

SAN MATEO COUNTY  
COMMUNITY COLLEGE DISTRICT

# CCFC CONFERENCE

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Financial Stability through Sustainability

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Vice Chancellor

Facilities Planning, Maintenance & Operations

# Outline

- District Demographics
- Energy Efficiency Improvements
- District / College Wide Planning
- Design Considerations
- Energy Efficiency & Sustainability



# San Mateo County Community College District

- Three Campuses (1.4M GSF / 346 Acres)
  - Cañada College – Redwood City - 1968
  - Skyline College – San Bruno - 1969
  - College of San Mateo – San Mateo – 1963
  - District Office – San Mateo - 1978
- 25,000 Students / 1,000 Staff / Adjuncts
- Capital Improvement Program
  - Multiple Funding Sources
    - **Measure C \$207 Million (2001)**
    - **Measure A \$468 Million (2006)**
    - **State / Local Resources \$75 Million\***

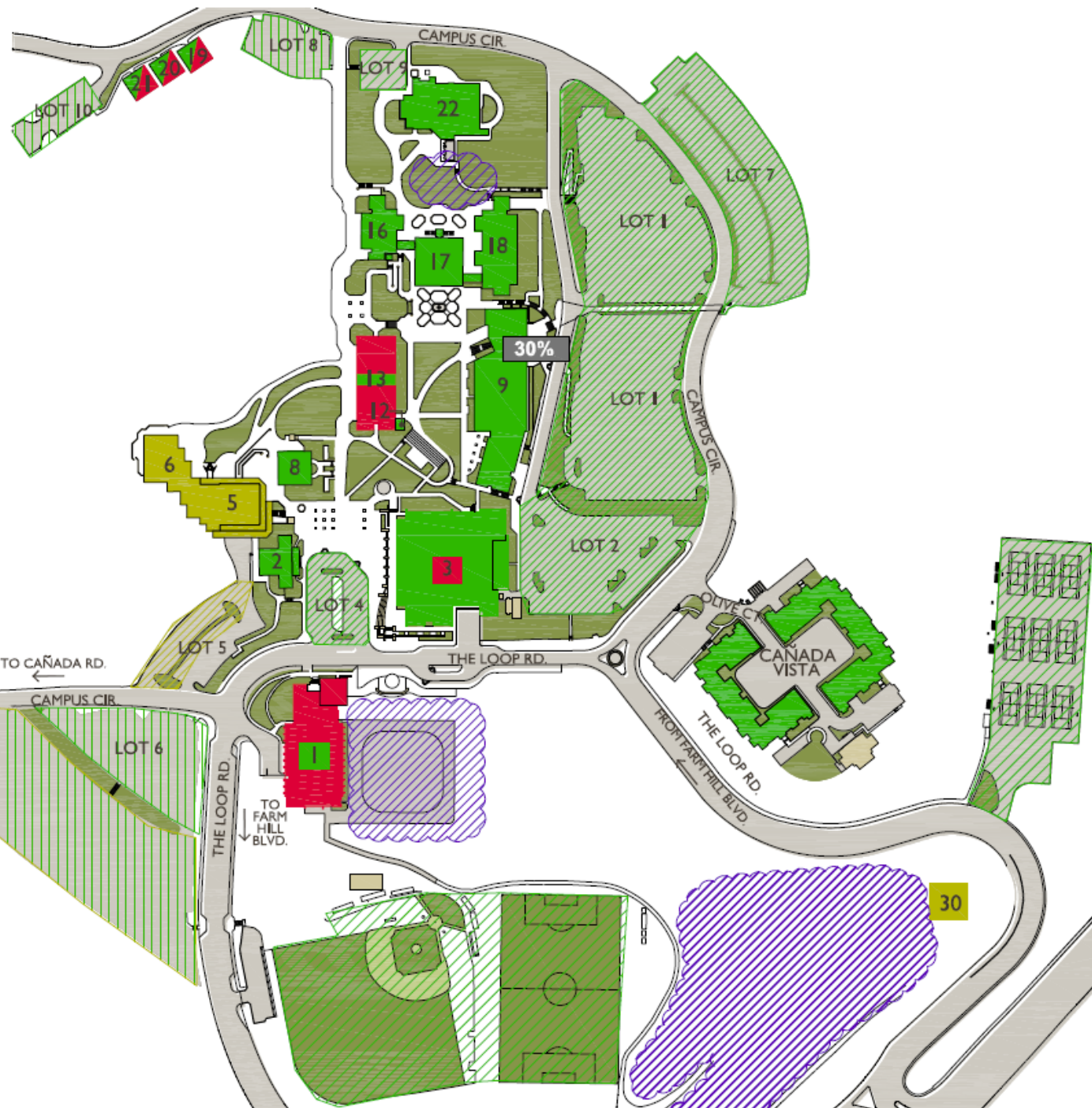
**\* \$20M Lehman Brothers / \$54M State**

