall not be deemed to waive or alter any provision under this Article 12, if at District's sole discretion, a claim is administered in a manner not in accord with this Article 12.

13. LEGAL AND MISCELLANEOUS

A. Laws And Regulations

1. Contractor shall keep fully informed of and shall comply with all laws, ordinances, regulations and orders of any properly constituted authority affecting the Contract Documents, Work and persons connected with Work, and shall, to the greatest extent permitted by law, protect and indemnify District and its officers, employees, consultants and agents against any claim or liability, including attorney's fees, arising from or based on violation of law, ordinance, regulation or order, whether by Contractor or by Subcontractors, employees or agents. Authorized persons may at any time enter upon any part of Work to ascertain compliance of all applicable laws, ordinances, regulations and orders.

2. Contractor shall comply with applicable portions of Title 19 and Title 24, California Code of Regulations (Uniform Building Code) (most recent edition), and Public Contract Code. Whenever Contract Documents require larger sizes or higher standards than are required by any applicable law, ordinance, regulation or order, Contract Documents shall govern. Whenever Contract Documents require something that will violate such laws, ordinances, regulations or orders, then such laws, ordinances, regulations or orders shall govern.

3. Contractor shall maintain in the Project Office a current copy of Title 19 and 24 of the California Code of Regulations at all times during construction.

B. Permits And Taxes

Contractor shall procure all permits and licenses applicable to the Work (including environmental matters to the extent applicable), pay all charges and fees, including fees for street opening permits, comply with, implement and acknowledge effectiveness of all permits, initiate and cooperate in securing all required notifications or approvals therefore, and give all notices necessary and incident to due and lawful prosecution of Work, unless otherwise provided herein. District will pay applicable building permits, school, sanitation and water fees, except as otherwise provided in the Contract Documents. If, under federal excise tax law, any transaction hereunder constitutes a sale on which a federal excise tax is imposed, and the sale is exempt from such excise tax because it is a sale to a state or local government for its exclusive use, the District, upon request, will execute a certificate of exemption which will certify (1) that the District is a political subdivision of the state for the purpose of such exemption, and (2) that the sale is for the exclusive use of the District. No excise tax for such materials shall be included in any bid price. Contractor shall pay all sales and/or use taxes levied on materials, supplies, or equipment purchased and used on or incorporated into Work, and all other taxes properly assessed against equipment or other property used in connection with Work, without any increase in the Contract Sum. Contractor shall make necessary arrangements with proper authorities having jurisdiction over roads, streets, pipelines, navigable waterways, railroads, and other works in advance of operations, even where District may have already obtained permits for the Work.

C. Responsibility Of Contractor And Indemnification

1. Except to the extent caused by their sole negligence, willful misconduct or active negligence, District and each of its officers, employees, consultants and agents including, but not limited to the Board, Architect/Engineer, and each District Representative, shall not be liable or accountable in any manner for loss or damage that may happen to any part of the Work; loss or damage to materials or other things used or employed in performing the Work; injury, sickness, disease, or death of any person; or damage to property resulting from any cause whatsoever, attributable to performance or character of the Work, and Contractor releases all of the foregoing persons and entities from any and all such claims.

2. To the furthest extent permitted by law (including without limitation California Civil Code Section 2782 and, if and to the extent applicable, California Civil Code Section 2782.8, Contractor shall assume defense of (with counsel approved by District), and indemnify and hold harmless, District and each of its officers, employees, consultants and agents, including but not limited to the Board,

Architect/Engineer, and each District representative, from claims, suits, actions, and liability of every kind, nature and description, including but not limited to claims and fines of regulatory agencies and attorney's fees and consultant's fees, directly or indirectly arising out of, connected with or resulting from performance of the Work, failure to perform the Work, or condition of the Work which is caused in whole or part by any act or omission of Contractor, Subcontractors, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether it is caused in part by the negligence of District or by any person or entity required to be indemnified hereunder.

3. With respect to third-party claims against Contractor, Contractor waives any and all rights to any type of express or implied indemnity against District and each of its officers, employees, consultants and agents including, but not limited to District, the Board, Architect/Engineer and each District representative.

4. Approval or purchase of any insurance contracts or policies shall in no way relieve from liability nor limit the liability of Contractor, its Subcontractors of any tier, or the officers or agents of any of them.

5. To the furthest extent permitted by law (including, without limitation, Civil Code Section 2782 and, if and to the extent applicable, Civil Code Section 2782.8, the indemnification provisions, releases of liability and limitations of liability, claims procedures, and limitations of remedy expressed throughout Contract Documents shall apply even in the event of breach of contract, negligence (active or passive), fault or strict liability of the party(is) indemnified, released, or limited in liability, and shall survive the termination, rescission, breach, abandonment, or completion of the Work or the terms of the Contract Documents. If Contractor fails to perform any of these defense or indemnity obligations, District may in its discretion back charge Contractor for District's costs and damages resulting therefrom and withhold such sums from progress payments or other contract moneys which may become due.

6. The indemnification provisions of this Contract as reflected in the Contract Documents shall not apply to any indemnified party to the extent of its sole negligence or willful misconduct; nor shall they apply to District or other indemnified party to the extent of its active negligence.

D. Suspension Of Work

1. District may, without cause, order Contractor in writing to suspend, delay or interrupt Work in whole or in part for such period of time as District may determine. An adjustment shall be made for increases in cost of performance of Work of the Contract Documents caused by any such suspension, delay or interruption, calculated using the measures set forth in Section 01 26 00 (Modification Procedures). No adjustment shall be made to extent that:
   a. Performance is, was or would have been so suspended, delayed or interrupted by another cause for which Contractor is responsible; or
   b. An equitable adjustment is made or denied under any other provision of Contract Documents; or
   c. The suspension of Work was the direct or indirect result of Contractor's failure to perform any of its obligations hereunder. Adjustments made in cost of performance may have a mutually agreed fixed or percentage fee; if the parties cannot agree, Contractor may file a claim under Article 12 of this Document 00 71 00.

2. In addition to the foregoing, if applicable, Contractor shall receive a time extension for the actual period of time Contractor proves it was delayed by District's order to suspend, delay or interrupt Work. For example, and not by way of limitation, if precipitation exceeding the specified parameters does not in fact delay Contractor's progress on the critical path, then no time extension shall be recognized; and conversely, if Contractor proves to District's satisfaction that precipitation exceeding the specified parameters causes delay to Contractor for a period longer than the number of precipitation days incurred (e.g., if it rains or snows during grading work), then Contractor shall be entitled to a time extension equal to the actual period of such delay.

E. Termination Of Contract For Cause

1. District may declare Contractor in default of Contract Documents and District may terminate Contractor's right to proceed under the Contract Documents for cause:
   a. Should Contractor make an assignment for the benefit of creditors; admit in writing its inability to pay its debts as they become due; file a voluntary petition in bankruptcy; be adjudged a

bankrupt or insolvent; be the subject of an involuntary petition in bankruptcy which is not dismissed within sixty (60) Days; file a petition or answer seeking for itself any reorganization, arrangement, composition, readjustment, liquidation, dissolution, or similar relief under any present or future statute, law, or regulation; file any answer admitting or not contesting the material allegations of a petition filed against Contractor in any such proceeding; or seek, consent to, or acquiesce in, the appointment of any trustee, receiver, custodian or liquidator of Contractor or of all or any substantial part of its properties or if Contractor, its directors or shareholders, take action to dissolve or liquidate Contractor; or

b. Should Contractor commit a material breach of the Contract Documents. If District declares Contractor in default due to material breach, however, District must allow Contractor an opportunity to cure such breach within ten (10) Days of the date of notice from District to Contractor providing notice of the default; or, if such breach is curable but not curable within such ten-Day period, within such period of time as is reasonably necessary to accomplish such cure. (In order for Contractor to avail itself of a time period in excess of ten (10) Days, Contractor must provide District within the ten-Day period with a written plan ("cure plan") acceptable to District to cure said breach which includes, for example, evidence of necessary resources, actual Subcontractor commitments, actual labor commitments, schedules and recovery schedules meeting Contract Document requirements and showing a realistic and achievable plan to cure the breach. Contractor must then diligently commence and continue such cure according to the written cure plan); or

c. Should Contractor violate or allow (by a Subcontractor or other person or entity for which Contractor is responsible) a violation of any valid law, statute, regulation, rule, ordinance, permit, license or order of any governmental agency applicable to the Project or Work and does not cure (or cause to be cured) such violation within ten (10) Days of the date of the notice from District to Contractor demanding such cure; or, if such violation is curable but not curable within such ten-Day period, within such period of time as is reasonably necessary to accomplish such cure. (In order for Contractor to avail itself of a time period in excess of ten (10) Days, Contractor shall provide District within the ten-Day period with a written plan to cure said violation acceptable to District, and then diligently commence and continue performance of such cure according to the written plan.)

2. If District at any time reasonably believes that Contractor is or may be in default under the Contract Documents as provided above, then District may in its sole discretion notify Contractor of this fact and request written assurances from Contractor of performance of Contract Documents and a written plan from Contractor to remedy any default under the terms of Contract Documents which District may advise Contractor of in writing. Contractor shall, within ten (10) Days of District's request, deliver a written cure plan which meets the requirements of the written cure plan as defined above. Failure of Contractor to provide such written assurances of performance and the required written cure plan within ten (10) Days of request will constitute a material breach of Contract Documents sufficient to justify termination for cause.

3. In event of termination for cause, District will immediately serve written notice thereof upon Surety and Contractor. Surety shall have the rights and obligations set forth in Document 00 61 00 (Construction Performance Bond). Subject to the Surety's rights under the Performance Bond (which rights are waived upon a default there under), District may take over the Work and prosecute it to completion by contract or by any other methods it may deem advisable.

4. In the event of termination by District for cause:

   a. District will compensate Contractor for the value of the Work delivered to District upon termination as determined in accordance with the Contract Documents, subject to all rights of offset and back charges, and provided that Contractor provides District with updated as-builts and Project Record Documents showing the Work performed up to the date of termination. However, District will not compensate Contractor for its costs in terminating the Work or any cancellation charges owed to third parties.

   b. Contractor shall deliver to District possession of the Work in its then condition including, but not limited to, all designs, engineering, Project records, Project Record Documents, cost data of all types, Drawings and Specifications and contracts with vendors and Subcontractors, all other documentation associated with the Project, and all construction supplies and aids dedicated solely to performing the Work which, in the normal course of construction, would be consumed or only have salvage value at the end of the construction period. Contractor shall remain fully liable for the failure of any Work completed and materials and equipment provided through the

date of such termination to comply with the provisions of the Contract Documents. The provisions of this subparagraph shall not be interpreted to diminish any right which District may have to claim and recover damages for any breach of Contract Documents or otherwise, but rather, Contractor shall compensate District for all loss, cost, damage, expense, and/or liability suffered by District as a result of such termination and failure to comply with Contract Documents.

c. District's rights under this subparagraph shall be specifically enforceable to the greatest extent permitted by law. District shall, to the extent applicable, have all other rights and remedies set forth in any Bidding Document.

5. District may terminate portions or parts of the Work for cause, provided these portions or parts (1) have separate geographic areas from parts or portions of the Work not terminated or (2) are limited to the work of one or more specific trades or Subcontractors. In such case, Contractor shall cooperate with a completing Contractor as required under Article 6 of this Document 00 71 00.

6. In the event a termination for cause is later determined to have been made wrongfully or without cause, then Contractor shall have no greater rights than if a termination for convenience had been effected (to include, as appropriate, the recovery rights specified therefore. Any Contractor claim arising out of a termination for cause, however, shall be made in accordance with Article 12 of this Document 00 71 00. No other loss cost, damage, expense or liability may be claimed, requested or recovered by Contractor.

F. Termination Of Contract For Convenience

1. District may terminate for convenience performance of the Work under the Contract Documents in accordance with this clause in whole, or from time to time in part, whenever District shall determine that termination is in District's best interest. Termination for convenience may only be effected by District delivering to Contractor written "Notice of Termination for Convenience" specifying the extent to which performance of the Work under the Contract Documents is terminated and the effective date of the termination.

2. After receiving a notice of termination for convenience under this subparagraph, and except as otherwise directed by District, Contractor shall:

a. Stop Work under the Contract Documents on date and to extent specified in notice of termination for convenience;

b. Place no further orders or subcontracts for materials, services, or facilities except as necessary to complete portion of Work under the Contract Documents which is not terminated;

c. Terminate all orders and subcontracts to extent that they relate to performance of Work terminated by the notice of termination;

d. Assign to District in manner, at times, and to extent directed by District, all right, title, and interest of Contractor under orders and subcontracts so terminated. District shall have the right, in its sole discretion, to settle or pay any or all claims arising out of termination of orders and subcontracts;

e. Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with approval or ratification of District to extent District may require. District's approval or ratification shall be final for purposes of this subparagraph;

f. Transfer title to District, and deliver in the manner, at the times, and to the extent, if any, directed by District, all fabricated or unfabricated parts, Work in process, completed Work, supplies, and all other material produced as part of, or acquired in connection with performance of, Work terminated by the notice of termination, and completed or partially completed drawings, drawings, specifications, information, and other property which, if the Project had been completed, would have been required to be furnished to District;

g. Use its best efforts to sell, in manner, at times, to extent, and at price or prices that District directs or authorizes, any property of types referred to in subparagraph, but Contractor shall not be required to extend credit to any purchaser, and may acquire any such property under conditions prescribed and at price or prices approved by District. Proceeds of transfer or disposition shall be applied to reduce payments to be made by District to Contractor under the Contract Documents or shall otherwise be credited to the price or cost of Work covered by Contract Documents or paid in such other manner as District may direct;

h. Complete performance of the part of the Work which was not terminated by the notice of termination; and

i. Take such action as may be necessary, or as District may direct, to protect and preserve all property related to Contract Documents which is in Contractor's possession and in which District has or may acquire interest.

3. After receipt of a notice of termination for convenience, Contractor shall submit to District its termination for convenience claim, in form and with all certifications required by Article 12 of this Document 00 71 00. Contractor's termination claim shall be submitted promptly, but in no event later than 6 months from effective date of the termination. Contractor and District may agree upon the whole or part of the amount or amounts to be paid to Contractor because of a total or partial termination of Work for convenience. If Contractor and District fail to agree on the whole amount to be paid to Contractor because of the termination of the Work under this subparagraph, District's total liability to Contractor by reason of the termination shall not exceed the total (without duplication of any items) of:

a. The reasonable cost to Contractor, without profit, for all Work performed prior to the effective date of the termination, including Work done to secure the Project for termination. Reasonable cost may not exceed the applicable percentage completion values derived from the progress schedule and the schedule of values. Deductions shall be made for cost of materials to be retained by Contractor, cost of Work defectively performed, amounts realized by sale of materials, and for other appropriate credits against cost of Work. Reasonable cost will include reasonable allowance for Project overhead and general administrative overhead not to exceed a total of ten percent of direct costs of such Work. When, in District's opinion, the cost of any item of Work is excessively high due to costs incurred to remedy or replace defective or rejected Work, reasonable cost to be allowed will be the estimated reasonable cost of performing the Work in compliance with requirements of Contract Documents and excessive actual cost shall be disallowed.

b. A reasonable allowance for profit on actual and allowable cost of Work performed as determined under this subparagraph, provided that Contractor establishes to District's satisfaction that Contractor would have made a profit had the Project been completed, and provided further that the profit allowed shall not exceed 5 percent of cost.

c. Reasonable costs to Contractor of handling material returned to vendors, delivered to District or otherwise disposed of as directed by District.

d. A reasonable allowance for Contractor's internal administrative costs in preparing termination claim.

e. Except as provided in this subparagraph, District shall not be liable for costs incurred by Contractor or Subcontractors after receipt of a notice of termination. Such non-recoverable costs include, but are not limited to, anticipated profits on Work not performed as of the date of termination, post-termination employee salaries, post-termination general administrative expenses, post-termination overhead or unabsorbed overhead, costs of preparing and submitting Contractor's Bid, attorney's fees of any type, and all costs relating to prosecution of claim or lawsuit.

f. District shall have no obligation to pay Contractor under this subparagraph unless and until Contractor provides District with updated and acceptable as-builts and Project Record Documents for Work completed prior to termination.

4. In arriving at the amount due Contractor under this clause, there shall be deducted in whole (or in the appropriate part[s] if the termination is partial):

a. All unliquidated advances or other payments on account previously made to Contractor, including without limitation all payments applicable to the terminated portion of Contract Documents;

b. Any claim which District may have against Contractor in connection with Contract Documents; and

c. The agreed price for, or proceeds of sale of, any materials, supplies, or other things kept by Contractor or sold under provisions of this subparagraph, and not otherwise recovered by or credited to District.

G. Contingent Assignment Of Subcontracts

1. Contractor hereby assigns to District each Subcontract for a portion of the Work (including Services), provided that:

a. The assignment is effective only after District's termination of Contractor's right to proceed under the Contract Documents (or portion thereof relating to that Subcontract) pursuant to the termination for cause subparagraphs herein.
b. The Assignment is effective only for the Subcontracts which District expressly accepts by notifying the Subcontractor in writing;
c. The assignment is subject to the prior rights, if any, of the Surety, obligated by Document 00 61 00 (Construction Performance Bond) provided under the Contract Documents, where the Surety exercises its rights to complete the Contract;
d. After the effectiveness of an assignment, Contractor shall, at its sole cost and expense, sign all instruments and take all actions reasonably requested by District to evidence and confirm the effectiveness of the assignment in District; and
e. Nothing in this subparagraph shall modify or limit any of Contractor's obligations to District arising from acts or omissions occurring before the effectiveness of any Subcontract assignment, including but not limited to all defense, indemnity and hold-harmless obligations arising from or related to the assigned Subcontract.

H. Remedies and Contract Integration

1. Subject to Contract Documents provisions regarding Contractor claims, claim review, and claim resolution, and subject to the limitations therein, the exclusive jurisdiction and venue for resolving all claims, counter-claims, disputes and other matters in question between District and Contractor arising out of or relating to Contract Documents, any breach thereof or the Project shall be the applicable court of competent jurisdiction located in the County of San Mateo. All District remedies provided in the Contract Documents shall be taken and construed as cumulative and not exclusive; that is, in addition to each and every other remedy herein provided; and in all instances District shall have any and all other equitable and legal rights and remedies which it would have according to law.

2. The Contract Documents, any Contract Modifications and Change Orders shall represent the entire and integrated agreement between District and Contractor regarding the subject matters hereof and thereof and shall constitute the exclusive statement of the terms of the parties' agreement. The Contract Documents, and any Contract Modifications and Change Orders, shall supersede any and all prior negotiations, representations or agreements, written or oral, express or implied, that relate in any way to the subject matter of the Contract Documents or written modifications. District and Contractor represent and agree that, except as otherwise expressly provided in the Contract Documents, they are entering into the Contract Documents and any subsequent written modification in sole reliance upon the information set forth or referenced in the Contract Documents or Contract Modifications and the parties are not and will not rely on any other information.

3. In any proceeding to enforce the Contract Documents, Contractor and District agree that the finder of fact shall receive detailed instructions on the meaning and operation of the Contract Documents, including their conditions, limitations of liability, claims and time extension procedures and any other provisions impacting major defenses and theories of liability of the parties. Detailed findings of fact shall be requested, to verify Contract enforcement.

4. Either party's waiver of any breach or failure to enforce any of the terms, covenants, conditions or other provisions of the Contract Documents at any time shall not in any way affect, limit, modify or waive that party's right thereafter to enforce or compel strict compliance with every term, covenant, condition or other provision hereof, any course of dealing or custom of the trade or oral representations notwithstanding.

I. Patents

Fees or claims for any patented invention, article or arrangement that may be used upon or in any manner connected with performance of the Work or any part thereof shall be included in the Bid price for doing the Work. To the greatest extent permitted by law, Contractor shall defend, indemnify and hold harmless District and each of its officers, employees, consultants and agents, including, but not limited to, the Board, Architect/Engineer and each District representative, from all damages, claims for damages, costs or expenses in law or equity, including attorney's fees, arising from or relating to any claim that any article supplied or to be supplied under the Contract Documents infringes on the patent rights, copyright, royalties, trade name, trademark, service mark, trade secret or other intellectual property right of any person or persons or that the person or entity supplying the article does not have a lawful right to sell the same. Such costs or expenses for which Contractor agrees to indemnify and hold harmless the above indemnities include but are not limited to

any and all license fees, whether such fees are agreed by any indemnitee or ordered by a court or administrative body of any competent jurisdiction.

J. Substitution For Patented And Specified Articles

Except as noted specifically in Specifications, whenever in Specifications, material or process is designated by patent or proprietary name or by name of manufacturer, such designation shall be deemed to be used for purpose of facilitating description of material and process desired, and shall be deemed to be followed by the words "or equal." Contractor may offer any substitute material or process that Contractor considers equal in every respect to that so designated and if material or process offered by Contractor is, in opinion of District, equal in every respect to that so designated, its use will be approved. However, Contractor may utilize this right only by timely submitting Document 00 43 25 (Substitution Request Form) as provided in Section 00 11 19 (Instructions to Bidders). A substitution will be approved only if it is a true "equal" item in every aspect of its design and quality, including but not limited to its dimensions, weights, service requirements, durability, functioning, impact on contiguous construction elements, overall schedule and design.

1. The foregoing limited right to an "or equal" substitution shall not apply to any material or process which is designated in the approved Drawings and Specifications by patent or proprietary name or by name of manufacturer. Any such substitution is a deviation subject to District's advance written approval as provided in subparagraph 5.F.1 above.
2. Additionally, any substitution under this paragraph may require DSA approval.

K. Interest Of Public Officers

No representative, officer, or employee of District, no member of the governing body of the locality in which the Project is situated, no member of the locality in which District was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the Project, during the tenure of the official or for one year thereafter, shall, as principal, agent, attorney or otherwise, be directly or indirectly interested, in the Contract Documents or the proceeds thereof.

L. Limit Of Liability

DISTRICT, AND EACH OF ITS OFFICERS, BOARD MEMBERS, EMPLOYEES, CONSULTANTS AND AGENTS INCLUDING, BUT NOT LIMITED TO, ARCHITECT/ENGINEER AND EACH OTHER DISTRICT REPRESENTATIVE, SHALL HAVE NO LIABILITY TO CONTRACTOR FOR SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, EXCEPT TO THE LIMITED EXTENT THAT THESE CONTRACT DOCUMENTS OR APPLICABLE PUBLIC CONTRACTING STATUTES MAY SPECIFY THEIR RECOVERY.

M. Severability

Any provisions or portions thereof of Contract Documents that are prohibited by, unlawful, or unenforceable under any applicable law of any jurisdiction shall as to such jurisdiction be ineffective without affecting other provisions or portions thereof in the Contract Documents.

N. Ownership Of Results/Works For Hire

Any and all artwork, copy, posters, billboards, photographs, videotapes, audiotapes, systems designs, software, reports, diagrams, surveys, source codes or any original works of authorship created by Contractor or its Subcontractors or designers in connection with services performed under this Contract shall be works for hire as defined under Title 17 of the United States Code, and all copyrights in such works are the property of District. In the event that it is ever determined that any works created by Contractor or its Subcontractors or designers under this Contract are not works for hire under U.S. law, Contractor hereby assigns all copyrights to such works to District. With the prior written approval of District, Contractor may retain and use copies of such works for reference and as documentation of its experience and capabilities.

14. MODIFICATIONS OF CONTRACT DOCUMENTS

A. Alterations, Modifications And Force Account Work

1. As provided in the latest edition of Part 1 of Title 24, California Code of Regulations, no modification or deviation from the DSA approved Drawings and Specifications will be permitted except by written addenda, written Change Order or written Supplemental Instruction. As

appropriate, Change Orders are subject to approval by the Division of State Architect. Refer to section 4-338, Part 1, Title 24, California Code of Regulations. Contractor shall aggressively plan and schedule its work, and coordinate with District and DSA, schedule RFI's and work inspections and progress, to avoid any delays or disruptions to the Work resulting from DSA requirements.

2. District may, without notice to the sureties, make alterations, deviations, additions to, or deletions from Contract Documents; increase or decrease the quantity of any item or portion of the Work; expand, contract or otherwise change the Contract Time; delete any item or portion of the Work; and require extra Work. Contractor shall perform such Work under applicable provisions of the Contract Documents, unless specifically provided otherwise at the time the change is ordered. As appropriate, such Change Orders are subject to approval by DSA. Refer to Section 4-338, Part 1, Title 24, California Code of Regulations. In the case of any ordered extra Work, District reserves the right to furnish all or portions of associated labor, material, and equipment, which Contractor shall accept and use without payment for costs, markup, profit, or otherwise for such District-furnished labor, materials, and equipment.

3. District may make changes to the Work during the course of construction to bring the Work into compliance with environmental requirements or standards established by state and federal statutes and regulations enacted after the Contract has been awarded. Contractor shall be compensated for changes affecting the Contract Time or Contract Sum of the Work as set forth in this Article 14 and in Section 01 26 00 (Modification Procedures).

4. Changes affecting the Contract Time or Contract Sum of the Work shall be set forth in a written Change Order that shall specify:
   a. The Work performed in connection with the change to be made;
   b. The amount of the adjustment of the Contract Sum, if any, and the basis for compensation for the Work ordered; and
   c. The extent of the adjustment in the Contract Time, if any.

5. A Change Order will become effective when signed by District. If District exercises its right to decide disputed issues pertaining to changed Work as set forth in Articles 12 and 14 of this Document 00 71 00, then the resulting Change Order shall be effective when signed by District, notwithstanding that Contractor has not signed it.

6. Changes not affecting the Contract Time or Contract Sum of the Work, in District's discretion, may be set forth in a written RFI-Reply executed by District. Execution of such an RFI-Reply constitutes Contractor's agreement to make the specified change without change to the Contract Sum or the Contract Time.

7. Changes or deviations from Contract Documents affecting the Contract Time or Contract Sum of the Work shall not be made without the authority of an effective Change Order or Construction Change Directive as provided in Section 01 26 00 (Modification Procedures), except in cases of emergency discussed in this Document 00 71 00.

8. If changes ordered in design, workmanship or materials are of such a nature as to increase or decrease the cost of any part of the Work, the price fixed in the Contract Documents shall be increased or decreased by the amount that Contractor and District may agree upon as a reasonable and proper allowance for the cost increase or decrease. If an agreement cannot be reached, then District will reach a determination, which shall be final, subject to Contractor's rights under Article 12 of this Document 00 71 00. In all cases Contractor shall perform the changed Work as directed by District subject to Contractor's rights under Article 12 of this Document 00 71 00.

9. Contractor shall, upon District's request, permit inspection of the original unaltered Bid estimate, subcontract agreements, purchase orders relating to the change, and documents substantiating all costs associated with its cost Bid or claims arising from changes in the Work.

10. Changes in the Work made pursuant to this Article 14 and extensions of Contract Time necessary by reason thereof shall not in any way release the guarantees and warranties given by Contractor pursuant to provisions of the Contract Documents, nor shall such changes in the Work relieve or release the Sureties of bonds executed pursuant to said provisions. The Sureties, in executing such bonds, shall be deemed to have expressly agreed to any such change in the Work and to any extension of time made by reason thereof.

11. Procedures for Modifications of Contract Documents and for calculating the cost of extra Work are given in Section 01 26 00 (Modification Procedures). Regarding delay and impact costs of any nature, Contractor may not seek delay compensation for on-Site or off-Site costs based on formulas,

e.g., "Eichlay" or other formula. Rather, Contractor shall prove actual costs resulting from such delays. If Contractor requests compensation for delay to the construction, then Contractor shall prove and document actual costs plus markup per the cost categories and procedures in Section 01 26 00 (Modification Procedures) in order to request, claim or prove compensation for delay.

12. A performance bond rider covering changed Work must be executed before proceeding with the changed Work.

B. Entitlement to Change Of Contract Time

1. Contract Time may only be changed by Change Order or by Contract Modification, and all time limits stated in the Contract Documents are of the essence of Contract Documents.

2. Contract Time will be adjusted in an amount equal to the time lost due to:
   a. Changes in the Work ordered by District;
   b. Acts or neglect by District, Architect/Engineer, any District representative, utility owners or other contractors performing other work, provided that Contractor has fully and completely performed its responsibilities under the Contract Documents;
   c. District ordered suspension, delay or interruption of Work which is otherwise compensable as provided in paragraph 13.D above; or
   d. Fires, floods, epidemics, abnormal weather conditions beyond the parameters otherwise set forth in this subparagraph, earthquakes, civil or labor disturbances, strikes or acts of God, provided damages resulting therefrom are not the result of Contractor's failure to protect the Work as required by Contract Documents.

3. Contract Time shall not be extended for any cause identified immediately above, however, unless:
   a. Contractor actually has been prevented from completing any part of the Work within the Contract Time due to delay that is beyond Contractor's control and due to reasons for which Contractor is not responsible (delays attributable to and within the control of a Subcontractor, or its subcontractors, or supplier shall be deemed to be delays within the control of Contractor);
   b. A claim for delay is made as provided herein; and
   c. Contractor submits a Time Impact Evaluation as required under Section 01 32 16 (Progress Schedules and Reports) that demonstrates actual delay to critical Work activities that actually delay the progress of the Work in the amount of time requested.

C. Notice Of Delay

Within seven Days of the beginning of any delay, Contractor shall notify District in writing, by submitting a notice of delay, describing all anticipated delays resulting from the delay event in question. Any request for extension of time include a written schedule document that demonstrates delay to the critical path using a Time Impact Evaluation as specified in Section 01 32 16 (Progress Schedules and Reports). District will determine all claims and adjustments in the Contract Time. No claim for an adjustment in the Contract Time will be valid and such claim will be waived if not submitted in accordance with the requirements of this subparagraph.

D. Non-Compensable Time Extensions; Adverse Weather Parameters

1. Where Contractor is prevented from completing any part of the Work within the Contract Time due to delay beyond the control of both District and Contractor (including, but not limited to, adverse weather conditions exceeding Contract Documents parameters, earthquakes, Acts of God, epidemics, and acts of other contractors or utilities) an extension of Contract Time, in an amount equal to the time lost due to such delay (without compensation) shall be Contractor's sole and exclusive remedy for such delays.

2. Delays due to abnormal or adverse weather conditions will not be allowed for weather conditions that fall within the parameters listed or referenced in this subparagraph. Adverse weather delays may be allowed only if the number of workdays of adverse weather exceeds these parameters first on a monthly basis and second on a cumulative annual basis, and Contractor proves that the adverse weather actually caused delays to work on the critical path. Contractor shall give written notice of intent to claim an adverse weather day within one Day of the adverse weather day occurring. Rain parameters are identified in Document 00 73 00 (Supplementary Conditions), pro-rated in the individual month Contractor starts and finishes Work.

3. In order to qualify as an adverse weather delay with respect to the foregoing parameters, daily rainfall must exceed .1 of an inch or more at the station identified in Document 00 73 00, as

measured by the National Oceanic & Atmospheric Administration, and Contractor shall prove that the rain actually caused delay to the Work, following the procedures in this subparagraph and the Contract Documents. Notwithstanding the foregoing allowances, Contractor shall at all times employ all available mitigation measures to enable Work to continue. Delays due to abnormal or adverse weather conditions will not be allowed for weather conditions that fall within the parameters listed above.

4. Contractor shall include the foregoing precipitation parameters as a monthly activity in its progress schedule. As Work on the critical path is affected by precipitation, Contractor shall notify District and request that the days be moved to the affected activities. Any adverse weather days remaining shall be considered Project float.

5. Adverse weather delay for precipitation shall be recognized for the actual period of time Contractor proves it was delayed by precipitation exceeding the specified parameters. For example, and not by way of limitation, if precipitation exceeding the specified parameters does not in fact delay Contractor's progress on the critical path, then no time extension shall be recognized; and conversely, if Contractor proves to District's satisfaction that precipitation exceeding the specified parameters causes delay to Contractor for a period longer than the number of precipitation days incurred (e.g., if it rains or snows during grading work), then Contractor shall be entitled to a time extension equal to the actual period of such delay.

6. Contractor shall take reasonable steps to mitigate potential weather delays, such as dewatering the Site, and covering Work and material that could be affected adversely by weather. Failure to do so shall be cause for District to not grant a time extension due to adverse weather, where Contractor could have avoided or mitigated the potential delay by exercising reasonable care.

E. Compensable Time Extensions

1. Contractor may receive a time extension and be compensated for delays caused directly and solely by District or, except as provided in subparagraph 3.b below, DSA. Provided Contractor provides proper notice and documentation under Section 01 32 16, such compensation may include extended field or home office overhead, field supervision, escalation charges, acceleration costs and extended subcontractor costs.

2. Contractor shall not be entitled to any time extension or compensation, however, for any delays caused in whole or in part by Contractor's failure to perform its obligations under the Contract Documents, or during periods of delay concurrently caused by Contractor and either District or others.

3. Contractor shall not be entitled to damages for delay to the Work caused by the following reasons:

   a. District's right to sequence the Work in a manner which would avoid disruption to District's tenants and their contractors or other prime contractors and their respective subcontractors, exercised as a result of Contractor's failure to perform its cooperation and coordination responsibilities required by Contract Documents; District's enforcement of any government act or regulation; or the provisions of the Contract Documents;

   b. Extensive requests for clarifications to Contract Documents or Contract Modifications thereto, provided such clarifications or Contract Modifications are processed by District or its consultants in a reasonable time commensurate with Contract Documents requirements.

F. Liquidated Damages

1. Time is of the essence. Execution of Contract Documents by Contractor shall constitute acknowledgement by Contractor that Contractor understands, has ascertained and agrees that District will actually sustain damages in the amount fixed in the Contract Documents for each and every Day during which completion of Work required is delayed beyond expiration of time fixed for completion or extensions of time allowed pursuant to provisions hereof. Contractor and District agree that specified measures of liquidated damages shall be presumed to be the damages actually sustained by District as defined below, and that because of the nature of the Project, it would be impracticable or extremely difficult to fix the actual damages.

2. Liquidated damages shall be considered not as a penalty but as agreed monetary damage sustained by District for increased Project administration expenses, including extra inspection, construction management and architectural and engineering expenses related to the Project and Contract

Documents because Contractor failed to perform and complete Work within time fixed for completion or extensions of time allowed pursuant to provisions hereof. Except as otherwise provided in Document 00 73 00 (Supplementary Conditions), liquidated damages shall also include lost revenues, interest expenses and cost of substitute facilities. However, liquidated damages shall not be deemed to include within their scope additional damages or administrative costs arising from Defective Work, cost of completion of the Work, claims and fines of regulatory agencies, damages suffered by others or other forms of liability claimed against District as a result of delay (e.g., delay or delay related claims of other contractors, subcontractors or tenants), and defense costs thereof. Contractor shall be fully responsible for the actual amount of any such damages it causes, in addition to the liquidated damages otherwise due District.

3. District may deduct from any money due or to become due to Contractor subsequent to time for completion of entire Work and extensions of time allowed pursuant to provisions hereof, a sum representing then-accrued liquidated damages. Should Contractor fall behind the approved Progress Schedule in circumstances where it is substantially likely that District will be entitled to assess liquidated damages, District may deduct liquidated damages based on its estimated period of late completion. District need not wait until Final Completion to withhold liquidated damages from Contractor's progress payments. Should money due or to become due to Contractor be insufficient to cover aggregate liquidated damages due, then Contractor forthwith shall pay the remainder of the assessed liquidated damages to District.

G. Differing Site Conditions

1. In the event that Contractor encounters underground conditions that exceed the scope of the Work, then Contractor shall promptly give District written notice of the condition, and shall give such notice before the conditions are disturbed, to include: (1) material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law, and is not within the scope of Work; (2) subsurface or latent physical conditions at the Site differing from those indicated by information about the Site made available to Contractors prior to the deadline for submitting Bids, that Contractor did not and could not have known about by performing its required pre-Bid investigations; or (3) unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for the contract, that Contractor did not and could not have known about by performing its required pre-Bid investigations.
   a. District shall promptly investigate the conditions, and if it finds that (i.) the conditions do materially so differ in a manner Contractor did not anticipate and could not have anticipated, or do involve hazardous waste outside the scope of the Work, and (ii.) cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, then (iii.) District shall initiate a change order under the procedures described in the Contract, including but not limited to, issuing either a Request for Proposal or a Construction Change Directive under the procedures described in the Contract Documents, including without limitation Section 01 26 00 (Modification Procedures).
   b. If District determines that physical conditions at the Site are not Latent or are not materially different from those indicated in Contract Documents or do not involve hazardous waste, or that Contractor should have anticipated the same through its required pre-Bid investigations, or for any other reason that that no change in terms of the Contract Documents is justified, District will so notify Contractor in writing, stating reasons.
   c. In the event that a dispute arises between District the Contractor whether the conditions do materially so differ, or involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all Work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law which pertain to the resolution of disputes and protests between contracting parties.
2. Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time regarding claimed hazardous waste or materials, claimed Latent or materially different Site conditions (whether above or below grade) if:

a. Contractor knew of the existence of such conditions at the time Contractor submitted its Bid; provided, that this requirement shall not apply if the condition results from the District's failure to timely address a known condition which is expressly outside the scope of Contractor's Work;
b. Contractor should have known of the existence of such conditions at the time Contractor submitted its Bid, or should have learned of such conditions and mitigated their impact, as a result of having complied with the requirements of Contract Documents, including without limitation, the investigation requirements herein at Articles 2 and 10 of Document 00 71 00;
c. The information or conditions claimed by Contractor to be Latent or materially different consist of information, conclusions, opinions or deductions made from underground conditions reports, of the kind that this Document 00 71 00 precludes reliance upon; or,
d. Contractor was required to give written notice and failed to do so within the time required.

3. If, because of a differing site condition as defined herein, Contractor does not agree to continue with the Work based on a reasonable belief that it is unsafe, or does not agree to resume Work under special conditions, District may order the disputed portion of Work deleted from the Work, or performed by others, or District may invoke its right to terminate Contractor's right to proceed under the Contract Documents in whole or in part, for convenience or for cause as the facts may warrant. If Contractor does not agree with District's determination of any adjustment in the Contract Sum or Contract Time as a result, Contractor may make a claim as provided in Article 12 of this Document 00 71 00.

H. Change Orders Related to Underground Facilities.

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated in the materials supplied by District or in information on file at USA or is not otherwise reasonably known to Contractor by performing its obligations in Articles 2 and 10 of this Document 00 71 00, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby (and in no event later than seven Days), and prior to performing any Work in connection therewith (except in an emergency as required by Article 15 of this Document 00 71 00), identify the owner of such Underground Facility and give written notice to that owner and to District. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. Contractor shall be allowed an increase in the Contract Sum or an extension of the Contract Time, or both, for Underground Facilities either not shown or inaccurately shown in the Contract Documents, the information supplied pursuant to Document 00 31 19 (Reports, Surveys and Existing Conditions) or in information on file at USA, only where the inaccuracy was (i.) material and outside of the normal experience on projects of this nature, (ii.) was not reasonably inferable from existing information, and (iii.) directly results in a material, justifiable and actual increase in the cost of Contractor's work. For example, if surface conditions such as pavement repairs, valve covers, or other markings, indicate the presence of an Underground Facility, or if the Underground Facility could be determined or its cost impact mitigated by performing the obligations in Articles 2 and/or 10 of this Document 00 71 00, then an increase in the Contract Price or an extension of the Contract Time will not be due, even if the Underground Facility was not indicated or was shown at a different place or a different elevation in the Contract Documents, in the information supplied to Contractor pursuant to Document 00 31 19 (Reports, Surveys and Existing Conditions), or in information on file at USA.

3. Main Line and Trunk Line Utilities (Government Code Section 4215). Consistent with Government Code Section 4215, as between District and Contractor, District will be responsible for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Site only if such utilities are not identified in the Contract Documents or Document 00 31 19 (Reports, Surveys and Existing Conditions). District will compensate for the cost of locating and repairing damage not due to Contractor's failure to exercise reasonable care, removing and relocating such main or trunk line utility facilities not indicated in the Contract Documents or Document 00 31 19 (Reports, Surveys and Existing Conditions) with reasonable accuracy, and equipment on the Project necessarily idled during such work.

15. WORKING CONDITIONS AND PREVAILING WAGES

A. Use Of Site/Sanitary Rules

1. All portions of the Work shall be maintained at all times in neat, clean and sanitary condition. Contractor shall furnish toilets for use of Contractor's and Subcontractors' employees on the Site where needed, and their use shall be strictly enforced. All toilets shall be properly secluded from public observation, and shall be located, constructed and maintained subject to District's approval.

2. Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Site and land areas identified in and permitted by Contract Documents and other land and areas permitted by applicable laws and regulations, rights of way, permits and easements or as designated by District, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, any improvement located thereon, or to the owner or occupant thereof resulting from the performance of Work.

3. During the progress of the Work, Contractor shall keep the Site and the Project free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, Contractor shall remove all waste materials, rubbish and debris from and about the Site as well as all tools, appliances, construction equipment and machinery and surplus materials. Contractor shall leave the premises clean and ready for occupancy by District at Substantial Completion of Work. Contractor shall restore to original condition all property not designated for alteration by Contract Documents.

4. Contractor shall not load nor permit any part of any structure or pavement to be loaded in any manner that will endanger the structure or pavement, nor shall Contractor subject any part of Work or adjacent property to stresses or pressures that will endanger it. Contractor shall conduct all necessary existing conditions investigation regarding structural, mechanical, electrical or any other system existing, shall perform Work consistent with such existing conditions, and shall have full responsibility for insufficiencies or damage resulting from insufficiencies of existing systems, equipment or structures to accommodate performing the Work.

B. Protection Of Work, Persons, Property And Operations

1. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with Work. Contractor shall comply with all safety requirements specified in any safety program established by District, or required by state, federal or local laws and ordinances. Contractor shall be responsible for all damage to Work, property or structures, all injuries to persons, and all damage and interruptions to District's operations, arising from the performance of Work of the Contract Documents. Except as otherwise expressly approved by District in writing, Contractor shall at all times perform all Work in a manner which does not interrupt, damage or otherwise adversely impact any facilities, operations, or real or personal property of District, its officers, employees, agents, invitees, licensees, lessees or contractors.

2. Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property.

3. Contractor shall remedy all damage, injury, loss or interruption to any property or operations of District or contiguous property owners, caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, supplier, or any other person or organization directly or indirectly employed by any of them to perform or furnish any Work or anyone for whose acts any of them may be liable. Contractor's duties and responsibility for safety and for protection of Work shall continue until such time as all the Work is completed and Final Acceptance of the Work. District and its agents do not assume any responsibility for collecting any indemnity from any person or persons causing damage to Contractor's Work. Contractor shall give all notices required by potentially responsible insurance carriers and require that its Subcontractors and suppliers do the same.

4. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

5. District may, at its option, retain such moneys due under the Contract Documents as District deems necessary until District receives satisfactory evidence that any and all suits or claims against Contractor for injury to persons, property or operations are either settled, or adequately provided for (such as by insurance or otherwise).

C. Responsibility For Safety And Health

1. Contractor shall ensure that its and each tier of Subcontractors' employees, agents and invitees comply with applicable health and safety laws while at the Site. These laws include the Occupational Safety and Health Act of 1970 and rules and regulations issued pursuant thereto, and District's safety regulations as amended from time to time. Contractor shall comply with all District directions regarding protective clothing and gear.
2. Contractor shall be fully responsible for the safety of its and its Subcontractors' employees, agents and invitees on the Site. Contractor shall notify District, in writing, of the existence of hazardous conditions, property or equipment at the Site that are not under Contractor's control. Contractor shall be responsible for taking all the necessary precautions against injury to persons or damage to the property of Contractor, Subcontractors or persons from recognized hazards until the responsible party corrects the hazard. Contractor shall provide protective clothing and gear to all visitors to the Site.
3. Contractor shall confine all persons acting on its or its Subcontractors' behalf to that portion of the Site where Work under the Contract Documents is to be performed: District designated routes for ingress and egress thereto and any other District designated area. Except those routes for ingress and egress over which Contractor has no right of control, within such areas, Contractor shall provide safe means of access to all places at which persons may at any time have occasion to be present.

D. Emergencies

In emergencies affecting the safety or protection of persons or Work or property at the Site or adjacent thereto, Contractor, without special instruction or authorization from District, is obligated to act to prevent threat and damage, injury or loss, until directed otherwise by District. Contractor shall give District prompt written notice if Contractor believes that any significant changes in Work or variations from Contract Documents have been caused thereby. If District determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Change Order or Construction Change Directive will be issued to document the consequences of such action. Emergency contact names & phone numbers, where Contractor's Superintendent and Project Manager can be reached at any time, are to be provided to the District, within 10 days after issuance of a Notice to Proceed with Construction.

E. Use Of Roadways And Walkways

Contractor shall not unnecessarily interfere with use of any roadway, walkway or other facility for vehicular or pedestrian traffic. Before beginning any interference and only with District's prior concurrence, Contractor may provide detour or temporary bridge for traffic to pass around or over the interference, which Contractor shall maintain in satisfactory condition as long as interference continues. Unless otherwise provided in the Contract Documents, Contractor shall bear the cost of these temporary facilities.

F. Nondiscrimination

No person or entity shall discriminate in the employment of persons upon public works because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sexual preference, or gender of such persons, except as provided in Section 12940 of the Government Code. Every Contractor for public works violating the provisions of Section 1735 of the Labor Code is subject to all the penalties imposed for a violation of Chapter 1, Part 7, Division 2 of the Labor Code.

G. Prevailing Wages

1. Contractor shall pay to persons performing labor in and about Work provided for in the Contract Documents an amount equal to or more than the general prevailing rate of per diem wages for (1) work of a similar character in the locality in which the Work is performed and (2) legal holiday and overtime work in said locality. The per diem wages shall be an amount equal to or more than the stipulated rates contained in a schedule that has been ascertained and determined by the Director of the State Department of Industrial Relations and District to be the general prevailing rate of per diem wages for each craft or type of workman or mechanic needed to execute this Contract. Contractor

shall also cause a copy of this determination of the prevailing rate of per diem wages to be posted at each Site.

2. Contractor shall forfeit, as a penalty to District, Fifty Dollars ($50.00) for each laborer, workman, or mechanic employed in performing labor in and about the Work provided for in the Contract Documents for each Day, or portion thereof, that such laborer, workman or mechanic is paid less than the said stipulated rates for any work done under the Contract Documents by him or her or by any Subcontractor under him or her, in violation of Articles 1 and 2 of Chapter 1 of Part 7 of Division II of the California Labor Code. The sums and amounts which shall be forfeited pursuant to this subparagraph and the terms of the Labor Code shall be withheld and retained from payments due to Contractor under the Contract Documents, pursuant to this Document 00 71 00 and the Labor Code, but no sum shall be so withheld, retained or forfeited except from the final payment without a full investigation by either the State Department of Industrial Relations or by District. The Labor Commissioner pursuant to Labor Code Section 1775 shall determine the final amount of forfeiture.

3. Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of work or labor on Work provided for in the Contract, provision that Subcontractor shall pay persons performing labor or rendering service under subcontract or other arrangement not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed in the Labor Code.

4. Contractor stipulates that it shall comply with all applicable wage and hour laws, including without limitation Labor Code Section 1813. Failure to so comply, including without limitation Labor Code Section 1776, shall constitute a default under this Contract.

5. Contractor and its Subcontractors shall be responsible for compliance with Labor Code Section 1776.

   a. Contractor and Subcontractors must keep accurate payroll records, showing the name, address, social security number, Work classification, straight time and overtime hours worked each Day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the Work of the Contract documents. Each payroll record shall contain or be verified by a written declaration as required by Labor Code Section 1776.

   b. The payroll records enumerated above must be certified and shall be available for inspection at all reasonable hours at the principal office of Contractor as required by Labor Code Section 1776.

      (X) Contractor shall inform District of the location of records enumerated above, including the street address, city and county, and shall, within five working Days, provide a notice of a change of location and address.

      (Y) Contractor or Subcontractor has 10 Days in which to comply subsequent to receipt of a written notice requesting the records enumerated above. In the event that Contractor or Subcontractor fails to comply with the ten-Day period, he or she shall, as a penalty to District on whose behalf the contract is made or awarded, forfeit $25.00 for each calendar Day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. Contractor is not subject to a penalty assessment pursuant to this subparagraph due to the failure of a Subcontractor to comply with this subparagraph.

   c. Contractor shall also deliver certified payrolls to District with each Application for Payment as described in Section 01 29 00 (Measurement & Payment).

H. Environmental Controls

1. Contractor shall comply with all rules, regulations, ordinances, and statutes that apply to any work performed under the Contract Documents including, without limitation, any toxic, water and soil pollution controls and air pollution controls specified in Government Code, Section 11017 and as required by Bay Area Air Quality Management District, water quality Best Management Practices. Contractor shall be responsible for insuring that Contractor's employees, Subcontractors and the public are protected from exposure to airborne hazards or contaminated water, soil or other toxic materials used during or generated by activities on the Site or associated with the Project.

I. Shoring Safety Plan

1. At least five Days in advance of excavating any trench five feet or more in depth, Contractor shall submit to District a detailed plan showing the shoring, bracing and sloping design and other provisions to be made for worker protection from the hazard of caving ground during the excavation, as required by Labor Code Section 6705. A civil or structural engineer registered in California shall prepare and sign any plan that varies from the shoring system standards established by the State Construction Safety Orders.
2. During the course of Work, Contractor shall be responsible for determining where sloping, shoring, and/or bracing is necessary and the adequacy of the design, installation, and maintenance of all shoring and bracing for all excavation, including any excavation less than five feet in depth. Contractor will be solely responsible for any damage or injuries that may result from excavating or trenching. District's acceptance of any drawings showing the shoring or bracing design or work schedule shall not relieve Contractor of its responsibilities under this subparagraph.
3. DSA must review and approve shoring of structures prior to commencement of shoring operations. Contractor shall submit shoring design sufficiently in advance of the Work as necessary to avoid delay.
4. Cal/OSHA Permit. Contractor shall comply with Labor Code 6500 and shall obtain, as applicable, a permit as required by Cal/OSHA for each of the following:
   a. Construction of trenches or excavations that are five feet or more in depth and into which a person is required to descend.
   b. Construction or demolition of any building, structure, or scaffolding for falsework more than three stories high, or the equivalent height (36 feet).
   c. Erection or dismantling of vertical shoring systems more than three stories high, or the equivalent height (36 feet).
   d. The underground use of diesel engines in mines or tunnels.

END OF DOCUMENT

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

[PMs UPDATE PER PROJECT- DELETE INSTRUCTIONS IN BRACKETS]

1. **SUMMARY**
   This document includes requirements that supplement the paragraphs of Document 00 71 00 (General Conditions).

2. **SUPPLEMENT TO PARAGRAPH 7.1 GENERAL CONDITIONS, SECTION 00 71 00**
   For the purposes of this contract [editable] is the District's Representative.

3. **SUPPLEMENT TO 11.E Design-Build Entity to Locate Underground Facilities**
   Before commencing work of digging trenches or excavation, Design-Build Entity shall meet with the College's Chief Facilities Engineer to ascertain if the maintenance staff have knowledge of underground utilities in the vicinity of the trench or excavation, which are not shown on drawings or indicated by USA.

4. **SUPPLEMENT TO 14.D Non-Compensable Time Extensions; Adverse Weather Parameters**
   Rain parameters are as follows, pro-rated in the individual month Contractor starts and finishes Work: January, [8]; February, [5]; March, [6]; April, [3]; May, [1]; June, [0]; July, [0]; August, [0]; September, [0]; October, [2]; November, [5]; and December, [6].

   In order to qualify as an adverse weather delay with respect to the foregoing parameters, daily rainfall must exceed .1 of an inch or more at the [**PM insert:** San Bruno, Redwood City or San Mateo], California station, as measured by the National Oceanic & Atmospheric Administration.

5. **Supplement to Paragraph 15.2.I GENERAL CONDITIONS, SECTION 00 71 00**
   The College activities and events applicable to this work include at least the following:

   [For College of San Mateo projects]
   Finals- Last week of every semester.
   Commencement ceremonies- ADD DATES
   Jazz on the Hill- ADD DATE
   [Check for important football games, athletic events…]

   [For Canada College projects]
   Finals- Last week of every semester.
   Commencement ceremonies- ADD DATES
   Olive Festival- ADD DATE
   [Check for important football games, athletic events…]

   [For Skyline College projects]
   Finals- Last week of every semester.
   Commencement ceremonies- ADD DATES
   Women on Writing Conference- ADD DATE
   Expanding Your Horizons – ADD DATE
   [Check for important football games, athletic events…]

   [For all projects end with] The Contractor is advised to consult the College's website, at [PM: Insert URL] for any updates to the College activities and events.

6. **Supplement to Paragraph 1.4.A SITE SECURITY AND SAFETY, SECTION 01 56 00**
   For this project the Contractor's employee parking area is:
   a. [PM: list parking lot or other area]
   b. [Refer to Section 00 21 15 Project Site Campus Map (PM, be sure to indicate parking area on Project Site Campus Map)]

7. **[Insert other items as needed]**

End of Document

SECTION 00 73 17
INSURANCE

PART 1 GENERAL

1.0 Section Includes

1. Introduction and Owner-Controlled Insurance Program (OCIP) Overview
2. District-Provided Insurance
3. Required Contractor-Provided Insurance Coverage
4. Additional Requirements
5. Forms

1.1 Introduction and Owner-Controlled Insurance Program (OCIP) Overview

The District has elected to implement an Owner Controlled Insurance Program ("OCIP"). The District agrees to pay all premiums associated with the OCIP and will be the sole recipient of any dividend(s) and/or return premium(s) generated by the OCIP. Contractor's / Subcontractor's bid shall exclude any and all costs for insurance coverage provided under the OCIP.

The OCIP will provide Workers' Compensation, Employer's Liability, General Liability, Excess Liability, Contractors' Pollution Liability, and Builders Risk insurance for eligible Contractors/Subcontractors providing direct, **on-site** labor to the District's Project, hereinafter called the "Project". Coverage provided by the OCIP is project site specific. The Project Site consists of any and all projects that are endorsed to this policy, which includes the:

1. Ways and means adjoining the endorsed project site.
2. Adjacent locations to the endorsed projects sites where incidental operations are being performed, excluding permanent locations.

Off-site locations, labor and operations are not covered by the OCIP. It will be the responsibility of each contractor / subcontractor to maintain off-site insurance, as identified in Paragraph 3.0, which specifies coverage types and minimum limits. **Contractors/subcontractors are also required to provide Automobile Liability coverage for both on-site and off-site activities.**

Keenan & Associates, herein after called "Program Administrator", shall administer the OCIP on behalf of the District. All Contractors/Subcontractors are required to cooperate with the District and its Program Administrator in all aspects of administering the OCIP. The Program Administrator's contact information is as follows:

Keenan & Associates
SEWUP Department
2355 Crenshaw Blvd., Ste. #200
Torrance, CA. 90501
Attention: Ms. Sandy Nottingham, OCIP Administrator
Phone: (310)212-3344 ext. 2006, Fax: (310)787-8838
E-mail: snottingham@keenan.com

1.2 APPLICABILITY OF THE OCIP

A. Eligibility

Eligible Contractors/Subcontractors includes those providing direct, on-site labor on the Project. Temporary labor services and leasing companies are to be treated as Eligible Contractors.

Ineligible Contractor includes, but is not limited to, consultants; suppliers who do not perform or do not subcontract installation; demolition that includes abatement and hazardous materials removal; vendors; materials dealers; guard services; non-construction janitorial services; and truckers, including trucking to the Project where delivery is the only scope of work performed. However, if contracted with an on-site

installer, suppliers/vendors should be enrolled in the OCIP only for General Liability, as it pertains to the contractual relationship of the installer's on-site work.

Any questions regarding a Contractor's status as "Eligible" or "Ineligible" should be referred to the Program Administrator.

B. Participation

Participation in the OCIP is mandatory but not automatic. Document 00 11 19 – Instructions to Bidders and Document 00 41 00 – Bid Form require submission of an *Insurance Qualification Form* at the time bids are submitted to the District. Pursuant to Government Code Section 4420.5, a Bidder and all identified Subcontractors must meet certain minimum standards for bids to be deemed responsive:

1. The number of allowable Serious and Willful violation findings (Labor Code Section 6300) against the Bidder's Contractor/Subcontractors by the Workers Compensation Appeals Board in the past five (5) years shall not exceed:
   - 1 to 3 Contractor/Subcontractors – a maximum of 1 Serious and Willful Violation
   - 4 to 6 Contractor/Subcontractors – a maximum of 2 Serious and Willful Violations
   - 7 or more Contractor/Subcontractors – a maximum of 3 Serious and Willful Violations

2. 100% of the listed firms must provide evidence of an Injury and Illness Prevention Program (IIPP)

3. Bidder's current published Workers' Compensation Experience Modification Factor (EMR) at bid opening shall not be greater than 1.25. 75% of the listed subcontractors must have an EMR of 1.25 or less averaged over the last three published years.

Failure of prospective bidders to participate in the mandatory insurance qualification process pursuant to Government Code Section 4420.5 shall disqualify them from participating in the Project as a Contractor/Subcontractor.

C. Post- Contract Award Enrollment

Document 00 51 00 – Notice of Award requires submission of a completed *Contract Enrollment Form* and a *Certificate of Insurance* as referenced in Section 1.5 and 1.6. An eligible contractor/subcontractor is not enrolled in the OCIP until the Program Administrator validates the *Contract Enrollment Form* and *certificates* by issuing a written notification to contractor/subcontractor.

Any Contractor/Subcontractor who enrolls in the OCIP after their start date will have to provide a No-Known-Loss Letter to the Program Administrator, along with the enrollment documentation. Enrollment is not guaranteed until acceptance of the enrollment documentation by the insurance carrier.

D. Reporting Requirements

1. Payroll Reporting

➢ Workers' Compensation Insurance Rating Bureau Requirements

Once an Eligible Contractor/Subcontractor is enrolled into the OCIP, the Program Administrator will issue a separate Workers' Compensation Policy. All Enrolled Contractors/Subcontractors will need to comply with the rules and regulations of the California Workers Compensation Insurance Rating Bureau (WCIRB).

➢ Project Site Monthly Payroll Report

Project Site Monthly Payroll Reports must be submitted to the Program Administrator on a monthly basis, until the completion of the contract. This report must summarize the unburdened payroll by Workers' Compensation Class Code. Certified payroll is not a requirement of the OCIP and cannot be accepted. If the *Project Site Monthly Payroll Report* is not submitted to

Program Administrator on a monthly basis, the Construction Manager and/or District can withhold payment until the report is received. Contractor agrees to keep and maintain accurate and classified records of their payroll for operations at the Project Site. This payroll information is submitted to the OCIP Insurance Carrier. At the end of each contract, a carrier audit may be performed using the reported payroll.

2. Contractor's Completion Notice

Contractor's Completion Notice must be submitted to the Program Administrator upon completion of work at the Project Site, which includes punch list items, but not warranty work. This form evidences all enrolled Contractors'/Subcontractors' actual start and completion dates, per each contract. This information is used to confirm that each Workers' Compensation Policy was issued with correct policy term dates, covering the Contractors/Subcontractors for the duration of their Work at the Project Site. This information is subsequently submitted to the WCIRB.

1.3 DISTRICT-PROVIDED INSURANCE (OCIP)

A. **Workers' Compensation and Employer's Liability Insurance**, will be provided by the Program Administrator, in accordance with applicable state laws, to all enrolled Contractors/Subcontractors reflecting the following Limits of Liability:

- Workers' Compensation – California Statutory Benefits
- Employer's Liability
  - $1,000,000 Bodily Injury each Accident
  - $1,000,000 Bodily Injury by Disease – Policy Limit
  - $1,000,000 Bodily Injury by Disease – Each Employee
- Deductible: None

B. **General Liability Insurance**, placed by the Program Administrator, will be provided on an "Occurrence" form under a master liability policy. Certificates of Insurance will be provided to all enrolled Contractors/Subcontractors reflecting the following Limits of Liability:

- $5,000,000 Bodily Injury and Property Damage Liability
- $10,000,000 General Aggregate
- $5,000,000 Products and Completed Operations
- 10 Years Completed Operations
- Limits are per Project
- Deductible: None

C. **Excess Liability Insurance**, placed by the Program Administrator, will be provided on an "Occurrence" form under a master liability policy. Certificates of Insurance will be provided to all enrolled Contractors/Subcontractors reflecting the following Limits of Liability:

- $25,000,000 Bodily Injury and Property Damage Liability
- $25,000,000 General Aggregate
- $25,000,000 Products and Completed Operations
- 10 Years Completed Operations
- Deductible: None

D. **Contractor's Pollution Liability**, placed by the Program Administrator, will be provided on a "Claims Made" form under a master liability policy. Certificates of Insurance will be provided to all enrolled Contractors/Subcontractors reflecting the following Limits of Liability:

- $25,000,000 Each Loss/Annual Aggregate
  - Claims expense, including defense cost, within limits

- $10,000 Deductible, Per Claim
  - The party legally responsible for any loss or damage shall, to the extent of such responsibility, pay the deductible

E. **Builders Risk,** property insurance purchased and maintained by the District, during the course of construction, at the Project Site. The coverage is maintained until Final Completion has been achieved. Such property insurance shall be written on a repair or replacement cost basis, subject to standard exclusions, property limitations and conditions. Such insurance shall include the interests of the District and Contractors/Subcontractors during the Course of Construction and shall provide broad coverage.

A deductible of $10,000-$25,000 ($50,000 on structural renovation work), which shall be determined by the type of construction, will apply to each occurrence. The deductible amount will be paid by the party or parties responsible for the loss or damage and will not be reimbursed by the OCIP Insurance Program.

1.4 OCIP CERTIFICATES AND POLICIES

The OCIP Program Administrator will provide each enrolled Contractor/Subcontractor their own Workers' Compensation policy. Certificates of Insurance will be furnished for the General Liability, any Excess Liability, Contractor's Pollution Liability, and Builders Risk coverage. These policies are available for review by the Contractor/Subcontractor, upon request to the District or the Program Administrator. Such policies or programs may be amended from time to time and the terms of such policies or programs are incorporated herein by reference. Contractors/Subcontractors hereby agree to be bound by the terms of coverage, as contained in such insurance policies and/or self-insurance programs.

1.5 REQUIRED CONTRACTOR-PROVIDED INSURANCE COVERAGE UNDER AN OCIP

For any work under this contract, and until completion and final acceptance of the work by the District, the Contractors/Subcontractors shall, at their own expense provide the following coverage for off-site locations, labor, and operations before commencing work on the Project Site. Automobile Liability Insurance must be maintained for both **on-site** and **off-site** operations. See Paragraph 1.6 for Certificate Holder specification. Furthermore, the policies shall provide not less than sixty (60) days prior written notice to the Program Administrator, of any material change in the insurance, cancellation, or non-renewal.

A. **General Liability Insurance,** minimum limits of liability are as follows:

	Prime Contractor	**Subcontractor**
Bodily Injury and Property Damage	$2,000,000	$1,000,000
Per Occurrence	$2,000,000	$1,000,000
General Aggregate	$2,000,000	$1,000,000
Products/Completed Operations Aggregate	$2,000,000	$1,000,000
Personal/Advertising Injury Aggregate	$2,000,000	$1,000,000

The policy shall be endorsed to exclude the Project.

Note: If an enrolled participant in the OCIP chooses to have the policy endorsed to include the Project site during the construction period, coverage should be excess and/or difference in conditions (DIC) of the OCIP. This cost is not permitted to be passed back to Owner. Inclusion of the Project site on such insurance policies shall not replace the OCIP coverage or otherwise affect the cost identification requirement in Section 1.1.2.

B. **Automobile Liability Insurance**, must cover all vehicles owned by, hired by, or used on behalf of the Contractors/Subcontractors with the following limits of liability:

	Prime Contractor	Subcontractor
Bodily Injury and Property Damage	$2,000,000	$1,000,000

C. Workers' Compensation and Employer's Liability Insurance (off-site)

- Workers' Compensation –Statutory Benefits - All States
- Employer's Liability
  - $1,000,000 Bodily Injury each Accident
  - $1,000,000 Bodily Injury by Disease – Policy Limit
  - $1,000,000 Bodily Injury by Disease – Each Employee

The policy shall be endorsed to exclude the Project.

D. Professional Liability Insurance, if Contractor's work requires design and/or design-assist services, Contractor shall purchase and maintain, at its sole cost and expense Professional Liability (Errors and Omissions) insurance for all professional services provided. This Professional Liability insurance shall include full prior acts coverage sufficient to cover the services under this Agreement, the limits of which shall not be less than the following:

- $2,000,000, Per Claim/Aggregate
- Deductible or self-insured retention amount must not be greater than $100,000, including coverage of contractual liability.

Professional Liability Insurance is to be maintained during the term of the contract and for so long as the insurance is reasonably available as provided herein, for a period of ten (10) years after completion of the services.

E. Environmental and Asbestos Abatement Coverages, if the Contractor's/Subcontractor's scope of work involves the removal of asbestos, the removal/replacement of underground tanks, or the removal of toxic chemicals and substances, the Contractor/Subcontractor shall be required to provide coverage, with limits not less than $1,000,000 per claim basis, for such exposures subject to requirements and approval of the District.

F. Aircraft or Watercraft Liability Insurance, if any Contractor/Subcontractor, requires the use of Aircraft, including helicopters, or Watercraft at the Project Site, the Contractor/Subcontractor shall purchase and maintain, or cause the operator of the Aircraft or Watercraft to purchase and maintain, Aircraft or Watercraft liability insurance. This must insure passengers and the General Public against personal injury, bodily injury or property damage arising out of the maintenance, use or entrustment to others. It includes Aircraft or Watercraft owned or operated by or rented or loaned to any insured. Use includes operation and "loading or unloading". Contractor/Subcontractor shall be required to provide coverage, with limits not less than $1,000,000 per claim basis, for such exposures subject to requirements and approval of the District.

G. Personal Property: All Contractors'/Subcontractors' shall be solely responsible for any loss or damage to their personal property including, without limitation, their tools and equipment, mobile construction equipment, scaffolding, and temporary structures, whether owned, borrowed, used, leased or rented by any Contractor/Subcontractor. Contractors/Subcontractors may at their sole discretion, purchase and maintain insurance or self-insure such equipment and property, and any deductible in relation thereto shall be their sole responsibility. Any insurance, including self-insurance, shall be the Contractors'/Subcontractors' sole source of recovery in the event of a loss.

H. The OCIP is intended to provide broad coverages and high limits to all Enrolled Contractors/Subcontractors. The Owner does not warrant or represent that the OCIP coverages constitute an insurance program that adequately addresses the risks of the Contractors/Subcontractors.

Prior to the commencement of work under the contract, it is the responsibility of all Contractors/Subcontractors to ensure that the OCIP coverages provided sufficiently address their insurance needs. Any type of insurance or any increase of limits of liability not described in this Section, which the Contractors/Subcontractors require for their own protection or on account of any statute, will be their own responsibility and expense.

1.6 REQUIRED CONTRACTOR-PROVIDED CERTIFICATES OF INSURANCE

A. Required Endorsements:

1. Certificate shall name San Mateo County Community College District, its Board of Trustees, and their employees, representatives, consultants, agents and Architect/Engineer as additional insured, but only with respect to liability arising out of the activities of the Named Insured for Auto Liability.
2. Each such policy shall apply separately to each insured against which claim is made or suit is brought, except with respect to the limit of the insurance company's liability.
3. Insurance shall be primary and no other insurance or self-insured retention carried or held by District shall be called upon to contribute to a loss covered by insurance for the named insured, except when covered by the OCIP.
4. Insurance shall contain a provision requiring the insurance carriers to waive their rights of subrogation against District and all additional insured, as well as other insurance carriers for the Work
5. Insurance certificates shall be addressed to:

San Mateo County Community College District
c/o Statewide Educational Wrap Up Program (SEWUP)
2355 Crenshaw Blvd., Suite 200
Torrance, CA 90501

B. Certificates of insurance and endorsements shall have clearly typed thereon District Bid Number and title of Contract Documents. Written notice of cancellation, non-renewal, or reduction in coverage of any policy shall be mailed to District (Attention: Contract Administration/Inspection) at the address listed in Section 00 52 00 (Agreement), sixty (60) Days in advance of the effective date of the cancellation, non-renewal, or reduction in coverage. Contractor shall maintain insurance in full force and effect during entire period of performance of Contract Documents. Contractor shall keep insurance in force during warranty and guarantee periods. At time of making application for extension of time, and during all periods exceeding the Contract Time resulting from any cause, Contractor shall submit evidence that insurance policies will be in effect during requested additional period of time. Upon District's request, Contractor shall submit to District, within thirty (30) Days, copies of the actual insurance policies or renewals or replacements.

1.7 ADDITIONAL REQUIREMENTS

A. Waiver of Subrogation and District Indemnification

With respect to their work on the Project Site:

- District waives all rights of subrogation and recovery against the Contractors/ Subcontractors to the extent of any loss or damage, which is insured under the OCIP.
- Contractors/Subcontractors waive all rights of subrogation and recovery against the District and other Contractors/Subcontractors to the extent of any loss or damage, which is insured under the OCIP.
- The Contractors/Subcontractors are obligated to indemnify the District for damages or claims not covered by the OCIP.

B. No Release

The provision of the OCIP, by the District, will in no way be interpreted as relieving the Contractors/Subcontractors of any other responsibility or liability under this agreement or any applicable law, statute, regulation, or order.

C. Coverage to be Provided by Contractor/Subcontractor During Warranty Period

OCIP coverage terminates on the Project's Final Acceptance Date. Contractors/subcontractors who return to the Project Site after this date, for any reason, do so under their own insurance coverage.

D. Change Order Pricing

Change Order pricing shall exclude any costs relating to insurance coverage afforded under the OCIP.

E. Duties in the Event of a Loss

Contractors/Subcontractors are required to report any and all losses, which include potential losses, promptly to the Insurance Company, Program Administrator and District. A full description and details of the incurred loss are also required.

The Contractor/Subcontractor shall assist the District, its agents, and the Program Administrator, by providing the utmost cooperation in the adjustment of claims arising out of the operations conducted under, or in connection with, the Project and shall cooperate with the District's Insurers in claims and demands that arise out of the Work and that the Insurers are called upon to adjust.

F. Safety Program Requirements

Contractor/Subcontractors are required to adhere to the requirements outlined in Section 01 56 00 – Site Security and Safety.

STATEWIDE EDUCATIONAL WRAP-UP PROGRAM
INSURANCE QUALIFICATION FORM
TO BE EXECUTED BY ALL CONTRACTORS AND SUBMITTED WITH PROPOSAL

As described in the bidding documents, the District has elected to implement an Owner Controlled Insurance Program (OCIP) for this Project. Pursuant to Government Code Section 4420.5, the District must conduct a bid evaluation to assess whether prospective bidders, including Contractors and Subcontractors of all tiers, meet minimum occupational, safety, and health qualifications established by the District. In order to complete this evaluation, all prospective bidders, of every tier, must submit the following information and satisfy the minimum standards established by the District for inclusion in the Program.

1.	Current Year Workers' Compensation Experience Modifier:	
	Workers' Compensation Bureau ID #:	
2.	Number of Serious and Willful violations (Labor Code Section 6300 et seq) that have been actually awarded against you in the last:	
	Five (5) Years?	
3.	Attach a copy of the following as evidence of your Injury & Illness Prevention Program (IIPP) (Labor Code Section 6401.7 and Cal OSHA regulation: CCR Title 8, #3203) Sample IIPP Programs can be obtained on the Cal OSHA web site at www.dir.ca.gov/title8/3203.html • Table of Contents of your Safety Program • A full copy of the IIPP is not required at time of bid submission	

Pursuant to Government Code Section 4420.5, CONTRACTORS AND SUBCONTRACTORS must meet certain minimum standards to enable the District to use an OCIP. The District and its SEWUP JPA have determined that the Contractors/Subcontractors must meet the following minimum standards.

- The number of allowable Serious and willful violations (Labor Code Section 6300 et seq)awarded against the Contractor/Subcontractors in the past Five (5) Years shall not exceed:
  - 1 to 3 Contractors/Subcontractor maximum of 1 Serious and Willful Violations
  - 4 to 6 Contractors/Subcontractor maximum of 2 Serious and Willful Violations
  - 7 or more Contractors/Subcontractor maximum of 3 Serious and Willful Violations
- 100% of the listed firms must provide evidence Injury & Illness Prevention Program (IIPP)
- 85% of the listed firms must have a Workers' Compensation Experience Modification Factor (EMR) of 1.10 or less. Under no circumstances will a Contractor/Subcontractor with an EMR of greater than 1.25 be allowed to enroll in the OCIP.

IMPORTANT: BIDDING CONTRACTORS AND SUBCONTRACTORS OF ALL TIERS SHALL COMPLETE AND RETURN the Insurance Qualification Form and evidence of IIPP to the DISTRICT with bid submission, on or before the date and time specified in the Notice to Bidders as part of your bid package.

Failure of prospective bidders to timely submit the required information or to satisfy the minimum occupational safety and health qualifications shall disqualify them from participation in the Project. Any bid submitted by a Contractor that has not, or which lists as a Subcontractor an entity that has not, participated in the insurance qualification process and satisfied the minimum occupational safety and health qualifications established to bid on the Project, shall render the bid non-responsive.

I declare under penalty of perjury, under the laws of the State of California, that the information provided on and with this form is true, correct, and complete.

Contractor Name:		Contractor License #:	
Address, City, State, Zip:			
Phone:		Fax #:	
Contact Person Name:		Title:	
Signature:			

Administrator: Keenan & Associates, SEWUP Dept., 2355 Crenshaw Blvd., Ste. #200, Torrance, CA 90501
Ph (310) 212-3344, Fax (310) 787-8838 License #0451271

Statewide Educational Wrap-Up Program
CONTRACTOR ENROLLMENT FORM

TO BE EXECUTED BY AWARDED CONTRACTOR AND SUBMITTED WITH EXECUTED CONTRACT
(Do not submit with Bid)

STATEWIDE EDUCATIONAL WRAP UP PROGRAM

CONTRACTOR ENROLLMENT FORM

District Name:	San Mateo County Community College District
Project Name:	

Contractor Information

Contractor/Subcontractor (Legal Name):			
If you are a subsidiary and / or division of another company, please indicate the name on file with the bureau:			
Address:			
City:		State:	Zip:
Name & Title Of Person(S) To Contact:		E-Mail Address:	
Phone Number:	( )	Fax:	
Contractor License #:		Federal Id #:	

Entity: ☐ Sole Proprietorship: ☐ Partnership: ☐ Corp: ☐ Other: ☐

Payroll/Accounting Contact (If Other Than Above):			
Phone:	( )	Fax:	( )
E-Mail Address:			

Contract Details

Your status on this Project:	☐ (a) General/Prime Contractor	☐ (b) Subcontractor	
	☐ (c) Tier/Subcontractor	☐ (d) Other	
If you checked (b), (c) or (d) above, give name of the contractor for whom you are under contract with:			
Bid package # (if applicable):		Total Contract Amount:	$
Contract Award Date:		Contract amount for *Self Performed Work*:	$
Estimated Start Date*:		Estimated Completion Date:	

*This will be the effective date of your OCIP coverage, unless notified otherwise

Description of work performed:				
For this project, will you be doing off-site work?	☐ Yes	☐ No		
If yes, please describe?				

Workers' Compensation Section

Each Contractor and Subcontractor of every tier is required to submit a list of job/WC classifications and their respective estimated payrolls and man- hours for all employees that will be working at the project site. This information must be submitted for each contract /bid package. If this applies to your firm, please contact the SEWUP Department for a Supplemental Contractor Enrollment Form. Payroll Records are subject to audit by the Owner's Workers' Compensation and General Liability insurance carrier

Description of Work	WC Class Code	On-Site Man-hours	On-Site Straight Time Payroll
Example: Carpenter <$22/hour	5403	160	$3,040
	Totals		

Project Name:		Contractor Name:	
Expected Subcontractors: If any work is to be subcontracted under this Contract, please complete the following information for each Subcontractor. Use additional pages, if necessary.			
Company Name:		Contact Person:	
ADDR			
City/State/Zip Code:			
Phone:		E Mail:	
Scope of Work:			
Contractor License		Contract Value:	
Est. Start Date:		Est. Completion Date:	
Company Name:		Contact Person:	
Address:			
City/State/Zip Code:			
Phone:		E Mail:	
Scope of Work:			
Contractor License		Contract Value:	
Est. Start Date:		Est. Completion Date:	
Company Name:		Contact Person:	
Address:			
City/State/Zip Code:			
Phone:		E Mail:	
Scope of Work:			
Contractor License		Contract Value:	
Est. Start Date:		Est. Completion Date:	
Company Name:		Contact Person:	
Address:			
City/State/Zip Code:			
Phone:		E Mail:	
Scope of Work:			
Contractor License		Contract Value:	
Est. Start Date:		Est. Completion Date:	

I DECLARE UNDER PENALTY OF PERJURY, UNDER THE LAWS OF THE STATE OF CALIFORNIA, THAT THE INFORMATION CONTAINED IN THIS DOCUMENT IS TRUE AND CORRECT. I HEREBY UNDERSTAND THAT ENROLLMENT IS CONTINGENT UPON RECEIPT AND ACCEPTANCE OF THIS FORM. SHOULD I SUBMIT AN INCOMPLETE FORM, KEENAN'S SEWUP DEPARTMENT WILL CONTACT ME AND MY FIRM WILL NOT BE ENROLLED UNTIL I PROVIDE ALL NECESSARY INFORMATION IN ITS ENTIRETY.

Print Name: ______________________ Title: ______________________

Signature: ______________________ Date: ______________________

Fax or Mail Completed Form To:
Keenan & Associates, 2355 Crenshaw Blvd., Ste. #200, Torrance, CA 90501
Attn: SEWUP Department
Phone (310) 212-3344, Fax (310) 787-8838

License No. 0451271

Keenan

STATEWIDE EDUCATIONAL WRAP UP PROGRAM

PROJECT SITE MONTHLY PAYROLL REPORT

District Name:	San Mateo County Community College District	Bid Pkg. #:	
Project Name:		REPORT # (For your Firm's use)	
Reporting Month:		Example:	February 2006
Company Name:		Dba Name:	
Under Contract With:		SEWUP Site Code*: (Internal Use Only) To be assigned by the SEWUP Administrator.	

Workers' Compensation Class Code	Work Description	Total Monthly Man-hours	Payroll*
	TOTALS	$	

I CERTIFY THAT THE INFORMATION REPORTED ABOVE IS TRUE AND ACCURATE. NOT REPORTING ACCURATE PAYROLL INFORMATION COULD AFFECT YOUR EXMOD - EXPERIENCE MODIFICATION RATING WITH THE WORKERS' COMPENSATION INSURANCE RATING BUREAU (WCIRB).

Signature:		Title:	
Print Name:		Date:	

*Do not include overtime wage rates, use straight time wage rates only, i.e., employee earns $20/hr. and works 10 hours in one day, you would report $200.00 ($20.00 x 10). If paid to third party (union) - exclude. If taxable to employee, then it is reported to WCIRB.

Fax or Mail Completed Form To:
Keenan & Associates, 2355 Crenshaw Blvd., Ste. #200, Torrance, CA 90501
Attn: SEWUP Department
Phone (310) 212-3344, Fax (310) 787-8838

License No. 0451271

Keenan

SEWUP **STATEWIDE EDUCATIONAL WRAP UP PROGRAM**

Contractor's Completion Notice

District Name:	San Mateo County Community College District
Project Name:	

IMPORTANT NOTIFICATION – PLEASE READ

Contractor or Subcontractor agrees to complete this form and return to Keenan & Associates upon completion or termination of work activities under this contract. Please include, with this form, any supporting documents for final contact value (if different from initial contract value).

Initial Contract Value:		
Final Contract Value:		
Last Day on Site*:		

**This would include work performed on final closeout or punch-list items and should not include warranty work.*

Contractor/Subcontractor Legal Name:			
Contractor/Subcontractor dba Name:			
Contractor License Number:			
Address:			
Representative's Name (Print):		Title:	
Signature:		Date:	

Fax or Mail Completed Form To:
Keenan & Associates, 2355 Crenshaw Blvd., Ste. #200, Torrance, CA 90501
Attn: SEWUP Department
Phone (310) 212-3344, Fax (310) 787-9838

License No. 0451271

Keenan

Rev. 04/06

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 00 73 37

APPRENTICESHIP PROGRAM

Contractor and Subcontractors shall comply with the requirements of California Labor Code Sections 1776, 1777.5, and 1777.6 concerning the employment of apprentices by Contractor or Subcontractors. Willful failure to comply may result in penalties, including loss of the right to Bid on or receive public works contracts.

Section 1777.5, as amended, requires a Contractor or Subcontractor employing tradespersons in any apprenticeable occupation to apply to the joint apprenticeship committee nearest the site of a public works project and which administers the apprenticeship program in that trade for a certification of approval. The certificate shall also fix the ratio of apprentices to journeypersons that will be used in performance of the Contract. The ratio of work performed by apprentices to journeypersons in such cases shall not be less than one hour of apprentices work for every five hours of labor performed by journeypersons (the minimum ratio for the land surveyor classification shall not be less than one apprentice for each five journeypersons), except:

A. When unemployment for the previous three-month period in the area exceeds an average of 15 percent;

B. When the number of apprentices in training in the area exceeds a ratio of one to five;

C. When a trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis state-wide or locally; or

D. Assignment of an apprentice to any work performed under a public works contract would create a condition which would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyperson.

Contractor is required to make contributions to funds established for administration of apprenticeship programs if Contractor employs registered apprentices or journeypersons in any apprenticeable trade on such contracts and if other contractors on the public works site are making such contributions.

Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of the California Department of Industrial Relations, or from the Division of Apprenticeship Standards and its branch offices.

In the event this Contract is governed by the District's Program Stabilization Agreement, and the Program Stabilization Agreement conflicts with this Section 00 73 37, the Program Stabilization Agreement will control to the extent permitted by law.

END OF SECTION

SECTION 00 91 01

ADDENDUM NO. 1

SUMMARY

This document includes requirements that clarify or supersede portions of the Request for Proposal. This Addendum is a Contract Document.

General
The following changes, additions and deletions shall be made to the following document(s); all other conditions shall remain the same.

I. BID FORM

XXX

II. AGREEMENT

XXX

III. SPECIFICATIONS

Item No.
XXX

IV. VOLUME ONE DRAWINGS

XXX

VI. CLARIFICATIONS

XXX

END OF ADDENDUM

SECTION 01 10 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

A. Section includes summary of Work including:
1. Work Covered By Contract Documents
2. Bid Items, Allowances, and Alternates
3. Work Under Other Contracts
4. Future Work (N/A)
5. Work Sequence
6. Business Days and Hours
7. Cooperation of Contractor and Coordination with Other Work
8. Maintenance, Product Handling, and Protection
9. Partial Occupancy/Utilization Requirements
10. Contractor Use of Premises
11. Lines and Grades
12. Protection of Existing Structures and Utilities
13. Damage to Existing Property
14. Dust Control
15. Parking
16. Laydown/Staging Area
17. Permits
18. Punch List Verification
19. Actual Damages for Violations
20. Unfavorable Construction Conditions
21. Construction Site Access
22. Specification Data Sheets and Schedules
23. Site Administration
24. Products Ordered In Advance
25. District-Furnished Products
26. CEQA Mitigations
27. Storm Water Pollution Program- *See Section 01 35 00*

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Work comprises [_____] located at [_____], [San Mateo, San Bruno or Redwood City], California [_____]. Upgrades are proposed to [_____].

B. Furnish all labor, materials, equipment, services, permits, temporary controls and construction facilities, and all general conditions, seismic requirements, general requirements and incidentals required to complete the Work in its entirety as described in the Contract Documents. The Work includes, but is not necessarily limited to the following:

1. Coordination with other contractors working at the site and its Subcontractors, coordination with local utility owners and [PG&E] and the District, obtaining necessary permits and complying with permit and environmental conditions, project startup and testing, site restoration and cleanup.

Formatted: Bullets and Numbering

C. The Work of this Contract comprises construction of all the Work indicated, described in the Specifications, or otherwise required by the Contract Documents.

D. Unless provided otherwise in the Contract Documents, all risk of loss to Work covered by Contract Documents shall rest with Contractor until Final Acceptance of the Work.

E. Contractor's use of the premises for Work and storage is limited to the area indicated.

F. Contractor shall be solely responsible for all utilities (including without limitation electricity, water, gas, etc.) at the Site.

G. Existing materials and equipment removed and not reused as a part of the Work shall be returned to the District. Contractor shall carefully remove, in a manner to prevent damage, all materials and equipment specified or indicated to be salvaged and reused or to remain the property of District. Contractor shall store and protect salvaged items specified or indicated to be reused in the Work.
Salvaged items not to be reused in the Work, but to remain District's property shall be delivered by Contractor in good condition to District.

Any items specified or indicated to be salvaged which are damaged in removal, storage, or handling through carelessness or improper procedures shall be replaced by Contractor in kind or with new items.
Contractor may furnish and install new items instead of those specified or indicated to be salvaged and reused, in which case such removed items will become Contractor's property.
Existing materials and equipment removed by Contractor shall not be reused in the Work, except where so specified or indicated.

1.3 BID ITEMS, ALLOWANCES, AND ALTERNATES

A. Any Bid Item may be deleted from the Work and Contract Sum, in total or in part, prior to or after award of Contract without compensation in any form or adjustment of other Bid Items or prices therefore.
B. Payment of all items is subject to provisions of Contract Documents, including without limitation Section 01 29 00 (Measurement and Payment).
C. For all Bid Items, furnish and install all work indicated and described in Specifications and all other Contract Documents, including connections to existing systems. Work and requirements applicable to each individual Bid Item, or unit of Work, shall be deemed incorporated into the description of each Bid Item..
D. Descriptions of Lump Sum Items (listed by Bid Item Numbers). Bid items are not intended to be exclusive descriptions of work categories and Bidder shall determine and include in its pricing all materials, labor, and equipment necessary to complete each Bid Item as shown and specified:
   1. Bonds and Insurance. The lump sum price paid under this item shall be full payment for all Bonds and Insurance required by Document 00 71 00 (General Conditions).
   2. Safety Plan and Programs. The lump sum price paid under this item shall be full payment for providing the Safety Plan and programs as required by Section 01 56 00 (Site Security and Safety) and 00 71 00 (General Conditions).
   3. Mobilization/Demobilization. The lump sum price paid under this item shall be full payment for initial mobilization at Project commencement (50% to be paid then), and cleanup and demobilization at Final Completion of Work to be completed (50% to be paid then).
   4. **[Electrical Upgrades]**. The lump sum price paid under this item shall be full payment for site preparation, excavation and foundation preparation, offsite disposal of excavated materials, sheeting, shoring and bracing, structural concrete and reinforcement, furnishing and installation of [_____], training of District personnel, submittals, and all other general conditions, general requirements, and seismic requirements.
   5. Installation, Operation, and Maintenance Manuals, Record Drawings-. The lump sum price paid under this item shall be full payment for preparation of installation, operation, and maintenance manuals.
   6. All Work of Contract Documents other than Work separately provided for under other Bid Items. The lump sum price paid under this item shall be full payment for all Work of Contract Documents other than Work separately provided for under other Bid Items, including cleaning, startup, and testing, submittals, and all other general conditions, general requirements, and seismic requirements.
E. Allowances:
   1. Allowance work shall be done as Change Orders and as specified in Section 01 26 00 (Modification Procedures). Identify Allowance Items (See Document 00 41 00 [Bid Form]) work on the Progress Schedules and on Applications for Payment.
   2. The Amount given on Document 00 41 00 (Bid Form) under each Allowance Item is the sum of money set aside for each Allowance Item. These amounts shall be included in the Contract Sum on the Bid Form.
   3. If the cost of work done under any Allowance Item is less than the amount given on the Bid Form under that Allowance Item, the Contract Sum shall be reduced by the difference between the amount given in the Bid Form and the cost of work actually done.
   4. Scope of Allowances:
      a. N/A
F. Alternates:

1. Alternative Item No. 1 (Bid Item [8]): [_____]. The lump sum price paid under this item shall be full payment for [_____], including: [_____], cleaning and testing, submittals, and all other general conditions, and general requirements.
2. Alternative Item No. 2 (Bid Item [9]): [_____]. The lump sum price paid under this item shall be full payment for furnishing and installation of [_____], cleaning and testing, submittals, and all other general conditions, and general requirements.

1.4 WORK UNDER OTHER CONTRACTS

Work at the site performed by others includes the following: [_____].

1.5 FUTURE WORK

[PROJECT MANAGER- CUSTOMIZE BY PROJECT]

1.6 WORK SEQUENCE

A. Construct Work in stages and at times to accommodate District operation requirements during the construction period; coordinate construction schedule and operations with District.
B. Contractor shall not have access to the [_____] before [_____], 200X, to allow District time to [_____], unless otherwise agreed upon by District. Contractor shall schedule Work in this area accordingly.
C. Contractor acknowledges that shoring may be required to maintain a safe excavation and protect facilities, including both existing and recently constructed under this Contract. All expenses for shoring of excavations shall be included in the appropriate bid items.

1.7 BUSINESS DAYS AND HOURS

A. The District's Regular Business Days and hours for construction personnel, such as facilities managers, architects, inspectors, and maintenance personnel, are Monday-Friday inclusive, 7:30 a.m. - 4:30 p.m. local time.
B. Contractor is advised that District, students and faculty are on campuses Monday – Friday, 8:00 a.m. - 10:00 p.m., with generally less activity between 1:00 p.m. and 6:00 p.m., and Saturday 8:00 a.m. – 1:00 p.m.
C. Contractor may work at the Site on weekends or holidays if it notifies District in writing at least 48 hours in advance. In the case of Work by Contractor after normal working hours or on weekends or holidays, Contractor shall be responsible for any additional inspection costs incurred by the District. Such costs may be withheld from any succeeding monthly progress payment.
D. See Section 00 73 00 Supplementary Conditions for College Activities and Events which may also result in Contractor's inability to work.
E. Contractor shall protect facilities against deleterious substances and damage.

