



STANFORD UNIVERSITY Facilities Operations – Utilities

STANFORD STADIUM PROJECT



C3 IMPLEMENTATION FROM DESIGN
THROUGH CONSTRUCTION AND BEYOND



STANFORD UNIVERSITY

Overview of Campus C.3 Program

- ❖ Campus Wide Master Plan prepared in 2005
 - Evaluates campus as a whole and examines feasibility of various treatment measures
 - Approved by Santa Clara County
 - Proposes measures to address infill projects on Stanford Campus

SUMMARY OF RESULTS

The table below summarizes the treatment options proposed, the runoff flow from the proposed development sites requiring treatment, the total treated flow, and the "banked flow" for both the East Campus and the West Campus. "Banked flow" is defined as surplus flow capacity derived from treated flows from existing developed areas that can be used to offset new development or redevelopment within the same watershed.

	Major Area	
	East Campus	West Campus
Types of Treatment BMPs		
Vegetated Ditches	x	
Detention Ponds	x	
Structural Control Measures		x
C.3 Mitigation		
Flows from new development requiring treatment (cfs)	1.68	18.42
Treated Flow Total (cfs)	8.11	23.80
Banked Flow for Future Development (cfs)	6.43	5.38



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Overview of Campus C.3 Program

- ❖ Project C3 Strategy evaluated on a case by case basis
 - When feasible on site treatment measures are preferred
 - Minimizing maintenance frequency and overall number of facilities is strongly encouraged
 - Regional facilities may be use to accommodate flows which cannot be treated by site design or on site measures
 - Tally of available flow in each watershed is maintained and provided to Santa Clara County



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Treatment Measures Implemented

❖ Regional Treatment Measure - Matadero Watershed

- Grassy Swale; Construction completed in November, 2005
- 3.5 cfs original treatment capacity; 2.07 cfs treatment capacity remaining as of June, 2007





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Treatment Measures Implemented

- ❖ Regional Treatment Measure – San Francisquito Watershed
 - CDS Hydrodynamic Separator Unit; Construction completed in December, 2005
 - 19 cfs original treatment capacity; 18.64 cfs treatment capacity remaining as of June, 2007





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Santa Clara County C.3 Requirements

- ❖ Governed by Santa Clara County Stormwater Ordinance, NS-517.74
- ❖ Storm Water Questionnaire and Certification by Professional Engineer for each project are required with ASA Submittal or Permit Submittal; Letter provided to County Stormwater Program certifying use of regional facilities, quantity of flow treated and remaining capacity.



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Santa Clara County C.3 Requirements

CLEAN WATER PROGRAM QUESTIONNAIRE

(Please remove this sheet from information packet, fill out both sides, and submit this form with your land use application)

If you are unable to fill this out form accurately, please ask your project civil engineer or architect to complete the form. Inaccurate responses delay processing.

• Project Name: (if any) _____

• APN # _____ Building Inspection Office Plan Check # _____

• County Planning File # _____

• Applicant Name: _____

• Project Location: _____
(Street Address and City)

1. Project Type (check all that apply):

- Residential (Subdivision, not individual Single Family Dwelling)
- Commercial
- Industrial Government: Name of Agency _____

2. Project Size, Impervious Area, and Disturbed Area:

a. Total Site Area: _____ sq. ft.

b. Existing (Pre-project) Impervious Surface Area _____ sq. ft.

Walkways _____ sq. ft.
Roof areas _____ sq. ft.
Parking lots _____ sq. ft.
Other areas _____ sq. ft.

c. Total New or replacement Impervious Surface Area _____ sq. ft.

Walkways _____ sq. ft.
Roof areas _____ sq. ft.
Parking lots _____ sq. ft.
Other areas _____ sq. ft.

d. Total (Post-Project) Impervious Surface Area (existing + new, or b+c) _____ sq. ft.

e. Percent of Increase and Replacement of Impervious Surface Area _____ %
(c/b)*100

THERE ARE ADDITIONAL QUESTIONS, SO PLEASE TURN THIS PAGE OVER TO COMPLETE THE QUESTIONNAIRE

f. Area of Land Disturbance During Construction _____ sq. ft.
(includes clearing, grubbing, grading, filling, building, paving, installing septic tank system, installing water tanks, etc.)

3. Please report the types of Pesticide Reduction Measures proposed for your project (check all that apply):

Description

- Specific Landscape Design and Pesticide Reduction Certification by Licensed Landscape Architect.
- Does Not Apply. (i.e., no landscaping proposed or involved)
- Project maintains existing natural vegetation without using pesticides.