# Cañada College

Building Renewal, Renovation, and New Construction Status

-   **Completed**
-   **In Progress**
-   **Not Funded**
-   **Undetermined**

The colors depicted on the buildings represent the percentage of the building that has been completed; not necessarily the area within the building where work has been performed



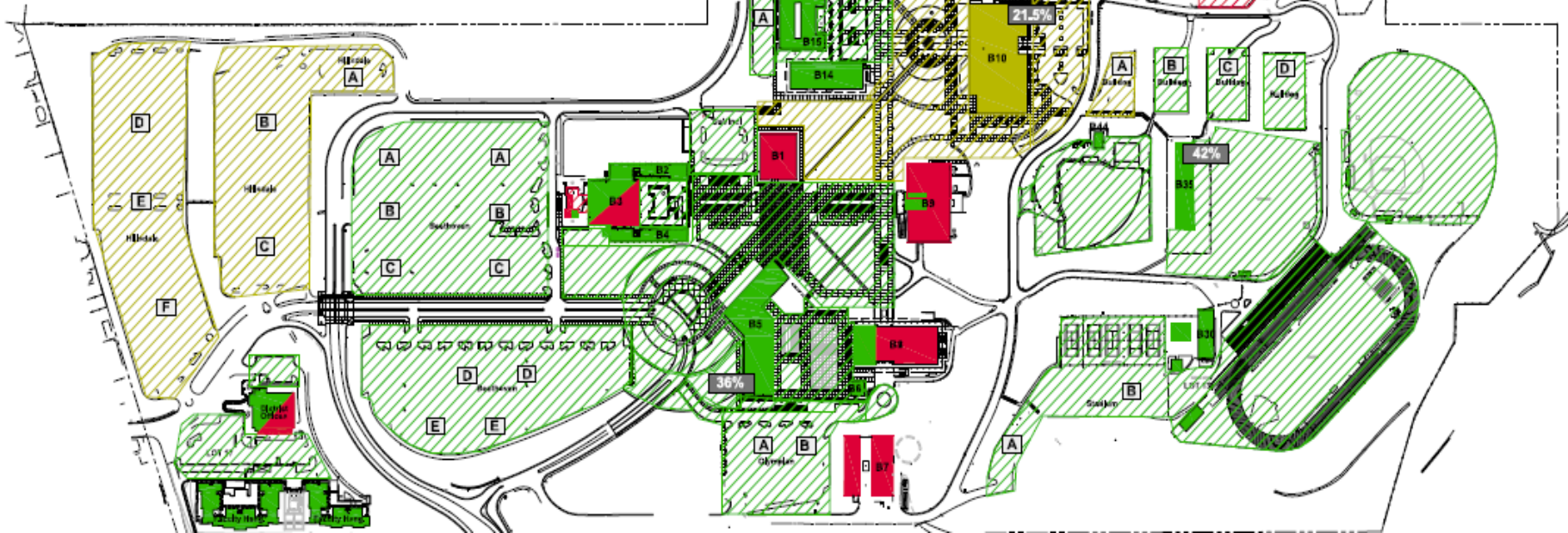
# College Of San Mateo

Building Renewal, Renovation, and New Construction Status



The colors depicted on the buildings represent the percentage of the building that has been completed; not necessarily the area within the building where work has been performed