1.8 COOPERATION OF CONTRACTOR AND COORDINATION WITH OTHER WORK

A. Coordinate with District and any District forces, or other contractors and forces, as required by Document 00 71 00 (General Conditions), paragraph 6.
B. Contractor shall coordinate the construction schedule with the regular daily operations schedule of the District and Campus for minimal interruption during utility service installations/modifications. All shut-downs required to perform the work and temporary facilities/utilities to affected District constituencies or other projects shall be coordinated by the Contractor and included in the base scope/cost of the project for normal power service installation.
C. Noise: Construction activities are to comply with applicable local noise ordinance and applicable Cal-OSHA regulations.
D. Connections to Existing Facilities. Unless otherwise specified or indicated, Contractor shall make all necessary connections to existing facilities, including structures, drain lines, and utilities such as water, sewer, gas, telephone, and electric. In each case, Contractor shall receive permission from District or the owning utility prior to undertaking connections.
E. [PM- add date(s) for required substantial completion here. This is only necessary if another project is pending completion of this project. Otherwise delete.]

1.9 MAINTENANCE, PRODUCT HANDLING, AND PROTECTION

A. Transport, deliver, handle, and store materials and equipment at the Site in such a manner as to prevent the breakage, damage or intrusions of foreign matter or moisture, and otherwise to prevent damage.

B. Hazardous substance compliance: Provide District with copies of the OSHA Material Safety Data Sheets (MSDS) for all products containing a hazardous substance, examples: Adhesives, paints, sealants, and the like.
C. Packaging: Provide packaged material in manufacturer's original containers with seals unbroken and labels intact until incorporated into the Work.
D. Remove all damaged or otherwise unsuitable material and equipment promptly from the Site.
E. Protection: Protect all finished surfaces.
F. Asbestos Removal: If, during the progress of the Work, suspected asbestos-containing products are identified, Contractor shall stop work in the affected area and immediately notify the Owner. Owner shall either directly engage an asbestos removal contractor to verify the materials and, if necessary, encapsulate, enclose, or remove and dispose of all asbestos in accordance with current regulations of the Environmental Protection Agency and the U. S. Department of Labor – Occupational Safety and Health Administration, the state asbestos regulating agency, and any local government agency; or Owner shall direct Contractor to do the same as a Change Order to the contract. The Contractor shall take all measures to avoid and/or mitigate delays due to Hazardous Materials/Waste finds such as: avoiding the area of the find and proceeding with other work on the project; developing "work around" plans; and documenting his best efforts to avoid and/or mitigate delays.
   1. Asbestos Removal Subcontractor's Qualifications. The Subcontractor for asbestos removal shall be regularly engaged in this type of activity and shall be familiar with the regulations that govern this work. The Subcontractor shall demonstrate to the satisfaction of District that it has successfully completed at least three asbestos removal projects that it has the necessary staff and equipment to perform the work, and that it has an approved site for disposal of the asbestos. Liability insurance covering the asbestos abatement work shall be provided as specified in the Supplementary Conditions.
   2. Asbestos Removal Methods. The asbestos removal Subcontractor shall submit a work plan of its proposed removal procedure to District before beginning work and shall certify that the methods are in full compliance with the governing regulations. The work plan shall cover all aspects of the removal, including health and safety of employees and building occupants, hygiene facilities, employee certification, clearance criteria, transportation and disposal, enclosure techniques, and other techniques appropriate for the proposed work.
G. Cost of maintenance of systems and equipment prior to either Substantial Completion or filing of a Notice of Completion will be considered as included in prices bid and no direct or additional payment will be made therefore.
H. Contractor is to complete, and if necessary develop, maintenance logs for each piece of major equipment installed and/or stored until project close out. This equipment includes:
   1) [PM TO UPDATE]
   2) [PM TO UPDATE]
I. Maintenance logs and all related contract close-out documentation will be submitted to the District's Representative no more than thirty (30) days after the date of Substantial Completion. A Notice of Completion will not be filed until all contract close-out documents are submitted and approved.

1.10 PARTIAL OCCUPANCY/UTILIZATION REQUIREMENTS

A. Allow District to take possession of and use any completed or partially completed portion of the Work during the progress of the Work as soon as is possible without interference to the Work.
B. Possession, use of Work, and placement and installation of equipment by District shall not in any way evidence the completion of the Work or any part of it.
C. Contractor shall not be held responsible for damage to the occupied part of the Work resulting from District occupancy.
D. Make available, in areas occupied, on a 24-hour per day and 7-day per week basis if required, any utility services, heating, and cooling in condition to be put in operation at the time of occupancy.
   1. Responsibility for operation and maintenance of said equipment shall remain with Contractor.
   2. Make, and District shall certify, an itemized list of each piece of equipment so operated with the date operation commences.
   3. Itemized list noted above shall be basis for commencement of warranty period for equipment.
   4. District shall pay for utility cost arising out of occupancy by District during construction.
E. Use and occupancy by District prior to acceptance of Work does not relieve Contractor of its responsibility to maintain insurance and bonds required under the Contract until entire Work is completed and accepted by District.

F. Prior to date of Final Acceptance of the Work by District, all necessary repairs or renewals in Work or part thereof so used, not due to ordinary wear and tear, but due to defective materials or workmanship or to operations of Contractor, shall be made at expense of Contractor, as required in Document 00 71 00 (General Conditions).

G. Use by District of Work or part thereof as contemplated by this Section 01 10 00 shall in no case be construed as constituting acceptance of Work or any part thereof. Such use shall neither relieve Contractor of any responsibilities under Contract, nor act as waiver by District of any of the conditions thereof.

H. District may specify in the Contract Documents that portions of the Work, including electrical and mechanical systems or separate structures, shall be substantially completed on dates described in paragraph 1.231.68 of this Section 01 10 00, if any, prior to substantial completion of all of the Work. Contractor shall notify District's Representative and Architect/Engineer in writing when Contractor considers any such part of the Work ready for its intended use and substantially complete and request District to issue a Certificate of Substantial Completion for that part of the Work.

1.11 CONTRACTOR USE OF PREMISES

A. Confine operations at Site to areas permitted by Contract Documents, permits, ordinances, and laws.

B. Do not unreasonably encumber Project Site with materials or equipment.

C. Assume full responsibility for protection and safekeeping of products stored on premises.

D. Move any stored products that interfere with operations of District or other contractor.

E. Parking, storage, staging, and work areas shall be coordinated with the District, and comply with all other Contract documents requirements. [PM CUSTOMIZE BY PROJECT]

1.12 LINES AND GRADES

A. All Work shall be done to the lines, grades, and elevations indicated on the Drawings.

B. District shall provide basic horizontal and vertical control points to be used as datums for the Work. All additional survey, layout, and measurement work shall be performed by Contractor as a part of the Work.

C. Contractor shall provide at its cost an experienced instrument person, competent assistants, and such instruments, tools, stakes and other materials required to complete the survey, layout, and measurement work. In addition, Contractor shall furnish at its cost competent persons and such tools, stakes, and other materials as District (and/or any Architect/Engineer) may require in establishing or designating control points, or in checking survey, layout, and measurement work performed by Contractor.

D. Contractor shall keep District informed, a reasonable time in advance, of the times and places at which it wishes to do survey/layout work, so that any checking deemed necessary by District may be done with minimum inconvenience to District and minimum delay to Contractor.

E. Contractor shall remove and reconstruct Work which is improperly located.

1.13 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. The Drawings may indicate existing above- and below-grade structures, drainage lines, storm drains, sewers, water, gas, electrical, hot water, and other similar items and utilities that are known to District.

B. Contractor shall locate these known existing installations before proceeding with trenching or other operations which may cause damage, shall maintain them in service where appropriate, and shall repair any damage to them caused by the Work, at no increase in Contract Sum.

C. Additional utilities whose locations are unknown to District are suspected to exist. Contractor must be alert to their existence. If additional utilities are encountered, Contractor must immediately report to District for disposition.

D. In addition to reporting, if a utility is damaged, Contractor must take appropriate action as provided in Document 00 71 00 (General Conditions).

E. Additional compensation or extension of time on account of utilities not indicated or otherwise brought to Contractor's attention including reasonable action taken to protect or repair damage shall be determined as provided in Document 00 71 00 (General Conditions).

1.14 DAMAGE TO EXISTING PROPERTY

A. Contractor will be responsible for any damage to existing structures, Work, materials, or equipment because of its operations and shall repair or replace any damaged structures, Work, materials, or equipment to the satisfaction of, and at no additional cost to, District.

B. Contractor shall protect all existing structures and property from damage and shall provide bracing, shoring, or other work necessary for such protection.

C. Contractor shall be responsible for all damage to streets, roads, curbs, sidewalks, highways, shoulders, ditches, embankments, culverts, bridges, or other public or private property, which may be caused by transporting equipment, materials, or workers to or from the Work. Contractor shall make satisfactory and acceptable arrangements with the agency having jurisdiction over the damaged property concerning its repair or replacement.

1.15 DUST CONTROL

A. Contractor shall take reasonable measures to prevent unnecessary dust. The following items shall be specifically implemented to control dust:
   1. All construction locations with active excavation shall be watered at least twice daily.
   2. Cover all trucks hauling soil, sand, and other loose materials; or require all trucks to maintain at least two feet of freeboard.
   3. Pave, apply water daily, or apply non-toxic soil stabilizers on all un-paved access roads, parking areas, and staging areas at construction site.
   4. Sweep daily with water sweepers all paved access roads, parking areas, and staging areas at construction sites during earthwork activities.
   5. Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.)
   6. Limit the speed of all construction vehicles to 5 miles per hour while on un-paved roads at the Site.

B. Buildings or operating facilities which may be affected adversely by dust shall be adequately protected from dust. Existing and new machinery, motors, instrument panels, or similar equipment shall be protected by suitable dust screens. Proper ventilation shall be included with dust screens.

C. Building Interiors: provide dust barriers, walk-off pads, etc. to minimize dust infiltration in buildings. If required, the Contractor will clean interior common areas (e.g., corridors, lobbies) as needed during each work day.

1.16 PARKING

Parking will be provided in designated areas at no cost to the Contractor.

1.17 LAYDOWN/STAGING AREA

Contractor shall utilize the area indicated on the Drawings for storage of all construction materials. This area shall be fenced and locked by Contractor for security purposes.

1.18 PUNCH LIST VERIFICATION

A punch list examination will be performed upon Substantial Completion of Work. One follow-up review of punch list items for each discipline will be provided. If further Site visits are required to review punch list items due to incompleteness of the Work by Contractor, at District's discretion, Contractor shall reimburse District for these visits.

1.19 UNFAVORABLE CONSTRUCTION CONDITIONS

During unfavorable weather, wet ground, or other unsuitable construction conditions, Contractor shall confine its operations to Work which will not be affected adversely by such conditions. No portion of the Work shall be constructed under conditions which would affect adversely the quality or efficiency thereof, unless special means or precautions are taken by Contractor to perform the Work in a proper and satisfactory manner. The Contractor will employ BEST practices to manage the construction site during inclement weather.

1.20 CONSTRUCTION SITE ACCESS

Contractor shall at all times limit access to the Site to necessary personnel only. All personnel associated with construction of the Project shall enter the site through Contractor's access gate, at the location indicated on the Drawings. Access for construction personnel shall be limited to regular work hours, unless prior approval is obtained from the District. All mail and deliveries (Federal Express, equipment, etc.) shall be sent to a separate address (at Contractor's gate), specifically arranged by Contractor for the Project. Contractor is responsible for providing adequate signage (subject to District approval) to alert delivery persons to the project site. The District will not receive or forward Contractor mail or deliveries.

1.21 SPECIFICATION DATA SHEETS AND SCHEDULES

Specifications may have data sheets and schedules as part of specific specification sections. Locations for data entries on the data sheets and schedules may be left blank intentionally. Each line where data may be entered on the data sheet has a selection box in the column "Chk". When the box for a line is checked and no data is entered in the respective line, this indicates that no data is required for that line of the data sheet.

Other standard codes which apply to the Work are designated in the Specifications.

1.22 SITE ADMINISTRATION

Contractor shall be responsible for all areas of the Site used by it and by all Subcontractors in the performance of the Work. Contractor shall exert full control over the actions of all employees and other persons with respect to the use and preservation of property and existing facilities, except such controls as may be specifically reserved to District or others. Contractor shall have the right to exclude from the Site all persons who have no purpose related to the Work or its inspection, and may require all persons on the Site to observe the same regulations as Contractor requires of its employees.

1.23 EROSION CONTROL

1.01 SCOPE OF WORK

A. General: Provide all materials, equipment and labor necessary to furnish and install straw wattles, silt fence barriers, hydroseed, or other Best Management Practices (BMP's) at locations shown on the Contractors Storm Water Pollution Prevention Plan. *See Section 01 35 00 for further detail.*

B. Storm Water Pollution Prevention Plan: Prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) tailored to the Contractor's operations, methods and equipment. Comply with State Water Resources Control Board requirements. The SWPPP shall be reviewed and approved by the authority having jurisdiction prior to the start of work. The SWPPP shall be tailored to the contractor's approach to the work in this contract. The Contractor shall as a minimum address:

1. Cut and fill operations
2. Temporary stockpiles
3. Vehicle and equipment storage, maintenance and fueling operations
4. Concrete, plaster, mortar and paint disposal
5. Dust control
6. Tracking of dirt and mud, on and off of site, and adjacent streets.
7. Pipe flushing and protection of drainage facilities both new and existing, on and off site as required by State Water Resources Control Board.

1.02 QUALITY ASSURANCE

A. General: Comply with governing codes and regulations of the State Water Resources Control Board.

1.03 SUBMITTALS

A. Notice Of Intent (NOI): The Contractor shall submit a NOI to the State Water Resources Control Board in the name of San Mateo County Community College District prior to beginning work on site if required.

PART 2 PRODUCTS

2.1 PRODUCTS ORDERED IN ADVANCE (if applicable)
[PM UPDATE BY PROJECT]

2.2 RESPONSIBILITIES FOR DISTRICT-FURNISHED PRODUCTS

A. District's Responsibilities:

1. Arrange for and deliver District-reviewed Shop Drawings, Product Data, and Samples, to Contractor.
2. Arrange and pay for delivery to site.
3. On delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.

5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:
1. Review District-reviewed Shop Drawings, Product Data, and Samples.
2. Receive and unload products at site; inspect for completeness or damage jointly with District.
3. Handle, store, install, and finish products.
4. Repair or replace items damaged after receipt.
5. Install into Project per Contract Documents.

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 21 00

OWNER'S ALLOWANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-specified work to be performed only at the determination and direction of the Owner/District.

1.2 RELATED SECTIONS

A. Section 01 29 00 - Measurement and Payment.
B. Section 01 32 19 – Submittal Procedures.

1.3 NON-SPECIFIED WORK ALLOWANCE

A. Include in the Contract, a stipulated sum/price of [_____] for non-specified items.
B. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Change Orders authorizing expenditure of funds from this Allowance.
C. Funds will be drawn from Allowance only by approval of the Owner and authorization of Change Orders by the Architect.
D. At closeout of Contract, funds remaining in Allowance will be credited to Owner by Changer Order.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

COST PROPOSAL (CP)

[__] PROJECT/Contract Number [__]

CP Number: _____
Date: _____
In Response To: (RFP#, etc.) _____

To: The San Mateo County Community College District
Attention: [Point of Contact]
[Insert POC address]
[Insert POC address]
Telephone: (650) [_____]
Fax: (650) [_____]

From:

REQUESTED CHANGE IN CONTRACT TIME (DAYS) _____

Brief description of change(s): _____

	Contractor	First-Tier Subcontractors			Lower-Tier Subs		Totals
		Sub A	Sub B	Sub C	Sub A1	Sub B1	
LABOR							
Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mark-up							
%	15%	15%	15%	15%	15%	15%	
$$	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Taxes	$ -	$ -	$ -	$ -	$ -	$ -	$ -
						Labor Total Including Taxes	**$ -**
MATERIALS							
Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mark-up							
%	15%	15%	15%	15%	15%	15%	
$$	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Taxes	$ -	$ -	$ -	$ -	$ -	$ -	$ -
						Materials Total Including Taxes	**$ -**
RENTALS							
Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mark-up							
%	10%	10%	10%	10%	10%	10%	
$$	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Taxes	$ -	$ -	$ -	$ -	$ -	$ -	$ -
						Rentals Total Including Taxes	**$ -**
DESIGN SERVICES							
Cost	$ -	$ -	$ -	$ -			$ -
Mark-up							
%	15%	15%	15%	15%			
$$	$ -	$ -	$ -	$ -			$ -
						Design Services Total	**$ -**
SPECIALTY WORK							
Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Discount	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mark-up							
%	15%	15%	15%	15%	15%	15%	
$$	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Taxes	$ -	$ -	$ -	$ -	$ -	$ -	$ -
						Specialty Work Total	**$ -**
Total All Costs n.i.c. Sales Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contractor Mark-up on Sub Costs		$ -	$ -	$ -	$ -	$ -	$ -
1st Tier Subcontractor Mark-up on Lower-tier Subs					$ -	$ -	$ -
						Total All Contractor Mark-ups	***$ -***
						Total Mark-up as a % of Costs	0.00%
						Total Sales Tax	$ -
						GRAND TOTAL	**$ -**

Print Name & Title:	Signature:	Date:

Notes:

1. Contractor figures are to include only self-performed work. Do not include the value of work performed by first or lower-tier subs.
2. First-tier subcontractor figures are to include only self-performed work. Do not include the value of work performed by lower-tier contractors.

SECTION 01 26 00

MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:
   1. Description of general procedural requirements for alterations, modifications, and extras.
B. Reference
   1. Public Contract Code Section 7105(d)(2).

1.2 GENERAL

A. Any change in scope of Work or deviation from Contract Documents including, without limitation, extra work, or alterations or additions to or deductions from the original Work, shall not invalidate the original Contract, and shall be performed under the terms of the Contract Documents.
B. Only Contractor or District may initiate changes in scope of Work or deviation from Contract Documents.
   1. Contractor may initiate changes by submitting RFIs, Notice of Concealed or Unknown Conditions, or Notice of Hazardous Waste Conditions.
      a. RFIs shall be submitted to seek clarification of or request changes in the Contract Documents. RFIs shall not be submitted to District seeking clarification to any errors or omissions on behalf of the Contractor's preparation of the Construction Documents or any other Contract Documents prepared by Contractor.
      b. Notices of Concealed or Unknown Conditions shall be submitted in accordance with Document 00 71 00 (General Conditions).
      c. Notices of Hazardous Waste Conditions shall be submitted in accordance with Document 00 71 00 (General Conditions).
   2. Contractor shall be responsible for its costs to implement and administer RFIs throughout the Contract duration. Regardless of the number of RFIs submitted, Contractor shall not be entitled to additional compensation. Contractor shall be responsible for both District and its consultant's administrative costs for answering RFIs where the answer could reasonably be found by reviewing the Contract Documents, as determined by District; at District's discretion, such costs may be deducted from progress payments or final payment.
   3. District may initiate changes by issuing a Supplemental Instruction, which may revise, add to or subtract from the Work.
   4. District may initiate changes in the Work or Contract Time by issuing RFPs to Contractor. Such RFPs will detail all proposed changes in the Work and request a quotation of changes in Contract Sum and Contract Time from Contractor.
   5. District may also, by Construction Change Directive ("CCD"), order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly. A CCD shall be used in the absence of total agreement on the terms of a Change Order and may, upon notice, consist of a Change Order executed by District only.
   6. Not used.
   7. It is the responsibility of the Contractor to notify the District within 14 days if there is a cost change. Notifications beyond this time limit may result in future claims being time barred.

1.3 PROCEDURES

A. Cost Proposal and Procedures: Whenever Contractor is required in this Section 01 26 00 to prepare a Cost Proposal, and whenever Contractor is entitled to submit a Cost Proposal and elects to do so, Contractor shall prepare and submit to District for consideration a Cost Proposal using the form attached to this Section 01 26 00, or other similarly prepared form previously approved by the District. All Cost Proposals must contain a complete breakdown of costs of credits, deducts and extras; itemizing materials, labor, taxes, overhead and profit. All Subcontractor Work shall be so indicated. Individual entries on the Cost Proposal form shall be determined as provided in paragraphs 1.4 and 1.5 of this Section 01 26 00. After receipt of a Cost Proposal with a detailed breakdown, District will act promptly thereon.

1. If District accepts a Cost Proposal, District will prepare Change Order for District and Contractor signatures.
2. If Cost Proposal is not acceptable to District because it does not agree with cost and/or time included in Cost Proposal, District will submit in a response what it believes to be a reasonable cost and/or adjustment, if any. Except as otherwise provided in this Section 01 26 00, Contractor shall have seven Days in which to respond to District with a revised Cost Proposal.
3. When necessity to proceed with a change does not allow the District sufficient time to conduct a proper check of a Cost Proposal (or revised Cost Proposal), District may order Contractor to proceed on basis to be determined at earliest practical date. In this event, value of change, with corresponding equitable adjustment to Contract, shall not be more than increase or less than decrease proposed.

B. Request for Information: Whenever Contractor requires information regarding the Project or Contract Documents or receives a request for information from a Subcontractor, Contractor may (except as provided in paragraph 1.2.B.1.a above), prepare and deliver an RFI to District. Contractor shall not submit an RFI to the District if it pertains to a Subcontractor's request for clarification of the Construction Documents or any other Contract Documents prepared by Contractor. Contractor shall use RFI format provided by District. Contractor must submit time critical RFIs at least 30 days before scheduled start date of the affected Work activity. Contractor shall reference each RFI to an activity of Progress Schedule and shall note time criticality of the RFI, indicating time within which a response is required. Contractor's failure to reference RFI to an activity on the Progress Schedule and note time criticality on the RFI shall constitute Contractor's waiver of any claim for time delay or interruption to the Work resulting from any delay in responding to the RFI.

1. District will endeavor to respond within seven Days from receipt of RFI with a written response to Contractor, provided that the RFI complies with paragraph B. above and is time critical. Additionally, District may return RFI requesting additional information should original RFI be inadequate in describing condition. Contractor shall distribute response to all appropriate Subcontractors.
2. If Contractor is satisfied with the response and does not request change in Contract Sum or Contract Time, then the response shall be executed without a change.
3. If Contractor believes the response is incomplete, Contractor shall issue another RFI (with the same RFI number with the letter "A" indicating if it is a follow-up RFI) to District clarifying original RFI.
4. If Contractor believes that the response results in change in Contract Sum or Contract Time, Contractor shall notify District in writing within seven Days after receiving the response. If District disagrees with Contractor, then Contractor may give notice of intent to submit a Claim as described in Article 12 of Document 00 71 00 (General Conditions), and submit its Claim within 30 days of District's response. If District agrees with Contractor, then Contractor must submit a Cost Proposal within 21 Days of District's response to the RFI. Contractor's failure to deliver either the foregoing notice of Claim or Cost Proposal by the respective deadlines stated in the foregoing sentences shall result in waiver of the right to file a Cost Proposal or Claim.

C. Supplemental Instruction: District may issue Supplemental Instruction to Contractor.

1. If Contractor is satisfied with Supplemental Instruction and does not request change in Contract Sum or Contract Time, then Supplemental Instruction shall be executed without a Change Order.
2. If Contractor believes that Supplemental Instruction results in change in Contract Sum or Contract Time, then Contractor shall notify District in writing within seven Days after receiving the

response. If District disagrees with Contractor, then Contractor may give notice of intent to submit a Claim as described in Article 12 of Document 00 71 00 (General Conditions), and submit its Claim within 30 days of District's response. If District agrees with Contractor, then Contractor must submit a Cost Proposal within 21 Days of District's response to the RFI. Contractor's failure to deliver either the foregoing notice of Claim or Cost Proposal by the respective deadlines stated in the foregoing sentences shall result in waiver of the right to file a Cost Proposal or Claim.

D. Construction Change Directives: If at any time District believes in good faith that a timely Change Order will not be agreed upon using the foregoing procedures, District may issue a CCD with its recommended cost and/or time adjustment. Upon receipt of CCD, Contractor shall promptly proceed with the change of Work involved and concurrently respond to District's CCD within 10 Days.
   1. Contractor's response must be any one of following:
      a. Return CCD signed, thereby accepting District's response, time and cost.
      b. Submit a (revised if applicable) Cost Proposal with supporting documentation (if applicable, reference original Cost Proposal number followed by letter A, B, etc. for each revision), if District so requests.
      c. Give notice of intent to submit a Claim as described in Article 12 of Document 00 71 00 (General Conditions), and submit its Claim with 30 days.
   2. If the CCD provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
      a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation.
      b. Unit prices stated in the Contract Documents or subsequently agreed upon.
      c. Force account.
      d. Cost to be determined in a manner agreed.
   3. CCD signed by Contractor indicates the agreement of Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.
   4. If Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by District on the basis of reasonable expenditures and savings of those performing the Work attributable to the change including, in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. If the parties still do not agree on the price for a CCD, Contractor may file a Claim per Article 12 of Document 00 71 00 (General Conditions). Contractor shall keep and present, in such form as District may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this paragraph shall be limited to those provided in paragraphs 1.4 and 1.5 of this Section 01 26 00.
   5. Pending final determination of cost to District, amounts not in dispute may be included in Applications for Payment. The amount of credit to be allowed by Contractor to District for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by District. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

E. District Requested RFP: Contractor shall furnish a Cost Proposal within 21 Days of District's RFP. Upon approval of RFP, District will issue a Change Order directing Contractor to proceed with extra Work. If the parties do not agree on the price for an RFP, District may either issue a CCD or decide the issue per Article 12 of Document 00 71 00 (General Conditions). Contractor shall perform the changed Work notwithstanding any claims or disagreements of any nature.

F. Differing Site Conditions: Contractor shall submit Notices of Differing Site Conditions to resolve problems regarding differing underground Site conditions encountered in the execution of the Work pursuant to paragraph 13.4 of Document 00 71 00 (General Conditions), which shall govern. If District determines that a change in Contract Sum or Contract Time is justified, District will issue RFP or CCD.

G. Hazardous Waste Conditions: Contractor shall submit Notices of Hazardous Waste Conditions to resolve problems regarding hazardous materials encountered in the execution of the Work pursuant to paragraph 13.5 of Document 00 71 00 (General Conditions), which shall govern. If District determines that a change in Contract Sum or Contract Time is justified, District will issue RFP or CCD.

H. All Changes:
   1. Documentation of Change in Contract Sum and Contract Time:
      a. Contractor shall maintain detailed records of Work performed on a time-and-material basis.
      b. Contractor shall document each proposal for a change in cost or time with sufficient data to allow evaluation of the proposal.
      c. Contractor shall, on request, provide additional data to support computations for:
         1) Quantities of products, materials, labor and equipment.
         2) Taxes, insurance, and bonds.
         3) Overhead and profit.
         4) Justification for any change in Contract Time and new Progress Schedule showing revision due, if any.
         5) Credit for deletions from Contract, similarly documented.
      d. Contractor shall support each claim for additional costs, and for Work performed on a cost-and-percentage basis, with additional information including:
         1) Credit for deletions from Contract, similarly documented.
         2) Origin and date of claim.
         3) Dates and times Work was performed and by whom.
         4) Time records and wage rates paid.
         5) Invoices and receipts for products, materials, equipment and subcontracts, similarly documented.

I. Correlation of Other Items:
   1. Contractor shall revise Schedule of Values and Application for Payment forms to record each authorized Change Order or CCD as a separate line item and adjust the Contract Sum as shown thereon prior to the next monthly pay period.
   2. Contractor shall revise the Progress Schedules prior to the next monthly pay period.
   3. Contractor shall enter changes in Project Record Documents prior to the next monthly pay period.

J. Responses: For all responses for which the Contract Documents, including without limitation this Section 01 26 00, do not provide a specific time period, recipients shall respond within a reasonable time.

K. Disputes: For all disputes arising from the procedures herein, Contractor shall follow Article 12 of Document 00 71 00.

1.4 COST DETERMINATION

A. Total cost of extra Work or of Work omitted shall be the sum of construction labor costs, material costs, equipment rental costs, design professional costs and specialist costs as defined herein plus overhead and profit as allowed herein. This limit applies in all cases of claims for extra Work, whether calculating Cost Proposals, Change Orders or CCDs, or calculating claims of all types, and applies even in the event of fault, negligence, strict liability, or tort claims of all kinds, including strict liability or negligence. Contractor may recover no other costs arising out of or connected with the performance of extra Work, of any nature. No special, incidental or consequential damages may be claimed or recovered against District, its representatives or agents, whether arising from breach of contract, negligence or strict liability, unless specifically authorized in the Contract Documents.

   Design Professional costs shall be calculated by multiplying the number of hours per design professional by the hourly rate established in the bid form.

B. Overhead and Profit: (Overhead shall be as defined in paragraph 1.8 of this Section 01 26 00)
   1. Overhead and profit on labor for extra Work shall not exceed 15 percent.
   2. Overhead and profit on materials for extra Work shall not exceed 15 percent.
   3. Overhead and profit on equipment rental for extra Work shall not exceed 10 percent.
   4. When extra Work is performed by a first tier Subcontractor or a Design Professional, Contractor shall receive a 5 percent markup on Subcontractors' or Design Professional's total costs of extra Work. First tier Subcontractor's markup on its Work shall not exceed 15 percent.
   5. When extra Work is performed by a lower tier Subcontractor, Contractor shall receive a total of 5 percent markup on the lower tier Subcontractors' total costs of extra Work. First tier

Subcontractors and lower tier Subcontractors shall divide the 20 percent markup as mutually agreed.

6. Notwithstanding the foregoing, in no case shall the total markup on any extra Work exceed 25 percent of the direct cost, notwithstanding the actual number of contract tiers.
7. On proposals covering both increases and decreases in Contract Sum, overhead, profit, and commission shall be allowed on the net increase only as determined in paragraph 1.4 above. When the net difference is a deduction, no percentage for overhead, profit and commission shall be allowed, but rather a deduction shall apply.
8. The markup shall include profit and overhead. No markup will be allowed on permits, fees, taxes, insurance, and bonds.

C. Taxes:
1. All State sales and use taxes, San Mateo County and applicable City sales taxes, shall be included.
2. Federal and Excise tax shall not be included.

D. Accord and Satisfaction: Every Change Order and accepted CCD shall constitute a full accord and satisfaction, and release, of all Contractor (and if applicable, Subcontractor) claims for additional time, money or other relief arising from or relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay and any other type of claim. Contractor may elect to reserve its rights to disputed claims arising from or relating to the changed Work at the time it signs a Change Order or approves a CCD, but must do so expressly in a writing delivered concurrently with the executed Change Order or approved CCD, and must also submit a Claim for the reserved disputed items pursuant to Article 12 of Document 00 71 00 no later than 30 days of Contractor's first written notice of its intent to reserve rights.

1.5 COST BREAKDOWN

A. Labor: Contractor will be paid cost of labor for workers (including forepersons when authorized by District) used in actual and direct performance of extra Work. Labor rate, whether employer is Contractor, Subcontractor or other forces, will be sum of following:
1. Actual Wages: Actual wages paid shall include any employer payments to or on behalf of workers for health and welfare, pension, vacation, and similar purposes.
2. Labor surcharge: Payments imposed by local, county, state, and federal laws and ordinances, and other payments made to, or on behalf of, workers, other than actual wages as defined in paragraph 1.5A.1 of this Section 01 26 00, such as taxes and worker's compensation insurance. Such labor surcharge shall not exceed that set forth in California Department of Transportation official labor surcharges schedule which is in effect on date upon which extra Work is accomplished and which schedule is incorporated herein by reference as though fully set forth herein.

B. Material: Only materials furnished by Contractor and necessarily used in performance of extra Work will be paid for. Cost of such materials will be cost, including sales tax, to purchaser (Contractor, Subcontractor or other forces) from supplier thereof, except as the following are applicable:
1. If cash or trade discount by actual supplier is offered or available to purchaser, it shall be credited to District notwithstanding fact that such discount may not have been taken.
2. For materials salvaged upon completion of extra Work, salvage value of materials shall be deducted from cost, less discounts, of materials.
3. If cost of a material is, in opinion of District, excessive, then cost of material shall be deemed to be lowest current wholesale price at which material is available in quantities concerned delivered to Site, less any discounts as provided in paragraph 1.5B.1 of this Section 01 26 00.

C. Equipment Rental: For Contractor- or Subcontractor-owned equipment, payment will be made at rental rates listed for equipment in California Department of Transportation official equipment rental rate schedule which is in effect on date upon which extra Work is accomplished and which schedule is incorporated herein by reference as though fully set forth herein. If there is no applicable rate for an item of equipment, then payment shall be made for Contractor- or Subcontractor-owned equipment at rental rate listed in the most recent edition of the Association of Equipment Distributors (AED) book. For rented equipment, payment will be made based on actual rental invoices. Equipment used on extra Work shall be of proper size and type. If, however, equipment of unwarranted size or type and cost is used, cost of use of equipment shall be calculated at rental rate for equipment of proper size and type, as determined by District. Rental rates paid shall be deemed to cover cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation,

storage, insurance, and all incidentals. Unless otherwise specified, manufacturer's ratings, and manufacturer-approved modifications, shall be used to classify equipment for determination of applicable rental rates. Individual pieces of equipment or tools not listed in said publication and having a replacement value of $100 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefore as payment is included in payment for labor. Rental time will not be allowed while equipment is inoperative due to breakdowns.

1. For equipment on Site, rental time to be paid for equipment shall be time equipment is in operation on extra Work being performed or on standby as approved by District. The following shall be used in computing rental time of equipment:
   a. When hourly rates are listed, less than 30 minutes of operation shall be considered to be ½ hour of operation.
   b. When daily rates are listed, less than four hours of operation shall be considered to be ½ Day of operation.
2. For equipment that must be brought to Site to be used exclusively on extra Work, cost of transporting equipment to Site and its return to its original location shall be determined as follows:
   a. District will pay for costs of loading and unloading equipment.
   b. Cost of transporting equipment in low bed trailers shall not exceed hourly rates charged by established haulers.
   c. Cost of transporting equipment shall not exceed applicable minimum established rates of California Public Utilities Commission.
   d. District will not make any payment for transporting and loading and unloading equipment if equipment is used on Work in any other way than upon extra Work.
3. Rental period may begin at time equipment is unloaded at Site of extra Work and terminate at end of the performance of the extra Work or Day on which District directs Contractor to discontinue use of equipment, whichever first occurs. Excluding Saturdays, Sundays, and District's legal holidays, unless equipment is used to perform extra Work on such Days, rental time to be paid per Day shall be four hours for zero hours of operation, six hours for four hours of operation and eight hours for eight hours of operation, time being prorated between these parameters. Hours to be paid for equipment that is operated less than eight hours due to breakdowns, shall not exceed eight less number of hours equipment is inoperative due to breakdowns.

D. Work Performed by Special Forces or Other Special Services: When District and Contractor, by agreement, determine that special service or item of extra Work cannot be performed by forces of Contractor or those of any Subcontractors, service or extra Work item may be performed by specialist. Invoices for service or item of extra Work on basis of current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with established practice of special service industry to provide complete itemization. In those instances wherein Contractor is required to perform extra Work necessitating a fabrication or machining process in a fabrication or machine shop facility away from Site, charges for that portion of extra Work performed in such facility may, by agreement, be accepted as a specialist billing. District must be notified in advance of all off-Site Work. In lieu of overhead and profit provided in paragraph 1.4B of this Section 01 26 00, 15 percent will be added to specialist invoice price, after deduction of any cash or trade discount offered or available, whether or not such discount may have been taken.

1.6 FORCE-ACCOUNT WORK

A. If it is impracticable because of nature of Work, or for any other reason, to fix an increase or decrease in price definitely in advance, the Contractor may be directed to proceed at a not-to-exceed (NTE) maximum price which shall not under any circumstances be exceeded. Subject to such limitation, such extra Work shall be paid for at actual necessary cost for Force-Account Work or at the negotiated cost, as determined by District. The cost for Force-Account Work shall be determined pursuant to paragraphs 1.4 and 1.5 of this Section 01 26 00.

B. Force-Account Work shall be used when it is not possible or practical to price out the changed Work prior to the start of that Work. In these cases, Force-Account Work will be utilized during the pricing and negotiation phase of the change. Once negotiations have been concluded and a bilateral agreement has been reached, the tracking of the Work under Force-Account is no longer necessary. Force-Account Work shall also be used when negotiations between District and Contractor have broken apart

and a bilateral agreement on the value of the changed Work cannot be reached. District may approve other uses of Force-Account Work.

C. Whenever any Force-Account Work is in progress, definite price for which has not been agreed on in advance, Contractor shall report to District each Business Day in writing in detail amount and cost of labor and material used, and any other expense incurred in Force-Account Work on preceding Day, by using the Cost Proposal form attached hereto. No claim for compensation for Force-Account Work will be allowed unless report shall have been made and acknowledged by District.

D. Whenever Force-Account Work is in progress, definite price for which has not been agreed on in advance, Contractor shall report to District when 75 percent of the NTE amount has been expended.

E. Force-Account Work shall be paid as extra Work under this Section 01 26 00. Methods of determining payment for Work and materials provided in this paragraph 1.6 shall not apply to performance of Work or furnishings of material that, in judgment of District, may properly be classified under items for which prices are otherwise established in Contract Documents.

1.7 DISTRICT-FURNISHED MATERIALS

A. District reserves right to furnish materials as it deems advisable, and Contractor shall have no claims for costs and overhead and profit on such materials.

1.8 OVERHEAD DEFINED

A. The following constitutes charges that are deemed included in overhead for all Contract Modifications, including Force-Account Work or CCD Work, whether incurred by Contractor, Subcontractors, or suppliers, and Contractor shall not invoice or receive payment for these costs separately:

1. Drawings: field drawings, Shop Drawings, etc., including submissions of drawings
2. Routine field inspection of Work proposed
3. General Superintendence, including Project Management or Construction Management services provided by Contractor
4. General administration and preparation of cost proposals, schedule analysis, change orders and other supporting documentation as necessary
5. Computer services
6. Reproduction services
7. Salaries of, superintendent, timekeeper, storekeeper and secretaries
8. Janitorial services
9. Temporary on-Site facilities, including for any extended periods of Contract Time:
   a. Offices
   b. Telephones
   c. Plumbing
   d. Electrical: Power, lighting
   e. Platforms
   f. Fencing, etc.
   g. Water
10. Home office expenses
11. Insurance and Bond premiums
12. Procurement and use of vehicles and fuel used coincidentally in Work otherwise included in the Contract Documents
13. Surveying
14. Estimating
15. Protection of Work
16. Handling and disposal fees
17. Final cleanup
18. Small tools
19. Warranty
20. Other incidental Work

1.9 RECORDS AND CERTIFICATION

A. Force-Account (cost reimbursement) charges shall be recorded daily and summarized in Cost Proposal form attached hereto. Contractor or authorized representative shall complete and sign form each Day.

Contractor shall also provide with the form: the names and classifications of workers and hours worked by each; an itemization of all materials used; a list by size type and identification number of equipment and hours operated; and an indication of all Work performed by specialists.

B. No payment for Force-Account Work shall be made until Contractor submits original invoices substantiating materials and specialists charges.

C. District shall have the right to audit all records in possession of Contractor relating to activities covered by Contractor's claims for modification of Contract, including Force-Account Work and CCD Work.

D. Further, District will have right to audit, inspect, or copy all records maintained in connection with this Contract, including financial records, in possession of Contractor relating to any transaction or activity occurring or arising out of, or by virtue of, the Contract. If Contractor is a joint venture, right of District shall apply collaterally to same extent to records of joint venture sponsor, and of each individual joint venture member. This right shall be specifically enforceable, and any failure of Contractor to voluntarily comply shall be deemed an irrevocable waiver and release of all claims then pending that were or could have been subject to the Article 12 of Document 00 71 00.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

SAMPLE OF COST PROPOSAL FORM FOLLOWS ON NEXT PAGE

END OF SECTION

COST PROPOSAL (CP)

[ ] PROJECT/Contract Number [ ]

CP Number: _____
Date _____
In Response To: (RFP#, etc.) _____

To: The San Mateo County Community College District
Attention: [Point of Contact]
[Insert POC address] **Telephone:** (650) [_____]
[Insert POC address] **Fax:** (650) [_____]

From:

REQUESTED CHANGE IN CONTRACT TIME (DAYS) _____

Brief description of change(s): _____

	Contractor	First-Tier Subcontractors			Lower-Tier Subs		Totals
		Sub A	Sub B	Sub C	Sub A1	Sub B1	
LABOR							
Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mark-up							
%	15%	15%	15%	15%	15%	15%	
$$	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Taxes	$ -	$ -	$ -	$ -	$ -	$ -	$ -
						Labor Total Including Taxes	**$ -**
MATERIALS							
Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mark-up							
%	15%	15%	15%	15%	15%	15%	
$$	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Taxes	$ -	$ -	$ -	$ -	$ -	$ -	$ -
						Materials Total Including Taxes	**$ -**
RENTALS							
Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mark-up							
%	10%	10%	10%	10%	10%	10%	
$$	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Taxes	$ -	$ -	$ -	$ -	$ -	$ -	$ -
						Rentals Total Including Taxes	**$ -**
DESIGN SERVICES							
Cost	$ -	$ -	$ -	$ -			$ -
Mark-up							
%	15%	15%	15%	15%			
$$	$ -	$ -	$ -	$ -			$ -
						Design Services Total	**$ -**
SPECIALTY WORK							
Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Discount	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Mark-up							
%	15%	15%	15%	15%	15%	15%	
$$	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Taxes	$ -	$ -	$ -	$ -	$ -	$ -	$ -
						Specialty Work Total	**$ -**
Total All Costs n.i.c. Sales Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Contractor Mark-up on Sub Costs		$ -	$ -	$ -	$ -	$ -	$ -
1st Tier Subcontractor Mark-up on Lower-tier Subs					$ -	$ -	$ -
						Total All Contractor Mark-ups	***$ -***
						Total Mark-up as a % of Costs	0.00%
						Total Sales Tax	$ -
						GRAND TOTAL	**$ -**

Print Name & Title:	Signature:	Date:

Notes:

1. Contractor figures are to include only self-performed work. Do not include the value of work performed by first or lower-tier subs.

SECTION 01 29 00

MEASUREMENT & PAYMENT

PART 1 GENERAL

1.1 SUMMARY

Section includes description of all "payment to complete" requirements and procedures for determining amount of Work performed and for obtaining payment for Work performed.

1.2 REFERENCES

A. California Public Contract Code
B. Code of Civil Procedures
C. Government Code
D. Specification 01320

1.3 SCOPE OF WORK

Work under Contract Documents, or under any Bid Item, allowance, or alternate, shall include all labor, materials, taxes, transport, handling, storage, supervision, administration, and all other items necessary for the satisfactory completion of Work, whether or not expressly specified or indicated.

1.4 DETERMINATION OF QUANTITIES

Quantity of work to be paid for under any item for which a unit price is fixed in Contract Documents shall be number, as determined by District, of units of work satisfactorily completed in accordance with Contract Documents or as directed by District. Unless otherwise provided, determination of number of units of work so completed will be based, so far as practicable, on actual measurement or count within prescribed or ordered limits, and no payment will be made for work done outside of limits. Measurements and computations will be made by methods set forth in Contract Documents, including without limitation this Section 01 29 00. If methods are not so set forth, measurements shall be made in any manner which District considers appropriate for class of Work measured (e.g., pre-assigned values, percentage completion, units completed or incremental milestones). Contractor must immediately inform District of any disputes regarding quantity measurements and shall immediately supply District with any documentation supporting the disputed measurements.

1.5 SCOPE OF PAYMENT

A. Except as otherwise expressly stated in Section 01 10 00 (Summary of Work), payment to Contractor at the lump sum price fixed in the Contract Documents for performing all Work required under Contract Documents may be adjusted pursuant to any approved Change Order or Construction change directive, shall be full compensation for completing, in accordance with Contract Documents, all Work required under the item or under Contract Documents, and for all expense incurred by Contractor for any purpose in connection with the performance and completion of said Work, including all incidental work necessary for completion of the Work.
B. The Contract Sum shall be deemed to include all costs necessary to complete required Work, all costs (if any) for loss or damage arising from nature of Work or prosecution of the Work, and from action of elements. Unless Contract Documents expressly provide otherwise, the Contract Sum shall be deemed to include:
   1. Any and all costs arising from any unforeseen difficulties which may be encountered during, and all risks of any description connected with, prosecution of Work or prosecution of Bid Item until acceptance by District;
   2. Escalation to allow for cost increases between time of Contract Award and completion of Work or completion of Bid Item.
C. Whenever it is specified herein that Contractor is to do work or furnish materials in Contract Documents, it shall be understood that Contractor is to do such work or furnish such materials without extra charge or allowance or direct payment of any sort, and that cost of doing work or furnishing materials is to be included in

price Bid, unless it is expressly specified herein, in particular cases, that work or material is to be paid for as extra work.

D. No payment shall be made for materials or equipment not yet incorporated into the Work, except as specified in Section 01 10 00 (Summary of Work).

E. The District may, in its discretion, where Contractor requests payment on the basis of materials and equipment not incorporated in the Work, Contractor must satisfy the following conditions:
   1. The materials and/or equipment shall be delivered and suitably stored at the Site or at another local location agreed to in writing, for example, a mutually acceptable bonded warehouse;
   2. Full title to the materials and/or equipment shall vest in District at the time of delivery to the Site, bonded warehouse or other bonded storage location;
   3. Obtain a negotiable warehouse receipt, endorsed over to District for materials and/or equipment stored in and off-site warehouse. No payment will be made until such endorsed receipts are delivered to District;
   4. Stockpiled materials and/or equipment shall be available for District inspection, but District shall have no obligation to inspect them and its inspection or failure to inspect shall not relieve Contractor of any obligations under the Contract Documents. Materials and/or equipment shall be segregated and labeled or tagged to identify these specific Contract Documents;
   5. After delivery of materials and/or equipment, if any inherent or acquired defects are discovered, defective materials and/or equipment shall be removed and replaced with suitable materials and/or equipment at Contractor's expense;
   6. At Contractor's expense, insure the materials and/or equipment against theft, fire, flood, vandalism, and malicious mischief, as well as any other coverages required under the Contract Documents;
   7. Contractor's Application for Payment shall be accompanied by a bill of sale, invoice or other documentation warranting that District has received the materials and equipment free and clear of all liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect District's interest therein, all of which must be satisfactory to District. This documentation shall include, but not be limited to, conditional releases of mechanics' liens and stop notices from all those providing materials and equipment as to which the Application for Payment relates, as well as unconditional releases of the same from the same as to the previous Application for Payment for which they have not already been provided. In addition, for each piece of major equipment listed in Section 01 10 00 (Summary of Work) the Contractor is to submit a sample of the maintenance log (See paragraph 1.6.H.11 of Section 01 60 00) that will be used during the project with the Application for Payment.

F. Amounts previously paid for materials and equipment prior to incorporation into the Work shall be deducted from amounts otherwise due Contractor as they are incorporated.

1.6 BASIS OF PAYMENT

A. Lump Sum: When estimated quantity for specific portion of Work is not indicated and unit is designated as lump sum, payment will be on a lump sum basis for Work satisfactorily completed in accordance with Contract Documents.

B. Allowances: Allowance items (if any) will be paid for as provided in Section 01 10 00 (Summary of Work). Funds authorized for Allowance work will not be released for Contract payments unless District has authorized Allowance work in writing.

C. District does not expressly, or by implication, agree, warrant, or represent in any manner, that actual amount of Work will correspond with amount shown or estimated and reserves right to increase or decrease amount of any class or portion of Work, to leave out entire Bid Item or Items, or to add work not originally included in Bid or Contract Documents, when in its judgment such change is in best interest of District. No change in Work shall be considered a waiver of any other condition of Contract Documents.

1.7 PROGRESS PAYMENTS

A. If requested by Contractor, progress payments will be made monthly.

B. Schedule of Values:
   1. Within ten (10) Days from issuance of Notice of Award and prior to the Contractor's first Application for Payment, submit a detailed breakdown of its Bid by scheduled Work items and/or activities, including coordination responsibilities and Project Record Documents responsibilities. Where more than one Subcontractor comprises the work of a Work item or activity, the Schedule of Values shall show a separate line item for each subcontract. Furnish such breakdown of the total Contract Sum by assigning dollar values (cost estimates) to each applicable Progress Schedule network activity, which cumulative sum

equals the total Contract Sum. See Specification 01320. The format and detail of the breakdown shall be as directed by District to facilitate and clarify future progress payments to Contractor for direct Work under Contract Documents. This breakdown shall be referred to as the Schedule of Values.

2. Contractor's overhead, profit, insurance, cost of bonds (except to the extent expressly identified in a Bid Item) and/or other financing, as well as "general conditions costs," (e.g., Site cleanup and maintenance, temporary roads and access, off-Site access roads, temporary power and lighting, security, and the like), shall be prorated through all activities so that the sum of all the Schedule of Values line items equals Contractor's total Contract Sum, less any allowances designated by District. Scheduling, record documents and quality assurance control shall be separate line items.
3. District will review the breakdown in conjunction with the Progress Schedule to ensure that the dollar amounts of this Schedule of Values are, in fact, fair market cost allocations for the Work items listed. Upon favorable review by District, District will accept this Schedule of Values for use. District shall be the sole judge of fair market cost allocations.
4. District will reject any attempt to increase the cost of early activities, i.e., "front loading," resulting in a complete reallocation of moneys until such "front loading" is corrected. Repeated attempts at "front loading" may result in suspension or termination of the Work for default, or refusal to process progress payments until such time as the Schedule of Values is acceptable to District.

C. Applications for Payment: Contractor shall establish and maintain records of cost of the Work in accordance with generally accepted accounting practices. In addition:
   1. On or before the 20th Day of each month (but after receipt of District's approval of the updated Schedule as required by Section 01 32 16 (Progress Schedules and Reports)), Contractor shall submit to District one copy of an Application for Payment for the cost of the Work put in place during the period from the 1st Day of the previous month to the Last Day of the previous month. Such Applications for Payment shall be for the total value of activities completed or partially completed, including approved activity costs, based upon Schedule of Values prices of all labor and materials incorporated in the Work up until midnight of the last Day of that one month period, less the aggregate of previous payments. Accumulated retainage shall be shown as separate item in payment summary. Contractor shall submit in a form similar in format to AIA form G702 and G703 an itemized cost breakdown of Contractor's record of Cost of the Work together with supporting data and any certification required by District. If Contractor is late submitting its Application for Payment, that Application may be processed at any time during the succeeding one-month period, resulting in processing of Contractor's Application for Payment being delayed for more than a Day for Day basis.
   2. Applications for Payment may include, but are not necessarily limited to the following:
      a. Material, equipment, and labor incorporated into the Work, less any previous payments for the same;
      b. Up to 75 percent of the cost of equipment identified in paragraph 1.5E of this Section 01 29 00 (if any), if purchased and delivered to the Site or stored off Site, as may be approved by District.
      c. Up to 50 percent of the cost of materials identified in paragraph 1.5E of this Section 01 29 00 (if any), specifically fabricated for the Project that are not yet incorporated into the Work.
   3. At the time any Application for Payment is submitted, certify in writing the accuracy of the Application and that Contractor has fulfilled all scheduling requirements of Section 00 71 00 (General Conditions) and Section 01 32 16 (Progress Schedules and Reports), including updates and revisions. A responsible officer of Contractor shall execute the certification.
   4. No progress payment will be processed prior to District receiving all requested, acceptable schedule update information. Failure to submit a schedule update complying with Section 01 32 16 (Progress Schedules and Reports) justifies denying the entire Application for Payment. Should Contractor fail to submit timely or accurate schedule updates the District has the right to impose a Withhold of funds in the amount up to $10,000 per occurrence until the contractor demonstrates compliance with timely, acceptable and accurate schedule update submittals. In the sole judgment of the District if it is determined that the contractor is not capable of delivering timely and accurate updates these Withheld monies may be converted to a back charge to Contractor to offset the costs to the District associated with providing the schedule update function. See also Section 01 32 16 (Progress Schedules and Reports), paragraph 1.2.J.
   5. If Contractor fails or refuses to participate in work reconciliations or other construction progress evaluation with District, Contractor shall not receive current payment until Contractor has participated fully in providing construction progress information and schedule update information to District.
   6. Each Application for Payment shall list each Change Order and Construction change directive ("CCD") executed prior to date of submission, including the Change Order/CCD Number, and a description of the

work activities, consistent with the descriptions of original work activities. Submit a monthly Change Order/CCD status log to District.

7. If District requires substantiating data, submit information requested by District, with cover letter identifying Project, Application for Payment number and date, and detailed list of enclosures. Submit one copy of substantiating data and cover letter for each copy of Application for Payment submitted.
8. With each Application for Payment the following reports and logs shall be submitted:
   a. Copies of completed maintenance logs for each piece of major equipment listed in Section 01 10 00 (Summary of Work) shall be submitted according to the requirements specified in Section 01 60 00 (Product Requirements).
   b. Copies of up-to-date Waste Reporting Log per Section 01 74 00 (Cleaning) paragraph 1.2.E.5

   Contractor's Application for Payment will be deemed incomplete without these documents.

D. Progress Payments
1. District will review Contractor's Application for Payment following receipt. If adjustments need to be made to percent of completion of each activity, District will make appropriate notations and return to Contractor. Contractor shall revise and resubmit. All parties shall update percentage of completion values in the same manner, i.e., express value of an accumulated percentage of completion to date.
2. Each Application for Payment may be reviewed by District and/or inspectors to determine whether the Application for Payment is proper, and shall be rejected, revised, or approved by District pursuant to the Schedule of Values prepared in accordance with this Section 01 29 00.
3. If it is determined that the Application for Payment is not proper and suitable for payment, District will return it to the Contractor as soon as practicable, but no later than seven (7) Days after receipt, together with a document setting forth in writing the reasons why the Application for Payment is not proper. If District determines that portions of the Application for Payment are not proper or not due under the Contract Documents, then District may approve the other portions of the Application for Payment, and in the case of disputed items or defective Work not remedied, may withhold up to 150 percent of the disputed amount from the progress payment.
4. Pursuant to Public Contract Code Section 20104.50, if District fails to make any progress payment within 30 Days after receipt of an undisputed and properly submitted Application for Payment from Contractor, District shall pay interest to the Contractor equivalent to the legal rates set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure. The 30-Day period shall be reduced by the number of Days by which District exceeds the seven (7) Day return requirement set forth herein.
5. As soon as practicable after approval of each Application for Payment for progress payments, District will pay to Contractor in manner provided by law, an amount equal to 90 percent of the amounts otherwise due as provided in the Contract Documents, or a lesser amount if so provided in Contract Documents, provided that payments may at any time be withheld if, in judgment of District, Work is not proceeding in accordance with Contract, or Contractor is not complying with requirements of Contract, or to comply with stop notices or to offset liquidated damages accruing or expected.
6. Before any progress payment or final payment is due or made, Contractor shall submit satisfactory evidence that Contractor is not delinquent in payments to employees, Subcontractors, suppliers, or creditors for labor and materials incorporated into Work. This specifically includes, without limitation, conditional lien release forms for the current progress payment and unconditional release forms for past progress payments. District also may elect in its sole discretion to pay progress payments by joint check to Contractor and each Subcontractor having an interest in that progress payment in such amount.
7. District reserves and shall have the right to withhold payment for any equipment and/or specifically fabricated materials that, in the sole judgment of District, are not adequately and properly protected against weather and/or damage prior to or following incorporation into the Work.
8. Granting of progress payment or payments by District, or receipt thereof by Contractor, shall not be understood as constituting in any sense acceptance of Work or of any portion thereof, and shall in no way lessen liability of Contractor to replace unsatisfactory work or material, though unsatisfactory character of work or material may have been apparent or detected at time payment was made.
9. When District shall charge sum of money against Contractor under any provision of Contract Documents, amount of charge shall be deducted and retained by District from amount of next succeeding progress payment or from any other moneys due or that may become due Contractor under Contract. If, on completion or termination of Contract, such moneys due Contractor are found insufficient to cover District's charges against it, District shall have right to recover balance from Contractor or Sureties.

1.8 SUBSTITUTION OF SECURITIES IN LIEU OF RETENTION

A. In accordance with the provisions of Public Contract Code Section 22300, substitution of securities for any moneys withheld under Contract Documents to ensure performance is permitted under following conditions:
   1. At request and expense of Contractor, securities listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by Contractor and District which are equivalent to the amount withheld under retention provisions of Contract shall be deposited with Controller or with a state or federally chartered bank in California, as the escrow agent, who shall then pay such moneys to Contractor. Upon satisfactory completion of Contract, securities shall be returned to Contractor.
   2. Alternatively, Contractor may request and District shall make payment of retentions earned directly to the escrow agent at the expense of Contractor. At the expense of Contractor, Contractor may direct the investment of the payments into securities and receive the interest earned on the investments upon the same terms provided for in this Section 01 29 00 for securities deposited by Contractor. Upon satisfactory completion of Contract Documents, Contractor shall receive from escrow agent all securities, interest, and payments received by the escrow agent from District, pursuant to the terms of this Section 01 29 00. Pay to each Subcontractor, not later than twenty (20) Days after receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount of retention withheld to insure the performance of Contractor.
   3. Contractor shall be beneficial owner of securities substituted for moneys withheld and shall receive any interest thereon.
   4. Enter into escrow agreement with Controller according to Document 00 43 45 (Escrow Agreement for Security Deposits in Lieu of Retention), as authorized under Public Contract Code Section 22300, specifying amount of securities to be deposited, terms and conditions of conversion to cash in case of default of Contractor, and termination of escrow upon completion of Contract Documents.
   5. Public Contract Code Section 22300 is hereby incorporated in full by this reference.

1.9 FINAL PAYMENT

A. As soon as practicable after all required Work is completed in accordance with Contract Documents, including punchlist, testing, record documents and Contractor maintenance after Final Acceptance, District will pay to Contractor, in manner provided by law, unpaid balance of Contract Sum of Work (including without limitation retentions), or whole Contract Sum of Work if no progress payment has been made, determined in accordance with terms of Contract Documents, less sums as may be lawfully retained under any provisions of Contract Documents or by law.

B. Prior progress payments shall be subject to correction in the final payment. District's determination of amount due as final payment shall be final and conclusive evidence of amount of Work performed by Contractor under Contract Documents and shall be full measure of compensation to be received by Contractor.

C. Contractor and each assignee under an assignment in effect at time of final payment shall execute and deliver at time of final payment, and as a condition precedent to District's obligation to make final payment, Document 00 65 73 (Agreement and Release of Any and All Claims) discharging District, its officers, District's Representative, employees, and consultants of and from liabilities, obligations, and claims arising under Contract Documents.

1.10 EFFECT OF PAYMENT

A. Payment will be made by District, based on District's observations at the Site and the data comprising the Application for Payment. Payment will not be a representation that District has:
   1. Made exhaustive or continuous on-Site inspections to check the quality or quantity of Work;
   2. Reviewed construction means, methods, techniques, sequences, or procedures;
   3. Reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by District to substantiate Contractor's right to payment; or
   4. Made examination to ascertain how or for what purpose Contractor has used money previously paid on account of the Contract Sum.

1.11 CONTINGENCY RESERVE

A. District will authorize and direct Contractor regarding provisions in this paragraph.

B. Contingency Reserve Amount: as listed in Document 00 52 00 (Agreement).

C. District shall determine in its sole discretion which, if any, costs it will authorize in writing to be paid from the Contingency Reserve. Generally, Contingency Reserve will be used only for District-initiated changes in scope of Work of Contract Documents.
D. Cost shall be determined as for CCD work as provided in Section 01 26 00 (Modification Procedures).
E. Prior to final payment, an appropriate Change Order will be issued to reflect actual amounts due Contractor on account of Work covered by this Contingency Reserve, and the Contract Sum will be correspondingly adjusted

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Descriptions of the required Project meetings for the Work. These meetings include:
    a. Preconstruction Conference.
    b. Not used.
    c. Weekly Progress Meetings.
    d. Not used.
    e. Special Meetings.

1.2 PRECONSTRUCTION CONFERENCE

A. District will call for and administer Preconstruction Conference at time and place to be announced.

B. Contractor, all major Subcontractors, Construction Scheduler, and major suppliers shall attend Preconstruction Conference.

C. Agenda will include, but not be limited to, the following items.

1. Schedules
2. Personnel and vehicle permit procedures
3. Use of premises
4. Location of the Contractor's on-Site facilities
5. Security
6. Housekeeping
7. Waste Reporting
8. Safety/HAZMAT/Regulatory Agencies
9. Site Conduct and Procedures
10. Submittal and RFI procedures
11. Inspection and testing procedures, on-Site and off-Site
12. Utility shutdown procedures
13. Control and reference point survey procedures
14. Injury and Illness Prevention Program
15. Contractor's Initial Schedule
16. Contractor's Schedule of Values
17. Contractor's Schedule of Submittals
18. Contract Administrative Processes
    a. Video tape existing conditions prior to start of all work
19. Project Directory
20. Contractor's Emergency Contact List
21. Other Project Specific Issues as required

D. District's Representative will distribute copies of minutes to attendees. Attendees shall have five (5) Workdays to submit comments or additions to minutes. Minutes will constitute final memorialization of results of Preconstruction Conference.

1.3 NOT USED

1.4 WEEKLY PROGRESS MEETINGS

A. District will schedule and administer weekly progress meetings throughout duration of Work. Progress meetings will be held weekly unless otherwise directed by District.

1. Meetings shall be held at location directed by District.
2. The District representative will prepare agenda and distribute it two (2) Workdays in advance of meeting to Contractor.
3. The District will record meeting notes of the Weekly Progress Meeting. Within two (2) Workdays after the meeting, District will distribute minutes to Contractor though e-mail, who will distribute to those affected by decisions made at meeting. Attendees can either submit comments or additions to minutes prior to the next progress meeting, or may attend the next progress meeting and submit comments or additions there. Minutes will constitute final memorialization of results of meeting.

B. Progress meetings shall be attended by Contractor's job superintendent, major Subcontractors and suppliers, District, and others as appropriate to agenda topics for each meeting.

C. Agenda will contain the following items, as appropriate:
1. Review, revise as necessary, and approve previous meeting minutes
2. Review of Work progress since last meeting
3. Status of Construction Work Schedule, delivery schedules, adjustments
4. Submittal, RFI, and Change Order status
5. Review of the Contractor's safety program activities and results, including report on all serious injury and/or damage accidents
6. Other items affecting progress of Work
7. Progress billings.

1.5 NOT USED

1.6 SPECIAL MEETINGS

A. Any party may call special meetings by notifying all desired participants and District five (5) Workdays in advance, giving reason for meeting. Special meetings may be held without advance notice in emergency situations.

B. At any time during the progress of Work, District shall have authority to require Contractor attend meeting of any or all of the Subcontractors engaged in Work or in other work, and notice of such meeting shall be duly observed and complied with by Contractor.

C. Contractor shall schedule and conduct coordination meetings as necessary to discharge coordination responsibilities in Document 00 71 00 (General Conditions). Contractor shall give District five (5) Workdays written notice of coordination meetings. Contractor shall maintain minutes of coordination meetings. Attendees shall have five (5) Workdays to submit comments or additions to minutes. Minutes will constitute final memorialization of results of coordination meetings.

1.7 GUARANTEES/WARRANTIES, BONDS, AND SERVICE AND MAINTENANCE CONTRACTS REVIEW MEETING/INSPECTION

A. Eleven months following date of Final Completion of entire work, Contractor to conduct an inspection with the District, or District's Representative, to review and act upon guarantees/warranties, bonds, and service and maintenance contracts for materials and equipment. Implement repair or replacement of defective items, and extend service and maintenance contracts, as desired by District.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 32 16

PROGRESS SCHEDULES AND REPORTS

[PM review and call Exec. Director of Planning with questions.]

PART 1 – GENERAL

1.1 DESCRIPTION

A. This Section is in addition to the Contract General Conditions and Supplementary General Conditions.

B. Contractor shall develop a network plan and schedule for the project demonstrating complete fulfillment of all contract requirements, shall keep the network plans up to date in accordance with the requirements of this section and shall utilize the Critical Path Method (CPM) in planning, coordinating, performing and reporting the work under this contract, including all activities of Subcontractors, equipment vendors, and suppliers, and in assisting District and District's Project Manager in monitoring the progress of the Work.

C. The CPM schedule shall be prepared using Primavera Project Planner 3.0, Primavera SureTrak 4.0, or Microsoft Project. Equivalency of a proposed substitute CPM program shall be determined by the District.

D. The principles and definition of CPM in terms used herein shall be as follows:
   1. CPM network is a graphic description of the Contractor's construction plan, showing the sequential steps needed to reach the completion of the Work within the prescribed Contract Time. It shall depict events and tasks as activities, and their interrelationships, and shall recognize the progress that must be made on one activity before subsequent activities can begin. These activities shall be logically represented in a CPM network showing their interrelationships in a chronological fashion. As each activity has a time allocation, the completed network shows the critical path of activities that must be completed on time if the entire Project is not to be delayed. It shall also be possible to identify the earliest and latest start and finish times for each activity if the overall Project is not to be delayed. Therefore, the CPM network shall be comprehensive and shall include all interdependencies and interactions required to perform the Work of the Project.

1.2 SUBMITTALS

A. Refer to Section 01 32 19 (Submittal Procedures), for procedures.

B. NOT USED

C. A "Draft" Contract Schedule shall be submitted no later than the pre-construction kick-off meeting date followed by the Final Contract Schedule submittal based upon District's comments. Once approved by District, Contract Schedule shall be known as the Baseline Schedule. Contractor shall submit an Updated Contract Schedule whenever the Baseline Contract Schedule does not represent the actual or anticipated progress of the work.

D. Contractor shall submit submittal schedule to District no later than 10 days following the Notice to Proceed.

E. NOT USED

F. Submit Final As-Built Schedule per paragraph 1.9 below.

G. NOT USED

H. All other required reports referenced herein, typically three (3) copies each per occurrence.

I. Submit one (1) copy in 8 ½" X 11" size of each required schedule and one (1) copy of all required reports. Contractor shall also submit a digital copy of these documents.

J. In addition to all other District rights and remedies in the Contract Documents, including without limitation those in Section 01 29 00 (Measurement and Payment), paragraph 1.7.C.4, should Contractor fail to submit timely or accurate schedule updates the District has the right, in addition to all other rights under the Contract Documents, to impose a withhold of funds in the amount up to $500 per occurrence, until the Contractor demonstrates compliance with timely, acceptable and accurate schedule update submittals. In the sole judgment of the District, if it is determined that the Contractor is not capable of delivering timely and accurate updates, these withheld monies may be converted to a back charge to Contractor to offset the costs to the District associated with providing the schedule update function.

1.3 ACCEPTANCE

A. N/A

B. Acceptance of the Contractor's Contract Schedule by the District will be a condition precedent to the making of any progress payment for work performed.

C. The required schedules and reports shall be prepared and submitted for review and approval in accordance with the General Conditions, Supplemental General Conditions and this Section.

D. The required updating of the Contract Schedule and reports shall be an integral part and basic element of the estimate upon which progress payments will be made. Submittal, review and approval by District of these items shall be a condition precedent to the making of progress payments. If, in the judgment of District, Contractor fails or refuses to provide a complete updated Contract Schedule or reports, as specified, the Contractor will be deemed to have not provided the required estimate upon which progress payments may be made, and shall not be entitled to such progress payments unless or until it has furnished the aforesaid schedules.

E. In the event the contractor submits a viable, contractually compliant construction schedule which indicates project completion at a date earlier than the contractually provided contract duration, the acceptance of such a schedule will not change the contract time. In such an event, a schedule activity entitled "project float", of a duration equal to the difference between the proposed construction duration and the contract duration, will be added to the schedule. All project float is a project resource for the contractor and the District, and is not for the exclusive use of either party.

1.4 CONSTRUCTION ANALYSIS

A. Contractor shall use Primavera Project Planner 3.0, Primavera SureTrak Project Manager 4.0, or Microsoft Project. Contractor shall coordinate with District to produce the following minimum information with the Contract Schedule:
1. Activity identification;
2. Activity description;
3. Status date and original/remaining duration;
4. Activity percentage complete;
5. Activity duration;
6. N/A ;
7. Total float;
9. The predecessor and successor activities for each individual activity;
10. A comparison between the current update and the baseline schedule;
11. Designation of the planned work day/work week for each activity;
12. A near critical item list of activities with ten (10) days or less total float;
13. Scheduled and actual manpower loading for each activity; and
14. Scheduled and actual progress payment for each activity.

1.5 N/A

1.6 CONTRACT DELIVERABLES

A. Draft Contract Schedule:
1. Submission:
a. Contractor shall submit a "draft" Contract Schedule to District no later than the date of the project

preconstruction conference as scheduled by the District. The draft Contract Schedule will include all activities that are required or anticipated to be completed.

b. N/A

2. Form:
   a. Prepare the "draft" Contract Schedule as a time-scaled CPM network showing continuous flow from left to right. Durations and specific calendar dates shall be clearly and legibly shown for the start and finish of each work activity in sufficient detail to demonstrate preliminary planning for the Work and to represent a practical plan to complete the Work within the Contract Time. The "draft" Contract Schedule shall also be submitted to the District in electronic format.
3. The "draft" Contract Schedule shall include but not be limited to:
   a. A legend of scheduled activities.
   b. Scheduled work activities that clearly indicate the scope of work to be completed.
   c. Major milestones, which are critical to the completion of the work, including but not limited to the following: NTP date; mobilization; coordination review and detailing activities; contractor quality control review activities; substantial completion and contract completion.
   d. Major work activity categories to be included in the Initial Contract Schedule
   e. Submittals Section, containing submission, review, procurement and delivery of all project materials
   f. OFCI/OFOI items
   g. Substantial Completion
   h. Punch list formulation (District's, etc.) and correction
   i. Contractor closeout documentation and training.
   j. Contractor punch list corrective work.
   k. Demobilization and project completion.
   m. Inclement weather days per Section 00 71 00 (General Conditions).
   n. A clearly highlighted critical path.
   o. Calendar designations identifying all holidays and non-working days.
   p. This "draft" Contract Schedule shall be formatted to accept manpower, resource and cost loading (i.e., resource dictionaries and cost codes, etc.) when fully developed. The cost loading shall be derived from the initial Schedule of Values submitted by the Contractor. Once an accepted Contract Schedule has been achieved, the costs reflected therein will be the official Schedule of Values for the project and utilized for payment application.
   q. [PM leave the item or remove if necessary and replace with 'N/A.']The "draft" Contract Schedule shall contain an activity code structure sufficient to allow future sorting/grouping by responsibility or subcontractor, area/location, CSI division, SOV identification, Milestones and a code entitled "Update" that will identify the schedule submission when specific activities were added to the network (new activities, Change Orders, RFI's, etc.).

B. Baseline Contract Schedule:
1. N/A
2. N/A
3. The work activities comprising the Initial Contract Schedule shall be of sufficient detail to ensure adequate planning and execution of the Work and such that the schedules provide an appropriate basis for monitoring and evaluating the progress of the Work. A work activity is defined as a singular task that requires time and resources (manpower, equipment, and/or material) to complete in a continuous operation (excepting submittal activities, review/approval activities, and fabrication and procurement activities). No activity shall be less than one (1) nor more than fifteen (15) days in duration for any on-site operation. All holidays and non-working days shall be identified by way of calendar designations.
4. Failure by Contractor to include any element of the work required for the performance of this Contract and completion of the Project shall not excuse Contractor from completing all work required within the time for completion, notwithstanding District's acceptance of the Initial Contract Schedule.
5. No more than 20% of the total number of activities shown on the schedule shall be critical or near critical. Near critical is defined as float less than ten (10) days.
6. The schedule shall indicate the sequence and interdependency of all work activities. All activities shall be linked by finish-to-start (FS) relationships only. No other relationships shall be permitted without the prior written permission of the District. Constraints on activities shall be kept to a minimum and subject to the written permission of the District.

7. N/A
8. Critical Work activities are defined as Work activities which, if delayed or extended, will delay the scheduled completion date of the Work. All other Work activities are defined as non-critical Work activities and are considered to have float.
9. Float is defined as the time that a non-critical Work activity can be delayed or extended without delaying the scheduled completion of milestones specified in this Section or the scheduled completion date of the Work, or both. Float time is not for the exclusive use or benefit of either District or Contractor. The Project owns the float. As such, liability for delay of any Substantial Completion or Final Completion date rest with the party whose actions, last in time, actually cause delay to a Substantial Completion or Final Completion date. Document the effect on the updated Contract Schedule whenever float has been used.
10. Delays of any non-critical Work shall not be the basis for an extension of Contract Time until the delays consume the float associated with that non-critical Work activity and cause the Work activity to become critical.
11. Contractor shall not sequester float through strategies including extending activity duration estimates to consume available float, using preferential logic, using extensive or insufficient crew/resource loading, use of float suppression techniques like Zero Total Float constraints, special lead/lag logic restraints or imposed dates. Use of float time disclosed or implied by the use of alternate float suppression techniques shall be shared to the benefit of both District and Contractor.
12. Include a critical path activity titled "Remaining Inclement Weather Days" on the Initial Contract Schedule. This activity shall have an initial duration of the number of days indicated in Section 00 71 00 (General Conditions), paragraph 14.D.2.
13. The Baseline Schedule shall be used by Contractor for executing the Work of the Contract, including planning, organizing and directing the Work, and reporting its progress until subsequently revised. No unilateral changes shall be made to the Baseline Schedule without the prior approval and consent of the District, excepting only the reporting of Actual Start, Actual Finish, and Activity Progress.

C. Baseline Schedule Updating and Progress Payments:
1. N/A Contractor shall meet with District weekly to review actual progress made to date, activities started and completed to date, and the percentage of work completed to date on each activity started but not completed. Upon completion of the joint review, Contractor shall prepare the updated Baseline Schedule as needed and submit it to District.
2. The updated Baseline Schedule shall incorporate all changes mutually agreed upon by Contractor and District during preceding periodic reviews and all changes resulting from approved Change Orders and Field Orders. Unauthorized, unilateral contractor changes to logic or activities shall not be allowed.
3. Prior to submission of the payment application, the Contractor shall submit to the District a report generated from the approved schedule that reflects the percent of completion by activity. The Contractor and the District shall walk the project to verify the percentage of completion of each activity. Once the percent of completion of each activity is agreed upon the Contractor shall incorporate this data into the schedule update and these percentages shall be the basis for development of that month's payment application.
4. Acceptance of the updated Baseline Schedule will be a condition precedent to the making of any progress payments for work performed.

D. Reports:
1. The Initial Schedule submittal shall include the following:
   A. N/A
   B. N/A
   C. N/A
   D. N/A
   E. N/A .
   F. Submittal Schedule:
      1. Contractor, within ten (10) days after Notice to Proceed, shall prepare and submit to District for approval a comprehensive Submittal Schedule which shall be maintained in the Contract Schedule. Contractor shall identify on the Submittal Schedule all of the submittal items required by the Contract Documents governing the Work, listing shop drawings and product data or literature separately. Contractor shall indicate for each submittal item on the Submittal Schedule:
         a. The date by which that item will be submitted to District.

b. Whether the submittal is for review, substitution, or for record only.
c. The date by which response by District is required.
d. The date by which the material or equipment must be on the Site in order not to delay the progress of the Work.

G. N/A

2. N/A

A. N/A
B. N/A
C. N/A
D. N/A

3. Submittal of the reports and schedule updates by Contractor are required regardless of the approval status of the Contract Baseline Schedule or any revision to the Baseline Schedule.

1.7 RESPONSIBILITY FOR COMPLETION

A. Contractor agrees that at the sole judgment of District, whenever it becomes apparent from the current Baseline Schedule that the contract completion date will not be met, it will take some or all of the following actions, as approved by District, at no additional cost to District:

1. Increase construction manpower in such quantities and crafts as will substantially eliminate, in the judgment of District, the backlog of work. Also, increase material, equipment and other items as required.
2. Increase the number of working hours per shift, shifts per working day, working days per week, or the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate, in the judgment of District, the backlog of work. This paragraph shall not be construed to permit contractor to violate the work hour restrictions specified in the Contract Document.
3. Reschedule activities to achieve maximum practical concurrence of accomplishment of activities.

Nothing here in will limit any other District rights under the Contract Documents, including without limitation those under Section 00 71 00, paragraph 11.D.3.

1.8 ADJUSTMENT OF TIMES FOR COMPLETION

A. In addition to provisions of the General Conditions, the time for completion of the Work will be adjusted in accordance with these procedures.

B. Any request for an adjustment of the Contract Time for completion submitted by Contractor for changes or alleged delays shall be accompanied by a complete Time Impact Analysis, (TIA), which shall be submitted for review within five (5) days after the initial request for time by Contractor. Time extensions will not be granted unless substantiated by the CPM Schedule, and then not until the CPM project float becomes zero. If Contractor fails to submit a TIA within the aforementioned time period, then the Contractor shall be deemed to have agreed that there is no time impact and that Contractor has irrevocably waived its rights to any additional contract time.

C. Each Time Impact Analysis shall provide information justifying the request and stating the extent of the adjustment requested for each specific change or alleged delay.

D. The Time Impact Analysis shall be determined on the basis of the date or dates when the change or changes were issued, or the date or dates when the alleged delay or delays began. The status of the construction project and Time Impact Analysis shall include event time computations for all affected activities including but not limited to work around sequencing, or recovery options to maintain the original Contract completion date.

E. Time Impact Analyses provided in order to demonstrate the time impact upon the overall project and the time for completion shall be accomplished at no additional cost to District.

F. If District finds, after review of the Time Impact Analysis, that Contractor is entitled to any extension of time for completion, the time for completion will be adjusted by Change Order issued by District, and Contractor shall then revise the Baseline Schedule accordingly. If District determines that Contractor is not entitled to any extension of time for completion, and Contractor objects to District's determination, Contractor's sole remedy is to file a claim under Section 00 71 00 (General Conditions).

1.9 FINAL AS-BUILT SCHEDULE

A. As a condition precedent to final acceptance of the Project, submit a final As-Built Construction Schedule and all final reports which accurately reflect the manner in which the Project was constructed and includes actual start and completion dates for all work activities on the Baseline Schedule.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 32 19

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Description of general requirements for Submittals for the Work:
   a. Procedures
   b. Schedule of Shop Drawing and Sample Submittals
   c. Safety Program
   d. Progress Schedules
   e. Not Used
   f. Not Used
   g. Product Data
   h. Vibration Control Drawings and Calculations
   i. Shop Drawings
   j. Samples
   k. Installation, Operations and Maintenance Manuals
   l. Quality Assurance Control Submittals
   m. Environmental Impact Mitigation Plan Documents
   n. Project Record Documents
   o. Delay of Submittals

1.2 OPTIONAL REVIEW MEETING PROCEDURES

A. Submit at Contractor's expense, the following items ("Submittals") required by the Contract Documents:
1. Schedule of Submittals
2. Safety Program
3. Progress Schedules
4. Design Development Drawings and Specifications
5. Construction Documents and Specifications
6. Product Data
7. Material Safety Data Sheets
8. Vibration Control Drawings and Calculations
9. Shop Drawings
10. Samples
11. Installation, Operation, and Maintenance Manuals
12. Quality Assurance Control Data
13. Environmental Impact Mitigation Documents
14. Computer Programs
15. Project Record Documents
16. Storm Water Pollution Prevention Plan
17. Seismic Submittal Review Forms, where specified in Divisions 2 through 60.

B. Submit these Submittals to District for review and approval in accordance with accepted Schedule of Shop Drawings and Samples Submittals. If no such schedule is agreed upon prior to, then all Shop Drawing, Samples, and product data Submittals shall be submitted within **30 Days** after receipt of Notice to Proceed with Construction from District. In all instances, District may require Contractor to submit any or all Submittals directly to Architect/Engineer for review.

C. Transmit each item with the appropriate Submittal transmittal form (attached to this Section 01 32 19 as Exhibits A and B). For project on which an electronic web-based Project Management System is used, per Section 01 31 23 Web Based Project Management System, Contractor shall use the system's similar electronic forms and formats for Submittal transmissions. Identify Project, Contractor, Subcontractor, major

supplier, pertinent Drawing sheet and detail number, and Specification Section number as appropriate. Where manufacturer's standard drawings or data sheets are used, they shall be marked clearly to show those portions of the data that are applicable to this Project. Inapplicable portions shall be marked out. Submittals shall be submitted based on each Specification Section. Submittals containing information about more than one Specification Section will be returned for re-submittal. Submittals shall include all information requested by each Specification Section. **(No partial Submittals.)** Incomplete Submittals will be returned and not reviewed by District.

D. The data shown on the Submittals shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show District the materials and equipment Contractor proposes to provide and to enable District to review the information for the limited purposes specified in this Section 01 32 19. Submittals shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which it is intended and otherwise as District may require to enable District to review the Submittal. The quantity of each Submittal to be submitted will be as required by individual Specification Sections or this Section 01 32 19.

E. At the time of each submission, give District specific written notice of all variations, if any, that the submitted Submittal may have from the requirements of the Contract Documents, and the reasons therefore. This written notice shall be in a written communication attached to the Submittal transmittal form. In addition, cause a specific notation to be made on each Submittal submitted to District for review and approval of each such variation. If District accepts deviation, District will note its acceptance on the returned Submittal transmittal form and, if necessary, issue appropriate Contract Modification.

F. Submittal coordination and verification is responsibility of Contractor; this responsibility shall not be delegated in whole or in part to Subcontractors or suppliers. Before submitting each Submittal, review and coordinate each Submittal with other Submittals and with the requirements of the Work and the Contract Documents, and determine and verify:
   1. All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto;
   2. All materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work; and
   3. All information relative to Contractor's sole responsibilities and of means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto.

G. Contractor's submission to District of a Submittal shall constitute Contractor's representation that it has satisfied its obligations under the Contract Documents, and as set forth immediately above in this paragraph 1.2 of Section 01 32 19, with respect to Contractor's review and approval of that Submittal.

H. Designation of work "by others," if shown in Submittals, shall mean that work will be responsibility of Contractor rather than Subcontractor or supplier who has prepared Submittals.

I. After review by District or Architect/Engineer or other consultant designated by District, of each of Contractor's Submittals, one set of material will be returned to Contractor with actions defined as follows:
   1. NO COMMENT - Accepted subject to its compatibility with future Submittals and additional partial Submittals for portions of the Work not covered in this Submittal. Does not constitute approval or deletion of specified or required items not shown on the Submittal.
   2. SEE COMMENTS NOTED (NO RESUBMISSIONS REQUIRED) - Same as item 1 above, except that minor corrections as noted shall be made by Design-Build Entity.
   3. SEE COMMENTS, REVISE AS NOTED AND RESUBMIT - District identified major inconsistencies or errors that shall be resolved or corrected by Design-Build Entity prior to subsequent review by District.
   4. SUBMITTAL DOES NOT MEET CONTRACT REQUIREMENTS - RESUBMIT - Submitted material does not conform to Contract Documents in major respect, e.g.,: wrong size, model, capacity, or material.

J. Make a complete and acceptable Submittal at least by second submission. District reserves the right to deduct monies from payments due Contractor to cover District and Architect/Engineer's additional costs of review beyond the second submission. Illegible Submittals will be rejected and returned to Contractor for resubmission. Contractor shall be in breach of the Contract if Contractor's first re-submittal, following a Submittal which District determines falls within categories 3 or 4 above, does not fall within categories 1 or 2 above. Deductions will be calculated in accordance with Section 1.2.T of this specification 01 32 19.

K. Favorable review will not constitute acceptance by District of any responsibility for the accuracy, coordination and completeness of the Submittals. Accuracy, coordination, and completeness of Submittals shall be sole responsibility of Contractor, including responsibility to back-check comments, corrections, and modifications from District's review before fabrication. Contractor, Subcontractors, or suppliers may prepare Submittals, but Contractor shall ascertain that Submittals meet requirements of Contract Documents, while

conforming to structural space and access conditions at point of installation. District's review will be only to assess if the items covered by the Submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as indicated by the Contract Documents. Favorable review of Submittal, method of work, or information regarding materials and equipment Contractor proposes to furnish shall not relieve Contractor of responsibility for errors therein and shall not be regarded as assumption of risks or liability by District , or any officer or employee thereof, and Contractor shall have no claim under Contract Documents on account of failure or partial failure or inefficiency or insufficiency of any plan or method of work or material and equipment so accepted. Favorable review shall be considered to mean merely that District has no objection to Contractor using, upon Contractor's own full responsibility, plan or method of work proposed, or furnishing materials and equipment proposed.

L. District's review will not extend the means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto. The review and comment on a separate item as such will not indicate approval of the assembly in which the item functions.

M. Submit complete initial Submittal for those items where required by individual Specification Sections. Complete Submittal shall contain sufficient data to demonstrate that items comply with Specifications, shall meet minimum requirements for submissions cited in Specification Sections, shall include motor data and seismic anchorage certifications, where required, and shall include necessary revisions required for equipment other than first named. If Contractor submits incomplete initial Submittal when complete Submittal is required, Submittal may be returned to Contractor without review.

N. Copy, conform, and distribute reviewed Submittals in sufficient numbers for Contractor's files, Subcontractors, and vendors.

O. After District's review of Submittal, revise as noted and resubmit as required. Identify changes made since previous Submittal.
   1. Begin no fabrication or work that requires Submittals until return of Submittals not requiring re-submittal. Do not extrapolate from Submittals covering similar work.
   2. Normally, Submittals will be processed and returned to Contractor within twenty-one (21) Days of receipt.

P. Distribute copies of reviewed Submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

Q. All Submittals shall be **number-identified** by Contractor, prior to submission to District, in accordance with the following:
   1. Sequentially number each Submittal by Specification Section (i.e., "1-2", "2-2", "3-2", etc.) as the basis for number identification of Submittals.
   2. Affix the Submittal number under which each Submittal is made on every copy of each Shop Drawing, product data, sample, certification, etc.
   3. Number Installation, Operation, and Maintenance Manuals with original root number of the approved Submittal for the item.
   4. If the Submittal is a re-submittal (including without limitation after an initial Submittal is rejected, returned without review or marked 'Revise as Noted and Resubmit'), add the suffix designation "A" (i.e., a re-submittal of Submittal 1-2 would be numbered 1A-2). Subsequent re-submittals would be identified by the Submittal number and sequential letters (i.e., "B", "C", "D", etc.).
   5. All Submittals shall include all information requested by each Specification Section. No partial Submittals will be accepted unless previously authorized by District. In the event a partial Submittal is authorized, each subsequent different Submittal (as opposed to re-submittal) is given a new number.

R. Submission Requirements:
   1. Deliver Submittals to District giving sufficient time for more than one review, but in no case less than thirty (30) Days before dates reviewed Submittals will be needed.
   2. Initial Submittal of Installation, Operation and Maintenance Manuals shall be forty-five (45) Days after the date Submittals that pertain to the applicable portion of the Installation, Operation and Maintenance Manual is satisfactorily reviewed.
   3. The following table lists the number of initial Submittals required from Contractor for each type of submission, to whom Contractor shall distribute the information, and District's distribution of reviewed submissions. If Contractor needs more copies of reviewed Submittals returned to it, then either submit additional copies or make copies from the returned transparency Submittal. Submittals requiring resubmission will require the same quantity and distribution as an initial Submittal.

Submittal	Contractor Initial Submittal		District Submittal Review Return	
	# of Electronic files	# of Hard Copies/ Prints/ Samples	# of Electronic files	# of Hard Copies/ Prints/ Samples
Schedule of Submittals	1	2	1	0
Safety Program	1	0	0	0
Progress Schedules	1	2	1	0
Product Data	1	2	1	0
Materials Safety Data Sheets	1	1	1	0
Vibration Control Drawings & Calculations	1	2	1	0
Shop Drawings	1	2	1	0
Samples	0	2	0	1
Installation, Operation, and Maintenance Manuals	1	2	1	0
Quality Assurance Control Submittals				
Computer Programs	1	0	0	0
Environmental Impact Mitigation Documents	1	0	1	0
Project Record Documents	1	2	1	0
Other Documents	1	2	1	0

4. Accompany Submittals with Submittal transmittal form, containing:
   a. Date, revision date, and Submittal log number.
   b. **Project name and District's Contract number**.
   c. Contractor's name, address, and job number.
   d. Specification Section number clearly identified.
   e. The quantity of Shop Drawings, Product Data, or Samples submitted.
   f. Notification of deviations from Contract Documents.
   g. Materials Safety Data Sheet (MSDS) for each item complying with OSHA's Hazard Communication Standard 29 CFR 1910.1200.
   h. Other pertinent data.
5. Submittal shall include:
   a. Date and revision dates.
   b. Revisions, if any, identified.
   c. Project Name and Contract number.
   d. The names of:
      1) Contractor, Subcontractor, Supplier, Manufacturer, and separate detailer, when pertinent.
   e. Identification of product material by location within the Project.
   f. Relation to adjacent structure or materials.
   g. Field dimensions, clearly identified as such.
   h. Specification Section number and applicable detail reference number on the Drawings.
   i. Applicable reference standards, such as ASTM, ANSI, FS, NEMA, SMACNA or ACI.
   j. A blank space, on each Drawing or data sheet, 5" x 4" for the District's stamp.
   k. Identification of deviations from Contract Documents.
   l. Contractor's stamp, initialed or signed, with language certifying the review of Submittals, verification of field measurements, construction criteria and technical standards in compliance with Contract Documents.

S. Resubmission requirements:
1. Shop Drawings:
   a. Revise initial Shop Drawings as required and resubmit as specified for initial Submittals.
   b. Indicate on Shop Drawings any changes that have been made other than those requested by District.
2. Product Data and Samples:
   a. Submit new Product Data and Samples as required for initial Submittals.
3. Installation, Operation, and Maintenance Manuals:

a. Revise initial Installation, Operation, and Maintenance Manual(s) as required and resubmit as specified for initial Submittals.

T. Number of resubmissions:

1. One reexamination of Contractor's Submittals that have been returned for correction or replacement will be included in District's budget. **Any additional re-examination of Contractor's Submittals will be considered additional scope services to be paid by Contractor through District. Contractor shall pay District (or District may deduct from any progress or final payment), for design team personnel, on an hourly basis at 2.5 times direct payroll expenses, and for consultant personnel time at 1.25 times the amount billed District**.

1.3 SCHEDULE OF SHOP DRAWING AND SAMPLE SUBMITTALS

A. Submit preliminary Schedule of Shop Drawing and Sample Submittals as required by Document 00 71 00 (General Conditions) and in quantities as required by paragraph 1.2A.1 of this Section 01 32 19.

B. Schedule of Submittals will be used by District to schedule its activities relating to review of Submittals. Schedule of Submittals shall indicate a spreading out of Submittals and early Submittals of long-lead-time items and of items that require extensive review.

C. Unless otherwise specified, make Submittals in groups containing all associated items to assure that information is available for checking each item when it is received. Identify on the Submittal which Submittals should be reviewed together.

