

The Green Roof on Stanford Parking Structure 6

Stanford, CA

STANFORD'S APPROACH TO C₃

- Individual projects on campus are strongly encouraged to implement site design BMPs to the maximum extent possible
- If on site opportunities do not exist due to specific challenges of a site, they may tap into available capacity of one of the regional C3 facilities which were built to address stormwater treatment associated with infill projects

STANFORD'S APPROACH TO C₃

- Stanford straddles 2 watersheds – Matadero and San Francisquito
- Each watershed has a regional C3 facility
- Revision to stormwater master plan is underway to plan additional regional facilities

REGIONAL FACILITIES

- Regional facilities have been constructed in each watershed, (Matadero and San Francisquito), to provide treatment for infill projects if on-site treatment is not feasible.
- Grassy Swale in Matadero Watershed
 - Constructed in 2005
 - 3.5 cfs original capacity, 1.37 cfs capacity remains as of May, 2008



REGIONAL FACILITIES

- CDS Unit in San Francisquito

Watershed

- Constructed in 2005
- 19 cfs original capacity, 16.9 remaining treatment capacity as of May, 2008



PARKING STRUCTURE 6 PROJECT OVERVIEW

- In March, 2006 excavation began on a 4 level 1,227 stall subterranean parking structure
- The project required 220,000 cubic yards of excavation;



DESIGN CRITERIA

- By providing a green roof and restoring the original field the project was able to address C3 treatment on site
- Wilbur field was an amenity which Stanford wished to preserve for student use

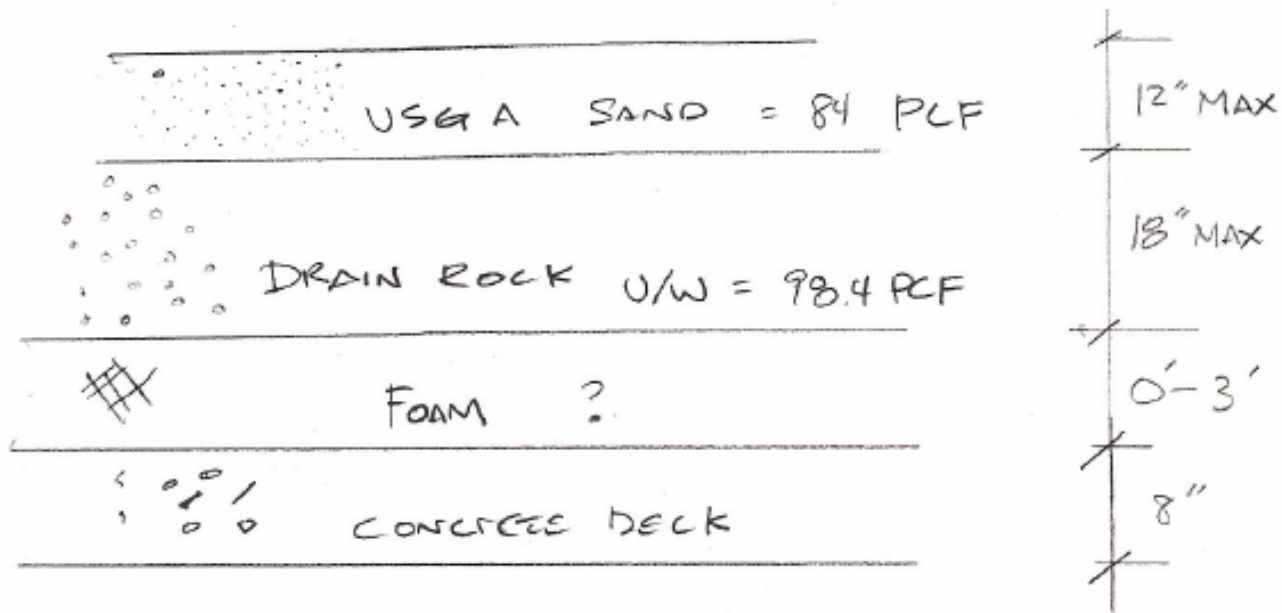
DESIGN DETAILS

- Weight of green roof section dictated design components
- Conventional Roof was placed with waterproofing and elaborate leak detection system
- At high end of structure, foam panels were used to reduce load of gravel and sand on the structure