Construction Planning Department  
10/26/2010

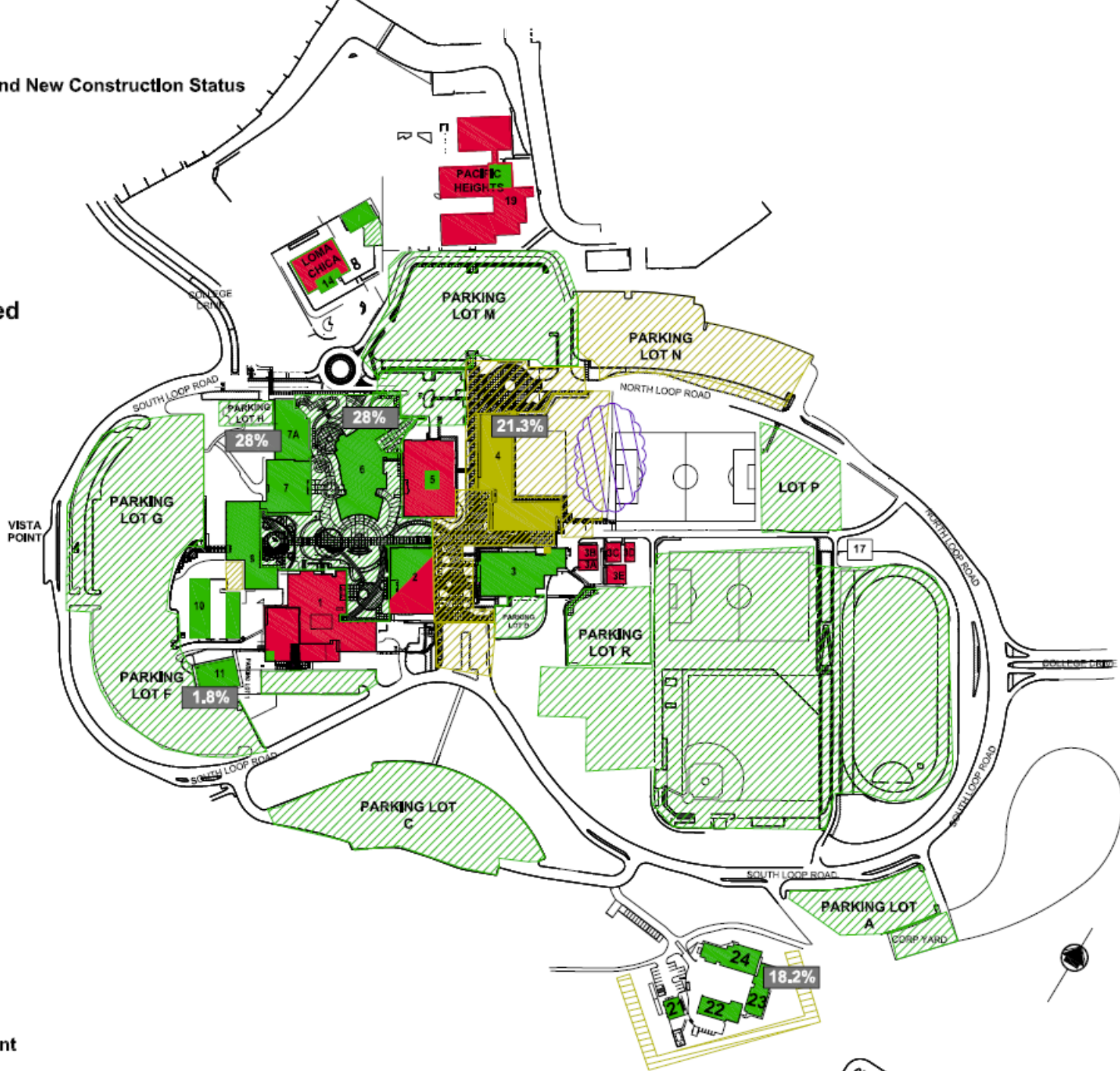


# Skyline College

## Building Renewal, Renovation, and New Construction Status

-   Completed
-   In Progress
-   Not Funded
-   Undetermined

The colors depicted on the buildings represent the percentage of the building that has been completed; not necessarily the area within the building where work has been performed



# District/College Wide Planning

*“The Plan is Nothing and Planning is Everything.”* Who is involved?