D. Schedule of Submittals will be reviewed by District and shall be revised and resubmitted until accepted by District.

1.4 SAFETY PROGRAM

A. Submit Safety Program in quantities as required by paragraph 1.2.R.3 of this Section 01 32 19, in Adobe pdf, to District within the time set forth in Section 01 56 00 (Site Security and Safety), paragraph 1.4. to District This submittal is for the District's information only.

1.5 PROGRESS SCHEDULE

A. See Section 01 32 16 (Progress Schedules and Reports) for schedule and report requirements. Section 01 32 16 shall control in any conflict with Section 01 32 19.

B. Submit in quantities as required by paragraph 1.2.R.3 of this Section 01 32 19, at each of the following times:
1. Initial Progress Schedule as set forth in Section 01 32 16.
2. Original Schedule as set forth in Section 01 32 16.
3. Adjustments to the Schedule as required.
4. Schedule updates monthly, as required.

C. Submit one electronic copy, in Adobe .pdf, of the reports listed in Section 01 32 16 (Progress Schedules and Reports) with:
1. Initial Schedule
2. Original Schedule
3. Each monthly Schedule update

D. Progress Schedules and Reports shall be submitted on CD Roms or other electronic media, **using software described in paragraph** 1.4.A **of Section 01 32 16** (in addition to hard copies specified in this paragraph 1.2.R.3. Electronic files shall be complete copies, including all programs and electronic coding

1.6 NOT USED

1.7 NOT USED

1.8 PRODUCT DATA

A. Submit Product Data in quantities and format as required by paragraph 1.2A.1 of this Section 01 32 19.

B. Ten Days prior to design phase system confirmation meeting(s), submit the complete list of major products proposed for use, with name of manufacturer, telephone number, trade name, and model number of each product. Tabulate product data by Specification Section.

C. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
D. Product or Catalog Data:
   1. Manufacturer's standard drawings shall be modified to delete non-applicable data or include applicable data.
   2. Manufacturer's catalog sheets, brochures, diagrams, schedules, charts, illustrations and other standard descriptive data:
      a. Mark each copy to identify pertinent materials, products, or models.
      b. Show dimensions and clearances required, performance characteristics and capacities, wiring diagrams and controls.
      c. Include applicable MSDS.
E. Supplemental Data:
   1. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to Project.
F. Provide final Project Record Data as described in Section 01 78 39 (Project Record Documents).

1.9 VIBRATION CONTROL DRAWINGS AND CALCULATIONS

A. Submit Vibration Control Drawings and Calculations in quantities as required by paragraph 1.2.R.3 of this Section 01 32 19.
B. Shop Drawings: Submit Shop Drawings showing isolator types and sizes, locations with static and dynamic load on each location, and installation details, including recording and alarm device wiring and control diagrams where required.
C. Product Data: Submit manufacturer's product data and certificates of compliance for each type of vibration control product provided.
D. Maintenance Data: Submit maintenance data for each type of vibration control product, and include in maintenance manual specified in 1.6 (Installation, Operations and Maintenance Manuals) of Section 01 78 39 (Project Record Documents).
E. Seismic Calculations: Submit seismic calculations on all equipment, ductwork and piping restraints, anchors and supports. Calculations shall be prepared by Civil or Structural Engineer of Record.
F. Measured Equipment Deflections: Upon completion of vibration control work, prepare a report showing measured device deflections for each major item of equipment indicated.

1.10 SHOP DRAWINGS

A. Submit Schedule of Submittals in quantities as required by paragraph 1.2.R.3 of this Section 01 32 19.
B. Minimum Sheet Size: 8½ inches by 11 inches. All others: Multiples of 8½ inches by 11 inches, 34 inches by 44 inches maximum.
C. Mark each copy to identify applicable products, models, options, and other data; supplement manufacturers' standard data to provide information unique to Work.
D. Include manufacturers' installation instructions when required by Specification Section.
E. If Contractor submits Shop Drawings for items that Shop Drawings are not specified, District will not be obliged to review them.
F. Contractor is responsible for procuring copies of Shop Drawings for its own use as it may require for the progress of the Work.
G. Shop Drawings shall be drawn to scale and completely dimensioned, giving plan view together with such sectional views as are necessary to clearly show construction detail and methods.

1.11 SAMPLES

A. Submit Schedule of Submittals in quantities as required by paragraph 1.2.R.3 of this Section 01 32 19.
B. Submit full range of manufacturers' standard colors, textures, and patterns for District's selection.
C. Submit samples to illustrate functional and aesthetic characteristics of product, with integral parts and attachment devices. Coordinate Submittal of different categories for interfacing work.
D. Include identification on each sample, giving full information.
E. Sizes: Unless otherwise specified, provide the following:
   1. Paint Chips: Manufacturers' standard
   2. Flat or Sheet Products: Minimum 6 inches square, maximum 12 inches square
   3. Linear Products: Minimum 6 inches, maximum 12 inches long

4. Bulk Products: Minimum 1 pint, maximum 1 gallon

F. Full size samples may be used in Work upon approval by District.

G. Field Samples and Mock-ups (if applicable):
   1. Erect field samples and mock-ups at Site in accordance with requirements of Specification Sections. If testing is conducted, record and certify results and full Contract compliance.
   2. Modify or make additional field samples and mock-ups as required to provide appearance and finishes approved by District.
   3. Approved field samples and mock-ups may be used in Work upon approval by District.
   4. Construct or prepare as many additional Samples as may be required, as directed by the District, until desired textures, finishes, and/or colors are obtained.
   5. Accepted Samples and mock-up shall serve as the standard of quality for the various units of work.

H. No review of a Sample shall be taken in itself to change or modify the requirements in the Contract Documents.

I. Finishes, materials, and workmanship in the completed Work shall match accepted Samples.

1.12 INSTALLATION, OPERATIONS AND MAINTENANCE MANUALS

A. Submit Installation, Operations and Maintenance Manuals in quantities as required by paragraph 1.2.R.3 of this Section 01 32 19.

B. Submit Project Record Documents as required in Section 01 78 39 Project Record Documents.

C. Contractor shall submit initial copies of the complete IOM manuals for review by the architect/engineer and commissioning agent within 45 calendar days after review of applicable Submittal.

D. Contractor shall submit final IOM manuals prior to substantial completion.
   1. Prior to final completion, the commissioning agent shall review the final IOM manuals (in addition to the initial IOM manuals), and documentation, with redline as-builts, for systems that were commissioned to verify compliance with the specifications. The commissioning agent will communicate, through District, deficiencies in the manuals to the contractor or Architect/Engineer, as requested.
   2. Upon successful review of the corrections, the commissioning agent will recommend approval and acceptance of the IOM manuals to District.
   3. The commissioning agent will also review each equipment warranty and verify that all requirements to keep the warranty valid are clearly stated. This work does not supersede the Architect/Engineer's review of the IOM manuals according to the Architect/Engineer's contract.

1.13 QUALITY ASSURANCE CONTROL SUBMITTALS

A. Submit Schedule of Submittals in quantities as required by paragraph 1.2.R.3 of this Section 01 32 19.

B. Test Reports:
   1. Indicate that material or product conforms to or exceeds specified requirements.
   2. Reports may be from recent or previous tests on material or product, but shall be acceptable to District. Comply with requirements of each individual Specification Section.

C. Certificates:
   1. Indicate that material or product conforms to or exceeds specified requirements.
   2. Submit supporting reference data, affidavits, and certifications as appropriate.
   3. Certificates may be recent or from previous test results on material or product, but shall be acceptable to District.

D. Manufacturers' Instructions:
   1. Include manufacturers' printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing.
   2. Identify conflicts between manufacturers' instructions and Contract Documents.

E. Material Safety Data Sheets:
   1. In addition to Material Safety Data Sheets (MSDS) otherwise required by the Contract Documents, submit MSDS for any paints, solvents, thinners, varnish, lacquer, glues and adhesives, mastics, or other materials needed for the Project as required by the individual Specification Sections or as otherwise specified in the Contract Documents.
   2. MSDS required for a Submittal shall be submitted with product data in order for the Submittal to be reviewed.

1.14 COMPUTER PROGRAMS

A. Submit Computer Programs in quantities as required by paragraph 1.2.R.3 of this Section 01 32 19.

B. Submit Computer Programs as listed in Section 01 78 39 Project Record Documents.

1.15 ENVIRONMENTAL IMPACT MITIGATION PLAN DOCUMENTS

A. Submit Project Record Documents in quantities as required by paragraph 1.2.R.3 of this Section 01 32 19.
B. Submit Noise Control Plan, Spill Prevention, Control and Countermeasure Program, Site Safety Plan, Hazardous Materials Program, Dust Control Plan, Erosion Control Plan, Cultural Resources Protection Plan, Traffic Control Plan, Tree Protection Plan, and Migratory Bird Protection Plan (if applicable) as listed in Section 01 35 00 Special Procedures.

1.16 PROJECT RECORD DOCUMENTS

A. Submit Project Record Documents in quantities as required by paragraph 1.2.R.3 of this Section 01 32 19.
B. Submit Project Record Documents listed in Section 01 78 39 Project Record Documents.

1.17 DELAY OF SUBMITTALS

A. Delay of Submittals by Contractor is considered avoidable delay.

1.18 OPTIONAL REVIEW MEETING

A. At the Contractor's request, in order to facilitate the timeliness of the review process, the District may schedule a meeting to review the materials submitted. If this option is exercised, the following requirements apply:
   1. Request a meeting date with the District at least ten (10) Business Days in advance.
   2. Provide the complete package of Submittal information at least five (5) Business Days in advance of the meeting.
   3. The meeting shall take place at District's office. District will provide the authorized staff to review and respond on the Submittal information during the meeting.
   4. Make available for this meeting the job superintendent and/or foreman, Contractor's safety officer, and someone knowledgeable of all the items submitted and authorized to make substitutions or changes.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

TRANSMITTAL SHEETS AND MAINTENANCE SHEET FOLLOW THIS PAGE

Submittal Transmittal Form

EXHIBIT A

SUBMITTAL
TRANSMITTAL NO. _____

Project Name:			Date Received:
San Mateo County Community College District 3401 CSM Drive San Mateo, CA 94402			Checked By:
DBE:	To:		Log Page:
Address: Attention:	Address: Attention:		Specification Section Number: 1st Submittal ☐ Resubmittal ☐
Date Transmitted:	Previous Transmittal Date:		

No. Copies	Description	Manufacturer	Dwg. or Data No.	Action Taken*

Remarks: _____

* The action designated above is in accordance with the following legend:

A – No Exceptions Taken
B – Make Corrections Noted (No Resubmission Required)
C. – Make Corrections Noted and Resubmit
D – Not Approved
1. Not enough information for review
2. No reproducibles submitted
3. Copies illegible
4. Not enough copies submitted
5. Wrong sequence number
6. Wrong re-submittal number
7. Wrong Specification section number
8. Wrong form used
9. See comments

E – District's review not required
1. Submittal not required
2. Supplemental information. Submittal retained for informational purposed only
3. Information reviewed and approved on prior Submittal
4. See comments

Comments _____

Distribution: Contractor ☐ File ☐ IOR ☐ District ☐ CM ☐ Other ☐

EXHIBIT B

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL
TRANSMITTAL NO. _____

Project Name:			Date Received:	
San Mateo County Community College District 3401 CSM Drive San Mateo, CA 94402			Checked By:	
DBE:	To:		Log Page:	
Address: Attention:	Address: Attention:		Specification Section Number: 1st Submittal ☐ / Resubmittal ☐	
Date Transmitted:	Previous Transmittal Date:			
No. Copies	Description	Manufacturer	Dwg. or Data No.	Action Taken*

Remarks: _____

* The action designated above is in accordance with the following legend:

A – No exceptions taken
B – Make Corrections Noted (No Resubmission Required)
C. – Make Corrections Noted and Resubmit
D – Not Approved– this manual Submittal is deficient in the following area:

1. Equipment record sheets
2. Functional description
3. Assembly, disassembly, installation, alignment, adjustment, and checkout instructions
4. Operating instructions

D – (continued)

5. Lubrication and maintenance instructions
6. Troubleshooting guide
7. Parts list and ordering instructions
8. Organization (indexing and tabbing)
9. Wiring diagrams and schematics specific to installation
10. Outline, cross section, and assembly diagrams
11. Test data and performance curves
12. Tag or equipment identification numbers
13. See comments

Comments _____

By _____ Date _____

Distribution: Contractor ☐ File ☐ IOR ☐ District ☐ CM ☐ Other ☐

SECTION 01 35 27

PROJECT LABOR AGREEMENT

[PM- Include this section only for the projects that are under the PLA; otherwise do not include this Section 01 35 27 in Project Manual and indicate "N/A" on TOC Section 00 01 10. If using this Section for a PLA project, update fields on letter of assent]

1.01 GENERAL

The San Mateo County Community College District Board of Trustees has approved a Program Stabilization Agreement for this project. The Contractor and all subcontract forces are to comply with the requirements set forth in the executed Project Stabilization Agreement. It is the responsibility of the Contractor and the subcontractors to adhere to the requirements set forth in the Agreement and to comply with its provisions. Any costs for compliance with the Project Stabilization Agreement are to be included in the Contractor's Bid price. Copies of the signed Program Stabilization Agreement are available from the District's Construction Planning Department at 650-358-6785 or on the District's website at:
http://www.smccd.edu/accounts/smccd/departments/facilities/Community.shtml

Click on Project Labor Stabilization Agreement.

1.02 List of Projects covered under Program Stabilization Agreement

A. Cañada College
1. Building 3, Phase 1 Modernization
2. Building 17 Modernization
3. Cañada Buildings 16/18 Modernization
4. Cañada Building 7 New Facilities Maintenance Center
5. Cañada Buildings 5/6 Modernization
6. Cañada Building 1 Gym Modernization
7. Cañada Building 13 Modernization
8. Cañada Gateways, Circulation & Parking Project
9. Cañada Building 8 Phase 2 Modernization

B. College of San Mateo
1. Building 35 Regional Public Safety Center
2. Building 18 Seismic Upgrade and Modernization
3. Building 36 Integrated Science Center
4. Buildings 1, 5 & 6 Modernization
5. CSM CIP2 Design-Build Project
6. Buildings 2,4 Modernization
7. Buildings 14,16 Modernization
8. Building 8 Gym Modernization
9. Building 12/15/17/34 Modernization

C. Skyline College
1. Student Union/Science Annex
2. Building 3, 7 & 8 Modernization
3. Skyline Building 7 Allied Health Renovation
4. Building 30 Replacement Facilities Maintenance Center
5. Skyline College CIP2 DB Project
6. Building 1 Modernization
7. Building 2 Modernization Phase 3
8. Corporation Yard

D. Districtwide
1. Utility & Infrastructure Upgrades - TBD

END OF SECTION

Exhibit A
Letter of Assent

Date: _____

Board of Trustees
San Mateo County Community College District
3401 CSM Dr.
San Mateo, CA 94402

Re: [Name of Project]
Project Stabilization Agreement – Letter of Assent

Dear Board of Trustees:

The undersigned party confirms that it agrees to be a party to and bound by the (Name of Project), Project Stabilization Agreement as such Agreement may, from time to time, be amended by the parties or interpreted pursuant to its terms.

By executing this Letter of Assent, the undersigned party subscribes to, adopts and agrees to be bound by the written terms of the legally established trust agreements specifying the detailed basis upon which contributions are to be made into, and benefits made out of, such trust funds and ratifies and accepts the trustees appointed by the parties to such trust funds.

Such obligation to be a party to and bound by this Agreement shall extend to all work covered by said Agreement undertaken by the undersigned party on the (Name of Project). The undersigned party shall require all of its subcontractors, of whatever tied, to become similarly bound for all their work within the scope of this Agreement by signing an identical Letter of Assent.

This letter shall constitute a subscription agreement, to the extent of the terms of the letter.

CONTRACTOR/SUBCONTRACTOR: _____

California State License Number: _____

Name and Signature of
Authorized Person: _____
(Print Name)

_____
(Title)

_____
(Signature)

_____
(Telephone Number)

_____
(Facsimile Number)

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: regulatory requirements applicable to Contract Documents.

B. Specific reference in the Specifications to codes and regulations or requirements of regulatory agencies shall mean the latest printed edition of each adopted by the regulatory agency in effect at the time of the opening of bids, except as may be otherwise specifically stated in the Contract Documents.

C. Should any conditions develop not covered by the Contract Documents wherein the finished Work will not comply with current codes, a change order detailing and specifying the required Work shall be submitted to and approved by District before proceeding with the Work.

1.2 REFERENCES TO REGULATORY REQUIREMENTS

A. Codes, laws, ordinances, rules and regulations referred to shall have full force and effect as though printed in full in these Specifications. Code, laws, ordinances, rules and regulations are not furnished to Contractor, because Contractor is assumed to be familiar with these requirements. The listing of applicable codes, laws, and regulations for hazardous waste abatement Work in the Contract Documents is supplied to Contractor as a courtesy and shall not limit Contractor's responsibility for complying with all applicable laws, regulations or ordinances having application to the Work. Where conflict among the requirements or with these Specifications occurs, the most stringent requirements shall be used.

B. Conform to referenced codes, laws, ordinances, rules and regulations.

C. Precedence:

1. Where specified requirements differ from the requirements of applicable codes, ordinances and standards, the more stringent requirements shall take precedence.
2. Where Drawings or Specifications require or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, Drawings and Specifications shall take precedence so long as such increase is legal.
3. Where no requirements are identified on Drawings or in Specifications, comply with all requirements of applicable codes, ordinances and standards of governing authorities having jurisdiction.

1.3 CODES

A. Codes that apply to Contract Documents include, but are not limited to, the following:

1. CBC (Part 2, Title 24, CCR, including, without means of limitation, Sections 16A, 102A.23, 308, 420A, 504-506, 904.2.6, 1019 and 1604)
2. CEC (Part 3, Title 24, CCR)
3. CMC (Part 4, Title 24, CCR)
4. CPC (Part 5, Title 24, CCR),
5. State Elevator Safety Regulations (Part 7, Title 24, CCR)
6. UBC
7. UPC
8. UMC
9. NEC

1.4 LAWS, ORDINANCES, RULES, AND REGULATIONS

A. During prosecution of Work to be done under Contract Documents, comply with applicable laws, ordinances, rules and regulations, including, but not limited to, the following:

1. Federal
    a. Americans with Disabilities Act of 1990
    b. 29 CFR, Section 1910.1001, Asbestos

c. 40 CFR, Subpart M, National Emission Standards for Asbestos
d. Executive Order 11246
e. Federal Endangered Species Act
f. Clean Water Act

2. State of California
   a. California Code of Regulations, Titles 5, 8, 19, 21, 22, 24 and 25
   b. California Public Contract Code
   c. California Health and Safety Code
   d. California Government Code
   e. California Labor Code
   f. California Civil Code
   g. California Code of Civil Procedure
   h. CPUC General Order 95, Rules for Overhead Electric Line Construction
   i. CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communications Systems
   j. Cal/OSHA
   k. OSHA: Hazard Communications Standards
   l. California Endangered Species Act
   m. Water Code
   n. Fish and Game Code
3. State of California Agencies
   a. State and Consumer Services Agency
   b. Office of the State Fire Marshall
   c. Office of Statewide Health Planning and Development
   d. Department of Fish and Game
   e. Bay Area Air Qualify Management District
   f. San Francisco Bay Regional Water Quality Control Board
   g. Division of the State Architects
4. Local Agencies:
   a. San Mateo Fire District (College of San Mateo); Woodside Fire District (Cañada College); San Bruno Fire District (Skyline College)
   b. Regional Water Quality Control Board requirements for storm water runoff control
5. Other Requirements:
   a. National Fire Protection Association (NFPA): Pamphlet 101, Life Safety.
   b. References on Drawings or in Specifications to "code" or "building code" not otherwise identified shall mean the codes specified in this Section 01 41 00, together with all additions, amendments, changes, and interpretations adopted by code authorities of the jurisdiction.

B. Have access to all of the foregoing within 24 hours.
C. Other Applicable Laws, Ordinances and Regulations:
   1. Work shall be accomplished in conformance with all applicable laws, ordinances, rules and regulations of federal, state, and local governmental agencies and jurisdictions having authority over the Project.
   2. Work shall be accomplished in conformance with all rules and regulations of public utilities and utility districts.
   3. Where such laws, ordinances rules, and regulations require more care or greater time to accomplish Work, or require better quality, higher standards or greater size of products, Work shall be accomplished in conformance to such requirements with no change to the Contract Time and Contract Sum, except where changes in laws, ordinances, rules and regulations occur subsequent to the time of opening of the bids.
D. Under California Government Code Section 930.2 et. seq. and Public Contract Code Section 7105(d)(2), neither the Contract Claims Procedure (Section 00 71 00, Article 12) nor the Change Order Procedure (Section 01 26 00 Modification Procedures) may be modified, waived, or otherwise not complied with, absent a written change order that explicitly and expressly makes such modifications.

1.5 CONFLICTS

A. Between referenced regulatory requirements: Comply with the one establishing the more stringent requirement.
B. Between referenced regulatory requirements and Contract Documents: Comply with the one establishing the more stringent requirement.

1.6 REQUIRED PROVISIONS ON CONTRACT CLAIM RESOLUTION

A. The California Public Contract Code specifies required provisions on resolving contract claims less than $375,000, which are set forth below, and constitute a part of this Contract.
   1. For the purposes of this section, "Claim" means a separate demand by Contractor of $375,000 or less for (1) a time extension, (2) payment or money or damages arising from Work done by or on behalf of Contractor arising under the Contract Documents and payment of which is not otherwise expressly provided for or the Claimant is not otherwise entitled to, or (3) an amount the payment of which is disputed by District. In order to qualify as a Claim, the written demand must state that it is a Claim submitted under paragraph 12 of Section 00 71 00 (General Conditions) and be submitted in compliance with all requirements of Section 00 71 00 (General Conditions), paragraph 12. Separate Claims which total more than $375,000 do not qualify as a "separate demand of $375,000 or less," as referenced above, and are not subject to this section.
   2. A voucher, invoice, payment application, or other routine or authorized form of request for payment is not a Claim for purposes of this section. If such request is disputed as to liability or amount, then the disputed portion of the submission may be converted to a Claim under this section by submitting a separate claim in claim in compliance with Contract Documents claim submission requirements.
   3. Caution. This section does not apply to tort claims and nothing in this section is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 and Chapter 2 of Part 3 of Division 3.6 of Title 1 of the California Government Code.

B. Procedure:
   1. The Claim must be in writing, submitted in compliance with all requirements of Section 00 71 00 (General Conditions), paragraph 12, including, but not limited to, the time prescribed by and including the documents necessary to substantiate the Claim, pursuant to Section 00 71 00 (General Conditions), paragraph 12. Claims must be filed on or before the day of final payment. Nothing in this section is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth in Section 00 71 00 (General Conditions), paragraph 12 or elsewhere in the Contract Documents.
   2. For Claims of fifty thousand dollars ($50,000) or less
      a. District shall respond in writing within forty-five (45) days of receipt of the Claim, or
      b. District may request in writing within thirty (30) days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims District may have against Claimant.
         1) If additional information is thereafter required, it shall be requested and provided in accordance with this section upon mutual agreement of District and Claimant.
         2) District's written response to the Claim, as further documented, shall be submitted to Claimant within fifteen (15) days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.
   3. For Claims over Fifty Thousand Dollars ($50,000) and less than or equal to $375,000:
      a. District shall respond in writing within sixty (60) days of receipt of the Claim, or
      b. District may request in writing within thirty (30) days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims District may have against Claimant.
         1) If additional information is thereafter required, it shall be requested and provided in accordance with this section, upon mutual agreement of District and Claimant;
         2) District's written response to the Claim, as further documented, shall be submitted to Claimant within thirty (30) days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.
   4. Meet and Confer:
      a. If Claimant disputes District's written response, or District fails to respond within the time prescribed above, Claimant shall notify District, in writing, either within fifteen (15) days of receipt of District's response or within fifteen (15) days of District's failure to timely respond, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon demand District will schedule a meet and confer conference within thirty (30) days for settlement of the dispute.
      b. Following the meet and confer conference, if the Claim or any portion remains in dispute, Claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2

(commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the California Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time Claimant submits its written claim as set forth in paragraph 12 of Section 00 71 00 (General Conditions), until the time that Claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

1.7 COMPLIANCE WITH AMERICANS WITH DISABILITIES ACT

A. Contractor acknowledges that, pursuant to the Americans with Disabilities Act (ADA), programs, services and other activities provided by a public entity to the public, whether directly or through a contractor, must be accessible to the disabled public. Contractor shall provide the services specified in the Contract Documents in a manner that complies with the ADA and any and all other applicable federal, state and local disability rights legislation. Contractor agrees not to discriminate against disabled persons in the provision of services, benefits or activities provided under this Agreement and further agrees that any violation of this prohibition on the part of Contractor, its employees, agents or assigns shall constitute a material breach of the Contract Documents.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 42 00

REFERENCES AND DEFINITIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Reference standards, abbreviations, symbols, and definitions used in Contract Documents.
B. Full titles are given in this Section for standards cited in other Sections of Specifications.
C. Material and workmanship specified by reference to number, symbol, or title of specific standard such as state standard, commercial standard, federal specifications, technical society, or trade association standard, or other similar standard, shall comply with requirements of standards except when more rigid requirements are specified or required by applicable codes.
D. Standards referred to, except as modified herein, shall have full force and effect as though printed in the Contract Documents. Standards are not furnished to Contractor because manufacturers and trades involved are assumed to be familiar with their requirements.

1.2 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES; REPORTING AND RESOLVING DISCREPANCIES

A. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code, or laws or regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated in the Contract Documents.
B. If during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such law or regulation applicable to the performance of the Work or of any such standard, specification, manual, or code or of any instruction of any supplier, Contractor shall report it in writing at once to Inspector, with copies to District's Representative and Architect/Engineer, and Contractor shall not proceed with the Work affected thereby until consent to do so is given by District.
C. Except as otherwise specifically stated in the Contract Documents or as may be provided by Change Order, CCD, or Supplemental Instruction, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
    1. The provisions of any such standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
    2. The provisions of any such laws or regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such law or regulation).
D. No provision of any such standard, specification, manual, code, or instruction shall be effective to change the duties and responsibilities of District, District's Representative, Architect/Engineer or Contractor, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to District, Engineer, or any of their consultants, agents, representatives or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.
E. Comply with the applicable portions of standards and specifications published by the technical societies, institutions, associations, and governmental agencies referred to in Specifications.
    1. Comply with referenced standards and specifications; latest revision in effect at the time of opening of Bids, unless otherwise identified by date.
        a. Exception: Comply with issues in effect as listed in governing legal requirements.
F. Referenced Grades, Classes, and Types: Where an alternative or optional grade, class, or type of product or execution is included in a reference but is not identified in Drawings or in Specifications, provide the highest, best, and greatest of the alternatives or options for the intended use and prevailing conditions.
G. Jobsite Copies:

1. Obtain and maintain at the Site copies of reference standards identified on Drawings and in Specifications in order to properly execute the Work.
2. At a minimum, the following shall be readily available at the Site:
   a. Safety Codes: State of California, Division of Industrial Safety regulations.

H. Edition Date of References:
1. When an edition or effective date of a reference is not given, it shall be understood to be the current edition or latest revision published as of the date of opening Bids.
2. All amendments, changes, errata and supplements as of the effective date shall be included.

I. ASTM and ANSI References: Specifications and Standards of the American Society for Testing and Materials (ASTM) and the American National Standards Institute (ANSI) are identified in the Drawings and Specifications by abbreviation and number only and may not be further identified by title, date, revision, or amendment. It is presumed that Contractor is familiar with and has access to these nationally- and industry-recognized specifications and standards.

1.3 ABBREVIATIONS

A. Listed hereinafter are the various organizations or references which may appear in the Contract Documents, along with their respective acronyms and/or abbreviations:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AAP	Affirmative Action Program
AASHTO	American Association of State Highway and Transportation Officials
ABMA	American Boiler Manufacturers Association
ABPA	American Board Products Association
ACI	American Concrete Institute
AED	Association of Equipment Distributors
AGA	American Gas Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association, Inc.
ANSI	American National Standards Institute (formerly American Standards Association)
APA	American Plywood Association
ARI	Air-Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWCI	Association of the Wall and Ceiling Industries
AWPA	American Wood- Preservers Association
AWPB	American Wood Preservers Bureau
AWS	American Welding Society
AWWA	American Water Works Association
BIL	Basic Insulation Level
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	State of California, Department of Transportation
CBC	California Building Code
CCD	Construction Change Directive
CCR	California Code of Regulations
CEC	California Electric Code
CFR	Code of Federal Regulations
CISPI	Cast Iron Soil Pipe Institute
CLMFI	Chain Link Fence Manufacturers Institute
CMC	California Mechanical Code
CO	Change Order
CPC	California Plumbing Code
CPM	Critical Path Method

CPUC	California Public Utilities Commission
CRA	California Redwood Association
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards, U.S. Department of Commerce
CSA	Canadian Standards Association
CTI	Ceramic Tile Institute
DHI	Door and Hardware Institute
DSA	Division of State Architect (formerly known as the Office of the State Architect)
EPA	Environmental Protection Agency
FGMA	Flat Glass Marketing Association
FM	Factory Mutual
FS	Federal Specifications
GA	Gypsum Association
HPMA	Hardwood Plywood Manufacturers Association
HVAC	Heating, Ventilating and Air Conditioning
I.D.	Identification
IACS	International Annealed Copper Standards
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronic Engineers, Inc.
IES	Illuminating Engineering Society
ISA	Instrumentation Society of America
JATC	Joint Apprenticeship Training Committee
JV	Joint Venture
LBE	Local Business Enterprise
M.I.	Middle Initial
M/WBE	Minority and/or Woman-Owned Business Enterprise
MBE	Minority Business Enterprise
MIA	Masonry Institute of America
MIA	Marble Institute of America
MLSFA	Metal Lath/Steel Framing Association
MS	Military Specifications
MSDS	Material Safety Data Sheet
MSS	Manufacturers Standardization Society of the Valve & Fitting Industry
NAAMM	National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electric Manufacturers Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Science and Technology (formerly the National Bureau of Standards)
NOFMA	National Oak Flooring Manufacturers Association
NSF	National Sanitation Foundation
NTMA	National Terrazzo & Mosaic Association
NWWDA	National Wood Windows and Doors Association
OSHA	Occupational Safety and Health Administration
OSHPD	Office of Statewide Health Planning and Department
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PDI	Plumbing and Drainage Institute
PG&E	Pacific Gas and Electric Company
PM	Preventive Maintenance
PR	Proposal Request

PS	Product Standard, U. S. Department of Commerce
RFI	Request for Information
RFP	Request for Proposals
RFS	Request for Substitution
RIS	Redwood Inspection Service
SDI	Steel Deck Institute
SFM	State of California, Office of State Fire Marshal
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joint Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPIB	Southern Pine Inspection Bureau
SSPC	Steel Structures Painting Council
SWI	Steel Window Institute
TCA	Tile Council of America
TIE	Time Impact Evaluation
UBC	Uniform Building Code
UFC	Uniform Fire Code
UL	Underwriters' Laboratories, Inc.
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
USA	Underground Service Alert
USC	United States Code
WCLIB	West Coast Lumber Inspection Bureau
WHI	Warnock Hersey International a testing lab
WIC	Woodwork Institute of California
WWPA	Western Wood Products Association

B. Abbreviations in Specifications:

AWG	American Wire Gauge
accord	Accordance
Co.	Company
Corp.	Corporation
cm.	centimeter (centimeters)
cu.	Cubic
Div.	Division
dia.	diameter
ft.	foot (feet)
g./gr.	gram (grams)
gal.	gallon (gallons)
gpd	gallons per day
gpm	gallons per minute
hr.	hour
kg.	kilogram (kilograms)
in.	inch (inches)
Inc.	Incorporated
km.	kilometer (kilometers)
Kw	Kilowatt
l.	liter (liters)
lbs.	pounds
m	meter (meters)
Mfg.	manufacturing
Mg.	milligram (milligrams)
ml. /mls.	milliliter (milliliters)
mm.	millimeter (millimeters)
No.	number
o.c.	on centers

O.D.	outside diameter
psi	pounds per square inch
psf	pounds per square foot
sq.	square
T & G	tongue and groove
U.S.	United States
yd.	yard (yards)

C. Abbreviations on Drawings:

Additional abbreviations, used only on drawings, are indicated thereon.

1.4 SYMBOLS

A. Symbols in Specifications:

:	"shall be" or "shall" - where used within sentences or paragraphs
#1	Number
1#	Pound
&	And
%	Percent
C	Centigrade
F	Fahrenheit
°	Degree
/	per, except where used to combine words; example: power/fuel, and in that case it means and
"	inch (inches)
'	foot (feet)
@	At

B. Symbols on Drawings:

Symbols, used only on Drawings, are indicated thereon.

1.5 DEFINITIONS

A. Wherever any of the words or phrases defined below, or a pronoun used in place thereof, is used in any part of the Contract Documents, it shall have the meaning here set forth. In the Contract Documents, the neuter gender includes the feminine and masculine, and the singular number includes the plural. While District has made an effort to identify all defined terms with initial caps, the following definitions shall apply regardless of case unless the context otherwise requires:

1. Addenda: Written or graphic instruments issued prior to the opening of Bids, which clarify, correct, or change the bidding requirements or the Contract Documents.
2. Agreement (Section 00 52 00): Agreement is the basic contract document that binds the parties to construction Work. Agreement defines relationships and obligations between District and Contractor and by reference incorporates Conditions of Contract, Drawings, and Specifications and contains Addenda and all Modifications subsequent to execution of Contract Documents.
3. Alternate: Work added to or deducted from the Base Bid, if accepted by District.
4. Application for Payment: Written application for monthly or periodic progress or final payment made by Contractor complying with the Contract Documents.
5. Approved Equal: Approved in writing by District as being of equivalent quality, utility and appearance.
6. Architect/Engineer: If used elsewhere in the Contract Documents, "Architect/Engineer" shall mean a person holding a valid California State Architect's or Engineer's license representing the District in the administration of the Contract Documents. Architect/Engineer may be an employee of or an independent consultant to District. When Architect/Engineer is referred to within the Contract Documents and no Architect/Engineer has in fact been designated, then the matter shall be referred to the District. The term Architect/Engineer shall be construed to include employees of Architect/Engineer and/or employees that

Architect/Engineer supervises. When the designated Architect/Engineer is an employee of District, his or her authorized representatives on the Project will be included under the term Architect/Engineer. If Architect/Engineer is an employee of District, Architect/Engineer is the beneficiary of all Contractor obligations to District, including without limitation, all releases and indemnities. Refer to Section 341, Part 1, Title 24, California Code of Regulations.

7. Asbestos: Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by OSHA or Cal/OSHA.
8. Bid: The offer or proposal of the Bidder submitted on the prescribed form(s) setting forth the prices for the Work to be performed.
9. Bidder: One who submits a Bid.
10. Bidding Documents: All documents comprising the Project Manual (including all documents and specification sections listed on Document 00 01 00 [Table of Contents]), including documents supplied for bidding purposes only and Contract Documents.

.

11. Board: The Board of Trustees of the District.
12. Business Day: Any Day other than Saturday, Sunday, and the following days that have been designated as holidays by District. If a holiday falls on a Saturday, the preceding Friday will be the holiday. If a holiday falls on a Sunday, the following Monday will be the holiday. Refer to the District's web site for a list of District observed holidays.
13. By District: Work that will be performed by District or its agents at the District's expense.
14. By Others: Work that is outside scope of Work to be performed by Contractor under this Contract, which will be performed by District, other contractors, or other means.
15. Change Order: A written instrument prepared by District and signed by District and Contractor, stating their agreement upon all of the following:
    a. a change in the Work;
    b. the amount of the adjustment in the Contract Sum, if any; and
    c. the amount of the adjustment in the Contract Time, if any.
16. Code Inspector: A local or state agency responsible for the enforcement of applicable codes and regulations.
17. Concealed: Work not exposed to view in the finished Work, including within or behind various construction elements.
18. Construction Change Directive: A written order prepared and signed by District, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both.
19. Consultant: See Section 00 73 00 (Supplementary Conditions – Hazardous Materials) (if included)
20. Construction Manager: See Section 00 52 00 (Agreement) (if this term is used).
21. Contract Conditions: Consists of two parts: General Conditions and Supplemental Conditions.
    a. General Conditions are general clauses that are common to the District Contracts, including Section 00 71 00.
    b. Supplemental conditions modify or supplement General Conditions to meet specific requirements for this Contract, including Section 00 73 00 and Section 0073 05 (if included).
22. Contract Documents and Contract: Contract Documents and Contract shall consist of the documents identified as the Contract Documents in Section 00 52 00 (Agreement), plus all changes, addenda, and modifications thereto.
23. Contract Modification: Either:
    a. a written amendment to Contract signed by Contractor and District; or
    b. a Change Order; or
    c. a Construction Change Directive (CCD); or
24. Contract Sum: The sum stated in the Agreement and, including authorized adjustments, the total amount payable by District to Contractor for performance of the Work and the Contract Documents. The Contract Sum is also sometimes referred to as the Contract Price or the Contract Amount.

25. Contract Time: The number or numbers of Days or the dates stated in the Agreement
    a. to achieve Substantial Completion of the Work or designated milestones; and/or
    b. to complete the Work so that it is ready for final payment and is accepted.
26. Contractor: The person or entity identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and neutral in gender. The term "Contractor" means the Contractor or its authorized representative.
27. Contractor's Employees: Persons engaged in execution of Work under Contract as direct employees of Contractor, as Subcontractors, or as employees of Subcontractors.
28. Day: One calendar day of 24 hours measured from midnight to the next midnight, unless the word "day" is specifically modified to the contrary.
29. Defective: An adjective which, when modifying the word "Work," refers to Work that is unsatisfactory or unsuited for the use intended, faulty, or deficient, that does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including but not limited to approval of samples and "or equal" items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by District). District is the judge of whether Work is defective.
30. District: The San Mateo County Community College District.
31. District-Furnished, Contractor-Installed: Items furnished by District at its cost for installation by Contractor at its cost under Contract Documents.
32. District's Representative(s): See Section 00 52 00 (Agreement).
33. Drawings: The graphic and pictorial portions of Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.
34. Equal: Equal in opinion of District. Burden of proof of equality is responsibility of Contractor.
35. Exposed: Work exposed to view in the finished Work, including behind louvers, grilles, registers and various other construction elements.
36. Final Acceptance or Final Completion: District's acceptance of the Work as satisfactorily completed in accordance with Contract Documents. Requirements for Final Acceptance/Final Completion include, but are not limited to:
    a. All systems having been tested and accepted as having met requirements of Contract Documents.
    b. All required instructions and training sessions having been given by Contractor.
    c. All Project Record Documents having been submitted by Contractor, reviewed by District and accepted by District.
    d. All punch list work, as directed by District, having been completed by Contractor.
    e. Generally all Work, except Contractor maintenance after Final Acceptance, having been completed to satisfaction of District.
37. Force Account: Work directed to be performed without prior agreement as to lump sum or unit price cost thereof, and which is to be billed at cost for labor, materials, equipment, taxes, and other costs, plus a specified percentage for overhead and profit.
38. Furnish: Supply only, do not install.
39. Indicated: Shown or noted on the Drawings.
40. Inspector. The person engaged by District to inspect the workmanship, materials, or manner of construction of buildings or portions of buildings, to determine if such construction complies with the Contract Documents and applicable codes. The Inspector is subject to approval by the Architect/Engineer, District and, as appropriate, Division of the State Architect, and he will report to District. Refer to section 4-333 and section 4-342, Part 1, Title 24, California Code of Regulations.
41. Install: Install or apply only, do not furnish.
42. Latent: Not apparent by reasonable inspection, including but not limited to, the inspections and research required as a condition to bidding under the General Conditions.
43. Law: Unless otherwise limited, all applicable laws including without limitation all federal, state, and local laws, statutes, standards, rules, regulations, ordinances, and judicial and administrative decisions

44. Material: This word shall be construed to embrace machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with Contract, except where a more limited meaning is indicated by context.
45. Milestone: A principal event specified in Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all Work.
46. Modification: Same as Contract Modification.
47. Not in Contract: Work that is outside the Scope of Work to be performed by Contractor under Contract Documents.
48. Notice of Completion: Shall have the meaning provided in California Civil Code Section 3093, and any successor statute.
49. Off Site: Not on Property Owned by the District.
50. Partial Utilization: Use by District of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all of the Work.
51. PCBs: Polyclorinated byphenyls.
52. Phase: A specified portion of the Work (if any) specifically identified as a Phase in Section 00 52 00 (Agreement) or 01 10 00 (Summary).
53. Product Data: That information (including brochures, catalogue cuts, MSDS, etc.) supplied by the vendor describing the technical and commercial characteristics of the supplier equipment or materials, and accompanying commercial terms such as warranties, instructions and manuals.
54. Progress Report: A periodic report submitted by Contractor to District with progress payment invoices accompanying actual work accomplished to the Progress Schedule. See Section 01 32 16 (Progress Schedules and Reports) and Section 00 71 00 (General Conditions).
55. Project: Total construction of which Work performed under Contract Documents may be whole or part.
56. Project Float: As defined in Section 01 32 16 (Progress Schedules and Reports), paragraph 1.06.B.9.
57. Project Manual: Project Manual consists of Bidding Requirements, Agreement, Bonds, Certificates, Contract Conditions, and Specifications.
58. Project Record Documents: All Project deliverables required under various Sections, including without limitation, as-built drawings, operations and maintenance manuals, Installation, Operation, and Maintenance Manuals, and Machine Inventory Sheets.
59. Provide: Furnish and install.
60. Request for Information ("RFI"): A document prepared by Contractor requesting information regarding the Project or Contract Documents as provided in Section 01 26 00 (Modification Procedures). The RFI system is also a means for District to submit Contract Document clarifications or supplements to Contractor.
61. Request for Proposals ("RFP"): A document issued by District to Contractor whereby District may initiate changes in the Work or Contract Time as provided in Contract Documents. See Section 01 26 00 (Modification Procedures).
62. Request for Substitution ("RFS"): A document prepared by Contractor requesting substitution of materials as permitted and to the extent permitted in Contract Documents. See Section 01 60 00 (Product Requirements).
63. RFI-Reply: A document consisting of supplementary details, instructions, or information issued by District that clarifies or supplements Contract Documents, and with which Contractor shall comply. RFI-Replies do not constitute changes in Contract Sum or Contract Time except as otherwise agreed in writing by District. RFI-Replies will be issued through the RFI administrative system.
64. Samples: Physical examples of materials, equipment, or workmanship, including Mock Ups, that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
65. Shop Drawings: All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
66. Shown: As indicated on Drawings.

67. Site: The particular geographical location of Work performed pursuant to Contract Documents.
68. Spare Parts: Includes all spare parts, attic stock, required additional materials in excess of what is incorporated into the facility such as paint, carpet, tile, flooring, etc.
69. Specifications: The written portion of the Contract Documents consisting of requirements for materials, equipment, construction systems, standards, and workmanship for the Work; performance of related services; and are contained in Divisions 1 through 16.
70. Specified: As written in Specifications.
71. Subcontractor: A person or entity that has a direct contract with Contractor to perform a portion of the Work at the Site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and neutral in gender and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.
72. Substantial Completion: The Work (or a specified part thereof) has progressed to the point where, in the opinion of District as evidenced by a Certificate of Substantial Completion, the Work is sufficiently complete, in accordance with Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if no such certificate is issued, when the Work (or specified part) is complete and ready for final payment as evidenced by written recommendation of District for final payment. The terms "Substantially Complete" and "Substantially Completed" as applied to all or part of the Work refer to Substantial Completion thereof.
73. Supplemental Instruction: A written directive from District to Contractor ordering alterations or modifications that do not result in change in Contract Sum or Contract Time, and do not substantially change Drawings or Specifications. See Section 01 26 00 (Modification Procedures).
74. Technical Specifications: Specification Divisions 2 through 48 of the Contract Documents.
75. Title 24: Title 24, California Code of Regulations.
76. Testing and Special Inspection Agency: An independent entity engaged by District to inspect and/or test the workmanship, materials, or manner of construction of buildings or portions of buildings, to determine if such construction complies with the Contract Documents and applicable codes.
77. Underground Facilities: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities that have been installed underground to furnish any of the following services or materials: Electricity, gases, chemicals, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.
78. Unit Price Work: Shall be the portions of the Work for which a unit price is provided in Section 00 52 00 (Agreement) or Section 01 10 0 (Summary of Work).
79. Verified Report: A periodic report submitted to District. Refer to Sections 4-336, 4-337 and 4-343, Part 1, Title 24, California Code of Regulations.
80. Work: The entire completed construction, or the various separately identifiable parts thereof, required to be furnished under the Contract Documents within the Contract Time. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents including everything shown in the Drawings and set forth in the Specifications. Wherever the word "work" is used, rather than the word "Work," it shall be understood to have its ordinary and customary meaning.

B. Wherever words "as directed," "as required," "as permitted," or words of like effect are used, it shall be understood that direction, requirements, or permission of District is intended. Words "sufficient," "necessary," "proper," and the like shall mean sufficient, necessary, or proper in judgment of District. Words "approved," "acceptable," "satisfactory," "favorably reviewed," or words of like import, shall mean approved by, or acceptable to, or satisfactory to, or favorably reviewed by District.

C. Wherever the word "may" or "ought" is used, the action to which it refers is discretionary. Wherever the word "shall" or "will" is used, the action to which it refers is mandatory.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 45 23

TESTING AND INSPECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Contractor's Quality Control
B. Quality of the Work
C. Inspections and Tests by Division of State Architect
D. Inspections and Tests by Serving Utilities
E. Inspections and Tests by Manufacturer's Representatives
F. Inspections by Independent Testing and Inspection Agency
G. Additional Testing and Inspection

1.2 CONTRACTOR'S QUALITY CONTROL

A. Contractor's Quality Control: Ensure that products, services, workmanship and Site conditions comply with requirements of Drawings and Specifications by coordinating, supervising, testing, and inspecting the Work and by utilizing only suitably qualified and appropriately audited, licensed or trained, personnel.
B. Quality Requirements: Work shall be accomplished in accordance with quality requirements of Drawings and Specifications, including, by reference, all codes, laws, rules, regulations, and standards. When no quality basis is prescribed, the quality and testing procedures shall be in accordance with the best-accepted practices of the construction industry for the locale of the Project, for projects of this type, or standards set by engineering or technical societies (e.g., ASTM or ASHRAE), whichever is more stringent.
C. Quality Control Personnel: Employ and assign knowledgeable and skilled personnel as necessary to perform quality control functions to ensure that the Work is provided as required.

1.3 QUALITY OF THE WORK

A. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects, and fit for the intended use.
B. Quality of Installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements, as shown on or required by Contract Documents.
C. Protection of Completed Work: Take all measures necessary to preserve completed Work free from damage, deterioration, soiling, and staining, until acceptance by District.
D. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report requirements in preparing, fabricating, erecting, installing, applying, connecting, and finishing Work.
E. Deviations from Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Secure District's advanced written consent. Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviations are acceptable and appropriate for the Project.
F. Verification of Quality: Work shall be subject to verification of quality by District in accordance with provisions of the Contract Documents.
    1. Cooperate by making Work available for inspection by Division of State Architect Inspector and independent testing and inspection agencies.
    2. Such verification may include mill, plant, shop, or field inspection as required.
    3. Provide access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.
    4. Provide all information and assistance as required, including that by and from subcontractors, fabricators, materials suppliers and manufacturers, for verification of quality by District.

5. Applicable provisions of the Contract Documents shall govern Contract Modifications, if any, resulting from such verification activities.

G. Observations by District's Consultants: Periodic and occasional observations of Work in progress will be made by District and District's consultants as deemed necessary to review progress of Work and general conformance with design intent.

H. Limitations on Inspection, Testing and Observation: Neither employment of independent testing and inspection agency nor observations or tests by District and District's consultants shall in any manner relieve Contractor of obligation to perform Work in full conformance to all requirements of Contract Documents.

I. District's Acceptance and Rejection of Work: District reserves the right to reject all Work not in conformance to the requirements of the Drawings and Specifications, or otherwise defective.

J. Correction of Defective Work: Defective Work shall be modified, replaced, repaired or redone by the Contractor at no change in Contract Sum or Contract Time.

K. Contract Adjustment for Defective Work: Should District determine that it is not feasible or in District's interest to require defective Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between District and Design-Build Entity, and documented in the form of a contract change order. If equitable amount cannot be agreed upon, a Construction Change Directive will be issued and the amount in dispute resolved in accordance with applicable provisions of Document 00 71 00 (General Conditions).

L. Non-Responsibility for Defective Work: District and District's consultants disclaim any and all responsibility for Work produced not in conformance with the Drawings and Specifications.

M. Responsibility for Defective Work: Contractor shall have full responsibility for all consequences resulting from defective work, including without limitation all delays, disruptions, extra inspection and correction costs by Contractor and District and re-Work, and extra time and costs of all types. Contractor waives excuses for defective work relating to District's prior review of Submittals and/or prior failure to notice defective work in place on inspection.

1.4 INSPECTIONS AND TESTS BY GOVERNING AUTHORITIES

A. Regulatory Requirements for Testing and Inspection: Contractor shall comply with Part 1, Title 24, Section 4-335, California Code of Regulations and shall cooperate with Inspector in all testing required by the Office of Regulation Services, Division of State Architect. Contractor shall comply with Part 2, Title 24, California Code of Regulations and shall cooperate with Inspector in all inspections, testing and approvals required by the Office of Regulation Services, Division of State Architect. Contractor shall also comply with Uniform Building Code (UBC) requirements and all other requirements of governing authorities having jurisdiction.

B. Inspections and Tests by Governing Authorities: Contractor shall cause all tests and inspections required by governing authorities having jurisdiction to be made for Work under this Contract.
   1. Such authorities may include, but are not limited to, the Division of State Architect, Fire Department, and similar agencies.
   2. Except as specifically noted, scheduling, conducting and paying for such inspections shall be solely the Contractor's responsibility.

1.5 INSPECTIONS AND TESTS BY SERVING UTILITIES

A. Cause all tests and inspections required by serving utilities to be made for Work under this Contract. Scheduling, conducting and paying for such inspections shall be solely the Contractor's responsibility.

1.6 INSPECTIONS AND TESTS BY MANUFACTURER'S REPRESENTATIVES

A. Cause all tests and inspections specified to be conducted by materials or systems manufacturers to be made. Additionally, all tests and inspections required by materials or systems manufacturers as conditions of warranty or certification of Work shall be made, the cost of which shall be included in the Contract Sum.

1.7 INSPECTIONS BY INDEPENDENT TESTING AND INSPECTION AGENCY

A. District will select an independent testing and inspection agency or agencies approved by the Architect/Engineer and the Division of State Architect to conduct tests and inspections in accordance with Part 1, Title 24, Section 4-335, California Code of Regulations and as indicated on Drawings, in Specifications and as required by governing authorities having jurisdiction.

B. Responsibility for time and costs shall be as indicated in schedule below. All time and costs for Contractor's service related to such tests and inspections shall be included in Contract Time and Contract Sum.

C. Notify District and Inspector in writing (and, if provided, on inspection request form provided by District) and, if directed by District, testing and inspection agency, when Work is ready for specified tests and inspections. Deliver this written notification at least 72 hours before the requested inspection date.

D. Pay for all additional charges by testing and inspection agencies and governing authorities having jurisdiction due to the following:
   1. Contractor's failure to properly schedule or notify testing and inspection agency or authorities having jurisdiction.
   2. Changes in sources, lots, or suppliers of products after original tests or inspections.
   3. Changes in means, methods, techniques, sequences, and procedures of construction that necessitate additional testing, inspection, and related services.
   4. Changes in mix designs for concrete and mortar after review and acceptance of submitted mix design.
   5. Contractor submitted requests to change materials or products, which are accepted, but require testing and/or reinspection beyond original design.

E. Tests and special inspections to be paid by District may, where required, include the following: [PM ask A/E to update this section; also, add DSA T&I form to Project Manual]

SECTION	MATERIAL TESTS
03 21 13	Reinforcing steel for concrete and concrete masonry
03 31 00	Concrete slump and strength
04 22 00	Masonry block strength, shrinkage and moisture content
04 22 00	Masonry grout strength
04 22 00	High strength grout strength
04 22 00	Masonry mortar strength
05 12 00	Structural steel bolting and welding
31 63 00	Pile concrete and reinforcing
31 23 33	Trench backfill
31 23 00	Building pad sub-grade and imported fill
31 63 00	Load test pile dowels

SECTION	SPECIAL INSPECTION
03 21 00	Placement of reinforcing steel for concrete and concrete masonry
03 31 00	Placement of cast-in-place concrete
04 20 00	Placement of concrete block and grout
05 12 00	Structural steel fabrication, erection, bolting and welding
07 00 00	Installation of roof membrane
04 20 00	Installation of anchor bolts, dowels embedded in concrete and masonry
To be determined	Installation of adhesive (epoxy) connections
31 63 00	Placement of pile concrete and reinforcement
31 62 00	Pile driving
31 22 00	Site grading, road and parking phase
31 23 00	Trench backfill

SECTION	ENVIRONMENTAL TESTS
To be determined	Storm water runoff sampling
TBD	Construction Noise Monitoring
TBD	Air quality monitoring within occupied spaces

F. Test and Inspection Reports: After each inspection and test, one copy of report shall be promptly submitted to Division of State Architect, District's Representative, or any other consultant District designates, Architect/Engineer, Contractor and any agency having jurisdiction (if required by Code).
   1. Reports shall clearly identify the following:
      a. Date issued.
      b. Project name and number.
      c. Identification of product and Specifications Section in which Work is specified.
      d. Name of inspector.

e. Date and time of sampling or inspection.
f. Location in Project where sampling or inspection was conducted.
g. Type of inspection or test.
h. Date of test.
i. Results of tests.
j. Comments concerning conformance with Contract Documents and other requirements.

2. Test reports shall indicate specified or required values and shall include statement whether test results indicate satisfactory performance of products.
3. Samples taken but not tested shall be reported.
4. Test reports shall confirm that methods used for sampling and testing conform to specified test procedures.
5. When requested, testing and inspection agency shall provide interpretations of test results.

G. Contractor Responsibilities in Inspections and Tests:
1. Unless specified otherwise, notify Inspector, District's Representative, or any other consultant District designates, Architect/Engineer and independent testing and inspection agencies 72 hours in advance of expected time of each test and inspection, and for all other operations requiring inspection and testing services, by submitting Contractor's inspection request in writing (or, if District provides a specific form, on that form).
a. When tests or inspections cannot be performed after such notice, reimburse District for testing and inspection agency personnel and travel expenses incurred due to Contractor's negligence.
2. Deliver to laboratory or designated location, adequate samples of materials proposed to be used that require advance testing, together with proposed mix designs.
3. Cooperate with Inspector, District's Representative, or any other consultant District designates, and District's consultants. Provide access to Work areas and off-Site fabrication and assembly locations, including during weekends and after normal Work hours.
4. Provide incidental labor and facilities to provide safe access to Work to be tested and inspected, to obtain and handle samples at the Site or at source of products to be tested, and to store and cure test samples.
5. Provide, at least fifteen (15) Days in advance of first test or inspection of each type, a schedule of tests or inspections indicating types of tests or inspections and their scheduled dates.

1.8 ADDITIONAL TESTING AND INSPECTION

A. If initial tests or inspections made by the Inspector or District's Representative, or any other consultant District designates reveal that materials do not comply with Title 24, California Code of Regulations or with the Contract Documents, or if District has reasonable doubt that materials do not comply with Title 24, California Code of Regulations or with Contract Documents, additional tests and inspections shall be made as directed.
1. If additional tests and inspections establish that materials comply with Contract Documents, District shall pay all costs for such tests and inspections.
2. If additional tests and inspections establish that materials do not comply with Contract Documents, all costs of such tests and inspections shall be deducted from Contract Sum.
3. If Work requiring inspection is covered by follow-on or follow-up Work before it is inspected, uncover Work so proper inspections can be performed. All costs of such tests and inspections shall be deducted from Contract Sum.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 51 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Temporary Electricity
2. Temporary Communications.
3. Temporary Water
4. Fences
5. Protection of Public and Private Property
6. Temporary Sanitary Facilities
7. Temporary Barriers and Enclosures
8. Water Control
9. Pollution Control
10. Construction Aids
11. Erosion Control
12. Noise Control
13. Traffic Control
14. Removal of Temporary Facilities and Controls

1.2 TEMPORARY ELECTRICITY

Contractor shall provide, maintain, and pay for electrical power at the Site for construction purposes and for Contractor's and Construction Manager's trailers. With the District's consent, power may be obtained from District at no cost to Contractor, but Contractor must provide all necessary wiring and appurtenances for connection to District's system. Contractor must coordinate point of connection with the District.

1.3 TEMPORARY COMMUNICATIONS

Provide, maintain, and pay for all applicable communications and data services (including without limitation telephone, facsimile, e-mail and internet) to field office commencing at time of Project mobilization, including all installation and connection charges. In addition, the Contractor shall provide, maintain and pay for a high speed internet service (minimum DSL) at the Site for both Contractor's field office and Construction Manager's trailer.

1.4 TEMPORARY WATER

A. Provide, maintain, and pay for suitable quality water service required for construction operations.
B. All water required for and in connection with the Work, including without limitation for dust control, shall be furnished by and at the expense of Contractor. Contractor may be allowed to utilize water from the District, with District's approval. However, District does not guarantee availability of this water. Contractor shall furnish necessary pipe, hose, nozzles, meter, and tools and perform all necessary labor to connect to the District's system. Unnecessary waste of water will not be permitted. Special hydrant wrenches shall be used for opening and closing fire hydrants; in no case shall pipe wrenches be used for this purpose.

1.5 FENCES

A. All existing fences affected by the Work shall be maintained by Contractor until Final Completion. Fences which interfere with construction operations shall not be relocated or dismantled until District gives written permission to do so, and the period the fence may be left relocated or dismantled has been agreed upon. Where fences must be maintained across the construction easement, adequate gates shall be installed. Gates shall be kept closed and locked at all times when not in use.
B. On completion of the Work across any tract of land, Contractor shall restore all fences to their original or to a better condition and to their original locations.

1.6 PROTECTION OF PUBLIC AND PRIVATE PROPERTY

A. Contractor shall protect, shore, brace, support, and maintain all underground pipes, conduits, drains, and other underground construction uncovered or otherwise affected by its construction operations. All pavement, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires, fences, and other surface structures affected by construction operations, together with all sod and shrubs in yards, parkways, and medians, shall be restored to their original condition, whether within or outside the easement. All replacements shall be made with new materials.

B. Contractor shall be responsible for all damage to streets, roads, highways, shoulders, ditches, embankments, culverts, bridges, and other public or private property, regardless of location or character, which may be caused by transporting equipment, materials, or workers to or from the Work, Site or any part thereof, whether by Contractor or Subcontractors. Contractor shall make satisfactory and acceptable arrangements with the District, or the agency or authority having jurisdiction over the damaged property, concerning its repair or replacement or payment of costs incurred in connection with the damage.

C. All fire hydrants and water control valves shall be kept free from obstruction and available for use at all times.

1.7 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required temporary buildings with sanitary toilets for use of all workers. At a minimum, sanitary facilities shall be located at trailer site, staging area, and adjacent to work area.

B. Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period, and obscured from public view to the greatest practical extent. If toilets of the chemically treated type are used, at least one toilet will be furnished for each 20 persons. Contractor shall enforce the use of such sanitary facilities by all personnel at the Site.

C. Comply with all minimum requirements of the Health Department or other public agency having jurisdiction; maintain in a sanitary condition at all times.

D. Provide temporary sanitary facilities for Campus and Staff during utility interruptions.

1.8 TEMPORARY BARRIERS AND ENCLOSURES

A. Provide barriers to prevent unauthorized entry to construction areas to allow for District's use of Site, and to protect existing facilities and adjacent properties from damage from construction operations.

B. Provide barricades required by governing authorities for public access to existing buildings.

C. Protect vehicular traffic, stored materials, Site, and structures from damage.

1.9 WATER CONTROL

The following will be performed in accordance with the SWPPP specification, as specified in 1.9 of Section 01 35 00 (Special Procedures).

A. Grade Site to drain.

B. Maintain excavations free of water.

C. Protect Site from puddling or running water.

D. Provide water barriers as required to protect Site from soil erosion.

E. Provide for drainage of storm water and such water as may be applied or discharged on the Site in performance of the Work. Drainage facilities shall be adequate to prevent damage to the Work, the Site, and adjacent property.

F. Clean, enlarge and/or supplement existing drainage channels and conduit as necessary to carry all increased runoff attributable to Contractor's operations. Construct dikes as necessary to divert increased runoff from entering adjacent property (except in natural channels), to protect District's facilities and the Work, and to direct water to drainage channels or conduits. Provide ponding as necessary to prevent downstream flooding.

1.10 POLLUTION CONTROL

The following will be performed in accordance with the SWPPP Specification, as specified in 1.5 of Section 01 35 00(Special Procedures) .

A. Contractor shall prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris, and other substances resulting from construction activities. No sanitary wastes shall be permitted to enter any drain or watercourse other than sanitary sewers. No sediment, debris, or other substance shall be permitted to enter sanitary sewers without authorization of the receiving sanitary sewer service, and all possible Best Management Practices (BMPs) shall be taken to prevent such materials from entering any drain to watercourse.

B. The Contractor shall implement BMPs during construction activities as specified in the California Storm Water Best Management Practices Handbook (Stormwater Quality Task Force, 1993) and/or the Manual of Standards for Erosion and Sediment Control Measures (ABAG, 1995). Erosion and sedimentation control practices shall include installation of silt fences, straw wattle, soil stabilization, revegetation, and runoff control to limit increases in sediment in stormwater runoff, including but not limited to, detention basins, straw bales, silt fences, check dams, geofabrics, drainage swales, and sand bag dikes.

C. In the event that dewatering of excavations is required, Contractor shall obtain the necessary approval and permits for discharge of the dewatering effluent from the local jurisdiction. Contractor shall be responsible for assuring that water quality of such discharge meets the appropriate permit requirements prior to any discharge.

1.11 CONSTRUCTION AIDS

Contractor shall furnish, install, maintain, and operate all construction aids required by it and its Subcontractors in the performance of the Work, except as otherwise provided herein. Such construction aids shall include elevators and hoists, cranes, temporary enclosures, swing staging, scaffolding and temporary stairs. Construction aids shall be furnished without charge to the Subcontractors, and all necessary erection, maintenance, and operating personnel shall be included. In the event of conflict, the contractor furnishing the equipment shall determine priorities in the best interest of the Project.

1.12 EROSION CONTROL

A. GENERAL
Provide all materials, equipment and labor necessary to furnish and install straw wattles, silt fence barriers, hydroseed, or other Best Management Practices (BMP's) at locations shown on the Contractors Storm Water Pollution Prevention Plan.

1. Contractor shall prevent soil erosion on the Site and adjacent property resulting from its construction activities to the maximum extent practical, including implementation of Best Management practices. Effective measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operations that will disturb the natural protection.
2. Work shall be scheduled to expose areas subject to erosion for the shortest possible time, and natural vegetation shall be preserved to the greatest extent practicable. Temporary storage and construction buildings shall be located, and construction traffic routed, to minimize erosion. Temporary fast-growing vegetation or other suitable ground cover shall be provided as necessary to control runoff.

B. STORM WATER POLLUTION PREVENTION PLAN: Prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) tailored to the Contractor's operations, methods and equipment. Comply with State Water Resources Control Board requirements. The SWPPP shall be reviewed and approved by the authority having jurisdiction prior to the start of work. The SWPPP shall be tailored to the contractor's approach to the work in this contract. The Contractor shall as a minimum address:

1. Cut and fill operations
2. Temporary stockpiles
3. Vehicle and equipment storage, maintenance and fueling operations
4. Concrete, plaster, mortar and paint disposal
5. Dust control
6. Tracking of dirt and mud, on and off of site, and adjacent streets.
7. Pipe flushing and protection of drainage facilities both new and existing, on and off site as required by State Water Resources Control Board.

1.13 NOISE CONTROL

A. When required by OSHA Standards, construction workers shall be provided with ear protection to operate equipment.

B. Contractor shall take reasonable measures to avoid unnecessary noise. Such measures shall be appropriate for the normal ambient sound levels in the area during working hours. All construction machinery and vehicles shall be equipped with practical sound-muffling devices, and operated in a manner to cause the least noise consistent with efficient performance of the Work. During construction activities on or adjacent to occupied buildings, and when appropriate, Contractor shall erect screens or barriers effective in reducing noise in the building and shall conduct its operations to avoid unnecessary noise which might interfere with the activities of building occupants.

C. Ensure and provide certification to District that all construction equipment and vehicles used for the Work are:

1. Maintained in good mechanical condition
2. Equipped with properly installed engine mufflers

D. The contractor will take care to minimize construction noise and coordinate construction operations in such a way that construction operations and noise shall not interfere or impact the operations of the College. The District has the authority to shut down contractors operations that are disrupting the College operations with no time or cost impacts for the failure of the contractor to coordinate operations with the District. The following is a partial listing of College events where particular care must be made on the part of the Contractor with regard to Noise Control (See Section 00 73 00 Supplementary Conditions for detailed list):

1. Finals
2. Commencement
3. Large community events

1.14 TRAFFIC CONTROL

All traffic associated with the construction, including without limitation delivery and mail trucks, shall follow the District's approved construction traffic route to and from the project site. Contractor shall provide signs directing construction and delivery traffic along this route. Construction truck traffic may be limited to specific, off-peak traffic hours, as directed by District's Representative. - The Contractor shall provide adequate traffic control measures such as Barricades, Flagmen and Escorts for all construction traffic on College roads, pathways and adjacent areas to the construction site.

1.15 REMOVAL OF TEMPORARY FACILITIES AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials prior to final inspection.
B. Remove underground installations.
C. Clean and repair damage caused by installation or use of temporary work.
D. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 56 00

SITE SECURITY AND SAFETY

PART 1 GENERAL

1.1 SUMMARY

A. Overview
B. Protection
C. Control of Site
D. Site Security
E. Safety Program
F. Safety Requirements
G. Site Safety Officer
H. Additional Safety Controls

1.2 OVERVIEW

A. In order to continue support of our educational mission, the District's campuses and many of its facilities will remain occupied during completion of the Work making Site Security and Safety of paramount importance. Campuses are visited, on a daily basis, by an ever-changing and diverse population. Students, District staff, visitors, the public at large and contractor personnel will encounter real and potential safety hazards on a regular basis. Among this population, knowledge of safety and security hazards varies from considerable to none. This makes the risk of an injury of utmost concern to the District.

For this reason, failure to comply with the requirements of this Section will be considered grounds for the District, or its designated representative, to issue an order suspending work or terminate a contract for cause.

The District, or its designated representative, will also perform safety inspections and may issue a written notice ordering a contractor to correct an unsafe act or condition. If the Contractor fails to correct the unsafe act or condition within the requested time frame, the District or its representative may have the condition corrected and bill the non-compliant contractor for the costs associated with the correction.

B. The General or Prime Contractor shall assume overall responsibility for project safety compliance.

1.3 PROTECTION

A. Continuously maintain protection as necessary to protect the Work, as a whole and in part, and adjacent property and improvements from accidents, injuries or damage.
B. Properly protect the Work:
   1. With lights, guard rails, temporary covers and barricades.
   2. Enclose excavations with proper barricades.
   3. Brace and secure all parts of the Work against storm and accident.
   4. Provide such additional forms of protection that may be necessary under existing circumstances.
C. Provide and maintain in good condition all protective measures required to adequately protect all persons, including students, District staff, contractors and members of the public from hazards resulting from the Work and to exclude unauthorized persons from the Work. When regulated by Building Code, Cal OSHA, or other authority, such legal requirements for protection shall be considered as minimum requirements. Be responsible for the protection in excess of such minimum requirements as required.

1.4 CONTROL OF SITE

Ensure that no alcohol, firearms, weapons, or controlled substance enters or is used at the Site. Immediately and permanently remove from the Site any employee, contractor, subcontractor, vendor or consultant found in violation of this provision.

A. Project Work Site parking will be limited to required work trucks, equipment pick-up/delivery vehicles and material delivery only. The Contractor's employees parking area is specified in Section 00 32 19 (Supplementary Conditions).
B. In addition to any other requirement in the Project Manual, or to enhance any existing requirement in these documents, the Contractor shall be aware of (and furnish and install or otherwise provide) the following:
   a. Access to all existing classrooms must be maintained while isolating the Project Work Site by protective measures. Phasing of the work as (or if) required maintaining access to the buildings shall be a requirement of this Bid.
   b. Isolation of the Project Work Site referenced immediately above shall be-
      i. For exterior work (if any)- through the use of "pre-paneled" 6-foot high chain link fence. Fence panels shall include end clips/brackets with which the individual panels can be made into a "fence section" of indefinite length.
      ii. For interior work (if any)- through the combined use of plywood and plastic sheeting walls constructed to prevent accidental entry to the work area and keep dust from entering occupied areas. Walls shall include end clips/brackets with which the individual panels can be made into a "wall section" of indefinite length.
C. The fencing shall be maintained and relocated when and as necessary to assure staff/student/ visitor safety while maintaining a positive isolation barrier between the public and the Project Work Site.
D. The contractor shall be responsible for posting, and maintaining, no less than the following construction site signage: CAUTION CONSTRUCTION; HARD HAT AREA; AND KEEP OUT. In the event that the Contractor's insurance carrier mandates that additional safety signs be posted, this contractor shall post and maintain those signs also.
E. Construction Site signage shall be posted at the entries/exits from the buildings, at every chain link fence corner and in fence line "straight runs" as necessary to assure that the distance between signs does not exceed 500 linear feet.

1.5 SITE SECURITY

A. As part of the Work included within the Contract Price, Contractor shall take and be fully responsible for all measures required to protect and maintain the security of persons, existing facilities and property at the Site, including without limitation preventing theft, loss, vandalism and improper concealment of personal property of the District and all persons lawfully present on the Site, and including times where workers are not present on the Site. Contractor's measures shall include, at a minimum, maintaining a log of all persons entering and leaving the Site and who they represent, what they are delivering and to whom.
B. No claim shall be made against District by reason of any act of an employee or trespasser, and Contractor shall repair all damage to District's property resulting from Contractor's failure to provide adequate security measures.
C. Contractor shall maintain a lock on the Construction access gate at all times. Contractor shall appoint one person to monitor the gate and maintain the sign-in/out list, with person's name, company, reason for entering, what they are delivering, time and date. Alternatively, Contractor shall provide a full-time guard at the gate at all times to control access and maintain the sign-in/out list. The sign in/out list shall be available to District at anytime upon request.
D. Contractor shall supply additional security fencing, barricades, lighting, and other security measures as required to protect and control the Site.

1.6 SAFETY PROGRAM

A. Within fifteen (15) days after Notice to Proceed, submit a Safety Program that has been reviewed and approved by an Industrial Hygienist certified by the American Board of Industrial Hygiene or a Certified Safety Professional. The Safety Program shall include the name, certification number, and certification seal of the Industrial Hygienist or Certified Safety Professional. Comply with the Safety Program and all applicable federal, state, and local regulation codes, rules, law and ordinances.
B. Receipt and/or review of the Safety Program by District, Engineer or District's representative shall not relieve Contractor of any responsibility for complying with all applicable safety regulations.
C. It is essential that Contractor and each Subcontractor implement an effective and vigorous Safety and Health Program to cover their respective portions of the Work. Subject to Contractor's overall responsibility for Project safety, it shall be understood that the full responsibility for providing a safe place to work with respect to their respective portions of the Work rests with Contractor and each individual Subcontractor.
D. Safety Program components:

1. Injury and Illness Prevention Program (IIPP): Conforming to the General Industrial Safety Orders (CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 3203), and the California Labor Code (Section 6401.7).
2. Site-Specific Safety and Health Plan (SSHP): Describing health and safety procedures that shall be implemented during the Work in order to ensure safety of the public and those performing the Work. Follow the guidelines for a SSHP listed in CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 5192, Item (b) (4) f.
3. Confined Space Program: District will provide Contractor with any available information regarding permit space hazards, entry operations, and safety information relating to work in the permit spaces as set forth in the General Industrial Safety Orders (CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 5157). Permit space entry is allowed only through compliance with a permit space program meeting the requirements of Section 5157 of the General Industrial Safety Orders. During entry operations, or at the conclusion of entry operations, verbally notify Engineer of the permit space program followed and of any hazards confronted or created in permit spaces during entry operations.
4. Emergency Response Plan (ERP): Describe procedures that shall be implemented in the event an incident or emergency occurs at the Project Site. The ERP should model multiple incident scenarios (e.g. minor injury, earthquake, fatality, fire, etc.). Special attention should be paid to Project Site access/egress and contractor personnel evacuation/staging areas. The District will provide contact information for designated internal staff.

E. The wearing of hard hats shall be mandatory at all times for personnel on Site. Supply sufficient hard hats to equip properly all employees and visitors.

F. Whenever an exposure exists, appropriate personal protective equipment (PPE) shall be used by all affected personnel. Supply PPE to all personnel under Contractor's direction.

1.7 SAFETY REQUIREMENTS

A. Standards: Maintain the Project in accordance with state and local safety and insurance standards.

B. Hazards Control:
1. Store volatile wastes in covered metal containers and remove from premises daily.
2. Prevent accumulation of wastes that create hazardous conditions.
3. Provide adequate ventilation during use of volatile or noxious substances.

C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
1. Do not burn or bury rubbish or waste material on the Site.
2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
3. Do not dispose of wastes into streams or waterways.

D. Provide accident information on the forms provided by Contractor. This information shall be provided on the same day as the occurrence of said incident.

E. The District, or its designated representative, must be notified of all contractor injuries in accordance with the timeline established by Cal-OSHA/OSHA. Injuries, no matter how minor, to students, District staff or the public at large must be reported to the District immediately. All incidents resulting in damage to District property or third-party must be reported to the District immediately. Damage to contractor property must be reported within 12 hours if Contractor expects to file a claim against the District or OCIP.

F. Contractors must make their employees, agents, contractors, subcontractors, vendors and officers available for post-incident investigations.

G. Contractors must make the involved employees, agents, contractors, subcontractors, vendors and officers available for post-incident/injury drug screening. Those employees failing the test will be removed permanently from the job site. The District will bear the cost of these tests.

1.8 SITE SAFETY OFFICER

A. Designate one of Contractor's staff as "Site Safety Officer" whose duties shall include the responsibility for enforcing the environmental protection provisions of the Contract Documents including safety and health, the requirements of the Occupational Safety and Health Act, and other applicable federal, state and local standards. Submit for review by District Contractor's intended traffic flow plan, security plan, program for temporary structures, housecleaning plan, demolition program, and environmental safety and health plan. After review by District, the implementation and enforcement of these plans shall become the responsibility of the Site Safety Officer. Any changes in the plans shall be requested by Contractor through the Site Safety Officer for written concurrence by District.

B. District's risk management representative(s) shall be allowed access to accident/injury and illness reports, inspection reports, scheduling and construction meetings, and safety meetings.

1.9 ADDITIONAL SAFETY CONTROLS

A. According to industry practices, it is the responsibility of all contractors of every tier to exercise reasonable care to prevent work-related injuries, property and equipment damage at the Project site, as well as minimize risk to the third-party persons and property. All contractors shall undertake loss control prevention practices according to those requirements set by federal, state and local laws, statutes and specific project procedures developed for this Project.

B. In the event of an accident it will be the responsibility of all contractors of every tier to see that injured workers or third-parties are given immediate medical treatment and that all medical and/or claim forms are filed with the appropriate authorities.

C. Contractors and subcontractors participating in the project will be expected to comply with the following safety and loss control requirements:

1. All subcontractors shall identify their contact person(s) to the General or Prime Contractor.
2. All contractors and subcontractors shall follow District procedures regarding dealing with the media.
3. All construction employees will be required to be attired in workpants, shirt and appropriate boots or closed toe shoes.
4. Alcohol is prohibited on District property at all times.
5. Smoking Policy: It is the policy of San Mateo County Community College District to provide a safe learning and working environment for both students and employees. It is recognized that smoke from cigarettes, pipes and/or cigars is hazardous to health; therefore, it is the intent of the District to provide a smoke-free environment to the greatest extent possible. To achieve this goal, the District limits smoking on District property to outdoor areas only, at a minimum of twenty (20) feet away from any doorway, entrance to an indoor facility, or fresh air intake vent. Smoking is prohibited in all indoor locations within the District. The sale or distribution of cigarettes or other smoking material is also prohibited.
    a. Contractor shall develop and enforce a smoking policy within work site area(s) that is in alignment with District's smoking policy. Contractor shall prohibit smoking in existing buildings that are under renovation. Contractor shall prohibit smoking in new buildings under construction no later than when the roof and exterior walls have been installed.
    b. Skyline College: Outside of the work site(s), smoking is prohibited except in designated smoking areas on the campus.
6. Contractors will be required to respond to all District complaints about objectionable levels of dust or noise and will be required to provide the appropriate abatement as quickly as possible.
7. Construction personnel cannot enter District grounds other than the construction site unless accompanied by District personnel, and are allowed only 'incidental' contact with students. Violations of these requirements by any construction employee will result in a mandatory background check of that employee – including fingerprinting – as required by state law.
8. Fall protection is mandatory on all projects in accordance with CAL OSHA, OSHA and any other appropriate code.
9. A site specific Injury and Illness Prevention Program shall be available on site with the General or Prime Contractor. All contractors shall abide by this program.
10. Personal radios, headsets, walkmans, I-pods and CD players are not allowed on the job-site.
11. All contractors and subcontractors must attend a pre-construction safety meeting.
12. No sexual reference or preference shall be permitted on any piece of clothing or the hardhat. Any employee observed disregarding this policy shall be removed from the job site until further notice.
13. All contractors' employees shall park in their designated parking area. Any sticker attached to the employees' vehicle that displays any form of sexual preference or reference shall be removed prior to parking at the site. Each employee will provide their license plate number to the General or Prime Contractor. Any employee disregarding this policy shall be removed from the site until further notice.

14. All contractors shall control the break time activities of the employees to assure the cleanup of all soda cans, food wrappers, plastic bottles, or food containers from the break area. Such areas shall be cleaned immediately after the break and all waste placed in trash receptacles. No glass containers are permitted on the site.
15. Theft or willful damage to any property of the District, student, or other contractors will be prosecuted fully.
16. No guns, switchblades, or knives with blades greater than two inches shall be allowed on the job site. Any employee disregarding this policy shall be removed from the site until further notice.
17. All contractors will advise non-English speaking employees in their native language either in a written format or via an interpreter of these policies.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 58 00

PROJECT IDENTIFICATION AND SIGNS

[PM – determine what signs should be provided by Contractor; delete and state "N/A" for signs that will not be required. If no project signage is to be provided by Contractor, do not include this Section in the Project Manual.]

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Project identification signs
2. Bronze plaque
3. Maintenance
4. Removal

B. Related Sections
1. Section 01 10 00: Summary of Work
2. Section 01 32 19: Submittal Procedures

1.2 QUALITY ASSURANCE

A. Design project identification signage and structure(s) to withstand 50 miles/hr wind.
B. Sign Manufacturer/Maker: Experienced as a professional signage company for a minimum of five years.
C. Project identification signs shall be constructed of new materials.
D. Finishes: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.3 SUBMITTALS

A. Submit shop drawings under provisions of Section 01 32 19 - Submittal Procedures.
B. Show content, layout, lettering style, lettering size, and colors. Make sign and lettering to scale, clearly indicating condensed lettering, if used.
C. Show proposed location(s) for signage.

PART 2 PRODUCTS

2.1 CONTRACTOR-PROVIDED PLYWOOD PROJECT IDENTIFICATION SIGNAGE [PM - for new construction projects only; for most renovation projects, state "N/A", unless the renovation will effect a significant exterior modification to the building (e.g., a new elevator tower, or an addition to the building]

A. Provide three painted signs, 48 sq. feet, bottom of signage no less than 4 feet above ground.
B. Content and composition:
1. "BUILDING TODAY FOR EDUCATION TOMORROW" across the top of each sign.

2. "Facilities Excellence" across the bottom of each sign.
3. A District Department name and number for more information or emergency response.
4. Name of Project.
5. Name of District and name of College, including logos.
6. Names and roles of Architect and any consultants specified by District.
7. Name of Prime Contractor.
8. New construction projects shall include Architect's artistic rendering of the building(s).
9. The information telephone number of the Construction Planning Department is centered near the bottom of the area with the blue background.
10. Graphic Design, Colors, Style of Lettering: to be determined in coordination with District's Representative.

C. Sign Materials

1. Structure and Framing: New, wood, structurally adequate.
   a) Sign Posts: Use 4-inch by 4-inch pressure treated wood posts, 9 feet long for skid mounting and 12 feet long minimum for in-ground mounting.
   b) Skid Bracing: 2-inch by 4-inch wood framing material.
   c) Skid Members: 2-inch by 6-inch wood framing material.
2. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum ¾ - inch thick, no joints. Use full-size 4-foot by 8-foot sheet
3. Rough Hardware: Galvanized steel fasteners
   a) Use 1/2-inch by 5-1/2-inch button head carriage bolts to attach sign to posts.
   b) Secure with nuts and flat head washers.
   c) Cover button heads with white reflective film or paint to match sign background.
4. Paint and Primers: Exterior quality, two coats.
   a) White paint used to prime surfaces and to resist weathering shall be an industrial grade, fast-drying, oil-based paint with gloss finish.
   b) Paint all sign surfaces with this weather-protective paint prior to adding any adhesive applications.
   c) Sign background of color as selected.
   d) Lettering of contrasting colors as selected.

2.2 OWNER-PROVIDED LAMINATED PROJECT IDENTIFICATION SIGNAGE [PM - for all projects]

A. Owner will provide three poster-sized, laminated signs, approximately 12 sq. feet, for Contractor to install.

B. Content and composition of signage to be determined by Owner. The intent of the signage is to inform the college community of the project. Content may include the following:

1. "BUILDING TODAY FOR EDUCATION TOMORROW" across the top of each sign.
2. "Facilities Excellence" across the bottom of each sign.
3. A District Department name and number for more information or emergency response.
4. Name of Project.

5. Name of District and name of College, including logos.
6. Names and roles of Architect and any consultants specified by District.
7. Name of Prime Contractor.
8. New construction projects shall include Architect's artistic rendering of the building(s).
9. The information telephone number of the Construction Planning Department is centered near the bottom of the area with the blue background.
10. Graphic Design, Colors, Style of Lettering: to be determined.

B. Sign Materials
1. Poster paper, laminated. Metal grommets at each corner, for mounting.
2. Mounting Hardware:
a) Use plastic tie wraps to secure the signage to the construction site perimeter chain link fence, at location(s) to be identified by Owner's construction manager.
b) Use clear tape to secure the signage to surfaces where tie wraps will not work.

2.3 BRONZE PLAQUE [PM - for new construction projects only; for renovation projects, state "N/A"]

A. Provide one bronze plaque, installed on building exterior, exact location to be determined by District when shop drawing is submitted for review. Anchor studs shall be concealed on back of plaque. Size: ¾" thick x 24" x 20" with ½" radius corners. Raised letters.

B. Content and composition:
a. An inspirational quote, not to exceed 250 characters.
b. Name of Project.
c. Date.
d. Name of College and/or District.
e. Names of six members of the Board of Trustees.
f. Name and title of one College President.
g. Name and title of one District Chancellor.
h. Name and roles of Architect and Contractor, or Design-Builder.
i. Graphic Design, Style of Lettering: to be determined in coordination with District's Representative.

B. Sign Materials: Plaque shall be solid bronze.

PART 3 EXECUTION

3.1 INSTALLATION

A. Plywood Project Identification Signage
a. Install project identification signage within twenty-one (21) days after date of Notice to Proceed.
b. Place signs at locations as directed by the District representative. The District representative will provide sign placement instructions at the preconstruction meeting.
i. Position the sign in such a manner as to be fully visible and readable to the general public.
ii. Erect sign level and plumb.

c. Post-mounted signs are preferred, but skid-mounted signs are allowed, especially for projects with noncontiguous locations where work progresses from one location to another. The skid structure shall be designed so that the sign will withstand a 60-mile-per-hour wind load directly to the face or back of the sign. Use stakes, straps, or ballast. Approval of the use of skid-mounted signs shall not release the Contractor from responsibility of maintaining project identification signage on the project site and shall not make the District responsible for security of such signs.

B. Laminated Project Identification Signage
   a. Install project identification signage within twenty-one (21) days after date of Notice to Proceed.
   b. Place signs at locations as directed by the District representative. The District representative will provide sign placement instructions at the preconstruction meeting.
      i. Position the sign in such a manner as to be fully visible and readable to the general public.
      ii. Erect sign level and plumb.

C. Bronze Plaque
   a. Install backing to support bronze plaque on building exterior wall.
   b. Use decorative finish hardware or fully concealed hardware, as directed by Architect.

3.2 MAINTENANCE AND REMOVAL OF PROJECT IDENTIFICATION SIGNAGE

A. Project identification signs shall be maintained to present a clean and neat look throughout the project duration. Maintain signs and supports, keep clean, repair deterioration and damage.

B. Remove signs, framing, supports and foundations at completion of Project and restore the area to a condition equal to or better than before construction.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

1.1 SECTION INCLUDES

A. Products
B. Product Options and Substitutions
C. Product Delivery Requirements
D. Shipping Requirements
E. Product Storage and Handling Requirements

1.2 PRODUCTS

A. Products: New material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
C. For similar components, provide interchangeable components of the same manufacturer.

1.3 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Summary: This paragraph 1.3 describes procedures for selecting products and requesting substitutions of unlisted materials in lieu of materials named in the Specifications or approved for use in Addenda that were not already the subject of a Document 00 43 25 (Substitution Request) submittal as provided in Document 00 11 19 (Instructions to Bidders).
B. Contractor's Options:
   1. For products specified only by reference standard: Select any product meeting that standard.
   2. For products specified by naming one or more products or manufacturers:
      a. Select products of any named manufacturer meeting specifications.
      b. If product becomes unavailable due to no fault of Contractor, submit Request for Substitution (RFS), including all information contained in this Section 01 60 00 and a fully executed Document 00 43 25 (Substitution Request), but using the term "Contractor" each place the term "Bidder" appears in that form.
C. Substitutions:
   1. Except as provided in Document 00 11 19 (Instructions to Bidders) with respect to "or equal" items, District will consider Contractor's substitution requests only when product becomes unavailable due to no fault of Contractor. Requests for review of proposed substitute items will not be accepted from anyone other than Contractor. The RFS shall state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice Contractor's achievement of Substantial Completion on time, and whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with District for work on the Project).
   2. Submit separate RFS (and four copies) for each product and support each request with:
      a. Product identification.
      b. Manufacturer's literature.
      c. Samples, as applicable.
      d. Name and address of similar projects on which product has been used, and dates of installation.
      e. Name, address, and telephone number of manufacturer's representative or sales engineer.
      f. For construction methods: Detailed description of proposed method; drawings illustrating methods.
   3. Where required, itemize a comparison of the proposed substitution with product specified and list significant variations including, but not limited to dimensions, weights, service requirements, and functional differences. If variation from product specified is not pointed out in submittal, variation will be rejected even though submittal was favorably reviewed. Identify all variations of the proposed substitute from that specified in the RFS and indicate available maintenance, repair, and replacement service.

4. State whether the substitute will require a change in any of the Contract Documents (or provisions of any other direct contract with District for work on the Project) to adapt the design of the proposed substitute, and whether or not incorporation or use of the substitute in connection with Work is subject to payment of any license fee or royalty. Submit data relating to changes in construction schedule.
5. Include accurate cost data comparing proposed substitution with product and amount of net change in Contract Sum including, but not limited to, an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by District in evaluating the proposed substitute. District may require Contractor to furnish additional data about the proposed substitute.
6. District will not consider substitutions which are for the Contractor's convenience, for acceptance (or, in District's sole discretion, District may make Contractor solely responsible for all resulting costs, expenses and other consequences) when a substitution:
   a. Results in delay meeting construction Milestones or completion dates.
   b. Is indicated or implied on submittals without formal request from Contractor.
   c. Is requested directly by Subcontractor or supplier.
   d. Acceptance will require substantial revision of Contract Documents.
   e. Disrupts Contractor's job rhythm or ability to perform efficiently.
7. Substitute products shall not be ordered without written acceptance of District.
8. District will determine acceptability of proposed substitutions and reserve right to reject proposals due to insufficient information.
9. Accepted substitutions will be evidenced by an approved Substitution Request Form. All Contract Documents requirements apply to Work involving substitutions.

D. Contractor's Representation and Warranty:
   1. Contractor's RFS constitute a representation and warranty that Contractor:
      a. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
      b. Will provide the same warranty for substitution as for specified product.
      c. Will coordinate installation and make other changes that may be required for Work to be complete in all respects.
      d. Waives claims for additional costs which may subsequently become apparent.
   2. Will compensate District for additional redesign costs associated with substitution. For substitutions made for the contractors convenience the contractor will be responsible for all costs pertaining to substitution request.
      a. Pay all costs incurred by the District associated with acceptance of substitutions including, but not limited to design, review and management activities.
      b. Will be responsible for Construction Schedule slippage due to substitution.
      c. Will be responsible for Construction Schedule delay due to late ordering of available specified products caused by requests for substitution that are subsequently rejected by District.
      d. Will compensate District for all costs; including extra costs of performing Work under Contract Documents, extra cost to other contractors, and any claims brought against District, caused by late requests for substitutions or late ordering of products.

E. District's Duties:
   1. Review Contractor's RFS with reasonable promptness.
   2. Notify Contractor in writing of decision to accept or reject requested substitution.

F. Administrative Requirements:
   1. Specified products, materials, or systems for Project may include engineering or on-file standards required by the regulatory agency. Contractor's substitution of products, materials or systems may require additional engineering, testing, reviews, approvals, assurances, or other information for compliance with regulatory agency requirements or both.
   2. Provide all agency approvals or other additional information required and Contractor shall pay additional costs for required redesign, inspection, etc. For substitutions made for the Contractors convenience the Contractor will be responsible for all costs pertaining to substitution request.