4. Please report the types of storm water controls planned (check all that apply):

Description

- Storm Water Treatment Measure (pollution treatment/ removal)
- Source Control Measure (pollution prevention--by permanent BMPs)
- Site Design Measure (pollution prevention--by site layout)

5. Other water quality related permits that may be required from other agencies, i.e., Santa Clara Valley Water District Permit, Dept. of Fish and Game Stream Alteration Agreement, Regional Water Quality Control Board 401 Water Quality Certification, Army Corps of Engineers 404 Certification, etc.

6. List of all water related resources located on site, including water courses, drainage ditches, streams, wetlands, springs, seeps, water wells, detention ponds, natural ponds or lakes, man-made impoundments, and septic tank systems.

DEPT. OF PLANNING AND DEVELOPMENT, LDE STAFF USE ONLY

Questionnaire reviewed by LDE Staff (initials) _____ Date: _____

Project Category: Group 1 Group 1 & HMP
(check one) Group 2A Group 2B
 Exempt Not in SF Bay Watershed

Clean Water Program Development Services Office COUNTY OF SANTA CLARA

STORM WATER TREATMENT DESIGN CERTIFICATION (To be submitted at time of building plans or grading plans submittal)

Check one: GROUP 1 GROUP 2A GROUP 2B

Design Method (circle all applicable):

C.3.d(i)1 C.3.d(i)2 C.3.d(ii)1 C.3.d(ii)2 C.3.d(ii)3

APN: _____

Building Inspection Plan Check #: _____

Name of Applicant: _____

Planning Office File No.: _____

Project Street Address: _____

I hereby certify that the storm water treatment device(s) designed for the above referenced project conforms to the requirements of the amended 2001 NPDES Permit issued to Santa Clara County and the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) agencies by the SFB-RWQCB.

Signature of CA Registered Civil Engineer _____

Name of Engineering Firm _____

Date: _____

Date of Plan: _____

Wet Signed Reg. Civil Engineer's Stamp:



STANFORD UNIVERSITY

Maintenance and Operations

❖ Responsibilities:

- Shared responsibility between Stanford Maintenance Departments (Water Shop, Athletics and Grounds)

❖ Efforts:

- Include a minimum of biannual visual inspections, annual inspection by professional engineer to ensure facility is functioning properly and there is no damage and annual cleaning of all facilities



STANFORD UNIVERSITY Maintenance and Operations

❖ Procedures:

- Vactor sump of CDS units; Process takes approximately 1 hour per facility



- Remove trash and debris from swales;
Maintain required length of grass.



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❖ Coordination with County

- Complete inspection form annually and provide to County Stormwater Program

Standard Stormwater Treatment BMP Inspection Data Collection Form

Date: _____ Time: _____ File Number: _____
Municipality: _____ Agency or Department: _____
Inspector: _____

I. REASON FOR INSPECTION

Initial Follow-up Other _____
 Routine Response to Complaint Inspection Frequency: _____

II. PROJECT INFORMATION

1. ID # or Assessor Parcel Number: _____
2. Project Type: Residential Commercial Industrial Multi-use Road Public
3. Facility Name: _____
Site Address: _____
Contact Name: _____ Phone: _____
4. If the property owner is different than the contact name, fill out information below:
Owner Name: _____ Title: _____
Owner's Address: _____ Phone: _____
5. If the BMP operator is different than the contact name, fill out information below:
Name: _____ Title: _____
Address: _____ Phone: _____
6. Maintenance Documentation: Reviewed Not Reviewed Not Available Other: _____
7. Party responsible for O&M Documentation: Property owner BMP Operator Contractor Other _____

III. BMP TYPE AND INSPECTION RESULTS (Codes and definitions on "Potential Inspection Results with Definitions" sheet)

<input type="checkbox"/> Bio-retention	<input type="checkbox"/> Multiple Systems	<input type="checkbox"/> Vortex Separator
<input type="checkbox"/> Drain Inlet	<input type="checkbox"/> Planter Boxes	<input type="checkbox"/> Water Quality Inlet
<input type="checkbox"/> Exfiltration Trench	<input type="checkbox"/> Porous Pavement	<input type="checkbox"/> Wet Pond
<input type="checkbox"/> Extended Detention Basin	<input type="checkbox"/> Releaser/Irrigation	<input type="checkbox"/> Wet Weir
<input type="checkbox"/> Hydrodynamic Separator	<input type="checkbox"/> Roof Gardens	<input type="checkbox"/> Wetland
<input type="checkbox"/> Infiltration Basin	<input type="checkbox"/> Underground Detention Systems	<input type="checkbox"/> Other (describe): _____
<input type="checkbox"/> Infiltration Trench	<input type="checkbox"/> Vegetated Buffer Strip	
<input type="checkbox"/> Media Filter	<input type="checkbox"/> Vegetated Swale	