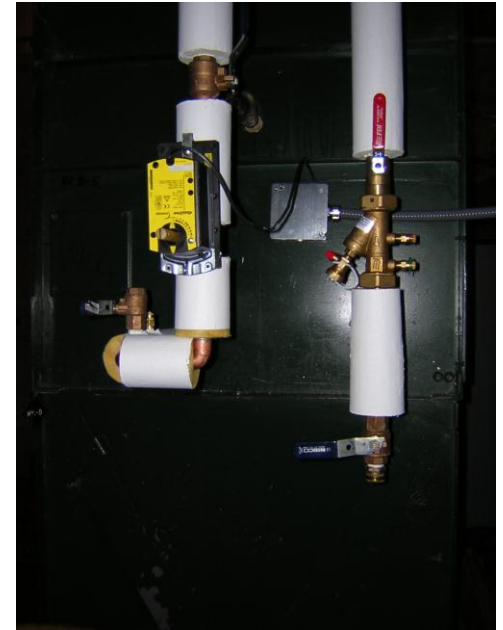
- Board of Trustees
  - **Is it Legal?**
- Chancellor/College President
  - **Where is the Common Sense?**
- Budget Officers (First time vs. On-going)
  - **We Don't have the \$\$**
- Facility Managers (Life Cycle Cost)
  - **We Don't have the time**
- Design Team
  - **It's per Code and Not Best Practice**
- Contractors
  - **It will kill our schedule**
- Users (Faculty, Staff, Students & Community)
  - **We've never done it that way**



# District/College Wide Planning

*"The Organization that Fails to Plan, Plans to Fail."*  
Affecting Factors & Challenges

- Funding Pressures
- Aging Facilities and Infrastructure
- Year Round Operation
- Environmental Laws
- Changing Roles of Utility & Energy Management
- New Digital Systems
- Changing Role of Trustees
- Internet and use of other technologies





# District/College Wide Planning

## Whole Facility Infrastructure Approach: Out of Sight – Out of Mind

- Water
  - Potable Water
  - Non-Potable Water
  - Irrigation
  - Fire Protection
- Drainage
  - Sanitary Sewer
  - Storm Drain
  - Rain Water Collection
- Electrical
  - Electrical Distribution
  - Emergency Power
  - Exterior Lighting
- HVAC
  - Chilled Water
  - Steam
  - High Temperature Hot Water
  - Natural Gas
  - Instrument or Control Air
- Information
  - Telephone
  - Fire Alarm
  - Security
  - Cable/Satellite TV
  - Video
  - LAN

# District/College Wide Planning

## Why Sustainability?

- Board of Trustees Goal
  - Exceed Title 24 Energy Requirements
  - LEED Certification
  - PG&E Savings by Design
  - Renewable Energy Sources
  - Recovery of Waste Heat
  - Re-Use and Diversion of Construction Materials
- Guiding Principle in the 2006 Facilities Master Plan
- Sustainable San Mateo County
- Economic & Financial Benefits
- IT'S THE RIGHT THING TO DO!