1.4 PRODUCT DELIVERY REQUIREMENTS

A. Deliver products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

1.5 SHIPPING REQUIREMENTS

A. Preparation for Shipment. All equipment shall be suitably packaged to facilitate handling and to protect against damage during transit and storage. All equipment shall be boxed, crated, or otherwise completely enclosed and protected during shipment, handling, and storage. All equipment shall be protected from exposure to the elements and shall be kept dry at all times.
   1. Painted and coated surfaces shall be protected against impact, abrasion, discoloration, and other damage. Painted and coated surfaces which are damaged prior to acceptance of equipment shall be repainted to the satisfaction of District.
   2. Grease and lubricating oil shall be applied to all bearings and similar items.

B. Shipping. Before shipping each item of equipment shall be tagged or marked as identified in the delivery schedule or on the Shop Drawings. Complete packing lists and bills of material shall be included with each shipment.

1.6 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Store products only in staging area per provisions of Section 01 10 00 (Summary of Work).
B. Handle, store, and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate-controlled enclosures.
C. For exterior storage of fabricated products, place on appropriate supports, above ground.
D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
E. Store loose granular materials on solid flat surfaces in a well-drained area.
F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.
H. Without limiting the foregoing:
   1. Contractor shall bear the responsibility for delivery of equipment, spare parts, special tools, and materials to the Site and shall comply with the requirements specified herein and provide required information concerning the shipment and delivery of the materials specified in Contract Documents. These requirements also apply to any subsuppliers making direct shipments to the Site. Acceptance of the equipment shall be made only after it is installed, tested, placed in operation and found to comply with all the specified requirements.
   2. All items shall be checked against packing lists immediately on delivery to the Site for damage and for shortages. Damage and shortages shall be remedied with the minimum of delay.
   3. No metalwork (miscellaneous steel shapes and reinforcing steel) shall be stored directly on the ground. Masonry products shall be handled and stored in a manner to hold breakage, chipping, cracking, and spalling to a minimum. Cement, lime, and similar products shall be stored off the ground on pallets and shall be covered and kept completely dry at all times. Pipe fittings and valves may be stored out of doors, but must be placed on wooden blocking. PVC pipe, geomembranes, plastic liner, and other plastic materials shall be stored off the ground on pallets and protected from direct sunlight.
   4. Electrical equipment and all equipment with antifriction or sleeve bearings shall be stored in weathertight structures maintained at a temperature above 60°F. Electrical equipment controls, and insulation shall be protected against moisture and water damage. All space heaters furnished in equipment shall be connected and operated continuously.
   5. Equipment having moving parts such as gears, bearings, and seals, shall be stored fully lubricated with oil, grease, etc., unless otherwise instructed by the manufacturer. Manufacturer's storage instructions shall be carefully followed by Contractor.
   6. When required by the equipment manufacturer, moving parts shall be rotated a minimum of twice a month to ensure proper lubrication and to avoid metal to metal "welding". Upon installation of the equipment, Contractor shall, at the discretion of District, start the equipment at one-half load for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.
   7. When required by the equipment manufacturer, lubricant shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment by Contractor at the time of acceptance.

8. Equipment and materials shall not show any pitting, rust, decay, or other deleterious effects of storage when installed in the Work.
9. In addition to the protection specified for prolonged storage, the packaging of spare units and spare parts shall be for export packing and shall be suitable for long-term storage in a damp location. Each spare item shall be packed separately and shall be completely identified on the outside of the container.
10. Handling. Stored items shall be laid out to facilitate their retrieval for use in the Work. Care shall be taken when removing the equipment for use to ensure the precise piece of equipment is removed and that it is handled in a manner than does not damage the equipment.
11. Contractor is to complete, and if necessary develop, maintenance forms for each piece of major equipment installed and/or stored until project close out. Maintenance forms are to document the recommended preventive maintenance as specified by the manufacturer of the equipment. Each completed form shall document no more than one piece of equipment. The make, model and serial number of each piece of equipment and the date it was purchased and delivered will be noted in the top right corner of each form. Maintenance forms will be completed at least monthly, according to the manufacturers' recommendations, beginning no later than thirty (30) days from purchase/delivery of the equipment. Copies of these maintenance forms are to be submitted with each pay application, matching the date range of the pay application. At project close a complete set of original maintenance forms are to be 3-hole punched, organized chronologically by equipment make, model and serial number, and will be submitted to the District's Representative no more than thirty (30) days after the date of Substantial Completion. See Section 01 10 00 (Summary of Work) for the list of equipment to which this applies.

PART 2 PRODUCTS - NOT USED.

PART 3 EXECUTION - NOT USED.

END OF SECTION

SECTION 01 74 00

CLEANING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Progress Cleaning
B. Final Cleaning

1.2 PROGRESS CLEANING

A. Contractor shall perform periodic cleaning to ensure that any streets and other District and public properties are maintained free from accumulation of waste materials, dust, mud, and debris.
B. Where required, Contractor shall wet down surfaces to lay dust and prevent the blowing of dust to nearby residences or public properties.
C. Contractor shall keep all streets clean and free of dust, mud, and debris resulting from Contractor's operations. Daily cleanup throughout the job will be necessary as Contractor progresses with its Work, but extra attention to cleanup shall be made prior to weekends and holidays. Without limiting the foregoing, Contractor shall remove trench spoil along traveled ways daily; grade and vacuum broom surfaces initially where applicable and later water flush with high-pressure sprays, being careful to avoid downstream contamination.
D. All dust, mud, spoils, and construction debris shall be removed daily from all roadways, ditches, shoulders, and private property (fills or spoils placed on private property at private property owner's written request excepted).
E. Disposal of Materials:
    1. As part of the scope of Work included within the Contract Sum, Contractor shall be fully responsible for disposing of all construction debris, dirt and spoils resulting from the Work.
    2. All waste materials, debris, dirt and rubbish shall be disposed of at sites to be chosen by Contractor in accordance with applicable local, state, and federal regulations.
    3. Contractor is cautioned that the County of San Mateo and cities within the county have regulations governing the disposal of rubble, broken pavement, and similar materials.
    4. Contractor shall become familiarized with the requirements of the agency having jurisdiction over any contemplated disposal site and shall comply with all such requirements.
    5. The contractor shall estimate, log and submit regular reports to the District, an estimate of quantities (e.g. tonnage) of waste materials disposed of for compliance with AB75. Documentation requirements including the nature of materials, destination, volume and tonnage, shall be submitted as follows:
        a. Up-to-date copies of the Waste Reporting Log (Exhibit A of this Section 01 74 00) shall be submitted with each payment application per Section 01 29 00 (Measurement and Payment) paragraph 1.7.C.8.
        b. The Contractor shall submit a cumulative report summarizing the nature of materials, destination, volume and tonnage of materials disposed for the preceding calendar year to the District's Representative by January 31st of each year or at the end of the project as part of the contract closeout.
F. All excess soil from performance of Work shall be disposed at sites to be chosen by Contractor in accordance with applicable local, state, and federal regulations. If Contractor elects to dispose of soil on any private property, prior to any dumping, a letter allowing such dumping shall be obtained from the property owner and presented to District. Contractor is advised that the property owner is required to obtain a fill permit from the applicable government agency (ies). In addition, placement of fill in wetland areas is subject to permit procedures of the US Army Corps of Engineers. At the completion of Work, a letter from each affected property owner will be required releasing Contractor, San Mateo County, District and any District consultant from future liability.
G. If Contractor does not properly clean the Site, in the opinion of District, then District shall have the option of using outside equipment to perform the cleanup and such cost will be withheld from the Contract Sum.
H. Contractor will take care to mitigate dust during interior renovation activities through proper use of dust controls. Dust controls will include, but not be limited to: dust barricades, walk-off mats, negative air machines and daily custodial clean-up employed by the Contract and at not additional cost to the District

1.3 FINAL CLEANING

A. Contractor shall execute final cleaning prior to final inspection, using only properly skilled workers.
B. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from exposed interior and exterior finished surfaces.
C. Repair, patch, and touch up marred surfaces to match adjacent finishes.
D. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
E. Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment operated during construction, clean ducts, blowers and coils of units operated without filters during construction.
F. Clean Site; mechanically sweep paved areas.
G. Remove waste and surplus materials, rubbish, and construction facilities from Site.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

WASTE REPORTING LOG FOLLOWS ON NEXT PAGE

EXHIBIT A

WASTE REPORTING LOG

[__] **PROJECT**
Contract Number [__]

To: The San Mateo County Community College District
Attention: [Point of Contact]
[Insert POC address]
Telephone: (650) [_____] **Fax:** (650) [_____]

From: _____
_____
_____

DISPOSAL DATE	NATURE OF MATERIALS DISPOSED	DESTINATION	VOLUME	TONNAGE	% RECYCLED

- Per Section 01 29 00 (Measurement and Payment) paragraph 1.7.C.8. a current and up-to-date copy of this log is to be submitted with each Application for Payment.

- Per Section 01 74 00 (Cleaning) paragraph 1.2.E.5 a summary report for each calendar year shall be submitted to the District's Representative by January 31st of each year or at the end of the project as part of the contract closeout. The data shall be summarized by 'Nature of Materials Disposed' and 'Destination' for the entire calendar year.

SECTION 01 76 01

EXISTING UNDERGROUND FACILITIES

PART 1 GENERAL

1.1 PUBLIC FACILITIES AFFECTED

A. Where overhead service to a structure, known to receive service, does not exist, then underground service shall be assumed to exist.

B. Contractor's attention is directed to the existence of underground sewer, water, gas, power, telephone, and cable lines and other utilities within the areas in which Work is to be performed. Contractor shall, at least 2 Business Days, or as otherwise noted, prior to commencement of excavation, notify the following owners of these Underground Facilities:

1. Water/sewer/drainage lines: District
2. Cable: District
3. Buried electrical Lines: District

1.2 PRIVATE FACILITIES AFFECTED

No attempt has been made to locate private utilities on private property such as sprinkler irrigation systems or electrical conduits. Contact the property owners prior to construction.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 77 00

CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Description of contract closeout procedures including:
      a. Removal of Temporary Construction Facilities
      b. Substantial Completion
      c. Final Completion
      d. Final Cleaning
      e. Project record documents
      f. Contractor shall comply with all applicable requirements in Section 01 78 39 (Project Record Documents).
      g. Project Guarantee
      h. Warranties
      i. Turn-In
      j. Release of Claims
      k. Fire Inspection Coordination
      l. Building Inspection Coordination

1.2 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES

A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.
B. Clean and repair damage caused by installation or use of temporary facilities.
C. Restore permanent facilities used during construction to specified condition.
D. Comply with paragraph 1.12 of Section 01 51 00 (Temporary Facilities and Controls).

1.3 SUBSTANTIAL COMPLETION

A. When Contractor considers Work or designated portion of the Work as Substantially Complete, submit written notice to District's Representative, with list of items remaining to be completed or corrected.
B. Within reasonable time, District's Representative will inspect to determine status of completion.
C. Should District's Representative determine that Work is not Substantially Complete, District will promptly notify Contractor in writing, listing all defects and omissions.
D. Remedy deficiencies and send a second written notice of Substantial Completion. District will reinspect the Work. If deficiencies previously noted are not corrected on reinspection, then Contractor shall pay District's cost of the reinspection.
E. When District's Representative determines that Work is Substantially Complete, District will issue a Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified by District.
F. Manufactured units, equipment and systems that require startup must have been started up and run for periods prescribed by District before a Certificate of Substantial Completion will be issued.
G. A punch list examination will be performed upon Substantial Completion. One follow-up review of punch list items for each discipline will be provided. If further Site visits are required to review punch list items due to incompleteness of the Work by Contractor, Contractor will reimburse District for costs associated with these visits.
H. District may enlist Consultants to assist with the above activities.

1.4 FINAL COMPLETION

A. Final Completion occurs when Work meets requirements for District's Final Acceptance. When Contractor considers Work is Finally Complete, submit written certification that:

1. Contractor has inspected Work for compliance with Contract Documents, and all requirements for Final Acceptance have been met.
2. Except for Contractor maintenance after Final Acceptance, Work has been completed in accordance with Contract Documents and deficiencies listed with Certificate of Substantial Completion have been corrected. Equipment and systems have been tested in the presence of District, and are operative.
3. Work is complete and ready for final inspection.

B. In addition to submittals required by Contract Documents, provide submittals required by governing authorities and submit final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.

C. When District's Representative find Work is acceptable and final closeout submittals are complete, District's Representative will issue final Change Order reflecting approved adjustments to Contract Sum not previously made by Change Order. Should District determine that Work is incomplete or defective:
1. District promptly will so notify Contractor, in writing, listing the incomplete or defective items.
2. Promptly remedy the deficiencies and notify the District when it is ready for reinspection.
3. When District determines that the Work is acceptable under the Contract Documents, District will request Contractor to make closeout submittals.

D. Final adjustments of accounts:
1. Submit a final statement of accounting to District, showing all adjustments to the Contract Sum and complete and execute Document 00 65 73 (Agreement and Release of Any and All Claims).
2. If so required, District shall prepare a final Change Order for submittal to Contractor, showing adjustments to the Contract Sum that were not previously made into a Contract Modification.

E. District may enlist Consultants to assist with the above activities.

1.5 FINAL CLEANING

Contractor shall comply with all applicable requirements in Section 01 74 00 (Cleaning).

1.6 PROJECT RECORD DOCUMENTS

Contractor shall comply with all applicable requirements in Section 01 78 39 (Project Record Documents).

1.7 PROJECT GUARANTEE

A. Requirements for Contractor's guarantee of completed Work are included in Article 9 of Document 00 71 00 (General Conditions). Guarantee Work done under Contract against failures, leaks, or breaks or other unsatisfactory conditions due to defective equipment, materials, or workmanship, and perform repair work or replacement required, at Contractor's sole expense, for period of one year from date of Final Acceptance.

B. Neither recordation of Final Acceptance nor final certificate for neither payment nor provision of the Contract or partial or entire use or occupancy of premises by District shall constitute acceptance of Work not done in accordance with Contract Documents nor relieve Contractor of liability in respect to express warranties or responsibility for faulty materials or workmanship.

C. District may make repairs to defective Work as set forth in Document 00 71 00 (General Conditions).

D. If, after installation, operation, or use of materials or equipment to be provided under Contract proves to be unsatisfactory to District, District shall have right to operate and use materials or equipment until said materials and equipment can, without damage to District, be taken out of service for correction or replacement. Period of use of defective materials or equipment pending correction or replacement shall in no way decrease guarantee period required for acceptable corrected or replaced items of materials or equipment.

E. Nothing in this Section shall be construed to limit, relieve, or release Contractor's, Subcontractors', and equipment suppliers' liability to District for damages sustained as result of latent defects in equipment caused by negligence of suppliers' agents, employees, or Subcontractors. Stated in another manner, warranty contained in the Contract Documents shall not amount to, nor shall it be deemed to be, waiver by District of any rights or remedies (or time limits in which to enforce such rights or remedies) it may have for defective workmanship or defective materials under laws of this State pertaining to acts of negligence.

1.8 WARRANTIES

A. Execute Contractor's submittals and assemble warranty documents, and installation, operations and maintenance manuals described in Section 01 32 19 (Submittal Procedures), executed or supplied by Subcontractors, suppliers, and manufacturers.
   1. Provide table of contents and assemble in 8½ inches by 11 inches three-ring binder with durable plastic cover, appropriately separated and organized.
   2. Include contact names and phone numbers for District personnel to call during warranty period.
   3. Assemble in Specification Section order.

B. Submit material prior to final application for payment.
   1. For equipment put into use with District's permission during construction, submit within 14 Days after first operation.
   2. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within 14 Days after acceptance, listing date of acceptance as start of warranty period.

C. Warranties are intended to protect District against failure of Work and against deficient, defective and faulty materials and workmanship, regardless of sources.

D. Limitations: Warranties are not intended to cover failures that result from the following:
   1. Unusual or abnormal phenomena of the elements
   2. Vandalism after Substantial Completion
   3. Insurrection or acts of aggression including war

E. Related Damages and Losses: Remove and replace Work which is damaged as result of defective Work, or which must be removed and replaced to provide access for correction of warranted Work.

F. Warranty Reinstatement: After correction of warranted Work, reinstate warranty for corrected Work to date of original warranty expiration or to a date not less than one year after corrected Work was done, whichever is later.

G. Replacement Cost: Replace or restore failing warranted items without regard to anticipated useful service lives.

H. Warranty Forms: Submit drafts to District for approval prior to execution. Forms shall not detract from or confuse requirements or interpretations of Contract Documents.
   1. Warranty shall be countersigned by manufacturers.
   2. Where specified, warranty shall be countersigned by Subcontractors and installers.

I. Rejection of Warranties: District reserves right to reject unsolicited and coincidental product warranties that detract from or confuse requirements or interpretations of Contract Documents.

J. Term of Warranties: For materials, equipment, systems, and workmanship, warranty period shall be one year minimum from date of Final Completion of entire Work except where:
   1. Detailed specifications for certain materials, equipment or systems require longer warranty periods.
   2. Materials, equipment or systems are put into beneficial use of District prior to Final Completion as agreed to in writing by District.

K. Warranty of Title: No material, supplies, or equipment for Work under Contract shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver premises, together with improvements and appurtenances constructed or placed thereon by Contractor, to District free from any claim, liens, security interest, or charges, and further agrees that neither Contractor nor any person, firm, or corporation furnishing any materials or labor for any Work covered by Contract shall have right to lien upon premises or improvement or appurtenances thereon. Nothing contained in this paragraph, however, shall defeat or impair right of persons furnishing materials or labor under bond given by Contractor for their protection or any rights under law permitting persons to look to funds due Contractor in hands of District.

1.9 TURN-IN

Contract Documents will not be closed out and final payment will not be made until all personnel Identification Media, vehicle permits, keys issued to Contractor during prosecution of Work, and letters

from property owners pursuant to paragraph 1.2.F of Document 01 74 00 (Cleaning) are turned in to District.

1.10 RELEASE OF CLAIMS

Contract Documents will not be closed out and final payment will not be made until Document 00 65 73 (Agreement and Release of Any and All Claims) is completed and executed by Contractor and District.

1.11 FIRE INSPECTION COORDINATION

Coordinate fire inspection and secure sufficient notice to District to permit convenient scheduling (if applicable).

1.12 BUILDING INSPECTION COORDINATION

Coordinate with District a final inspection for the purpose of obtaining an occupancy certificate (if applicable).

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Administrative and procedural requirements for Project Record Documents.
B. Project Record Documents required include:
   1. Marked-up copies of Drawings
   2. Marked-up copies of Shop Drawings
   3. Newly prepared Drawings
   4. Marked-up Product Data submittals
   5. Field records, such as photographs, for variable and concealed conditions
   6. Record information on Work that is recorded only schematically
   7. Maintenance forms for major equipment
C. Specific Project Record Documents requirements that expand requirements of this Section are included in the individual Sections of Divisions 2 through 60.
D. General Project closeout requirements are included in Section 01 77 00 (Contract Closeout).
E. Maintenance of Documents and Samples:
   1. Store Project Record Documents and Samples in the field office apart from Contract Documents used for construction.
   2. Do not permit Project Record Documents to be used for construction purposes.
   3. Maintain Project Record Documents in good order and in a clean, dry, legible condition.
   4. Make Documents and Samples available at all times for inspection by District.
F. Dedicate one full size set of the Drawings and one Project Manual for use for recording as-built conditions.

1.2 PROJECT RECORD DRAWINGS

A. Mark-up Procedure: During the construction period, maintain a set of blueline or blackline prints of Contract Drawings and Shop Drawings for Project Record Documents purposes. Label each document (on first sheet or format page) "PROJECT RECORD" in 2-inch high printed letters. Keep record documents current. Note: A reference by number to a Change Order, CCD, RFI, RFQ, RFP, Field Order or other such document is not acceptable as sufficient record information on any record document. Do not permanently conceal any Work until required information has been recorded.
   1. Mark these Drawings to indicate the actual installation where the installation varies appreciably from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:
      a. Dimensional changes to the Drawings
      b. Revisions to details shown on the Drawings
      c. Depths of various elements of foundation in relation to main floor level or survey datum
      d. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements
      e. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure
      f. Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stub outs, invert elevations, and similar items
      g. Actual numbering of each electrical circuit
      h. Field changes of dimension and detail
      i. Revisions to routing of piping and conduits
      j. Revisions to electrical circuitry
      k. Actual equipment locations
      l. Duct size and routing
      m. Changes made by Change Order or CCD

n. Details not on original Contract Drawings

2. Mark completely and accurately Project Record Drawing prints of Contract Drawings or Shop Drawings, whichever is the most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
3. Mark Project Record Drawing sets with red, erasable colored pencil; use other colors to distinguish between changes for different categories of the Work at the same location.
4. Mark important additional information that was either shown schematically or omitted from original Drawings.
5. Note CCD numbers; alternate numbers, Change Order numbers, and similar identification.
6. Responsibility for Mark-up: Where feasible, the individual or entity who obtained Project Record Drawing data, whether the individual or entity is the installer, Subcontractor, or similar entity, is required to prepare the mark-up on Project Record Drawings.
   a. Accurately record information in an understandable and legible drawing technique.
   b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.

B. Preparation of Record Drawings: Immediately prior to inspection for Certification of Substantial Completion, review completed marked-up Project Record Drawings with District, Inspector of Record and Architect of Record to consolidate and ensure accuracy of information. Once accuracy of information is confirmed, prepare and submit a full electronic set, in AutoCAD format, of as-built Contract Drawings and Shop Drawings.
   1. Incorporate changes and additional information previously marked on print sets. Delete, redraw, and add details and notations where applicable. Identify and date each Drawing; include the printed designation "PROJECT RECORD DRAWING" and the date prepared in a prominent location on each Drawing.
   2. Distribution: Whether or not changes and additional information were recorded, organize and bind original marked-up set of prints that were maintained during the construction period into manageable sets. Bind the set with durable paper cover sheets, with appropriate identification, including titles, dates, and other information on cover sheets, and submit to District.

C. In addition to requirements of this Section, comply with supplemental requirements of other Divisions 2 through 60.
   1. Divisions 22, 23, 25 and 26 of the Specifications require the preparation of large scale, detailed layout drawings of the Work of those Divisions. These layout drawings are not Shop Drawings as defined by Section 00 71 00 (General Conditions), but together with Shop Drawings or layout drawings of all other affected Sections are used to check, coordinate, and integrate the work of the various Sections.
   2. Include these layout drawings as part of the Project Record Documents.

1.3 PROJECT RECORD SPECIFICATIONS

A. During the construction period, maintain one copy of the Project Specifications, including addenda and modifications issued, for Project Record Documents purposes.

B. Mark the Project Record Specifications to indicate the actual installation where the installation varies substantially from that indicated in Specifications and Modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options, Change Order and Construction Change Directive work, and information on concealed installation that would be difficult to identify or measure and record later.
   1. In each Specification Section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
   2. Record the name of the manufacturer, catalog number, supplier and installer, and other information necessary to provide a record of selections made and to document coordination with Project Record Product Data submittals and maintenance manuals.
   3. Note related Project Record Product Data, where applicable, for each principal product specified, indicate whether Project Record Product Data has been submitted in maintenance manual instead of submitted as Project Record Product Data.
   4. Upon completion of mark-up, submit Project Record Specifications to District for District's records.

1.4 ADDITIONAL REQUIREMENTS FOR FINAL PROJECT RECORD DOCUMENTS

A. Using a distinct AutoCAD layer, clearly indicate at each affected detail and other drawings a full description of changes made during construction, and the actual location of items as previously specified.

B. "Cloud" all affected areas using a distinct AutoCAD layer.
C. Submit duplicate electronic files of all drawings in Tag Image File Format (.tif).
D. In the event that Contractor utilizes Building Information Modeling (BIM) software or an alternate computerized application to AutoCAD to design and record its design and construction services, Contractor shall submit as Project Record Documents the equivalent files, computer software, and any other relevant items, and train District personnel in its use, to allow District to receive and fully utilize the alternate method to meet the intent of the requirements of this Section 01 78 39 Project Record Documents.

1.5 PROJECT RECORD PRODUCT DATA

A. During the construction period, maintain one copy of each Project Record Product Data submittal for Project Record Document purposes.
   1. Mark Project Record Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Project Record Product Data submitted. Include significant changes in the product delivered to the Site, and changes in manufacturer's instructions and recommendations for installation.
   2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   3. Note related Change Orders and mark-up of Project Record Drawings, where applicable.
   4. Upon completion of mark-up, submit a complete set of Project Record Product Data to District for District's records.
   5. Where Project Record Product Data is required as part of maintenance manuals, submit marked-up Project Record Product Data as an insert in the manual, instead of submittal as Project Record Product Data.
   6. Contractor is responsible for mark-up and submittal of Project Record Product Data for its own Work.
B. Material, Equipment, and Finish Data:
   1. Provide data for primary materials, equipment and finishes as required under each Specification Section. Submit three (3) hard copy sets and one (1) digital copy, on compact disc (CD) prior to final inspection, bound in 8-1/2 inches by 11 inches three-ring binders with durable plastic covers; provide typewritten table of contents for each volume. Provide project identification information on binder covers and spines.
C. Arrange by Specification Section number and give names, addresses, and telephone numbers of Subcontractors and suppliers. List:
   a. Trade names.
   b. Model or type numbers.
   c. Assembly diagrams.
   d. Operating instructions.
   e. Cleaning instructions.
   f. Maintenance instructions.
   g. Recommended spare parts.
   h. Product data.

1.6 MISCELLANEOUS PROJECT RECORD SUBMITTALS

A. Refer to other Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified, ready for use and reference. Submit to the District for District's electronic records, in Adobe pdf format. Categories of requirements resulting in miscellaneous records include, but are not limited to, the following:
   1. Field records on excavations and foundations
   2. Field records on underground construction and similar work
   3. Survey showing locations and elevations of underground lines
   4. Invert elevations of drainage piping
   5. Surveys establishing building lines and levels
   6. Authorized measurements utilizing unit prices or allowances
   7. Records of plant treatment
   8. Ambient and substrate condition tests
   9. Certifications received in lieu of labels on bulk products
   10. Batch mixing and bulk delivery records

11. Testing and qualification of tradespersons
12. Documented qualification of installation firms
13. Load and performance testing
14. Inspections and certifications by governing authorities
15. Leakage and water-penetration tests
16. Fire resistance and flame spread test results
17. Final inspection and correction procedures
18. Final As-Built Construction Schedule

1.7 MAINTENANCE FORMS FOR MAJOR EQUIPMENT

A. See Section 01 60 00 Product Requirements

1.8 INSTALLATION, OPERATIONS AND MAINTENANCE MANUALS

A. The contractor shall compile O&M manuals for every piece of equipment and building operating or electrical system, commissioned or not, with the following formats:

1. Quantity: as specified in Section 01 32 19 Submittal Procedures, Paragraph 1.2.R.3 (unless more are required by the technical specifications).

2. Hard Media Format:
   (a) Size: $8^1/_2$ x 11 inch, 3 ring loose-leaf binders. Use as many binders as required for each element as listed below. Do not overload binders.
   (b) Binding: Bind in stiff, metal-hinged, three-ring binder(s) with standard three-hole punching. Binders shall be 3-inch maximum. Use white or black colored binders with integrated clear plastic covers to enable insertion of binder titles.
   (c) Sheet lifters: Provide plastic sheet lifters prior to first page and following last page.
   (d) Binder titles: Include the following title on front and spine of binder:

NAME OF PROJECT (YEAR)
INSTALLATION, OPERATION AND MAINTENANCE MANUAL

   (e) Sheet Size: 8½ x 11 inch
   (f) Drawing Size: Reduce drawings or diagrams to an 8½ x 11 inch or 11 x 17 inch size. However, where reduction is not practical to ensure readability, fold larger drawings separately and place in vinyl envelopes bound into the binder. Identify vinyl envelopes with drawing numbers.
   (g) Dividers: Use dividers with permanently marked tabs of card stock to separate each section and sub section. Tab labels shall not be handwritten. Use a main tab for each specification section. Behind the section number tab there shall be the equipment ID tag sub-tab for each piece of major equipment (or group, if small or numerous). These sub-tabs shall be similar to the specification number tabs but of a different color.
   (h) Contents
      (1) Title page, which shall be a duplicate of front binder title
      (2) Table of Contents
      (3) Equipment Sections and Sub sections
         (i) Contractor. The first page behind the equipment tab shall be the Contractor's name, address and telephone number of the manufacturer and installing contractor and the 24-hour number for emergency service for all equipment in this section, identified by equipment.
         (ii) Submittal and Product Data. This section shall include all approved submittal data, cut sheets, data base sheets and appropriate shop drawings. If submittal was not required for approval, descriptive product data shall be included.
         (iii) Operation and Maintenance Instructions. These shall be the written manufacturer's data with the model and features of this installation clearly marked and edited to omit reference to products or data not applicable to this installation. This section shall include data on the following:

1. Model number, serial number and nameplate data for each piece of equipment and any subcomponent.
2. Installation, startup and break-in instructions.
3. All starting, normal shutdown, emergency shutdown, manual operation and normal and emergency operating procedures and data, including any special limitations.
   i. Step-by-step procedure for system startup, including a pre-start checklist. Refer to controls and indicators by nomenclature consistent with that used on panels and in control diagrams.
   ii. Sequence of operation, with detailed instruction in proper sequence, for each mode of operation (i.e., day-night; staging of equipment).
   iii. Emergency operation: If some functions of the equipment can be operated while other functions are disabled, give instructions for operations under these conditions. Include here only those alternate methods of operations (from normal) which the operator can follow when there is a partial failure or malfunctioning of components, or other unusual condition.
   iv. Shutdown procedure: Include instructions for stopping and securing the equipment after operation. If a particular sequence is required, give step-by-step instructions in that order.
4. O&M and installation instructions that were shipped with the unit.
5. Preventative and corrective maintenance, with service procedures and schedules:
   i. Provide a schedule for preventive maintenance in a printed format and an electronic format compatible with owner's system. State, preferably in tabular form, the recommended frequency of performance for each preventive maintenance task, cleaning, inspection and scheduled overhauls.
   ii. Cleaning: Provide instructions and schedules for all routine cleaning and inspection with recommended lubricants.
   iii. Inspection: If periodic inspection of equipment is required for operation, cleaning or other reasons, indicate the items to be inspected and give the inspection criteria for: motors; controls; filters and any other maintenance items.
   iv. Provide instructions for minor repairs or adjustments required for preventive maintenance routines. Identify test points and give values for each. Include sensor calibration requirements and methods by sensor type.
   v. Corrective maintenance instructions shall be predicated upon a logical effect-to-cause troubleshooting philosophy and a rapid replacement procedure to minimize equipment downtime.
   vi. Troubleshooting: Troubleshooting tables, charts, or diagrams shall be used to present specified procedures. A guide to this type shall be a three-column chart. The columns shall be titled: malfunction, probable cause and recommended action.
   vii. Repair and Replacement: Indicate repair and replacement procedures most likely to be required in the maintenance of the equipment.
   viii. A list of recommended spare parts with a price list and a list of spare parts provided under this Contract.
   ix. Outline, cross-section, and assembly drawings; engineering data; and electrical diagrams, including elementary diagrams, labeled wiring diagrams, connection diagrams, word description of wiring diagrams and interconnection diagram

6. Safety Precautions: This subsection shall comprise a listing of safety precautions and instructions to be followed before, during and after making repairs, adjustments or routine maintenance.
7. Manufacturers' brochures (including controls): Manufacturers' descriptive literature covering devices and equipment used in the system, together with illustrations, exploded views and renewal parts lists. Manufacturers' standard brochures and parts list shall be corrected so that information applying to the actual installed equipment is clearly defined.
8. Supply any special tools required to service or maintain the equipment.
9. Performance data, ratings and curves.
10. Warranty and guarantee, which clearly lists conditions to be maintained to keep warranty in effect and conditions that would affect the validity of the warranty.
11. Any service contracts issued.

(4) Supplemental Data. Prepare written text and/or special drawings to provide necessary information, where manufacturer's standard printed data is not available and information is necessary for a proper understanding and operation and maintenance of equipment or systems, or where it is necessary to provide additional information to supplement data included in the manual or project documents.

(5) Control Diagrams/Drawings. Include the as-built control diagrams/drawings for the piece of equipment and its components, including full points list, full print out of all schedules and set points after testing and acceptance of the system, and copies of all checkout tests and calibrations performed by the contractor (not commissioning tests).

(6) Specifications. This section is comprised of the component or system specification section copied and inserted complete with all addenda.

(7) System Description. This section shall include the individual equipment portion of the overall system Design Basis Narrative.

3. Electronic Media Format: Electronic media format shall be Adobe pdf, with chapter markers and/or bookmarks inserted in place of the equivalent hard copy section tabs. Electronic copy shall include all tables, charts, drawings, codes and all other matters reflected in hard copies. Electronic media files shall be delivered on a unique CD-ROM.

4. A separate manual or chapter shall be provided for each applicable system as follows:

(a) Chillers
(b) Cooling Towers
(c) Boilers
(d) Pumps
(e) Air Handling Units (include sequence of operation, one line diagram and area served in a plastic pouch for mounting on equipment or in equipment room)
(f) Exhaust Fans
(g) Supply Air Fans (excluding Air Handling Units)
(h) Plumbing and Drainage Systems/Equipment
(i) Emergency Generator Systems
(j) UPS
(k) Fire Protection Systems
(l) Fire Alarm System
(m) Valves and Pipe Specialties (include valve identification chart)
(n) Variable Frequency Drives (VFD)
(o) Smoke Control Systems
(p) Water Treatment System
(q) Elevator Systems
(r) Lighting Systems and Controls (interior, exterior and airfield)
(s) Switchgear, Transformers, Panel boards, Motor Control Centers and Motor Starters
(t) Lightning Protection and Surge Suppression Systems

(u) Public Address, Closed Circuit TV, Communication and Telephone Systems
(v) Security System
(w) Building Management/Temperature Control System (BMS)
(x) Fuel System
(y) Doors and Hardware.
(z) Power monitoring systems
(aa) HVAC, Testing Adjusting, and Balancing

1.9 COMPUTER PROGRAMS

A. When any equipment requires operation by computer programs, submit copy of program on appropriate CD, plus a hard-copy and an electronic copy (Adobe .PDF format) of all user manuals and guides for operating the programs and making changes in the programs for upgrading and expanding the databases. Program shall be Windows XP compatible. Provide required licenses to District at no additional cost.

1.10 DISTRICT'S RECOURSE

A. If Contractor is not able to provide project record documents in specified formats, District and Contractor shall negotiate a credit back to the District for this work.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 RECORDING

Post changes and modifications to the Contract Documents as they occur. Do not wait until the end of the Project. District may periodically review Project Record Documents to assure compliance with this requirement.

3.2 SUBMITTAL

A. At completion of Project, deliver Project Record Documents to District, per Section 01 32 19 Submittal Procedures.
B. Accompany submittal with transmittal letter containing:
   1. Date
   2. Project title and number
   3. Contractor's name and address
   4. Number and title of each Project Record Document
   5. Certification that each document as submitted is complete and accurate, and signature of Contractor or Contractor's authorized representative.

END OF SECTION

SECTION 01 91 13
GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 DESCRIPTION

A. Commissioning: Commissioning is a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems and assemblies meet defined objectives and criteria. The Commissioning process begins at project inception (during the pre-design phase) and continues through the life of the facility. The commissioning process includes specific tasks to be conducted during each phase in order to verify that design, construction, and training meets the owner's project requirements.

B. Commissioning Team: The members of the commissioning team consist of the contracted commissioning agent (CxA), the owner's representative/construction manager (CM), the general contractor (GC), the architect and design engineers, the mechanical contractor (MC), the electrical contractor (EC), the testing and balancing (TAB) contractor, the control contractor (CC), the facility operating staff, and any other installing subcontractors or suppliers of equipment. The contracted commissioning agent is hired by the owner directly. The CxA directs and coordinates the project commissioning activities and the reports to the owner. All team members work together to fulfill their contracted responsibilities and meet the objectives of the contract documents.

Commissioning shall:

1) Verify that applicable equipment and systems are installed according to the contract documents, manufacturer's recommendations, and industry accepted minimum standards and that they receive adequate operational checkout by installing contractors.
2) Verify and document proper performance of equipment and systems.
3) Verify that O&M documentation left on site is complete.
4) Verify that the owner's operating personnel are adequately trained.

C. The commissioning process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished and fully functioning product.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.

B. Owner's Project Requirements and Basis of Design documents are included by reference for information only.

C. ASHRAE Guideline 0-2005, ASHRAE Standards 55 & 62.1-2004

1.03 SUMMARY

A. This section includes general requirements that apply to the implementation of the commissioning process without regard to specific systems, assemblies and components.

B. Related sections include the following:

1) Division 23 Section 23 08 00 Commissioning of HVAC for commissioning process activities for heating, ventilating, air- conditioning, and refrigerating systems, assemblies, equipment, and components.

1.04 DEFINITIONS

Acceptance - A formal action, taken by a person with appropriate provider (which may or may not be contractually defined) to declare that some aspect of the project meets defined requirements, thus permitting subsequent activities to proceed.

Approval - Acceptance that a piece of equipment or system has been properly installed and is functioning in the tested modes according to the contract documents.

Basis of Design - A document that records the concepts, calculations, decisions, and product selections used to meet the owner's project requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

Checklists - Verification checklists that are developed and used during all phases of the commissioning process to verify that the owner's project requirements are being achieved. This includes checklists for general verification, plus testing, training, and other specific requirements.

Commissioning Authority (CxA) - The entity identified by the owner who leads, plans, schedules, and coordinates the commissioning team to implement the commissioning process.

Commissioning Plan - An overall plan developed by the commissioning agent that provides the structure, schedule and coordination planning for the commissioning process.

Commissioning Process - A quality-focused process for enhancing the delivery of a project. The process focuses upon verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the owner's project requirements.

Commissioning Process Activities - Components of the commissioning process.

Commissioning Process Progress Report - A written document that details activities completed as part of the commissioning process and significant findings from those activities that is continuously updated during the course of a project. Usually it is incorporated into the commissioning plan as an ongoing appendix.

Commissioning Team - The individuals who through coordinated actions are responsible for implementing the commissioning process.

Construction Checklist - A form used by the contractor to verify that appropriate components are on-site, ready for installation, correctly installed, and functional. Also see **Checklists**.

Construction Documents - This includes a wide range of documents, which will vary from

project to project, with the owner's needs and with regulations, laws, and countries. Construction documents usually include the project manual (specifications), plans (drawings) and general terms and conditions of the contract.

Continuous Commissioning Process - A continuation of the commissioning process well into the occupancy and operations phase to verify that a project continues to meet current and evolving owner's project requirements. Continuous commissioning process activities are on-going for the life of the facility. Also see **On-Going Commissioning Process**.

Contract Documents - This includes a wide range of documents, which will vary from project to project, with the owner's needs and with regulations, laws, and countries. Contract documents frequently include price agreements, construction management process, sub-contractor agreements or requirements, requirements and procedures for submittals, changes, and other construction requirements, timeline for completion, and the construction documents.

Coordination Drawings - Drawings showing the work of all trades to illustrate that equipment can be installed in the space allocated without compromising equipment function or access for maintenance and replacement. These drawings graphically illustrate and dimension manufacturers' recommended maintenance clearances.

Control system - A component of environmental, HVAC, security, and fire systems for reporting/monitoring and issuing of commands to/from field devices.

Data logging -The monitoring and recording of flows, currents, status, pressures, etc., of equipment using stand-alone data recorders separate from the control system or the trending capabilities of control systems.

Deferred Performance Tests (DPTs) - Performance tests that are performed, at the discretion of the CxA, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design, or other site conditions that disallow the test from being performed.

Deficiency - A condition in the installation or function of a component, piece of equipment, or system that is not in compliance with the contract documents.

Factory Testing - Testing of equipment on-site or at the factory, by factory personnel, with or without an owner's representative present.

Issues Log - A formal and ongoing record of problems or concerns – and their resolution – that have been raised by members of the commissioning team during the course of the commissioning process.

Nominal Group Technique - A formal, structured brainstorming process used to obtain the maximum possible ranked input from a variety of viewpoints in a short period of time. The typical approach is a workshop session where a question is presented, the attendees each record their responses on a piece of paper, the individual responses are recorded on a flip chart without discussion in a round robin fashion, all of the responses are discussed, and the participants rank their top five responses.

Non-Compliance - See **Deficiency**.

Non-Conformance - See **Deficiency**.

On-Going Commissioning Process - A continuation of the commissioning process well into the occupancy and operations phase to verify that a project continues to meet current and evolving owner's project requirements. On-going commissioning process activities occur throughout the life of the facility. Some of these will be close to continuous in implementation, and others will be either scheduled or unscheduled (as needed). Also see **Continuous Commissioning Process**.

Owner's Project Requirements - A written document that details the functional requirements of a project and the expectations of how it will be used and operated. This includes project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information. (The term "Project Intent" is used by some owners for their commissioning process owner's project requirements or design.)

Over-ridden Value -Riding over a sensor value in the equipment's controls to observe the response of the equipment's operation. Also see **Simulated Signal**.

Phased Commissioning - Commissioning that is completed in phases as required by the phasing plan as approved for the project and other scheduling issues.

Quality Based Sampling - A process for evaluating a sub-set (sample) of the total population. The sample is based upon a known or estimated probability distribution of expected values; an assumed statistical distribution based upon data from a similar product, assembly, or system; or a random sampling that has scientific statistical basis.

Re-Commissioning - An application of the commissioning process requirements to a project that has been delivered using the commissioning process. This may be a scheduled re-commissioning developed as part of an ongoing commissioning process, or it may be triggered by use change, operations problems, or other needs.

Retro-Commissioning -The commissioning process applied to an existing facility that was not previously commissioned. This guideline does not specifically address retro-commissioning. However, the same basic process needs to be followed from pre-design through occupancy and operations to optimize the benefits of implementing the commissioning process philosophy and practice.

Seasonal Performance Tests - Performance tests that are deferred until the system(s) will experience conditions closer to their design conditions based on weather conditions.

Simulated Condition - Condition that is created for the purpose of testing the response of a system (e.g., raising/lowering the setpoint of a thermostat to see the response in a VAV box).

Simulated Signal - Disconnecting a sensor and using a signal generator to simulate a sensor value for the purpose of testing a full range of conditions.

Startup - The initial starting or activating of dynamic equipment, including completing construction checklists.

Systems Manual - A system-focused composite document that includes the operation manual, maintenance manual, and additional information of use to the owner during the occupancy and operations phase.

Test Procedure - A written protocol that defines methods, personnel, and expectations for tests conducted on components, equipment, assemblies, systems, and interfaces among systems. The test procedures are specified in the Technical Specifications sections of the contract documents. Performance testing covers the dynamic functions and operations of equipment and systems using manual or monitoring methods. Performance testing is the dynamic testing of systems under full operation. Systems are tested under various modes, such as during low cooling loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc. The systems are run through all the control system's sequences of operation and components are verified to respond as the sequences state.

Training Plan - A written document that details the expectations, schedule, budget, and deliverables of commissioning process activities related to training of project operating and maintenance personnel, users, and occupants.

Verification - The process by which specific documents, components, equipment, assemblies, systems, and interfaces among systems are confirmed to comply with the criteria described in the Owner's Project Requirements.

Trending – The monitoring, by a building management system or other electronic data gathering equipment, and analyzing of the data gathered over a period of time.

Vendor - Supplier of equipment.

Warranty Period - Refer to Document 00 65 36 Guaranty.

1.05 COORDINATION

A. Project Commissioning Team - The members of the project commissioning team will consist of the commissioning authority and any support personnel, the construction manager, the owner's facility staff (FS) or designee, the general contractor, subcontractors and/or vendors as required, and the architect/ engineer (A/E).

B. Management - The CxA coordinates the commissioning activities through the construction manager. All members shall work together to fulfill their contracted responsibilities and meet the objectives of the contract documents. Refer to Paragraph 1.06 for additional management details.

C. Scheduling - The CxA, through the owner or CM, will provide sufficient notice to the contractor for scheduling commissioning activities with respect to the owner's participation. The contractor will integrate all commissioning activities into the overall project schedule. All parties will address scheduling problems and make necessary notifications in a timely manner in order to expedite the commissioning process.

1.06 COMMISSIONING PLAN

A. The CxA will develop the commissioning plan which shall be included in the project schedule when approved by the owner or CM. The following narrative provides a brief overview of the typical commissioning tasks during construction and the general order in which they occur.

1) Commissioning during construction begins with an initial commissioning meeting conducted by the CxA where the commissioning process is reviewed with the project commissioning team members.

2) Additional meetings will be required throughout construction, scheduled by the CxA, through the owner or CM, with necessary parties attending to plan, scope, coordinate, schedule future activities and resolve problems.

3) MEP Equipment documentation is submitted to the CxA, through the owner or CM, during normal submittals, including detailed startup procedures.

4) The construction checklists are to be completed by the contractor (or its subcontractors), before and during the startup process.

5) Construction checklists, TAB and startup must be completed before performance testing.

6) Items of non-compliance in material, installation, or setup shall be corrected at no expense to the owner.

7) The contractor ensures that the subcontractors' construction checklists are executed and documented and that startup and initial checkout are performed. The CxA verifies that the TAB, construction checklists and startup were completed according to the approved plans. This includes the CxA approving TAB, checklists and startup plans. This also includes witnessing startup of selected equipment. Any testing failure is to be corrected at no additional cost to the owner, and a re-test is to be performed, observed, and documented.

8) The CxA develops and implements equipment and system performance test procedures. The forms and procedures are approved by the owner, CM and A/E.

9) The performance tests are executed by the contractor under the direction of the CxA with the assistance of the facility staff. All documentation is by the CxA.

10) The CxA reviews the O&M documentation for completeness and provides the commissioning record for the O&M manuals.

11) Commissioning should be completed before substantial completion.

12) The CxA develops procedures, reviews, pre-approves, coordinates, and implements the training provided by the contractor.

13) Deferred testing is conducted as specified or required.

1.07 COMMISSIONING TEAM

A. Members appointed by contractor(s): Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions. The commissioning team shall consist of, but not be limited to, representatives of each contractor, including project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.

B. Members appointed by owner:

1. CxA - An entity identified by the owner who leads, plans, schedules, and coordinates the commissioning team to implement the commissioning process. Owner will engage the CxA under a separate contract.

2. Representatives of the facility user and operation and maintenance personnel.

3. Architect and engineering design professionals.

1.08 RELATED REQUIREMENTS

A. Section 01 32 19 Submittal Procedures

B. Section 01 32 16 Progress Schedules and Reports

C. Section 01 77 00 Contract Closeout Procedures

D. Section 01 78 39 Project Record Documents

E. Document 00 65 36 Guaranty

F. Section 23 08 00 Commissioning of HVAC

1.09 RESPONSIBILITIES

A. The general responsibilities of various parties in the commissioning process are provided in this sub-section. The specific responsibilities are in the Technical Specifications.

B. All Parties
1. Follow the commissioning plan.
2. Attend initial commissioning meeting and additional meetings as necessary.

C. Architect (of A/E)

Construction Phase
1. Attend the commissioning scoping meeting and selected commissioning team meetings.
2. Perform normal submittal review, construction observation, as-built drawing preparation, O&M manual preparation, etc., as contracted.
3. Provide any design narrative documentation requested by the CxA.
4. Coordinate resolution of system deficiencies identified during commissioning, according to the contract documents.
5. Prepare and submit final as-built design intent documentation for inclusion in the O&M manuals. Review and approve the O&M manuals.

D. Mechanical and Electrical Designers/Engineers (of the A/E)

Construction Phase

1. Perform normal submittal review, construction observation, as-built drawing preparation, etc., as contracted. On site observation should be completed just prior to system startup.
2. Provide any design narrative and sequences documentation requested by the CxA. The designers shall assist (along with the contractors) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
3. Attend commissioning scoping meetings and other selected commissioning team meetings.
4. Participate in the resolution of system deficiencies identified during commissioning, according to the contract documents.
5. Prepare and submit the final as-built design intent and operating parameters documentation for inclusion in the O&M manuals. Review and approve the O&M manuals.
6. From the contractor's red-line drawings, edit and update one-line diagrams developed as part of the design narrative documentation and those provided by the vendor as shop drawings for the chilled and hot water, condenser water, domestic water, steam and condensate systems; supply, return and exhaust air systems and emergency power system.
7. Provide a presentation at one of the training sessions for the owner's personnel.
8. Review and approve the construction checklists for major pieces of equipment for sufficiency prior to their use.
9. Review and approve the performance test procedure forms for major pieces of equipment for sufficiency prior to their use.
10. Witness testing of selected pieces of equipment and systems

Occupancy and Operations Phase

1. Participate in the resolution of non-compliance, non-conformance and design deficiencies identified during commissioning during warranty-period commissioning.
2. Attend lessons learned session

E. Commissioning Authority (CxA)

The contractors will provide all tools or the use of tools to start, check-out and test equipment and systems.

The CxA will verify the execution of commissioning process activities using random sampling. The sampling rate may vary from 1 to 100 percent. Verification will include, but is not limited to, equipment submittals, construction checklists, training, operating and maintenance data, tests, and test reports to verify compliance with the OPR. When a random sample does not meet the requirement, CxA will report the failure in the "Issues Log."

Construction Phase

1. Coordinates and directs the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules and technical expertise.
2. Coordinate the commissioning work and, with the GC and owner/CM, help integrate commissioning activities into the master schedule.
3. Revise the Construction Phase Commissioning Plan as necessary.
4. Plan and conduct a commissioning scoping meeting and other commissioning meetings.

5. Request and review additional information required to perform commissioning tasks, including O&M materials, contractor startup and checkout procedures.
6. Before startup, gather and review the current control sequences and interlocks and work with contractors and design engineers until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.
7. Review and approve normal contractor submittals applicable to systems being commissioned for compliance with commissioning needs, concurrent with the A/E reviews.
8. Write and distribute construction checklists. Prepare and maintain completed construction checklist log.
9. Develop an enhanced startup and initial systems checkout plan with subcontractors.
10. Perform site visits, as necessary, to observe component and system installations. Attend selected planning and job-site meetings to obtain information on construction progress. Review construction meeting minutes for revisions/substitutions relating to the commissioning process. Assist in resolving any discrepancies.
11. Witness all or part of the HVAC piping test and flushing procedure, sufficient to be confident that proper procedures were followed. Document this testing and include the documentation in O&M manuals. Notify owner/CM of any deficiencies in results or procedures.
12. Witness all or part of any ductwork testing and cleaning procedures, sufficient to be confident that proper procedures were followed. Document this testing and include the documentation in O&M manuals. Notify owner's project manager of any deficiencies in results or procedures.
13. Approve construction checklist completion by selected site observation and spot checking.
14. Recommend approval of systems startup by reviewing startup reports and by selected site observation.
15. Review TAB execution plan.
16. Oversee sufficient testing of the control system and approve it to be used for TAB, before TAB is executed.
17. Recommend approval of air and water systems balancing by reviewing completed reports and by selected site observation.
18. With necessary assistance and review from installing contractors, write the performance test procedures for equipment and systems, including energy management control system trending or manual performance testing. Submit to CM for review, and for approval if required.
19. Analyze any performance trend logs and monitoring data to verify performance.
20. Coordinate, witness, and recommend approval of manual performance tests performed by installing contractors. Coordinate retesting as necessary until satisfactory performance is achieved
21. Maintain a master Issues Log and a separate testing record. Provide the owner/ CM with written progress reports and test results with recommended actions.
22. Review equipment warranties to ensure that the owner's responsibilities are clearly defined.
23. Oversee and approve the training of the owner's operating personnel.
24. Compile and maintain a commissioning record and building systems book(s).
25. Review and approve the preparation of the O&M manuals.
26. Provide a final commissioning report (as described in this section).
27. Coordinate the development of a systems manual

28. Prepare a standard trend logging package of primary parameters that will provide the operations staff clear indications of system function in order to identify proper system operation and trouble shoot problems. The CxA shall also provide any needed information on interpreting the trends.

Occupancy and Operations Phase

1. Coordinate and supervise seasonal testing and deficiency corrections.
2. Return to the site at 10 months into the 12 month warranty period and review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal commissioning. Also interview facility staff and identify problems or concerns they have operating the building as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals. Identify areas that may come under warranty or under the original construction contract. Assist facility staff in developing reports, documents and requests for services to remedy outstanding problems.
3. Assist in the development of a preventative maintenance plan, a detailed operating plan or an energy and resource management plan or as-built documentation.
4. Attend owner coordinated lessons learned sessions as requested.

F. Owner or Owner's Representative (CM)

Construction and Acceptance Phase

1. Facilitate the coordination of the commissioning work by the CxA, and, with the CM/GC and CxA, ensure that commissioning activities are being scheduled into the master schedule.
2. Review and approve the final *Commissioning Plan—Construction Phase*.
3. Attend a commissioning scoping meeting and other commissioning team meetings.
4. Perform the normal review of MEP contractor submittals.
5. Furnish a copy of all construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CxA.
6. Review and approve the performance test procedures submitted by the CxA, prior to testing.
7. When necessary, observe and witness startup and performance testing of selected equipment.
8. Review commissioning progress and deficiency reports.
9. Coordinate the resolution of non-compliance and design deficiencies identified in all phases of commissioning.
10. Sign-off (final approval) on individual commissioning tests as completed and passing. Recommend completion of the commissioning process to the Project Manager.
11. Assist the GC in coordinating the training of owner personnel.
12. Provide the OPR documentation to the CxA and all contractors for information and use.
13. Provide the BoD documents, prepared by Architect and approved by owner, to the CxA and all contractors for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.
14. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.

Occupancy and Operations Phase

1. Assist the CxA as necessary in the seasonal or deferred testing and deficiency corrections required by the specifications.
2. Attend lessons learned session

G. Owner's Project Manager (CM&Owner)

Construction Phase

1. Manage the contract of the A/E and of the GC.
2. Arrange for facility operating and maintenance personnel to attend various field commissioning activities and field training sessions.
3. Provide final approval for the completion of the commissioning work.

Occupancy and Operations Phase

1. Ensure that any seasonal or deferred testing and any deficiency issues are addressed.
2. Attend lessons learned session

H. Contractor. All contractors and their subcontractors and vendors shall assign representatives with expertise and authority to act on their behalf and schedule them to participate in and perform commissioning process activities including, but not limited to, the following:

Construction Phase

1. Facilitate the coordination of the commissioning and incorporate commissioning activities (the Commissioning Plan) into the Overall Project Schedule (OPS).
2. Provide detailed startup procedures
3. Include the cost of commissioning in the total contract price.
4. Ensure that all subcontractors and vendors execute their commissioning responsibilities according to the contract documents and the OPS.
5. Provide copies of all submittals as required in Section 01 32 19 Submittal Procedures, including all changes thereto.
   Attend and participate in commissioning team meetings held monthly.
6. No later than 60 days prior to startup of the first piece of major equipment, meet with the CxA, CM, A/E, and PM and owner to finalize the detailed commissioning procedures/ schedule.
7. Provide the training of owner personnel.
8. Review and accept construction checklists provided by the commissioning authority.
9. Complete paper or electronic construction checklists as work is completed and provide to the commissioning agent on a weekly basis.
10. Accomplish commissioning process test procedures.
11. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
12. Cooperate with the CxA for resolution of issues recorded in the "Issues Log".
13. Prepare O&M manuals, according to the contract documents, including clarifying and updating the original sequences of operation to as-built/as-tested conditions.

Occupancy and Operations Phase

1. Ensure that subcontractors provide assistance for seasonal performance testing, performed by the CxA, according to the specifications.
2. Ensure that subcontractors correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

3. Perform all guarantee work for materials furnished under the contract for the time specified in the contract, including all warranties and curing all latent defects within the time period provided in the contract.

I. Vendors/Subcontractors

1. Provide all requested submittal data, including detailed startup procedures and specific responsibilities of the owner to keep warranties in force.
2. Assist in equipment testing per agreements with subcontractors and/or contractor.
3. Include cost of all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing, operating, and maintaining equipment according to these contract documents in the base bid price to the contractor.
4. Analyze specified products and verify that the A/E has specified the newest, most current equipment reasonable for this project's scope and budget.
5. Provide requested information regarding equipment sequence of operation and testing procedures.
6. Review construction checklists and test procedures for equipment installed by factory representatives.

1.10 EQUIPMENT/SYSTEMS TO BE COMMISSIONED

A. The following equipment/systems will be commissioned for this project:
1. Chillers and Towers
2. Boilers and related equipment
3. Chilled water system and pumps
4. Hot water system and pumps
5. Steam system and components
6. Air Handling Units (with supply, return and outside air duct, variable air volume boxes and units, air distribution equipment, fan coil units, unit heaters, etc., and temperature control system)
7. Exhaust air systems (including fans, ductwork and interconnection with air handling/supply systems)
8. Supply or make-up air systems (including fans, ductwork and interconnection with air handling and/or exhaust systems)
9. Specialty air removal/ventilation systems (including fans, ductwork and interconnection with air handling/supply systems)
10. Potable water system (including backflow preventers, fixtures, piping cleaning and flushing, hot water generators, and booster pumps)
11. Sanitary drainage/sewer system
12. Storm drainage system
13. Emergency power system (including emergency generator, automatic transfer switch and fuel oil system)
14. Lighting systems (interior and exterior)
15. Switchgear, transformers, panelboards and/or motor control centers
16. Lightning protection and/or surge suppression system
17. Access Control system
18. Elevator systems
19. HVAC, Test, Adjust, and Balance

20. BMS System

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. All standard testing equipment required to perform startup and initial checkout and required performance testing shall be provided by the contractor for the equipment being tested. This includes, but is not limited to, two-way radios, meters, and data recorders. Data recorders may be provided by the CxA at the option of the CxA,

B. Special equipment, tools, and instruments required for testing equipment according to these contract documents shall be included in the contractor's base bid price and shall be turned over to the owner at Project close-out.

C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance within the tolerances specified in the specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration to NIST traceable standards within the past year to an accuracy of 0.5 degree F and a resolution of + or - 0.1 degree F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year. All equipment shall be calibrated according to the manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates readily available.

PART 3 - EXECUTION

3.01 MEETINGS

A. Initial Meeting. Within 10 days of the Notice to Proceed (NTP), the CxA, through the owner/CM, will schedule, plan and conduct an initial commissioning meeting. The contractor and its responsible parties are required to attend.

B. Miscellaneous Meetings. Other meetings will be planned and conducted by the CxA as construction progresses. These meetings will cover coordination, deficiency resolution, and planning issues. These meetings will be held at least monthly, until the final 3 months of construction, when they may be held as frequently as one per week.

3.02 STARTUP, CONSTRUCTION CHECKLISTS, AND INITIAL CHECKOUT

A. The following procedures apply to all equipment/systems to be commissioned, according to Paragraph 1.10 Equipment/Systems to be commissioned.

B. General. Construction checklists are important to verify that the equipment and systems are fully connected and operational. It ensures that performance testing (in-depth system checkout) may proceed without unnecessary delays. The construction checklists for a given system must be successfully completed and approved prior to startup and formal performance testing of equipment or subsystems of the given system.

C. Startup and Checkout Plan. The CxA will assist the project commissioning team members responsible for startup of any equipment. The primary role of the CxA in this process is to ensure that there is written documentation that each of the manufacturer-recommended procedures has been completed. The CxA shall provide construction checklists and startup shall be identified in the commissioning scoping meeting and on the checklist forms.

1. The construction checklists are provided by the CxA. These checklists indicate required procedures to be executed as part of startup and initial checkout of the systems and the party responsible for their execution.

2. The contractor shall determine which trade is responsible for executing and documenting each of the line item tasks and transmit the checklists to the responsible subcontractors. Each form may have more than one trade responsible for its execution.

3. The contractor/subcontractor with assistance from the CxA responsible for the purchase of the equipment shall develop the full startup plan by combining the manufacturer's detailed startup and checkout procedures and the construction checklists.

4. The contractor/subcontractor shall submit the full startup plan to the CxA for review and approval.

5. The CxA will review and approve the procedures and the documentation format for reporting. The CxA will return the procedures and the documentation format to the contractor, through the CM.

6. The contractor will transmit the full startup plan to the subcontractors for their review and use.

D. Sensor and Actuator Calibration. All field-installed temperature, relative humidity, CO, CO_2, refrigerant, O_2, and/or pressure sensors and gages, and all actuators (dampers and valves) on all equipment shall be calibrated. Verify that all locations are appropriate and away from causes of erratic operation. Submit to the CxA through the CM the calibration methods and results. All test instruments shall have had a certified calibration within the last 6 months to NIST traceable standards, and comply with all local, state and/or federal requirements/certifications, as required. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated. Provide bench testing as required at the direction of the CxA.

Sensor Calibration Methods

All Sensors-- Verify that all sensor locations are appropriate and away from causes of erratic operation. Verify that sensors with shielded cable, are grounded only at one end. For sensor pairs that are used to determine a temperature or pressure difference, make sure they are reading within 0.2°F of each other for temperature and within a tolerance equal to 2% of the reading, of each other, for pressure. Tolerances for critical applications may be tighter.

Sensors Without Transmitters-- Standard Application. Make a reading with a calibrated test instrument within 6 inches of the site sensor. Verify that the sensor reading, via the permanent thermostat, gage or building automation system (BAS), is within the tolerances in the table below of the instrument-measured value. If not, install offset in BAS, calibrate or replace sensor.

Sensors With Transmitters-- Standard Application. Disconnect sensor. Connect a signal generator in place of sensor. Connect amp meter in series between transmitter and BAS control panel. Using manufacturer's resistance-temperature data, simulate minimum desired temperature. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the BAS. Record all values and recalibrate controller as necessary to conform with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction. Reconnect sensor. Make a reading with a calibrated test instrument within 6 inches of the site sensor. Verify that the sensor reading, via the permanent thermostat, gage or building automation system (BAS), is within the tolerances in the table below of the instrument-measured value. If not, replace sensor and repeat. For pressure or humidity sensors, perform a similar process with a suitable signal generator.

Critical Applications-- For critical applications (process, manufacturing, etc.) more rigorous calibration techniques may be required for selected sensors. Contractor shall describe any such methods used on an attached sheet.

Tolerances, Standard Applications

Sensor	Required Tolerance (+/-)	Sensor	Required Tolerance (+/-)
Cooling coil, chilled and condenser water temps	0.4F	Flow rates, water Relative humidity	4% of design 4% of design
AHU wet bulb or dew point	2.0F	Combustion flue temps	5.0F
Hot water coil and boiler water temp	1.5F	Oxygen or CO_2 monitor	0.1 % pts
Outside air, space air, duct air temps	0.5F	CO monitor	0.01 % pts
Watthour, voltage & amperage	1% of design	Natural gas and oil flow rate	1% of design
Pressures, air, water and gas	3% of design	Steam flow rate	3% of design
Flow rates, air	10% of design	Barometric pressure	0.1 in. of Hg

Valve and Damper Stroke Setup and Check EMS Readout-- For all valve and damper actuator positions checked, verify the actual position against the BAS readout.
Set pumps or fans to normal operating mode. Command valve or damper closed, visually verify that valve or damper is closed and adjust output zero signal as required. Command valve or damper open, verify position is full open and adjust output signal as required. Command valve or damper to a few intermediate positions. If actual valve or damper position doesn't reasonably correspond, replace actuator or add pilot positioner (for pneumatics).

Closure for heating coil valves (NO) -- Set heating setpoint 20°F above room temperature. Observe valve open. Remove control air or power from the valve and verify that the valve stem and actuator position do not change. Restore to normal. Set heating setpoint to 20°F below room temperature. Observe the valve close. For pneumatics, by override in the EMS, increase pressure to valve by 3 psi (do not exceed actuator pressure rating) and verify valve stem and actuator position does not change. Restore to normal.

Closure for cooling coil valves (NC)-- Set cooling setpoint 20°F above room temperature. Observe the valve close. Remove control air or power from the valve and verify that the valve stem and actuator position do not change. Restore to normal. Set cooling setpoint to 20°F below room temperature. Observe valve open. For pneumatics, by override in the EMS, increase pressure to valve by 3 psi (do not exceed actuator pressure rating) and verify valve stem and actuator position does not change. Restore to normal.

Spring Return Actuators (NC or NO)—During normal operation, disconnect the power and visually inspect the operation of the desired action (open or closed)

E. Execution of Construction Checklists and Startup.
   1. Four weeks prior to the scheduled startup, the contractor shall coordinate startup and checkout with the CM, A/E, and CxA. The execution and approval of the construction checklists, startup, and checkout shall be directed and performed by the contractor, subcontractor or vendor. Signatures are required of the applicable subcontractors for verification of completion of their work.
   2. The owner/CM, and A/E as necessary, shall observe, at minimum, the procedures for each piece of primary equipment, unless there are multiple units, in which case a sampling strategy may be used. The CxA will observe all testing.
   3. For lower-level components of equipment, (e.g., sensors, controllers), the CxA shall observe a sampling of the startup procedures.
   4. The subcontractors and vendors shall execute startup and provide the CxA and A/E, through the owner/CM, with a signed and dated copy of the completed startup and construction checklists.
   5. Only individuals of the contractor (technicians, engineers, tradesmen, vendors, etc.) who have direct knowledge and witnessed that a line item task on the construction checklist was actually performed shall check off that item. It is not acceptable for witnessing supervisors to fill out these forms.

F. Deficiencies, Non-Conformance, and Approval in Checklists and Startup(Master Issues Log).
   1. The contractor shall ensure that the subcontractors clearly list any outstanding items of the initial startup and construction checklist procedures that were not completed successfully, on an attached sheet. The form and any outstanding deficiencies shall be provided, through the owner/CM, to the CxA within two days of test completion.
   2. The CxA will review the report and issue either a non-compliance report or an approval form, through the CM, to the contractor. The installing subcontractors or vendors shall correct all areas that are deficient or incomplete in the checklists and tests in a timely manner, shall notify the owner/CM as soon as outstanding items have been corrected, and resubmit an updated startup report with a Statement of Correction on the original non-compliance report. When satisfactorily completed, the CxA will recommend approval of the execution of the checklists and startup of each system.
   3. Items left incomplete, which later cause deficiencies or delays during performance may result in backcharges to the contractor. Refer to Paragraph 3.05, herein, for details.

3.03 SUBMITTALS

A. The CxA will provide appropriate contractors with a specific request for the type of submittal documentation the CxA requires facilitating the commissioning work. These requests will be

integrated into the normal submittal process and protocol of the construction team. At minimum, the request will include the manufacturer and model number, the manufacturer's printed installation and detailed startup procedures, full sequences of operation, O&M data, performance data, any performance test procedures, control drawings and details of owner contracted tests. In addition, the installation and checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the commissioning authority. All documentation requested by the CxA will be included by the subcontractors in their O&M manual contributions.

B. The CxA will review and approve submittals related to the commissioned equipment for conformance to the contract documents as it relates to the commissioning process, to the performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of performance procedures and only secondarily to verify compliance with equipment specifications. The commissioning authority will notify the owner/CM, PM or A/E as requested, of items missing or areas that are not in conformance with contract documents and which require resubmission.

C. The CxA may request additional design narrative from the A/E and controls contractor, depending on the completeness of the OPR documentation and sequences provided with the specifications.

D. These submittals to the CxA do not constitute compliance for O&M manual documentation. The O&M manuals are the responsibility of the contractor, though the CxA will review and approve them.

3.04 PERFORMANCE TESTING

A. Requirements. The performance testing shall demonstrate that each system is operating according to the documented design intent and contract documents. Performance testing facilitates bringing the systems from a state of individual substantial completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems.

B. Coordination and Scheduling. The contractor shall provide sufficient notice, regarding their completion schedule for the construction checklists and startup of all equipment and systems to allow the performance testing to be scheduled The commissioning team shall oversee, witness, and document the performance all equipment and systems. The CxA in association with the contractor/subcontractors and facility staff shall execute the tests. Performance testing shall be conducted after the construction checklists, and startup has been satisfactorily completed. The control system shall be sufficiently tested and approved by the CxA before it is used, to verify performance of other components or systems. The air balancing and water balancing shall be completed before performance testing of air or water-related equipment or systems. Testing proceeds from components to sub-systems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems shall be checked.

C. Development of Test Procedures. Before test procedures are finalized, the contractor shall provide to the A/E and the CxA all requested documentation and a current list of changes affecting equipment or systems, including an updated points list, program code, control sequences, and testing parameters. Using the testing parameters and requirements in the technical specifications, the CxA shall

update/develop specific test procedures and forms to verify and document proper operation of each piece of equipment and system. Each contractor/subcontractor or vendor, as appropriate, shall provide assistance to the CxA in developing the final procedures. Prior to finalization, the A/E shall review and concur with the test procedure.

D. Test Methods.

1. Performance testing and verification may be achieved by manual testing or by monitoring the performance and analyzing the results using the control system's trend log capabilities or by stand-alone data loggers. The CxA may substitute specified methods or require an additional method to be executed other than what was specified, with the approval of the A/E and owner/CM. The CxA will determine which method is most appropriate for tests that do not have a specified method.
2. Simulated Conditions. Simulating conditions shall be allowed, though timing the testing to experience actual conditions is encouraged wherever practical.
3. Overridden Values. Overriding sensor values to simulate a condition, such as overriding the outside air temperature reading in a control system to be something other than it really is, is acceptable.
4. Simulated Signals. Using a signal generator which creates a simulated signal to test and calibrate transducers and DDC constants is generally recommended over using the sensor to act as the signal generator via simulated conditions or overridden values.
5. Altering Setpoints. Rather than overriding sensor values, and when simulating conditions is difficult, altering setpoints to test a sequence is acceptable.
6. Indirect Indicators. Relying on indirect indicators for responses or performance shall be allowed only after visually and directly verifying and documenting, over the range of the test parameters, that the indirect readings through the control system represent actual conditions and responses.
7. Setup. Each performance test shall be performed under conditions that simulate actual conditions as closely as is practically possible. The contractor/subcontractor(s) assisting the CxA in executing the test shall provide all necessary materials, system modifications, etc., to produce the necessary flows, pressures, temperatures, etc., necessary to execute the test according to the specified conditions. At completion of the test, the contractor/subcontractor(s) shall return all affected equipment and systems to their approved operating settings.

E. Test Equipment. Refer to Part 2 for test equipment requirements.

F. Problem Solving. The burden of responsibility to solve, correct, and retest malfunctions/failures is with the contractor, with A/E approval as required.

3.05 DOCUMENTATION, NON-CONFORMANCE, AND APPROVAL OF TESTS

A. Documentation. The CxA shall witness and verify/pre-approve the documentation of the results of all performance tests. The CxA shall complete all documentation for performance testing.

B. Non-Conformance.

1. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA. In such cases the deficiency and resolution will be documented on the procedure

form or on an attached sheet.

2. As tests progress and a deficiency is identified, the CxA shall discuss the issue with the commissioning team, and the contractor.

   a. When there is no dispute on the deficiency and the contractor accepts responsibility to correct it:
      1) The CxA will document the deficiency and the contractor's response and intentions. After the day's work, the CxA will submit the non-compliance reports to the CM. The contractor corrects the deficiency, signs the statement of correction at the bottom of the non-compliance form certifying that the equipment is ready to be retested and sends it back to the CxA.
      2) The contractor shall reschedule the test; and the test repeated.

   b. If there is a dispute about a deficiency, regarding whether or not it is a deficiency:
      1) The dispute shall be documented on the non-compliance form with the contractor's response.
      2) Resolutions are made at the lowest management level possible. Other parties are brought into the discussions as needed. Final interpretive authority is with the A/E. Final acceptance authority is with the construction manager.
      3) The CxA documents the resolution process.
      4) Once the interpretation and resolution have been decided, the contractor corrects the deficiency, signs the statement of correction on the non-compliance form and provides it to the CxA, through the CM. The contractor shall reschedule the test and the test repeated until satisfactory performance is achieved.

3. Cost of retesting a performance test hall is the contractor's.

4. The contractor shall submit in writing to the CM at least as often as commissioning meetings are being scheduled, the status of each outstanding discrepancy identified during commissioning. Discussion shall cover explanations of any disagreement and proposals for their resolutions.
   a. The CxA retains the original non-conformance forms until the end of the project.
   b. Retesting shall not be considered a justified reason for a claim of delay or for a time extension by the contractor.

C. Failure Due to Manufacturer Defect. If 10% (or three, whichever is greater) of identical pieces of equipment fail to perform to the contract documents (mechanically or substantively) due to a manufacturing defect, not allowing it to meet its submitted performance specification, all identical units may be considered unacceptable by the A/E or CxA. In such case, the contractor shall provide the owner with the following:

   a. Within one week of notification from the owner/CM, the contractor or manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the CM within two weeks of the original notice.
   b. Within two weeks of the original notification, the contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc., and all proposed solutions. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
   c. The A/E will determine whether a replacement of all identical units or a repair is acceptable.

d. Two examples, where applicable, of the proposed solution shall be installed by the contractor and the A/E shall be allowed to test the installations for up to one week, upon which the A/E will decide whether to accept the solution.

e. Upon acceptance, the contractor and/or manufacturer shall replace or repair all identical items, at their expense. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

D. Approval. The CxA notes each satisfactorily demonstrated function on the test form. Final approval of the performance test by the owner is made after review by the CxA and CM, following recommendations by the A/E.

3.06 DEFERRED TESTING

A. Unforeseen Deferred Tests. If any check or test cannot be completed due to the project completion level, required occupancy condition or other deficiency, execution of checklists and performance testing may be delayed upon approval of the CxA and CM. These tests will be conducted in the same manner as the seasonal tests as soon as possible. Services of necessary parties will be negotiated.

B. Seasonal Testing. During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity through the owner/CM. Tests will be executed, documented by the CxA and deficiencies should be corrected by the appropriate contractor/ subcontractors with the CxA witnessing. Any final adjustments to the O&M manuals and as-builts due to the testing shall be made by the contractor.

3.07 TRAINING OF OWNER PERSONNEL

A. The contractor shall provide training coordination, scheduling of subcontractors, and ensure that training is completed. All training shall be coordinated, through the CM, with the CxA.

B. The contractor shall ensure that each subcontractor and vendor (mechanical, plumbing, fire, electrical, specialty, etc.) shall have the following responsibilities:

1. Provide, to the CxA through the CM, a training plan sixty days before the planned training covering the following elements:
   a. Equipment
   b. Intended audience
   c. Location of training
   d. Objectives
   e. Subjects covered (description, duration of discussion, special methods, etc.)
   f. Duration of training on each subject
   g. Instructor for each subject
   h. Methods (classroom lecture, manufacturer's quality video, site walk-through, actual operational demonstrations, written handouts, etc.).
2. Provide designated owner personnel with comprehensive orientation and training in the understanding of the systems and the operation and maintenance of each piece of equipment that makes up the system.
3. Training shall normally start with classroom sessions followed by hands-on demonstration/training on each piece of equipment.
4. During any demonstration, should the system fail to perform in accordance with the

requirements of the O&M manual or sequence of operations, the system shall be repaired or adjusted as necessary and the demonstration repeated at another scheduled time, if necessary.

5. The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment is required. More than one party may be required to execute the training.
6. The controls contractor shall attend sessions other than the controls training, as specified, to discuss the interaction of the controls system as it relates to the equipment being discussed.
7. The training sessions shall follow the outline in the table of contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
8. Training shall include:
    a. Use of the printed installation, operation and maintenance instruction material included in the O&M manuals.
    b. A review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include startup, operation in all modes possible, shutdown, seasonal changeover and any emergency procedures.
    c. Discussion of relevant health and safety issues and concerns.
    d. Discussion of warranties and guarantees.
    e. Common troubleshooting problems and solutions.
    f. Explanatory information included in the O&M manuals.
    g. Discussion of any peculiarities of equipment installation or operation.
    h. Classroom sessions shall include the use of overhead projections, slides, video/audio-taped material as might be appropriate.
    i. Hands-on training shall include startup, operation in all modes possible, including manual, shut-down, alarms, power failure and any emergency procedures, and preventative maintenance for all pieces of equipment.
9. The contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls not controlled by the central control system.

D. At the discretion of the CxA, training may occur before performance testing is complete if required by the facility operators to assist the CxA in the performance testing.

E. Videotaping of the training sessions will be provided by the contractor and added to the O&M manuals. In addition, factory training videos identifying key troubleshooting, repair, service and/or replacement techniques shall be provided and reviewed with the owner.

F. The CxA at the beginning of each training session presents the overall system narrative and the design concept of each equipment section.

3.08 INSTALLATION, OPERATION AND MAINTENANCE MANUALS/DATA

A. The commissioning process requires detailed installation, operation and maintenance documentation as identified in this section and technical specifications.
B. See Section 01 32 19 Submittal Procedures.
C. See Section 01 78 39 Project Record Documents.
D. See Section 23 08 00 Commissioning of HVAC.

3.09 COMMISSIONING RECORD

A. The CxA is responsible to compile, organize and index the following commissioning data by equipment into labeled, indexed and tabbed, three-ring binders and deliver it to District, to be delivered with the O&M manuals.

B. Commissioning Plan

C. System reports including design narratives and criteria including sequences. Each system shall contain the startup plan and report, approvals, corrections, construction checklists, completed performance tests, trending and analysis, training plan and recommended recommissioning schedule.

D. Final Commissioning Report including an executive summary, list of participants and roles, brief building description, overview of commissioning and testing scope and a general description of testing and verification methods. For each piece of commissioned equipment, the report should contain the disposition of the commissioning authority regarding the adequacy of the equipment, documentation and training meeting the contract documents in the following areas:

1) equipment meeting the equipment specifications
2) equipment installation
3) performance and efficiency
4) equipment documentation and design intent
5) operator training

All outstanding non-compliance items shall be specifically listed. Recommendations for improvement to equipment or operations, future actions, commissioning process changes, etc. shall also be listed. Each non-compliance issue shall be referenced to the specific performance test, inspection, trend log, etc. where the deficiency is documented. The performance and efficiency section for each piece of equipment shall include a brief description of the verification method used (manual testing, BMS trend logs, data loggers, etc.) and include observations and conclusions from the testing.

END OF SECTION

SECTION 23 08 00
COMMISSIONING of HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. OPR, BoD, and BoD-HVAC documentation prepared by Owner and Architect contains requirements that apply to this Section.

1.2 SUMMARY

A. This Section includes requirements for commissioning the HVAC system and its subsystems and equipment. This Section supplements the general requirements specified in Division 1 Section "General Commissioning Requirements."

B. Related Sections include the following:

1. Division 1 Section 01 91 13 General Commissioning Requirements for general requirements for commissioning processes that apply to this Section.

1.3 DEFINITIONS

A. Architect: Includes Architect identified in the Contract for Construction between College and Contractor, plus consultant/design professionals responsible for design of HVAC, electrical, communications, controls for HVAC systems, and other related systems.

B. BoD: Basis of Design.

C. BoD-HVAC: HVAC systems basis of design.

D. CxA: Commissioning Authority.

E. OPR: Owner's (College) Project Requirements.

F. Systems, Subsystems, and Equipment: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, and equipment.

G. TAB: Testing, Adjusting, and Balancing.

1.4 CONTRACTOR'S RESPONSIBILITIES

A. The following responsibilities are in addition to those specified in Division 1 Section "General Commissioning Requirements."

B. Contractor:
1. Attend procedures meeting for TAB Work.
2. Certify that TAB Work is complete.

C. Mechanical Subcontractor:

1. Attend TAB verification testing.
2. Provide measuring instruments and logging devices to record test data, and data acquisition equipment to record data for the complete range of testing for the required test period.

D. HVAC Instrumentation and Control Subcontractor: With the CxA, review control designs for compliance with the OPR and BoD, controllability with respect to actual equipment to be installed, and recommend adjustments to control designs and sequence of operation descriptions.

E. TAB Subcontractor:

1. Contract Documents Review: With the CxA, review the Contract Documents before developing TAB procedures.

a. Verify the following:

1) Accessibility of equipment and components required for TAB Work.

2) Adequate number and placement of duct balancing dampers to allow proper balancing while minimizing sound levels in occupied spaces.

3) Adequate number and placement of balancing valves to allow proper balancing and recording of water flow.

4) Adequate number and placement of test ports and test instrumentation to allow reading and compilation of system and equipment performance data needed to conduct both TAB and commissioning testing.

5) Air and water flow rates have been specified and compared to central equipment output capacities.

b. Identify discontinuities and omissions in the Contract Documents.

c. This review of the Contract Documents by the TAB Subcontractor satisfies requirements for a design review report as specified in Division 23 Section "Testing, Adjusting, and Balancing."

2. Additional Responsibilities: Participate in tests specified in Division 23 Sections "HVAC Instrumentation and Controls" and "Sequence of Operation."

F. Electrical Subcontractor:

1. With the Mechanical Subcontractor, coordinate installations and connections between and among electrical and HVAC systems, subsystems, and equipment.
2. Attend TAB verification testing.

1.5 COMMISSIONING DOCUMENTATION

A. The following are in addition to documentation specified in Division 1 Section "General Commissioning Requirements."

B. BoD HVAC: Owner will provide BoD-HVAC documents, prepared by Architect and approved by College Representative, to the CxA and Contractor for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

C. Test Checklists: CxA with assistance of Architect shall develop test checklists for HVAC systems, subsystems, and equipment, including interfaces and interlocks with other systems. CxA shall prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. In addition to the requirements specified in Division 1 Section "General Commissioning Requirements," checklists shall include, but not be limited to, the following:

1. Calibration of sensors and sensor function.
2. Testing conditions under which test was conducted, including (as applicable) ambient conditions, set points, override conditions, and status and operating conditions that impact the results of test.
3. Control sequences for HVAC systems.
4. Responses to control signals at specified conditions.
5. Sequence of response(s) to control signals at specified conditions.
6. Narrative description of observed performance of systems, subsystems, and equipment. Notation to indicate whether the observed performance at each step meets the expected results.
7. Interaction of auxiliary equipment.
8. Issues log.

1.6 SUBMITTALS

The following submittals are in addition to those specified in Division 1 Section "General Commissioning Requirements."

A. Testing Procedures: CxA shall submit detailed testing plan, procedures, and checklists for each series of tests. Submittals shall include samples of data reporting sheets that will be part of the reports.

B. Certificate of Readiness: CxA shall compile certificates of readiness prepared by Contractor certifying that systems, subsystems, equipment, and associated controls are ready for testing.

C. Certificate of Completion of Installation, Prestart, and Startup: CxA shall certify that installation, prestart, and startup activities have been completed. Certification shall include completed checklists provided by TAB Subcontractor as specified in Division 23 Section "Testing, Adjusting, and Balancing." and the Pre-Functional Checklist by the Controls Contractor

D. Certified Pipe Cleaning and Flushing Report: CxA shall certify that pipe cleaning, flushing, hydrostatic testing, and chemical treating have been completed.

E. Test and Inspection Reports: CxA shall compile and submit test and inspection reports and certificates, and shall include them into the systems manual and commissioning report.

F. Corrective Action Documents: CxA shall submit corrective action documents.

G. Certified TAB Reports: CxA shall submit verified, certified TAB reports.

PART 2 - PRODUCTS

The following products and services providers will be directly involved in the commissioning of the building system:

A. T.A.C. Americas (Yamas Controls)
Y-Net Building Automation System

PART 3 - EXECUTION

3.1 TESTING PREPARATION

A. Prerequisites for Testing:

1. Certify that HVAC systems, subsystems, and equipment have been completed, calibrated, and started; are operating according to the OPR, BoD, and Contract Documents; and that Certificates of Readiness are signed and submitted.
2. Certify that HVAC instrumentation and control systems have been completed and calibrated; are operating according to the OPR, BoD, and Contract Documents; and that pretest set points have been recorded.
3. Certify that TAB procedures have been completed, and that TAB reports have been submitted, discrepancies corrected, and corrective work approved.
4. Test systems and intersystem performance after approval of test checklists for systems, subsystems, and equipment.
5. Set systems, subsystems, and equipment into operating mode to be tested (e.g., normal shut down, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
6. Verify each operating cycle after it has been running for a specified period and is operating in a steady-state condition.
7. Inspect and verify the position of each device and interlock identified on checklists. Sign off each item as acceptable, or failed. Repeat this test for each operating cycle that applies to system being tested.
8. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.
9. Annotate checklist or data sheet when a deficiency is observed.
10. Verify equipment interface with monitoring and control system and TAB criteria; include the following as applicable:

    a. Supply and return flow rates for VAV and constant volume systems in each operational mode.
    b. Operation of terminal units in both heating and cooling cycles.
    c. Minimum outdoor-air intake in each operational mode and at minimum and maximum airflows.
    d. Building pressurization.
    e. Total exhaust airflow and total outdoor-air intake.
    f. Operation of indoor-air-quality monitoring systems.

11. Verify proper responses of monitoring and control system controllers and sensors to include the following:

    a. For each controller or sensor, record the indicated monitoring and control system reading and the test instrument reading. If initial test indicates that the test reading is outside of the control range of the installed device, check calibration of the

installed device and adjust as required. Retest malfunctioning devices and record results on checklist or data sheet.

b. Report deficiencies and prepare an issues log entry.

12. Verify that HVAC equipment field quality-control testing has been completed and approved. CxA shall direct, witness, and document field quality-control tests, inspections, and startup specified in individual Division 23 Sections.

B. Testing Instrumentation: Install measuring instruments and logging devices to record test data for the required test period. Instrumentation shall monitor and record full range of operating conditions and shall allow for calculation of total capacity of system for each mode of operation. For individual room cooling tests, provide temporary heaters to impose a cooling load indicated in BoD. Operational modes include the following:

1. Occupied and unoccupied.
2. Warm up and cool down.
3. Economizer cycle.
4. Emergency power supply.
5. Life-safety and safety systems.
6. Smoke control.
7. Fire safety.
8. Stair pressurization system.
9. Temporary upset of system operation.
10. Partial occupancy conditions.
11. Special cycles.

3.2 TAB VERIFICATION

A. TAB Subcontractor shall coordinate with CxA for work required in Division 15 Section "Testing, Adjusting, and Balancing." TAB Subcontractor shall copy CxA with required reports, sample forms, checklists, and certificates.

B. Contractor, HVAC Subcontractor, and CxA shall witness TAB Work.

C. TAB Preparation:

1. TAB Subcontractor shall provide CxA with data required for "Pre-Field TAB Engineering Reports" specified in Division 23 Section "Testing, Adjusting, and Balancing."

a. CxA shall use this data to certify that prestart and startup activities have been completed for systems, subsystems, and equipment installation.

D. Ductwork Air Leakage Testing:

1. Architect will identify, for HVAC Subcontractor and CxA, portions of duct systems to have ductwork air leakage testing. Ductwork air leakage testing shall be performed according to Division 23 Section "Metal Ducts," and shall be witnessed by the CxA.
2. On approval of preliminary ductwork air leakage testing report, the CxA shall coordinate verification testing of ductwork air leakage testing. Verification testing shall include random retests of portions of duct section tests, reported in preliminary ductwork air leakage testing report. The HVAC Subcontractor shall perform tests using the same instrumentation (by model and serial number) as for original testing; the CxA shall witness verification testing.

E. Verification of Final TAB Report:

1. CxA shall select, at random, 10 percent of report for field verification.
2. CxA shall notify TAB Subcontractor 10 days in advance of the date of field verification; however, notice shall not include data points to be verified. The TAB Subcontractor shall use the same instruments (by model and serial number) that were used when original data were collected.
3. Failure of an item is defined as follows:

    a. For all readings other than sound, a deviation of more than 10 percent.

        1) For sound pressure readings, a deviation of 3 dB. (Note: Variations in background noise must be considered.)
4. Failure of more than 10 percent of selected items shall result in rejection of final TAB report.

F. If deficiencies are identified during verification testing, CxA shall notify the HVAC Subcontractor and Architect, and shall take action to remedy the deficiency. Architect shall review final tabulated checklists and data sheets to determine if verification is complete and that system is operating according to the Contract Documents.

G. CxA shall certify that TAB Work has been successfully completed.

3.3 TESTING

A. Test systems and intersystem performance after test checklists for systems, subsystems, and equipment have been approved.

B. Perform tests using design conditions whenever possible.

1. Simulate conditions by imposing an artificial load when it is not practical to test under design conditions and when written approval for simulated conditions is received from CxA. Before simulating conditions, calibrate testing instruments. Set and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.
2. Alter set points when simulating conditions is not practical and when written approval is received from CxA.
3. Alter sensor values with a signal generator when design or simulating conditions and altering set points are not practical. Do not use sensor to act as signal generator to simulate conditions or override values.

C. Scope of HVAC Subcontractor Testing:

1. Testing scope shall include entire HVAC installation, from central equipment for heat generation and refrigeration through distribution systems to each conditioned space. It shall include measuring capacities and effectiveness of operational and control functions.
2. Test all operating modes, interlocks, control responses, responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.

D. Detailed Testing Procedures: CxA, with HVAC Subcontractor, TAB Subcontractor, and HVAC Instrumentation and Control Subcontractor, shall prepare detailed testing plans, procedures, and checklists for HVAC systems, subsystems, and equipment.

E. Boiler Testing and Acceptance Procedures: Testing requirements are specified in Division 23 boiler Sections. CxA shall review and comment on submittals, test data, inspector record, and boiler certification and shall compile information for inclusion in systems manual.

F. HVAC Instrumentation and Control System Testing:

1. Field testing plans and testing requirements are specified in Division 23 Sections "HVAC Instrumentation and Controls" and "Sequence of Operation." The CxA, HVAC Subcontractor, and the HVAC Instrumentation and Control Subcontractor shall collaborate to prepare testing plans.

2. CxA shall convene a meeting of appropriate entities to review test report of HVAC instrumentation and control systems.

G. Pipe cleaning, flushing, hydrostatic tests, and chemical treatment requirements are specified in Division 15 piping Sections. HVAC Subcontractor shall prepare pipe system cleaning, flushing, and hydrostatic testing. CxA shall review and comment on plan and final reports. CxA shall certify that pipe cleaning, flushing, hydrostatic tests, and chemical treatment have been completed. Plan shall include the following:

1. Sequence of testing and testing procedures for each section of pipe to be tested, identified by pipe zone or sector identification marker. Markers shall be keyed Drawings for each pipe sector showing the physical location of each designated pipe test section. Drawings keyed to pipe zones or sectors shall be formatted to allow each section of piping to be physically located and identified when referred to in pipe system cleaning, flushing, hydrostatic testing, and chemical treatment plan.
2. Description of equipment for flushing operations.
3. Minimum flushing water velocity.
4. Tracking checklist for managing and ensuring that all pipe sections have been cleaned, flushed, hydrostatically tested, and chemically treated.