2. Is maintenance needed at this time? Yes No 3. Mosquitoes or Mosquito Larvae Present? Yes No
4. Comments/Notes: _____

IV. FOLLOW-UP AND ENFORCEMENT ACTIONS (Add additional information on back)

1. Describe corrective actions: _____
2. Describe materials distributed (brochures, BMPs, etc.): _____
3. Describe Enforcement Action: None Verbal Notice Warning Notice
 Administrative Action Administrative Action with Penalty/Fine
 Criminal Action Referral for Enforcement
4. Follow-up required? Yes No Comments: _____
5. Priority for reinspection: High Medium Low
6. Return inspection needed? Yes No Comments: _____
7. Required Compliance Date: _____ Date Corrected: _____

Facility Representative: _____ Inspector: _____

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STANFORD FOOTBALL STADIUM RENOVATION

C3 Implementation from Design Through Construction & Beyond



Before



After

OBJECTIVE

**To Comply with SCVRUPP C3
Requirements for
Stormwater Runoff in
Obtaining Santa Clara County
Boiling Permit Approval and
to Provide Stanford with Low
Maintenance BMP's**



Before



Before

SOLUTION

Implement a Combination of Both Flow Based and Volume Based Post Construction BMP Measures to Treat the Storm Water at Both the Upper and Lower Levels



After



After

EXISTING SITE CONDITIONS



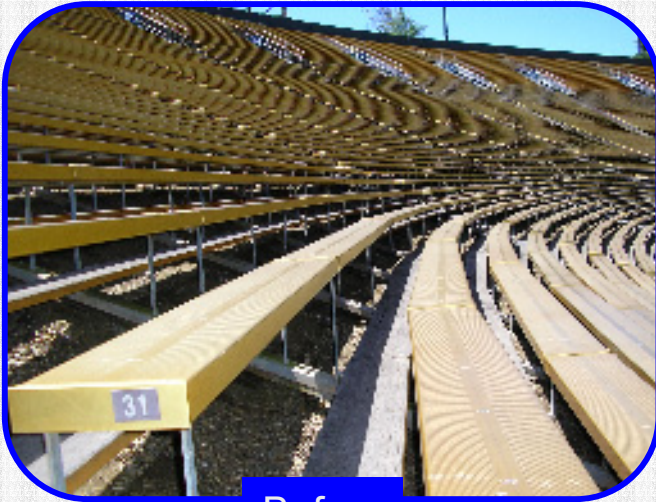
Before



Before

**Existing Structure Served as
Seat Support, Roadway
Access Around the Rim and
Concession Area**

EXISTING SITE CONDITIONS



Before



Before

**Bleachers were Placed Directly
on the Earthen Berm**

EXISTING SITE CONDITIONS



Before



Before

**Entire Area Within the Bowl
drained to Field Level and
Percolated into Field
(No Storm Drainage)**

EXISTING SITE CONDITIONS



Before



Before

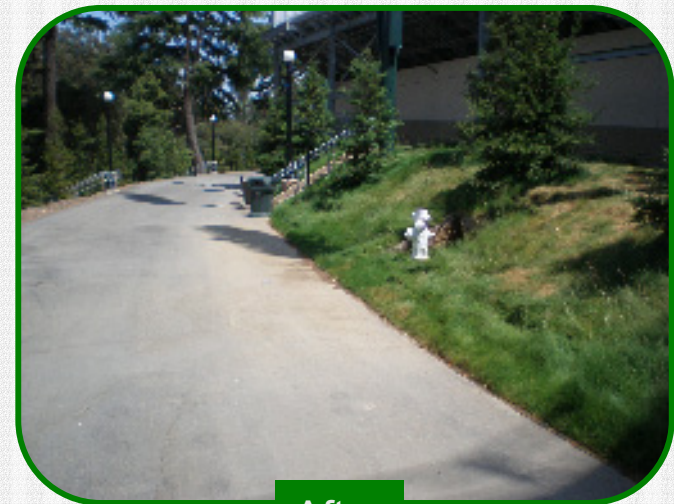
**County Designated the
Existing Berms
And Stairs of Historic
Significance**