# District/College Wide Planning

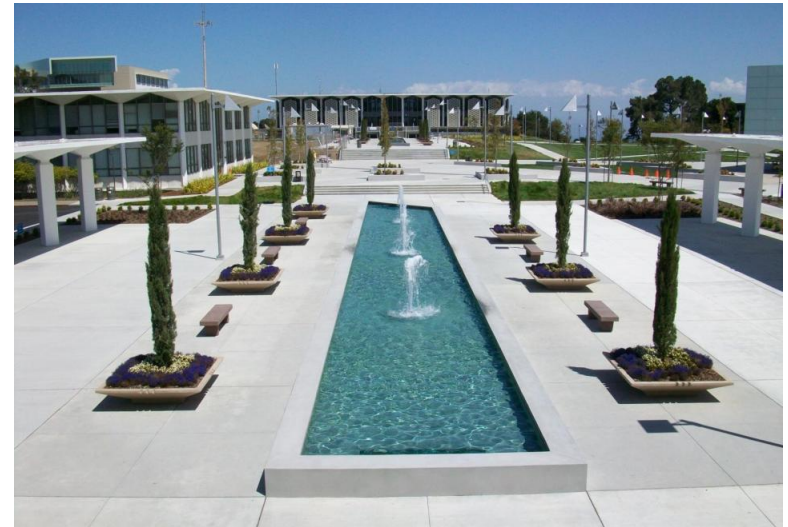
## Sustainability Strategies

- Energy Management
- Waste Reduction
- Water Conservation
- Indoor Air Quality (IAQ) Management Program
- Use of Green Construction Materials and Renewables
- Recovery of Waste Heat
- Re-Use and Diversion of Construction Materials
- Building Design

# District/College Wide Planning

## Energy & Utilities: Poor Job of Telling the Story

- Usage Trends & Consumption (Gas, Electrical, Water, Waste)
- Aging Facilities & Physical Plant
- Chilled Water Systems (Closed Loop)
- HHW System (Closed Loop)
- Commissioning
- New Systems (Relatively)
  - **Geothermal Storage**
  - **Evaporative Cooling**
  - **Photovoltaic**
  - **Co-Generation**
  - **Energy Wheels**
  - **Ice Storage**
- Automation/ Building Management System (BMS)



# Energy Efficiency & Sustainability Design Considerations

- Design Guidelines & Specifications
  - Design a building that approaches or achieves LEED Certification (Self Enacted)
  - Preference for LEED experienced or accredited Contractors, Designers, and Engineers
  - Design and construct a sustainable and energy efficient building
  - Include PG&E Savings by Design
- Allows selection of mechanical engineers and designers
- Collaborative process; encourages sharing of ideas



# Energy Efficiency & Sustainability

Design Considerations

Facility Managers/M&O Staff - Need to be engaged

- Programming
- Plan Reviews
- Building Systems
  - **HVAC**
  - **Electrical**
  - **Plumbing**
  - **Flooring**
  - **ITS**
- Submittal Reviews
- Systems Life Cycle Cost Analysis
- New Technologies



# Energy Efficiency & Sustainability Improvements

- Site near public transportation
  - (SS Credit 4.1 Alternative Transportation: Public Transportation Access)
- Bicycle Storage
  - (SS Credit 4.2 Alternative Transportation: Bicycle Storage)
- Bio Swales / Rain Water Cistern
  - (SS Credit 6.1 Storm Water Design Quantity Control)
- Light colored, single ply roofing with Solar Reflectance Index
  - (SS Credit 7.2 Heat Island Effect, Roof)
- Constructed on Previous Developed Site
  - (SS Credit 2 Development Density)



# Energy Efficiency & Sustainability Improvements

- Storm water detention catch basin underneath landscaping on North side of building
  - (SS Credit 6.1 Stormwater Management: Rate and Quantity)
- On site Commissioning Agent
  - (EA Prerequisite 1 Fundamental Commissioning – Energy Systems)
- 8' GFRC rooftop overhang – provides shade
  - (EA Credit 1 Optimize Energy Performance)
- Energy efficient light fixtures
  - (EA Credit 1 Optimizing Energy Performance)
- Direct Digital Controls
  - (EA Credit 1 Optimizing Energy Performance)
- Daylight Sensors
  - (EA Credit 1 Optimize Energy Performance)





# Energy Efficiency & Sustainability Improvements

- Occupancy Sensors
  - (EA Credit 1 Optimize Energy Performance)
- Landscaping Native Species, Drought tolerant and Irrigation Efficiency
  - (WE Credit 1.1 Water Efficient Landscaping reduce by 50%)
- High Efficiency fixtures such Automatic flush valve (toilets / urinals)
  - (WE Credit 2 Innovative Waste Water Technologies Water efficiency)
- Reduction of Water use
  - (WE3.1 Water Use Reduction 20%)
- Resilient flooring and carpet
  - (IEQ Credit 4.3 Low –Emitting materials, carpet)
- Low VOC paint
  - (IEQ Credit 4.2 Low – Emitting materials, paints and coatings)