H. Energy Supply System Testing: HVAC Subcontractor shall prepare a testing plan to verify performance of systems and equipment. Plan shall include the following:

1. Sequence of testing and testing procedures for each equipment item and pipe section to be tested, identified by pipe zone or sector identification marker. Markers shall be keyed to Drawings for each pipe sector showing the physical location of each designated pipe test section. Drawings keyed to pipe zones or sectors shall be formatted to allow each section of piping to be physically located and identified when referred to in system testing plan.
2. Tracking checklist for managing and ensuring that all pipe sections have been tested.

I. Heat-Generation System Testing: HVAC Subcontractor shall prepare a testing plan to verify performance of boilers, feedwater equipment, furnaces, and auxiliary equipment. Plan shall include the following:

1. Sequence of testing and testing procedures for each item of equipment and section of pipe to be tested, identified by identification marker. Markers shall be keyed to Drawings for each pipe sector showing the physical location of each item of equipment and pipe test section. Drawings shall be formatted to allow each item of equipment and section of piping to be physically located and identified when referred to in the system testing plan.
2. Tracking checklist for managing and ensuring that all pipe sections have been tested.

J. Refrigeration System Testing: HVAC Subcontractor shall prepare a testing plan to verify performance of chillers, cooling towers, refrigerant compressors and condensers, heat pumps, and other refrigeration systems. Plan shall include the following:

1. Sequence of testing and testing procedures for each item of equipment and section of pipe to be tested, identified by identification marker. Markers shall be keyed to Drawings showing the physical location of each item of equipment and pipe test section. Drawings shall be formatted to allow each item of equipment and section of piping to be physically located and identified when referred to in the system testing plan.
2. Tracking checklist for managing and ensuring that all pipe sections have been tested.

K. HVAC Distribution System Testing: HVAC Subcontractor shall prepare a testing plan to verify performance of air, steam, and hydronic distribution systems; special exhaust; and other distribution systems. Include HVAC terminal equipment and unitary equipment. Plan shall include the following:

1. Sequence of testing and testing procedures for each item of equipment and section of pipe to be tested, identified by identification marker. Markers shall be keyed to Drawings showing the physical location of each item of equipment and pipe test section. Drawings shall be formatted to allow each item of equipment and section of piping to be physically located and identified when referred to in the system testing plan.
2. Tracking checklist for managing and ensuring that all pipe sections have been tested.

L. Vibration and Sound Tests: HVAC Subcontractor shall prepare testing plans to verify performance of vibration isolation and seismic controls. CxA shall witness and certify tests and inspections.

M. Deferred Testing:

1. If tests cannot be completed because of a deficiency outside the scope of the HVAC system, the deficiency shall be documented and reported to Owner. Deficiencies shall be resolved and corrected by appropriate parties and test rescheduled.
2. If the testing plan indicates specific seasonal testing, appropriate initial performance tests shall be completed and documented and additional tests scheduled.

N. Testing Reports:

1. Reports shall include measured data, data sheets, and a comprehensive summary describing the operation of systems at the time of testing.
2. Include data sheets for each controller to verify proper operation of the control system, the system it serves, the service it provides, and its location. For each controller, provide space for recording its readout, the reading at the controller's sensor(s), plus comments. Provide space for testing personnel to sign off on each data sheet.
3. Prepare a preliminary test report. Deficiencies will be evaluated by Architect to determine corrective action. Deficiencies shall be corrected and test repeated.
4. If it is determined that the system is constructed according to the Contract Documents, Owner will decide whether modifications required to bring the performance of the system to the OPR and BoD documents shall be implemented or if tests will be accepted as submitted. If corrective Work is performed, Owner will decide if tests shall be repeated and a revised report submitted.

END OF SECTION

SECTION 02050
DEMOLITION

PART 1GENERAL

1.01 SUMMARY

A. Provide selective demolition, salvage, protection and removal, complete with all related utilities and site modifications, as indicated on the Drawings and as required for the new work.
B. Related Sections:
   1. Division 15 - Mechanical: Capping and removing existing mechanical or plumbing work.
   2. Division 16 - Electrical: Capping and removing existing electrical work.

1.02 DEFINITIONS

A. Remove: Remove and carefully dispose of items except those indicated to be reinstalled, salvaged, or to remain the District's property.

B. Remove and Salvage: Items indicated to be removed and salvaged remain the District's property.

1.03 REFERENCES

A. American National Standards Institute, Inc. (ANSI).
   1. A10.6 - American National Standard Safety Requirements for Demolition.

1.04 SUBMITTALS

A. Procedure: In accordance with Section 01 32 19.
B. Provide detailed information, for review prior to demolition commencement, on methods and sequencing for accomplishing this Work.
   1. Information may be in the form of drawings, print mark-overs or field markings, and walk-throughs with District as required to adequately describe the Work to be done and procedures to be followed.
C. Schedule of demolitions activities indicating the following:
   1. Detailed sequence of demolition and removal work, with starting and ending dates for each activity.
   2. Interruption of utility services.
   3. Coordination for shutoff, capping, and continuation of utility services.
D. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by demolition.
E. Record Drawings at Project closeout according to Section 01 77 00.
   1. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with applicable rules, codes, regulations, and safety orders of public authorities having jurisdiction.

1.06 PROJECT CONDITIONS

A. Preplan demolition Work for minimal interruptions or disruptions to District's ongoing operations.

B. Special care shall be exercised to protect items to remain.
   1. Damage or disturbance to these items shall be promptly restored, repaired, or replaced to match existing at no cost to the District.
   2. If the Contractor has any questions as to the extent of items to remain, he shall notify the Architect and request a clarification before proceeding.

C. Provide dirt and dust barriers, debris containers, removal routes and disposal to protect areas utilized by District's personnel. Provide cleanup services to maintain cleanliness of these spaces from dirt caused by demolition work.

D. Traffic:
   1. Conduct demolition operations and the removal of debris to ensure minimum interference with streets, walks, and other adjacent occupied or used facilities.
   2. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.
   3. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

E. Prohibited from use are any form of explosives.

F. Contractor or any personnel employed on the Work shall not trespass beyond Limits of Work.

G. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.
   1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction and in accordance with Architect's approval.
   2. Provide temporary services during interruptions to existing utilities, as acceptable to the governing authorities.

H. Noise Control: Keep noise levels to the minimum possible and obey local noise ordinance.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Salvaged items become the property of the District.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas affected by Work of this Section and verify that required protection is in place.

B. Do not commence demolition Work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Provide protection as necessary and in accordance with applicable regulations, and insure that protection is properly in place prior to Work commencement:
   1. For workmen, public, District's employees, and other contractors.
   2. For existing finishes, structures, equipment, utilities, systems, and improvements to remain.

3. To prevent damage or injury due to dust or dirt; see Division 1.

B. Lay out cutting work at jobsite and coordinate with related work for which cutting is required. Review proposed layout with District prior to performing cutting operations.

C. Verify existing utility services to remain in operation during course of Work, cooperate with District in scheduling Work so there will be a minimum of interference. Prearrange utility shutdown or temporary interruption with District prior to Work commencement.

D. Notify utility companies having service connections within building such as water, electricity, gas, sewer and other connections.

E. Contact municipal and regulatory agencies affected by and interested in the Work, including but not limited to Public Works, Water, Street, Police, Fire, and Building Inspection. Secure necessary information and permits required, and make detailed arrangements for smooth, safe prosecution of the Work.

3.03 DEMOLITION

A. Existing work to be removed shall, in general, be as indicated on Drawing and shall include other existing materials and work necessary to install new work indicated and specified.

B. Perform work in accordance with ANSI A10.6 unless otherwise specified.

C. Contractor shall be solely responsible for safety, adequacy and satisfactory performance of methods and means employed.
1. Provide necessary temporary enclosures to adequately protect persons from possible injury.
2. Provide necessary temporary partitions, enclosure coverings, and the like.

D. Perform demolition as much as possible with small tools. Demolish in small sections

E. Pollution Controls: Use suitable methods as necessary to limit the amount of dust and dirt rising and scattering in the air to the lowest level of air pollution practicable for the condition of Work; comply with the governing regulations.
1. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations, as directed by governing authorities.

3.04 REMOVAL AND SALVAGE

A. Where required by the Drawings or specified and when so directed to be salvaged, existing materials shall be removed in the most careful manner possible to avoid damage; and, if damaged, such items shall be restored to conditions satisfactory to the Architect.
1. Materials to be removed and not reinstalled shall become the property of the Contractor who shall be responsible for their timely removal from the Project site and their legal disposal, unless otherwise noted.
2. All locksets to be removed and not reinstalled shall become the property of the District.

B. Remove, clean, and pack or crate items to protect against damage. Removal shall be under direct supervision of District's Representative.

C. Identify contents of containers with labels. Provide a Salvage Log as an electronic spreadsheet in Microsoft Excel 2000 format, and in hard-copy format. Salvage Log shall indicate item and stored location. Salvage Log shall be delivered to the District's Representative.

D. Deliver salvaged items to District's designated storage area unless otherwise directed by District's Representative.

3.05 CUTTING

A. Take care not to damage existing surfaces that are to remain.

B. At the limits of demolition Work shown or specified, provide neat, orderly and clean joints, lines and edges of surfaces, whether for junctions with new materials or surfaces or whether to be left as existing. Where demolition methods or controls may not permit the intended jointure, submit conditions and alternatives to the Architect, and obtain resolution prior to commencing Work.
1. Saw-cut concrete at walls and floor slabs.

3.06 PATCHING

A. Repair or replace any surfaces, equipment, or other improvements to remain which become exposed, defaced, or damaged as a result of demolition Work at no increase in Contract Sum.

B. Make all such repairs with materials equal in kind and quality to match existing adjacent surfaces or existing equipment or improvements intended to remain.

C. Repair entire surface of patched surfaces to nearest intersection.

D. Where repair scope is more than incidental, repairs shall comply with current codes.

3.07 ADJUSTING AND CLEANING

A. Provide cleaning during demolition as necessary and to the acceptance of the District.

B. Leave all portions of demolition area in a level, safe, and sanitary condition acceptable to public authorities and the District.

END OF SECTION

SECTION 03542

CEMENT-BASED UNDERLAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes cement-based, polymer-modified, self-leveling underlayment for interior finish flooring.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer (applicator) who is acceptable to manufacturer, who has completed cement-based underlayment applications similar in material and extent to that required for this Project, and whose work has resulted in construction with a record of successful in-service performance.

B. Mockups: Before installing underlayment, apply mockups to demonstrate qualities of materials and execution. Comply with the following requirements, using materials indicated for the completed Work:

1. Architect will select one area or surface to represent surfaces and conditions for application on each substrate required.
2. Notify Architect seven days in advance of dates and times when mockups will be applied.
3. Obtain Architect's approval of mockups before starting underlayment application.
4. Maintain mockups, during underlayment application and until installation of finish flooring, in an undisturbed condition as a standard for judging the completed Work.
5. Approved mockups may become part of the completed Work if undisturbed when finish flooring is installed.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage, mixing with other components, and application.

B. Store materials to comply with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written recommendations for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting underlayment performance.

B. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.

1.7 COORDINATION

A. Coordinate cement-based underlayment with requirements of finish flooring products, including adhesives, specified in Division 9 Sections.

1. Before installing surface sealers recommended by underlayment manufacturer, if any, verify compatibility with finish flooring installation adhesives.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the following:

1. K-15 Self-Leveling Underlayment Concrete; Ardex, Inc.
2. 300 Premium Underlayment; Burke Group, LLC (The).
3. LeveLayer I; Dayton Superior Corp.
4. Thoro Underlayment, Self-Leveling; Harris Specialty Chemicals, Inc.
5. Levelex Underlayment; L&M Construction Chemicals, Inc.
6. Ultra/Plan MB; Mapei Corporation.

2.2 PRODUCTS AND MATERIALS

A. Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in uniform thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C 219.
2. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.
3. Underlayment Additive: Resilient-emulsion product of underlayment manufacturer formulated for use with underlayment when applied to substrate and conditions indicated.

B. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch, or coarse sand as recommended by underlayment manufacturer.

1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.

C. Water: Potable and at a temperature of not more than 70 deg F.

D. Reinforcement: For underlayment applied to wood substrates, provide galvanized metal lath or other corrosion-resistant reinforcement recommended in writing by underlayment manufacturer.

E. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for conditions affecting performance of underlayment including substrate moisture content. Begin underlayment application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Prepare and clean substrate according to manufacturer's written instructions for substrate indicated. Provide clean, dry, neutral-pH substrate for underlayment application.

1. Treat nonmoving substrate cracks to prevent cracks from telegraphing (reflecting) through underlayment according to manufacturer's written recommendations.
2. Fill substrate voids to prevent underlayment from leaking.

B. Concrete Substrates: Mechanically remove laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond according to manufacturer's written instructions.

C. Wood Substrates: Mechanically fasten loose boards and panels to eliminate substrate movement and squeaks. Sand to remove coatings that might impair underlayment bond and remove sanding dust.

1. Install underlayment reinforcement recommended in writing by manufacturer.

D. Metal Substrates: Mechanically remove rust, foreign matter, and other contaminants that might impair underlayment bond according to manufacturer's written instructions. Apply corrosion-resistant coating compatible with underlayment if recommended in writing by underlayment manufacturer.

E. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond according to manufacturer's written instructions.

F. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

3.3 APPLICATION

A. General: Mix and apply underlayment components according to manufacturer's written instructions.

1. Coordinate application of components to provide optimum underlayment-to-substrate and intercoat adhesion.
2. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Apply underlayment to produce uniform, level surface.

1. Apply a final layer without aggregate if required to produce smooth surface.
2. Feather edges to match adjacent floor elevations.

D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.

E. Do not install finish flooring over underlayment until after time period recommended by underlayment manufacturer.

F. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

3.4 FIELD QUALITY CONTROL

A. Slump Test: If slump testing is recommended in writing by manufacturer, test underlayment for slump as it is placed for compliance with manufacturer's written recommendations.

B. Field Samples: Take at least three molded-cube samples from each underlayment batch. Test samples according to ASTM C 109/C 109M for compliance with compressive-strength requirements. When requested, provide test results to Architect.

3.5 PROTECTION

A. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION

SECTION 05400
LIGHTGAGE METAL FRAMING

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

SUMMARY:

Extent of cold-formed metal framing is shown on drawings.

Types of cold-formed metal framing units include the following:

"C" shaped load-bearing steel studs.

"C" shaped steel joists.

Metal framed suspended ceiling systems.

Accessories.

QUALITY ASSURANCE:

Comply with Chapter 22, Title 24, C.B.C.

Test in accordance with Section 1701A, Title 24, C.B.C.

Component Design: Compute structural properties of studs and joists in accordance with Section 2217.A and 2218.A, 1998 CBC AICS "Specification for Design of Cold- Formed Steel Structural Members".

Fire-Rated Assemblies: Where framing units are components of assemblies indicated for a fire-resistance rating, including those required for compliance with governing regulations, provide units which have been approved by governing authorities having jurisdiction.

SUBMITTALS:

Product Data: Submit manufacturer's product information and installation instructions for each item of lightgage framing and accessories.

Shop Drawings: Submit shop drawings for special components and installations not fully dimensioned or detailed in manufacturer's product data.

Include placing drawings for framing members showing size and gage designations, number, type, location and spacing. Indicate supplemental strapping, bracing, splices, bridging, accessories, and details required for proper installation.

PRODUCT DELIVERY, STORAGE AND HANDLING:

Protect metal framing units from rusting and damage. Deliver to project site in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade. Store off ground in a dry ventilated space or protect with suitable waterproof coverings.

PART 2 - PRODUCTS

MANUFACTURERS:

Manufacturer: Subject to compliance with requirements, provide products of one of the following:

Angeles Metal Systems
Dietrich Industries, Inc.
Western Metal
Ceco Corp.
Inryco/Milcor
U.S. Gypsum.

METAL FRAMING:

System Components: With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, and accessories as recommended by manufacturer for applications indicated, as needed to provide a complete metal framing system.

Materials and Finishes:

Exterior Wall And Other Systems: 16-gage and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 50,000 psi; ASTM A 446, Grade D.

Interior Partition And Ceiling Systems: 18-gage fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi; ASTM A 446, Grade A.

Provide galvanized finish to metal framing components complying with ASTM A 525 for minimum G 60 coating. All exterior walls, toilet & shower rooms, or soffits to have galvanized finish.

Provide prime coated finish with one coat of shop-applied red- oxide, zinc-chromate, or other similar rust-inhibitive primer. Provide for all other walls/ceilings not designated as galvanized.

"C"-Shape Studs: Manufacturer's standard load-bearing steel studs of size, shape, and gage indicated, with 1.625" flange and flange return lip.

Joists: Manufacturer's standard C-shape sections of size shape, and gage indicated.

Manufacturer: Subject to compliance with requirements, provide "C"-shaped steel joists of one of the following:

Angeles Metal Systems
Dietrich Industries
Western Metal
Ceco Corp.
Inryco/Milcor.
U.S. Gypsum.

ACCESSORIES:

Galvanized Hangers: Stud thicknesses, gage and location as indicated on the drawings:

12 gage (0.1046 thickness) cold rolled steel.
10 gage (0.1350 thickness) cold rolled steel.
8 gage (0.1644 thickness) cold rolled steel.

Wire hanger gage and location as indicated on the drawings:

12 gage (0.1084 diameter) USA Steel Wire Gage.
8 gage (0.1681 diameter) USA Steel Wire Gage.

Carrying Channels: Cold rolled steel, 1-1/2" by 7/16" wide flange, 475 lbs. minimum per 1000 lineal feet painted.

Do not use in exterior walls, or in walls perpendicular to exterior walls within ten (10) lineal feet of the exterior wall.

Cold rolled steel, 1-1/2" by 7/16" wide flange, 508 lbs. minimum per 1000 feet galvanized.

Furring Channels:

Gypsum Board Furring Hat Channels: "Screwable" 7/8" deep hat channels, (25 gage), 278 lbs. per 1000 feet painted.

Cement Plaster "C" Furring Channels: Cold rolled steel, 3/4" deep by 7/16" wide flanges, 316 lbs. minimum per 1000 feet galvanized.

Zee Channels: "Zee" shaped 1" x 1-1/2" x 1-1/4" 25 gage galvanized steel.

Slip Track: "SLP-TRK", 20 gage minimum or gage to match metal studs, DSA/ORS/SSS approved. Track must be rated for both 1 and 2 hour "T" and "F" assemblies. Provide one (1) #6 screw to each stud on both sides through slotted holes to allow 1/2" gap at the top of the studs.

Flush Mount Backing: Gage as indicated on the drawings, minimum 16 gage, DSA/ORS/SSS approved. Provide #10 screws as required by manufacturer to each stud in accordance with code authority approvals.

Standard Backing: 16 gage minimum, continuous pre-notched, face screw backing DSA/ORS/SSS approved. Provide at least three (3) #10 screws to each stud.

RC-1 Resilient Channels: 25 gage corrosion resistant steel, with pre-punched holes at 4 inches on center in the flange to facilitate screw attachment only into framing. Product is used for improving sound transmission loss through framed partitions and ceilings.

Type 1 1/2" x 2-1/2", 200 lbs/1000 feet weight.

OTHER MATERIALS:

All other materials, not specifically described but required for a complete and proper installation of metal studs, shall be new, first quality, in strict accordance with recommendations of manufacturer of light gage metal framing used, and subject to approval of Architect.

FABRICATION:

General: Framing components may be prefabricated into panels prior to erection. Fabricate panels plumb, square, true to line and braced against racking with joints welded. Perform lifting of prefabricated panels in a manner to prevent damage or distortion.

Fastenings: Attach similar components by welding or screwing as shown in the structural drawings.

Wire tying of framing components is not permitted.

PART 3 - EXECUTION

INSPECTION AND PREPARATION:

Pre-Installation Conference: Prior to start of installation of metal framing systems, meet at project site with installers of other work including door and window frames and mechanical and electrical work. Review areas of potential interference and conflicts, and coordinate layout and support provisions for interfacing work.

INSTALLATION:

Manufacturer's Instructions: Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations, unless otherwise indicated.

Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure tracks as shown on structural drawings. Provide fasteners at corners and ends of tracks.

Set studs plumb, except as needed for diagonal bracing or
required for non-plumb walls or warped surfaces and similar requirements.

Where stud system abuts structural column or walls, including masonry walls, anchor ends of stiffeners to supporting structure.

Install supplementary framing, blocking and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.

Installation of Wall Stud System: Secure studs to top and bottom runner tracks by either welding or screws as detailed.

Frame wall openings larger than 2'-0" square with double stud at each jamb of frame except where more than 2 are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated.

Frame both sides of expansion and control joints, with separate studs; do not bridge the joint with components of stud system.

Install horizontal lateral bracing in stud system, spaced (vertical distance) at not more than 4'-0" o.c. Weld at each intersection, as detailed.

Installation of Joists: Install level and plumb, complete with bracing and reinforcing as indicated on drawings. Provide not less than 1-1/2" end bearing.

Reinforce ends with end clips, steel hangers, steel angle clips, steel stud section, end grain wood block, or as otherwise recommended by joist manufacturer.

Installation of Wire Hangers: Attach wire hangers or brace wires to the construction above the specific ceiling. For each of the installations described below, execute the attachment in a manner which will insure the development of the full hanger or brace wire strength.

Attach wire hanger or brace wire in accordance with "Interpretations of Regulations – The DSA "IR" Manual, M-2, M-3 and M-4, and per the drawings.

Installation of Runners: Main runners shall be of the size and spacing for the distance between hangers (runner spans) as set forth in the schedule at the end of this section.

Main runners should be spliced by lapping and interlocking flanges 12" minimum and tying near each end with double loops of No. 16 gage wire.

Cross-furring should be spliced by lapping and interlocking the pieces 8" minimum and tying near each end with double loops of No. 16 gage wire.

Cross-furring shall be of the type and spacing for the distance between runners (furring spans) as set forth in the schedule at the end of this section.

Hanger wire shall be of the type and size for the area of ceiling supported as set forth in the schedule at the end of this section.

Interface with Other Work:

Stud Installation Coordination: Space studs as required for compliance with all pertinent regulations, to give proper support of the facing material, and as indicated on the drawings.

Coordinate all requirements for backing support of items to be mounted on finished walls.

Coordinate all requirements for pipes and other items designed to be housed within the partition and wall systems.

Site Tolerances:

Stud Tolerances: Align all partition and wall assemblies to a tolerance of one in 200 horizontally and one in 500 vertically.

Field Painting: Touch-up shop-applied protective coatings damaged during handling and installation. Use compatible primer for prime coated surface; use galvanizing repair paint for galvanized surfaces.

FIELD QUALITY CONTROL

Inspection: Inspection of welding per DSA/ORS/SSS T & I Sheet.

PROJECT CLOSE-OUT: (not applicable)

MAXIMUM ALLOWABLE RUNNER SPANS

MAIN RUNNERS OF COLD ROLLED STEEL CHANNELS (CRSC)	48" Spacing	42" Spacing	36" Spacing	30" Spacing	24" Spacing
3/4" CRSC	-	-	2'-0"	2'-6"	2'-6"
1-1/2" CRSC	3'-0"	3'-6"	4'-0"	4'-0"	5'-0"
2" CRSC	4'-6"	5'-0"	5'-0"	6'-0"	7'-0"

MAXIMUM ALLOWABLE FURRING SPANS

CROSS-FURRING	24" Spacing	19" Spacing	16" Spacing	12" Spacing
3/8" Pencil Rod	-	2'-0"	2'-0"	2'-6"
3/4" CRSC	3'-0"	3'-6"	3'-6"	4'-0"

MAXIMUM AREA OF HANGERS SUPPORTED	
TYPE OF HANGER	SQ. FT. PER HANGER
12 gage wire	8.0
10 gage wire	12.0
9 gage wire	12.5
8 gage wire	16.0

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated ferrous metal items, galvanized and prime painted for field or shop painting as indicated on drawings and as specified herein.

1.02 RELATED SECTIONS

A. Section 09900 - Interior Painting

1.03 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All Components:
1. Basis of Measurement: By the pound, except as modified by manufacturer of shop cast or shop forged products.
2. Basis of Payment: Includes fabrication, finishing, and installation.

1.05 REFERENCES

A. ASTM A36 - Structural Steel.

B. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.

C. ASTM A123 - Zinc (Hot-Galvanized) Coatings on Products Fabricated From Rolled, Pressed and Forged Steel Shapes, Plates, Bars, and Strip.

D. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

E. ASTM A283 - Carbon Steel Plates, Shapes, and Bars.

F. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.

G. ASTM A325 - High Strength Bolts for Structural Steel Joints.

H. ASTM A386 - Zinc-Coating (Hot-Dip) on Assembled Steel Products.

I. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.

J. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

K. ASTM B177 - Chromium Electroplating on Steel for Engineering Use.

L. AWS A2.0 - Standard Welding Symbols.

M. AWS D1.1 - Structural Welding Code.

N. SSPC - Steel Structures Painting Council.

1.06 SUBMITTALS

A. Submit under provisions of Division 1.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

1.07 QUALIFICATIONS

A. For all shop fabricated items, prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

B. Welders Certificates: Submit under provisions of Division 1, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.08 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on Drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Steel Sections: ASTM A36.

B. Steel Tubing: ASTM A500, Grade B.

C. Plates: ASTM A283.

D. Pipe: ASTM A53, Grade B.

E. Bolts, Nuts, and Washers: ASTM A325, galvanized to ASTM A153 for galvanized components.

F. Welding Materials: AWS D1.1; type required for materials being welded.

G. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

2.02 FABRICATION

A. Fit and shop assemble in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FINISHES

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Prime paint items with one coat.

D. Galvanize in accordance with ASTM A123, structural steel members.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Beginning of installation means erector accepts existing conditions.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on Drawings.

D. Perform field welding in accordance with AWS D1.1.

E. Obtain Architect/Engineer approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.04 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

3.05 SCHEDULE

A. The Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.

B. Guard Rails: As detailed; prime paint finish.

C. Joist Hangers: Joist strap anchors, fabricated with 18 gauge steel; prime paint finish.

D. Ledge and Shelf Angles, Channels and Plates Not Attached to Structural Framing: For support of metal decking, joists, and masonry; prime paint finish.

E. Lintels: As detailed; prime paint finish.

F. Door Frames for Wall Openings: Channel and Angle sections; prime paint finish.

END OF SECTION

SECTION 07920

JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes joint sealants for which the type and form is indicated on the drawings.

1. Exterior joints in vertical surfaces and horizontal nontraffic surfaces:

2. Exterior joints in horizontal traffic surfaces:

3. Interior joints in vertical surfaces and horizontal nontraffic surfaces:

4. Interior joints in horizontal traffic surfaces:

B. Related Sections include the following:

1. Division 9 Section "Gypsum Board Assemblies" for sealing perimeter joints of gypsum board partitions to reduce sound transmission.
2. Division 9 Section "Ceramic Tile" for sealing tile joints.

1.3 PERFORMANCE REQUIREMENTS

A. Provide joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

E. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.

F. Qualification Data: For Installer and testing agency.

G. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

H. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

I. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the Notice to Proceed with the Work.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
4. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY *(Project Close-Out Item)*

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two (2) years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two (2) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 LATEX JOINT SEALANTS

A. Latex Sealant: Comply with ASTM C 834, Type OP, Grade NF.

B. Products:

1. Bostik Findley; Chem-Calk 600.
2. Pecora Corporation; AC-20+.
3. Sonneborn, Division of ChemRex Inc.; Sonolac.
4. Tremco; Tremflex 834.

2.4 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:

1. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
2. Flame-spread and smoke-developed indexes of less than 25 per ASTM E 84.
3. Products:

    a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
    b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

B. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

1. Products:

    a. Pecora Corporation; BA-98.
    b. Tremco; Tremco Acoustical Sealant.

2.5 FIRE RESISTANT JOINT SEALERS

A. General: Provide manufacturer's standard sealant and accessory materials with fire-resistance rating indicated which are identical to those of assemblies whose fire endurance has been determined by testing per ASRM E 814 by Underwriters Laboratory, Inc. or other testing and inspecting agency acceptable to authorities having jurisdiction.

B. Foamed in Place Fire Stopping Sealant: Two part, foamed-in-place, silicone sealant formulated for use as part of a through-penetration fire-stop system for filling openings around cables, conduit, pipes and similar penetrations through walls and floors.

1. Products:

    a. Dow Corning Corporation; Dow Corning Fire Stop Foam.
    b. Specified Technologies, Inc.; SSS100.

C. One Part Fire Stopping Sealant: One part elastomeric sealant formulated for use as a part of a through penetration fire stop system for sealing openings around cables, conduit, pipes and similar penetrations through walls and floors.

1. Products:

    a. Dow Corning Corporation; Dow Corning Fire Stop Sealant.
    b. Electrical Products Division/3M Corporation; 3M Fire Barrier Caulk CP25WB+.

2.6 JOINT FILLERS FOR CONCRETE PAVING

A. General: Provide joint fillers of thickness and widths indicated.

1. Self-Expanding Cork Joint Filler: Preformed strips complying with ASTM D1752 for Type III.
2. Sponge Rubber Joint Filler: Preformed strips complying with ASTM D1752 for Type I.

2.7 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), Type O (open-cell material), B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.8 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

H. Installation of Preformed Tapes: Install according to manufacturer's written instructions.

I. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch. Hold edge of sealant bead 1/4 inch inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

J. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

K. Installation of Fire Stopping Sealant: Install sealant, including forming, packing and other accessory materials to fill openings around mechanical and electrical services penetrating floors and walls to provide fire-stops with fire resistance ratings indicated for floor or wall assembly in which penetration occurs.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

SECTION 09110

NON-LOAD BEARING WALL FRAMING SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Provide metal studs and channel framing of vertical surfaces, as shown and as specified.

B. Related Work Specified Elsewhere:
1. Section 09250 - Gypsum Board: metal accessories.
3. Section 10800 - Toilet Accessories.

1.02 SUBMITTALS

A. Procedure: In accordance with Section 01 32 19.

B. Product Data: Submit manufacturer's specifications and installation instructions for each type of steel studs required to show compliance with these Specifications.

1.03 QUALITY ASSURANCE

A. Allowable Tolerance: Limit tolerance for bow and alignment to 1/8 inch in 10 feet.

B. Welding Qualifications: Welding procedures, welders, and tackers shall be qualified in accordance with AWS 1.3.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products and materials in original unopened packages, containers, or bundles with manufacturer's label intact and legible.

B. Remove items delivered in broken, damaged, rusted, or unlabeled condition from Project site immediately.

C. Protect metal studs from rusting and damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Metal Manufacturer: Supply materials by one manufacturer.
1. Knorr Steel Framing
2. Western Metal Lath.
3. Angeles Metal Systems.
4. Cemco.
5. Or accepted equal.

2.02 MATERIALS

A. Materials shall comply with ASTM C645.

B. Interior Studs: Punched webs, galvanized steel, nonbearing "CEE" stud; Knorr "SS" section except as noted. 20 gage typical, other gages where shown.

C. Track: "Screwable Track, 'S' Series," gage to match studs, unpunched, galvanized steel, 1-1/2-inch flanges.

D. Compensating Channel: "T-DL" Deep leg Track, 16 gage, unpunched, 1-1/2-inch flanges, rust inhibitive finish; throat dimension as needed to allow track to nest inside.
   1. Contractor's Option: Cemco/Metal Lite, Inc. "Slotted Top Track System" of 16 gage slotted track with No. 6 screws, in lieu of compensating channel and top track.

E. Horizontal Stiffeners: 16 gage, 3/4-inch and 1-1/2-inch cold-rolled steel channels, rust inhibitive finish.

F. Backing Plates: Knorr "WC" Section unpunched. Steel sheet, plate, and unpunched "Wide Flange" studs of gages or thickness scheduled, galvanized or rust inhibitive finish.

G. Cold Rolled Channels: 16 gage steel, 3/4-inch furring channels and 1-1/2-inch runner channels, rust inhibitive finish.

H. Furring Channels: Roll formed 25 gage galvanized steel, hat-shaped channels, 2-5/8 inches wide and 7/8 inches deep, with 1/2-inch flanges; other sizes where shown.

I. Clips: 16-gage steel unless noted otherwise, of sizes and shapes shown.

J. Angles: 20-gage galvanized steel, 1-1/2-inch x 1-1/2-inch.

K. Z-Channel: 25 gage galvanized steel, 1-1/2-inch deep.

L. Shaft Wall:
   1. 20-gage, C-H-stud and sill track, 2-1/2 inches wide, galvanized.

M. Fasteners: Grabber, as manufactured by John Wagner Associates, Inc., or equal to suit stud, track, or channel gage.
   1. Sheet Metal Screws To Be Overlaid With Gypsum Wallboard or Other Finish Material:
      a. No. 8 by 9/16-inch Wafer Head Streaker for fastening 20-gage material.
      b. No. 8 by 1/2-inch wafer Head Self-Drilling for fastening 18-gage and above material. Length and gage as required and as indicated.
   2. Sheet Metal Screws Not Overlaid with Finish Material:
      a. No. 8 by 9/16-inch Hex Head Streaker for fastening 20-gage material.
      b. Hex Head Self-Drilling for fastening 18-gage and above material; No. 8 by 1/2-inch minimum. Length and gage as required and as indicated.
      c. Others: As shown.
   3. Low – Velocity fasteners (LVF) 0.157" diameter Hilti X-U fasteners (ICC ESR-2269)
   4. Concrete Nails: Case hardened stub nails 3/4 inch long.
   5. Wire: 16-gage annealed galvanized steel tie wire.

N. Welding Electrodes: AWS, low hydrogen type, as required.

O. Miscellaneous Accessories: Manufacturer's standard, suitable for the use intended.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine conditions under which metal support systems will be installed.

B. Notify the Architect, in writing, of conditions detrimental to the proper and timely completion of the Work.

C. Proceed when conditions are satisfactory.

3.02 INSTALLATION

A. Install Work in accordance with the applicable requirements of Metal Lath/Steel Framing Association (MLSFA), AWS, and ASTM C754.

B. Framing and furring work shall be plumb, straight, true and rigid. Fire rated partitions shall conform to requirements of regulatory agencies for minimum fire resistance ratings.

C. Interior Framing:
1. Frame partitions from floor to structure above at 16 inches on center, unless otherwise noted.
2. Use track at floor and structure above. Provide compensating channel at structure above as shown.
3. Use stud type and gages as follows:
   a. At Backing Plates all Areas: Gage and type as shown.
   b. At All Other Partitions: 20-gage metal studs, unless otherwise shown.
4. Openings: Frame and reinforce openings for doors, windows, and ducts, as shown.
5. Fasten runner track at 2-foot centers and 2 inches from ends, or as shown.
   a. To Concrete Slab: With powder actuated devices.
6. Secure studs in floor tracks with sheet metal screws to suit stud gage. Provide welded, bolted or screwed connections as shown or required.
7. Install accessories and miscellaneous specialties to plumb, true and level lines, including other materials furnished and located as part of the Work of other Sections.
8. Provide backing plates as scheduled and detailed of length to fasten each end to metal framing. Provide backing plate to support for each point of fastening of any unit to be anchored. Provide backing plates for Owner-furnished casework and equipment as shown.
9. Furred Spaces: Provide furring channels at 16-inch centers vertically or as shown. Fasten at top and bottom and tie to horizontal furring channels at 4-foot centers. Fasten furring brackets to concrete with powder-actuated devices.
10. Studs and portions of studs without finish shall be braced as shown.

D. Provide welded, bolted, or screwed connections as shown or required.

END OF SECTION

SECTION 09210

GYPSUM PLASTER

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Gypsum and gypsum lath for use in patching and repair of openings in existing plaster and lath partitions.

B. Related Sections:
1. Section 0910, Non-Load Bearing Wall-Framing Systems.
2. Section 09250, Gypsum Board.
3. Section 09900, Painting.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. A 641, Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
2. C 28, Specification for Gypsum Plasters.
3. C 35, Specification for Inorganic Aggregates for Use in Gypsum Plaster.
4. C 37, Specification for Gypsum Lath Plaster.
5. C 841, Specification for Installation of Interior Lathing and Furring.
6. C 842, Specification for Application of Interior Gypsum Plaster.
7. C 954, Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.33 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
8. C 1002, Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.

1.03 SUBMITTALS

A. Product Data: Manufacturers' specifications and installation instructions for each product specified.

B. Shop Drawings: Show layout of control joints and details indicating interface with adjacent finish materials.

C. See Section 01 32 19 for additional submittal requirements.

1.04 QUALITY ASSURANCE

A. Mock-Ups:
1. Lath and plaster an actual wall surface for each finish specified to show workmanship. Provide mock-up of one opening patchwork. Obtain the Architect's approval of mock-up location. Approved mock-up(s) may remain a part of the finished work where approved by Architect.
2. Do not start final plastering until mock-up is approved by the Architect. Provide additional mock-ups if necessary to obtain approval. Mock-ups shall constitute the standard of workmanship for the duration of the work specified under this section. Do not alter mock-ups until all plastering work is completed.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packaging and Shipping: Have materials shipped in manufacturer's original packages showing manufacturer's name and product brand name.

B. Storage and Protection: Store materials inside and protected from damage by the elements. Protect ends, edges, and faces of gypsum lath from damage. Protect metal framing and accessories from bending.

1.06 PROJECT CONDITIONS

A. Environmental Requirements: Comply with ASTM C 842.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. National Gypsum Company or approved equal.
   1. Gypsum Lath:
      a. Regular: Kal-Kore Brand Plaster Base or approved equal.
      b. Fire Rated: Kal-Kore Brand Fire-Shield and Fire-Shield C Plaster Base or approved equal.
   2. Gypsum Plaster:
      a. Base Plaster: Gold Bond Brand Two-Way Hardwall Gypsum Plaster or approved equal.
      b. Base Plaster: Gold Bond Brand Gypsolite Plaster or approved equal.
      c. Finish Plaster: Gold Bond Brand Super-White Gauging Plaster or approved equal.

2.02 MATERIALS

A. Metal Framing:
   1. Studs: See Section 09110.
   2. Main Runner Channels: 2 in. cold rolled steel channel, weighing 590 lbs. per 1000 lin. ft. with min. base steel of 0.054 in., galvanized or painted.
   3. Main Runner Channels: 1-1/2 in. cold rolled steel channel, weighing 475 lbs. per 1000 lin. ft. with min. base steel of 0.054 in., galvanized or painted.
   4. Cross Furring Channels: 3/4 in. cold rolled steel channel, weighing 300 lbs. per 1000 lin. ft. with min. base steel of 0.054 in., galvanized or painted.
   5. Channel Studs: 3/4 in. cold rolled steel channel, weighing 300 lbs. per 1000 lin. ft. with min. base steel of 0.054 in., galvanized or painted.
   6. Floor and Ceiling Runner: L shaped runner, weighing 545 lbs. per 1000 lin. ft. with min. base steel of 0.0329 in., galvanized.

B. Gypsum Lath:
   1. Regular: A gypsum core lathing panel surfaced with absorptive paper on front, back, and long edges and complying with ASTM C 588/C 1396 (Kal-Kore Brand Plaster Base or approved equal).
      a. Thickness: 1/2 in.
      b. Width: 4 ft.
      c. Length: 8 ft. through 16 ft.
      d. Edges: Tapered.
   2. Fire-Rated: A gypsum core lathing panel with additives to enhance the fire resistance of the core and surfaced with absorptive paper on front, back, and long edges and complying with ASTM C 588/C 1396, Type X.

a. Thickness: 1/2 in. (Kal-Kore Brand Fire-Shield C Plaster Base or approved equal) or 5/8 in. (Kal-Kore Brand Fire-Shield and Fire-Shield C Plaster Base or approved equal) as required and as indicated on Drawings.
b. Width: 4 ft.
c. Length: 8 ft. through 16 ft.
d. Edges: Tapered.

C. Gypsum Plaster:
1. Base Plaster: Gypsum neat plaster complying with ASTM C 28 (Gold Bond Brand Two-Way Hardwall Gypsum Plaster or approved equal).
2. Base Plaster: Gypsum plaster with mill-mixed perlite aggregate complying with ASTM C 28 (Gold Bond Brand Gypsolite Plaster or approved equal).
3. Finish Plaster: Gypsum gauging plaster complying with ASTM C 28 (Gold Bond Brand Super-White Gauging Plaster Quick Set and Gold Bond Brand Super-White Gauging Plaster Slow Set or approved equal).

D. Sand: ASTM C 35, clean and free of deleterious matter, grade as recommended by manufacturer for specified finish system.

E. Water: Potable and free of deleterious matter. Test alkalinity to verify that water quality meets or exceeds the manufacturer's recommendations for the specified finish system. Adjust alkalinity or provide alternate source as required to comply with manufacturer's recommendations and as required to receive the specified finish.

2.03 ACCESSORIES

A. Corner Bead: Formed steel nose with 2-1/2 in. expanded metal flanges, weighing 200 lbs. per 1000 lin. ft. with min. base steel of 0.0179 in., galvanized.

B. Corner Bead: Formed steel nose with 3/4 in. radius and 2-1/2 in. expanded metal flanges, weighing 350 lbs. per 1000 lin. ft., galvanized.

C. Corner Bead: Formed steel nose with 3-3/16 in. reinforced expanded metal flanges, weighing 241 lbs. per 1000 lin. ft.

D. Casing Bead: J shaped steel bead with expanded metal flange for 1/2 in., 5/8 in. and 3/4 in. grounds, weighing 200 lbs., 210 lbs. and 220 lbs. per 1000 lin. ft., galvanized.

E. Expansion Joints: W shaped steel joint with expanded metal flanges for 1/2 in., 3/4 in. and 7/8 in. grounds, weighing 225 lbs. and 285 lbs. per 1000 lin. ft., galvanized.

F. Expansion Joints: W shaped steel joint with splayed expanded metal flanges for 1/2 in., 3/4 in. and 7/8 in. grounds, weighing 232 lbs. and 285 lbs. per 1000 lin. ft., galvanized.

G. Expansion Joints: Two piece formed steel joint with slipped connection for 1/2 in., 3/4 in. and 7/8 in. grounds, galvanized.

H. Tie Wire: Manufacturer's standard soft, annealed steel protected by Class 1 zinc coating and manufactured in accordance with ASTM A 641.

I. Fasteners:
1. Nails: As recommended by the manufacturer.
2. Screws: ASTM C 954 or ASTM C 1002 or both with heads, threads, points, and finish as recommended by the manufacturer.

2.04 MIXES

A. Proportions and Procedures: In accordance with ASTM C 842 and the manufacturer's recommendations.

PART 3 - EXECUTION

3.01 INSTALLATION

A. In accordance with the following ASTM Standards and manufacturer's recommendations:
   1. ASTM Standards:
      a. Metal Lath, Gypsum Lath, and Accessories: C 841.
      b. Gypsum Plaster: C 842.
   2. Manufacturer's Recommendations:
      a. "Gypsum Construction Guide" and "Plaster Resource Manual," 110753; National Gypsum Company.

B. Tolerances: Install true, plumb and without defects visible to the naked eye. For flatness of surface, do not exceed 1/4 in. in 8 ft. for bow or warp of surface and for plumb and level.

3.02 CLEANING

A. Remove plaster and protective materials from accessories and from adjacent surfaces.
B. Remove all dust and debris resulting from the work specified under this section from all adjacent vertical and horizontal surfaces.

END OF SECTION

SECTION 09250

GYPSUM BOARD

PART 1 - GENERAL

1.01 SUMMARY

A. Provide gypsum board construction complete as shown and as specified.

B. Related Sections:
3. Section 09110 - Non-Load Bearing Wall Framing System.
5. Section 09900 - Painting.
7. Section 09300 - Tile

C. Applicable to this section:
1. Bidding and Contract Requirements
2. General Requirements - Division 01
3. Coordination: See Division 01.
   a. Coordinate with framing
   b. Ensure that inserts provided by other trades are completed.
   c. Coordinate with penetrations, that rough-in work by other trades is completed.
   d. Coordinate with installation of insulation
4. Submittals - See Section 01 32 19.

1.02 SYSTEM DESCRIPTION

A. Design Requirements:
1. Gypsum board throughout the Project, including accessories and fasteners, shall be produced by one manufacturer: Specification is based on products by U.S. Gypsum .
2. Construction Tolerances:
   a. Gypsum board surfaces to be painted shall have no measurable variation in any 2-foot direction and a maximum variation of 1/8 inch in 10 feet 0 inches when a straightedge is laid on the surface in any direction. See Section 09300 for tolerances required for surfaces to receive tile.
   b. Shim work as required to comply with specified tolerances.
   c. Do not exceed 1/16-inch offset between planes of abutting sheets at edges or ends.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Fire-Resistance Ratings:
   a. Comply with fire-resistance ratings as indicated and required by governing authorities and codes.
   b. Provide materials, accessories, and application procedures which have been listed by a nationally recognized testing agency or tested according to ASTM E119 for type of construction shown.

B. Industry Standards: Work shall comply with the applicable requirements of Gypsum Association (GA) publication GA-216. "Recommended Specifications for the Application and Finishing of Gypsum Board."

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and stack flat.

B. Stack gypsum board so that long lengths are not over short lengths.

C. Gypsum board shall not be stored or stacked on floors of new work in excess of 40 pounds per square foot equivalent loading.

1.05 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Temperature: During cold weather, in areas receiving gypsum board installation, maintain temperature range between 55 degrees and 70 degrees F for 24 hours before, during, and after gypsum board and joint treatment application.
   2. Ventilation:
      a. Provide ventilation during and following adhesives and join-treatment applications.
      b. Use temporary air circulators in enclosed areas lacking natural ventilation.
      c. Under slow drying conditions allow additional drying time between coats of joint treatment.
      d. Protect installed materials from drafts during hot, dry weather.

B. Protection: Protect adjacent surfaces against damage and stains.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Gypsum Board:
   1. Typical: 5/8 inch thick as scheduled, paper bound edges. ASTM 36
   2. Fire-Rated Board:
      a. ASTM C36, Type X.
      b. Thickness: 5/8 inch, except ½ inch where radius required.
      c. Edges: Tapered and rounded.
   3. Water-Resistant Board:
      a. ASTM C630, Type X.
      b. Thickness: 5/8 inch, unless otherwise noted.
      c. Edges: Tapered.

B. Laminating Adhesive: As recommended by gypsum board manufacturer for laminating gypsum board together in fire-rated construction.

C. Fasteners:
   1. Screws: Phillips head with bugle shape, Type S, conforming to ASTM C1002.
   2. Sizes of fasteners shall be as required by code and as recommended by gypsum board manufacturer.

D. Metal Reinforcements and Casing: Electro-galvanized or zinc-coated as specified.
   1. Exterior Corner: Fine-mesh expanded steel wing type, zinc-coated in conformance with ASTM A525, G90 coating designation, or ASTM A164, Type GS.
   2. Intersection of Gypsum Board with Dissimilar Material: USG No. 200-B metal trim or accepted equal.
   3. Edge Trim: "L", "LK", or "LC" casing beads.
   4. Control Joints: USG No. 093 or equal.

E. Corner Bead: CB-114x114 typical

F. Joint-Treatment Materials:
   1. Joint Tape: ASTM C475.
   2. Ready-Mixed Joint Compounds: Vinyl formulation complying with ASTM C475. Provide the following types as required:
      a. Joint compounds for taping and topping.
      b. All-Purpose joint compound.
      c. Joint compound for water-resistant board.

G. Miscellaneous Items: Furnish components not specified but shown on the Drawings and other items required to complete the installation.

H. Gypsum Board Finish Coat: US Gypsum "Sheetrock First Coat", Hamilton "Prep Coat", or accepted equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Check framing for accurate spacing and alignment.

B. Verify that spacing of installed framing does not exceed maximum allowable for thickness of gypsum board to be used.

C. Do not proceed with installation of gypsum board until deficiencies are corrected and surfaces to receive gypsum board are acceptable.

D. Protrusions of framing, twisted framing members, or unaligned members shall be repaired before installation of gypsum board is started.

E. Clean partition cavities prior to installation of gypsum board.

3.02 APPLICATION OF GYPSUM BOARD

A. General: Work shall comply with applicable requirements of GA-216 (ASTM C840), except where more stringent requirements are specified; by local codes; or by manufacturer of gypsum board.
   1. Apply water-resistant gypsum board to Mens and Womens Toilet Rooms and where indicated on the Drawings.
   2. Neatly fit and stagger end joints.
   3. Make joints occur on different studs at opposite sides of partition.'
   4. Cut and fit neatly around outlets and switches.
   5. Erection technique shall result in plumb and straight surfaces with no waves or buckles, free of unevenness at joints.
   6. Brush cut edges and penetrations of water-resistant gypsum board with thinned water-resistant (W/R) compound.

B. Ceilings:
   1. Apply with long dimension at right angles to horizontal supports.
   2. Provide solid bearing at end joints.

C. Partitions:
   1. General: Apply with long dimensions at right angles to supports (horizontal application), unless vertical application results in fewer joints or is required by fire rating. Do no make vertical joints at jambs at openings unless a stress relief joint is installed.
   2. Horizontal Application:

a. Use longest lengths practical.
b. Start application at top of wall.
c. Work out from corner of room or space.
d. Butt ends on solid backing.

3. Vertical Application:
   a. Apply full lengths between floor and ceiling.
   b. Start application at corner of room or space.
   c. Butt edges and ends on solid backing.

D. Fastening:
1. Attach gypsum board with fasteners as specified.
2. Space fasteners in accordance with GA-216 recommendations.
3. Drive screws with power screwdriver recommended by gypsum board manufacturer.
4. Do not hammer-drive screws.
5. Do not break through paper surface gypsum board.
6. Set fastener heads slightly below surface of gypsum board.
7. Stagger fasteners opposite each other on adjacent ends or edges.
8. Omit fasteners at edges where metal edge trim will be installed.
9. Provide "floating" interior-angle construction for partition/walls if recommended by manufacturer of gypsum board.
   a. Do not float ends at rated construction.

E. Double-Layer Application:
1. Apply base layer vertically, offsetting vertical joints at least one stud space between layers.
2. Fasten to supports in accordance with manufacturer's instructions and GA-216.
3. Precut and fit face layer by laminating to base layer with adhesive.
4. Provide temporary support for face layer, by fasteners or shoring, until adhesive is dry.
   a. Provide alternate permanent support by attaching face layer to base layer with screws in accordance with manufacturer's instructions.

F. Metal Trim:
1. Apply trim at exterior corners and at interior corners where gypsum board intersects metal or other dissimilar materials.
2. Install in longest lengths practicable.
3. Run trim straight and square with planes.
4. Control Joints: Maximum joint size ½ inch faced with metal control joint accessory.
   a. Ceilings: Install where areas exceed 2500 sf Distance between ceiling control joints shall not exceed 50 feet in either direction.
      1) Back with continuous furring channels each side spaced 2-1/4 inches apart centered on break.
      2) Fire-Rated Ceilings: Install 2-inch-wide continuous strip of gypsum board between channels of same thickness as ceiling board.
   b. Butt strip against one channel to permit 1/4-inch clearance.
   c. Secure butted side to ceiling board with adhesive.
   d. Partitions: Install where distances exceed 30 feet and are not broken by doors or windows.
      1) Back with double studs.
      2) Maintain integrity of rated partition with gypsum board or mineral fiber construction as shown.
5. Edges: Apply applicable shape metal edge trim at exposed edges of gypsum board and where otherwise shown.
   a. Gypsum Board Abutting Other Materials: Install edge trim with 1/8-inch clearance to allow for caulking.
   b. Apply neoprene tape where shown to assure sealed joints at abutting surfaces.
      1) Install in longest lengths practicable.

2) Adhere to edge trim prior to installation of trim.

6. External Corners: Apply metal corner beads at external corners and where otherwise shown in single lengths.

G. Perimeters, penetration, and openings in sound-rated partitions shall be installed and sealed in accordance with requirements specified in Section 07901.

H. Provide fire rated enclosures at fire dampers specified in Division 15.

3.03 TAPING AND FINISHING

A. Apply finishing compounds in accordance with manufacturer's directions.
1. Do not apply tape and joint compound over joints containing acoustical sealant until the sealant has completely cured.

B. Center tape over joints and embed in uniform layer of joint compound of sufficient width and depth to provide form and complete bond.
1. Apply skim coat while embedding tape.
2. At water-resistant gypsum board, fill fastener heads, penetrations, and joints with water-resistant (W/R) compound.

C. Treat angles with reinforcing tape forded to conform to adjacent surfaces and straight, true angles.

D. Provide minimum 24 hours drying time between applications of compounds.

E. Apply coat of finishing compound over joint compound and tape.
1. Spread evenly and feather out beyond edge of board.
2. After first finishing coat is thoroughly dry, cover with second coat with edges feathered out slightly beyond the preceding coat.

F. Give dimples at fastener heads and marred spots on surface of gypsum board one coat joint compound and two coats finishing compound, applied in same manner as for joints specified above.

G. Conceal flanges of metal reinforcement with minimum two coats compound.
1. Extend compound 8 to 10 inches each side of metal nosing.

H. After each application of joint or finishing compound has dried, lightly sand joints.
1. Leave gypsum board and treated areas uniformly smooth and ready for painting or other decoration.

I. Levels of Gypsum Board Finish: Finish shall be in accordance with "Recommended Specification: Levels of Gypsum Board Finish".
1. Level 2 at tile backer board.
2. Level 4 at gypsum board to receive painted finish except as noted below.
3. Level 5 where scheduled to receive gloss or semi-gloss paint finish under severe lighting condition, apply gypsum board finish coat in accordance with manufacturer's recommendations.

3.04 PROTECTION OF FINISHED WORK

A. Provide proper procedures for protection of completed gypsum board from damage or deterioration until final acceptance of the Project.

END OF SECTION

SECTION 09300

CERAMIC TILE

PART 1 - GENERAL

1.01 SUMMARY

A. Provide ceramic tile and quarry tile work as indicated on the Drawings and as specified.

B. Related Sections:
1. Section 07920 - Joint Sealants.
2. Section 09250 - Gypsum Board.
3. Section 10170 - Toilet Partitions.

1.02 REFERENCES

A. American National Standards Institute (ANSI): "Standard Specifications for the Installation of Ceramic Tile."
1. ANSI A108.1: "Installation of Glazed Wall tile, Ceramic Mosaic Tile, Quarry Tile and Paver Tile with Portland Cement Mortar."
2. ANSI A108.4: "Installation of Ceramic Tile, with Water-Resistant Organic Adhesive."
3. ANSI A108.5: "Installation of Ceramic Tile, with Dry-Set Portland Cement Mortar or Latex Portland Cement mortar."
4. ANSI A108.10: "Installation of Grout in Tilework."
5. ANSI A118.1: "Dry-Set Portland Cement Mortar."
6. ANSI A118.4: "Latex Portland Cement Mortar."
7. ANSI A118.6: "Ceramic Tile Grout."
8. ANSI A137.1: "Standard Specifications for Ceramic Tile."

B. Tile council of America (TCA): "Handbook for Ceramic Tile Installation."

1.03 SYSTEM DESCRIPTION

A. Design Requirements: Floor tile tested both wet and dry shall have minimum static coefficient of friction of 0.60 in accordance with ASTM C1028.

1.04 SUBMITTALS

A. Procedure: In accordance with Section 01 32 19.

B. Product Data:
1. Manufacturer's information on tile, including pictorial information on manufacturer's full line of standard patterns and colors.
2. Upon completion of ceramic tile Work, submit two copies of a list of recommended maintenance products and procedures.

C. Samples:
1. Tile: Submit three full-size samples of each color, size, and type of tile specified.
2. Submit grout colors for color selection.
3. Trim Shapes: Each pattern and color selected.

D. Certificates: Master Grade Certificate conforming to ANSI A137.1, for all tile, issued and signed by manufacturer when tile is shipped. Type of tile, identification marks for tile packages, and name and location of Project shall be stated thereon.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Tile cartons shall be grade sealed by manufacturer in accordance with TCA 137.1, and with grade seals unbroken.

B. Manufactured mortars and grouts shall contain hallmarks certifying compliance with reference standards and be types recommended by tile manufacturer for application.

C. Deliver dry-set mortar in sealed, moisture proof containers.

D. Organic adhesive containers shall bear hallmark of either Adhesive and Sealant Council or Tile Contractors of America certifying compliance with ANSI A136.1.

E. Store materials in accordance with manufacturer's directions and under cover in a manner to prevent damage or contamination.

F. Handle tile carefully to avoid chipping and breakage.

1.06 PROJECT CONDITIONS

A. Environmental: Comply with minimum temperature recommendations of manufacturers for bonding and grouting materials.
1. If manufacturer has no recommendations, maintain temperature at not less than 50 degrees F. during tile installation and for at least 7 days after completion of installation.

B. Protect adjoining work surfaces before tile work begins.
1. Close spaces in which tile is being set to traffic and other work; keep closed until firmly set.

1.07 MAINTENANCE

A. Extra Materials:
1. Supply extra 2 percent of the quantity of each color, size, and type of tile used.
2. Supply 10 percent of each type of trim used.
3. Each carton shall be clearly identified as to contents.

PART 2 - PRODUCTS

2.01 TILE

A. General Requirements:
1. Standard Grade: ANSI A137.1.

B. Floor Tile:

1. Manufacturer: Dal-Tile, Keystone style or approved eq.
2. Size: 2" x 2"
3. Finish: See drawings
4. Pattern: Stack
5. Color: See drawings.

6. Grout: Bostik Findley Hydroment s125/ U210 Taupe 117, or approved equal.

D. Wall Base Tile:

1. Manufacturer: Dal-Tile, Keystone style or approved eq.
2. Size: 2" x 2"
3. Finish: Matt Finish.
4. Pattern: See drawings.
5. Color: See drawings.
6. Grout: Bostik Findley Hydroment s125/ U210 Taupe 117, or approved equal.

E. Wall Tile:

1. Manufacturer: Dal-Tile, Keystone style or approved eq.
2. Size: 6" x 6"
3. Finish: Semi Gloss
4. Pattern: See drawings.
5. Color: See drawings.
6. Grout: Bostik Findley Hydroment s125/ U210 Taupe 117, or approved equal.

2.02 SETTING MATERIALS

A. Portland Cement: ASTM C150, Type 1.

B. Sand: ASTM C144.

C. Water: Clean and portable.

D. Portland Cement Mortar: One part Portland cement and six parts damp sand by volume.

E. Latex Portland Cement Mortar: Conforming to ANSI A118.4.

F. Dry-Set Mortar: Conforming to ANSI A118.1.

G. Organic Adhesive: Conforming to ANSI A136.1, Type I.

H. Two-Component Adhesive: Mapei "Planicrete W" or equal.

I. Bonded Waterproof Membrane: The Noble Company "Chloraloy" flexible elastromeric sheet or equal of nonplasticized chlorinated polyethylene, 0.04 inch thick, and weldable with solvent bonding liquid.

J. Bond Coat: Portland cement paste on a plastic bed or dry-set mortar on a cured bed.

K. Reinforcing: 2-inch x 2-inch by 16/16-gage welded wire mesh conforming to ASTM A185.

L. Sealant: As specified in Section 07900.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine surfaces to receive ceramic tile, setting beds, or accessories before tile installation begins for;
   1. Defects or conditions adversely affecting quality and execution of tile installation.
   2. Deviations beyond allowable tolerances of surfaces to receive tile:
      a. Organic Adhesive Method:
         1) Maximum Variation in Vertical Surfaces: 1/8 inch in 8 feet.
      b. Dry-Set Mortar Method:
         1) Maximum Variation in Horizontal Surfaces: 1/8 inch in 10 feet.

B. Condition of Surfaces to Receive Tile:
   1. Surfaces shall be firm, fry, clean, and free of oily or waxy films.
   2. Grounds, anchors, plugs, hangers, bucks, and electrical and mechanical work in or behind tile shall be installed prior to proceeding with tile Work.

C. Quarry Tile at Stairs: Prepare surface as follows:
   1. Use 80 to 100 grit sandpaper to remove all scale and coating.
   2. Use denaturalized alcohol to clean.

D. Do not proceed with installation work until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Prepare surface, fit, set, or bond, grout, and clean in accordance with applicable requirements of ANSI standards for setting method specified and as specified herein.
   1. Wall Tile:
      a. ANSI A108.4, organic adhesive.
      b. TCA Method W242 with dry-set grout.
      c. Prime surface before applying adhesive when recommended by adhesive manufacturer.
   2. Floor Tile, concrete substrate
      a. ANSI A108.5, latex-Portland cement mortar or dry-set mortar.
         1) Backbutter tile as required for 100 percent coverage.
      b. TCA Method F113 with sanded latex Portland cement grout.
   3. Expansion Joints: TCA Method EJ171.

B. Laying out Tile Work:
   1. Lay out tile work so that, insofar as possible, no tile less than full size occurs.
   2. Lay floors out from center lines of areas to that major adjustments are made at walls.
   3. Lay out tiles on walls so that fields and patterns center exactly on individual wall areas.
      a. Exterior angles shall be bullnose.
      b. Cap shall be bullnose same size as wall tile.
   4. Align joints vertically and horizontally and as shown per drawings.

C. Cutting of Tiles:
   1. Do cutting and drilling without marring the tile.
   2. Rub cuts smooth with a fine abrasive stone.
   3. Set no cut edge against any fixture, cabinet, or other tile without a joint at least 1/16 inch wide.
   4. Whenever possible, turn cut to inside corner.
   5. Fit tile around electric outlets, plumbing pipes, fixtures, and fittings close enough to permit standard plates and collars to overlap the tile.
   6. Fill joints with grout, using colors selected by the Architect.

D. Curing: Apply nonstaining laminated and reinforced Kraft paper having a bituminous or latex binder over floor tile as soon as pointing and grouting and cleaning are completed.

1. Lap the sheets at least 4 inches, and seal the laps against the escape of moisture.
2. Leave curing paper in place until job is ready for final cleaning.
3. Keep traffic off floors during the curing period (7 days).
4. Do not permit cement grouts to dry out until cured a minimum of 72 hours.

E. Joint Sealants:
1. Install sealant in expansion joints, at junction of wall tile and tub, and around floor drains and pipes.
   a. After curing, remove spacers and dry and clean joints requiring sealant.
   b. Prime joints to receive sealant, if required, with primer recommended by manufacturer of sealant.
   c. Sealant shall be expertly applied, beaded smooth and concave, without protruding beyond adjacent surfaces.
   d. Sealant shall match color of grout in adjacent joints.

3.03 ADJUSTING AND CLEANING

A. Remove cracked, stained, broken, or damaged tile; replace with new tile.

B. Clean tile surfaces as thoroughly as possible on completion of grouting.

C. Remove grout haze, observing grout manufacturer's recommendations as to use of acid and chemical cleaners.

D. Rinse tile work thoroughly with clean water before and after using chemical cleaners.
1. Use no acids or abrasive soaps on tile, except as approved by tile manufacturer.
2. Tile having stains or discolorations shall be replaced.

3.04 PROTECTION

A. Apply a protective coat of neutral cleaner solution, one part cleaner to one part water, to clean, completed tile walls and floors.

B. Maintain curing paper cover on floor tile to protect from construction dirt.

C. Place board walkways on newly tiled floors for at least 7 days where floors must be used as passageway by workmen.

D. Just before final acceptance of tile work, remove paper and rinse protective coat of neutral cleaner from tile surfaces.

END OF SECTION

SECTION 09900

INTERIOR PAINTING

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to the work specified in this section.

DESCRIPTION OF WORK:

Extent of painting work is indicated on drawings and schedules, and as herein specified.

Work includes painting and finishing of interior and exterior exposed items and surfaces throughout project.

This work also includes application of coating system to items and surfaces as scheduled, including surface preparation, primary and topcoats.

Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of work.

Work includes field painting of exposed bare and covered pipes and ducts (including color coding), and of hangers, exposed steel and iron work and primed metal surfaces of equipment.

Work includes field painting of mechanical and electrical equipment of aluminum, galvanized or other metallic finish not acceptable as a prefinished surface as determined by Architect.

"Paint" as used herein means all coating systems materials including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, Architect will select these from standard colors or finishes available.

Following categories of work are not included as part of field-applied finish work.

Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finish or installer finishing is specified for such items as (but not limited to) toilet enclosures, acoustic materials, architectural casework, and architecturally finished mechanical and electrical equipment including light fixtures exposed in habitable spaces. Electrical panels, panel covers switchgear, etc. shall be painted unless otherwise noted.

Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts etc.

Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting.

Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting.

Following categories of work are included under other sections of these specifications.

Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, metal fabrications, hollow metal work, and similar items.

Back Priming Lumber for Painted Finish: Backprime exterior lumber scheduled to receive painted finish. Refer to Division 6 where noted and shall be backprimed per the requirements of this section.

Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

QUALITY ASSURANCE:

Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

Coordination of Work: Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.

SUBMITTALS:

Samples: Prior to beginning work, Architect will furnish colors for surfaces to be painted.

On 8-1/2" x 11" cardboard, provide four (4) samples of actual and tints of each color and material, with texture to simulate actual conditions or on actual material as requested by Architect. Resubmit samples as requested by Architect until acceptable sheen, color, and texture is achieved.

Brushouts shall include manufacturer's product number, sheen, texture and color on the reverse side.

PRODUCT DELIVERY, STORAGE AND HANDLING:

Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:

Name or title of material.
Fed. Spec. number, if applicable.
Manufacturer's stock number and date of manufacturer.
Manufacturer's name.
Contents by volume, for major pigment and vehicle constituents.
Thinning instructions.
Application instructions.
Color name and number.

Take precautions to ensure that workman and work areas are adequately protected from fire hazard and health hazards resulting from handling, mixing and application of paint and coatings.

Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.

JOB CONDITIONS:

Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C), unless otherwise permitted by paint manufacturer's printed instructions.

Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C), unless otherwise permitted by paint manufacturer's printed instructions.

Do not apply paint in snow, rain, fog or mist; or when relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by paint manufacturer's printed instructions.

Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS:

Manufacturer:

Kelly-Moore (K-M)
All interior paint to be latex.

No substitutes allowed.
Pursuant to Section 3400 of the Public Contract: Kelly-Moore Paints are now in use on the particular public improvement described as San Mateo County Community College District. At each instance in these specifications that a designated material, product, thing or service is designated by the brand name "Kelly-Moore" are designated to support the existing painting systems that are in place at College of San Mateo, Cañada College, Skyline College, and the District Administration Building. The Contractor will furnish and apply only "Kelly-Moore" paints and coatings as required, and no substitutions shall be deemed to be "or equal" or allowed.

MATERIALS:

Material Quality: Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to the exclusion of equivalent products of other manufacturers.

Federal Specifications establish minimum acceptable quality for paint materials. Provide written certification from paint manufacturer that materials provided meet or exceed these minimums.

Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

Lead content in pigment, if any, is limited to contain not more than 0.5% lead, as lead metal based on the total non- volatile (dry-film) of paint by weight.

This limitation is extended to interior surfaces and those exterior surfaces, such as stairs, decks, porches, railings, windows, and doors which are readily accessible to children under seven years of age.

PART 3 - EXECUTION

INSPECTION:

Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator.

Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.

Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

SURFACE PREPARATION:

General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.

Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems in using the specified coating systems with substrates primed by others.

Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.

Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.

Cementitious Materials: Prepare cementitious surfaces of concrete, concrete block and cement plaster to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.

Use abrasive blasting cleaning method if recommended by coating system manufacturer.

Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.

Clean concrete floor surfaces scheduled to be painted with a commercial solution of muriatic acid, or other etching cleaner, Flush floor with clean water to neutralize acid, and allow to dry before painting.

Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.

Ferrous Metals: Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.

Aluminum and Galvanized Surfaces: Clean free of oil and surface contaminants with non-petroleum based solvent, and apply one coat of phosphoric acid etch treatment with separate primer or etching type primer per manufacturer recommendations.

Wood, Exterior (Painted): Clean surfaces as required of any foreign matter. Pitch must be scraped clean and the area brushed to remove residue. Repair and sand smooth all surface defects (including unset/reset nails, cracks, staple holes, knot holes, etc.). Fill all holes with wood filler approved by Architect.

Wood, Exterior (Stained or Varnished): Clean surfaces as required of any foreign matter.

Remove all defective caulking, and sealants between dissimilar materials, clean and prime joint and caulk and reseal with color matching paint color or as selected by Architect. See Section 08800 Glass and Glazing for reglazing requirements for existing windows.

Wood, Interior (Painted): Clean surfaces as required. Repair and sand smooth all surface defects (including unset/reset nails, cracks, staple holes, knot holes, splits, etc.). Fill all holes with wood filler approved by Architect. Seal all knots.

Wood, Interior (Stained or Varnished): Clean surfaces as required. Smooth, sound surfaces shall be lightly sanded to insure adhesion of the new coat. Repair and sand smooth all surface defects (including unset/reset nails, cracks, etc.).

EXISTING SURFACES TO BE PAINTED:

Wood, Exterior (Painted): Clean surfaces as required to remove existing cracked, blistered, flaking, and chalked surface coatings and any other foreign matter, paying particular attention to areas under soffits, if necessary to repaint. Thick and sharp edges of paint build-up should be sanded to achieve a feathered edge. Pitch must be scraped clean and the area brushed to remove residue. All wood trim windows, doors, etc., shall be given particular attention to removal of defective paint products. Repair and sand smooth all surface defects (including unset/reset nails, cracks, staple holes, knot holes, etc.). Fill all holes with wood filler approved by Architect. Prior to bid, contractor shall inspect existing surfaces to determine extent of defects.

Wood, Exterior (Stained or Varnished): Clean surfaces as required to remove existing deteriorated coatings and any foreign matter. Where substrates are sound, stained or varnished surfaces having defects detrimental to proper refinishing shall be stripped using an appropriate removal system. When stripped, it may be necessary to touch up stain to obtain uniformity of color. It is not always possible to remove all old stains.

Remove all defective caulking, and sealants between dissimilar materials, clean and prime joint and caulk and reseal with color matching paint color or as selected by Architect. See Section 08800 Glass and Glazing for reglazing requirements for existing windows.

Wood, Interior (Painted): Clean surfaces as required and/or remove existing coatings. Thick and sharp edges of paint build-ups, runs and sags shall be sanded smooth (feather edge). Repair and sand smooth all surface defects (including unset/reset nails, cracks, staple holes, knot holes, etc.). Fill all holes with wood filler approved by Architect. Prior to bid, contractor shall inspect existing surfaces to determine extent of defects.

Wood, Interior (Stained or Varnished): Clean surfaces as required and/or remove existing coatings. Particular attention must be paid to areas (such as window-sills, etc.) exposed to direct sunlight or moisture. Where substrates are unsound, it may be necessary to strip off all previous coatings. Smooth, sound surfaces shall be lightly sanded to insure adhesion of the new coat. Repair and sand smooth all surface defects (including unset/reset nails, cracks, etc.).

Concrete, Masonry, Stucco, Bricks, Concrete Blocks, Unglazed Tile, etc., (Exterior): Wash with water all areas to be painted; use a mild detergent solution, if necessary and then rinse with clean water until all detergent has been removed. Steam-cleaning and/or high pressure water system may be used for cleaning, when approved by Architect. After washing, the areas shall be carefully examined for cracking, blistering, peeling or flaking paint. All loose, unsound, non-adhering paint shall be removed from such areas. The thick edge of remaining old paint shall be feathered-edged. The surface shall then be dusted. Allow surface to dry thoroughly before repainting is started. Spot prime all areas where paint has been removed to substrate and patched areas.

Concrete, Masonry, Stucco, Bricks, Concrete Block, Unglazed Tile etc., (Interior): Same as for exterior work. Remove surface oil and grease with solvent. All holes, cracks, etc., shall be filled with a filler approved by Architect. Spot prime all areas where paint has been removed to substrate and patched areas.

Plaster, Gypsum Wallboard: All surface defects shall be filled, sanded and spot-primed. Cracks and holes shall be cut back and double-filled. All glossy surfaces shall be sanded or otherwise effectively treated prior to the application of any coatings. Where patched surface texture cannot be made to match surrounding areas the entire wall surface shall be given a uniform knock down dash coat finish.

Nail-pops shall be repaired, filled, sanded and spot primed, prior to painting.

Ferrous Metals: Steel preparation shall be the same as for new steel. All existing paint shall be removed prior to pretreatment for painting. If the preparation was not properly performed on previous paintings, it must be accomplished before repainting. Specifically, sharp edges, protruding welds, and weld splatters shall be ground smooth before painting.

Galvanized Metals: Remove all flaking and failing paint using either water rinseable organic solvent type paint removers or sand blasting. Surface shall have sufficient tooth to assure full adhesion of the primer coat. If sand blasting is used care must be taken to prevent full removal of the entire galvanized coating, otherwise a replacement film of a high zinc coating shall be applied to areas where the galvanized coating has been reduced to base metal.

After pretreatment of existing surfaces finish paint shall be applied as specified for new work.

EXISTING SURFACE TO BE REFINISHED/RESURFACED:

Wood, Interior (Stained or Varnished): Clean surfaces and remove all existing coatings. Smooth, sound surface shall be sanded to insure adhesion of new varnish. Repair and sand smooth all surface defects, (including unset/reset nails, cracks, etc.). Non smooth surfaces shall be sanded and restored to a smooth plane. Wood holes and defects shall be filled with wood filler approved by Architect. Bare sanded wood surfaces shall be restained to match adjacent stained surfaces, where required.

After pretreatment of existing surfaces, finish coatings shall be applied as specified for new work.

MATERIALS PREPARATION:

Before painting exterior building, document locations of existing "fire extinguisher inside" signs at room numbers.

Mix and prepare painting materials in accordance with manufacturer's directions.

Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.

Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

APPLICATION:

General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

Paint colors, surface treatments, and finishes are to be selected by Architect.

Provide finish coats which are compatible with prime paints used.

Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.

Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.

Paint all visible registers and grilles.

Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.

Finish door top, bottom and side edges the same as visible faces, unless otherwise indicated.

Sand lightly between each succeeding enamel or varnish coat.

Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.

Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

Allow sufficient time between successive coatings to permit proper drying. Intermediate coats of paint shall be applied lighter in color than the final coat. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.

Mechanical and Electrical Work: Painting of mechanical and electrical work includes those items exposed in mechanical equipment rooms and in occupied spaces, exterior mechanical equipment, switchgear, exposed conduits, panelboard covers and similar items.

Prime Coats: Apply prime coat of material which is required to be painted or finished.

Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.

Where paint schedule has not been provided, provide number and type of paint coats compatible with the materials to be painted per manufacturer's instructions.

Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surfaces imperfections.

Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.

Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.

Provide satin finish for final coats, unless otherwise indicated.

Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

FIELD QUALITY CONTROL:

The right is reserved by the Owner to invoke following material testing procedure at any time, and any number of times during period of field painting:

> The Owner will engage service of an independent testing laboratory to sample materials being used. Samples of materials delivered to project site will be taken, identified and sealed, and certified in presence of Contractor.
>
> Testing laboratory will perform appropriate tests for any of following characteristics: Abrasion resistance, apparent reflectivity, flexibility, washability, absorption, accelerated weathering, dry opacity, accelerated yellowness, recoating, skinning, color retention, alkali resistance, and quantitative materials analysis.
>
> If test results show materials being used do not comply with specified requirements, Contractor may be directed to stop work, and remove non-complying materials; pay for testing; repaint or recoat surfaces painted or coated with rejected materials; remove rejected materials from previously painted surfaces if, upon repainting and recoating with specified materials, two coats are incompatible.

CLEAN-UP AND PROTECTION:

Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day.

Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch otherwise damage finished surfaces.

Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.

At completion of work of other trades, touch-up and restore all damaged or defaced surfaces.

Paint all room numbers at each door and "fire extinguisher inside" as documented. Verify with owner if room numbers have changed.

INTERIOR PAINT SCHEDULE:

General: Provide paint systems for the various materials, as follows:

Gypsum Wallboard Systems:

Semi-Gloss 100% Acrylic Enamel Finish: 3 coats with total dry film thickness not less than 2.5 mils.

First Coat: Interior Latex Base Primer Coat.

K-M: 971 Acry-Prime Interior Latex Primer/Sealer.

Second and Third Coats: Interior Semi-Gloss 100% Acrylic Enamel.

K-M: 1685 Dura Poxy Semi-Gloss Acrylic Enamel.

Zinc-Coated Metal:

Semi-Gloss 100% Acrylic Finish: 2 coats over primer, with total dry film thickness not less than 2.5 mils.

Prime Coat: Acrylic Metal Primer.

K-M: 1725 Kel-Guard Acrylic Metal Primer.

First and Second Finish Coats: Semi-Gloss 100% Acrylic Enamel.

K-M: 1685 Dura Poxy Acrylic Semi-Gloss Enamel.

Ferrous Metal:

Semi-Gloss 100% Acrylic Enamel Finish: 2 coats over primer, with total dry film thickness not less than 2.5 mils.

Prime Coat: Acrylic Metal Primer. Prime coat is not required on items delivered shop primed.

K-M: 1725 Kel-Guard Acrylic Metal Primer.

First Coat: Interior Enamel Undercoat.

K-M: 1685 Dura Poxy Plus semi-Gloss Acrylic Enamel.

Second Coat: Interior Semi-Gloss 100% Acrylic Enamel.

K-M: 1685 Dura Poxy Plus Semi-Gloss Acrylic Enamel.

Natural Finish Woodwork (Doors):

Rubbed Varnish Finish: 3 Finish coats over sealer plus filler on open grain wood.

First Coat:

K-M: 2097 Kel-Thane II Waterborne Interior Clear Satin Finish.

Filler Coat on Open Grain Wood: Paste Wood Filler. Wipe before first varnish coat.

K-M: Jasco Paste Wood Filler.

Second thru Fourth Coats: Oil Rubbing Varnish.

K-M: 2097 Kel-Thane II Waterborne Interior Clear Satin Finish.

Paste Wax: Provide paste wax as recommended by the coating manufacturer for use on interior stained and natural-finished woodwork.

Natural Finish Stained Woodwork (Doors):

Rubbed Varnish Finish: 3 Finish coats over stain plus sealer on open grain wood.

First Coat:

K-M: 2050 Kel-Aqua Stain.

Sealer Coat:

K-M: 2164-EZ sand Q.D. Sealer.

Second thru Fourth Coats:

K-M: McCloskey 6509 ManO'War Marine Gloss Spar Varnish.

Natural Finish Woodwork (Trim)

Two Coats Varnish

K-M: McCloskey 6509 ManO'War Marine Satin Spar Varnish.

Painted Woodwork, Wood Trims, and Wood Doors:

Semi-Gloss 100% Acrylic Enamel Finish: 3 Coats with total dry film thickness not less than 2.5 mils.

First Coat:

K-M: 975 Latex Enamel Undercoat.

Second and Third Coats: Interior Semi-Gloss 100% Acrylic Enamel.

K-M: 1685 Dura-Poxy Plus Semi-Gloss 100% Acrylic.

Exposed Concrete Wall and Floors: Interior application only

Clear Acrylic Sealer: coat over new uncoated concrete, free of contamination and curing compound.

First Coat:

K-M: 5010 Rust-Oleum Clear Floor Sealer.

Painting of Existing Exterior and Interior Painting Surfaces:

Two coat (finish) application is required for all repainting work. Preparation of existing previously painted surface, including spot priming, remains a requirement to guarantee coverage.

PROJECT CLOSE-OUT: (not applicable)

END OF SECTION

SECTION 10170
TOILET PARTITIONS

PART 1– GENERAL

1.01 Work Included

A. Toilet Compartments
B. Urinal Screens
C. Shower Dividers
D. Dressing Compartments

1.02 Related Sections

A. Wall backing required to secure mounting brackets.
B. Support for floor-anchored compartments.
C. Toilet room accessories.

1.03 References (including, but not limited to)

A. *National Fire Protection Association 101 Life Safety Code 2000 Edition*, Chapters 5, 6, 8-30.

B. *ANSI A117.1-1998 Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.*

C. Title 24, *California Code of Regulations,* Parts 2, 3, and 5.

D. ADA, *Accessibility Guidelines for Buildings and Facilities,* Federal Register Volume 56, Number 144, Rules and Regulations.

E. US Green Building Council (USGBC) *Leadership in Energy and Environmental Design (LEED) Program*, Version 2.1

F. American Society for Testing and Materials Standards:

1. ASTM E84-01 Standard Test Method for Surface Burning Characteristics of Building Material.
2. ASTM D2794-93(1999)e1 Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
3. ASTM D2197-98(2002) Standard Test Method for Adhesion of Organic Coatings by Scrape Adhesion.
4. ASTM D6578-00 Standard Practice for Determination of Graffiti Resistance.

1.04 Performance Requirements

A. Graffiti Resistance: Partition material shall have the following graffiti removal characteristics when tested in accordance with ASTM D6578-00 Standard Practice for Determination of Graffiti Resistance in accordance with Section 9, "Graffiti Removal Procedure Using Manual Solvent Rubs":

1. Cleanability: Five (5) required staining agents shall be cleaned off material.

B. Scratch Resistance: Partition material shall have the following characteristics when tested in accordance with ASTM D2197-98(2002) Standard Test Method for Adhesion of Organic Coating by Scrape Adhesion, using Gardner Stock #PA-2197/ST pointed stylus attachment on scrape tester:

1. Scratch Resistance: Maximum Load Value shall exceed 10 kilograms.

C. Impact Resistance: Partition material shall have the following characteristics when tested in accordance with ASTM D2794-93(1999)e1 Standard Test Method for Resistance of Organic Coating to the Effects of Rapid Deformation (Impact), using .625" hemispherical indenter with 2-lb impact weight:

1. Impact Resistance: Maximum Impact Force value shall exceed 30 inch-lbs.

D. Fire Resistance: Partition material shall comply with the following requirements, when tested in accordance with ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials:

1. Smoke Developed Index: Not to exceed 450.
2. Flame Spread Index: Not to exceed 75.
3. Material Fire Ratings:
   a. National Fire Protection Association (NFPA): Class B.
   b. International Code Council (ICC): Class B.

1.05 Submittals

A. Comply with requirements of Section regarding submittals.

B. Manufacturer's Data

1. Provide required number copies of:

   a. Product data sheets.
   b. Installation instructions.
   c. Cleaning and maintenance instructions.
   d. Replacement parts information.

C. Shop Drawings

1. Provide required number of copies of all shop drawings.
2. Show fabrication and erection of compartment assemblies, to extent not fully described by manufacturer's data sheets.
3. Show anchorage, accessory items and finishes.
4. Provide location drawings for bolt hole locations in supporting members for attachment of compartments.

D. Samples

1. Furnish scale model of compartments, including stile, shoe, door, door hardware, divider panel, and mounting brackets.
2. Furnish sections showing stile anchoring and leveling devices, concealed threaded inserts, panel, stile, and edge construction.

1.06 Product Delivery, Storage, and Handling

A. Deliver items in manufacturer's original unopened protective packaging.

B. Store materials in original protective packaging to prevent physical damage or wetting.

C. Handle so as to prevent damage to finished surfaces.

1.07 Warranty

A. Furnish ten-year limited warranty for panels, doors, and stiles against breakage, corrosion, delamination, and defects in factory workmanship.

B. Furnish one-year guarantee against defects in material and workmanship for stainless steel door hardware and mounting brackets.

PART 2– PRODUCTS

2.01 Manufacturers

A. Model numbers for toilet partitions manufactured by Bobrick Washroom Equipment, Inc., represented by R. E. Edwards & Associates (925-829-2942), are listed to establish a standard of quality for design, function, materials, workmanship, and appearance. Other manufacturers may be submitted for evaluation by the contractor by following the conditions of the substitutions language in Section 00200 Instructions to Bidders or Section 01600 Product Requirements. Unless approval is obtained ten days prior to the bid date, all bids shall be based on the standard of quality. The architect shall be the sole judge as to the acceptability of all products submitted for substitution.

B. Toilet partitions shall be the product(s) of a single manufacturer.

2.02 Mounting Configurations

A. Toilet Partitions/Shower Dividers/Dressing Compartments shall be:
1. Overhead-Braced (1092.67 Sierra™ Series)

2.03 Components/Materials

A. Stiles, Panels, Doors, and Screens
1. Stiles, Panels, Doors, and Screens shall be all be manufactured from Solid Color Reinforced Composite material.

B. Toilet Partition Material

1. Toilet partitions shall be constructed of Solid Color Reinforced Composite material, which is composed of dyes, organic fibrous material, and polycarbonate/phenolic resins. Material shall have a non-ghosting, graffiti-resistant surface integrally bonded to core through a series of manufacturing steps requiring thermal and mechanical pressure. Edges of material shall be the same color as the surface. Color : SC04-Forest Green

2. Subject to compliance with the material performance requirements, solid surface manufactured toilet partition systems or manufactured using the solid surface materials stated below will be acceptable:

a. Privacy Plus™ Toilet Compartments by Gerali Custom Design, Inc.
b. Ultimate Corian® System by Shower Shapes

c. WilsonArt® Gibraltar® Material
d. WilsonArt® EarthStone™ Material

3. Toilet partitions constructed of High Density Polyethylene (HDPE) or High Density Polypropylene will not be acceptable.

C. Finish Thickness

1. Stiles and doors shall be 3/4" (19 mm).
2. Panels and benches shall be 1/2" (13 mm).

D. Hardware

1. All hardware to be 18-8, type-304 stainless steel with satin finish.
2. Hardware of chrome-plated "Zamak", aluminum, or extruded plastic is unacceptable.

E. Latch

1. Sliding door latch shall be 14 gauge (2 mm) and shall slide on nylon track.
2. Sliding door latch shall require less than 5-lb force to operate. Twisting latch operation will not be acceptable.
3. Latch track shall be attached to door by machine screws into factory-installed threaded brass inserts.
4. Threaded brass inserts shall be factory installed for door hinge and latch connections and shall withstand a direct pull exceeding 1,500 lbs. per insert.
5. Through bolted, stainless steel, pin-in-head Torx sex bolt fasteners shall be used at latch keeper-to-stile connections and shall withstand direct pull force exceeding 1,500 lbs. per fastener.
6. ADD U-PULL BELOW LATCH ON EACH SIDE OF A DOOR.

F. Hinges

1. Hinge shall be 16-gauge (1.6-mm) continuous piano hinge.
2. All doors shall be equipped with self-closing hinge.
3. Continuous piano hinge shall be attached to door and stile by theft-resistant, pin-in-head Torx stainless steel machine screws into factory-installed, threaded brass inserts.
4. Fasteners secured directly into the core are not acceptable.
5. Door shall be furnished with two 11-gauge (3-mm) stainless steel door stop plates with attached rubber bumpers to resist door from being kicked in/out beyond stile.
6. Door stops and hinges shall be secured with stainless steel, pin-in-head Torx machine screws into threaded brass inserts.
7. Threaded brass inserts shall withstand a direct pull force exceeding 1,500 lbs per insert.

G. Mounting Bracket

1. Mounting brackets shall be 18-gauge (1.2- mm) stainless steel and extend full height of panel.
2. U-channels shall be furnished to secure panels to stiles.
3. Angle brackets shall be furnished to secure stiles to walls and panels to walls.
4. Fasteners at locations connecting panels-to-stiles shall utilize through bolted, stainless steel, pin-in-head Torx sex bolt fasteners. Through-bolted fasteners shall withstand direct pull force exceeding 1,500 lbs. per fastener.
5. Wall mounted urinal screen brackets shall be 11 gauge (3 mm) double thickness.

H. Leveling Device shall be 7-gauge, 3/16" (5-mm) hot rolled steel bar; chromate-treated and zinc-plated; through-bolted to base of solid color reinforced composite stile.

I. Stile Shoe shall be one-piece, 4" (102-mm) high, type-304, 22-gauge (0.8-mm) stainless steel with satin finish. Top shall have 90° return to stile. Shoe will be composed of one-piece of stainless steel and capable of being fastened (by clip) to stiles starting at wall line.

J. Headrail (Overhead Braced) shall be satin finish, extruded anodized aluminum (.125" / 3-mm thick) with anti-grip profile.

K. Comportment Hooks: In each toilet compartment, furnish and install a Bobrick B212 Clothes Hook and Bumper at 38" to 40" AFF for a barrier – free installation. Utilize through – bolted, stainless steel, pin – in – head Torx sex bolt fasteners.

2.04 FABRICATION

A. Vandal-Resistant Hardware Option: for Institutional Hardware option add suffix .67 to 1092 Series.

PART 3– EXECUTION

3.01 Inspection

A. Check areas scheduled to receive compartments for correct dimensions, plumbness of walls, and soundness of surfaces that would affect installation of mounting brackets.

B. Verify spacing of plumbing fixtures to assure compatibility with installation of compartments.

C. Do not begin installation of compartments until conditions are satisfactory.

3.02 Erection

A. Install compartments rigidly, straight, plumb, and level and in accordance with manufacturer's installation instructions.

B. Installation methods shall conform to manufacturer's recommendation for backing and proper support.

C. Conceal evidence of drilling, cutting, and fitting to room finish.

D. Maintain uniform clearance at vertical edge of doors.

3.03 Adjustment and Cleaning

A. Adjust hardware for proper operation after installation.

B. Set hinge cam on in-swinging doors to hold doors open when unlatched.

C. Set hinge cam on out-swinging doors to hold unlatched doors in closed position.

D. Clean exposed surfaces of compartments, hardware, and fittings.

END OF SECTION

SECTION 10800

TOILET ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Provide toilet accessories complete with attachment hardware as shown and as specified.

B. Related Sections:

1. Section 09300 – Tile: Provision of ceramic tile surfaces.
2. Section 10170 - Plastic Toilet Compartments.
3. Division 15 - Mechanical: plumbing.

1.02 SYSTEM DESCRIPTION

A. Accessories shall be the product of a single manufacturer unless otherwise specified.

B. All locks shall be keyed alike.

1.03 SUBMITTALS

A. Procedures: In accordance with Section 01 32 19.

B. Product Data: Manufacturer's catalog cuts and data sheets, complete parts list, and installation requirements for each accessory item specified.

C. Maintenance data, operating instructions, and keys required for each type of equipment and lock.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver items in manufacturer's original unopened protective packaging.

B. Store materials in original protective packaging to prevent soiling, physical damage, or wetting.

C. Handle so as to prevent damage to finished surfaces.

D. Protection:
1. Maintain protective covers on units until installation is complete.
2. Remove protective covers at final cleanup of installation.

1.05 PROJECT CONDITIONS

A. Coordinate submission of installation instructions so that backing, blocking, framing, and formwork can be properly installed and work of other trades will not be delayed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Bobrick Washroom Equipment, Inc. (District Standard). No substitutions unless otherwise specified.