PROPOSED IMPROVEMENTS AND BMP TREATMENTS

**New 21 ft Emergency Access
Road Around the Perimeter
which was designed to Drain
to Bioswales SD**



After



After

PROPOSED IMPROVEMENTS AND BMP TREATMENTS

**RWL's and Upper Plaza Areas
Drain to Landscape and
Bioswales**



After



After

PROPOSED IMPROVEMENTS AND BMP TREATMENTS

Continuous Concourse Drains to Field Level and Storm Drains



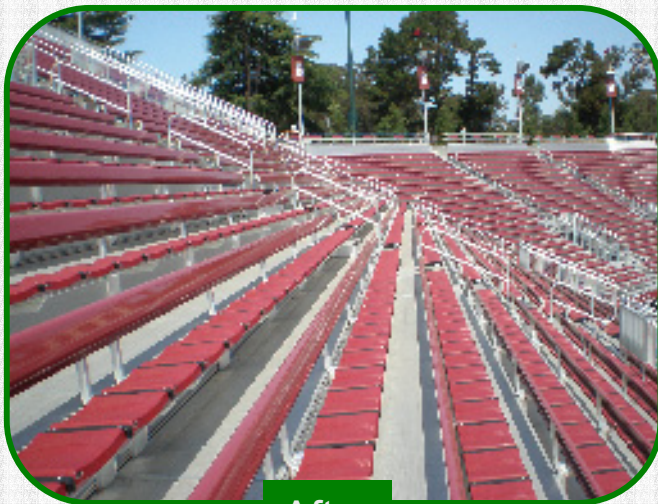
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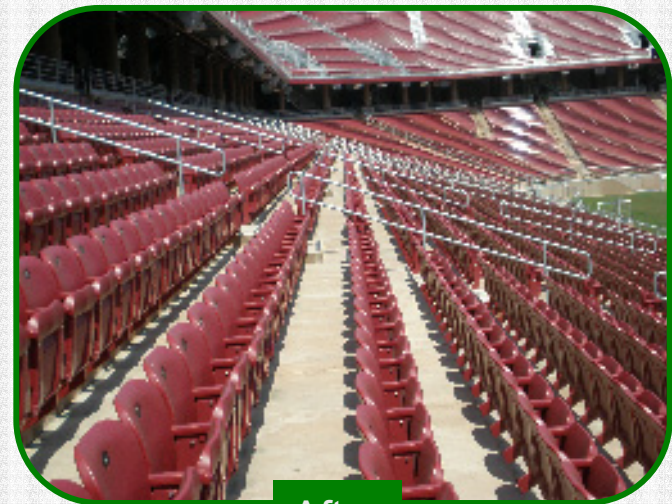
After

PROPOSED IMPROVEMENTS AND BMP TREATMENTS

**Bleacher Area is Now Paved
and Drains to Field Level**



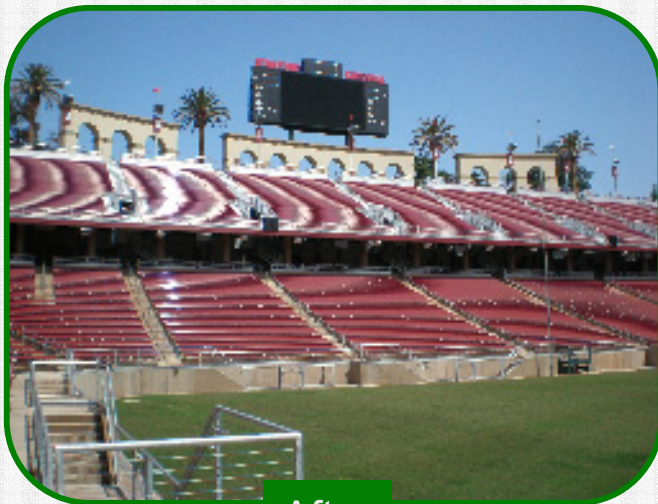
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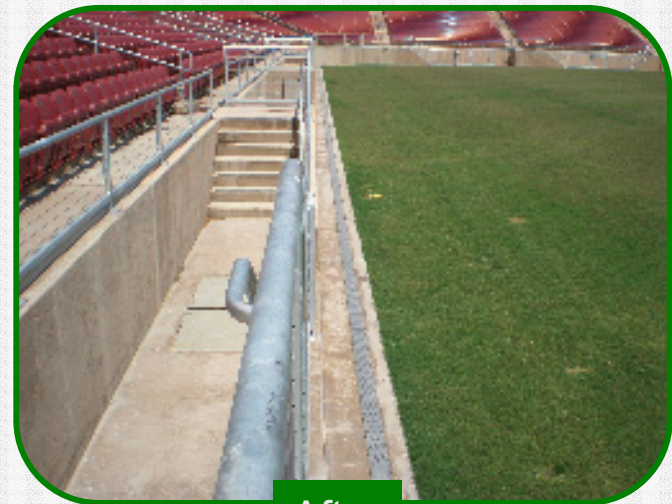
After