DESIGN DETAILS

Roof Section

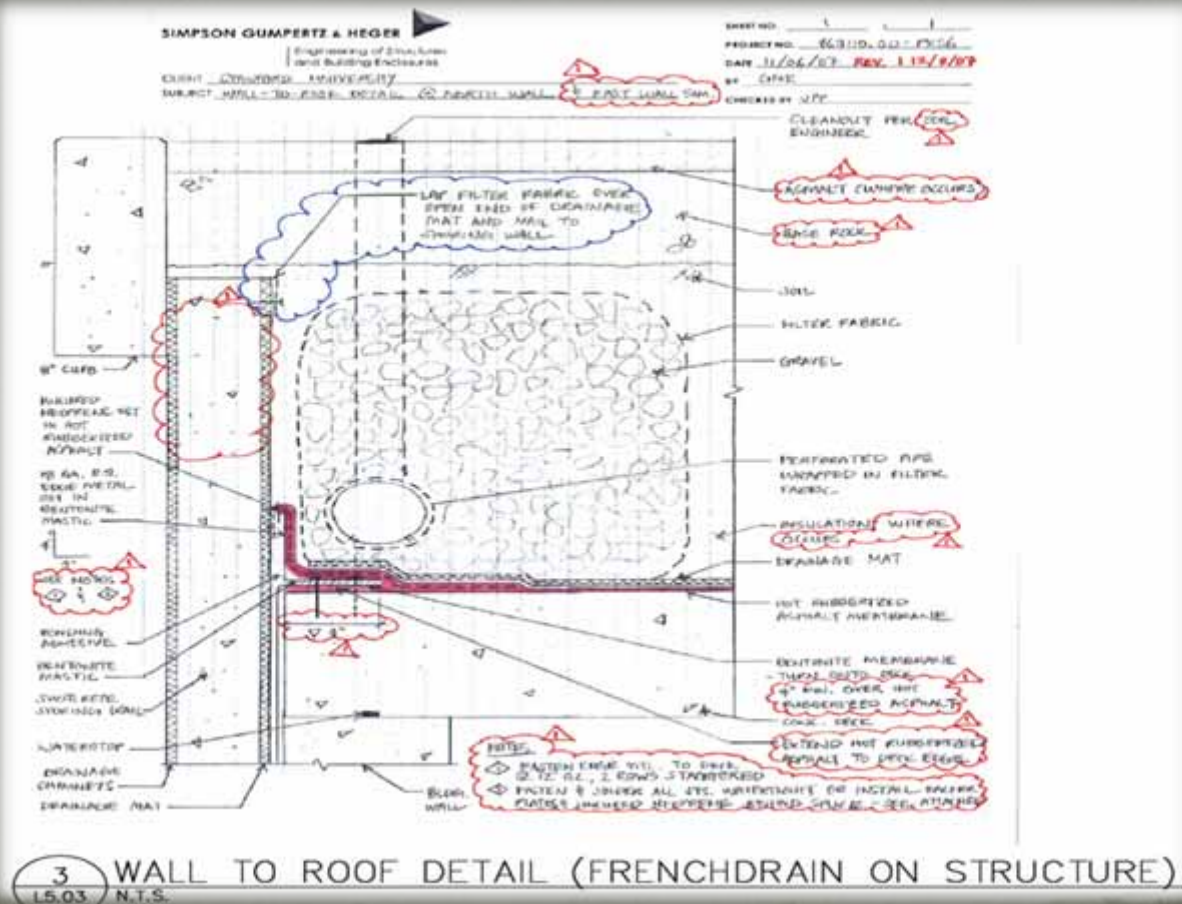


* NO CONCRETE
TOPPING SLABS

≈ 231 PSF

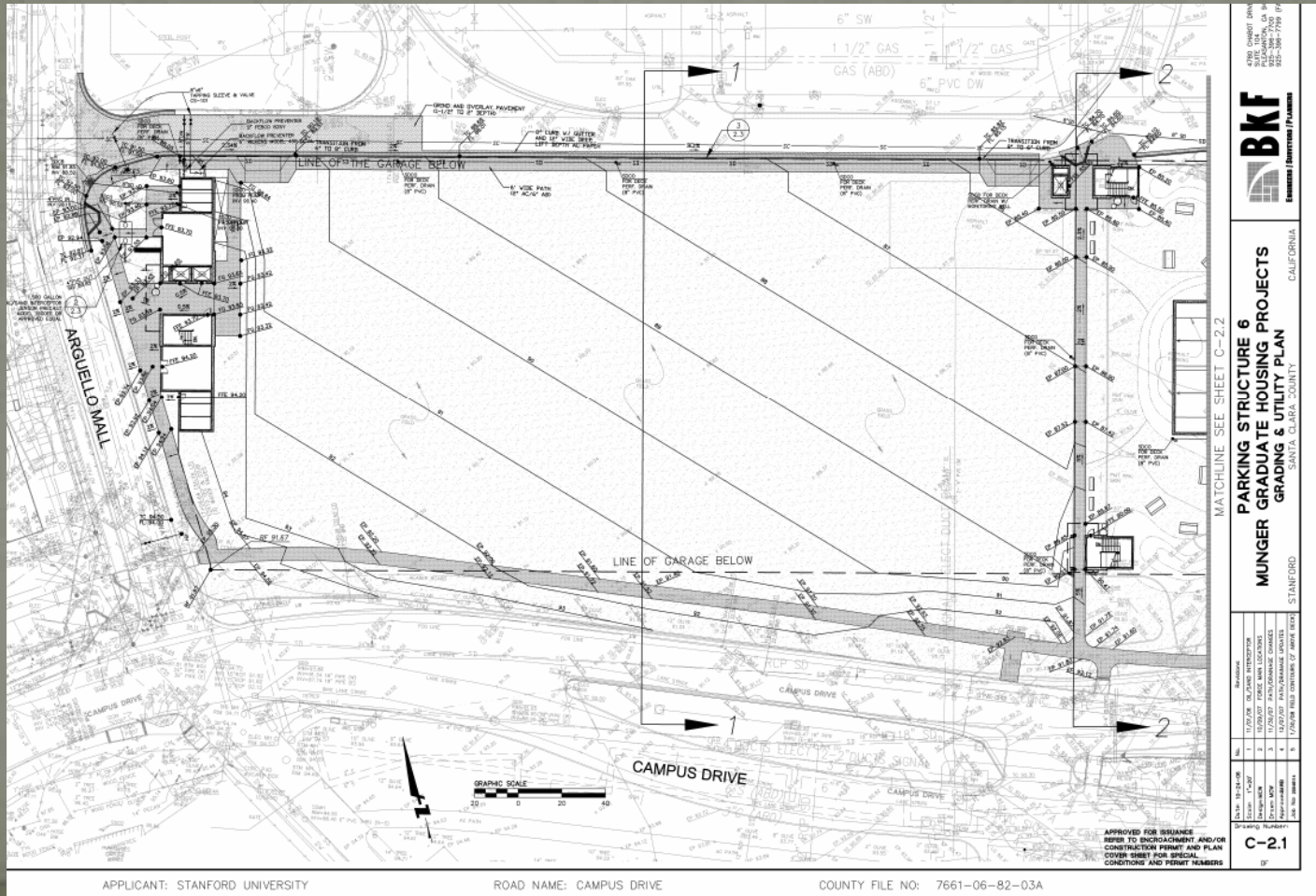
DESIGN DETAILS

- Green Roof Section and connection to underlying conventional roof structure consisted of french drain along side of structure