2.02 MATERIALS

A. Stainless Steel Sheet: ASTM A167, commercial grade, Type 302/304, gauge as standard with manufacturer of specified items.

B. Stainless Steel Tubing: ASTM A269, commercial grade, seamless welded.

C. Sheet Steel: ASTM A366, cold rolled stretcher leveled; with G90 galvanized coating.

D. Adhesive: Epoxy type contact cement.

E. Fasteners, Screws, and Bolts: Hot dip galvanized; as recommended by accessory manufacturer for component and substrate.
1. Fastening shall be concealed and theft-proof when available.

F. Locks: Provide locks and furnish keys for standard lockable items.

2.03 FINISHES

A. Provide manufacturer's finish for each item indicated in accessory schedule, stainless steel where available.
1. Where there are choices of available finishes, not including satin stainless, provide chart for Architect's selection.

B. Exposed Finishes: Stainless steel, No. 4, satin finish; satin chrome finish acceptable where stainless steel not available for accessory item scheduled.

C. Concealed Surfaces: Pretreat and clean. Spray apply one coat primer and baked enamel finish.

2.04 MANUFACTURED UNITS

A. Provide the following manufactured units:

1. Recessed toilet seat cover dispenser, sanitary napkin disposal and toilet tissue dispenser (serves two toilet compartments): For ADA stalls B - 3574 and B- 357 for a standard stall, or approved equal.

2. Partition mounted toilet seat cover dispenser, sanitary napkin disposal and toilet tissue dispenser (serves two toilet compartments): As manufactured by Bobrick Washroom Equipment: B-357, or approved equal.

3. Surface Mounted Soap Dispenser: Owner Furnished, Contractor Installed.

4. At Toilet Partitions Install Surface Mounted Coat Hook With Bumper: As manufactured by Bobrick Washroom Equipment: B-212, or approved equal.

5. Recessed Paper Towel Dispenser and Waster Receptacle: As manufactured by Bobrick Washroom Equipment: B- 9344, or approved equal.

6. Mirror: As manufactured by Bobrick Washroom Equipment, B-166 1836 for 18" x 36" size and B-165-2060 for 20" x 60" size, or approved equal.

7. Surface Mounted Stainless Steel Shelf: As manufactured by Bobrick Washroom Equipment: B-683, or approved equal.

8. Surface Mounted Utility Hook: As manufactured by Bobrick Washroom Equipment: B-6707, or approved equal.

9. Grab Bars: Concealed mounting, 1-1/2" diameter, 18 gage, 8,000 psi M. 0. R., 1,000 psi shear and pull out, stainless steel, satin finish. As manufactured by Bobrick Washroom Equipment: B-6806 Series or approved equal.

10. Recessed Mounted Napkin/Tampon Vendors: As manufactured by Bobrick Washroom Equipment: B-3500 25 with 25 cents single coin operation.

B. Mounting Plates: Manufacturer's standard non-corrosive material. Provide as required per manufacturer's recommendations.

2.05 FABRICATION

A. Weld and grind smooth joints of fabricated components.

B. Form exposed surfaces from one sheet of stock, free of joints.

C. Provide steel anchor plates and anchor components for installation on building finishes.

D. Form surfaces flat without distortion; maintain flat surfaces without scratches or dents.

E. Back paint components where contact is made with building finishes, to prevent electrolysis.

F. Hot dip galvanize components; package complete with anchors and fittings.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Check openings scheduled to receive recessed units for correct dimensions, plumbness of blocking or frames, and preparation that would affect installation of accessories.

B. Check areas to receive surface-mounted units for conditions that would affect quality and execution of Work.

C. Do not begin installation until conditions are satisfactory.

3.02 INSTALLATION

A. Install fixtures and accessories in accordance with manufacturer's printed instructions.

B. Install true, plumb and level, securely and rigidly anchored to substrate.

C. Use tamper-proof, security type fasteners.

D. Attach grab bars to backing installed in wall to withstand loads prescribed by California Code of Regulation (CCR), Title 24, Section 1115B.8.

3.03 ADJUSTING AND CLEANING

A. Adjust accessories for proper operation.

B. After completion of installation, clean and polish exposed surfaces.

C. Deliver keys and instruction sheets to Owner.

END OF SECTION

SECTION 15010

BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included: Work included in 15010 applies to Division 15 work to provide materials, labor, tools, permits and incidentals to provide and make ready for Owner's use ventilation, and plumbing systems for proposed project.

B. Related Work Specified Elsewhere:
   1. Contents of Section applies to Division 15 specifications.
   2. Requirements of Section are a minimum for Division 15 Sections, unless otherwise stated in each Section, in which case that Section's requirements take precedence.

1.02 DEFINITIONS

A. Following is a list of abbreviations generally used in Division 15:

1.	ADA	Americans with Disabilities Act.
2.	AHJ	Authority Having Jurisdiction.
3.	ANSI	American National Standards Institute.
4.	ARI	Air-Conditioning & Refrigeration Institute.
5.	ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers.
6.	ASME	American Society of Mechanical Engineers.
7.	ASTM	American Society for Testing and Materials.
8.	ASSE	American Society of Sanitary Engineering.
9.	AWWA	American Water Works Association.
10.	CBC	California Building Code.
11.	CEC	California Electrical Code.
12.	CMC	California Mechanical Code.
13.	CPC	California Plumbing Code.
14.	CGA	Canadian Gas Association.
15.	CISPI	Cast Iron Soil Pipe Institute.
16.	CSA	Canadian Standards Association.
17.	DSA	Division of State Architect
18.	ETL	Electric Testing Laboratories.
19.	FM	FM Global.
20.	HI	Hydraulic Institute Standards.
21.	HVAC	Heating, Ventilating and Air Conditioning.
22.	FC	International Fire Code.
23.	IMC	International Mechanical Code.
24.	NEC	National Electric Code.
25.	MSS	Manufacturers Standardization Society.
26.	NEMA	National Electrical Manufacturers Association.
27.	NFPA	National Fire Protection Association.
28.	NFGC	National Fuel Gas Code.
29.	NRCA	National Roofing Contractors Association.
30.	NSF	National Sanitation Foundation.

31.	OSHA	Occupational Safety and Health Administration.
32.	SMACNA	Sheet Metal and Air Conditioning Contractors' National Association, Inc.
33.	TEMA	Tubular Exchanger Manufacturers Association.
34.	TIMA	Thermal Insulation Manufacturers Association.
35.	UL	Underwriters Laboratories Inc.

B. Provide: To furnish and install, complete and ready for the intended use.

C. Furnish: Supply and deliver to the project site, ready for unpacking, assembly and installation.

D. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at the project site as required to complete items of work furnished by others.

1.03 ADDITIONAL REQUIREMENTS TO DIVISION 1

A. Operation and Maintenance Documentation: Copies of certificates of code authority acceptance, test data, parts lists, maintenance information for equipment, valves, balancing reports, equipment start-up documentation, and other special guarantees, certificates of warranties, and the like, specified elsewhere herein or indicated on Drawings.

B. Shop Drawings: Provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and the like. Refer to individual Specification Sections for additional requirements for the shop drawings.

C. Close-out Documentation: Submit mechanical/plumbing code authority certification of inspection.

D. Record Drawings:
1. Show changes and deviations from the Drawings. Include issued Addendum and change order items.
2. Make changes to the Drawings in a neat, clean, and legible manner.

E. Product Data:
1. Submit manufacturer's technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, supplied or provided. Refer to individual specification sections for specific items required in product data submittal. Submit at one time in 3-ring binder, tabbed and referenced to match the Contract Documents.
2. Maintain an updated product submittal package to be included in the final operation and maintenance documentation.

1.04 QUALITY ASSURANCE

A. Where Contract Documents are at variance with applicable codes governing work, code and local jurisdiction requirements take precedence, and include cost necessary for code compliance or local jurisdiction compliance in bid price. Machinery and equipment to comply with Occupational Safety and Health Act of 1970, as currently revised, as interpreted for equipment manufacturer requirements.

B. Mechanical Drawings: Drawings are intended to be diagrammatic and are based on one manufacturer's equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e., ducts and piping) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than basis of design, including but not limited to architectural, structural, electrical, HVAC, fire sprinkler, and plumbing.

C. Requirements: As a minimum requirement, work in accordance with following rules and regulations and applicable laws:
1. NFPA.
2. OSHA.
3. Related supplements and standards.
4. California State Energy Code.
5. California Building Code
6. California Mechanical Code
7. California Plumbing Code
8. State of Oregon and local jurisdictional requirements.

D. Permits and Inspections:
1. Unless otherwise distinctly hereinafter specified, apply and pay for necessary permits, plans check, and inspections required by public AHJ.
2. Refer to General and Supplementary Conditions for payment of water and sewer service connection fees.
3. Obtain certificates of inspection from AHJs and deliver to Owner before final acceptance.
4. Each trade to consult local building department and utility companies prior to commencement of work to ascertain existence and location of existing underground utilities. Protect existing service against damage and interruption of use, and reroute as may be necessary to accomplish new work. Include costs for materials and installation for rerouting as specified for new work in bid price.

E. Regulatory Requirements:
1. UL and CSA Compliance: Provide units which are UL, ETL, and CSA listed.
2. ASME Compliance: Provide units which are ASME listed when water heaters and boilers which exceed 200,000 BTUH, hot water storage tanks which exceed 120 gallons, and hot water expansion tanks which are connected to ASME rated equipment or required by code or local jurisdiction.
3. Provide safety controls required by National Boiler Code (CSD-1) for boilers and water heaters exceeding 400,000 BTUH.

1.05 SEQUENCING AND SCHEDULING

A. For proper execution of work cooperate with other trades as needed.

B. To avoid installation conflicts, thoroughly examine complete set of Contract Documents. Resolve conflicts with Architect prior to fabrication and installation.

C. Prior to installation of equipment requiring electrical connections, examine manufacturer's shop drawings, wiring diagrams, product data, and installation instructions. Verify that electrical characteristics indicated in Contract Documents are consistent with electrical characteristics of actual equipment being installed. When inconsistencies occur request clarification from Architect.

1.06 COORDINATION DOCUMENTS

A. Prepare and submit coordinated layout drawings, prior to construction, to coordinate installation and location of HVAC equipment, ductwork, grilles, diffusers, piping, fire sprinklers, plumbing, lights, and electrical services. Composite Drawings show services on single sheet. Key Drawings to structural column identification system, and progressively number. Prior to completion of Drawings, coordinate proposed installation with architectural and structural requirements, and other trades (including plumbing, fire protection, electrical, ceiling suspension, and tile systems), and provide reasonable maintenance access requirements.

B. Prepare Drawings as follows:
1. Prepare Drawings to accurate scale of 1/4 inch = 1 foot or larger on Mylar sheets or AutoCAD. Drawings are to be same size as Contract Drawings and to indicate location, size and elevation above finished floor of HVAC/plumbing equipment, ductwork, and piping. Drawings to also indicate proposed ceiling grid and lighting layout as shown on electrical drawings and reflected ceiling drawings.
2. Review and revise as necessary section cuts in Contract Drawings after verification of field conditions.
3. Indicate plumbing system piping including fittings, hangers, access panels, valves, and bottom of pipe elevations above finished floor.
4. Piping that must be graded to have right-of-way over more flexible items.
5. Drawings are to incorporate Addenda items and change orders.
6. Distribute drawings to trades and provide additional coordination as needed.

C. Advise Architect, in event a conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

D. Verify in field exact size, location, invert, and clearances regarding existing material, equipment and apparatus, and advise Architect of discrepancies between that indicated on Drawings and that existing in field prior to installation related thereto.

E. Final coordination drawings with appropriate information added to be submitted as Record Drawings at completion of project.

1.07 EXISTING SOILS CONDITIONS

A. Understand existing soils conditions before submitting bid on work. No additional allowance will be granted due to lack of information for existing conditions of subsurface soils.

B. Submission of a bid will be considered acknowledgment of review/understanding of project geotechnical soils report.

PART 2 - PRODUCTS

2.01 HAZARDOUS MATERIALS

A. Do not use products containing asbestos, lead, arsenic, or any other material defined by EPA as hazardous to human or animal life.

2.02 MATERIALS

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, the latest products as listed in manufacturer's printed catalog data and are to be UL or CSA approved or acceptable by state, county, and city authorities. Equipment supplier is responsible for obtaining state, county, and city acceptance on equipment not UL approved or not listed for installation.

B. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer.

C. Trade names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

PART 3 - EXECUTION

3.01 ACCESSIBILITY AND INSTALLATION

A. Install equipment having components requiring access (i.e., drain pans, drains, fire dampers, control dampers, control operators, valves, motors, drives, and the like) so that they may be serviced, reset, replaced or recalibrated and the like, by service people with normal service tools and equipment. Notify Architect in writing if equipment or components are shown in such a position that above cannot be accomplished.

B. Install equipment complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment, examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods and sequencing, in coordination with other trades and disciplines.

C. Firestopping:
   1. Coordinate with Drawings location of fire rated walls, ceilings, floors and the like. When these assemblies are penetrated, seal around piping, ductwork, equipment, and the like, with approved firestopping material.
   2. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814.

3.02 SEISMIC CONTROL

A. Provide per Section 15240, Mechanical Equipment Sound, Vibration and Seismic Control.
   1. General:
      a. Earthquake resistant designs for mechanical equipment, i.e., air handling units, water heaters, blowers, motors, ductwork, mechanical and plumbing piping, to conform to regulations of CBC.
      b. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment piping, ductwork, and the like, to withstand a force in direction equal to value defined in CBC.
      c. Retain licensed structural engineer to provide shop drawings of seismic bracing and seismic movement assemblies for piping/ ductwork/ equipment/ water heaters, and the like. Engineer to design and provide stamped shop drawings for equipment, ductwork, water heaters, piping seismic bracing, and the like. Submit shop drawings along with equipment submittals.

d. Retain licensed structural engineer to provide shop drawings of seismic flexible joints for piping/ductwork and the like crossing building expansion or seismic joints. Engineer to design and provide stamped shop drawings for piping/ductwork flexible seismic joints. Coordinate actual design deflection or travel with project structural engineer. Submit shop drawings along with seismic bracing details. Coordinate exact design requirements from project structural engineer.

2. Piping and Ductwork:
   a. Use "Seismic Restraints Manual Guidelines for Mechanical Systems," published by SMACNA.
   b. Sway bracing is not required for pipes that are installed on very short individual hangers (12 inch or less).
   c. As approved by code authority, use a bracing system manufactured by Tolco, Superstrut, Mason, or Pipe Shields Inc. or approved.
3. Equipment:
   a. Provide a means to prohibit excessive motion of mechanical equipment during earthquake.
   b. Provide mechanical equipment, both hanging and base mounted, with mounting connection points of sufficient strength to resist lateral seismic forces per ASCE 7-05 Section 13.3.

3.03 REVIEW BY ENGINEER

A. Notify Architect/Engineer, in writing, at following stages of construction so that Architect/Engineer may, at their option, visit site for review and construction observation:
   1. Plumbing:
      a. Underground piping installation prior to backfilling.
      b. Prior to covering walls.
      c. When ceiling installation is started.
      d. When main systems, or portions of, are being tested and ready for inspection by AHJ.
   2. HVAC:
      a. When ductwork installation starts.
      b. When installation starts for each different major type of equipment.
      c. When ceiling installation is started.
      d. When lines or ducts are to be permanently concealed by construction or insulation systems.
      e. When balancing and testing is started.

3.04 OPERATING DURING CHANGEOVER

A. During remodeling of existing structure, or addition of a structure to existing structure, while existing structure is occupied, present services to remain intact until new construction, facilities or equipment is installed.

B. Prior to changing over to new service, verify that every item is thoroughly prepared. Install new piping, wiring, and the like, to point of connection.

C. Perform actual transfer to new service at off-peak time, as coordinated with Owner. Once changeover is started, pursue it to its completion, to keep interference to a minimum.

3.05 MUTILATION

A. Repair mutilation of building around pipes, ducts, fixtures, and the like.

3.06 DEMOLITION

A. Scope:
   1. It is intent of these documents to provide necessary information and adjustments to mechanical system required to meet code, and accommodate installation of new work.
   2. Coordinate with Owner so that work can be scheduled not to interrupt operations, normal activities, building access, access to different areas.
   3. Existing Conditions: Determine exact location of existing utilities and equipment before commencing work, compensate Owner for damages caused by failure to exactly locate and preserve underground utilities. Replace damaged items with new material to match existing. Promptly notify Owner if utilities are found which are not shown on Drawings.

B. Equipment: Unless otherwise directed, equipment, fixtures, or fittings being removed as part of the demolition process are the Owner's property. Remove other items not scheduled to be reused or relocated from job site as directed by Owner.

C. Unless specifically indicated on the Drawings, the Contractor shall remove unused piping. Cap piping and patch surfaces to match surrounding finish.

D. Unless specifically indicated on the Drawings, the Contractor shall remove unused equipment, fixtures, fittings, rough-ins, connectors, etc. Removal is to be to a point behind finished surfaces (floors, walls, ceilings, etc.).

3.07 ELECTRICAL INTERLOCKS

A. Where equipment motors are to be electrically interlocked with other equipment for simultaneous operation, utilize mechanical equipment wiring diagrams to coordinate with electrical systems so that proper wiring of equipment involved is affected.

3.08 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing, at no additional cost to Owner.

B. Maintain design intent where equipment other than as shown in Contract Documents is provided. Where equipment requires piping arrangement, control diagrams, or sequencing different from that indicated in Contract Documents, provide electrical motors, wiring, controls, or other required electrical components at no additional cost to Owner.

3.09 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle materials and equipment in a manner to prevent damage and deterioration. Store in original container which identifies manufacturer's name, brand and model number. Do not store indoor equipment outdoors unless provided with a waterproof protective cover.

B. Replacement: In event of damage, immediately make repairs and replacements necessary.

3.10 DEMONSTRATION

A. Upon completion of work and adjustment of equipment, test systems to demonstrate to Owner's Representative and Architect that equipment furnished and installed or connected under provisions of these Specifications functions mechanically in manner required.

B. Manufacturer's Field Services: Furnish services of a qualified person for a period of not less than 4 hours, at a time approved by Owner, to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in a satisfactory manner and complies with requirements of other trades or Contractors that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

3.11 CLEANING

A. Upon completion of installation, thoroughly clean exposed portions of equipment, removing temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated by this work.

3.12 INSTALLATION

A. Install equipment and fixtures in accordance with manufacturer's installation instructions, plumb and level, firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.

B. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
1. Do not place equipment in sustained operation prior to initial balancing of mechanical systems.
2. Furnish sufficient refrigerant and dry nitrogen for pressure testing under manufacturer's supervision.
3. Provide and install additional fan sheaves to obtain design capacities. Coordinate exact requirements with balancing firm.

3.13 CUTTING AND PATCHING

A. Refer to Division 1, Section "Cutting and Patching."

3.14 ACCEPTANCE

A. System can not be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
1. Testing and balancing reports.
2. Cleaning.
3. System balancing and balancing logs.
4. Operating and Maintenance Manuals.
5. Training of operating personnel.
6. Record Drawings.
7. Guaranty certificates.
8. Start-up and test document.
9. Letter of conformance.

3.15 LETTER OF CONFORMANCE

A. Provide letter and copies of extended warranties with a statement in letter that mechanical items were installed in accordance with manufacturer's recommendations. Include letter of conformance and warranties in operating and maintenance manuals.

B. Warranties to begin at date of substantial completion.

END OF SECTION 15010

SECTION 15040

ACCEPTANCE TESTING AND DOCUMENTATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This section describes the Acceptance Testing and documentation of the mechanical system(s) and outlines the duties and responsibilities of the contracting team for Acceptance Testing.

B. Apply the Acceptance requirements to products, equipment and systems provided under this Division, where indicated on plans, and where required by California Title 24 requirements.

C. Engage the services of a firm specializing in commissioning of mechanical systems or shall submit contractor qualifications for review by architect where testing and documentation is to be performed by contractor. Where duct pressure testing validation is required, submit name and qualification for HERS Certified testing agency.

1.02 THE COMMISSIONING TEAM

A. Form the Commissioning Team of:
1. Mechanical contractor's representative
2. DDC Controls contractor's representative
3. HERS Certified Testing Agency where required
4. Inspector of record
5. Owner's staff representative

PART 2 - PRODUCTS

2.01 DUTIES OF THE TEAM

A. The duties of the Team are as outlined in the Title 24 Requirements and summarized below:
1. Plan, organize and implement the Acceptance Testing process and within 1 month of the award of the contract, submit the names and addresses of the Testing team member(s).
2. The Acceptance testing team shall submit a complete description of the testing procedures and systems to be tested to the architect for review.
3. The Acceptance testing team shall coordinate tests of systems and equipment and assemble documentation related to tests. Submit documentation relative to tests and proposed procedures to design engineer for review prior to submitting documentation to Authority having Jurisdiction (AHJ.) Team responsible for performing data analysis, calculation of performance indices and crosschecking of results with the requirements of Title 24 and the Contract documents. The installing contractor or agent responsible for testing and documentation shall record their State of California Contractor's license number or their State of California Professional Registration License number on each Certificate of Acceptance for submittal.

4. Responsible for submitting Certificate of Acceptance including paper and electronic copies of measurements and monitoring results and supporting documentation to the AHJ. Where AHJ questions results or requires additional testing, complete additional testing and provide required documentation at no additional cost to the Owner.

2.02 TIME SCHEDULE

A. Determine the time period of the commissioning of the systems by the general contractor and Acceptance testing team. It is important to note that AHJ will not release a final Certificate of Occupancy until a Certificate of Acceptance is submitted that demonstrates that the specified systems and equipment have been shown to be performing in accordance with the Title 24 standards.

2.03 ACCEPTANCE TESTING – PHASE I - DOCUMENTATION

A. Team shall assemble documentation showing thermostat and sensor locations, control device locations, control sequences and notes.
B. Per Title 24 requirements, team shall provide record drawings to building owner within 90 days of receiving a final occupancy permit (refer to other specification sections for requirements on record drawings.)
C. Per Title 24 requirements, team shall provide operating and maintenance manuals to the building owner (refer to other specification sections for requirements on operation and maintenance manuals.)

2.04 ACCEPTANCE TESTING – PHASE II – INSPECTION AND TESTING

A. Team shall review the installation, perform acceptance testing and document results for the following systems:
1. Variable Air Volume Systems
2. Constant Volume Systems
3. Package Systems
4. Air Distribution Systems
5. Economizers
6. Demand Control Ventilation Systems
7. Ventilation Systems
8. Variable Frequency Drive Fan Systems
9. Hydronic Control Systems
10. Hydronic Pump Isolation Controls and Devices
11. Supply Water Reset Controls
12. Water Loop Heat Pump Control
13. Variable Frequency Drive Pump Systems
14. System Programming
15. Time Clocks

B. Review of installation shall confirm mechanical equipment and devices are properly located, identified, calibrated, and set points and schedules programmed per contract document requirements.

2.05 ACCEPTANCE TESTING - PHASE III - CERTIFICATION

A. Team shall document operating and maintenance information, complete installation certificate, and indicate test results on the Certificate of Acceptance, and submit the Certificate to the AHJ prior to receiving final occupancy permit. Team shall submit forms MECH-1-A through MECH-9-A as required by Title 24 requirements.

PART 3 - EXECUTION

3.01 ACCEPTANCE TESTS AND DOCUMENTATION

A. Refer to California Title 24, Non-residential manual for specific testing procedures and documentation requirements. The detailed requirements can be found at http://www.energy.ca.gov/title 24/2005standards/index.html. Contractor is responsible for reviewing and complying with these standards

END OF SECTION 15040

SECTION 15050

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY

A. Materials, installation and testing of pipe, tubing and fittings, and valves.
   1. Refer to Specification Sections for each system medium (i.e., plumbing, hydronics, gas, and the like) for pipe application.
   2. Motors and starters.
   3. Rooftop equipment supports.
   4. Mechanical identification materials.
   5. Seismic/vibration isolation.

1.02 QUALITY ASSURANCE

A. Manufacturer's Inspection: Inspect flanges, fittings and field applied welds in accordance with manufacturer's standard written quality control procedure in accordance with the following techniques:
   1. Visual Method: Comply with MSS SP-55 except as otherwise indicated.
   2. Radiographic (X-Ray) Method: Employ wherever recommended or required for pressurized piping systems.

B. Welding Qualification: Qualify welding procedures, welders and operators in accordance with ANSI B31.9 for shop and project site welding of piping work.

1.03 SUBMITTALS

A. Piping Materials List: Provide typewritten list which schedules the piping materials to be used for each system as a function of applicable nominal pipe size ranges. Arrange schedule in outline form for each specific piping system, e.g., "Chilled Water System," "Soil, Waste, and Vent Piping System," and the like. Include ASTM, ANSI or other numbers and other data as necessary to demonstrate compliance with requirements.

B. Test Procedure: Submit a typewritten checklist type of testing procedure indicating testing medium (i.e., water, air, nitrogen, and the like), pipe service, pipe and fitting type and classification, test pressure, pass/fail criteria and any other pertinent data.

C. Maintenance Data: Submit maintenance data and parts list for each type valve. Include this data, product data, and certifications in maintenance manual.

PART 2 - PRODUCTS

2.01 PRODUCT STANDARDS

A. References to product Specifications for materials are listed according to accepted base standards. Materials to meet latest approved versions of these standards.

B. See Section 15010, Basic Mechanical Requirements and Section 15400, Plumbing, where piping materials are approved for use.

2.02 ACCESS PANELS

A. Provide flush mounting access panels as required for service of fire dampers, cleanouts, valves, and the like, and other items requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly. Ceiling access panels to be minimum 24x24 (or required and approved size). Wall access panels to be minimum 12x12 (or required and approved size).

B. Manufacturers: Milcor, Karp, Elmdor, In-Ryko, Acudor, or approved. Provide two keys for each set of locks provided.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General Electrical Equipment Clearances: Do not route piping through electrical rooms, transformer vaults, elevator equipment rooms, and other electrical or electronic equipment spaces and enclosures. Within equipment rooms, provide minimum 3-foot lateral clearance from sides of electric switchgear panels. Do not route piping above any electric power or lighting panel, switchgear, or similar electric device. Coordinate with electrical and coordinate exact pipe routing to provide proper clearance with such items.

B. Pressure Piping Routing:
1. Route piping, except as otherwise indicated, vertically and horizontally (sloped to drain). Avoid diagonal runs wherever possible. Orient horizontal routes parallel with walls and beam lines.
2. Install piping as shown or described by diagrams, details and notations on Drawings or, if not indicated, install piping to provide the shortest route which does not obstruct usable space or block access for servicing the building and its equipment.
3. Support piping adjacent to walls, overhead construction, columns and other structural and permanent enclosure elements of the building. Limit clearance to 1/2 inch wherever furring is indicated for concealment of piping. Allow for insulation thickness, if any. Locate insulated piping to provide minimum 1-inch clearance outside insulation.
4. Wherever possible in finished and occupied spaces, conceal piping from view by locating within column or beam enclosures, hollow wall construction, or above suspended ceilings. Do not encase horizontal routes in solid partitions, except where approved.

C. Preparation:
1. Cast Iron Soil Pipe: Conform with state plumbing code and standards, CISPI recommendations and applicable adopted code amendments.
2. Hubless Cast Iron Joints: Comply with CISPI HSN utilizing calibrated torque wrenches for tightening bands to manufacturer's recommended settings.
3. Unions:
   a. Standard Unions: Install where indicated on Drawings and on each side of pieces of equipment to permit easy removal of equipment.
4. Copper Tubing:
   a. Remove burrs from and clean outer surface of tube ends and inner surface of fittings.

b. Copper-Soldered: Make soldered joints for copper tubing and fittings with code approved solder alloys meeting ASTM and ANSI standards and listings. Solder-paste-flux combination fillers are not approved. Installations to conform to accepted published procedures; i.e., UPC IS 375, IS 21-80 standards and CDA Publications. Use of steel wool for cleaning tube and fittings is prohibited. Apply flux as recommended by manufacturer. Solder domestic hot and cold water and condensate pipe within building above grade with 95 percent tin and 5 percent antimony, Allstate Silver Bearing Solder 430 or other approved solder alloys which do not contain lead or cadmium.

c. Copper-Brazed: Make brazed joints for copper tubing and fittings with code approved brazing filler alloys meeting ASTM and AWS standards and listings. Filler alloys of BCuP2 classification (e.g., "Phos-0" or "Fos-Copper") may not be used to make joints between copper tubing and cast brass or bronze fittings. Filler alloys containing cadmium are not approved for use in potable water piping. Installations to conform to accepted published procedures, i.e., UPC IS 3-75 standards and CDA Publications. Use of steel wool for cleaning tube and fittings is prohibited. Braze other copper pressure piping underground including water service. Remove bonnets and nonmetallic seats on valves and cool body with damp cloth while soldering or brazing. Remove excess flux from completed joints in accordance with manufacturer's instructions and code standards.

d. Pressurized Service:
   1) Unless otherwise indicated, wrought copper/bronze solder joint fittings complying with ANSI B16.22-1995.
   2) Copper Tube Unions: Standard products as recommended by manufacturer for use in the service. Rated at 150 percent design operating pressure.
   3) Mechanically Formed Tee Connections:
      a) Form mechanically extracted collars in a continuous operation consisting of drilling a pilot hole and drawing out the tube surface to form a collar having a height of not less than three times the thickness of the tube wall. Fully adjustable collaring device to ensure proper tolerance and complete uniformity of the joint.
      b) Notch the branch to conform with the inner curve of the run tube and dimpled to ensure penetration of the branch tube into the collar is of sufficient depth for brazing and that the branch tube does not obstruct the flow in the main line tube.
      c) Braze joints in accordance with the Copper Development Association Copper Tube Handbook using B-cup series filler metal. Note: Soft soldered joints will not be permitted.

3.02 PIPE AND PIPE FITTINGS

A. Pipe Sleeves:
   1. Lay out work in advance of pouring concrete and furnish and set sleeves necessary to complete work.
   2. Floor Sleeves (Except DWV Piping at Slab on Grade): Provide sleeves on pipes passing through concrete or masonry construction. Extend sleeve 1 inch above finished floor. Caulk pipes passing through floor with nonshrinking grout or approved caulking compound. Provide "Link-Seal" sleeve sealing system for slab on grade. Caulk/seal piping and ductwork passing through fire rated building assembly with UL rated assemblies. Provide fire-rated assemblies per local AHJ requirements.
   3. Wall Sleeves: Provide sleeves on pipes passing through concrete or masonry construction. Provide sleeve flush with finished face of wall. Caulk pipes passing through walls with nonshrinking caulking compound. Caulk/seal piping and ducts passing through fire-rated building assemblies with UL approved fire-rated assemblies. Provide fire-rated assemblies per local AHJ requirements.

4. Beam Sleeves: Coordinate with trades for locations of pipe sleeves in reinforced concrete and steel beams. Penetrations must be indicated on structural shop drawings. See Drawings and Specifications for specific sleeve location limitations. Plumbing Drawings are diagrammatic. Offset piping as required to meet these limitations. Pipe sleeve locations must be indicated on reinforced concrete and steel beam shop drawings. Field cutting of beams not allowed without written approval of structural engineer. No extra costs allowed for failure to coordinate beam penetrations prior to reinforced concrete and steel beam shop drawing submittal.

B. Conform with applicable codes and industry standards.

C. Install uninsulated piping so that unrestrained direct contact with the structure or other system installations is avoided. Where contact with or passage through building or structural features cannot be avoided; firmly anchor piping to, or isolated from, the structure to prevent noise transmission and occurrence of physical damage. Install piping to be insulated with adequate clearance around piping to allow for placement of full thickness insulating material.

D. Corrosion Control:
1. Underground Steel Piping Corrosion Protection: Factory wrap uninsulated underground steel piping systems with protective coating composed of a coal-tar saturated wrapping tape over a 20 mil thick coal-tar epoxy coating, equivalent to "Republic X-Tru-Coat." Wrap joints spirally with a minimum overlap of 1/2 tape width. Extend wrap not less than 3 inches above grade. Provide tinker test to check for holidays. Provide cathodic protection to meet requirements of NACE Standard RP0169-2002.

E. Installation/Coordination:
1. Expansion and Flexibility: Install work with due regard for expansion, contraction, and building settlement to prevent damage to the piping, ductwork, equipment and the building and its contents. Provide piping offsets, loops, expansion joints, anchors or other means to control pipe movement, to minimize pipe forces and effects of building settlement.
2. Install piping to prevent stresses and strains to piping and hangers and supports due to expansion or contraction and building settlement. Provide proper loops, guides, offsets, anchor points, or expansion joints. Verify with anticipated settlement or shrinkage of building. Verify construction phasing of project, type of building construction products and type for coordinating installation of piping systems. Include provisions for servicing and removal of equipment without dismantling piping.

3.03 ESCUTCHEONS

A. Install on exposed pipes passing through walls or floors, and on fixture stops and waste connections to wall, except not required in stockrooms.

3.04 PIPING AND EQUIPMENT REMOVAL

A. Piping and equipment removed as salvage by Owner to remain property of the Owner.

B. Comply with Division 2, Section "Site Demolition."

C. Remove as shown on drawings. Piping and ductwork to be reused where shown. Dispose and remove excess piping, ductwork and equipment (and not identified by Owner as salvage).

3.05 ACCESSIBILITY

A. Installation of valves, gauges and equipment conveniently and accessibly located with

reference to finished building for repairs, removal and service.

B. Access Panels: Label access panels with engraved nameplates indicating function of panel. Seton, Bakelite or approved. Nameplates to have 1/4-inch high white letters on black background, unless noted otherwise.

3.06 PAINTING

A. Ferrous Metal: After completion of mechanical work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces in mechanical rooms, i.e., hangers, hanger rods, equipment stands, and the like, with one coat of black asphalt varnish or black enamel suitable for hot surfaces.

B. Machinery:
1. In a mechanical room, on the roof or other exposed areas, machinery and equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.
2. See individual equipment specifications for other painting.

C. Structural Steel: Repair damage to structural steel finishes or the finishes of other materials damaged by cutting, welding or patching to match original.

D. Piping: Clean, primer coat, and paint exposed piping on the roof or at other exterior locations with two coats of paint suitable for metallic surfaces and exterior exposures. Color selected by Architect.

3.07 ACCESS PANELS

A. Install ceiling or wall access panels to provide access to concealed valves, fans, motors, shock arrestors, fire dampers, terminal units, coils and other mechanical items needing service. Provide access panels at locations required or as specified herein. Coordinate locations/sizes of access panels with Architect prior to work.

B. Where access panels are for service of fire, fire/smoke, or smoke dampers, stencil the words "Fire Damper," "Fire/Smoke Damper," or "Smoke Damper" in 1/2-inch high capital letters on the outside of the panels.

3.08 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES

A. Provide proper sizing when providing sleeves or core-drilled holes to accommodate the penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet the requirements of ASTM E814.

B. Manufacturers: Hilti, Proset, or approved.

3.09 FIELD QUALITY CONTROL

A. Upon completion of installation of equipment and plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.

B. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect. Remove cracked or dented units and replace with new units.

3.10 VALVE INSTALLATION

A. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.

B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable. Install valve drains with hose-end adapter for each valve that must be installed with stem below horizontal plane.

C. Insulation: Where insulation is indicated, install extended-stem valves, arranged in proper manner to receive insulation.

D. Mechanical Actuators: Install with chain operators where indicated. Extend chains to 5 feet above floor and hook to clips to clear aisle passage.

E. Stem Selection: Outside screw and yoke stems, except provide inside screw, nonrising stem where space prevents full opening of OS&Y valves.

F. Seats: Renewable seats, except where otherwise indicated.

G. Installation of Check Valves:
1. Swing Check Valves: Install in horizontal position with hinge pin horizontally perpendicular to centerline of pipe. Install for proper direction of flow.
2. Rubber Flapper Check Valves: Install in piping line in horizontal or vertical upward flow position for proper direction of flow. To be used exclusively for raw sewage, storm water, or sub-soil water applications. For piping 1-1/2 inches or smaller, provide a swing check valve.
3. Wafer Check Valves: Install between two flanges in horizontal or vertical position, position for proper direction of flow.
4. Lift Check Valves: Install in piping line with stem vertically upward, position for proper direction of flow.

3.11 VALVE ADJUSTING AND CLEANING

A. Inspect valves for leaks. Adjust or replace packing to stop leaks. Replace valve if leak persists.

3.12 VALVE IDENTIFICATION

A. General: Provide valve tag on every valve, cock and control device in each piping system. Exclude check valves, valves within factory fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibbs, shutoff valves at plumbing fixtures, and similar rough-in connections of end-use fixtures. List each tagged valve in valve schedule for each piping system.

B. Install mounted valve schedule in each mechanical room.

3.13 MECHANICAL EQUIPMENT IDENTIFICATION

A. General: Install engraved plastic laminate sign or plastic equipment marker on or near each item of mechanical equipment and each operational device, as specified herein if not otherwise specified for each item or device. Provide signs for the following general categories of equipment and operational devices: terminal units, coils, fans, water heaters, blowers, unitary HVAC equipment, similar equipment.

3.14 ROOFTOP SEISMIC STRAPS

A. Provide 8-inch wide by 8-inch long, 16 gauge straps fastened from rooftop-mounted equipment to curb at minimum of one or more locations per side as determined by seismic design requirements.

3.15 DUCTWORK IDENTIFICATION

A. General: Identify air supply, return, exhaust, and intake ductwork with duct markers, showing ductwork service and direction of flow, in black or white (whichever provides most contrast with ductwork identification color).

B. Location: In each space where ductwork is exposed, locate signs near points where ductwork originates or continues into concealed enclosures (shaft, underground or similar concealment), and at 50-foot spacing along exposed runs.

C. Access Doors: Provide duct markers or stenciled signs on each access door in ductwork and housings, indicating purpose of access (to what equipment) and other maintenance and operating instructions.

D. Dampers: Provide 12-inch plenum rated marker ribbon to end of balancing damper handles.

3.16 PIPING SYSTEM IDENTIFICATION

A. Install pipe markers on each system and include arrows to show normal direction of flow.

B. Locate pipe markers and color bands wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels and plenums), and exterior nonconcealed locations, in locations as follows:
   1. Near each valve and control device.
   2. Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.
   3. Near locations where pipes pass through walls or floors/ceilings, or enter nonaccessible enclosures.
   4. At access doors, manholes and similar access points which permit view of concealed piping.
   5. Near major equipment items and other points of origination and termination.
   6. Spaced intermediately at maximum spacing of 50 feet along each piping run, except reduce spacing to 25 feet in congested areas of piping and equipment, i.e., mechanical rooms.

3.17 ADJUSTING AND CLEANING

A. Adjusting: Relocate any mechanical identification device which has become visually blocked.

B. Cleaning: Clean face of identification devices, and glass frames of valve charts.

3.18 CONNECTIONS TO EXISTING

A. Prior to connection of piping and ductwork to existing as illustrated on Mechanical Drawings, field verify existing conditions and exact sizes and locations of existing piping and ductwork. Provide additional offsets, transitions, joints, cut-ins, and replace portions of existing as required to facilitate connections of new as shown on Documents.

3.19 CAULKING

A. Provide Geocel Corporation, (800) 348-7615, Construction 2000 Caulking Sealant. Standard color to match as close as possible to surrounding surface. Application standards, ASTM C920, Type S, Grade NS, Class 25, ICBO approved, Report No. 3680. Apply per manufacturer's recommendations.

3.20 STARTERS

A. Install in sight of equipment controlled, easily accessible, protected from possible piping leaks and no more than 6 feet above the floor.

END OF SECTION 15050

SECTION 15060

PIPES AND PIPE FITTINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Materials, installation and testing of pipe, tubing and fittings.
   2. Refer to Specification Sections for each system medium (i.e., plumbing, hydronics, gas, and the like), for pipe application.

1.02 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer's Qualifications: Firms regularly engaged in manufacture of piping products of types and sizes required.
   2. Welding Qualification: Qualify welding procedures, welders and operators in accordance with ANSI B31.9 for shop and project site welding of piping work.

B. Manufacturer's Inspection: Inspect flanges, fittings and field applied welds in accordance with manufacturer's standard written quality control procedure in accordance with the following techniques:
   1. Visual Method: Comply with MSS SP-55 except as otherwise indicated.
   2. Radiographic (X-Ray) Method: Employ wherever recommended or required for pressurized piping systems.

1.03 SUBMITTALS

A. Piping Materials List: Provide a typewritten list which schedules the piping materials to be used for each system as a function of applicable nominal pipe size ranges. Arrange schedule in outline form for each specific piping system, e.g., "Chilled Water System," "Soil, Waste, and Vent Piping System," and the like. Include ASTM, ANSI or other numbers and other data as necessary to demonstrate compliance with requirements.

B. Test Procedure: Submit a typewritten checklist type of testing procedure indicating testing medium (i.e., water, air, nitrogen, and the like), pipe service, pipe and fitting type and classification, test pressure, pass/fail criteria and any other pertinent data.

PART 2 - PRODUCTS

2.01 PIPING - GENERAL

A. Provide pipe, tube and fittings of the type, fitting requirements, grade, class, size and weight indicated or required for each service, as indicated in other Division 15 Specifications. Where type, grade, or class is not indicated, provide proper selection as determined by installer for installation requirements, and comply with governing regulations and industry standards.

2.02 STEEL PIPE

A. ASTM A53, Welded or Seamless, Grade B: Schedule as specified.

B. ASTM A106, Seamless, Grade B: Black, unless otherwise indicated, schedule as specified.

C. ASTM A135, Electric Resistance Welded, Grade B: Black, unless otherwise indicated, schedule as specified.

2.03 COPPER TUBE

A. Temper: Annealed (hard drawn).

B. Water Service: ASTM B88, Type as indicated for each service.

C. Drain, Waste, and Vent (DWV): ASTM B306.

2.04 CAST IRON PIPE

A. ASTM A74, hub-and-spigot, service weight.

B. ASTM A888/CISPI 301 hubless, including coupling assembly.

2.05 FITTINGS FOR STEEL PIPE

A. General: Flanges, fittings, unions and other products, mark in accordance with MSS SP-25.

B. Welding Fittings: Wrought carbon steel fittings, ASTM A234, ANSI B16.9, B16.28. Butt-welding type unless otherwise indicated to be socket welding type.

C. Branch Connections: From mains or headers 2-1/2 inches or larger, welded tees or forged welding outlets.

D. Welding Outlets: "Weldolets" or "Threadolets" equivalent to Bonney Forge. Use forged welding outlets wherever branch line is at least 1 nominal pipe size smaller than local main or header.

E. Threaded Fittings: ANSI B2.1, ASTM A47, 150 PSI rating, except where otherwise specified, prevailing codes or requirements or Specifications dictate use of 300 PSI rating. Fabricate from standard malleable iron with dimensions conforming to ANSI B16.3.
1. Fitting requirements for galvanized steel piping systems to be the same as for black steel pipe except each to have galvanized coating.
2. Fittings for waste, vent and drainage piping to be drainage pattern type.

F. Flanges: Carbon steel conforming to ASTM A105, ANSI B16.5, and factory forged in the USA. Flanges which have been machined, remade, painted, or are nondomestic origin are not acceptable. Provide raised or full face ends wherever indicated or required.

G. Unions: ANSI B16.39, ASTM A47, and be fabricated from malleable iron with bronze-to-iron ground joints rated at 150 percent design operating pressure. Threads: ANSI B2.1.

H. Fasteners: Semi-finished carbon steel bolts and hex nuts conforming to ASTM A307. Threads and Dimensions: ANSI B1.1 and B18.2.

I. Threaded Pipe Plugs: ANSI B16.14.

J. Thread Lubricant: RectorSeal No. 5 or Slic-tite Teflon Paste.

2.06 FITTINGS FOR COPPER TUBE

A. Wrought copper/bronze solder joint fittings complying with ANSI B16.22.

B. DWV Service:
1. Cast Copper Solder Joint Drainage Fittings: ANSI B16.23.
2. Wrought Copper Solder Joint Drainage Fittings: ANSI B16.29.

2.07 FITTINGS FOR CAST IRON PIPE

A. Hubless Cast Iron Drainage Pipe Fittings: CISPI 301 as manufactured by ABI, Charlotte or Tyler with stainless steel clamp assemblies.
1. Manufacturers for standard duty applications: Anaco, Mission, or Tyler.

B. Cast Iron Hub-and-Spigot Drainage Pipe Fittings: Match drainage pipe units, ASTM A74. Fitting joints: Positive seal compression type gaskets, ASTM C564.

2.08 MISCELLANEOUS PIPING MATERIALS/PRODUCTS

A. Welding Materials: Comply with Section 2-C of ASME Boiler Code, as applicable.

B. Tin-Antimony Soldering Materials: ASTM B13.

C. Gaskets for Flanged Joints: ANSI B16.12; full faced for cast iron flanges; raised face for steel flanges, unless otherwise indicated or recommended by manufacturer. Gaskets: Minimum 1/8-inch thick fabricated from nonasbestos bases.

D. Copper-Brazed: Make brazed joints for copper tubing and fittings with code approved brazing filler alloys meeting ASTM and AWS standards and listings. Filler alloys of BCuP2 classification (e.g., "Phos-O" or "Fos-Copper") may not be used to make joints between copper tubing and cast brass or bronze fittings. Filler alloys containing cadmium are not approved for use in potable water piping. Installations conform to accepted published procedures, i.e., UPC Installation Standard 3-75 and CDA Publications. Use of steel wool for cleaning tube and fittings is prohibited.

2.09 UNIONS

A. Steel Pipe Union: 150 PSI malleable iron, brass to iron seat, ground joint, black or galvanized to match pipe.

B. Copper Pipe Union: 200 PSI working pressure. Bronze body, solder or grooved ends. Pipes 2 inches and under use ground joint, pipes 2-1/2 inches and larger use flanged face or grooved ends.

C. Insulating Unions: 250 PSI working pressure. Pipe ends and material to match piping. Electric current below 1 percent of galvanic current. Gasket material as recommended by manufacturer. Epco or approved.

2.10 ESCUTCHEONS

A. Brass material, chrome plated finish. Size sufficient to cover pipe openings through wall, floor or ceiling. Set screw or spring to secure to pipe. Coordinate opening sizes.

2.11 ACCESS PANELS

A. Provide flush mounting access panels as required for service of fire dampers, cleanouts, valves, and the like, and other items requiring maintenance or inspection. Where access

panels are located in fire-rated assemblies of building, rate access panels accordingly. Ceiling access panels to be minimum 24x24 (or required and approved size). Wall access panels to be minimum 12x12 (or required and approved size).

B. Manufacturers: Milcor, Karp, Elmdor, In-Ryko, Acudor, or approved. Provide two keys for each set of locks provided.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General Electrical Equipment Clearances: Do not route piping through electrical rooms, transformer vaults, elevator equipment rooms, and other electrical or electronic equipment spaces and enclosures. Within equipment rooms, provide minimum 3 feet lateral clearance from sides of electric switchgear panels. Do not route piping above any electric power or lighting panel, switchgear, or similar electric device. Coordinate with electrical and coordinate exact pipe routing to provide proper clearance with such items.

B. Installation/Coordination:
1. General: Comply with basic requirements of Section 15140, Supports and Anchors. Install pipe, tube and fittings in accordance with recognized industry practices which will achieve permanently leakproof piping systems, capable of performing each indicated service without piping failure. Install each route with a minimum of joints and couplings, but with adequate and accessible unions or flanges for disassembly, maintenance, and replacement of valves and equipment. Reduce sizes by use of reducing fittings. Align piping accurately at connections, within 1/16-inch misalignment tolerance. Comply with ANSI B31.9 Code for Pressure Piping.
2. Installed piping not to interfere with maintenance of equipment, opening of doors or other moving parts nor be directly above or near any portion of electrical equipment.
3. Support piping such that connected equipment and flanges do not bear weight of piping.
4. Adequately support vertical lines at their bases or by a suitable hanger placed in horizontal line near the riser or, preferably, by a base fitting set on a pedestal.
5. Piping not to be suspended or supported by pumps. Apply no force to pumps by connecting pipes. After final pipe adjustments and initial operational verification of the pumps, recheck alignment of pumps and realign as required.
6. Piping systems are to be installed to drain. Provide properly sized drain valves at low points.
7. Ream pipes after cutting to full bore. Remove foreign matter from inside of pipe before installing. Keep installed piping free from dirt and scale and protect open ends from foreign matter. Use temporary plugs or other approved methods for opening and closure.
8. Remake or replace defective, leaking or otherwise unsatisfactory joints or material. Peening, caulking, or doping of piping is not permitted.
9. Install piping to prevent stresses and strains to piping and hangers and supports due to expansion or contraction and building settlement. Provide proper loops, guides, offsets, anchor points, or expansion joints. Verify with anticipated settlement or shrinkage of building. Verify construction phasing of project, type of building construction products and type for coordinating installation of piping systems. Include provisions for servicing and removal of equipment without dismantling piping.

10. Piping Systems Routing Within Unconditioned Spaces, Plenums, Chases, or Cavities:
    a. Unless absolutely unavoidable, route fluid filled and (or) pressurized piping systems on the "warm" side of local building wall, roof, or ceiling thermal insulation batts, boards, or blankets as near to heated space as practical.
    b. Whenever such routing as described above is entirely impractical or impossible, provide heat tracing systems to piping, wherever necessary. Inform Architect before proceeding.
11. Expansion and Flexibility: Install work with due regard for expansion, contraction, and building settlement to prevent damage to the piping, ductwork, equipment and the building and its contents. Provide piping offsets, loops, expansion joints, anchors or other means to control pipe movement, to minimize pipe forces and effects of building settlement.
12. Corrosion Control:
    a. Underground Steel Piping Corrosion Protection: Factory wrap uninsulated underground steel piping systems with protective coating composed of a coal-tar saturated wrapping tape over a 20 mil thick coal-tar epoxy coating, equivalent to "Republic X-Tru-Coat." Wrap joints spirally with a minimum overlap of 1/2 tape width. Extend wrap not less than 3 inches above grade. Provide tinker test to check for holidays. Provide cathodic protection to meet requirements of NACE Standard RP0169-2002.
13. Conform with applicable codes and industry standards.
14. Install uninsulated piping so that unrestrained direct contact with the structure or other system installations is avoided. Where contact with or passage through building or structural features cannot be avoided; firmly anchor piping to, or isolated from, the structure to prevent noise transmission and occurrence of physical damage. Install piping to be insulated with adequate clearance around piping to allow for placement of full thickness insulating material.

C. Pressure Piping Routing:
1. Route piping, except as otherwise indicated, vertically and horizontally (sloped to drain). Avoid diagonal runs wherever possible. Orient horizontal routes parallel with walls and beam lines.
2. Install piping as shown or described by diagrams, details and notations on Drawings or, if not indicated, install piping to provide the shortest route which does not obstruct usable space or block access for servicing the building and its equipment.
3. Support piping adjacent to walls, overhead construction, columns and other structural and permanent enclosure elements of the building. Limit clearance to 1/2 inch wherever furring is indicated for concealment of piping. Allow for insulation thickness, if any. Locate insulated piping to provide minimum 1-inch clearance outside insulation.
4. Wherever possible in finished and occupied spaces, conceal piping from view by locating within column or beam enclosures, hollow wall construction, or above suspended ceilings. Do not encase horizontal routes in solid partitions, except where approved.

D. Preparation:
1. Cast Iron Soil Pipe: Conform with state plumbing code and standards, CISPI recommendations and applicable adopted code amendments.
2. Hubless Cast Iron Joints: Comply with CISPI HSN utilizing calibrated torque wrenches for tightening bands to manufacturer's recommended settings.
3. Unions:
    a. Standard Unions: Install where indicated on Drawings and on each side of pieces of equipment to permit easy removal of equipment.
4. Copper Tubing:
    a. Remove burrs from and clean outer surface of tube ends and inner surface of fittings.
    b. Copper-Soldered: Make soldered joints for copper tubing and fittings with

code approved solder alloys meeting ASTM and ANSI standards and listings. Solder-paste-flux combination fillers are not approved. Installations to conform to accepted published procedures, i.e., UPC IS 375, IS 21-80 standards and CDA Publications. Use of steel wool for cleaning tube and fittings is prohibited. Apply flux as recommended by manufacturer. Allstate Silver Bearing Solder 430 or other approved solder alloys which do not contain lead or cadmium.

c. Copper-Brazed: Make brazed joints for copper tubing and fittings with code approved brazing filler alloys meeting ASTM and AWS standards and listings. Filler alloys of BCuP2 classification (e.g., "Phos-0" or "Fos-Copper") may not be used to make joints between copper tubing and cast brass or bronze fittings. Filler alloys containing cadmium are not approved for use in potable water piping. Installations to conform to accepted published procedures, i.e., UPC IS 3-75 standards and CDA Publications. Use of steel wool for cleaning tube and fittings is prohibited. Remove bonnets and nonmetallic seats on valves and cool body with damp cloth while soldering or brazing. Remove excess flux from completed joints in accordance with manufacturer's instructions and code standards.

d. Pressurized Service:
   1) Unless otherwise indicated, wrought copper/bronze solder joint fittings complying with ANSI B16.22.1995.
   2) Copper Tube Unions: Standard products as recommended by manufacturer for use in the service. Rated at 150 percent design operating pressure.
   3) Mechanically Formed Tee Connections:
      a) Form mechanically extracted collars in a continuous operation consisting of drilling a pilot hole and drawing out the tube surface to form a collar having a height of not less than three times the thickness of the tube wall. Fully adjustable collaring device to ensure roper tolerance and complete uniformity of the joint.
      b) Notch the branch to conform with the inner curve of the run tube and dimpled to ensure penetration of the branch tube into the collar is of sufficient depth for brazing and that the branch tube does not obstruct the flow in the main line tube.
      c) Braze joints in accordance with the Copper Development Association Copper Tube Handbook using B-cup series filler metal. Note: Soft soldered joints will not be permitted.

3.02 FIELD QUALITY CONTROL

A. Inspection:
   1. Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
   2. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect. Remove cracked or dented units and replace with new units.

3.03 ADJUSTING AND CLEANING

A. General: Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of painting, insulation, or coatings, if any. Comply with the preparation requirements of Section 15190, Mechanical Identification, and Section 15250, Insulation, as applicable. Flush out water filled or drainage piping systems with clean water, and flush other piping systems with dry air or nitrogen after completing required

tests. Inspect each segment of each system for completion of joints, supports, and accessory items.

B. Inspection: Inspect pressurized piping in accordance with the procedures of ANSI B31.9.

3.04 PROTECTION

A. Protect piping from damage. Replace damaged items with new.

3.05 ESCUTCHEONS

A. Install on exposed pipes passing through walls or floors, and on fixture stops and waste connections to wall.

3.06 ACCESS PANELS

A. Install wall and ceiling access panels to provide access to concealed valves, fans, motors, shock arrestors, fire dampers, terminal units, coils and other mechanical items needing service. Provide access panels at locations required or specified herein. Coordinate locations/sizes of access panels with Architect prior to work.

B. Where access panels are for service of fire, fire/smoke, or smoke dampers, stencil the words "Fire Damper," "Fire/Smoke Damper," or "Smoke Damper" in 1/2-inch high capital letters on the outside of the panels.

END OF SECTION 15060

SECTION 15100

VALVES

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included - Materials, installation and testing of valves, including the following:
   1. Drain valves.
   2. Ball valves.
   3. Swing check valves.

B. Refer to Specification sections for each system medium (i.e., plumbing, hydronics, gas, and the like), for valve application.

1.02 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of valves of types and sizes required.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data, installation instructions, and dimensioned drawings for each type of valve.

B. Maintenance Data: Submit maintenance data and parts list for each type valve. Include this data, product data, and certifications in maintenance manual.

PART 2 - PRODUCTS

2.01 VALVES - GENERAL

A. General:
   1. Sizes: Unless otherwise indicated, provide valves of same size as upstream pipe size.
   2. Operators: Provide handwheels, fastened to valve stem, for valves other than quarter-turn. Provide lever handle for quarter-turn valves 6 inches and smaller, and 4 inches and smaller for plug valves. Provide gear operators for quarter-turn valves 8 inches and larger. Provide chain-operated sheaves and chains for overhead valves.
   3. End Connections: Mate with pipe, tube and equipment connections. Where more than one type is indicated, selection is installer's option.

B. Service:
   1. Domestic Hot and Cold Water Shutoff and Isolation Valves:
      a. Pipe Sizes 2-1/2 Inches and Smaller: Ball valve
   2. Drain Service; All Pipe Sizes: Drain valves.
   3. Check Valves: Swing check valve.

C. Manufacturers: Crane, Fairbanks, Anvil, Jenkins, Kennedy, Walworth, Red/White (commercial grade), Mueller, Legend, Conbraco, Nibco, DeZurik, Hays, Powell, Stockham, Hammond, Watts, Milwaukee, or approved. Note: See individual sections for specialty valves (balancing valves, pressure regulators, relief valves, earthquake valves, gas valves).

2.02 DRAIN VALVES

A. Class 125, bronze body, screw-in bonnet, rising stem, composition disc, 3/4-inch hose outlet. Threaded: Nibco 73. Solder: Nibco 72.

2.03 BALL VALVES

A. 2-1/2 Inches and Smaller: 150 PSI, bronze body, full port, bronze trim, two-piece construction, TFE seats and seals. Threaded: Nibco T-595-Y. Soldered: Nibco S-595-Y.

2.04 SWING CHECK VALVES

A. 2 Inches and Smaller: Class 125, bronze body, horizontal swing, regrinding type, Y-pattern, renewable disc. Nibco 413.

B. 2-1/2 Inches and Larger: Class 125, iron body, bolted bonnet, horizontal swing, renewable seat and disc, flanged ends. Nibco F918.

C. Rubber Flapper Check Valve: Horizontal or vertical upward flow installation. Working pressure to 175 PSI. Ductile iron or cast iron body. Steel reinforced Buna-N rubber flapper epoxy coating on wetted parts. Apco Series 100l, Crispin RF Series.

D. Check Valve: Horizontal installation. Working pressure to 300 PSI. Ductile body, ASTM A536, and stainless clapper, EPDM, nitrile or optional viton bumper and bonnet seals. Stainless wetted parts.

2.05 ACCESS PANELS

A. Provide flush mounting access panels as required for service of fire dampers, cleanouts, valves, and the like, and other items requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly. Ceiling access panels to be minimum 24x24 (or required and approved size). Wall access panels to be minimum 12x12 (or required and approved size).

B. Manufacturers: Milcor, Karp, Elmdor, In-Ryko, Acudor, or approved. Provide two keys for each set of locks provided.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.

B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable. Install valve drains with hose end adapter for each valve that must be installed with stem below horizontal plane.

C. Insulation: Where insulation is indicated, install extended stem valves, arranged in proper manner to receive insulation.

D. Mechanical Actuators: Install with chain operators where indicated. Extend chains to 5 feet above floor and hook to clips to clear aisle passage.

E. Stem Selection: Outside screw and yoke stems, except provide inside screw, nonrising stem where space prevents full opening of OS&Y valves.

F. Seats: Renewable seats, except where otherwise indicated.

G. Installation of Check Valves:
1. Check Valves: Install in horizontal position with hinge pin horizontally perpendicular to centerline of pipe. Install for proper direction of flow.

3.02 VALVE ADJUSTING AND CLEANING

A. Inspect valves for leaks. Adjust or replace packing to stop leaks. Replace valve if leak persists.

B. Valve Identification. Tag valves per Section 15190, Mechanical Identification.

3.03 ACCESS PANELS

A. Install wall and ceiling access panels to provide access to concealed valves, fans, motors, shock arrestors, fire dampers, terminal units, coils and other mechanical items needing service. Provide access panels at locations required or specified herein. Coordinate locations/sizes of access panels with Architect prior to work.

B. Where access panels are for service of fire, fire/smoke, or smoke dampers, stencil the words "Fire Damper," "Fire/Smoke Damper," or "Smoke Damper" in 1/2-inch-high capital letters on the outside of the panels.

END OF SECTION 15100

SECTION 15140

SUPPORTS AND ANCHORS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included: Material and installation of supports, anchors and sleeves including: horizontal piping hangers and supports; vertical piping clamps; hanger rod attachments; building attachments; saddles and shields; miscellaneous metals, miscellaneous materials; roof equipment supports; anchors; equipment supports; wall and floor sleeves; and escutcheon plates.

1.02 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in the manufacture of supports and anchors, of types and sizes required.

B. Regulatory Requirements:
   1. Provide pipe hangers and supports whose materials, design and manufacture comply with MSS SP-58, "Pipe Hangers and Supports - Materials, Design and Manufacture," latest edition.
   2. Select and apply pipe hangers and supports complying with MSS SP-69, Pipe Hangers and Supports - Selection and Application, latest edition.
   3. A copy of the above-referenced standards at the construction site.

C. Seismic: Provide per Section 15050, Basic Materials and Methods, 15240, Mechanical Equipment Sound, Vibration and Seismic Control.

D. Manufacturers: B-Line, Elcen Metal Products Co., F&S Control, Globe, Kindorf, Kinline, Michigan, Superstrut, Unistrut, Power-Strut. Note: See individual Sections for roof equipment support.

1.03 SUBMITTALS

A. Submit the following:
   1. Manufacturer's technical product data, including installation instructions, for each type of support, anchor and sleeve. Include UL approval drawing from manufacturer for each different pre-engineered firestop assembly.
   2. Assembly type shop drawings for each type of sleeve, indicating dimensions, weights, required clearances, and methods of assembly of components.
   3. Shop drawings for each individual roof pipe curb assembly, indicating number and location of each pipe or conduit which is to pass through the curb. Indicate pipe insulation requirements.

PART 2 - PRODUCTS

2.01 PIPING HANGERS AND SUPPORTS

A. General:
1. Horizontal Piping Hangers and Supports-Horizontal and Vertical Piping, and Hanger Rod Attachments: Factory fabricated horizontal piping hangers and supports complying with MSS SP-58, to suit piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper-plated hangers and supports for uninsulated copper piping systems.
2. Building Attachments: Factory fabricated attachments complying with MSS SP-58, selected to suit building substructure conditions, in accordance with MSS SP-69 and manufacturer's published product information. Select size of building attachments to suit hanger rods.
3. Saddles and Shields: Factory fabricated saddles or shields under piping hangers and supports for insulated piping. Size saddles and shields for exact fit to mate with pipe insulation. 1/2 round, 18 gauge, minimum 12 inches in length (4-inch pipe and larger to be three times longer than pipe diameter).
4. Roller Hangers: Adjustable roller hanger. Black steel yoke, cast iron roller.
5. Concrete Inserts: Malleable iron body, black finish. Lateral adjustment.
6. Continuous Concrete Insert: Steel construction, minimum 12 gauge. Electrogalvanized finish. Pipe clamps and insert nuts to match.

B. angers For Pipes 2 Inches and Smaller: Adjustable swivel ring hanger, UL listed. Michigan 100 or 101.

C. Hangers For Pipes 2-1/2 Inches and Larger: Adjustable clevis type, UL listed. Michigan 400.

D. Riser Clamps: Steel, UL listed. Michigan 510 or 511. Copper coated; Michigan 368.

E. Plumbers Tape: Not permitted as pipe hangers or pipe straps.

F. Michigan numbers are indicated for type and quality. Comparable products manufactured by Globe, Elcen, B-Line, Kindorf, Kinline, Unistrut, Anvil, Super Strut, Tolco, PHD, Power-Strut, or approved.

2.02 ANCHORS

A. General: Anchor supports to existing concrete or metal stud framing manufacturer's recommendations or as modified by project structural engineer.

B. Manufacturers: See notes on A9.4.

PART 3 - EXECUTION

3.01 PREPARATION

A. Examine the Drawings and coordinate for verification of exact locations of fire and smoke rated walls, partitions, floors and other assemblies. Indicate, by shading and labeling on Record Drawings such locations and label as "1-Hour Wall," "2-Hour Fire/Smoke Barrier," and the like. Determine proper locations for piping penetrations. Set sleeves in place in new floors, walls or roofs prior to concrete pour or grouting.

B. Install hangers, supports, anchors and sleeves after required building structural work has been completed in areas where the work is to be installed. Coordinate proper placement of inserts, anchors and other building structural attachments.

3.02 INSTALLATION

A. Building Attachments: Install within concrete or on structural steel or wood. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert secure to forms. Where concrete with compressive strength less than 2500 PSI is indicated, install reinforcing bars through openings at top in inserts.

B. Hangers and Supports:
   1. Group parallel runs of horizontal piping to be supported together on trapeze-type hangers. Maximum spacings: MSS SP-69. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not support piping from other piping.
   2. Support fire protection piping independently of other piping.
   3. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated.
   4. Allow controlled movement of piping systems to permit freedom of movement between pipe anchors and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
   5. Piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
   6. Insulated Piping: Provide protection saddles where insulation without vapor barrier is indicated. Provide protection shields on insulated piping where insulation with a vapor barrier is indicated.
   7. Hanger Spacing:
      a. Cast Iron Soil Pipe: Within 1 foot of each side of joints and at intervals not to exceed 8 feet.
      b. Steel Pipe 1 Inch and Smaller: 6 feet.
      c. Steel Pipe 1-1/4 Inches and Larger: 10 feet.
      d. Copper Tubing 1-1/2 Inches and Smaller: 6 feet.
      e. Copper Tubing 2 Inches and Larger: 10 feet.
      f. 90 Degree Offsets: Within 2 feet, both sides of offset.

C. Anchors: Install at ends of principal pipe runs where indicated on Drawings. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

D. Roof Equipment Supports, Equipment Curbs, and Pipe Curb Assemblies:
   1. Provide prefabricated units for roof membrane and insulation penetrations related to mechanical equipment. Coordinate with roofing system. Set supports on the structural deck. Do not set supports on insulation or roofing. Provide level supports by prefabricated pitch built into the curb.
   2. Equipment Supports: Provide for roof mounted equipment which does not require a structural roof deck penetration (i.e., condensing units).
   3. Equipment Curbs: Provide for equipment which requires a structural roof deck penetration other than piping or conduit (i.e., fans, ducts).
   4. Pipe Curb Assemblies: Provide for piping and electrical conduit which penetrates the structural roof deck to service equipment above the roof level (i.e., refrigerant piping, electrical power and control wiring).
   5. Piping above roof to be supported with freestanding roof pipe supports unless detailed otherwise.

E. Escutcheon Plates: Install around horizontal and vertical piping at visible penetrations through walls, partitions, floors, or ceilings, including penetrations through closets, through below ceiling corridor walls, and through equipment room walls and floors.

F. "Link-Seal" Pipe Sleeves: Install at exterior wall piping penetrations. For penetrations below grade provide Schedule 40 steel sleeve with 1-inch, continuously welded, "weep ring" centered on length of sleeve.

G. Fabricated Pipe Sleeves:
   1. Provide either steel or sheet metal pipe sleeves accurately centered around pipe routes. Size such that piping and insulation, if any, will have free movement within the sleeve, including allowance for thermal expansion. Sleeves not to be more than 1 pipe size larger than piping or piping plus insulation size.
   2. Length: Equal to thickness of construction penetrated, except extend floor sleeves 1/4 inch above floor finish and, where floor surface drains to a floor drain, extend floor sleeve 3/4 inch above floor finish.
   3. Provide temporary support of sleeves during placement in concrete and other work around sleeves. Provide temporary end closures to prevent concrete and other materials from entering pipe sleeves.
   4. Seal each end airtight with a resilient nonhardening sealer.

H. Installation of metallic or plastic piping penetrations through non fire-rated walls and partitions and through smoke-rated walls and partitions:
   1. Install fabricated pipe sleeve.
   2. After installation of sleeve and piping, tightly pack entire annular void between piping or piping insulation and sleeve I.D. with specified material.

I. Piping penetrations through fire-rated (1 to 3 hour) assemblies: Select and install pre-engineered pipe penetration system in accordance with the UL listing and manufacturer's recommendation.

3.03 ADJUSTING AND PAINTING

A. Adjust hangers so as to distribute loads equally on attachments. Provide grout under supports to bring piping and equipment to proper level and elevations.

B. Prime paint ferrous nongalvanized hangers, accessories, and supplementary steel which are not factory painted.

3.04 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES

A. Provide proper sizing when providing sleeves or core-drilled holes to accommodate the penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet the requirements of ASTM E84.

B. Manufacturers: Hilti, Proset, or approved.

END OF SECTION 15140

SECTION 15170

MOTORS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included: Materials, installation and testing of motors and starters.

B. Refer to Specification sections for each system medium (i.e., plumbing, hydronics, gas, and the like), for motor/starter application.

1.02 QUALITY ASSURANCE

A. Motor Manufacturers:
1. General Electric, Westinghouse, U.S. Motors, Wagner, Century/Gould, Louis-Allis, Reliance, Marathon, or approved.
2. Standards: ANSI/IEEE 112 and NEMA MG-1.

B. Starter Manufacturers:
1. Allen Bradley, Square D, General Electric, Siemens, Furnas, Eaton Electrical, Cerus, or approved.
2. Manufacturer is certified ISO 9002 facility 3, UL listed.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data, motor efficiency, installation instructions, and dimensioned drawings for each type of motor or starter.

B. Maintenance Data: Submit maintenance data and parts list for each type. Include this data, product data, and certifications in maintenance manual.

PART 2 - PRODUCTS

2.01 ELECTRIC MOTORS

A. Motors: Energy efficient, suitable for nonoverloading operation, and capable of continuous operation at full nameplate rating. Motors 1 HP and larger must meet Energy Policy act of 1992. Motors to be high efficient type similar to Century/Gould E-plus.

B. Take NEMA standards as minimum requirements for motor design and performance. Motors suitable for load, duty, voltage, frequency, hazard and for service and location intended. Motors, unless specified otherwise, to be general purpose open dripproof type, ball bearing equipped, 40C temperature rise; and rated for continuous duty under full load. Motors to have name plate giving manufacturer's name, shop number, HP, RPM and current characteristics.

C. Motors smaller than 1/2 horsepower, 1 phase; and motors 1/2 horsepower and larger, 3 phase and voltage as indicated on Drawings. Maximum motor speed of 1750 RPM, unless otherwise noted. One phase motors to have internal thermal overload protection with automatic reset.

D. Motors for belt drive to have adjustable bases with set screw to maintain belt tension. Motor horsepowers indicated on the Equipment Schedule on Drawings are the minimum size acceptable.

E. Provide two-speed motors where indicated on schedule or in sequence.

F. Provide inverter rated motors per NEMA MG1-31 where variable frequency drives are applied or soft start starters.

2.02 STARTERS

A. Single Phase Motors:
1. Manual across-the-line starting switch having toggle-operated switch pilot running light and built-in thermal overload device with heating element rated not more than 115 percent motor full load current indicated on name plate of motor to be protected. Surface mount starters. Provide NEMA-1 enclosure.
2. Overload relays to be melting alloy type with a replaceable control circuit module. Thermal units to be interchangeable. Starter to be nonoperative if thermal unit is removed.
3. Single phase motors with automatic controls. Provide motor rated relay with coils rated for control voltage.

B. Starters up to size 8 to be suitable for the addition of a minimum of three external auxiliary contacts (normally open or normally closed). Contactor, coils, and relays to perform the control functions of the associated equipment and control sequence.

2.03 DISCONNECTS

A. Provided by Division 16 unless otherwise specified.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install a soft start per the manufacturer's specifications with a minimum clearance of 4 inches on each side of the enclosure.

B. Include a standard wiring diagram for making the appropriate electrical connections.

3.02 START UP

A. For soft starters provide the services of a qualified technician to program, test, and start up soft starts furnished under this Specification.

3.03 ELECTRICAL INTERLOCKS

A. Where equipment motors are to be electrically interlocked with other equipment for simultaneous operation, utilize mechanical equipment wiring diagrams to coordinate with the electrical systems so that proper wiring of the equipment involved is affected.

END OF SECTION 15170

SECTION 15190

MECHANICAL INDENTIFICATION

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included: Materials and installation of mechanical systems identification.

1.02 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of identification devices of types and sizes required.

B. Codes and Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices, unless otherwise indicated.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for each identification material and device required.

B. Schedules: Submit valve schedule for each piping system, typewritten and reproduced on 8-1/2- by 11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on tag), location of valve (room or space), and variations for identification (if any). Mark valves which are intended for emergency shutoff and similar special uses by special "flags" in margin of schedule. In addition to mounted copies, furnish extra copies for maintenance manuals.

PART 2 - PRODUCTS

2.01 MECHANICAL IDENTIFICATION MATERIALS

A. General: Manufacturer's standard products of categories and types required for each application as referenced in other Division 15 sections. Where more than a single type is specified for application, provide single selection for each product category.

B. Manufacturers: Allen Systems, Inc., W. H. Brady Co., Signmark Division, Industrial Safety Supply Co., Inc., Seton Name Plate Corporation, or approved.

2.02 PLASTIC PIPE MARKERS

A. Provide one of the following:
   1. Snap-on Type: Manufacturer's standard preprinted, semi-rigid snap-on, color-coded pipe markers.
   2. Pressure-Sensitive Type: Manufacturer's standard preprinted, permanent adhesive, color-coded, pressure sensitive, vinyl pipe markers.

B. Small Pipes: For external diameters less than 6 inches (including insulation, if any), provide full-band pipe markers, extending 360 degrees around pipe at each location, fastened by one of the following methods:
   1. Snap-on application of pretensioned semi-rigid plastic pipe marker.

2. Adhesive lap joint in pipe marker overlap.
3. Laminated or bonded application of pipe marker to pipe (or insulation).
4. Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than 3/4 inch wide; full circle at both ends of pipe marker, tape lapped 1-1/2 inches.

C. Large Pipes: For external diameters of 6 inches and larger (including insulation, if any), provide either full-band or strip-type pipe markers, but not narrower than three times letter height (and of required length), fastened by one of the following methods:
1. Laminated or bonded application of pipe marker to pipe (or insulation).
2. Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than 1-1/2 inches wide; full circle at both ends of pipe marker, tape lapped 3 inches.
3. Strapped-to-pipe (or insulation) application of semi-rigid type, with manufacturer's standard stainless steel bands.

D. Lettering: Comply with piping system nomenclature as specified, scheduled or shown, and abbreviate only as necessary for each application length.

E. Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as separate unit of plastic.

2.03 PLASTIC DUCT MARKERS

A. General: Manufacturer's standard laminated plastic, color-coded duct markers. Supply separate color codes for supply, exhaust, outside, and return air.

B. Include the Following Nomenclature:
1. Direction of air flow.
2. Duct service (supply, return, exhaust, outdoor air).

2.04 VALVE TAGS

A. Brass Valve Tags: Polished brass valve tags with stamp-engraved piping system abbreviation in 1/4-inch high letters and sequenced valve numbers 1/2 inch high, and with hole for fastener. 1-1/2-inch diameter tags, except as otherwise indicated. Valve designations to be coordinated with existing valve identifications to ensure no repetitive designations are utilized.

B. Valve Tag Fasteners: Solid brass chain (wire link or beaded type), or solid brass S-hooks.

C. Access Panel Markers: Manufacturer's standard 1/16-inch thick engraved plastic laminate access panel markers, with abbreviations and numbers corresponding to concealed valve. Include center hole to allow attachment.

2.05 VALVE SCHEDULE FRAMES

A. General: For each page of a valve schedule, provide glazed display frame with removable mounting as appropriate for wall construction upon which frame is to be mounted. Provide frames of finished hardwood or extruded aluminum, with SSB-grade sheet glass.

2.06 ENGRAVED PLASTIC-LAMINATE SIGNS

A. General: Engraving stock melamine plastic laminate, Federal Specification L-P-387, in the size and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core (letter color), punched for mechanical fastening except where adhesive mounting is necessary because of substrate.

B. Thickness: 1/16 inch for units up to 20 sq.in. or 8 inches in length; 1/8 inch for larger units.

C. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

2.07 PLASTIC EQUIPMENT MARKERS

A. General: Manufacturer's standard laminated plastic, color-coded equipment markers. Conform to the following color code:
1. Green: Cooling equipment and components.
2. Yellow: Heating equipment and components.

B. Nomenclature: Match terminology used on drawing schedules as closely as possible.

C. Size: Provide approximate 2-1/2- by 4-inch markers for control devices, dampers, and valves; and 4-1/2- by 6-inch markers for equipment.

2.08 LETTERING AND GRAPHICS

A. General: Coordinate names, abbreviations and other designations used in mechanical identification work with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of mechanical systems and equipment.

B. Multiple Systems: Where multiple systems of same generic name are shown and specified, provide identification which indicates individual system number as well as service (as examples: Chiller No. 3, Air Handling Unit No. 42, Standpipe F12, and the like).

2.09 CEILING TILE LABELS

A. Machine-generated, adhesive-backed tape labels with black letters on clear tape.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.02 DUCTWORK IDENTIFICATION

A. General: Identify air supply, return, exhaust, and intake ductwork with duct markers, showing ductwork service and direction of flow, in black or white (whichever provides most contrast with ductwork identification color).

B. Location: In each space where ductwork is exposed, locate signs near points where ductwork originates or continues into concealed enclosures (shaft, underground or similar concealment), and at 50 foot spacing along exposed runs.

C. Access Doors: Provide duct markers or stenciled signs on each access door in ductwork and housings, indicating purpose of access (to what equipment) and other maintenance and operating instructions.

D. Dampers: Provide 12-inch, plenum-rated marker ribbon to end of balancing damper handles.

3.03 PIPING SYSTEM IDENTIFICATION

A. Install pipe markers on each system and include arrows to show normal direction of flow.

B. Locate pipe markers and color bands wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels and plenums), and exterior nonconcealed locations, in locations as follows:
1. Near each valve and control device.
2. Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.
3. Near locations where pipes pass through walls or floors/ceilings, or enter nonaccessible enclosures.
4. At access doors, manholes and similar access points which permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. Spaced intermediately at maximum spacing of 20 feet along each piping run, except reduce spacing to 10 feet in congested areas of piping and equipment, i.e., mechanical rooms.

3.04 VALVE IDENTIFICATION

A. General: Provide valve tag on every valve, cock and control device in each piping system. Exclude check valves, valves within factory fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibbs, shutoff valves at plumbing fixtures, and similar rough-in connections of end use fixtures. List each tagged valve in valve schedule for each piping system.

B. Install mounted valve schedule in each mechanical room.

3.05 MECHANICAL EQUIPMENT IDENTIFICATION

A. General: Install engraved plastic laminate sign or plastic equipment marker on or near each item of mechanical equipment and each operational device, as specified herein if not otherwise specified for each item or device. Provide signs for the following general categories of equipment and operational devices: Pumps, compressors, chillers, cooling towers and similar motor driven units, electric duct heaters, terminal units, coils, fans, water heaters, blowers, unitary HVAC equipment, tanks and pressure vessels, filters, water treatment systems and similar equipment.

3.06 ADJUSTING AND CLEANING

A. Adjusting: Relocate mechanical identification devices which have become visually blocked.

B. Cleaning: Clean face of identification devices, and glass frames of valve charts.

END OF SECTION 15190

SECTION 15240

MECHANICAL EQUIPMENT SOUND, VIBRATION AND SEISMIC CONTROL

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included: Materials and installation of seismic restraint devices and related items. Provide complete vibration isolation systems in proper working order.

1.02 CERTIFICATION DATA

A. Bidders on the air handling devices and fans, terminal units, and sound attenuators must supply the appropriate inlet, outlet, radiated, discharge, and loss or regenerated octave band sound power level data, measure in accordance with the applicable ASHRAE or ANSI Specifications at a certified laboratory. The units selected should meet the Specification criteria of the tables in this Section and Equipment Schedules on Drawings. Do not consider units in excess of the listed values as appropriate for use on this project.

1.03 SEISMIC CONTROL AND RESTRAINT

A. Mechanical Equipment:
   1. Brace or anchor mechanical equipment to resist a horizontal force acting in any direction using CBC, latest edition.
   2. Vibration Isolated Equipment: Provide factory fabricated seismic restrained vibration isolating components. Earthquake resistant designs for mechanical equipment, i.e., air handling units, water heaters, blowers, motors, ductwork, mechanical and plumbing piping, to conform to the regulations of the CBC, latest edition. Where standard factory fabricated components are not available, provide properly designed custom components which meet the requirements herein.
   3. Provide any restraints noted on Drawings for Division 15 work.

B. Anchorage:
   1. In other cases, retain a professional structural engineer licensed in the state in which the work will be done to provide shop drawings of seismic bracing for ductwork/equipment/water heaters. Professional engineer to design and provide wet stamped (sealed) shop drawings for equipment, ductwork, water heaters, and piping seismic bracing. Submit shop drawings and calculations along with equipment submittals.
   2. The restraints which are used to prevent disruption of the function of the piece of equipment because of the application of the horizontal force to be such that the forces are carried to the frame of the structure in such a way that the frame will not be deflected when the apparatus is attached to a mounting base and equipment pad, or to the structure in the normal way, utilizing the attachments provided. Secure equipment to withstand a force in any direction.

C. Specify the seismic bracing and anchorage of piping in Section "Supports and Anchors."

D. Provide earthquake bumpers to prevent excessive motion during starting and stopping of equipment and for earthquake bracing. Install bumpers after equipment is in operation to allow proper placement and alignment and ensure that bumpers are not engaged during normal system operation.

1.04 ISOLATORS

A. Isolators for a single piece of equipment to have approximately equal spring deflection.

B. Ends of springs remain parallel during deflection.

C. For each spring, provide built-in equipment leveling bolt.

D. Equipment must be mounted absolutely level.

E. Springs must be selected for additional 50 percent capacity to solid.

F. Installed isolators easily adjustable or removed for replacement.

G. Use matching height-saving brackets as required to achieve a 1-1/2-inch clearance (plus or minus 1/2 inch) between base and housekeeping pad.

H. Springs must be rigidly attached, by welding or other acceptable means, to base plate and top plate except for spring hangers.

I. Design springs for minimum ratio of horizontal to vertical spring stiffness of 0.8 and minimum ratio of spring diameter to spring operating height of 0.8.

J. Mount isolated motor-driven equipment with motors on common base of sufficient rigidity to maintain permanent alignment.

1.05 RUSTPROOFING

A. General: Design vibration isolation hardware or treat for corrosion resistance.

B. Isolators exposed to weather to have steel parts zinc electroplated, PVC coated, plus coating of neoprene or bitumastic paint. Etch aluminum components for outdoor installation and paint with industrial grade enamel.

C. Nuts, bolts and washers zinc electroplated.

D. Structural steel bases thoroughly cleaned of welding slag, primed with zinc chromate and finished with two coats of industrial enamel.

1.06 ELECTRICAL CONNECTIONS

A. Make electrical connections to mechanical equipment motors through a flexible conduit designed to reduce motor vibration transfer into the rigid conduit which is directly attached to the building structure.

B. Flexible Conduit: Sufficiently long to provide a 360 degree loop in the flex between the motor and the rigid conduit. Route conduit through side of equipment roof curb and attaching flexible conduit. Caulk around curb penetration water tight.

C. Provide a soft neoprene bushing at the connection point between the flex and the rigid conduit to break the metal-to-metal contact.

D. Ground wires from vibrating equipment to be flexible with sufficient slack to prevent vibration transfer. Ground wires must not directly contact structural membranes (floors, walls or ceilings) of the building.

1.07 QUALITY ASSURANCE

A. Coordinate the size, location, and special requirements of vibration isolation equipment and systems with building systems. Coordinate plan dimensions of final selections and mechanical equipment with size of housekeeping pads.

B. Supply and install any incidental materials needed to meet the requirements stated herein.

1.08 SUBMITTALS

A. Provide a complete description of products to be supplied including product data, dimensions and specifications. Provide installation instructions for each product.

B. Provide a complete tabulation showing for each piece of vibration isolator supporting equipment the following:
1. The equipment identification mark.
2. The isolator type with rated load.
3. The actual load per isolator.

C. Provide fabrication/shop drawings of steel rails, inertia bases, steel base frames, reinforcing, vibration isolator mounting attachment method, unitary straps and location of equipment attachment bolts.

D. Provide structural calculations for isolator seismic restraint for mechanical/plumbing equipment including, but not limited to boilers, chillers, cooling towers, heat exchangers, roof curbs, fuel storage tanks, pumps, condensing units, AC units, exhaust fans, water heaters, storage tanks, sealed by a professional structural engineer, registered in the state of California.

PART 2 - PRODUCTS

2.01 METAL PARTS INSTALLED OUT-OF-DOORS

A. Cold dip galvanized, cadmium plated or neoprene coated after fabrication.

2.02 SEISMIC RESTRAINTS FOR PIPING AND DUCTWORK

A. Use the document "Seismic Restraints Manual Guidelines for Mechanical Systems." Secure piping, ductwork, and the like to withstand a force in any direction.

B. Sway bracing is not required for pipes that are installed on very short hangers (12 inches or less).

C. Secure HVAC and plumbing piping bracing at every fourth hanger transversely and every eighth hanger longitudinally.

D. As approved by code authority, use a bracing system manufactured by Superstrut, Mason, or Pipe Shields Inc., or approved.

E. Design restraints to meet CBC standards. Provide structural engineering calculations sealed by a professional engineer registered in state of California.

2.03 EQUIPMENT

A. Provide a means to prohibit excessive motion of mechanical equipment during an earthquake.

B. Provide mechanical equipment, both hanging and base mounted, with mounting connection points of sufficient strength to resist lateral seismic forces equal to 0.5 of equipment operating weight.

C. Design restraints to meet CBC standards. Provide structural engineering calculations sealed by a professional engineer registered in state of California.

D. Rooftop Seismic Straps: Provide 8-inch wide by 8-inch long, 16 gauge straps fastened from rooftop mounted equipment to curb at minimum of one or more locations per side as determined by calculations performed. Curb seismically attached to structure. Provide engineered calculations where required.

2.04 HANGER SPRING AND NEOPRENE OR GLASS FIBER (HSN)

A. Freestanding, laterally stable steel spring and a neoprene or a glass fiber element in series, contained within a steel housing. Provide a neoprene neck bushing (or other means) where the hanger rod passes through the hanger housing to prevent the rod from contacting the hanger housing. Provide spring diameters and hanger housing lower hole sizes large enough to permit the hanger rod to swing through a 30 degree arc before contacting the housing. Neoprene Element: 0.3 inch minimum static deflection.

B. HSN Isolators: Amber/Booth type BSRA.

C. Manufacturers: Supply vibration isolation mounts by a single manufacturer. Acceptable suppliers are as follows: Amber/Booth Co. - A.B., Korfund Dynamics - K.D., Mason Industries, Inc. - M.I., Peabody Noise Control Inc. - P.N.C., Vibration Mountings & Controls, Inc. - V.M.&C., IAC, Koppers, Vibrex.

2.05 FLEXIBLE DUCT CONNECTIONS (FDC)

A. Neoprene loaded vinyl material or neoprene loaded canvas with vapor barrier. Flame spread rating of 25 or less, and a smoke spread rating of 50 or less, per ASTM E84. Not affected by temperatures as low as minus 10F, or as high as 200F.

B. Flexible Connections: Ventglas manufactured by Ventfabrics, Amatex, or approved.

2.06 GROMMETS

A. Combine a neoprene washer and sleeve.

B. Isogrommets manufactured by MBPS, Inc.

C. Series W by Barry Controls, or approved.

D. Neoprene Durometer: Between 40 and 50. Grommets: Specially formed to prevent fastening bolts from directly contacting the isolator base plate.

2.07 RESILIENT NONHARDENING SEALANT

A. Sealants for Acoustical Purposes: DAP acoustical sealant.

B. Manufacturers: Pecra, Tremco, USG, or approved.

2.08 FOAM RUBBER

A. Foam Rubber Sheets: Armstrong Armaflex, or approved.

2.09 SNUBBERS

A. Heavy duty construction to withstand 1.0G acceleration. Neoprene coated.

2.10 SEISMIC PIPE LOOPS

A. General: Seismic connectors for straight pipe runs to be designed with sufficient live length on each flexible leg to provide the minimum movement in directions as required by movement allowed at joint. Verify with structural total movement required in planes and list with submittal.

B. Materials: Type 321 stainless steel hose and braid, with carbon steel elbows and ends. Flanged connectors will be used in steel piping 2-1/2 inches or larger, and threaded connectors for piping smaller than 2-1/2 inches. Carbon steel FNPT drain port will be utilized on connectors. For copper piping systems, manufacture connectors with bronze hose and braid and copper elbows and sweat ends. Guide seismic connectors per manufacturer's guidelines.

C. Pressure Rating: 150 PSI.

D. Manufacturers: Unisource, Metraflex, or approved.

2.11 ACCESS PANELS

A. Provide flush mounting access panels as required for service of fire dampers, cleanouts, valves, and the like, and other items requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly. Ceiling access panels to be minimum 24x24 (or required and approved size). Wall access panels to be minimum 12x12 (or required and approved size).

B. Manufacturers: Milcor, Karp, Elmdor, In-Ryko, Acudor, or approved. Provide two keys for each set of locks provided.

PART 3 - EXECUTION

3.01 APPLICATION

A. General:
1. Install flexible duct connections at fan unit intakes, fan unit discharges, and wherever else shown on Drawings.
2. Isolate miscellaneous pieces of mechanical equipment, i.e., storage tanks, and expansion tanks from the building structure by NP or HN isolators.
3. Under no circumstances destroy isolation efficiency by bolting the isolators to the roof or floor or equipment. If bolting is necessary, provide rubber grommets and washers to isolate the bolt from the base plate.
4. Hot and Cold Plumbing Pipes: Isolate hot and cold water piping in plumbing chases and walls behind plumbing fixtures, which are adjacent to occupied areas, from the structure by a piping isolator, Cush-A-Strip S-716, or a 6-inch section of 3/8-inch thick foamed plastic between the hanger and pipe. Contractor's Option: Acousto-Plumb System using plastic bushings.
5. Pipe and Duct Hangers in Equipment Rooms: Support water, gas piping and ducts connected to rotating equipment within the equipment rooms on spring and neoprene hangers. The first three hangers from a piece of vibrating equipment to have a minimum of 1/2 the static deflection of that of the equipment isolators. Other isolators should have a minimum of 1/4 the static deflection of that of the equipment.

B. Drain Service Piping Connected to Vibration Isolated Equipment: Do not contact the building structure or other nonisolated system unless it is resiliently mounted as described above.