PROPOSED IMPROVEMENTS AND BMP TREATMENTS

**Entire Field was Lowered 4 ft
and Track was removed to
Accommodate New Intimate
Seating**

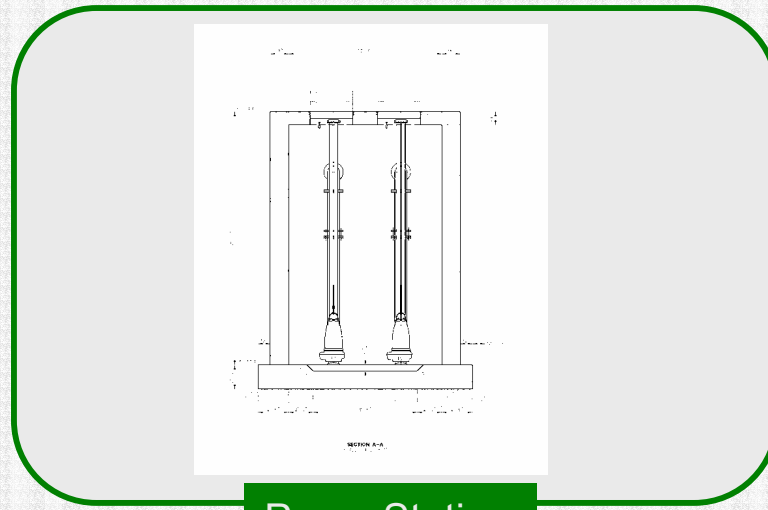


After



After

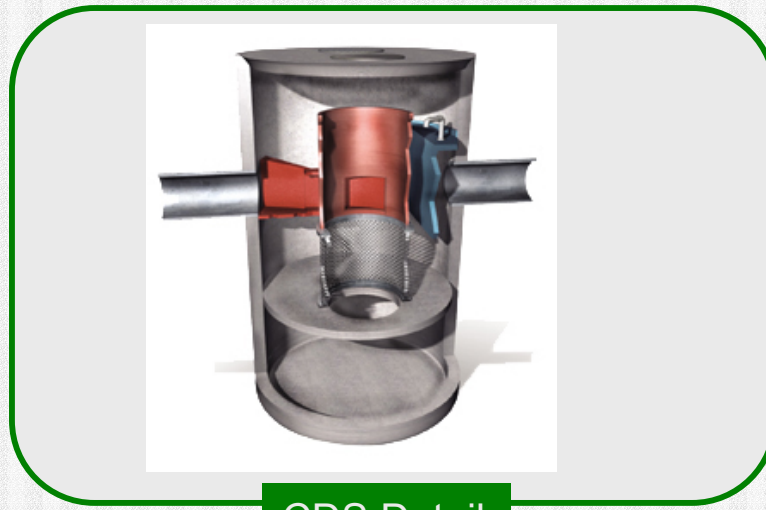
PROPOSED IMPROVEMENTS AND BMP TREATMENTS



Pump Station

**Storm Water Pump Station
Was Designed to Lift Storm
Water 30 ft**

PROPOSED IMPROVEMENTS AND BMP TREATMENTS



CDS Detail

**CDS Hydro Dynamic Vault was
Installed to Filter Storm
Runoff**

CONCLUSION

By Implementing a Combination of Both Biotreatment Measures to Treat the Roadway and a Hydro Mechanical Device to Treat the Concourse, Bleachers and Field, Maintenance Requirements are Kept to a Minimum and Treatment is Achieved

CONGRATULATIONS TO:

- ❖ **Vance Brown Construction, Inc**
- ❖ **Pacific Underground Construction**
 - ❖ **Colony Landscaping**

**For Completing a Successful Project in
Record Time**