# Energy Efficiency & Sustainability Improvements

- Recycling stations throughout building
  - (MR Prerequisite 1 Storage & Collection of Recyclables)
- Construction debris – 73% sorted for recyclable materials
  - (MR Credit 2.1 Construction Waste Management: Divert 50% from Disposal)
- “Utility Vision” Monitoring of Electrical & Gas Consumption
  - (EA Credit 5 Measurement & Verification)
- East – West building orientation
- Mechoshades at windows



# Energy Efficiency & Sustainability Overall Campus Improvements

- Campus Building Management System (BMS)
- Campus Heating / Hot Water Loop
- 9000 Lighting Fixture Retrofits
- 960 Air Handlers Retrofit
- Nine Boiler Retubing
- CO2 Sensors
- Co-Generation
  - 560 KW (CSM)
  - 375 KW (SKY)
- Reflective Roofing



# Energy Efficiency & Sustainability

## % Above Title 24 Requirements

Building	GSF	%
Cañada Building 9	75,917	30.0%
Cañada Facilities Maintenance Center (FMC)	17,292	15.9%
College of San Mateo Building 5	89,086	36.0%
College of San Mateo Building 10	140,149	21.5%
College of San Mateo Building 36	60,904	42.0%
Skyline Facilities Maintenance Center (FMC)	8,307	18.2%
Skyline Building 4	70,310	21.3%
Skyline Building 6	38,828	28.0%
Skyline Building 7A	28,965	28.0%
Skyline Building 11	8,800	1.8%

# Energy Efficiency & Sustainability Rebate Breakdown

- PG&E Energy Efficiency
  - CAN Air Handler Retrofits: Jan 2002 - \$27,000
  - DW High Efficiency Lighting Systems: July 2002 - \$102,600
  - CSM & SKY Co-Generation: November 2004 - \$878,557
- Savings by Design
  - Cañada 9: March 2008 - \$24,927
  - Cañada Facilities Maintenance Center (FMC): Estimated \$5,810
  - College of San Mateo 5 Health & Wellness: PG&E Assessment
  - College of San Mateo 5 Aquatic Center: PG&E Assessment
  - College of San Mateo 9 Chiller: In Process
  - College of San Mateo 10: PG&E Assessment
  - College of San Mateo 35: Summer 2006 - \$2,400
  - College of San Mateo 36: November 2006 - \$56,117
  - College of San Mateo Site Work Lighting: PG&E Assessment
  - Skyline B6/7A: May 2007 - \$38,546
  - Skyline Facilities Maintenance Center (FMC): Estimated \$2,130
  - Skyline 11: In Process

# Energy Efficiency & Sustainability Rebate Breakdown

## Energy Efficiency

- CCC/IOU Partnership
  - Rebates Received
    - Cañada 16/18 DDC Controls Retrofit: April 2009 - \$11,067
    - College of San Mateo DDC Controls Retrofit: April 2009 - \$52,459
    - College of San Mateo 8 VAV Retrofit: May 2007 - \$7,594
    - College of San Mateo 9 Library Chiller: May 2007 - \$33,770
    - Skyline 3 VAV Retrofit: May 2007 - \$39,686
    - Skyline 5 Library Lighting: April 2009 - \$15,203
    - Skyline 7 DDC Controls Retrofit: April 2009 - \$9,011
    - District Wide Parking Lot Lighting: April 2009 - \$1,914
  - Rebates Forthcoming
    - Cañada 5/6: PG&E Assessment
    - Cañada 8: PG&E Assessment
    - College of San Mateo 2/4: PG&E Final Review
    - College of San Mateo 14/16: PG&E Final Review
    - Skyline Electrical Upgrade/Boiler: In Process
    - District Wide PC Power Management: PG&E Assessment

# Energy Efficiency & Sustainability Savings Summary

- Operational Savings \$1.7M
- PG&E Energy Efficiency: \$1,008,157
- Savings by Design: \$129,930
- CCC/IOU Partnership: \$170,704



## Question & Answer

[www.smccd.edu/facilities](http://www.smccd.edu/facilities)

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