3.02 VIBRATION ISOLATION EQUIPMENT INSTALLATION

A. General: Install vibration isolation equipment in accordance with the manufacturer's written instructions.

B. Isolation Mounts:
1. Squarely align vibration isolators above or below mounting points of the supported equipment.
2. If a housekeeping pad is provided, install isolators such that they bear on the housekeeping pad and the isolator base plate rests entirely on the pad.
3. Connect hanger rods for vibration isolated support to structure. Provide intermediate members as necessary.
4. Position vibration isolation hanger elements as high as possible in the hanger rod assembly but not in contact with the building structure. Install hangers so that the hanger housing may rotate a full 360 degrees about the rod axis without contacting any object.
5. Where parallel running pipes are hung together on a trapeze which is isolated from the building, provide isolator deflections for the largest determined by provisions for pipe isolation. Do not mix isolated and nonisolated pipes in the same trapeze.
6. Install resiliently isolated pipes such that they do not contact any rigid building structure or equipment.
7. Adjust leveling bolts and hanger rod bolts so the isolated equipment is level and in proper alignment with connecting ducts or pipes.

C. Flexible Duct Connections: Squarely align sheet metal ducts or plenum openings with the fan discharge, fan intake or adjacent duct section prior to installation of the flexible connection, so that the clear length is approximately equal all the way around the perimeter. Install connections such that the fan unit or adjacent duct section is able to move 1 inch in any direction without causing metal-to-metal contact or stretching taught the flexible connection. Install the connections so that the clear space between ducts is a minimum of 4 inches, and the connection has a minimum of 1-1/2 inches of slack material. Install flexible connections per SMACNA.

D. Foam Rubber: Provide foam rubber sheets between fan bases and roof mounted equipment curbs and between rooftop mounted HVAC equipment and their curbs.

E. Anchorage: Adequately anchor or brace mechanical equipment, piping and ductwork to resist displacement due to seismic action, include snubbers on equipment mounted on spring isolators, chiller, pump, cooling tower, and the like.

3.03 ADJUSTING AND CLEANING

A. Clean each vibration isolator. Verify that each is working freely, and that there is no debris in the immediate vicinity of the unit that could short circuit unit isolation.

3.04 EQUIPMENT SCHEDULE

A. Provide vibration isolation component deflections as a minimum per the following:
Belt-Driven Equipment:

Motor Size Horsepower	Installation Above Grade	Installation at Grade or Below
5 - 10	3/4 inch	3/4 inch

Direct-Driven Equipment:

Motor Size Horsepower	Installation Above Grade	Installation at Grade or Below
5 - 20	3/4 inch	3/4 inch

B. Schedule:

Equipment:	Type:
Fans	FDC
Air Handler Casings	NP
Piping, ducts, flues	HSN

3.05 DUCT SILENCERS

A. Install at locations shown.

3.06 ACCESS PANELS

A. Install wall and ceiling access panels to provide access to concealed valves, fans, motors, shock arrestors, fire dampers, terminal units, coils and other mechanical items needing service. Provide access panels at locations required or specified herein. Coordinate locations/sizes of access panels with Architect prior to work.

END OF SECTION 15240

SECTION 15250

INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Piping and Equipment Insulation: Materials and installation of insulation, jackets and accessories for the following applications:
   1. Hot and cold domestic water piping systems.
   2. ADA accessible lavatory/sink P-trap and supplies/stops.

B. Ductwork Insulation - Materials and installation of duct insulation including the following applications:
   1. Air conditioning and heating ductwork.
   2. Outside air ductwork.
   3. Equipment related to air handling systems.
   4. Exterior louver blank-off areas.
   5. Underground ductwork.

1.02 QUALITY ASSURANCE

A. Qualification of Workers: Use proficient journeyman insulators and supervisors in the execution of this portion of the work to ensure proper and adequate installation of insulation throughout. A firm with at least 5 years successful installation experience on projects with installations similar to that required for this project.

B. Compliance with Specifications:
   1. Whenever required during progress of the work, furnish proof acceptable to the Owner that items installed are equal to or exceed requirements specified for this work.
   2. In the event such proof is not available, or is not acceptable to the Owner, the Owner may require the Contractor to remove the item or items and replace with material meeting the specified requirements and to repair damage caused in the removal and replacement, at no additional cost to the Owner.
   3. Install per manufacturer's written instructions.
   4. As a minimum, comply with appropriate state energy code or other applicable codes.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for each type of insulation, jacket, glue, paint, fitting cover, and accessory. Submit schedule showing manufacturer's product number, thickness, and furnished accessories for each piping, equipment and duct system requiring insulation.

1.04 PRODUCT HANDLING

A. Protection: Use all means necessary to protect insulation materials before, during and after installation.

B. Replacements: In the event of damage, immediately make repairs and replacements necessary.

1.05 FIRE HAZARD CLASSIFICATION

A. Maximum fire hazard classification of the composite insulation construction as installed to be not more than a flame spread of 25, fuel contributed of 50 and smoke developed of 50 as tested by ASTM E84 (NFPA 255) method.

B. Test pipe insulation in accordance with the requirements of UL "Pipe and Equipment Coverings R5583 400 8.15."

C. Test duct insulation in accordance with ASTM E84 and bear the UL label.

1.06 LINING MATERIALS

A. Materials to be mold-, humidity-, and erosion-resistant surface that meets the requirements of UL 181.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Piping: Armacell LLC Armaflex, Certainteed, Imcoa, Johns Manville, Knauf, Nomaco, Owens-Corning, PPG, or approved.

B. Ductwork: Armacell LLC Armaflex, Certainteed, Johns Manville, Knauf, Owens-Corning, PPG, or approved.

2.02 TYPE 1, FIBERGLASS PIPE INSULATION

A. Glass Fiber: ASTM C547; rigid molded, noncombustible.
1. Thermal Conductivity Value: 0.27 at 75F.
2. Maximum Service Temperature: 850F.
3. Vapor Retarder Jacket: White Kraft paper reinforced with glass fiber and bonded to aluminum foil, secure with self sealing longitudinal laps and butt strips or AP Jacket with outward clinch expanding staples or vapor barrier mastic as needed.

2.03 TYPE 2, FLEXIBLE ELASTOMERIC INSULATION

A. Elastomeric Foam: ASTM C534; flexible, cellular elastomeric, molded or sheet.
1. Thermal Conductivity Value: 0.27 at 75F.
2. Maximum Service Temperature of 220F.
3. Maximum Flame Spread: 25.
4. Maximum Smoke Developed: 50 (1-inch thick and below).
5. Connection: Waterproof vapor retarder adhesive as needed.
6. UV Protection: UV outdoor protective coating as needed.

B. Glue Used in Cementing Rubber Insulation: Contact adhesive specifically manufactured for cementing flexible elastomeric foam. Armacell LLC Armaflex 520 adhesive, or Halstead.

C. Paint Used to Cover Rubber Insulation: Nonhardening high elasticity type, specifically manufactured as a protective covering of flexible elastomeric foam insulation for the prevention of degradation due to exposure to sunlight and weather. Armacell LLC Armaflex, or Halstead.

2.04 TYPE 7, ADA ACCESSIBLE LAVATORY/SINK INSULATION KIT

A. P-traps, hot water and cold water insulating guards. Molded closed cell vinyl with nylon fasteners, paintable. Thermal conductivity; K = 1.17 (BTU/in)/ (hr/sq.ft./deg. F) at 75F mean temperature. Provide accessories as required for complete installation. Color white. Truebro Inc. Model 102. McGuire, ProWrap, Brocar Trap Wrap, or approved.

2.05 TYPE 10, FLEXIBLE FIBERGLASS BLANKET

A. ASTM C553, Type 1, Class B-2; flexible blanket.

B. 'K' Value: 0.27 at 75F installed.

C. Density: 0.75 lb./cu.ft.

D. Vapor Barrier Jacket: FSK aluminum foil reinforced with fiberglass yarn and laminated to

E. fire resistant Kraft, secured with UL listed pressure sensitive tape or outward clinched expanded staples and vapor barrier mastic as needed.

2.06 TYPE 13, FLEXIBLE FIRE PROTECTION DUCT WRAP

A. ASTM E84, ASTM E119, ASTM E2336.

B. Completely encapsulated core insulating blanket with aluminum foil fiberglass reinforced scrim covering.

2.07 ACCESSORIES

A. Equipment Insulation Compounds: Provide adhesives, cement, sealers, mastics and protective finishes as recommended by insulation manufacturer for applications indicated.

B. General: Provide staples, bands, wire, wire netting, tape corner angles, anchors, stud pins and metal covers as recommended by insulation manufacturer for applications indicated. Accessories, i.e., adhesives, mastics, cements and tape to have the same flame and smoke component ratings as the insulation materials with which they are used. Shipping cartons to bear a label indicating that flame and smoke ratings do not exceed those listed above. Provide permanent treatment of jackets or facings to impart flame and smoke safety. Provide nonwater soluble treatments.

2.08 PIPE FITTING INSULATION COVERS

A. PVC preformed molded insulation covers. Zeston, or approved.

2.09 DUCT INSULATION ACCESSORIES

A. Staples, bands, wires, tape, anchors, corner angles and similar accessories as recommended by insulation manufacturer for applications indicated.

2.10 DUCT INSULATION COMPOUNDS

A. Cements, adhesives, coatings, sealers, protective finishes and similar accessories as recommended by insulation manufacturer for applications indicated.

PART 3 - EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Do not apply insulation until pressure testing of the ducts has been completed. Do not apply insulation until the duct has been inspected.

B. Examine areas and conditions under which duct insulation will be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean and dry surfaces to be insulated.

3.03 INSTALLATION

A. Insulation: Continuous through walls, floors, partitions except where noted otherwise.

B. Piping and Equipment:
1. Install insulation over clean, dry surfaces with adjoining sections firmly butted together and covering surfaces. Fill voids and holes. Seal raw edges. Install insulation in a manner such that the insulation may be split, removed, and reinstalled with vapor barrier tape on strainer caps and unions. Do not install insulation until the piping has been leak tested and has passed such tests. Do not insulate chiller manholes, equipment manufacturer's nameplates, handholes, and ASME stamps. Provide beveled edge at such insulation interruptions. Repair voids or tears.
2. Cover insulation on pipes above ground, outside of buildings, with aluminum jacketing. Position seam on bottom of pipe.

C. Ductwork:
1. Install insulation in conformance with the manufacturer's recommendations to completely cover the duct.
2. Butt insulation joints firmly together and install jackets and tapes smoothly and securely.
3. Apply duct insulation continuously through sleeves and prepared openings, except as otherwise specified. Apply vapor barrier materials to form a complete unbroken vapor seal over the insulation.
4. Coat staples and seals with vapor barrier coating.
5. Cover breaks in the jacket material with patches of the same material as the vapor barrier. Extend the patches not less than 2 inches beyond the break or penetration in all directions and secure with adhesive and staples. Seal staples and joints with brush coat of vapor barrier coating.
6. Fill jacket penetrations, i.e., hangers, thermometers and damper operating rods, and other voids in the insulation with vapor barrier coating. Seal the penetration with a brush coat of vapor barrier coating.
7. Seal and flash insulation terminations and pin punctures with a reinforced vapor barrier coating.
8. Continue insulation at fire dampers up to and including those portions of the fire damper frame which are visible at the outside of the rated fire barrier. Insulation terminations at fire dampers in accordance with the above.
9. Do not conceal duct access doors with insulation. Install insulation terminations at access doors in accordance with the above.

10. Duct Liners: Install mat finish surface on air stream side. Secure insulation to cleaned sheet metal duct with a continuous 100 percent coat of adhesive. For widths over 20 inches, additionally secure the liner with mechanical fasteners 15 inches on center. Accurately cut liner and thoroughly coat ends with adhesive. Butt joints tightly. Top and bottom sections of insulation overlap sides. Keep duct liner clean and free from dust. At completion of project, vacuum duct liner if it is dirty or dusty. Cut studs off near washers. Do not use small pieces. If insulation is installed without horizontal, longitudinal, and end joints butted together, installation will be rejected and work removed and replaced with work that conforms to this Specification.
11. Duct Wrap: Cover supply air ducts except ducts internally lined. Wrap tightly with circumferential joints butted and longitudinal joints overlapped minimum of 2 inches. Adhere insulation with 4-inch strips of insulating bending adhesive at 8 inches on center. On ducts over 24 inches wide, additionally secure insulation with suitable mechanical fasteners at 18 inches on center. Circumferential and longitudinal joints stapled with flare staples 6 inches on center and covered with 3-inch-wide, foil reinforced tape.

3.04 PROTECTION AND REPLACEMENT

A. Protect installed insulation during construction. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

3.05 FIBERGLASS INSULATION

A. Lap seal insulation with waterproof adhesive. Do not use staples or other methods of attachment which would penetrate the vapor barrier. Apply fitting covers with seated tacks and vapor barrier tape.

B. Apply insulation to pipe and seal with self-sealing lap. Use self-sealing butt strips to seal butt joints. Insulate fittings, valves and unions with single or multiple layers of insulation and cover to match pipe or use preformed PVC molded insulation covers.

3.06 LABELING AND MARKING

A. Provide labels, arrows and color coding on piping. Attach labels and arrows to the jacketing.

3.07 PIPING SURFACES TO BE INSULATED

Item to be Insulated:	System Insulation Type:	Pipe Size:	Insulation Thickness:
Domestic hot water and hot water recirculation piping above grade.	1	Runouts up to 2" Mains =<2" Mains >2"	1" 1" 1-1/2"
Domestic cold water except minor branch piping within walls serving fixtures.	1	=<2" >2"	1/2" 1"
ADA accessible lavatory/sink.	7	All	as listed
Clothes dryer vent.	1	All	1"

Note: Insulation thickness shown is a minimum. If state codes require additional thickness, then provide insulation thickness per code requirements.

3.08 DUCTWORK SURFACES TO BE INSULATED

Item to be Insulated:	System Insulation Type:	Duct Size:	Insulation Thickness:
Supply ductwork (where duct is not specified to be lined or where ductboard is not utilized).	10	All	1"

Note: Insulation thickness shown is a minimum. If state codes require additional thickness, then provide insulation thickness per code requirements.

3.09 ADA ACCESSIBLE LAVATORIES/SINKS

A. Install lavatory/sink insulation kit.

3.10 FLEXIBLE ELASTOMERIC TUBING

A. Slip insulation over piping or if piping is already installed, it should be slit and snapped over the piping. Joints and butt ends must be adhered with 520 adhesive.

END OF SECTION 15250

SECTION 15400

PLUMBING

PART 1 - GENERAL

1.01 SUMMARY

A. Piping system work includes but not limited to:
1. Aboveground soil, waste and vent piping within buildings, including soil stacks, vent stacks, horizontal branches, traps, and connections to fixtures and drains.
2. Storm building drain piping from conductor piping and area drains terminating at connection to storm sewers 5 feet outside foundation wall.
3. Domestic cold water piping.
4. Domestic hot water piping.
5. Domestic circulating hot water piping.
6. Plumbing Fixtures: See Schedule on Drawings for types.
7. Furnishing and installation of access doors required for work furnished by this Section.
8. Furnishing and installing of sleeves, inserts and anchorage required for the installation, which are embedded in work of other trades. Sleeve, wrap and seal piping in concrete.
9. Electrical: For plumbing trim/fixtures (sensor type faucets/flushometers, and the like), provide, from the 120-volt connection by Division 16, the low voltage electrical connections and wiring as required for complete and operable system. Includes, but is not limited to low voltage electrical raceway, wiring and accessories, such as step-down transformers as necessary for function of sensors and automatic valve and faucet controls. Supply step-down transformers and size wiring as recommended by manufacturer of plumbing trim/faucets requiring electrical low voltage connection.

B. Fixtures:
1. Plumbing fixtures and trim, including rims for sinks and lavatories in casework or counters, chair carriers (as required), drinking fountains, drains, cleanouts, floor sinks, and related fixtures shown on the Drawings.
2. Rough and final connection to equipment and fixtures, relocated or provided under other sections by Owner and under other divisions of the work.
3. Standards and supports for equipment requiring them.
4. Instructions and maintenance manuals for equipment furnished by this Section.

1.02 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of plumbing system products, of types, materials, and sizes required.

B. Regulatory Requirements:
1. Codes: Comply with UPC pertaining to plumbing materials, construction and installation of products. Comply with local and state regulations.
2. ANSI Compliance: Comply with applicable American National Institute standards pertaining to products and installation.
3. PDI Compliance: Comply with applicable Plumbing and Drainage Institute standards pertaining to products and installation.
4. Federal Standards: Comply with applicable Federal Specification WW-P-541 Series sections pertaining to plumbing fixtures.
5. NAHB Label: Provide fiberglass bathtub units and shower stalls which have been tested and labeled by NAHB Research Foundation.

6. ADA Compliance: Construct and install barrier-free plumbing fixtures in accordance with "The Americans with Disabilities" Act.
7. UL and NEMA Compliance: Provide electric motors and electrical components required as part of plumbing equipment, which have been listed and labeled by UL and which comply with NEMA standards.
8. CEC, NEC Compliance: Comply with CEC, NEC as applicable to installation and electrical connections of ancillary electrical components of plumbing equipment.

1.03 SUBMITTALS

A. Product data in accordance with Division 1, Section "Shop Drawings, Product Data and Samples." Manufacturer's specifications, installation and startup instructions, capacity and ratings, with selection indicated. Provide pump performance curves with selection points indicated. Provide specialties and accessories required for a complete and operable installation.

B. Shop Drawings: Provide assembly type shop drawings indicating dimensions, weights, required clearances, and methods of assembly of components and anchorages.

C. Wiring Diagrams: Ladder type wiring diagrams for components, indicating required field electrical connections.

D. Maintenance Data: Submit maintenance data and parts list for each item. Include "troubleshooting" maintenance guides. Include this data in operation and maintenance manual.

1.04 PLUMBING FIXTURES

A. General: Provide factory fabricated fixtures of type, style and material indicated on the plumbing fixture connection schedule on the Drawings. For each type fixture, provide fixture manufacturer's standard trim, carrier, seats, and valves as indicated by their published product information; either as designed and constructed, or as recommended by manufacturer, and as required for complete installation. Where more than one type is indicated, selection is installer's option; but, fixtures of same type must be furnished by a single manufacturer. Where type is not otherwise indicated, provide fixtures complying with governing regulations.
1. Fixtures: Complete with fittings, supports, fastening devices, faucets, valves, traps, stops and appurtenances required.
2. Exposed IPS Piping and Tubing: Brass, chrome plated.
3. Escutcheons: Brass, chrome plated.
4. Fixture Locations: As shown on Drawings.
5. Stops: Stops installed in each supply pipe at each fixture accessibly located with wall escutcheons.
6. Public Lavatories: Provide with flow control device to prevent flow over 0.5 GPM.
7. Interior Faucets Except Public Lavatories: Provide with flow control device to prevent flow over 2.5 GPM.

PART 2 - PRODUCTS

See Fixture Schedule on Drawings

PART 3 - EXECUTION

3.01 CHLORINATION

A. General: Upon completion of tests and necessary replacements, thoroughly flush and disinfect domestic water piping.

B. Method: After thoroughly flushing system with water to remove sediment, fill system with a solution containing 50 parts per million of chlorine for not less than 24 hours or 200 parts per million of chlorine for not less than 3 hours. After retention, drain, reflush and return system to service.

C. Certification: Provide copy of domestic water chlorination certificate in each operations and maintenance manual.

3.02 OWNER-FURNISHED EQUIPMENT

A. Some equipment is to be furnished under another Contract including soap dispensers and if indicated as such on Drawings. Rough-in for such equipment, receive, uncrate, install and connect plumbing equipment, faucets, and fixtures as furnished by others. Furnish and install stops, traps, strainers, backflow preventers, valves and other appurtenances not furnished by others in order to provide a complete operating system.

B. Comply with paragraph on Plumbing Fixtures Installation, this Section, for installation procedures.

C. Refer to plumbing fixture connection schedule on Drawings.

3.03 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES

A. Provide proper sizing when providing sleeves or core-drilled holes to accommodate the penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet the requirements of ASTM E814.

B. Manufacturers: Hilti, Proset, or approved.

3.04 PROTECTION

A. Protect fixtures and equipment from damage. Replace damaged items with new.

B. Keep pipe openings closed by means of plugs or caps to prevent the entrance of foreign matter. Protect piping, ductwork, fixtures, equipment and apparatus against dirty water, chemical or plumbing damage both before and after installation. Restore to its original condition or replace fixtures, equipment or apparatus damaged prior to final acceptance of the work.

C. Protect bright finished shafts, bearing housings and similar items, until in service; no rust will be permitted.

D. Cover equipment and materials stored on the job site or otherwise suitably protect at the direction of, and to the satisfaction of Architect. If coverings become torn, replace until the equipment is connected and operating.

3.05 PIPING SYSTEMS INSTALLATION

A. Piping:
   1. General: Lay underground building drains beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install required gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements. Clean interior of piping of dirt and other superfluous materials as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. Place plugs in ends of uncompleted piping at end of day or whenever work stops. Coordinate installation of piping below with structural components and other system installations.
   2. Install piping pitched to drain at minimum slope of 1/4 inch per foot (2 percent). Where this slope is impractical, slope at 1/4 inch per foot for pipes below 4-inch size, and 1/8 inch per foot (1 percent) for piping 4 inches and larger, with the approval of the local code authority.
   3. Seismic Restraint: Brace plumbing piping and plumbing equipment against lateral movement as detailed in document "Seismic Restraint Manual Guidelines for Plumbing Systems" as published by SMACNA.
   4. Rough-in Piping: Provide temporary caps or plugs at piping shown on Drawings to be roughed-in for future connections by others.
   5. Sanitary Waste and Storm Drain Piping: Slope at uniform grade of 1/4 inch per foot unless noted otherwise. Make changes in size with reducing and wye fittings. Run exposed piping parallel or perpendicular to building structure.
   6. Sanitary Waste Piping from Back-to-Back Water Closets: Provide individual rough-in piping for each back-to-back water closet, no common sanitary cross, double fixture or double combination wye and 1/8 bend fittings allowed.
   7. Vent Piping:
      a. General: Horizontal runs free of drops and sloped to drainage system.

B. Cleanouts: Install in aboveground piping and building drain piping as indicated, as required by code; at each change in direction of piping greater than 135 degrees; at minimum intervals of 100 feet; and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping. Select type to match adjacent building finish. Coordinate locations and types of cleanouts with Architect prior to installation.

C. Equipment Connections:
   1. Provide soil and waste piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated; but in no case smaller than required by code.
   2. Locate piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.
   3. Piping Runouts to Fixtures: Provide hot and cold piping runouts to fixtures of sizes indicated, but in no case smaller than required by code.
   4. Equipment Connections: Connect hot and cold water piping system to equipment as indicated, and comply with equipment manufacturer's instructions. Provide shutoff valve and union for each connection; provide drain valve on drain connection.

D. Domestic Water Distribution Piping:
   1. Water Service Piping: Provide sleeve in foundation wall for water service entry; make entry watertight. Provide shutoff valve at water service entry inside building; pressure gauge, test tee with valve.
   2. Water Hammer Arrestors: Install in upright position, in locations and of sizes in accordance with PDI WH-201, and elsewhere as indicated.
   3. Group piping installations and valves where possible to obtain maximum practical use of available space.

4. Arrange locations of valves, unions, drains and other components to provide for ease of cleaning, operation, repair or service. Size access panels and locate to provide both acceptable proximity and working space for such devices.
5. Provide valves and shock arrestors where required by code and where otherwise indicated in Specifications and on Drawings.
6. Provide protection plates for piping installed in wood stud walls and other building substructures as required by code.
7. Wherever piping is installed in exterior walls, route on warm side of insulation and as close to inside wall finish as possible, as detailed.
8. Provide low point drains and shutoff valves as required by local AHJ. Provide valve boxes, access panels, and the like, for complete installation.

E. Valves:
1. Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves two or more plumbing fixtures or equipment connections, and elsewhere as indicated.
2. Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated.
3. Drain Valves: Install on each plumbing equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain domestic water piping system.
4. Check Valves: Install as indicated.
5. Balancing Valves: Install in each hot water recirculating loop, and elsewhere as indicated.

F. Backflow Preventers:
1. Install where indicated, and where required by code. Where practical, locate in same room as equipment being protected.
2. Submit product cut sheets to local AHJ for approval prior to purchase.
3. Install as close to wall as possible with clearances for access and maintenance as required by AHJ.
4. Coordinate exact location of installation and type of backflow device serving a particular piece of equipment with AHJ and Architect prior to purchase and installation.
5. Provide wall/floor brackets that are of fully welded, hot dipped galvanized construction, fabricated to meet field conditions. Mount backflow preventer to brackets using cadmium plated "U" type bolts and nuts.
6. Contact: Contact local water district/backflow specialist and request backflow installation literature. Install backflow devices per UPC and local water district/backflow specialist requirements.
7. Route waste piping from air gap waste fitting concealed within walls to point of air gap termination at indirect waste interceptor.
8. General: Perform necessary excavation and backfill required for installation of plumbing work. Repair piping or other work damaged by Contractor's operations.
9. Water: Keep excavations free of standing water. Reexcavate and fill back excavations damaged or softened by water or frost to original level with sand, crushed rock or other approved material at no expense to Owner.
10. Tests: During progress of work for compacted fill, Owner reserves right to request compaction tests made under direction of a testing laboratory.
11. Trench Excavation: Excavate trenches to necessary depth and width, removing rocks, unstable soil (muck, peat, and the like), roots and stumps. Excavation material is classified as "base fill" and "native." Base fill excavation material consisting of placed crushed rock may be used as backfill above "Pipe Zone." Remove and dispose off site native excavation material at no expense to Owner. Adequate width of trench for proper installation of piping or conduit.

12. Support Foundations:
    a. Foundations: Excavate trenches located in unstable ground areas below elevation required for installation of piping to a depth which is determined by Architect as appropriate for conditions encountered. Place and compact approved foundation material in excavation up to "Bedding Zone." Dewatering, placement, compaction and disposal of excavated materials to conform to requirements contained in other sections of Specifications or drawings.
    b. Over-Excavations: Where trench excavation exceeds required depths, provide, place and compact suitable bedding material to proper grade or elevation at no additional cost to Owner.
    c. Foundation Material: Where native material has been removed, place and compact necessary foundation material to form a base for replacement of required thickness of bedding material.

	Class A		Class B	
Material Passing:	Min.	Max.	Min.	Max.
3/4-inch Square Opening	27	47	0	1

    d. Bedding Material: Full bed site piping on sand, pea gravel or 3/4-inch minus crushed rock. Place a minimum 4-inch deep layer of sand or crushed rock on leveled trench bottom for this purpose. Remove bedding to necessary depth for piping bells and couplings to maintain contact of pipe on bedding for its entire length. Provide additional bedding in excessively wet, unstable, or solid rock trench bottom conditions as required to provide a firm foundation.

G. Testing:
1. General:
    a. Provide temporary equipment for testing, including pumps, compressors, tanks, and gauges, as required. Test piping systems before insulation (if any) is installed and remove or disengage control devices before testing. Where necessary, test sections of each piping system independently, but do not use piping valves to isolate sections where test pressures exceed local valve operating pressure rating. Fill each section with water, compressed air, or nitrogen and pressurize for the indicated pressure and time.
    b. Notify Architect and local Plumbing Inspector two days before tests.
    c. Drainage, Waste and Vent Piping: Test in accordance with governing plumbing code or as follows: Test drainage and venting systems, with necessary openings plugged, to permit system to be filled with water and subjected to a water pressure of a minimum of 5 PSI head. System to hold water without a water level drop greater than 1/2 pipe diameter of largest nominal pipe size within a 24-hour period. Test system in sections if minimum head cannot be maintained in each section. The 5 PSI head to be the minimum pressure at the highest joint.
    d. Water Piping: Eliminate air from system. Fill and test at 125 PSIG or minimum 1-1/2 times static pressure at connection to serving utility main for a period of two hours with no loss in pressure.
    e. Send test results to Architect for review and approval.
2. Testing of Pressurized Systems:
    a. Test each pressurized piping system at 150 percent of operating pressure indicated, but not less than 125 PSIG test pressure.
    b. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 2 percent of test pressure.
    c. Test hot and cold domestic water piping systems upon completion of rough-in and before connection to fixtures at a hydrostatic pressure of 125 PSIG.
3. Repair:
    a. Repair piping system sections which fail the required piping test by disassembly and reinstallation, using new materials to the extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.

b. Drain or purge test water, air, or nitrogen from piping system after testing and repair work have been completed.

H. Water Hammer Arrestors (Shock Absorbers): Locate shock absorbers in supply pipe in accordance with recommendations of Plumbing and Drainage Institute PDI-WH201. Install ahead of solenoid operated valves. Determine size of absorber by fixture unit value of fixture supplied, using PDI symbols to designate sizes. Provide access panel for each shock absorber.

3.06 FIXTURES INSTALLATION

A. General:
1. Install plumbing fixtures of types indicated where shown and at indicated heights; in accordance with fixture manufacturer's written instructions, roughing-in drawings, and with recognized industry practices. Ensure that plumbing fixtures comply with requirements and serve intended purposes.
2. Verification of Conditions: Examine roughing-in work of potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping and other unsatisfactory conditions for installation of plumbing fixtures.
3. Set and connect to soil, waste, vent and water piping in neat, finished and uniform manner. Connections to be equal height, plumb and set at right angles to floor, or both unless otherwise required or specified.
4. Seal fixtures mounted on floors and walls at abutting joints with approved sealant compounds as directed by Architect.
5. For ADA accessible toilets, provide with handle at wide portion of stall.
6. Lavatories: Set mixing valves to limit outlet temperature to 110F.

B. Fixture Locations: As shown on Drawings. Center water closets and urinals between privacy partitions unless noted otherwise.

C. Stops: Stops installed in each supply pipe at each fixture accessibly located with stops of loose key type. Concealed stops to be screwdriver or loose key type with wall escutcheons.

D. Fixture Supports:
1. Support wall hung water closets, urinals and lavatories on heavy duty, full size, concealed, commercial grade chair carriers mounted to floor structure. Refer to plumbing fixture connection schedule on drawings.
2. Support other fixtures mounted on stud partitions on heavy concealed wall brackets bolted to a 1/4-inch thick by 5-inch high steel plate anchored firmly to studs with bolts (or welded to metal studs). Plate to extend one stud each way beyond fixture mounting point width.

E. Flushometers: Provide "drop-ear" ells or couplings in wall at water supply outlets to flushometers; anchor firmly to structure. At ADA accessible fixtures, face handle to wide portion of stall.

F. After fixtures are set in place and secured to walls, caulk around between fixtures and wall with white silicone caulking compound. Dow Corning 780, General Electric Construction Sealant, or approved.

G. Set countertop lavatories and stainless steel sink rims in waterproof sealant made for application.

H. Adjust self-closing faucets to provide minimum of 10 seconds of waterflow, and maximum of 15 seconds.

I. After fixture installation is complete, cover and protect rims, fronts and exposed parts until completion of construction phase. Contractor to be responsible for damage to fixtures and assumes related fixture repair or replacement costs.

J. Adjusting and Cleaning: Clean plumbing fixtures, trim, and strainers of dirt and debris upon completion of installation. Adjust water pressure at drinking fountains, faucets, shower valves and flushometers to provide proper flow stream and specified GPM. Repair leaks at faucets and stops.

K. Extra Stock: Furnish special wrenches and other devices necessary for servicing plumbing fixtures and trim to Owner.

L. Field Quality Control:
1. Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
2. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect. Remove cracked or dented units and replace with new units.

M. Adjusting and Cleaning: Piping: Clean piping exterior surfaces. Comply with Section 15250, Insulation, as applicable. Flush out water filled or drainage piping systems with clean water.

N. Hose Bibb Piping: Provide each hose bibb with an individual accessible shutoff valve (ball type). Locate where shown on Drawings. Provide full access.

3.07 FLOOR DRAINS AND FLOOR SINKS

A. General: Install drains in accordance with manufacturer's written instructions and in locations indicated.

B. Coordinate with piping as necessary to interface drains with drainage piping systems.

C. Install floor drains at low points of surface areas to be drained, or as indicated. Set tops of floor drains flush with finished floor. Set floor sinks as required by local codes.

D. Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.

E. Position drains so that they are accessible and easy to maintain.

F. Coordinate drain flashing, flanges and strainer types and depths with floor substrate and topping configuration.

G. Primers:
1. Prime drains that experience intermittent use. Refer to Drawings and coordinate location with Architect. Coordinate with local AHJ for exact requirements.
2. Primer Locations:
   a. Public Restrooms: Primer connection at water closet flushometer tailpiece to connect to rear of pipe using chrome-plated piping at exposed locations.
   b. Other Areas: PPP-type trap-priming valve. Do not install primer valves above ceiling. Coordinate trap primer locations with Architect/Engineer. If installed in wall, provide access panel and coordinate exact panel location with Architect.

3.08 HOSE BIBBS (INSIDE)

A. Install on exposed piping where indicated, with vacuum breaker.

3.09 SILL FAUCETS

A. Install on concealed piping where indicated, with vacuum breaker.

3.10 CIRCULATING PUMPS

A. Install per manufacturer's instructions.

B. Adjust flow rate to design point.

END OF SECTION 15400

SECTION 15420

PLUMBING PIPING SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Work includes but is not limited to:
1. Aboveground soil, waste and vent piping within buildings, including soil stacks, vent stacks, horizontal branches, traps, and connections to fixtures and drains.
2. Underground building drain piping including mains, branches, traps, connections to fixtures and drains, and connections to stacks, terminating at connection to sanitary sewers 5 feet outside foundation wall.
3. Domestic cold water piping.
4. Domestic hot water piping.
5. Domestic circulating hot water piping.
6. Furnishing and installation of access doors required for work furnished by this Section.
7. Furnishing and installing of sleeves, inserts and anchorage required for the installation, which are embedded in work of other trades. Sleeve, wrap and seal piping in concrete.

1.02 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of plumbing system products, of types, materials, and sizes required.

B. Regulatory Requirements:
1. Codes: Comply with UPC pertaining to plumbing materials, construction and installation of products. Comply with local and state regulations.
2. ANSI Compliance: Comply with applicable American National Standards Institute Standards pertaining to products and installation.
3. PDI Compliance: Comply with applicable Plumbing and Drainage Institute standards pertaining to products and installation.

PART 2 - PRODUCTS

2.01 SOIL, WASTE, VENT AND DRAINAGE PIPING

A. Underground Piping to 5 Feet Outside Building Line:
1. 10 Inches and Smaller: "No-Hub" cast iron soil pipe and fittings with heavy-duty stainless steel couplings and neoprene gaskets.

B. Aboveground Piping:
1. 10 Inches and Smaller: "No-Hub" cast iron soil pipe and fittings with standard-duty stainless steel couplings and neoprene gaskets.

2.02 DOMESTIC WATER PIPING

A. Above Ground: Type "L" copper tubing. Wrought copper or cast bronze sweat fittings.
1. Piping 2-1/2 Inches and Smaller: Soldered (95/5 solder) joints.

2. Approved Fillers:
   a. Pressure Range 81 to 150 PSI and Temperatures 151F to 200F: 95/5 tin-antimony or silver-bearing solders, i.e., Allstate 430, Harris Stay Brite 5 or 8.
   b. Use appropriate flux per manufacturer's recommendations. Use of corrosive fluxes is prohibited.

B. Below Ground:
   1. Type "K" copper tubing with brazed joints. Approved Fillers: "Phos-0," "Silfos 5," "Aircosil 15," "Braze 450(DE)." Use appropriate flux per manufacturer's recommendations.

2.03 PRIMER PIPING

A. Above Ground: Type "L" hard-drawn copper tubing with wrought sweat fittings and soldered joints.

B. Below Ground: Type "L" soft annealed copper tubing with wrought sweat fittings and brazed joints.

2.04 BELOW GRADE DOMESTIC HOT WATER SUPPLY AND RETURN PIPING

A. Preinsulated Piping System:
   1. Factory preinsulated piping system, consisting of an inner media carrier pipe, insulation around the carrier pipe, and a water/vapor seal jacket over the insulation.
   2. Carrier Pipe Material: Type "K" copper with brazed fittings approved.
   3. See Section 15050, Basic Materials and Methods, 15060, Pipes and Pipe Fittings.

2.05 CLEANOUTS

A. General: Locate cleanouts as shown on Drawings and as required by local code. Cleanouts same size as pipe except that greater than 4 inches will not be required. Plastic components not allowed, except unless specifically noted.

B. Types:
   1. Tile Floor Cleanouts: J. R. Smith 4020-U with round heavy-duty nickel bronze top, taper thread, ABS plug and standard screws.
   2. Carpeted Floor Cleanout: J. R. Smith 4020-U-X with carpet clamping frame with round heavy-duty nickel bronze top, taper thread, ABS plug, carpet clamping device and standard screws.
   3. Concrete Floor Cleanout (General): J. R. Smith 4020 with round heavy-duty nickel bronze top, taper thread and ABS plug with standard screws.
   4. Concrete Floor Cleanout (Heavy Load): Same as for "General" locations, Item 3 above, except J. R. Smith 4100.
   5. Wall Cleanout: J. R. Smith 4472-U, countersunk bronze taper thread plug, stainless steel shallow cover and vandalproof screws.
   6. Outside Area Walks and Drives: J. R. Smith 4023-U with round heavy-duty nickel bronze top, taper thread, ABS plug and top secured with vandalproof screws. Install in 18- by 18- by 6-inch deep concrete pad flush with grade.

C. Manufacturers: J. R. Smith, Zurn, Wade, Watts, or approved. J. R. Smith model numbers used as a basis of selection.

2.06 SUBSURFACE DRAIN PIPE BELOW GRADE

A. Corrugated polyethylene drainage tubing, perforated with maximum 1/8-inch wide slots. ADS, or approved.

2.07 VALVES

A. General:
1. End Connections: Mate with pipe, tube and equipment connections. Where more than one type is indicated, selection is installer's option.
2. Sizes: Unless otherwise indicated, provide valves of same size as upstream pipe sizes.
3. Refer to Section 15050, Basic Materials and Methods, 15100, Valves, for detailed valve specifications.

B. Service:
1. Domestic Hot and Cold Water Shutoff and Isolation Valves:
   a. Pipe Sizes 2-1/2 Inches and Smaller: Ball valve.
2. Drain Service; All Pipe Sizes: Drain valves.
3. Bypass Around Pressure-Reducing Valves: Globe valves.
4. Check Valves on Ejector (Sump) Pump Discharge: Lift check, vertical installation or swing check if horizontal installation.
5. Check Valves Other than Pump Discharge: Swing check.

2.08 WATER HAMMER ARRESTORS (SHOCK ABSORBERS)

A. Bellows-type, stainless steel casing and bellows, pressure rated, tested and certified in accordance with PDI WH-201. Manufacturers: Amtrol, Inc., J. R. Smith, Wade, Zurn, or approved.

B. Piston-type, copper, brass or stainless steel with O-ring piston, pressure rated, tested and certified in accordance with PDI WH-201. Manufacturers: PPP, Sioux Chief, or approved

2.09 TRAP PRIMERS

A. Trap seal primer valve with integral automatic antisiphon protection. Code approval required. Wade, Zurn, J. R. Smith, PPP, or approved.

B. Electronic trap seal primer valve with integral automatic antisiphon protection tied to DDC system. Coordinate quantity, locations and voltage characteristics for control points and with Section 15950, Controls. Wade, Zurn, J. R. Smith, PPP, or approved.

2.10 BACKFLOW PREVENTERS

A. General: Provide shutoff valve and unions upstream and downstream of backflow preventers. Provide bronze "Y" strainer upstream of backflow preventers. Note: For hot water applications of 140F or greater, provide backflow preventer rated for temperature of hot water system serving.

B. Atmospheric Vacuum Breaker: Watts Model 288A with Watts 777S "Y" strainer. Febco, Wilkins, or approved.

C. Pressure Vacuum Breaker: Watts Model 800MCQT with 777S "Y" strainer. Febco, Wilkins, Conbraco, or approved.

D. Double Check Backflow Preventer: Watts Model 007QT Series with strainer, Febco, Wilkins, Conbraco, or approved.

E. Reduced Pressure Backflow Preventer: Watts Model 909QT Series with strainer. Febco, Wilkins, Conbraco, or approved. Provide with air gap fitting and indirect drain piping to drain.

2.11 WATER VALVE BOXES

A. Rectangular concrete valve box with cast iron hinged locking access cover, labeled "water." Provide size adequate for depth, maintenance accessibility for valve assembly, and the like. Provide extensions as required. Manufacturers: Brooks Products Model 36-HFL, or approved.

2.12 DOMESTIC HOT WATER TEMPERATURE MAINTENANCE SYSTEM

A. Apply an electric self-regulating heater to the hot water piping as indicated on the Drawings. Nominal Water Maintained Temperature: 105F.

B. The self-regulating heater consists of two 16AWG nickel coated copper bus wires embedded in a radiation cross-linked self-regulating polymer core covered by a radiation cross-linked modified polyolefin dielectric jacket which is covered by a tinned copper braid incorporating a colored strand for easy product identification.

C. The heater operates on a line voltage of 208, 220 or 240V without the use of thermostats or transformers to control the heater.

D. The heater and components must have a UL System listing specifically for maintaining service hot water systems at selected temperature.

E. When powered in an oven at 400F for 30 minutes, the power output of the self-regulating heater continuously decreases or remain unchanged. The current measured after heating in the oven to be within 15 percent of the current measured before heating.

F. The product shows a strong decrease in power output with increasing temperature as defined below. This is required for accurate control of temperature and for maximum energy savings. Products will meet the following criteria:
   1. The maximum power output at 100F will be 52 percent or less of the power output at 50F.
   2. The maximum power output at 120F will be 35 percent or less of the power output at 50F.
   3. The maximum power output at 140F will be 22 percent or less of the power output at 50F.

G. Manufacturers: HWAT-B (for 105F), HWAT-D (for 120F), HWAT-F (for 140F) manufactured by Raychem Corporation.

2.13 PREMANUFACTURED COUNTERFLASHINGS

A. Factory-fabricated counterflashing constructed from Schedule 40 galvanized steel or galvanized malleable iron pipe coupling with tapered threads and 3 lb. lead sheet lead formed and soldered to coupling to produce counterflashing minimum of 4-inch overlap over roof flashings. Provide for pipe sizes as required. Manufacturers: A&B Sheetmetal, 503-254-5581.

2.14 ACCESS PANELS

A. Provide flush-mounting access panels as required for service of fire dampers, cleanouts, valves, and the like, and other items requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly. Ceiling access panels to be minimum 24x24 (or required and approved size). Wall access panels to be minimum 12x12 (or required and approved size). Manufacturers: Milcor, Karp, Elmdor, In-Ryko, Acudor, or approved. Provide two keys for each set of locks provided.

PART 3 - EXECUTION

3.01 DRAIN PIPING

A. General: Lay underground building drains beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install required gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements. Clean interior of piping of dirt and other superfluous materials as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. Place plugs in ends of uncompleted piping at end of day or whenever work stops. Coordinate installation of piping below with structural components and other system installations.

B. Install piping pitched to drain at minimum slope of 1/4 inch per foot (2 percent). Where this slope is impractical, slope at 1/4 inch per foot for pipes below 4-inch size, and 1/8 inch per foot (1 percent) for piping 4 inches and larger, with the approval of the local code authority having jurisdiction.

3.02 CLEANOUTS

A. Install in aboveground piping and building drain piping as indicated, as required by code; at each change in direction of piping greater than 135 degrees; at minimum intervals of 100 feet; and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping. Select type to match adjacent building finish. Coordinate locations and types of cleanouts with Architect prior to installation.

3.03 EQUIPMENT CONNECTIONS

A. Provide soil and waste piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated; but in no case smaller than required by code.

B. Locate piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.

C. Piping Runouts to Fixtures: Provide hot and cold piping runouts to fixtures of sizes indicated, but in no case smaller than required by code.

D. Mechanical Equipment Connections: Connect hot and cold water piping system to mechanical equipment as indicated, and comply with equipment manufacturer's instructions. Provide shutoff valve and union for each connection; provide drain valve on drain connection.

3.04 DOMESTIC WATER DISTRIBUTION PIPING

A. Water Service Piping: Provide sleeve in foundation wall for water service entry; make entry watertight. Provide shutoff valve at water service entry inside building; pressure gauge, test tee with valve.

B. Water Hammer Arrestors: Install in upright position, in locations and of sizes in accordance with PDI WH-201, and elsewhere as indicated.

C. Group piping installations and valves where possible to obtain maximum practical use of available space.

D. Arrange locations of valves, unions, drains and other components to provide for ease of cleaning, operation, repair or service. Size access panels and locate to provide both acceptable proximity and working space for such devices.

E. Provide valves and shock arrestors where required by code and where otherwise indicated in Specifications and on Drawings.

F. Provide protection plates for piping installed in wood stud walls and other building substructures as required by code.

G. Wherever piping is installed in exterior walls, route on warm side of insulation and as close to inside wall finish as possible, as detailed.

H. Provide low point drains and shutoff valves as required by local AHJ. Provide valve boxes, access panels, and the like, for complete installation.

3.05 VALVES

A. Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves two or more plumbing fixtures or equipment connections, and elsewhere as indicated.

B. Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated.

C. Drain Valves: Install on each plumbing equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain domestic water piping system.

D. Check Valves: Install on discharge side of each pump, and elsewhere as indicated.

E. Balancing Valves: Install in each hot water recirculating loop, and elsewhere as indicated.

3.06 BACKFLOW PREVENTERS

A. Install where indicated, and where required by code. Where practical, locate in same room as equipment being protected.

B. Submit product cut sheets to local AHJ for approval prior to purchase.

C. Install as close to wall as possible with clearances for access and maintenance as required by AHJ.

D. Coordinate exact location of installation and type of backflow device serving a particular piece of equipment with AHJ and Architect prior to purchase and installation.

E. Provide wall/floor brackets that are of fully welded, hot dipped galvanized construction, fabricated to meet field conditions. Mount backflow preventer to brackets using cadmium plated "U" type bolts and nuts.

F. Contact: Contact local water district/backflow specialist and request backflow installation literature. Install all backflow devices per UPC and local water district/backflow specialist requirements.

G. Route waste piping from air gap waste fitting concealed within walls to point of air gap termination at indirect waste receptor.

3.07 PIPE INSTALLATION

A. Seismic Restraint: Brace mechanical piping and plumbing equipment against lateral movement as detailed in document "Seismic Restraint Manual Guidelines for Mechanical Systems" as published by SMACNA.

B. Rough-in Piping: Provide temporary caps or plugs at piping shown on Drawings to be roughed-in for future connections by others.

C. Sanitary Waste and Storm Drain Piping: Slope at uniform grade of 1/4 inch per foot unless noted otherwise. Make changes in size with reducing and wye fittings. Run exposed piping parallel or perpendicular to building structure.

D. Vent Piping:
   1. General: Horizontal runs free of drops and sloped to drainage system.

3.08 TESTING

A. General:
   1. Provide temporary equipment for testing, including pumps, compressors, tanks, and gauges, as required. Test piping systems before insulation (if any) is installed and remove or disengage control devices before testing. Where necessary, test sections of each piping system independently, but do not use piping valves to isolate sections where test pressures exceed local valve operating pressure rating. Fill each section with water, compressed air, or nitrogen and pressurize for the indicated pressure and time.
   2. Notify Architect and local Plumbing Inspector 2 days before tests.
   3. Drainage, Waste and Vent Piping: Test in accordance with governing plumbing code or as follows: Test drainage and venting systems, with necessary openings plugged, to permit system to be filled with water and subjected to a water pressure of a minimum of 5 PSI head. System to hold water without a water level drop greater than 1/2 pipe diameter of largest nominal pipe size within a 24-hour period. Test system in sections if minimum head cannot be maintained in each section. The 5 PSI head to be the minimum pressure at the highest joint.
   4. Water Piping: Eliminate air from system. Fill and test at 125 PSIG or minimum 1-1/2 times static pressure at connection to serving utility main for a period of two hours with no loss in pressure.
   5. Send test results to Architect for review and approval.

B. Testing of Pressurized Systems:
   1. Test each pressurized piping system at 150 percent of operating pressure indicated, but not less than 125 PSIG test pressure.
   2. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 2 percent of test pressure.

C. Test hot and cold domestic water piping systems upon completion of rough-in and before connection to fixtures at a hydrostatic pressure of 125 PSIG.

D. Repair:
   1. Repair piping system sections which fail the required piping test by disassembly and reinstallation, using new materials to the extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.
   2. Drain or purge test water, air, or nitrogen from piping system after testing and repair work have been completed.

3.09 WATER HAMMER ARRESTORS (SHOCK ABSORBERS)

A. Locate shock absorbers in supply pipe in accordance with recommendations of Plumbing and Drainage Institute PDI-WH201. Install ahead of solenoid operated valves. Determine size of absorber by fixture unit value of fixture supplied, using PDI symbols to designate sizes. Provide access panel for each shock absorber.

3.10 ADJUSTING AND CLEANING

A. Piping: Clean piping exterior surfaces. Comply with Section 15250, Insulation, as applicable. Flush out water-filled or drainage piping systems with clean water.

3.11 HOSE BIBB PIPING

A. Provide each hose bibb with an individual accessible shutoff valve (ball type). Locate where shown on Drawings.

3.12 CHLORINATION

A. General: Upon completion of tests and necessary replacements, thoroughly flush and disinfect domestic water piping.

B. Method: After thoroughly flushing system with water to remove sediment, fill system with a solution containing 50 parts per million of chlorine for not less than 24 hours or 200 parts per million of chlorine for not less than 3 hours. After retention, drain, reflush and return system to service.

C. Certification: Provide copy of domestic water chlorination certificate in each operations and maintenance manual.

3.13 PROTECTION

A. Keep pipe openings closed by means of plugs or caps to prevent the entrance of foreign matter. Protect piping, ductwork, fixtures, equipment and apparatus against dirty water, chemical or mechanical damage both before and after installation. Restore to its original condition or replace fixtures, equipment or apparatus damaged prior to final acceptance of the work.

3.14 ACCESS PANELS

A. Install ceiling or wall access panels to provide access to concealed valves, motors, shock arrestors, and other plumbing items needing service. Provide access panels at locations required or as specified herein. Coordinate locations/sizes of access panels with Architect prior to work.

END OF SECTION 15420

SECTION 15440

PLUMBING FIXTURES

PART 1 - GENERAL

1.01 SUMMARY

A. Provide labor, materials, equipment and services necessary to furnish and install a complete plumbing system as shown on the Drawings and specified herein. The work includes, but is not necessarily limited to:
   1. Plumbing fixtures and trim, including rims for sinks and lavatories in casework or counters, chair carriers (as required), drinking fountain, drains, cleanouts, floor sinks, and related fixtures shown on the Drawings.
   2. Rough-in and final connection to equipment and fixtures, relocated or provided under other sections or under other divisions of the work.
   3. Standards and supports for equipment requiring them.
   4. Instructions and maintenance manuals for equipment furnished by this Section.
   5. Electrical: For plumbing trim/fixtures (sensor type faucets/flushometers, and the like, provide, from the 120-volt connection by Division 16 to the plumbing equipment, low voltage electrical connections and wiring as required for complete and operable system. Includes, but is not limited to low voltage electrical raceway, wiring and accessories, such as step-down transformers as necessary for function of sensors and automatic valve and faucet controls. Supply step-down transformers and size wiring as recommended by manufacturer of plumbing equipment requiring low voltage electrical connection.

1.02 SUBMITTALS

A. Product Data in Accordance with Division 1: Manufacturer's specifications, installation and startup instructions, capacity and ratings, with selection indicated. Provide pump performance curves with selection points indicated. Provide specialties and accessories required for a complete and operable installation.

B. Shop Drawings:
   1. Assembly type shop drawings indicating dimensions, weights, required clearances, and methods of assembly of components and anchorages.
   2. Submit For:
      a. Fixtures, see Plumbing Fixture Schedule.
      b. Floor and roof drains.
      c. Trench drains.

C. Wiring Diagrams: Ladder type wiring diagrams for components, indicating required field electrical connections.

D. Maintenance Data: Submit maintenance data and parts list for each item. Include "troubleshooting" maintenance guides. Include this data in maintenance manual.

1.03 PLUMBING FIXTURES

A. General: Provide factory fabricated fixtures of type, style and material indicated on the Plumbing Fixture Schedule on the Drawings. For each type fixture, provide fixture manufacturer's standard trim, carrier, seats, and valves as indicated by their published product information; either as designed and constructed, or as recommended by manufacturer, and as required for complete installation. Where more than one type is indicated, selection is installer's option; but, fixtures of same type must be furnished by a single manufacturer. Where type is not otherwise indicated, provide fixtures complying with governing regulations.
   1. Fixtures: Complete with fittings, supports, fastening devices, faucets, valves, traps, stops and appurtenances required.
   2. Exposed IPS Piping and Tubing: Brass, chrome plated.
   3. Escutcheons: Brass, chrome plated.
   4. Fixture Locations: As shown on Drawings.
   5. Stops: Stops installed in each supply pipe at each fixture accessibly located with wall escutcheons.
   6. Public Lavatories: Provide with flow control device to prevent flow over 0.5 GPM.
   7. Interior Faucets except Public Lavatories: Provide with flow control device to prevent flow over 2.5 GPM.

1.04 DELIVERY, HANDLING AND STORAGE

A. Fixtures: Deliver plumbing fixtures individually wrapped in factory fabricated containers. Handle plumbing fixtures carefully to prevent breakage, chipping and scoring fixture finish. Do not install damaged plumbing fixtures; replace and return damaged units to equipment manufacturer.

PART 2 - PRODUCTS

2.01 FIXTURE TRIM

A. Traps: Provide traps on fixtures except fixtures with integral traps. Exposed traps chromium plated cast brass or 17 gauge chromium plated brass tubing. American Standard, Kohler, Chicago, or approved.

B. Supplies and Stops: First quality, chrome plated with brass stems. Stops: Loose key type. American Standard, Kohler, Chicago, or approved.

PART 3 - EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Fixtures: Examine roughing-in work of potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping and other unsatisfactory conditions for installation of plumbing fixtures.

3.02 FIXTURES INSTALLATION

A. General:
1. Install plumbing fixtures of types indicated where shown and at indicated heights; in accordance with fixture manufacturer's written instructions, roughing-in drawings, and with recognized industry practices. Ensure that plumbing fixtures comply with requirements and serve intended purposes.
2. Set and connect to soil, waste, vent and water piping in neat, finished and uniform manner. Connections to be equal height, plumb and set at right angles to floor, wall or both unless otherwise required or specified.
3. Seal fixtures mounted on floors and walls at abutting joints with approved sealant compounds as directed by Architect.
4. For ADA accessible toilets, provide with actuator at wide portion of stall.
5. Lavatories: Set mixing valves to limit outlet temperature to 110F.

B. Fixture Locations: As shown on Drawings. Center water closets and urinals between privacy partitions unless noted otherwise.

C. Stops: Stops installed in each supply pipe at each fixture accessibly located with stops of loose key type. Concealed stops to be screwdriver or loose key type with wall escutcheons.

D. Fixture Supports:
1. Support wall hung water closets, urinals and lavatories on heavy duty, full size, concealed, commercial grade carriers mounted to floor structure. Refer to Plumbing Fixture Connection Schedule on Drawings.
2. Support other fixtures mounted on stud partitions on heavy concealed wall brackets bolted to a 1/4-inch thick by 5-inch high steel plate anchored firmly to studs with bolts (or welded to metal studs). Plate to extend one stud each way beyond fixture mounting point width.

E. Flushometers: Provide "drop-ear" ells or couplings in wall at water supply outlets to flushometers; anchor firmly to structure.

F. After fixtures are set in place and secured to walls, caulk around between fixtures and wall with white silicone caulking compound. Dow Corning 780, General Electric Construction Sealant, or approved.

G. Set countertop lavatories and stainless steel sink rims in waterproof sealant made for application.

H. Adjust self-closing faucets to provide minimum of 10 seconds of waterflow, and maximum of 15 seconds.

I. After fixture installation is complete, cover and protect rims, fronts and exposed parts until completion of construction phase. Contractor responsible for damage to fixtures and assumes related fixture repair or replacement costs.

J. At ADA accessible drinking fountains/water coolers, set at heights required for ADA compliance. See Architectural Drawings for bi-level fixtures. Provide right/left high/low orientation to match installation. Provide apron/skirt as required.

3.03 FLOOR DRAINS AND FLOOR SINKS

A. General: Install drains in accordance with manufacturer's written instructions and in locations indicated.

B. Coordinate with piping as necessary to interface drains with drainage piping systems.

C. Install floor drains at low points of surface areas to be drained, or as indicated. Set tops of floor drains flush with finished floor. Set floor sinks as required by local codes.

D. Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.

E. Position drains so that they are accessible and easy to maintain.

F. Coordinate drain flashing, flanges and strainer types and depths with floor substrate and topping configuration.

G. Primers:
1. Prime drains which experience intermittent use. Refer to Drawings and coordinate location with Architect. Coordinate with local AHJ for exact requirements.
2. Primer Locations:
   a. Public Restrooms: Primer connection at water closet flushometer tailpiece connects to rear of pipe using chrome-plated piping at exposed locations.
   b. Other Areas: PPP-type trap-priming valve. Do not install primer valves above ceiling. Coordinate trap primer locations with Architect/Engineer. If installed in wall, provide access panel and coordinate exact panel location with Architect.

3.04 ROOF DRAINS/OVERFLOW DRAINS

A. General: Install drains in accordance with manufacturer's written instructions and in locations indicated.

B. Provide 4 lb. lead flashing and coordinate flashing work with work of roofing, waterproofing, and adjoining substrate work.

C. Coordinate with roofing as necessary to interface roof drains with roofing work.

D. Coordinate with storm water piping as necessary to interface drains with drainage piping systems.

E. Install drains at low points of surface areas to be drained.

F. Install drains flashing collar or flange so that no leakage occurs between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.

G. Position drains so that they are accessible and easy to maintain.

H. Set overflow drains at proper elevation relative to main roof drains.

I. Install flexible expansion joints on roof drains which do not have horizontal offsets at storm drainage piping.

3.05 HOSE BIBBS (INSIDE)

A. Install on exposed piping where indicated, with vacuum breaker.

3.06 SILL FAUCETS

A. Install on concealed piping where indicated, with vacuum breaker.

3.07 ADJUSTING AND CLEANING

A. Clean plumbing fixtures, trim, and strainers of dirt and debris upon completion of installation. Adjust water pressure at drinking fountains, faucets, shower valves and flushometers to provide proper flow stream and specified GPM. Repair leaks at faucets and stops.

3.08 EXTRA STOCK

A. General: Furnish special wrenches and other devices necessary for servicing plumbing fixtures and trim to Owner.

3.09 FIELD QUALITY CONTROL

A. Inspection:
   1. Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
   2. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect. Remove cracked or dented units and replace with new units.

3.10 PROTECTION

A. Protect fixtures and equipment from damage. Replace damaged items with new.

END OF SECTION 15440

SECTION 15500

HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

PART 1 - GENERAL

1.01 SUMMARY

A. Work includes but is not limited to the following major items:
   1. Air distribution, heating, cooling, ventilation and exhaust systems.
   2. Equipment used for distribution of air, including fans, motors, controls, control wiring, filters, ductwork, air supply outlets, air return and exhaust inlets.
   3. Sleeves, hangers, flashings, counterflashing and weatherproofing for mechanical equipment.
   4. Combustion air and flues for gas-fired equipment including gas water heaters.
   5. Fire dampers, sleeves, frames, fire/smoke dampers, and control devices.

B. Installation and startup instructions.

1.02 QUALITY ASSURANCE

A. Qualifications: Firms regularly engaged in the manufacture of HVAC equipment, of the types and capacities required.

B. Regulatory Requirements; UL and CSA Compliance: Provide units which are UL and CSA listed.

C. Unless otherwise noted, where the Specification refers to SMACNA in reference to sheet-metal or flexible ductwork accessories, this refers to HVAC Duct Construction Standards, Metal and Flexible, latest edition, as published by SMACNA .

D. Unless otherwise noted, where the Specification refers to SMACNA in reference to fibrous glass ductwork accessories, this refers to Fibrous Glass Duct Construction Standard.

E. Regulatory Requirements - Packaged Air Conditioning Units:
   1. ARI 210/240-2003: Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
   2. ARI 270-95: Sound Rating of Outdoor Unitary Equipment.
   3. NRCA: Provide roof curbs in accordance with NRCA.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, weights (shipping, installed and operating), furnished specialties and accessories, and installation and start-up instructions.

B. Shop Drawings: Submit manufacturer's assembly type shop drawings indicating dimensions, weight loadings, required clearances, methods of assembly of components, location and size of each field connection, arrangement and construction including bussing, and number and type of contactors employed. Submit manufacturer's catalog data on sealer, flexible ducting, vent piping, factory fabricated devices, and factory fabricated duct and fittings.

C. Wiring Diagrams: Submit manufacturer's electrical requirements for power supply to HVAC equipment. Submit manufacturer's ladder type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory installed and portions to be field installed.

D. Maintenance Data: Submit maintenance data and parts list for equipment including control, accessory, and "troubleshooting" maintenance guide. Include this data and product data in maintenance manual.

E. Equipment Start-Up Procedures: Submit equipment start-up procedures for HVAC systems for each piece of equipment. Include completed Start-up Documentation as filled out by the field technician and include this data in the Operations & Maintenance manual.

F. For equipment that is roof mounted or hung from structure, equipment manufacturer to provide, as a shop drawing submittal, details, devices, and the like, required for appropriate equipment mounting. Details and drawings to be stamped by a registered structural engineer in the state of California.

G. Record Drawings: At project closeout, submit Record Drawings of installed ductwork, duct accessories, and outlets and inlets.

1.04 AIR DISTRIBUTION DUCT SYSTEM

A. General: Provide ductwork, including collars, register boxes, fire dampers, exhaust fans, ventilation louvers, roof vents and screens, as well as dampers and other miscellaneous items not specifically mentioned but necessary for a complete installation. Apply the latest standards of SMACNA and ASHRAE with respect to sheet- metal gauge and general construction for round and rectangular ducts.

1.05 DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer's rigging and installation instructions for unloading and installing HVAC equipment.

B. Protect accessories from damage during shipping, storage and handling.

1.06 GUARANTY

A. General: Provide written guaranty on HVAC work, agreeing to replace/repair inadequate and defective materials and quality of work, including leakage, breakage, improper assembly and failure to perform as required for a period of 1 year from date of Owner's acceptance. Include separate product warranties as indicated (if any) for specific parts or products in the work. Provide guaranty signed by both the installer and Contractor.

B. Include manufacturer's standard product warranty, covering HVAC equipment operation under normal conditions and use, where installed, operated and maintained in accordance with manufacturer's instructions. Provide product warranty period terminating 12 months after final acceptance, by Owner, of the project.

PART 2 - PRODUCTS

2.01 FANS

A. See section 15860.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine areas and conditions under which HVAC equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 VERIFICATION OF CONDITIONS

A. Examine areas and conditions under which equipment and air terminals are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.03 VIBRATION AND ISOLATION APPLICATION

1. Install flexible duct connections at fan unit intakes, fan unit discharges, and wherever else shown on Drawings.
2. Isolate miscellaneous pieces of mechanical equipment, i.e., storage tanks, and expansion tanks from the building structure by NP or HN isolators.
3. Under no circumstances destroy isolation efficiency by bolting the isolators to the roof or floor or equipment. If bolting is necessary, provide rubber grommets and washers to isolate the bolt from the base plate.
4. Hot and Cold Plumbing Pipes: Isolate hot and cold water piping in plumbing chases and walls behind plumbing fixtures, which are adjacent to occupied areas, from the structure by a piping isolator, Cush-A-Strip S-716, or a 6-inch section of 3/8-inch thick foamed plastic between the hanger and pipe. Contractor's Option: Acousto-Plumb System using plastic bushings.
5. Pipe and Duct Hangers in Equipment Rooms: Support water, gas piping and ducts connected to rotating equipment within the equipment rooms on spring and neoprene hangers. The first three hangers from a piece of vibrating equipment to have a minimum of 1/2 the static deflection of that of the equipment isolators. Other isolators should have a minimum of 1/4 the static deflection of that of the equipment.

B. Drain Service Piping Connected to Vibration Isolated Equipment: Do not contact the building structure or other nonisolated system unless it is resiliently mounted as described above.

3.04 VIBRATION ISOLATION EQUIPMENT INSTALLATION

A. General: Install vibration isolation equipment in accordance with the manufacturer's written instructions.

B. Isolation Mounts:
1. Squarely align vibration isolators above or below mounting points of the supported equipment.
2. If a housekeeping pad is provided, install isolators such that they bear on the housekeeping pad and the isolator base plate rests entirely on the pad.
3. Connect hanger rods for vibration isolated support to structure. Provide intermediate members as necessary.
4. Position vibration isolation hanger elements as high as possible in the hanger rod assembly but not in contact with the building structure. Install hangers so that the hanger housing may rotate a full 360 degrees about the rod axis without contacting any object.
5. Where parallel running pipes are hung together on a trapeze which is isolated from the building, provide isolator deflections for the largest determined by provisions for pipe isolation. Do not mix isolated and nonisolated pipes in the same trapeze.
6. Install resiliently isolated pipes such that they do not contact any rigid building structure or equipment.

7. Install FSNTL isolators such that the installed and operating heights of vibration isolated equipment is identical. Install limit stops so that they are out of contact during normal operation.
8. Adjust leveling bolts and hanger rod bolts so the isolated equipment is level and in proper alignment with connecting ducts or pipes.

C. Boiler Stack: Provide a corrugated metal connector designed for the temperature and corrosive nature of the boiler stack. Must allow an offset of 1/4 inch. Universal Metal Hose Co. Type U190.

3.05 VIBRATION ISOLATION EQUIPMENT SCHEDULE

A. Provide vibration isolation component deflections as a minimum per the following:
Belt-Driven Equipment:

Motor Size Horsepower	Installation Above Grade	Installation at Grade or Below
5 - 10	3/4 inch	3/4 inch
40 - 75	2 inches	1-1/2 inches

Direct-Driven Equipment:

Motor Size Horsepower	Installation Above Grade	Installation at Grade or Below
5 - 20	3/4 inch	3/4 inch

B. Schedule:

Equipment:	Type:
Fans	FDC
Piping, ducts, flues	HSN

3.06 DUCTWORK INSTALLATION

A. Install ductwork in strict conformance with SMACNA standards and comply with CMC requirements.

B. Erect ductwork true to dimensions indicated, straight and smooth on inside with neatly finished joints lapped in direction of air travel. Properly brace and reinforce ducts with steel angles or members.

C. Elbows: Standard centerline radius to equal 1-1/2 times width of duct.

D. Install single thickness turning vanes in square throat rectangular elbows and in tees. Provide 3/4-inch trailing edge on turning vanes, turned slightly past parallel to the duct.

E. Duct sizes shown on Drawings are net inside dimensions.

F. Locate access doors in ductwork as required for service of fire dampers, automatic dampers and other items requiring maintenance or inspection.

G. Duct Hangers and Supports:
   1. Hang rectangular sheet-metal ducts with a cross sectional area of less than 7 sq.ft. with galvanized strips of No. 16 USS gauge steel 1 inch wide, and larger ducts with steel angles and adjustable hanger rods similar to piping hangers. Support at 8 feet on center, as detailed.
   2. Anchor ducts securely to building in such a manner as to prevent transmission of vibration to structure. Do not connect duct hanger straps to roof deck. Do not support ducts from other ducts or piping.
   3. For round sheet-metal ducts, provide duct support in accordance with SMACNA Guidelines. Verify type of building construction.
   4. Attach strap hangers installed flush with end of sheet-metal duct run to duct with sheet-metal screws.

H. Joints:
   1. Seal joints in sheet-metal ducts in concealed locations (i.e., enclosed ceiling spaces) with Hardcast joint sealant system applied in accordance with manufacturer's recommendations, or use Ductmate type joints.
   2. To Connect Sheet-metal Ductwork to Fiberglass Ductboard: Hardcast only.
   3. Standard gray duct tape not allowed.

I. Do not install duct stiffeners on interior (air side) of unlined ductwork; install on exterior only or on interior of ductwork with duct liner.

J. Flexible Duct Installation:
   1. Provide round neck grilles/diffusers or square-to-round transitions. No flex duct connections directly to square neck allowed.
   2. Flex duct allowed only for vertical drops to diffusers. Maximum offset angle from vertical: 30 degrees.
   3. Approved for use on supply ducts only; not allowed for return or exhaust.
   4. Minimum length 2 feet, maximum length 5 feet, unless noted otherwise.
   5. Flex duct allowed in concealed spaces only.
   6. Install with bend radius no less than three duct diameters.

K. Paint inside surface of bare ductwork which is visible through face of grilles with flat black paint for ceilings 12 feet and lower.

L. Standby Generator Connections: Provide complete discharge air ductwork system as shown on Drawings, including flexible duct boot. Connect full size to louvers in exterior wall. Verify exact generator connection size with equipment supplier.

M. Mounting for Sidewall Grilles and Registers:
   1. Mounting heights indicated on Drawings from finish floor to lower edge of grille or register. Exception: If note on Drawings states for example "Down 6 inches," this indicates measurement from ceiling to top edge of grille or register.
   2. Install sidewall return air grilles for "sight-tight" visibility at eye level (position blades to obscure visibility from floor level).

N. Transitions: Where transitions are required in metal or fiberglass ductwork, horizontal and vertical angles forming transition not to exceed 30 degrees. Provide supply and return air transitions at AC unit connections. Plenum connections not allowed at AC unit inlet and outlet.

O. Grille and Exposed Duct Cleaning:
   1. After completion of ductwork installation, operate each fan system (excluding exhaust fans) for a minimum of 30 minutes prior to installation of ceiling grilles and diffusers. After grilles and diffusers are installed, clean out accumulation of particles from grilles and diffusers prior to acceptance.

2. Clean exterior surface of ducts exposed to public view of chalk, pencil and pen marks, labels, sizing tags, dirt, dust, and the like, so that upon completion of installation, ducts are left in clean and unblemished manufactured condition.

P. Seismic Restraint: Brace ductwork and HVAC equipment against lateral movement as detailed in document "Seismic Restraint Manual Guidelines for Mechanical Systems" as published by SMACNA.

Q. Limitations: Do not run ductwork within confines of electrical rooms, elevator shafts or elevator equipment rooms except those ducts specifically serving only such rooms.

R. Duct Access Doors:
1. Install where shown and required by SMACNA. Provide on the reset side of fire dampers and adjacent to duct mounted automatic dampers. Install per manufacturer's recommendations.
2. Where access doors are for service of fire or smoke dampers, stencil the words "Fire Damper" or "Smoke Damper" in 1/2-inch-high capital letters on the outside of the door.

S. Volume Dampers: Provide in main duct branches where shown and in branch ducts serving air inlets and outlets.

T. Air Outlets and Inlets:
1. Install grilles, registers, and diffusers per manufacturer's instructions. Locate and size openings through finished surfaces to provide complete coverage of rough openings by integral device flanges or auxiliary frames.
2. Paint exterior of devices per color selected by Architect.
3. Coordinate duct connections with device final dimensions. Provide square to round adapters where required for connection to round ducts.
4. Adjust the throws of air outlets to eliminate drafts.

3.07 EQUIPMENT INSTALLATION

A. Secure fans to curb with lag bolts on each side. Seal with mastic. Mount level.

B. Equipment:
1. General: Install in accordance with manufacturer's installation instructions, plumb and level, firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.
2. Controls: Furnish field installed automatic temperature control requirements as indicated.
3. Manufacturer's Supervision: Equipment manufacturer supervises field assembly (if any) and installation of equipment work, with factory trained technical service representative. Prepare manufacturer's written report of installation and testing, signed by representative.
   a. Include leak testing, evacuation, dehydration, vacuum pumping, and charging in scope of supervision by manufacturer's representative.
   b. Include lubrication, including filling of reservoirs, and confirm that lubricant is of quantity and type recommended by manufacturer in scope of supervision by manufacturer's representative.
   c. Paint damaged or abraded factory finish with touch up paint matching factory finish.
   d. Grounding: Provide positive electrical equipment ground for HVAC equipment and components where indicated.

4. Start up equipment in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
   a. Do not place equipment in sustained operation prior to initial balancing of mechanical systems.
   b. Furnish sufficient refrigerant and dry nitrogen for pressure testing under manufacturer's supervision.

3.08 TRAINING OF OWNER'S PERSONNEL

A. Provide services of manufacturer's technical representative for 4 hours to instruct Owner's personnel in operation and maintenance of equipment provided under this Section. Schedule training with Owner; provide at least a 7-day notice to Owner and Architect of training date.

3.09 CLEANING

A. Clean exposed factory finished surfaces.

3.10 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES

A. Provide proper sizing when providing sleeves or core-drilled holes to accommodate the penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet the requirements of ASTM E814.

B. Manufacturers: Hilti, Proset, or approved.

3.11 FACTORY TESTING

A. Test equipment at the factory prior to shipping.

3.12 FIELD QUALITY CONTROL

A. Terminal Units: Upon completion of installation and prior to initial operation, test and demonstrate that air terminals and duct connection to air terminals are leaktight. Repair or replace air terminals and duct connections as required to eliminate leaks, and retest to demonstrate compliance.

END OF SECTION 15500

SECTION 15860

FANS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included: Materials, installation, and testing of fans used for ventilation and exhaust service.

1.02 SUBMITTALS

A. Submit manufacturer's catalog data, fan curves with operating points indicated, spare parts list, operation and maintenance manuals, and test reports for each type and size of fan.

B. Submit sound power levels for fan inlet and outlet at operation points.

PART 2 - PRODUCTS

2.01 INLINE CABINET FANS

A. Type: Duct mounted inline cabinet fan with belt-drive manufactured by Greenheck, Carnes, Cook, Penn, ILG, Breidert, Acme, JencoFan, or approved.

B. Unit Casing: Fabricated of heavy gauge steel, reinforced and braced with steel angle framework, for maximum rigidity. Factory assembled, sectionalized casing.
   1. Removable panels in fan access to internal parts.
   2. Casings and accessories given a protective enamel finish. Metal parts of units chemically cleaned, phosphatized and coated with baked enamel finish. Fan cabinet should be lined with 1 inch thick, 1.5 lbs./cu.ft. density glass fiber lining.
   3. Duct collars at fan discharge are an integral part and extension of fan housing.

C. Fan: AMCA rated, nonoverloading, forward curved, multi-blade centrifugal type, and statically and dynamically balanced and tested after being installed on properly sized hollow or solid shafts. Fan shafts not to pass through their first critical speed as unit comes up to rated RPM. Permanently lubricated bearings with 200,000 hour minimum life.

PART 3 - EXECUTION

3.01 INSTALLATION

A. See plans for details.

END OF SECTION 15860

SECTION 15890

DUCTWORK

PART 1 - GENERAL

1.01 SUMMARY

A. Materials, installation and testing of HVAC ductwork and accessories, including the following:
   1. Heating and air conditioning supply return systems.
   2. Exhaust systems.

1.02 QUALITY ASSURANCE

A. Unless otherwise noted, where the Specification refers to SMACNA in reference to sheet metal or flexible ductwork, this refers to HVAC Duct Construction Standards, Metal and Flexible, latest edition, as published by SMACNA.

B. Unless otherwise noted, where the Specification refers to TIMA in reference to fiberglass ductwork, this refers to Fibrous Glass Duct Construction Standards, latest edition, as published by TIMA.

C. Provide duct systems per CMC, latest edition, and referenced standards.

D. Have available at the project field office a copy of the referenced standards.

1.03 SUBMITTALS

A. Provide shop drawings for duct materials, flues.

B. Submit duct pressure testing reports. Provide individual reports for each AHU duct system.

1.04 AIR DISTRIBUTION DUCT SYSTEM

A. General: Ductwork, including collars, register boxes, fire dampers, exhaust fans, ventilation louvers, roof vents and screens, as well as dampers and any other miscellaneous items not specifically mentioned but necessary for a complete installation. Apply the latest standards of SMACNA and ASHRAE with respect to sheet-metal gauge and general construction for round and rectangular ducts.

PART 2 - PRODUCTS

2.01 GALVANIZED SHEET-METAL DUCTWORK

A. General: CMC Duct Construction Standards, latest edition, or latest edition of ASHRAE Guide Table. 1-1/2 ounce galvanizing per square foot, both sides.

2.02 FLEXIBLE DUCTS

A. General: Comply with CMC, latest edition, Class 0 or Class 1.

B. Standard factory fabricated product, construct an inner wall of impervious vinyl or chlorinated polyethylene, permanently bonded to a vinyl or zinc-coated spring steel helix. Cover the assembly with fiberglass blanket insulation covered by an outer wall of vinyl or fiberglass-reinforced metalized vapor barrier. UL 181 listed Class 1 flexible air duct material. Overall thermal transmission no more than 0.25 (BTU/in)/(hr/sq.ft./deg. F) at 75F differential, per ASTM C335. Vapor transmission value no more than 0.10 perm, per ASTM E96. Rated for a minimum of 4-inch w.g. positive pressure and 1-inch w.g. negative pressure.

C. Air friction correction factor of 1.3 maximum at 1000 FPM. Working air velocity of at least 2000 FPM. Flame spread rating no more than 25. Smoke development rating no more than 50 as tested per ASTM E84. Must have cataloged data on insertion loss characteristics, minimum attenuation of 29 DB for 10-foot straight length at 8-inch diameter and 500 Hz.

D. Manufacturers: J. P. Lamborn Co., Norflex, Clevaflex, Genflex, Atco, Flexmaster, Thermaflex, or approved.

2.03 FACTORY FABRICATED METAL ROUND AND FLAT OVAL DUCTWORK

A. General: Provide per CMC Duct Construction Standards, latest edition, and ASTM A527 Class 0. Round sheet metal, spiral lock seam type. Fittings: Same construction as the duct. Tap in fittings not allowed. Duct sealer: Specifically formulated for sealing field joints for round spiral lock-seam duct systems.

2.04 SHEET-METAL DUCT SEALER

A. Hardcast "Duct-Seal 321" or United McGill. Indoor/outdoor, low VOC (<80 grams/liter), water based with fiber reinforcement.

2.05 PREFABRICATED DUCT JOINTS

A. Manufactured flanged traverse rectangular and round duct joints.

B. Manufacturers: Ductmate, Mez, Ward Duct Connectors, Lockformer TDC, or approved.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The duct layout shown on the Contract Drawings is diagrammatic in nature. Coordinate the ductwork routing and layout, and make alterations to the ductwork routing and layout as required to eliminate physical interferences. Where deviations in the ductwork routing as shown in the Contract Drawings are required, such alterations not to compromise the air flow, pressure drop, and sound characteristics of the duct fitting or run as shown on the Contract Drawings. Make such determination by Architect. In the event Architect determines that the installed ductwork is inconsistent with the above mentioned criteria, remove and replace at no additional cost to the Owner.

B. Install ductwork in the location and manner shown and detailed. Review deviations required by job conditions with Architect prior to any fabrication. Provide fittings construction per SMACNA.

C. Connect duct assemblies such as ductwork, plenums, etc., and operating machines or mechanisms such as fans, air conditioners, etc., with flexible connections per Section 15240, Mechanical Equipment Sound, Vibration and Seismic Control.

D. Fabricate radius elbows with centerline radius not less than 1-1/2 duct diameters.

E. Do not install duct size transition pitch angles which exceed 30 degrees for reductions in duct size in the direction of airflow, and 15 degrees for expansions in duct size in the direction of airflow.

F. Install single thickness turning vanes in square throat rectangular elbows and in tees. Provide 3/4-inch trailing edge on turning vanes, turned slightly past parallel to the duct.

G. Duct sizes indicated are free inside dimensions including where internal lining is shown.

H. Provide galvanized sheet-metal duct material for ducts unless otherwise indicated or specified.

I. Provide temporary closures of open ducts during construction to prevent dust and debris from entering the system.

J. Flexible Duct:
1. Install flexible duct with bend radius equal to 1.5 times the diameter. Minimum length 2 feet. Maximum length 5 feet, unless noted otherwise.
2. Provide round neck grilles/diffusers or square-to-round transitions. No flex duct connections directly to square neck allowed.
3. Flex duct allowed only for vertical drops to diffusers. Maximum offset angle from vertical: 30 degrees.
4. Approved for use on supply ducts only; not allowed for return or exhaust.
5. Flex duct allowed in concealed spaces above lay-in ceilings only.

K. Fabricate ductwork and sheet metal work of prime grade, lock forming quality steel in accordance with the current issues of the ASHRAE "Guide" and SMACNA standards and installed in strict conformance with SMACNA standards.

L. Submit shop drawings for approval for ductwork. Ductwork to be sheet metal unless specifically authorized as ductboard or other material.

M. Construct ductwork for 2-inch pressure class.

N. Round spiral duct and fittings or where required due to available clearances, use flat oval ductwork and fittings upstream of terminal units manufactured by United Sheet Metal, Rolok or approved in accordance with ASTM A527.

O. Seal joints and seams in supply, exhaust, and return air ductwork and plenums.

P. Fabricate ductwork and plenums with a smooth inside surface and support and brace to prevent sagging and vibration at any time. Provide galvanized steel angles for reinforcing and bracing.

Q. Joints:
1. Carefully cut and trim joints and seams in fabricated ducts and fitting to form a closed joint with no portion of the duct or fitting protruding into the air stream.
2. Seal joints in sheet-metal ducts in concealed locations (such as enclosed ceiling spaces) with Hardcast joint sealant system applied in accordance with manufacturer's recommendations, or use Ductmate-type joints.
3. Seal joints in sheet-metal ducts in exposed locations with sealant system applied in accordance with manufacturer's recommendations. Wipe off excess sealer on duct to give a clean finish, or use Ductmate-type joints.
4. To connect sheet-metal ductwork to fiberglass ductboard, use Hardcast only.
5. Standard gray duct tape not allowed.

R. Fasteners such as sheet-metal screws, machine screws or rivets to be cadmium plated.

S. Crimp flat duct surfaces diagonally or beaded regardless of size, unless acoustically lined.

T. Fabricate duct size transitions with a slope of not more than 1 foot to 5 feet where possible, but in no case more than 1 foot in 3 feet.

U. Fabricate duct turns with the inside (smallest) radius at least equal to the duct width. Where necessary, square elbows may be used, with maximum available inside radius and with fixed single thickness curved vanes, with trailing edge extended 3/4 inch.

V. Provide flexible connectors at connections to equipment, in ducts crossing building expansion joints and may be used at connections of dissimilar metals. Flexible Connections: Minimum 16 ounce airtight "Ventglass" noncombustible fabric with fire retardant neoprene coating on outside, fastened with bolted galvanized steel bands. Maintain a minimum 1-inch space between the connecting surfaces.

W. Duct Hangers and Supports:
1. Hang rectangular sheet-metal ducts with a cross sectional area of less than 7 sq.ft. with galvanized strips of No. 16 USS gauge steel 1 inch wide, and larger ducts with steel angles and adjustable hanger rods similar to piping hangers. Support at 8 feet on center, as detailed.
2. Anchor ducts securely to building in such a manner as to prevent transmission of vibration to structure. Do not connect duct hanger straps to roof deck. Do not support ducts from other ducts or piping.
3. For round sheet-metal ducts, provide duct support in accordance with SMACNA Guidelines. Verify type of building construction.
4. Attach strap hangers installed flush with end of sheet-metal duct run to duct with sheet-metal screws.
5. Do not install duct stiffeners on interior (air side) of unlined ductwork; install on exterior only or on interior of ductwork with duct liner.
6. Seismic Restraint: Brace ductwork against lateral movement as detailed in document "Seismic Restraint Manual Guidelines for Mechanical Systems" as published by SMACNA.

X. Ductwork not to be supported from the roof deck. Hang ducts from beams, joists or supplementary structural members provided by Contractor. Do not hang ductwork from joist bridging or from other ducts.

Y. Although not necessarily indicated on the Drawings, provide turning vanes at mitered elbows, opposed blade balancing dampers with locking quadrants at branch ducts, volume extractors and any other applicable devices necessary for minimum duct resistance and proper system air balancing. Sufficiently stiffen dampers to prevent noise or vibration and in no case be lighter than 20 gauge steel. Provide with accessibly located adjuster, manufactured by Young Regulator Co., Parker Kalon Corporation, or approved.

Z. Construct exterior ductwork or ductwork which is otherwise exposed to weather watertight.

AA. Increase the size of sheet-metal ducts as required to accommodate insulation lining.

BB. Locate access doors in ductwork as required for service of fire dampers, automatic dampers and other items requiring maintenance or inspection.

CC. Paint inside surface of bare ductwork which is visible through face of grilles with flat black paint for ceilings 12 feet and lower.

3.02 DUCTWORK PRESSURE TESTING

A. Provide air pressure testing of concealed ductwork systems (testing is not required for ductwork exposed to air conditioned space). Test ductwork prior to connection to fan equipment. Repair leaks and retest until stipulated results are achieved.
   1. Test at positive static pressure for 5 minutes with maximum air leakage not to exceed 1 percent of rated flow.
   2. Testing machine: Meet requirements of SMACNA standards. Pacific Air Products "Port-O-Lab," Rolok, United Sheet Metal, or approved.
   3. Test supply systems prior to connecting VAV boxes.
   4. Perform tests in the presence of Owner's Representative. Give 48 hours advance notice before commencement of each test.
   5. Test ductwork systems in sections as large as possible and record test results according.
   6. Coordinate testing with ceiling installation.
      a. Provide sheet-metal plates and install between each duct test section (applies to main-to-main fittings, branch-to-branch fittings and main-to-branch fittings). At each plate location, fabricate joint with Ductmate. Insert 14 gauge sheet metal between Ductmate using a neoprene gasket on both sides of metal plate.
      b. Leave plates in place until isolated section has been tested and approved by Owner's Representative.
      c. Once sections have passed test, remove plates and reattach Ductmate joints. After fan unit is running, test joint for leakage by using a mixture of soap and water. If any noise or bubbling occurs, reseal joint. Owner's representative to witness this procedure.
   7. Test duct at 1-1/2 times the design air pressure. Seal any audible leaks.

3.03 GRILLE AND EXPOSED DUCT CLEANING

A. After completion of ductwork installation, operate each fan system (excluding exhaust fans) for a minimum of 30 minutes prior to installation of ceiling grilles and diffusers. After grilles and diffusers are installed, clean out accumulation of particles from grilles and diffusers prior to acceptance.

B. Clean exterior surface of ducts exposed to public view of chalk, pencil and pen marks, labels, sizing tags, dirt, dust, etc., so that upon completion of installation, ducts are left in clean and unblemished manufactured condition.

C. Exposed duct and grilles shall remain free of dust entrained streaks due to leakage at joints and grille connections during warranty period. Clean leaks, seal and refinish to match existing if visible streaks develop.

END OF SECTION 15890

SECTION 15910

DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included: Materials, installation, and testing of HVAC duct accessories such as volume dampers, splitter dampers, adjustable deflectors, duct access doors, backdraft dampers, fire dampers, duct silencers, spin-in fittings, and smoke dampers.

1.02 QUALITY ASSURANCE

A. Provide fire dampers in conformance with the requirements of Fire Damper and Heat Stop Guide for Air Handling Systems, as published by SMACNA.

1.03 SUBMITTALS

A. Submit manufacturer's catalog data and fabrication/installation drawings for each factory fabricated duct accessory.

PART 2 - PRODUCTS

2.01 DAMPERS

A. Volume Dampers (VD):
   1. Construct of galvanized sheets not lighter than 18 gauge, reinforced to prevent vibration, equipped at both ends with brass bearing mounts and of sufficient length to provide a complete shutoff of the duct.
   2. Provide each damper with an adjustment and locking quadrant device manufactured by Young Regulator Co., No. 403 operator for accessible locations, or No. 315 for nonaccessible locations. Ventlock, or approved. Provide operating rod and attaching devices as required for No. 315 operator. Provide Young Regulator No. 443 or 443B raised platform for insulated duct.

B. Register Dampers: Dampers utilized with grilles. Opposed blade dampers utilizing a side operated worm drive which provides external duct operation. Slot the end of the shaft to receive a screwdriver. Factory assembled side operator. Construct of the same material as the grille. Manufacturers: Same as grilles and diffusers. Provide Young Regulator 443 or 443B raised platform for insulated duct.

C. Backdraft Dampers: All welded 14 gauge aluminum, with blades pivoting off center, double crimped front and rear, polyurethane seals. Link blades to work in unison, pivoting in ball bearings, and provide adjustable counterweights attached to the blades. . Blades start to open at 0.05-inch APD - 55 FPM. Blades fully open at 0.06-inch APD - 680 FPM. Frames: Channel type with flanges to facilitate mounting. Manufacturers: Louvers & Dampers, Ruskin, Cesco, Greenheck, Prefco, or approved.

2.02 ADJUSTABLE DEFLECTORS

A. Adjustable deflectors and adjustable turning devices for diverting airflow from a main duct into a branch duct: Multiblade assembly hinged at one end and so constructed that, as it is closed, the air passage between the blades narrows until no air passage remains when the assembly is in the fully closed position.

B. Construct of the same material as the ductwork in which they are installed.

C. Manufacturers: Titus, Aero-Dyne, or approved.

2.03 DUCT ACCESS DOORS

A. Gasketed, hinged or removable, rated for operating pressure. Ductmate "Sandwich" for rectangular ductwork or "Metu" for round ductwork, or approved.

PART 3 - EXECUTION

3.01 VOLUME DAMPERS

A. Provide in main duct branches where shown. Provide in branch ducts serving air inlets and outlets.

B. Locate dampers as close to trunk or main branch as possible.

3.02 DUCT ACCESS DOORS

A. Install where shown and required by SMACNA. Provide on the reset side of all fire dampers and adjacent to duct mounted automatic dampers. Install per manufacturer's recommendations.

B. Where access doors are for service of fire or smoke dampers, stencil the words "Fire Damper" or "Smoke Damper" in 1/2-inch high capital letters on the outside of the door.

END OF SECTION 15910

SECTION 15940

AIR OUTLETS AND INLETS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included: Materials, installation, and testing of HVAC outlets and inlets.

1.02 QUALITY ASSURANCE

A. Components: Tested, rated and certified per Air Diffusion Council procedures.

B. Air Movement and Control Association Int'l (AMCA) Compliance: Test and rate louvers in accordance with AMCA 500, "Test Method for Louvers, Dampers and Shutters." Provide louvers bearing AMCA Certified Rating Seal.