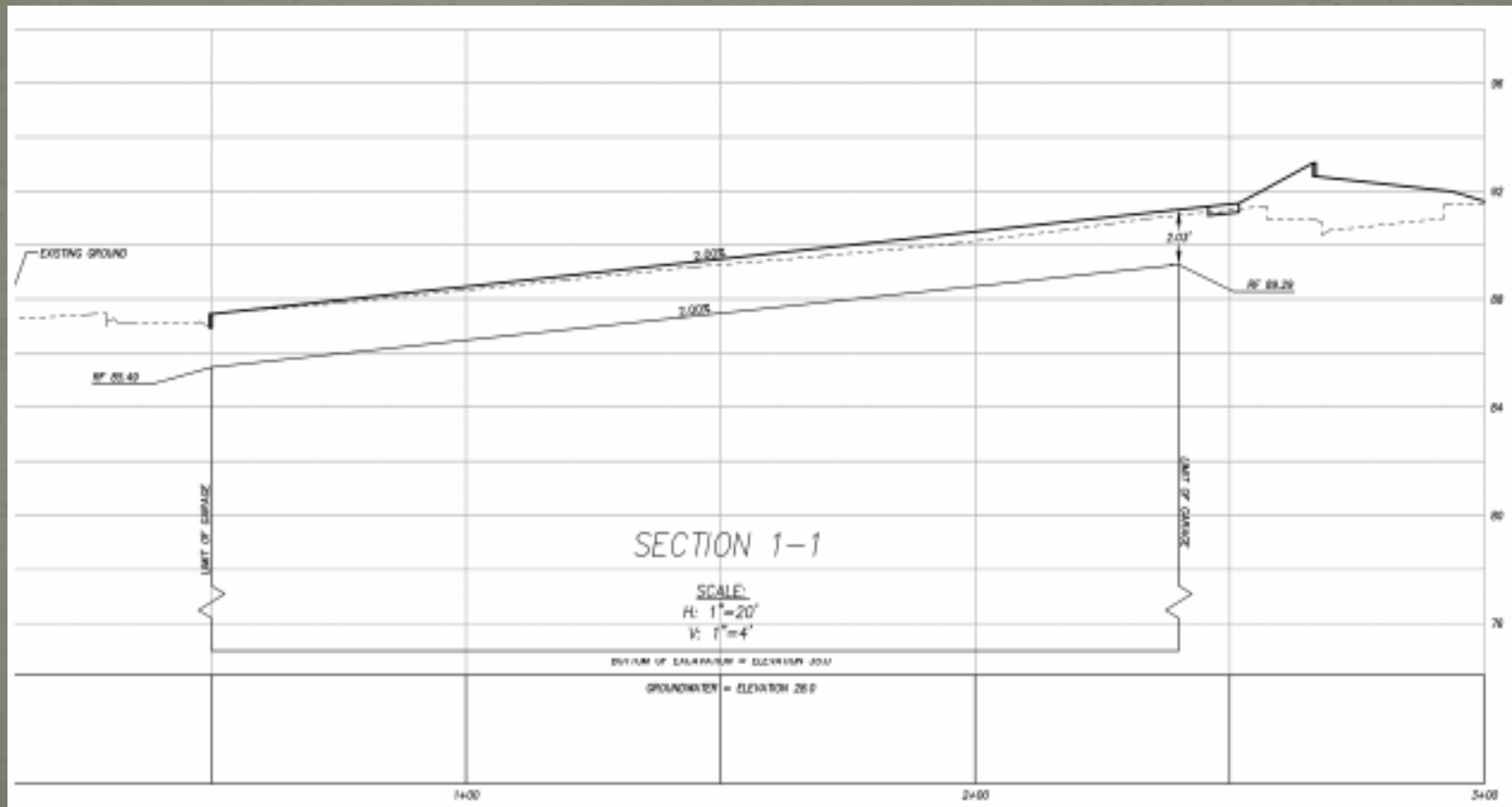
DESIGN DETAILS

- Top of Structure slopes from high point at south west corner to low point at north east corner.