1.03 SUBMITTALS

A. Manufacturer's catalog data on each of the following:
   1. Type of register, diffuser, grille, frame, louver, and dampers.
   2. Schedule of air outlets and inlets indicating drawing designation, model number and accessories furnished.
   3. Louvers: Performance data indicating face area, free area velocity, and corresponding pressure drop and water penetration data.

PART 2 - PRODUCTS

2.01 GRILLES, REGISTERS, DIFFUSERS

A. Subject to compliance with requirements, provide products of one of the following.

B. Provide 1-, 2-, 3-, or 4-way deflection as indicated.

C. Register Dampers: Dampers utilized with grilles. Opposed blade dampers utilizing a side operated worm drive which provides external duct operation. Slot the end of the shaft to receive a screwdriver. Factory assembled side operator. Construct of the same material as the grille. Manufacturers: Same as grilles and diffusers.

D. Coordinate mounting frames with construction types per finish schedule.

E. Performance: Provide components that have velocity, throw and drop, and noise criteria ratings for each size device as listed in manufacturer's current standard literature, which are plus or minus 10 percent of the components as listed in the Diffuser, Register and Grille Schedule, or as specified herein.

F. Manufacturers: Agitaire, Air Concepts, Anemostat, Carnes, Connor, Environmental Air Products, Hart & Cooley, J&J Register, Krueger, Metalaire, Nailor, Price Co, Shoemaker, Titus, Tuttle & Bailey, Seiho.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install grilles, registers, and diffusers per manufacturer's instructions. Locate and size openings through finished surfaces to provide complete coverage of rough openings by integral device flanges or auxiliary frames.

B. Paint exterior of devices per color selected by Architect.

C. Coordinate duct connections with device final dimensions. Provide square to round adapters where required for connection to round ducts.

D. Adjust the throws of air outlets to eliminate drafts.

END OF SECTION 15940

SECTION 15990

TESTING, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included: Materials, equipment and labor required for testing, adjusting, and balancing work required by this Section, including air, hydronic systems, and associated equipment and apparatus. The work consists of setting speed and volume (flow) adjustments, recording data, conducting tests, preparing and submitting reports, and recommending modifications to work as required.

1.02 SCOPE OF WORK

A. Testing, adjusting, and Balancing (TAB) of the air conditioning systems and related ancillary equipment will be performed by a certified third party independent of the Contractor who specializes in testing, adjusting, and balancing of heating, ventilating, air-moving equipment and hydronic systems and has a minimum of 5 years experience in this specialty.

B. Make changes or replacements to the sheaves, belts, dampers, valves, etc. required for the correct balance as advised the TAB Firm, at no additional cost to the Owner.

C. The Drawings and Specifications indicate valves, dampers, and miscellaneous adjustment devices for the purpose of adjustment to obtain optimum operating conditions, and it will be the responsibility of the Contractor to install these devices in a manner that will leave them accessible and readily adjustable. Should any such device not be readily accessible, provide access as requested by the TAB Firm. Correct equipment malfunction encountered during the balancing process.

D. Complete TAB services prior to Owner occupancy.

1.03 QUALIFICATIONS

A. Perform work of this Section by a firm certified by National Environmental Balancing Bureau (NEBB) or Associated Air Balance Council (AABC).

B. Do work of this Section under the direct supervision of a person who has passed written and practical NEBB or AABC examinations for testing, adjusting, and balancing of air and hydronic systems.

1.04 QUALITY ASSURANCE

A. Codes and Standards:
   1. NEBB Compliance: Comply with NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" as applicable to mechanical air and hydronic distribution systems, and associated equipment and apparatus; or comply with AABC's Manual MN-1, "AABC National Standards," as applicable to mechanical air and hydronic distribution systems, and associated equipment and apparatus.
   2. Industry Standards: Comply with ASHRAE recommendations pertaining to measurements, instruments, and testing, adjusting and balancing, except as otherwise indicated.

B. Personnel: TAB personnel used on the project will be employees of the Test and Balance Agency. Perform TAB work under the direct supervision of the NEBB or AABC Certified Test and Balance Supervisor.

C. Instrumentation:
1. List in balance report instrument description, serial number, and date of calibration.
2. Use instruments calibrated no longer than 1 year prior to report submission.

1.05 SUBMITTALS

A. Procedures: Submit certified test reports, signed by TAB supervisor who performed TAB work.

B. Qualification Statements: Submit company's certification documents including Contractor Certification and Supervisor certification.

C. Report Forms:
1. Submit copies of report forms to Architect within 30 days of award of the Contract by Owner prior to commencement of testing and balancing work at the site.
2. Provide 8-1/2- by 11-inch paper for looseleaf binding, with blanks for listing the required test ratings and for certification of report.
3. Submit reports on forms similar in content to standard AABC or NEBB test forms.
4. Submit final test and balance report. Include Record Drawings with terminal codes for cross-reference with the Submittal, such that terminals referenced in the Submittal are easily located on the Drawings.
5. Include identification and types of instruments used, and their most recent calibration date.
6. Submit resume data on person who is to directly supervise testing, adjusting and balancing work.

D. Maintenance Data: Include copies of balancing report and identification of instruments in maintenance manuals.

E. NEBB or AABC Certificate: At time of submittal of forms, submit NEBB or AABC certification form for review.

1.06 WARRANTY

A. TAB Agency provides warranty for a period of 90 days following submission of completed report, during which time, Owner may request a recheck of up to 10 percent of total number of terminals, or resetting of any outlet, coil, or device listed in the final TAB report.

B. Warranty shall meet the requirements of the following programs:
1. AABC – National Project Performance Guarantee
2. NEBB – Conformance Certification

PART 2 - PRODUCTS

2.01 PATCHING MATERIALS

A. Ductwork and Housings: Use plastic plugs with retainers to patch drilled holes.

2.02 INSTRUMENTS

A. Utilize test instruments and equipment as recommended in the following:
   1. NEBB's Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.
   2. AABC's Manual MN-1, "AABC National Standards."

PART 3 - EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Perform TAB work with doors, closed windows, and ceilings installed, etc., to obtain simulated or project operating conditions. Do not proceed until systems scheduled for testing, adjusting and balancing are clean and free from debris, dirt and discarded building materials.

B. Verify the following:
   1. Equipment is operable and normal condition.
   2. Temperature control systems are installed complete and operable.
   3. Final filters are clean and in place.
   4. Duct systems are clean of debris.
   5. Fan rotation is correct.
   6. Dampers are in place and open.
   7. Access doors are closed.
   8. Air outlets are installed and connected.
   9. Hydronic Systems have been flushed, filled, and vented.
   10. Correct pump rotation.
   11. Proper strainer baskets are clean and in place.
   12. Service and balance valves are open.
   13. Any conditions affecting system operation, such as open doors, adjacent pressurized areas, and the like, are in final operating conditions prior to testing and balancing.

C. Report any defects or deficiencies noted during performance of services to Architect and Commissioning Agent. Promptly report abnormal conditions in Mechanical Systems or conditions which prevent system balance.

D. Automatic Temperature Control Systems:
   1. Set and adjust automatically operated devices to achieve required sequence of operations. Coordinate with the automatic temperature control supplier. Do not proceed without his representation.
   2. Verify controls for proper calibration and correct as necessary.

3.02 TEST HOLE LOCATIONS

A. Install test holes at the inlet and outlet of air handling unit fans, exhaust fans, utility fans, and the like, and elsewhere as required to facilitate traverses and to test the air systems. Plug holes when finished. Install test holes in air handlers to obtain test data for each component.

3.03 AIR SYSTEM PROCEDURE

A. Adjust air handling and distribution systems to provide required or design supply, return, outside, and exhaust air quantities.

B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.

C. Measure air quantities at air inlets and outlets. Log shows each successive test.

D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.

E. Use volume control devices to regulate air quantities only to the extent that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.

F. Vary total system air quantities by adjustment of fan speeds. Vary branch air quantities by damper regulation.

G. Adjust fans to deliver within 5 percent of specified flow. Adjust air outlets and inlets to within 10 percent of specified flow. Adjust to obtain balance with minimum fan speed possible.

H. Adjust fan for variable air volume systems with terminal units at 50 percent cooling airflow, opening terminal units at end of controlling duct run to achieve fan flow specified. Report final duct static pressure setpoint and supply fan and exhaust/return fan VFD speeds and frequencies.

I. Adjust outside air to fans as scheduled. Measure outside air for variable air volume fans at full flow. Adjust belt driven fan speeds to obtain necessary flow with variable frequency drive at 60 Hertz.

J. Adjust relief exhaust fans on variable air volume systems to maintain a positive building static pressure of 0.05 inch w.c. Verify and document calibration of building static pressure sensors.

3.04 EXHAUST FAN TESTING

A. Location

B. Manufacturer.

C. Model.

D. Airflow, specified and actual.

E. Total external static pressure, specified and actual.

F. Inlet pressure.

G. Discharge pressure.

H. Fan RPM.

3.05 DUCT TRAVERSE TESTING

A. System zone/branch.

B. Duct size.

C. Area.

D. Design velocity.

E. Design airflow.

F. Test velocity.

G. Test airflow.

H. Duct static pressure.

I. Air temperature.

J. Air correction factor.

3.06 AIR DISTRIBUTION TESTING

A. Air terminal number.

B. Room number/location.

C. Terminal type.

D. Terminal size.

E. Design velocity.

F. Design airflow.

G. Test (final) velocity.

H. Test (final) airflow.

I. Percent of design airflow.

3.07 ADJUSTING

A. Recorded data represents actually measured or observed conditions. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops. Adjust air systems to deliver specified volumes with lowest possible fan speed.

3.08 DOMESTIC WATER

A. Adjust domestic water recirculation system to ensure hot water circulation in mains.

END OF SECTION 15990

SECTION 16010

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Electrical systems required for this work includes labor, materials, equipment, and services necessary to complete installation of electrical work shown on Drawings, specified herein or required for a complete operable facility and not specifically described in other Sections of these Specifications. Among the items required are:
   a. Branch circuit wiring from the distribution panels for lighting, receptacles, motors, signal systems and other detailed circuit wiring.
   b. Luminaires, control switches, receptacles, relays, supports and other accessory items.
   c. Wiring and power connections for motors installed for heating, cooling and ventilation.
   d. Fire alarm system.
   e. Low voltage systems.

1.02 DEFINITIONS

A. Following is a list of abbreviations generally used in Division 16:

1.	ADA	Americans With Disabilities Act
2.	AHJ	Authority Having Jurisdiction
3.	ANSI	American National Standards Institute
4.	APWA	American Public Works Association
5.	ASTM	American Society for Testing and Materials
6.	CBC	California Building Code
7.	CEC	California Electrical Code
8.	CFC	California Fire Code
9.	HVAC	Heating, Ventilating and Air Conditioning

B. Provide: To furnish and install, complete and ready for the intended use.

C. Furnish: Supply and deliver to the project site, ready for unpacking, assembly and installation.

D. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at the project site to complete items of work furnished by others.

1.03 ADDITIONAL REQUIREMENTS TO DIVISION 01

A. Product Submittals and Shop Drawings:
1. When requested by individual Sections provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and the like. Refer to individual Specification Sections for additional requirements for the shop drawings.

2. Provide product submittals and shop drawings in two formats – electronic (PDF, or portable document format) and paper. Electronic format must be submitted on CD, DVD, portable flash drive, or via e-mail in a zip file. Provide one electronic file for each specification section. When documents are submitted via e-mail, copy architect on all transmissions.

B. Operation and Maintenance Documentation: Provide copies of certificates of code authority acceptance, test data, product data, guarantees, warranties, and the like.

C. Shop Drawings: When requested by individual Sections provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and the like. Refer to individual Specification Sections for additional requirements for the shop drawings.

D. Closeout Documentation: Submit electrical code authority certification of inspection. Include documentation of on-site electrical testing that was performed.

E. Record Drawings:
1. Show changes and deviations from the Drawings. Include written Addendum and change order items.
2. Make changes to drawings in electronic format. Obtain electronic copy from Architect, use the same version of AutoCAD to prepare record drawings as was used by the Architect. Provide electronic copy and hard copy to Architect for review.

1.04 QUALITY ASSURANCE

A. Conform to the latest adopted version of the National Electric Code (NEC) with state amendments.

B. Obtain and pay for electrical permits, plan review, and inspections from local AHJs.

C. Furnish products listed by UL or other testing firm acceptable to AHJ.

1.05 SEQUENCING AND SCHEDULING

A. For the proper execution of the work cooperate with other crafts and contracts as needed.

B. To avoid installation conflicts, thoroughly examine the complete set of Contract Documents. Resolve conflicts with Architect prior to installation.

C. Prior to installation of feeders to equipment requiring electrical connections, examine the manufacturer's shop drawings, wiring diagrams, product data, and installation instructions. Verify that the electrical characteristics detailed in the Contract Documents are consistent with the electrical characteristics of the actual equipment being installed. When inconsistencies occur request clarification from Architect.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide like items from one manufacturer, such as luminaire types, switches, receptacles, breakers, panels, and the like.

2.02 MATERIALS

A. Provide new electrical materials of the type and quality detailed, listed by UL, bearing their label wherever standards have been established. Indicated brand names and catalog numbers are used to establish standards of performance and quality. The description of materials listed herein governs in the event that catalog numbers do not correspond to materials described herein.

B. Provide material and equipment that is acceptable to AHJ as suitable for the use indicated. For example, provide wet labeled equipment in locations that are wet.

C. Include special features, finishes, accessories, and other requirements as described in the Contract Documents regardless of the item's listed catalog number.

D. Provide incidentals not specifically mentioned herein or noted on Drawings, but needed to complete the system, in a safe and satisfactory working condition.

2.03 FIRESTOPPING

A. Foam Sealant: Foam sealant for use around conduit penetrations to prevent passage of smoke, fire, toxic gas or water. Maintain seal before, during and after fire. In and around conduit for thermal break at penetration of barrier between heated and unheated spaces. Chase Technology Corporation, Fire Foam, Thomas & Betts, or approved.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Construction Documents:
1. Drawings are diagrammatic with symbols representing electrical equipment, outlets, luminaires, and wiring.
2. Electrical symbols indicating wiring and equipment shown in the Contract Documents are included in the Contract unless specifically noted otherwise.
3. Examine the entire set of Drawings to avoid conflicts with other systems. Determine exact route and installation of electrical wiring and equipment with conditions of construction.

B. Clarification:
1. The Drawings govern in matters of quantity, the Specification in matters of quality. In event of conflict on Drawings or in the Specifications, the greater quantity and the higher quality apply.
2. Should the Electrical Documents indicate a condition conflicting with the governing codes and regulations, refrain from installing that portion of the work until clarified by Architect.

3.02 INSTALLATION

A. Install electrical equipment complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of the electrical equipment, examine the instructions thoroughly. When requirements of the installation instructions conflict with the Contract Documents, request clarification from Architect prior to proceeding with the installation.

B. Do not install electrical equipment in obvious passages, doorways, scuttles or crawl spaces which would impede or block the area passage's intended usage.

C. Noise Control:
   1. Do not install outlet boxes back to back. Do not use straight through boxes.
   2. Do not place contactors, starters and similar noise producing devices on walls which are common to occupied spaces unless specifically called for on Drawings. Where such devices must be mounted on walls common to occupied spaces, mount or isolate in such a manner as to effectively prevent the transmission of their inherent noise to the occupied space.

D. Firestopping:
   1. Coordinate with the Drawings the location of fire rated walls, ceilings, floors and the like. When these assemblies are penetrated by electrical equipment, seal around the equipment with approved firestopping material.
   2. Install firestopping material complete as directed per the manufacturer's installation instructions.

3.03 FIELD QUALITY CONTROL

A. Tests:
   1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified in Division 16. Refer to individual Specification Sections for required tests. Document tests and include in Closeout Documents.
   2. During site evaluations by Architect, provide an electrician with tools to remove and replace trims, covers, devices, and the like, so that a proper evaluation of the installation can be performed.

B. Lighting System Control Testing and Commissioning:
   1. Test lighting controls to ensure that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with Drawings and Specifications. Provide functional testing of sequences of operation to ensure operation in accordance with Drawings and Specifications. Provide complete report of test procedures and results to engineer and insert approved copy into project closeout documents.
   2. Testing shall include: Occupant sensing automatic controls.

3.04 CLEANING

A. Remove dirt and debris caused by the execution of the electrical work.

B. Leave the entire electrical system installed under this Contract in clean, dust-free and proper working order.

C. Vacuum clean interiors of all new and modified electrical signal and communication equipment enclosures.

3.05 DEMOLITION

A. Coordinate with Owner so that work can be scheduled not to interrupt operations, normal activities, building access, access to different areas. The Owner will cooperate to the best of their ability to assist in a coordinated schedule, but will remain the final authority as to time of work permitted.

B. Examination: Determine the exact location of existing utilities and equipment before commencing work, compensate the Owner for damages caused by the failure to locate and preserve utilities. Replace damaged items with new material to match existing.

C. Promptly notify Owner if utilities are found which are not shown on Drawings.

D. Execution:
1. Remove existing luminaires, switches, receptacles, and other electrical equipment and devices and associated wiring from walls, ceilings, floors, and other surfaces scheduled for remodeling, relocation, or demolition unless shown as retained or relocated on Drawings.
2. Maintain electrical continuity of existing systems. Remove or relocate electrical boxes, conduit, wiring, equipment, luminaires, and the like, as encountered in removed or remodeled areas in the existing construction affected by this work.
3. Remove and restore wiring which serves usable existing outlets clear of the construction or demolition
4. If existing junction boxes will be made inaccessible, or if abandoned outlets serve as feed through boxes for other existing electrical equipment which is being retained, provide new conduit and wire to bypass the abandoned outlets.
5. If existing conduits pass through partitions or ceiling which are being removed or remodeled, provide new conduit and wire to reroute clear of the construction or demolition and maintain service to the existing load.
6. Extend circuiting and devices in existing walls to be furred out.
7. Remove abandoned wiring to leave site clean.
8. If existing electrical equipment contains PCBs (polychlorinated biphenyl), replace with new. Dispose of material containing PCBs as required by federal and local regulations.
9. Repair adjacent construction and finishes damaged during demolition work.
10. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

3.06 SALVAGED EQUIPMENT

A. Salvage the following equipment not being reused and return to owner:
1. Luminaires

B. Electrical equipment that cannot be salvaged for reuse sell/give to recycling company. Recycle the following excess, removed, or demolished electrical material:
1. Copper or aluminum conductors.
2. Steel and aluminum from raceways, boxes, enclosures, housings and the like.
3. Acrylic and glass from luminaire lenses/refractors.

3.07 CONTINUITY OF SERVICE

A. No interruption of services to any part of existing facilities will be permitted without express permission in each instance from the Owner. Requests for outages shall state the specific dates and hours and the maximum durations, with the outages kept to these specific dates and hours and the maximum durations. Obtain written permission from the Owner for any interruption of power, lighting or signal circuits and systems.

B. If overtime is necessary, there will be no allowance made by Owner for extra expense for such overtime or shift work, due to maintaining continuity of service herein required.

C. Organize work to minimize duration of power interruption.

END OF SECTION 16010

SECTION 16040

BUILDING LIGHTING ACCEPTANCE TESTING AND DOCUMENTATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This section describes the Acceptance Testing and documentation of the lighting system(s) and outlines the duties and responsibilities of the contracting team for Acceptance Testing.

B. Supply the acceptance requirements to products, equipment and systems provided under this Division, where indicated on plans, and where required by California Title 24 requirements.

C. Engage the services of a firm specializing in commissioning of lighting systems or shall submit contractor qualifications for review by architect where testing and documentation is to be performed by contractor.

1.02 THE COMMISSIONING TEAM

A. Form the Commissioning Team of:
1. Electrical contractor's representative
2. Lighting controls manufacturer's representative
3. Inspector of record
4. Owner's staff representative

PART 2 - PRODUCTS

2.01 DUTIES OF THE TEAM

A. The duties of the Team are as outlined in the Title 24 Requirements and summarized below:
1. Plan, organize and implement the Acceptance Testing process and within 1 month of the award of the contract, submit the names and addresses of the Testing team member(s).
2. The Acceptance testing team shall submit a complete description of the testing procedures and systems to be tested to the architect for review.
3. The Acceptance testing team shall coordinate tests of systems and equipment and assemble documentation related to tests. Submit documentation relative to tests and proposed procedures to design engineer for review prior to submitting documentation to Authority having Jurisdiction (AHJ). Team responsible for performing data analysis, calculation of performance indices and crosschecking of results with the requirements of Title 24 and the Contract documents. The installing contractor or agent responsible for testing and documentation shall record their State of California Contractor's license number or their State of California Professional Registration License number on each Certificate of Acceptance for submittal.
4. Responsible for submitting Certificate of Acceptance including paper and electronic copies of measurements and monitoring results and supporting documentation to the AHJ. Where AHJ questions results or requires additional testing, complete additional testing and provide required documentation at no additional cost to the Owner.

2.02 TIME SCHEDULE

A. Determine the time period of the commissioning of the systems by the general contractor and Acceptance testing team. It is important to note that AHJ will not release a final Certificate of Occupancy until a Certificate of Acceptance is submitted that demonstrates that the specified systems and equipment have been shown to be performing in accordance with the Title 24 standards.

2.03 ACCEPTANCE TESTING – PHASE I - DOCUMENTATION

A. Team shall assemble documentation showing lighting fixture locations, lighting control device locations, control sequences and notes.

B. Per Title 24 requirements, team shall provide record drawings to building owner within 90 days of receiving a final occupancy permit (refer to other specification sections for requirements on record drawings.)

C. Per Title 24 requirements, team shall provide operating and maintenance manuals to the building owner (refer to other specification sections for requirements on operation and maintenance manuals.)

2.04 ACCEPTANCE TESTING – PHASE II – INSPECTION AND TESTING

A. Team shall review the installation, perform acceptance testing and document results for the following systems:
1. Occupancy Sensors
2. Manual Daylight Controls
3. Automatic Daylight Controls
4. Automatic Time Switch Controls

B. Review of installation shall confirm lighting fixtures and lighting controls are properly located, identified, calibrated, and set points and schedules programmed per contract document requirements.

2.05 ACCEPTANCE TESTING - PHASE III - CERTIFICATION

A. Team shall document operating and maintenance information, complete installation certificate, and indicate test results on the Certificate of Acceptance, and submit the Certificate to the AHJ prior to receiving final occupancy permit. Team shall submit forms LTG-1-A through LTG-3-A as required by Title 24 requirements.

PART 3 - EXECUTION

3.01 ACCEPTANCE TESTS AND DOCUMENTATION

A. Refer to California Title 24, Non-residential manual for specific testing procedures and documentation requirements. The detailed requirements can be found at http://www.energy.ca.gov/title 24/2005standards/index.html. Contractor is responsible for reviewing and complying with these standards

END OF SECTION 16040

SECTION 16050

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Raceways.
2. Wires, cables and connectors.
3. Outlet boxes.
4. Devices and plates.
5. Identification.

1.02 SYSTEM DESCRIPTION

A. Provide raceways, wires, cables, connector, boxes, devices, finish plates and the like for a complete and operational electrical system.

B. Electrical Connections: Connect equipment, whether furnished by Owner or other Divisions of the Contract, electrically complete.

C. Supporting Devices: Safety factor of 4 required for every fastening device or support for electrical equipment installed. Support to withstand four times weight of equipment it supports. Provide seismic bracing per CBC requirements for this building location.

1.03 SUBMITTALS

A. Provide shop drawings and product data for the following:
1. Raceways.
2. Wires, cables and connectors.
3. Outlet boxes.
4. Devices and plates.

B. Provide the following operating and maintenance instructions from the manufacturer for project closeout, see project closeout requirements in Division 1:
1. Devices and plates.

1.04 REGULATORY REQUIREMENTS

A. Conform to the latest adopted version of the National Electric Code (NEC) with state amendments.

B. Furnish products listed by UL or other testing firm acceptable to AHJ.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Wires and Cables: Carol, General Cable, Okonite, Southwire, or approved.

B. Connectors: Stranded conductors by Anderson, Burndy, Ilsco, Thomas & Betts, or approved.

C. Splices:
1. Branch Circuit Splices: Ideal, Scotch-Lock, 3M, or approved.
2. Feeder Splices: Compression barrel splice with two layers Scotch 23 and four layers of Scotch 33+ as vapor barrier.

2.02 RACEWAYS

A. Conduits:
1. Galvanized Rigid Steel Conduit (RMC): Hot-dip galvanized after thread cutting. Manufacture in conformance with ANSI C80.1.
2. Electrical Metallic Tubing (EMT): Hot-dip galvanized and chromate coated. Manufacture in conformance with UL 797 and ANSI C80.3.
3. Flexible Conduit (FMC): Reduced wall flexible steel conduit. Hot-dip galvanized. Manufacture in conformance with Federal Specification A-A-55810.

B. Conduit Fittings:
1. Bushings: Malleable iron with plastic insulator lining, 150C rated.
2. Ground Bushings: Malleable iron with plastic insulating liner and aluminum grounding lug rated for copper or aluminum conductor, 150C rated.
3. EMT Connectors and Couplings: Compression Type: Zinc plated steel, insulated throat connectors, raintight up to 2 inches.

2.03 WIRES AND CABLES

A. Copper, 600 volt rated throughout. Conductors 14AWG to 10AWG, solid or stranded. Conductors 8AWG and larger, stranded. Phase color to be consistent at feeder terminations; A-B-C, top to bottom, left to right, front to back. Conductors 3AWG and larger, minimum insulation rating of 75C. Insulation types THWN-2 or XHHW-2. Minimum insulation rating of 90C for branch circuits. Color code conductors as follows:

PHASE	208 VOLT WYE	240 VOLT DELTA	480 VOLT
A	Black	Black	Brown
B	Red	Orange (High Leg)	Orange
C	Blue	Blue	Yellow
Neutral	White	White	White
Ground	Green	Green	Green
Isolated Ground	Green w/yellow trace	N/A	N/A

2.04 CONNECTORS

A. Copper Pads: Drilled and tapped for multiple conductor terminals.

B. Lugs: Compression type for use with stranded branch circuit or control conductors; mechanical lugs not acceptable. Manufacturers: Anderson, Ilsco, Panduit, Thomas & Betts, 3M, or approved.

C. Conductor Branch Circuits: Wire nuts with integral spring connectors for conductors 18 through 8AWG. Push-in type connectors where conductors are not required to be twisted together are not acceptable. Manufacturers: 3M, Ideal, or approved.

D. Fluorescent Luminaire Disconnect: polycarbonate housing, tin-plated brass contacts, insulated 18AWG, factory-installed solid copper leads, 105C temperature rating, UL94-V2 flammability, 4A, 600V. NEC Article 410 compliant. Finger-safe line side. Push-and-click connector. Thomas & Betts Sta-Kon, Lithonia or approved.

2.05 BOXES

A. General:
1. Luminaire Outlet: 4-inch octagonal box, 1-1/2 inches deep with 3/8-inch luminaire stud if required. Provide raised covers on bracket outlets and on ceiling outlets.
2. Device Outlet: Installation of one or two devices at common location, minimum 4 inches square, minimum 1-1/2 inches deep. One- or two-gang flush device raised covers. Bowers, Hubbell, or approved.
3. Signal and Communication Systems Outlet: 4-inch square box, 2-1/8 inches deep. One- or two-gang raised device cover. Bowers, Hubbell, or approved.
4. Masonry Boxes: Outlets in concrete, Bowers, Hubbell, or approved.
5. Accessories: Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, luminaire studs, cable clamps and metal straps for supporting outlet boxes, compatible with outlet boxes being used and meeting requirements of individual wiring situations.

B. Junction and Pull Boxes: Provide ANSI 49 gray enamel painted sheet steel junction and pull boxes, with screw-on covers; of the type shape and size, to suit each respective location and installation; with welded seams and equipped with steel nuts, bolts, screws and washers. Circle AW, Hoffman, or approved.

C. Box Extension Adapter: Die-cast aluminum construction. Install over flush wall outlet boxes to permit flexible raceway extension to equipment. Bell 940 Series, Carlon, Red Dot IHE4 Series, or approved.

D. Conduit Fittings: Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and plastic conduit bushings of the type and size to suit each respective use and installation. O-Z Gedney, Thomas & Betts, or approved.

2.06 WIRING DEVICES

A. Wall Switches: Toggle Type Characteristics: Quiet acting, 20 amp, 120/277 volt, UL listed for motor loads up to 80 percent of rated amperage. Cooper 1221, Leviton 1221, Hubbell 1221, Pass & Seymour 20ACI.

B. Receptacles:
1. Finish: Same exposed finish as switches.
2. Duplex Receptacle Characteristics: Straight parallel blade, 125 volt, 2 pole, 3 wire grounding.
   a. Commercial Grade: Riveted. Brass ground contact on steel mounting strap. 20 amp. Cooper BR20, Hubbell CR5362, Leviton BR20, Pass & Seymour BR20. 15 amp. Cooper BR15, Hubbell CR5262, Leviton BR15, Pass & Seymour BR15.
3. Ground Fault Circuit Interrupter (GFCI) Receptacle: Meets or exceeds UL943 (Class A GFCI), UL498. Feed through type, back-and-side wired, 20 amp, 125VAC, Cooper XGF20, Hubbell GF5362, Leviton 8898, Pass & Seymour 2094.

C. Finish Plates: Match building standard.

2.07 SUPPORTING DEVICES

A. Hangers: Kindorf B-905-2A channel, H-119-D washer, C105 strap, 3/8-inch rod with ceiling flange.

B. Concrete Inserts: Kindorf D-255, cast in concrete for support fasteners for loads up to 800 lbs.

C. Pipe Straps: Two-hole galvanized or malleable iron.

D. Luminaire Chain: Single jack chain No. 10, 40 lb. working load limit.

2.08 ELECTRICAL IDENTIFICATION

A. Engraved Labels: Melamine plastic laminate, white with black core, 1/16 inch thick, manufactured by Lamicoid. Engravers standard letter style, minimum 3/16-inch high letters, capitals. Drill or punch labels for mechanical fastening except where adhesive mounting is necessary because of substrate. Use self-tapping stainless steel screws.

B. Conductor Numbers: Manufacturers standard vinyl-cloth self-adhesive cable and conductor markers of the wraparound type. Preprinted black numbers on yellow field. Brady, Panduit, or approved.

C. Branch Circuit Panel Schedules: Provide branch circuit identification schedules, typewritten, clearly filled out, to identify load connected to each circuit and location of load. Numbers to correspond to numbers assigned to each circuit breaker pole position.

D. Circuit Breaker Identification: Provide permanent identification number in or on panelboard dead-front adjacent to each circuit breaker pole position.

PART 3 - EXECUTION

3.01 ELECTRICAL CHARACTERISTICS

A. Verify electrical characteristics of equipment prior to installation of conduits and wiring for equipment. Coordinate HVAC voltage requirements with drawings and equipment submittals prior to rough in.

3.02 MOTOR BRANCH CIRCUIT WIRING

A. Do not install electrical equipment or wiring on mechanical equipment without approval of Architect.

B. Provide moisture tight equipment wiring and switches in ducts or plenums used for environmental air.

C. Connect motor branch circuits complete from panel to motor as required by code and manner herein described.

D. Motor starter, control devices and control wiring provided by other Divisions unless noted on drawings.

3.03 INSTALLATION

A. Conduit:
1. Conduit Joints: Assemble conduits continuous and secure to boxes, panels, luminaires and equipment with fittings to maintain continuity. Provide watertight joints where embedded in concrete, below grade or in damp locations. Seal PVC conduit joints with solvent cement and metal conduit with metal thread primer. Rigid conduit connections to be threaded, clean and tight (metal to metal).
2. Conduit Placement:
   a. Install continuous conduit and raceways for electrical power.
   b. Conceal conduits. Exposed conduits are permitted only in the following areas:
      1) Mechanical rooms, electrical rooms or spaces where walls, ceilings and floors will not be covered with finished materials.
      2) Existing walls that are concrete or block construction.
      3) Where specifically noted on the drawings.

c. Where exposed conduits are permitted install parallel or at right angles to building lines, tight to finished surfaces and neatly offset into boxes.
d. Do not install conduits or other electrical equipment in obvious passages, doorways, scuttles or crawl spaces which would impede or block the area passage's intended usage.
e. Do not install conduits on surface of building exterior, across roof, on top of parapet walls, or across floors.
f. Route raceway at least 6 inches from hot surfaces above 120F, including noninsulated steam lines, heat ducts, and the like.

3. Maximum Bends: Install code sized pull boxes to limit sum of bends in a run of conduit to 270 degrees.
4. Flexible Conduit: Install 12-inch minimum slack loop on flexible metallic conduit and PVC coated flexible metallic conduit.
5. Conduit Size: Size as indicated on drawings. Where size is not indicated, provide conduit in minimum code permitted size for THW conductors of quantity required for complete operation. Minimum trade size 3/4 inch.
6. Provide pull cord in empty conduits that exceed 10 feet in length or the total sum of bends exceed 90 degree radius.
7. Conduit Use Locations:
   a. Underground: PVC.
   b. Wet Locations and Subject to Mechanical Damage: RMC.
   c. Cast-In-Place Concrete and Masonry: RMC and PVC. Horizontal runs of conduit in poured-in-place concrete slabs, maximum diameter of conduit is 1.25 inches.
   d. Dry, Protected: RMC, EMT.
   e. Sharp Bends and Elbows: RMC, EMT use factory elbows.
   f. Install pull wire or nylon cord in empty raceways provided for other systems. Secure wire or cord at each end.
   g. Recessed luminaires and equipment connections subject to movement or vibration, use flexible metallic conduit.
8. Branch Circuits: Do not change the intent of the branch circuits or controls without approval. Homeruns for 20 amp branch circuits may be combined to a maximum of six current carrying conductors in a homerun. Apply derating factors as required by NEC. Increase conductor size as needed.
9. Feeders: Do not combine or change feeder runs.
10. Unless otherwise indicated, provide raceway systems for conductors.

B. Conduit Fittings:
1. Use compression fittings in dry locations, damp and rain-exposed locations. Maximum size permitted in damp locations and locations exposed to rain is 2 inches in diameter.
2. Provide bushing or EMT connector for conduits that do not terminate in box, enclosure, or the like.

C. Conductors, Wires and Cables:
1. Conductor Installation: Install conductors in raceways having adequate, code size cross-sectional area for wires indicated. Install conductors with care to avoid damage to insulation. Do not apply greater tension on conductors than recommended by manufacturer during installation. Use of pulling compounds is permitted. Clean residue from exposed conductors and raceway entrances after conductor installation. Do not use pulling compounds for installation of conductors connected to GFCI circuit breakers or GFCI receptacles.
2. Conductor Size and Quantity: Install no conductors smaller than 12AWG unless otherwise shown. Provide required conductors for a fully operable system.

D. Connectors: Retighten lugs and connectors for conductors to equipment prior to Substantial Completion.

E. Boxes:
1. Location: Locate boxes and conduit bodies so as to ensure accessibility of electrical wiring.
2. Round Boxes: Avoid using round boxes where conduit must enter through side of box, which would result in a difficult and insecure connection with a locknut or bushing on the rounded surface.
3. Anchoring: Secure boxes rigidly to the substrate upon which they are being mounted, or solidly embed boxes in concrete or masonry.
4. Knockout Closures: Provide knockout closures to cap unused knockout holes where blanks have been removed.
5. Outlet System: Provide electrical boxes and fittings as required for a complete installation. Include but not limited to outlet boxes, junction boxes, pull boxes, bushings, locknuts, and other necessary components.
6. Code Compliance: Comply with NEC as applicable to construction and installation of electrical boxes and fittings and size boxes according to NEC, except as noted otherwise.
7. Flush Outlets in Finished Spaces: Maintain integrity of insulation and vapor barrier. Surface outlets are only acceptable in areas with surface conduit.
8. Mount center of outlet boxes as required by ADA, or noted on drawings, the following distance above the floor:
   a. Control Switches: 46 inches.
   b. Receptacles: 18 inches.
   c. Other Outlets: As indicated in other Sections of Specifications or as detailed on drawings.
9. Coordinate electrical device locations (switches, receptacles, and the like) with drawings to prevent mounting devices in mirrors, back splashes, behind cabinets, and the like.

F. Wiring Devices:
1. Wall-Mounted Receptacles: Install with long dimension oriented vertically at centerline height shown on drawings or specified herein.
2. Vertical Alignment: When more than one outlet is shown on drawings in close proximity to each other, but at different elevations, align the outlets on a common vertical center line for best appearance. Verify with Architect.

G. Supporting Devices:
1. Verify mounting height of luminaires or items prior to installation when heights are not detailed.
2. Install vertical support members for equipment and luminaires, straight and parallel to building walls. Provide independent supports to structural member for electrical luminaires, materials, or equipment installed in or on ceiling, walls or in void spaces or over furred or suspended ceilings.
3. Do not use other trade's fastening devices as supporting means for electrical equipment, materials or luminaires. Do not use supports or fastening devices to support other than one particular item.
4. Support conduits within 18 inches of outlets, boxes, panels, cabinets and deflections. Maximum distance between supports not to exceed 8 foot spacing.
5. Securely suspend junction boxes, pull boxes or other conduit terminating housings located above suspended ceiling from the floor above or roof structure to prevent sagging and swaying.
6. Provide seismic bracing per CBC requirements for this building location.

H. Electrical Identification:
1. Graphics: Coordinate names, abbreviations and designations used on drawings with equipment labels.
2. Conductor Identification: Apply markers on each conductor for power, control, signaling and communications circuits.

3. On the back of receptacle and switch finish plates legibly write with indelible ink pen the circuit that each device is connected to.
4. On the front of receptacle and switch finish plates provide label with the circuit that each device is connected to. Label is self-adhesive type with black letters and clear background, 18 point lettering size.

3.04 FIELD QUALITY CONTROL

A. Wiring Device Tests: Test wiring devices to ensure electrical continuity of grounding connections, and after energizing circuitry, to demonstrate compliance with requirements. Test receptacles for line to neutral, line to ground and neutral to ground faults. Correct any defective wiring.

B. Feeder Tests:
1. Test conductor insulation on feeders of 100 amp and greater for conformity with +1000 volt megohmeter. Use Insulated Cable Engineers Association testing procedures. Minimum insulation resistance acceptable is 1 megohm for systems 600 volts and below. Notify Architect if insulation resistance is less than 1 megohm.
2. Test Report: Prepare a typed tabular report indicating the testing instrument, the feeder tested, amperage rating of the feeder, insulation type, voltage, the approximate length of the feeder, conduit type, and the measured resistance of the megohmeter test. Submit report with operating and maintenance manual.

END OF SECTION 16050

SECTION 16500

LIGHTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Luminaires and lampholders.
   2. Ballasts and power supplies.
   3. Lamps.
   4. Emergency lighting equipment.

1.02 SUBMITTALS

A. Submit for:
   1. Luminaires: Include electrical ratings, dimensions, mounting, material, required clearances, terminations, wiring and connection diagrams, photometric data, diffusers, and louvers.
   2. Ballasts and power supplies.
   3. Lamps.
   4. Emergency lighting equipment.

B. Submittal Cutsheets: Highlight, circle or otherwise indicate which option(s) are being selected for the products submitted. Cutsheets that are not edited to indicate which products are submitted for this project are not acceptable.

C. Specified manufacturers are approved to submit bid. However, inclusion does not relieve manufacturer from supplying product as described.

D. Provide the following operating and maintenance instructions from the manufacturer for project closeout, see Project Closeout Requirements in Division 1:
   1. Luminaires.
   2. Ballasts and power supplies.
   3. Lamps.
   4. Emergency lighting equipment.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Provide luminaires acceptable to code authority for application and location as indicated.
   2. Comply with applicable ANSI standards pertaining to lamp materials, lamp ballasts and transformers, and luminaires.
   3. Comply with applicable NEMA standards pertaining to lighting equipment.
   4. Provide luminaires and lampholders which comply with UL standards and have been listed and labeled for location and use indicated by a testing agency acceptable by the AHJ (e.g. UL, ETL, and the like).
   5. Comply with NEC as applicable to installation and construction of luminaires.
   6. Comply with fallout and retention requirements of CBC for diffusers, baffles, louvers, and the like.
   7. Provide same type lamps and ballasts from same manufacturer (e.g. fluorescent lamps from Osram/Sylvania, MR lamps from Ushio, and the like).

1.04 WARRANTY

A. Ballast Manufacturer's Warranty: Not less than 2 years for magnetic type ballasts and 5 years for electronic type ballasts, based on date of substantial completion. Warranty includes normal cost of labor for replacement of ballast.

B. Linear T8 and T5 Lamp and Ballast Combination Warranty: Provide ballast and lamp combinations which will result in written factory warranty covering lamps for 3 years and ballasts for 5 years, based on date of substantial completion.

C. Lamp Warranty: 30 days for incandescent, 12 months for compact fluorescent, 36 months for fluorescent and 12 months for HID lamps, based on date of substantial completion.

D. Induction: 5 years for the lamp and ballast.

1.05 MAINTENANCE

A. Furnish 2 percent extra lens or louvers for each size and type of fluorescent luminaire.

B. Furnish 10 percent extra lamps for each size and type installed.

C. Furnish 5 percent extra ballasts for each size and type.

PART 2 - PRODUCTS

2.01 LUMINAIRES

A. Luminaires: Refer to description and manufacturers in Luminaire schedule.

B. Where recessed luminaires are installed in cavities intended to be insulated, provide IC rated luminaires or other code approved installation.

C. Recessed Luminaires: Frame compatible with ceiling material installed at particular luminaire location. Provide proper factory trim and frame for luminaire to fit location and ceiling material.

D. Finishes:
1. Manufacturer's standard finish (unless otherwise indicated) over a corrosion resistant primer.
2. Interior Light Reflecting Finishes: White or specular finish with not less than 85 percent reflectances.
3. Exterior Finishes: As detailed in luminaire schedule or on Drawings. Refer cases of uncertain applicability to Architect for resolution prior to release for fabrication.

E. Light Transmitting Components:
1. Plastic diffusers, molded or extruded of 100 percent virgin acrylic.
2. Prismatic acrylic, extruded, flat diffusers, 0.125 inch overall thickness, unless otherwise noted.

F. Fluorescent Luminaires:
1. Provide open lamp fluorescent luminaires without diffusers or guards with turret type, spring loaded sockets.

2.02 BALLASTS AND POWER SUPPLIES

A. General:
1. Provide ballasts UL rated for specified lamps.
2. Thermal Protection: Internal UL Class 'P' with automatic reset.
3. Sound Ratings: Class 'A'. Where not available as standard product from any specified manufacturer, provide quietest rating available.
4. Total Harmonic Distortion: Not to exceed 20 percent of the input current unless otherwise indicated.
5. Input Voltage: Provide universal voltage ballast matching branch circuit supply voltage, with minimum +/- 10 percent variation tolerance.
6. Provide quantity of ballasts to provide switching as indicated on Drawings.
7. Provide factory printed wiring diagram on ballast housing.
8. Ballasts used in enclosed and gasketed luminaires shall be of Type 1 construction.
9. Comply with FCC rules and regulations Part 18, Class A concerning generation of both electromagnetic interference and radio frequency interference.

B. Ballasts for Linear Fluorescent Lamps:
1. Power Factor: Minimum 97 percent.
2. Do not provide magnetic fluorescent ballasts.
3. Linear T8 ballasts: anti-striation circuitry, and UL type CC rated for arc protection. Compliant with NEMA/CEE high performance T8 lighting system specifications.
4. Nondimming Electronic:
   a. Tandem wiring between luminaires may be used to minimize the number of ballasts while accomplishing the switching requirements shown on Drawings. Provide label in lamp compartment of luminaire to identify the function of ballast. Label shall not be visible from room.
   b. Provide ballasts that meet requirements of UL 935, ANSI C82.11 and bear the appropriate UL label.
   c. Provide ballasts that withstand input power line transients as defined in ANSI C62.41, Category-A and IEEE 587.
   d. Provide series wired programmed start ballast unless noted on drawings.
   e. High frequency operation: Not less than 42kHz.
   f. Integral end of lamp life detection and shutdown circuit with automatic reset.
   g. Lamp Crest Factor: Maximum 1.7 for programmed rapid start ballasts and maximum 1.85 or less for instant start ballasts.
   h. Average Ballast Factor (BF): Minimum 88 percent or as indicated in the luminaire schedule.
   i. Provide 0 degree Fahrenheit minimum starting temperature ballasts for luminaires installed where exposed to anticipated ambient temperature less than 55F.
   j. Manufacturers for Ballasts for T8 lamps: Philips Optanium Sieres, Universal Lighting Technologies Accustart Sieres, Osram/Sylvania Quicktronic Sieres, or approved.
   k. Manufacturers for Ballasts for T5 and T5HO lamps: Philips Centium Sieres, Universal Lighting Technologies Accustart Sieres, Osram/Sylvania Quicktronic Sieres, or approved.

2.03 LAMPS

A. Provide lamps for luminaires.

B. Provide lamp cataloged for specified luminaire type.

C. Provide similar lamps by a common manufacturer unless indicated in the luminaire schedule.

D. Manufacturers: Osram/Sylvania, General Electric, Philips, Venture, Ushio (MR only), EYE (MR only), or approved unless specific manufacturer is indicated in the luminaire schedule.

E. Incandescent: Not allowed unless noted in luminaire schedule.

F. Fluorescent:
1. Provide 3500K fluorescent lamps unless noted in luminaire schedule.
2. Linear Fluorescent:
   a. T-8: Provide the following:
      1) Bi-pin base, tri-phosphor coated
      2) Initial 3100 lumen output.
      3) CRI equal to or exceeding 85.
      4) 36000 hours rated on 3 hour switching cycle and 42000 hours rated on 12 hour switching cycles when used with programmed start ballast.
      5) Compatible with dimming ballasts.
      6) Low mercury type.
      7) Length and wattage as indicated in the luminaire schedule.
   b. Manufacturers: Osram/Sylvania, General Electric, Philips, or approved.

2.04 EMERGENCY FLUORESCENT LAMP POWER SUPPLY

A. Description: Self-contained, nickel-cadmium based, battery-operated power supply for operating one linear or compact fluorescent lamp for a minimum output of 90 minutes.

B. Minimum initial lumen output for linear fluorescent lamps: 1350.

C. Provide access hatches for emergency battery backup ballasts, adjacent to recessed 6-inch or less diameter downlights installed in inaccessible ceilings.

D. Manufacturers: Bodine, Iota, Lithonia.

PART 3 - EXECUTION

3.01 COORDINATION

A. Coordination of Conditions: Coordinate ceiling construction, recessing depth and other construction details prior to ordering luminaires for shipment. Refer cases of uncertain applicability to Architect for resolution prior to release of luminaires for shipment. Where luminaires supplied do not match ceiling construction, replace luminaires at no cost to Owner.

B. Electrical drawings are schematic, identifying quantity and type of luminaires used and their approximate location, but are not to be used for dimensional purposes. Refer to architectural drawings for exact locations, including mounting heights.

C. Provide fluorescent and HID luminaires with ballast compatible to lighting control system as shown in drawings and specifications.

3.02 INSTALLATION

A. Install luminaire of types indicated where shown and at indicated heights in accordance with manufacturer's written instructions and with recognized industry practices to ensure that luminaires comply with requirements and serve intended purposes.

B. Egress Luminaires: Provide unswitched circuit for battery charging and autotransfer circuiting for exit signs and luminaires with integral batteries.

C. Interior Luminaire Supports:
   1. Support Luminaires: Anchor supports to structural slab or to structural members within a partition, or above a suspended ceiling.
   2. Maintain luminaire positions after cleaning and relamping.
   3. Support luminaires without causing ceiling or partition to deflect.
   4. Provide recessed fluorescent luminaires with four supports as required by DSA.

D. Wiring:
   1. Recessed luminaires to be installed using flexible metallic conduit with luminaire conductors to branch circuit conductors in a nearby accessible junction box over ceiling. Junction box fastened to a building structural member within 6 feet of luminaire.
   2. Install luminaires for lift out and removal from ceiling pattern without disconnecting conductors or defacing ceiling materials.
   3. Flexible connections where permitted to exposed luminaires; neat and straight, without excess slack, attached to support device.
   4. Install junction box, flexible conduit and high temperature insulated conductors for through wiring of recessed luminaires.
   5. Unit Battery Equipment in Egress Luminaires: Provide unswitched conductor to each egress luminaire from serving circuit. This is for the transfer electronics to determine when power has actually been lost.
   6. Provide unswitched conductor to exit signs.

E. Relamp luminaires which have failed lamps at completion of work.

3.03 ADJUSTING

A. Align luminaires that are not straight and parallel/perpendicular to structure.

3.04 CLEANING

A. Clean paint splatters, dirt, dust, fingerprints, and debris from luminaires.

B. Where finish of luminaires has been damaged, touch up finish as directed by manufacturer's instructions.

END OF SECTION 16500

SECTION 16721

FIRE DETECTION AND ALARM SYSTEM

PART 1 - GENERAL

3.01 SCOPE

A. This Section describes a Protected Premises Fire Detection system for the following San Mateo County Community College District sites: Cañada College, College of San Mateo and Skyline College. Modifications to the existing fire alarm system shall provide evacuation alarm tone signaling using horns to sound the alarm signals and ADA-compliant strobe notification devices for visual notification. The system shall be intelligent device addressable, analog detecting, low voltage and modular, with digital communication techniques, in full compliance with all applicable codes and standards. The system provided shall have a Fire Alarm Control Panel (FACP) and field devices as indicated on the DSA-approved drawings.

B. The features and capacities described in this specification are a requirement for this project and shall be furnished by the successful contractor. The District has determined that the Siemens MXL system, provided by Siemens Building Technologies, Hayward, CA (contact Kelly Rogers: 510-783-6000), is the District standard, no equal. The system as described in this specification and as shown on the drawings shall be installed, programmed, tested, and delivered to the owner in fully operational condition. The system shall include all required hardware, software, raceways and interconnecting wiring to accomplish the requirements of this specification and the contract drawings, whether or not specifically itemized herein. The system shall consist of, but not be limited to, the following:
   1. Fire Alarm Control Panel (FACP).
   2. Fire Alarm Remote Annunciator (FAAP).
   3. Booster Power Supplies.
   4. Addressable Manual Fire Alarm Pull Stations.
   5. Addressable Analog Smoke Detectors.
   6. Addressable Area Heat Detectors.
   7. Addressable Analog Duct Smoke Detectors.
   8. Addressable Intelligent Interface Modules.
   9. Audible and Visual Notification Appliances.

C. Non-addressable alarm initiating, supervisory and status monitored devices shall be integrated into the fire alarm system, as applicable, via an addressable intelligent interface module, as indicated on the drawings:

D. Sprinkler Water Flow Alarm (alarm initiating)
   1. Sprinkler Valve Tamper Switch (supervisory).
   2. PIV, OS&Y.
   3. Kitchen Ansul Systems.
   4. Security Interface.
   5. Magnetic hold-opens.

E. Connections to existing elevator control panels (by others) and providing the necessary modules for elevator recall and shunt trip functionality.

F. Audible/visual notification appliances and communicating devices to be controlled by the FACP:
   1. Horns.
   2. Strobe Lights.

3. Combination Horn/Strobes.

G. Connect system to the existing campus MXL network system such that all status changes are transmitted to the Main Campus FACP.

H. DSA and local requirements shall be adhered to with regard to submitting specifications, wiring diagrams, shop drawings and plans. Responsibility for furnishing the quantities of copies in digital format and/or hard copy, as directed by contract requirements, shall be included as part of the work of this section.

3.02 RELATED SECTIONS, RELATED WORK AND EXISTING CONDITIONS

A. RELATED WORK

1. The contractor shall coordinate work described within this section with all related trades and shall relay all necessary coordination information to the System Supplier in a timely manner such that proper coordination shall take place. Work and/or equipment provided in other sections and related to the fire alarm system shall include, but not be limited to:
   a. Mechanical Coordination: Sprinkler water flow alarm and valve tamper switches to be provided and installed by the fire protection sprinkler contractor, if a part of this project. See Division 21. They shall be wired and connected to the fire alarm system monitor modules by the contractor.
   b. Mechanical Coordination: Duct Smoke Detectors shall be provided and wired under this Section and installed under the mechanical section as shown on the fire alarm system drawings.
   c. Security Interface, if required.
   d. Coordinate with all other trade contractors for the mounting of and/or interfacing with any and all other fire alarm system related devices.

B. EXISTING CONDITIONS

1. This project consists of modifying the existing fire alarm system within the existing building. The contractor shall visit the site to determine and verify all existing conditions. Existing conditions that would, in the contractor's opinion, prohibit or greatly delay construction progress shall be brought to the Architect and Engineer's attention in writing in a timely manner.
2. No additional compensation shall be permitted for variations due to accessible field conditions that would affect the installation of the fire alarm system.

3.03 REFERENCES - APPLICABLE LISTINGS, CODES, STANDARDS, DOCUMENTS

A. STANDARDS AND CODES

1. All equipment shall be installed and comply with the current adopted provisions of the following codes and standards.
2. All equipment shall be Underwriters' Laboratories (UL), Inc. listed for its intended use. At a minimum, the following standards shall apply:
   a. UL 268 and 268A - Smoke Detectors for Fire Protective Signaling Systems.
   b. UL 346 – Water-Flow Indicators for Fire Protective Signaling Systems.
   c. UL 464 - Audible Signaling Appliances.
   d. UL 864 - Control Units for Fire Protective Signaling Systems.
   e. UL 1481 - Power Supplies for Fire Protective Signaling Systems.
   f. UL 1971 - Signaling Devices for the Hearing-Impaired.
3. National Fire Protection Association (NFPA) standards:
   a. NFPA No. 13 - 1999 Edition - Sprinkler Alarm and Supervision.
   b. NFPA **No**. 70 National Electrical Code.
   c. NFPA No. 72 National Fire Alarm Code.

d. NFPA No. 90A Installation of Air Conditioning & Ventilating Systems.
e. NFPA No. 101 Life Safety Code.

4. All raceways and wiring shall be installed in compliance with NFPA Standard 70 (National Electrical Code - Article 760) with applicable California amendments. Codes shall be implicitly followed, in particular, with regard to material type and quality, circuitry extensions from and connections to outlet and junction boxes, panel boards and similar appurtenances.
5. The fire alarm system and its installation shall comply with all applicable requirements of the Americans with Disabilities Act of 1992.
6. The fire alarm system and its installation shall comply with DSA and all other local codes and authorities having jurisdiction, including but not limited to, San Mateo County Community College District's engineering design standards and guidelines.

3.04 SYSTEM DESCRIPTION

A. The system shall operate as an integrated, multiplexed, protected premises fire alarm control system tied into the existing campus network system.

B. Changes in the status of monitored points shall be detected by the microprocessor based fire alarm control panel and shall report any change in status to the Main Campus Fire Alarm System utilizing master-slave (Cañada College) networking protocol.

C. Sensor "dirty" and "excessively dirty" trouble conditions shall report automatically.

D. Devices shall be listed by UL for sensitivity testing by means of the portable programmer/tester or by readout from the control panel. Each addressable device address shall be set electronically, devices requiring dipswitch settings, rotary switch settings, staples or jumper settings are not acceptable.

E. Smoke detectors shall alarm at their programmed sensitivity settings and shall not revert to a common default setting when their operating system segment is in the fail safe degrade mode.

F. System shall individually identify each addressable initiating device and other addressable monitor functions using multiplexing interfacing techniques.

G. System shall be capable of operating alarm notification appliances, and other control functions, using multiplexing techniques.

H. Life safety alarm function programs shall perform automatically upon system alarm actuation. In addition, control points may be operated manually at any time by the attendant through appropriate keyboard commands. The FACP shall also provide integral programmable function control switches to allow personnel to manually operate specific pre-programmed control output functions, as required.

3.05 QUALITY ASSURANCE

A. It is the intent of these specifications to provide a complete fire alarm system that complies in all respects with the requirements of all applicable codes and standards. Equipment, materials, software, installation practices, etc. that do not meet these requirements or do not meet the performance standards herein specified shall not be acceptable.

B. The equipment furnished under this specification shall be that of the specified manufacturer, no equal. All information herein is intended to establish minimum standards of performance, quality and construction, and is based upon the Siemens MXL addressable analog equipment designed and manufactured by Siemens Building Technologies, Inc. Catalog and model numbers are specified herein and indicate the materials as well as the operating features required. It is not the intent of these specifications to eliminate competitive installation proposals, only to standardize the District's Fire Life Safety Systems.

C. Before commencing work the fire protection contractor shall submit data showing that contractor has successfully installed fire alarm systems of the same scope, type and design as specified. The contractor shall also include the names and locations of at least three installations where such systems have performed satisfactorily for the preceding 18 months.

1. The contractor shall submit copies of all required Licenses and Bonds as required by the State.
2. The system supplier shall employ on staff a minimum of one NICET level 4 personnel or a professional engineer, registered in the State of California.
3. Installing contractors unable to comply with the provisions of 1.06 shall present proof of engaging the services of a subcontractor qualified to furnish the required services.

D. Provide the services of a representative or technician from Siemens Building Technologies. The representative or technician is to be certified and experienced in the installation and operation of the type of system specified. The representative shall be licensed in the State, if required by law. The fire alarm contractor shall supervise installation (duct detector locations are to be determined by the mechanical contractor). The system supplier shall provide all software programming, software documentation, system adjustments, preliminary testing, final testing and certification of the system. The fire alarm supplier shall also be required to provide a 4 hour operational instruction to the owner's personnel.

E. All fire alarm system equipment furnished under this specification shall be UL listed, under the appropriate category, as the product of a single manufacturer. All control equipment shall be listed under UL as a single control unit. The manufacturer shall have been engaged in the production of this type of equipment for at least ten (10) years and have a fully equipped service organization capable of responding within 48 hours from the initial contact for warranty or regular service work. Emergency and/or off hours calls shall be responded to within 4 hours of initial contact, seven days a week.

F. Prior to bid submittal, contractor shall state what, if any, specific points of the proposed system's operation or the equipment's quality differ in any way from this specification by submission of a complete technical proposal to include supporting literature and drawings. Only those departures from these specifications shall be considered by the engineer. Failure to submit all departures from these specifications and to receive approval for such departures, shall be cause for summary rejection of any submittal documents where unapproved departures are discovered.

G. Should conflicts arise between project drawings and/or these specifications, regarding design, quantities of devices or circuits, the higher standard and/or quantity and/or cost shall be considered correct.

H. It is the contractor's responsibility to submit acceptable equipment for review by the engineer. The contractor shall bear all liability for damages arising from his failure to submit equipment that meets these specifications, including, but not limited to, any penalties for failure to meet construction deadline.

I. Final determination of compliance with these specifications shall rest with the Engineer of Record, who, at its discretion, may require proof of performance at the cost of the contractor. Required proof may include, but shall not be limited to, expense paid visits by representatives of the owner and engineer to sites where identical equipment is installed and providing beneficial use.

3.06 SUBMITTAL REQUIREMENTS

A. Prior to the start of work, the contractor shall provide a complete and comprehensive submittal for review by the engineer. These are to describe the proposed system and its equipment. Failure to provide a complete submittal shall be grounds for summary rejection of any incomplete submittal documentation. District reserves the right to deduct monies from payments due Contractor to cover District and Architect/Engineer's additional costs of review beyond the second submission. The complete submittal shall include, but not be limited to, all of the following material:

1. Power Calculations
   a. Battery capacity calculations shall be a minimum of 125% of the calculated requirement.
   b. Supervisory power requirements for all equipment.
   c. Alarm power requirements for all equipment.
   d. Power supply rating justification showing power requirements for each of the system power supplies. Power supplies shall be sized to furnish the total connected load in a worst case condition plus 25% spare capacity.
   e. Voltage-drop calculations for wiring runs demonstrating worst-case condition.
2. Complete manufacturers catalog data including supervisory power usage, alarm power usage, physical dimensions, finish and mounting requirements.
3. Complete drawings covering the following shall be submitted by the contractor for the proposed system. Floor plans in the current AutoCAD version showing the locations of all equipment and raceways, conductor counts with type and size.
4. A complete proposed system database including a description of all logic strings, control by event programming and point identification labels on a unique CD-ROM and in a formatted printed form, as required for off site editing, shall be submitted for evaluation by the owner: The program shall include all required interactive control functions between the local network systems and the methods for implementing these actions.
5. Provide the address, telephone number, and contact person(s) of the manufacturer's local service facility for normal and off-hour warranty issues.
6. Provide a fire alarm system function matrix. Matrix shall illustrate alarm output events in association with initiating devices input events. Matrix shall represent a summary of the installed system alarm, supervisory and trouble functions. (See Appendix-A NFPA-72 for minimum matrix requirements - A-7-5.2.2 (9) 1999).
7. For each system control and/or power panel, provide panel ampere loading during both normal and alarm modes, with time calculations to substantiate compliance with battery back-up power requirements (battery Ampere-Hour capacity), described elsewhere in these specifications.
8. For each system control panel, provide written schedule of active and spare addresses provided on each addressable circuit to substantiate compliance with circuit usage/spare requirements, described elsewhere in these specifications.
9. For each system control panel and system transponder notification appliance circuit, provide proof of spare capability in amperes available for future use, if needed.

10. Provide manufacture's printed product data, catalog pages and descriptions of any special installation requirements and/or procedures. Drawings depicting any special physical installation requirements shall show physical plans, elevations, all dimensions, conduit entry, minimum access clearances and any other details required.
    a. Provide shop drawings as follows:
    b. Drawing or catalog page showing actual dimensions of the main FACP.
    c. Drawing(s) or catalog page(s) showing actual dimensions of any additional system control panels and/or battery cabinets.
    d. Drawing or catalog page showing actual dimensions of the Remote Annunciator.
    e. Single line riser diagram showing, all equipment, all connections and number and size of all conductors and conduits.
    f. Provide samples of various items when so requested by the Architect/Engineer.

B. A maximum of two submittal reviews will be performed by Engineer. Compensate additional time and material to the Engineer based on their published fees for additional reviews.

PART 2 - SYSTEM OPERATION

3.01 BASIC SYSTEM EQUIPMENT, CIRCUITING, ADDRESSING AND OPERATING CAPABILITIES

A. GENERAL
1. The FACP shall communicate via an RS-485 Carrier Sense, Multiple Access, Collision Detect protocol, also known as CSMA/CD or an ETHERNET type topology.
2. The FACP shall provide NFPA 72, Style 4 (Class B) analog signaling line circuits. Each loop card shall communicate with and receive alarms from up to 120 points, consisting of a maximum of sixty intelligent analog alarm initiating and sixty intelligent controllable output devices. Circuits shall be configured with loop isolators and wired in a manner that prevents a catastrophic wiring event on a floor from affecting the performance of other floors.
3. Remote Annunciator (Siemens RCC Series): LCD type with two lines of 40 characters each. The Remote Annunciator shall communicate to the FACP on one #16 TSP and derive power from the FACP over a pair of #14 AWG conductors. It shall be possible to Acknowledge general "ALARM", "TROUBLE", and "SUPERVISORY" conditions from the Remote Annunciator using a key. Each Remote Annunciator must be housed in a lockable box. NEMA rated boxes are required for any locations, interior or exterior, where adverse weather or high humidity conditions occur. Mount Remote Annunciator(s) as indicated on the drawings, at a height where reasonable viewing is possible by the responding fire authority. Obtain approval of the specific location from the Architect and/or Engineer of Record prior to mounting the Annunciator.

4. System power supplies, including necessary Booster Power Supplies, transformers rectifiers, regulators, filters and surge protection required for system operation, with the capacity to power the system in a worst case condition with all devices in alarm and all local indicating appliances active without exceeding the listed ratings. Provide adequate notification appliance Booster Power Supplies so as to allow for a minimum of 20% spare capacity on each NAC.
   a. System primary power: Primary power for the FACP and the secondary power battery chargers shall be obtained from a dedicated emergency power circuit. Circuit breakers shall be fitted with a suitable guard, requiring removal of a screw to open, and used only for fire alarm. Each circuit used for fire alarm purposes shall be permanently labeled for function.
   b. Secondary power supply: Provide sealed gelled electrolyte batteries as the secondary power supply for all fire alarm functions. The battery supply shall be calculated to operate loads in a supervisory mode for twenty-four (24) hours no primary power applied and after that time, operate in alarm mode for five (5) minutes. Batteries shall be sized at 125% of the calculated size to compensate for deterioration and aging during the battery life cycle. Battery calculations shall be submitted to justify the battery size.
5. The system 16 bit core processor shall incorporate an internal operating system to process incoming alarm signals and issue output commands required as a result of the alarm reception, by system programming or by manual commands. All system processors shall be supervised by individual watchdog circuitry furnishing automatic restart after loss of activity. Systems with single watchdog circuits for all processors shall not be acceptable unless supplied with a "hot" standby CPU. Digital communication capabilities required for the control panel to communicate with remote annunciators, input/output drivers and displays shall be provided.
6. Manual Addressable Pull Stations (Siemens MSI-10B) shall be the single action type, unless specifically noted otherwise by these specifications or on project drawings, and listed by Underwriters' Laboratories, Inc. The intelligent manual fire station shall operate on any addressable detection circuit. It shall be red in color. Manual fire stations shall be individually annunciated on the control panel. Mounting height shall be 48" inches to the manual station actuation handle from the finished floor.
7. Intelligent/analog smoke detectors (Siemens FP-11) shall be photoelectric and listed by Underwriters' Laboratories, Inc. The detector shall contain a long life light emitting diode (LED) as its light source, and photo diode as a light receiver. An automatic gain control circuit shall be compensating for detector aging and dirt accumulation. The smoke detector shall be a plug-in twist/lock unit that allows for easy connection to its mounting base. Each smoke detector, when activated, shall have a flashing tri-color LED alarm indicator that shall indicate red for alarm, yellow for trouble and green for normal operational mode. Application Specific Detection environmental settings shall be programmed as directed by the engineer. System programming shall provide multiple output functions from a single initiating multi-criteria smoke detector. This capability shall mean a separate alarm event output for smoke alarm and a separate alarm output function for thermal alarm from a single analog initiating address device. Systems not capable of providing this design requirement shall provide alternate programmable logic accomplishing design performance, acceptable to the Engineer of Record.
   a. It shall be possible to adjust and/or electronically measure the sensitivity of each individual intelligent analog smoke sensor from the control panel. Relative sensitivity or manual test methods, which check the smoke sensor at the maximum allowable obscuration, will not be considered as being equivalent.

b. Smoke detectors shall alarm at their programmed sensitivity settings and shall not revert to a common default setting when their operating system segment is in the fail safe degrade mode.

8. Intelligent/Analog Duct Smoke Detector (Siemens FP-11/AD2-XHR, or ILP-1/AD-3ILP for rooftop applications) shall be photoelectric and listed by Underwriters' Laboratories, Inc. The detector shall contain a long life light emitting diode (LED) as its light source, and photo diode as a light receiver. An automatic gain control circuit shall be compensating for detector aging and dirt accumulation. The smoke detector shall be a plug-in twist/lock unit that allows for easy connection to its mounting base. Each smoke detector, when activated, shall have a flashing tri-color LED alarm indicator that shall indicate red for alarm, yellow for trouble and green for normal operational mode. Application Specific Detection environmental settings shall be programmed as directed by the Engineer. System programming shall provide multiple out-put functions from a single initiating multi-criteria smoke detector. This capability shall mean a separate alarm event output for smoke alarm and a separate alarm output function for thermal alarm from a single analog initiating address device. Systems not capable of providing this design requirement shall provide alternate programmable logic accomplishing design performance, acceptable to the Engineer of Record.
   a. It shall be possible to adjust and/or electronically measure the sensitivity of each individual intelligent analog smoke sensor from the control panel. Relative sensitivity or manual test methods, which check the smoke sensor at the maximum allowable obscuration, will not be considered as being equivalent.
   b. Smoke detectors shall alarm at their programmed sensitivity settings and shall not revert to a common default setting when their operating system segment is in the fail safe degrade mode.
   c. Coordinate sampling tube sizing with mechanical ducting requirements prior to shipping.

9. Heat detectors (Siemens FPT-11) shall be 135° F fixed temperature or fixed temperature/rate of rise and be listed by Underwriters' Laboratories, Inc. Rate-of-rise alarm threshold rate shall be 15° F per minute with a maximum coverage area of 2,500 sq. ft. Activation of the rate-of-rise heat detector shall be self-restoring. All detectors shall be addressable and have a white finish. The thermal detectors shall be individually annunciated on the control panel. Each heat detector, when activated, shall have a flashing tri-color LED alarm indicator that shall indicate red for alarm, yellow for trouble and green for normal operational mode.

10. High temperature heat detectors (Siemens DT-200R) shall be conventional 200° R fixed temperature/rate compensated and listed by Underwriters' Laboratories, Inc. The detector shall have a maximum coverage area of 2,500 sq. ft. Upon activation, the detector shall latch in alarm until reset at the main fire control panel and be self-restoring. The detector shall be individually annunciated at the control panel by means of interfacing with a remote addressable monitor module (TRI Series) or an addressable conventional zone module (CZM-4). The detector's interface module address shall be set by electronic means only, no mechanical means such as programming pins, dip-switches or rotary dials shall be used.

11. Interface modules (Siemens TRI Series) shall be intelligent and listed by Underwriters' Laboratories, Inc. The unit shall incorporate a custom microprocessor based integrated circuit that provides communication with main fire control panel. The interface module shall supervise and monitor normally open or normally closed dry contacts and report their status to the control panel. The intelligent interface module shall be used to uniquely identify field devices (contacts) such as kitchen Ansul, suppression system, water flow switches, tamper switches, OS&Y valves or as directed by these specifications and project drawings.
12. Intelligent interface modules (TRI-R) shall also be used when remote relays are required for system control functions, such as, but not limited to, fan shut down, door holder trip and elevator recall and shunt trip functions. Relay dry contacts shall be rated at 4 AMPS, 120 VAC resistive or 30 VDC resistive and contacts shall be Form "C" type.
13. The MXL and Booster Power Supplies shall provide NFPA 72, Style Y, two-wire (Class B), notification appliance circuits.
14. Horns (Wheelock Z Series) shall be installed as shown on the drawings in accordance with the requirements of the UL 1971 standard and NFPA 72. Provide UL listed weatherproof units and their required back boxes where shown on the drawings.
15. Horn Strobes (Wheelock Z-Series) shall be installed as shown on the drawings in accordance with the requirements of the UL 1971 standard and NFPA 72. Provide UL listed weatherproof units and their required back boxes where shown on the drawings. See Strobe requirements below.
16. Strobes (Wheelock Z-Series) shall be installed as shown on the drawings in accordance with the requirements of the UL 1971 standard and NFPA 72. Where multiple visual notification appliances can be seen from any location, circuitry shall be incorporated for the synchronization of flash rate. Strobes shall be of the latest compatible Siemens appliances. See DSA approved drawings for device quantities and locations. Provide UL listed weatherproof units and their required back boxes where shown on the drawings.
    a. Strobes shall produce a flash rate of one (1) flash per second minimum over the listed input voltage (20VDC - 31VDC) range.
    b. Strobes shall incorporate a Xenon flashtube enclosed in a rugged Lexan lens or equivalent with solid state circuitry.
    c. Strobe intensity shall be rated per UL 1971 for 15/75, 30/75, 60/75, 75 or 110 Candela. Dual listing strobes of 15/75 intensity for UL 1971/near-axis requirements shall be used where acceptable.
    d. Strobes shall be available for semi-flush or surface mounting and in conjunction with audible appliances as required.
17. Magnetic Door Hold-Opens (Rixen FM-998) shall be of the wall mount type and capable of operating at three voltages, 120VAC, 24VDC AND 24VAC, shall be provided under this section. They shall operate using local 24VDC power. The power shall be intercepted by a fire alarm system addressable control module or a relay base detector in order to interrupt the circuit so that the door closes in a fail-safe manner. See DSA approved drawings for device quantities and locations.
18. Software and firmware control:
    a. All software and firmware provided with a fire alarm system shall be listed for use with the fire alarm control unit.
    b. A record of installed software and firmware version numbers shall be maintained at the location of the fire alarm control unit.
    c. All software and firmware shall be protected from unauthorized changes through the use of "access levels."

B. SYSTEM ALARM OPERATION

1. Activation of any addressable manual fire pull box, area smoke detector, heat detector or waterflow switch shall result in, at a minimum, the following functions and indications:
   a. Activate "ALARM" status change at the local FACP and annunciate on its LCD display, indicating device address, device type, device location, time and date.
   b. Indicate "ALARM" status change at the respective building Remote Annunciator indicating device address, device type, device location, time and date.
   c. Activate General "ALARM" status change at the Off-Site Monitoring Station, through the Campus Network System.
   d. Activate emergency evacuation audible and visual notification appliances within the associated building(s).
   e. Annunciate "ALARM" status change at the On-site Main Campus Fire Alarm Control Panel location.
   f. Record event in the non-volatile system historical log.
   g. Record event system status change on the Main Campus Printer.
2. Elevator Recall:
   a. Activation of smoke detector in an Elevator Lobby (other than the Lobby designated "Primary Recall Floor) Machine Room or Elevator Shaft shall cause the associated elevator(s) to be recalled to the designated Primary Recall Floor.
   b. Activation of the Lobby Smoke detector on the designated Primary Recall Floor shall cause the associated elevators to be recalled to the designated Secondary Recall Floor.
   c. Activation of any Elevator Machine Room heat detector shall shunt trip the respective elevator main breaker.

C. SYSTEM SUPERVISORY FUNCTIONS

1. Activation of any Supervisory circuit, (i.e.; duct detector, supervised fire sprinkler valve closure, fire suppression system air pressure abnormal, low temperature, fire pump trouble, emergency fuel tank level alarm, as applicable to this project), shall cause the following actions and indications:
   a. Activate "SUPERVISORY" status change at the FACP and annunciate on its LCD display, indicating device address, device type, device location, time and date.
   b. Indicate "SUPERVISORY" status change at the respective building Remote Annunciator indicating device address, device type, device location, time and date.
   c. Activate General "SUPERVISORY" status change at the Off-Site Monitoring Station, through the Campus Network System.
   d. Annunciate "SUPERVISORY" status change at the On-site Main Campus Fire Alarm Control Panel location.
   e. Record event in the non-volatile system historical log.
   f. Record event system status change on the Main Campus Printer location.

D. SYSTEM TROUBLE FUNCTIONS

1. Receipt of a system trouble alarm, shall cause the following actions and indications:
   a. Activate "TROUBLE" status change at the FACP and annunciate on its LCD display, indicating device address, device type, device location, time and date.

b. Indicate "TROUBLE" status change at the respective building Remote Annunciator indicating device address, device type, device location, time and date.
c. Activate General "TROUBLE" status change at the Off-Site Monitoring Station, through the Campus Network System.
d. Annunciate "TROUBLE" status change at the On-site Main Campus Fire Alarm Control Panel location.
e. Record event in the non-volatile system historical log.
f. Record event system status change on the Main Campus Printer location.

2. The fire alarm system wiring shall be electrically supervised to automatically detect and report trouble conditions to the FACP.
3. System addressable devices shall be supervised for placement and normal operation. Removal of an addressable device or the failure of its internal electronic circuitry shall initiate a system trouble condition.
4. The FACP shall initiate a system trouble condition when the following occurs:
   a. Primary 120/220 VAC power loss.
   b. Battery disconnect.
   c. Battery low voltage.
   d. LCD annunciator panel power loss.
5. Operating an Off-Site Station agency alarm disconnect switch or any manual control commands that alter the system from its normal programmed standby configuration shall initiate a trouble condition.
6. Trouble conditions shall automatically activate an audible signal and flash the general system trouble LED indicator at the FACP. Pressing the trouble acknowledge key on the FACP shall silence the audible signal and continuously light the LED indicator, until the trouble condition is repaired. Subsequent trouble conditions shall re-sound the audible signal and again flash the LED. Each trouble condition must be individually acknowledged.
7. Removal of or failure of internal electronic circuitry of any addressable device shall initiate a system trouble condition.

E. INSTALLATION SHOP/AS-BUILT DRAWINGS

1. Show general layout of complete system including equipment arrangement. It shall be the responsibility of the fire alarm installing contractor to verify dimensions and ensure compatibility of all system interfaces. Shop drawings shall be maintained at the job site and shall be updated on an as needed basis. During the project life cycle, the Architect/Engineer may require updated drawings as reference during scheduled project meetings: Identify on the drawings, conduit and conductor sizes and types with number of conductors in each conduit. Provide each conduit and device with a unique identification. For addressable alarm initiation devices, the system identifier shall be the system address for that device. Signals shall be sequentially numbered with the address of the associated control module.
2. As-built drawings shall indicate point to point wiring diagrams of interconnecting wiring within all system control panels and termination enclosures showing wiring between modules and connecting field device terminals. All field numbering and/or labeling shall be reflected on As-built drawings.
3. Provide mounting details of FACP, remote transponder control panels (if any), system terminal enclosures and other boxes to building structure, showing fastener type, sizes, material and embedded depth.

F. CONDUIT, BOXES, ENCLOSURES AND WIRING DEVICES

1. All system wiring shall be in conduit and shall comply with all applicable article of the current California-amended NEC edition.
2. Boxes shall be installed plumb and firmly in position.
3. Extension rings with blank covers shall be installed on junction boxes where

required.

4. Junction boxes served by concealed conduit shall be flush mounted.
5. Upon initial installation, all wiring outlets, junction, pull and outlet boxes shall have dust covers. Dust covers shall not be removed until wiring installation when permanent dust covers or devices are installed.
6. All junction boxes shall be painted fire department red and be affixed with a decal or silk-screened label "Fire Alarm System."
7. Wet or damp locations shall require a NEMA rated enclosure suitable for the environment in which an addressable field device or module are to be installed (i.e. monitoring of sprinkler water flow, tamper switches and OS&Y valves).
8. Electrical conduits shall enter only at the side or the bottom of control cabinets, unless designed and approved for entry on the top.
9. All conduits shall be grounded to a water main by approved ground clamps with a conductor equal in size to the largest conductor used in the system; but in no case shall the ground conductor be smaller than no. 10 AWG.
10. All openings in fire rated walls, floors or ceilings where conduits, cables or wiring trays pass through shall be fire stopped with an approved fireproofing material rated to meet or exceed the rating of the assembly penetrated.

G. CONDUCTORS

1. Each conductor shall be identified as shown on the drawings at each with wire markers at terminal points. Attach permanent wire markers within 2 inches of the wire termination. Marker legends shall be visible.
2. All wiring shall be supplied and installed in compliance with the requirements of the National Electric Code, NFPA 70, Article 760, and that of the manufacturer-wiring guides.
3. Wiring for analog loop circuits, conventional detection circuits, speaker circuits and telephone circuits shall based on the fire alarm manufactures wiring guidelines, but shall not be smaller than #16 AWG.
4. Notification Device Circuits: Minimum wire size shall be 12 AWG for horn and strobe circuits.
5. Splices shall be made with UL listed mechanical connectors to assure reliable service.
6. Crimp-on type spade lugs shall be used for terminations of stranded conductors to binder screw or stud type terminals. Spade lugs shall have upset legs and insulation sleeves sized for the conductors.
7. Wire nuts or other solderless splicing devices shall not be used.
8. A consistent color code for fire alarm system conductors throughout the installation shall be provided. The installation contractor shall submit for approval prior to installation of wire, a proposed color code for system conductors to allow rapid identification of circuit types.
9. All nominal voltage branch circuit power feeds (120/220 VAC) shall be identified "labeled" at both ends of the circuit to indicate its source and purpose. Each FACP and control panels shall have a dedicated branch circuit with shunt trip disconnect, labeled as such.
10. Wiring within system control panels shall be arranged and routed to allow accessibility to equipment for adjustment and maintenance and to isolate nominal voltage wiring from system low voltage wiring.

H. DEVICE DESCRIPTORS

1. Descriptors at SMCCCD MXL panels shall be developed following this standard SMCCCD protocol. No exceptions are allowed.
   a. Address, Device, Equipment ID (if needed), Building Number, Floor Number, Description

2. Devices shall be identified by an abbreviation or code from the following table below.

Initiating Devices			Communication Devices	
Smoke Detector	SD		Fireman's Phone	FP
Heat Detector	HD		Fireman's Jack	FJ
Duct Detector	DD			
Beam Detector	BD		**Panels**	
Air Sampling	AS		Fire Alarm Control Panel	FACP
Monitoring Device (By Name)	MSC		Printer	PRT
Pull Station	PS		Annunciator	ANN
Tamper Switch	TS		Video Display Terminal	VDT
Water Flow	WF		Voice Evac Panel	EVAC
Fire Smoke Damper	FSD		Fan Control Panel	FAN
			Network Control Center	NCC
Notification Devices			Aux Power Supply	PWR
Audible	AUD		Dialer	DIAL
Visual	VIS		Foreign System Interface	FSI
Audible/Visual	AV			
Voice Evac Speaker	SPKR			

3. If the device is monitoring or controlling a piece of equipment, then that equipment's ID shall immediately follow the Device. (e.g., TRI HV-5A).
4. If the description is to contain a single compass point, it should be spelled out (e.g., North). If the description uses multiple compass points such as North East it should be abbreviated (e.g., N.E.).
5. If the description contains a room number, then state the building number followed by a dash and then the three digit room number. (e.g., 2-105)
6. Examples:
   a. 02:002-007 PS B2 F1 RM 2-105.
   b. 02:001-047 SD B1 F3 MECH RM.
   c. 02:004-034 DD B7 F3 N.E. CORRIDOR.
   d. 02:004-059 TRI HV-5A B7 F1 MCC.

PART 3 - TESTING AND ACCEPTANCE

3.01 FIELD QUALITY CONTROL

A. CERTIFICATE OF COMPLIANCE: Complete and submit to the project engineer in accordance with NFPA 72, paragraph 1.7.2.

B. FIELD - TESTING GENERAL
   1. Each addressable analog smoke detector shall be individually field tested prior to installing the device at its designated location to ensure reliability after shipment and storage conditions. A dated log indicating correct address, type of device, sensitivity and initials of the technician performing the test - using test equipment specifically designed for that purpose - shall be prepared and kept for final acceptance documentation. After testing, the detection devices and base shall be labeled with the system address, date and initials of installing technician. Labeling shall not be visible after installation is complete.

2. Wiring runs shall be tested for continuity, short circuits and grounds before system is energized. Resistance (Megger), current and voltage readings shall be made as work progresses.
   a. A systematic record shall be maintained of all readings using schedules or charts of tests and measurements. Areas shall be provided on the logging form for readings, dates and witnesses.
   b. The acceptance inspector shall be notified before the start of any required tests. All items found at variance with the drawings or this specification during testing or inspection by the acceptance inspector shall be corrected.
   c. Test reports shall be delivered to the acceptance inspector as completed.
3. All test equipment, instruments, tools and labor required to conduct the system tests shall be made available by the installing contractor. The following equipment shall be a minimum for conducting the tests:
   a. Ladders and scaffolds as required to access all installed equipment.
   b. Multimeter for reading voltage, current and resistance.
   c. Intelligent device programmer-tester.
   d. Laptop computer with programming software for any required program revisions.
   e. Two way radios, flashlights, smoke generation devices and supplies.
   f. An approved device for measuring air flow through air duct smoke detector sampling assemblies.
   g. Decibel meter.
   h. Testing documentation.
4. In addition to the testing specified to be performed by the installing contractor, the installation shall be subject to test by the acceptance inspector.

C. FINAL ACCEPTANCE TESTING
1. A written "Acceptance Test Procedure" (ATP) for testing the fire alarm system components and installation will be prepared by the Engineer in accordance with NFPA 72 and this specification. The contractor shall be responsible for the performance of the ATP, demonstrating the function of the system and verifying the correct operation of all system components, circuits and programming.
2. The acceptance inspector shall use the system record drawings in combination with the documents specified under sections (2.01-G and 3.01-C.) during the testing procedure to verify operation as programmed. In conducting the ATP, the acceptance inspector shall request demonstration of any or all input and output functions. The items tested shall include but not be limited to the following:
   a. System wiring shall be tested to demonstrate correct system response and correct subsequent system operation in the event of:
      1) Open, shorted and grounded intelligent analog signaling line circuit.
      2) Open, shorted and grounded conventional initiating device circuits.
      3) Intelligent device removal.
      4) Primary power or battery disconnected.
      5) Incorrect device address.
   b. System evacuation alarm indicating appliances shall be demonstrated as follows:
      1) All alarm notification appliances actuate as programmed.
      2) Audibility and visibility at required levels.
   c. System indications shall be demonstrated as follows: Correct message display for each alarm input, at the control panel alphanumeric LCD display.

d. System on-site and/or off-site reporting functions shall be demonstrated as follows:
   1) Correct alarm custom message display, address, device type, date and time transmitted for each alarm input.
   2) Correct trouble custom message display, address, device type, date and time transmitted for each alarm input.
   3) Trouble signals received for disconnect.

e. Secondary power capabilities shall be demonstrated as follows:
   1) System primary power shall be disconnected for a period of time as specified herein. At the end of that period, an alarm condition shall be created and the system shall perform as specified for a period as specified.
   2) System primary power shall be restored for forty-eight hours and system-charging current shall be normal trickle charge for a fully charged battery bank.
   3) System battery voltages and charging currents shall be checked at the fire alarm control panel using the test codes and displayed on the LCD display.

3. In the event of system failure to perform as specified and programmed during the ATP procedure, at the discretion of the acceptance inspector, the test shall be terminated.
   a. The installing contractor shall retest the system, correcting all deficiencies and providing test documentation to the acceptance inspector.
   b. In the event that software changes are required during the ATP, the system manufacturer to compare the edited program with the original shall furnish a utility program. This utility shall yield a printed list of the changes and all system functions, inputs and outputs effected by the changes. The items listed by this program shall be the minimum acceptable to be retested before calling for resumption of the ATP. The printed list and the printer log of the retesting shall be submitted before scheduling of the ATP.
   c. The acceptance inspector may elect to require the complete ATP to be performed again if, in his opinion, modifications to the system hardware or software warrant complete retesting.

D. DOCUMENTATION
1. System documentation shall be furnished to the owner and shall include but not be limited to the following:
   a. System record drawings and wiring details including 3 sets of as-builts as well as as-builts on a CD-ROM in the current version of AutoCAD.
   b. System operation, installation and maintenance manuals.
   c. Written documentation for all logic modules as programmed for system operation with a matrix showing interaction of all input signals with output commands.
   d. System program "hard copy" showing system functions, controls and labeling of equipment and devices.
   e. All specified documentation as required under sections (2.01.E. and 3.01.C.).

E. CLEANING: Contractor shall thoroughly clean all areas in which it works at the end of each work day and upon completion of installation.

F. WARRANTY/SERVICES: The contractor shall warrant the entire system against system hardware and electrical defects including programming software defects for a period of one year. This period shall begin upon Substantial Completion of the project by the Architect of Record/Engineer of Record, but not prior to certification of final acceptance testing of the system. Contractor shall provide to owner a letter stating the start-date and end-date of warranty period. In addition, the contractor shall also provide an updated list of name(s) and phone number(s) for normal and off-hours contacts necessary to respond to warranty issues. Response to warranty notification shall require a reply within 24 hours of initial contact.

G. TRAINING
1. The fire alarm contractor shall furnish training as follows for a minimum of four employees of the system user:
   a. Training in the receipt, handling and acknowledgment of alarms.
   b. Training on system operation including manual control of output functions from the FACP.
   c. The total training requirement shall be a minimum of 4 hours, but shall be sufficient to cover all items specified.

END OF SECTION

SECTION 16906

OCCUANCY SENSORS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Occupancy sensors.

1.02 SYSTEM DESCRIPTION

A. Provide occupancy sensors to sense the presence of human activity within the desired space and enable or disable the on/off manual lighting control function provided by local switches.

B. Upon detection of human activity by the detector, sensor initiates a time delay to maintain the lights on for a preset period of time. Field adjustable time delay setting from 30 seconds to 15 minutes.

C. Factory set sensors for maximum sensitivity.

D. LED lamp built into sensor indicates when occupant is detected.

E. Provide zero cross relay control with sensors and sensor/switches; relay contacts close and open when AC voltage signal is at zero.

F. Where line voltage sensors and sensor/switches are used, provide to match voltage of controlled circuit.

G. Line Voltage Sensors, Control Units, and Relays: UL listed.

1.03 SUBMITTALS

A. Provide, on reproducible architectural floor plan, a layout of sensors indicating their sensing distribution.

B. Provide wiring diagrams indicating low voltage and line voltage wiring requirements.

PART 2 - PRODUCTS

2.01 OCCUPANCY SENSORS (CEILING AND WALL MOUNTED)

A. Ultrasonic Occupancy Sensors:
1. Sensor Function: Detects human presence in the controlled floor area by detecting Doppler shifts in 40kHz ultrasound created by sensor.
2. Sensors are precision crystal controlled and do not interfere with each other when two or more are placed in the same area. Sensor includes advanced digital signal processing to reduce false on signals without decreasing sensitivity, as well as immunity to RFI/EMI sources.
3. Depluggable terminal for plug-and-play replacement.
4. Sensor utilizes DIP switches for adjustment to time delay and override. Field adjustable settings for sensitivity.

5. Low Voltage Sensor: 24VDC power. Sensor operates remote power switch packs. Multiple sensors can be wired in parallel allow coverage of large areas.
6. Ceiling-Mounted Sensor:
   a. Maximum protrusion of 1.1 inches and blend in aesthetically with the ceiling.
   b. Coverage: 360 degree sensor range; coverage: 2,000 square feet, unless otherwise noted on Drawings.
   c. Manufacturers: The Watt Stopper UT Series, or approved.

PART 3- EXECUTION

3.01 INSTALLATION

A. Install occupancy sensors as directed by manufacturer's instructions. Provide connections to control circuits, occupancy sensors, power supply pack and low voltage wiring.

B. Drawings were laid out using Watt Stopper sensors as the basis of design. If another manufacturer is approved for installation under this Contract, verify with manufacturer representative that sensors are laid out to provide coverage across room space, adding additional sensors as needed.

C. Provide power packs for the sensor to control the number of circuits and/or switch legs within its area of coverage.

D. Field adjust each sensor to maximize its coverage of the room space.

E. Relocate sensors with ultrasonic technology to avoid being closer to HVAC diffusers and power packs than recommended by manufacturer.

F. Field set time delay for each device: Restrooms: 15 minutes

3.02 QUALITY CONTROL

A. Use manufacturer's published testing and adjusting procedures to adjust sensors time delay, daylight sensitivity, and passive infrared sensitivity to satisfaction of the Owner.
B. Prepare and complete report of test procedures and results. Submit these test procedures and results to Owner.

END OF SECTION 16906