DESIGN DETAILS

- Section 1-1:



DESIGN DETAILS

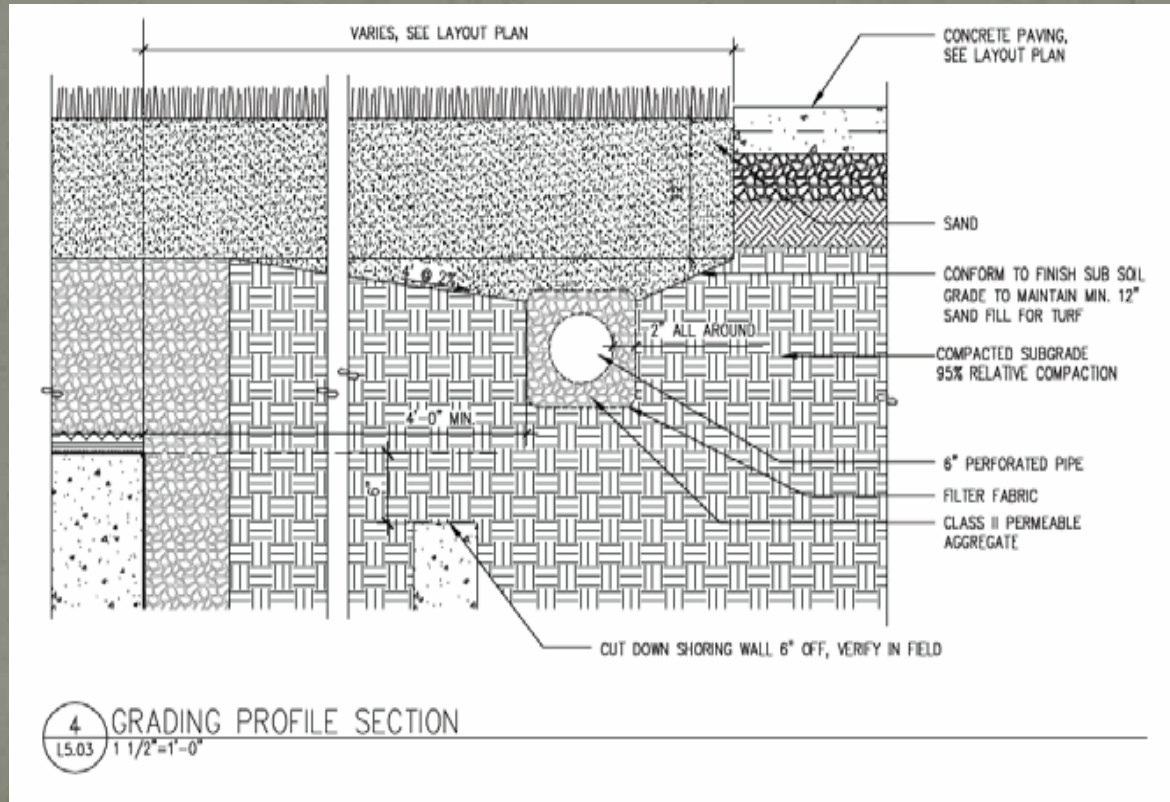
Grading and Drainage Plan

- Perforated pipe was provided along entire north wall which will collect flows and discharge to storm drain system in Bowdoin lane



DESIGN DETAILS

- Section consisted of 12" of gravel overlain with minimum of 12" of sand fill for the turf



DESIGN DETAILS

- Sand Based Sod used for vegetated surface of Roof.
- Grain size and distribution of sand at transplant site match that in which sod is grown to ensure health of vegetation



PROJECT TEAM

- Civil Design – BKF; Mitch Burley, PE
- Building Contractor – Vance Brown
- Landscaping Contractor – Colony Land scape