

Exercise 2:

Stormwater Review of

Example Regulated Project

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EOA, Inc.

New Development Workshop
May 22, 2013

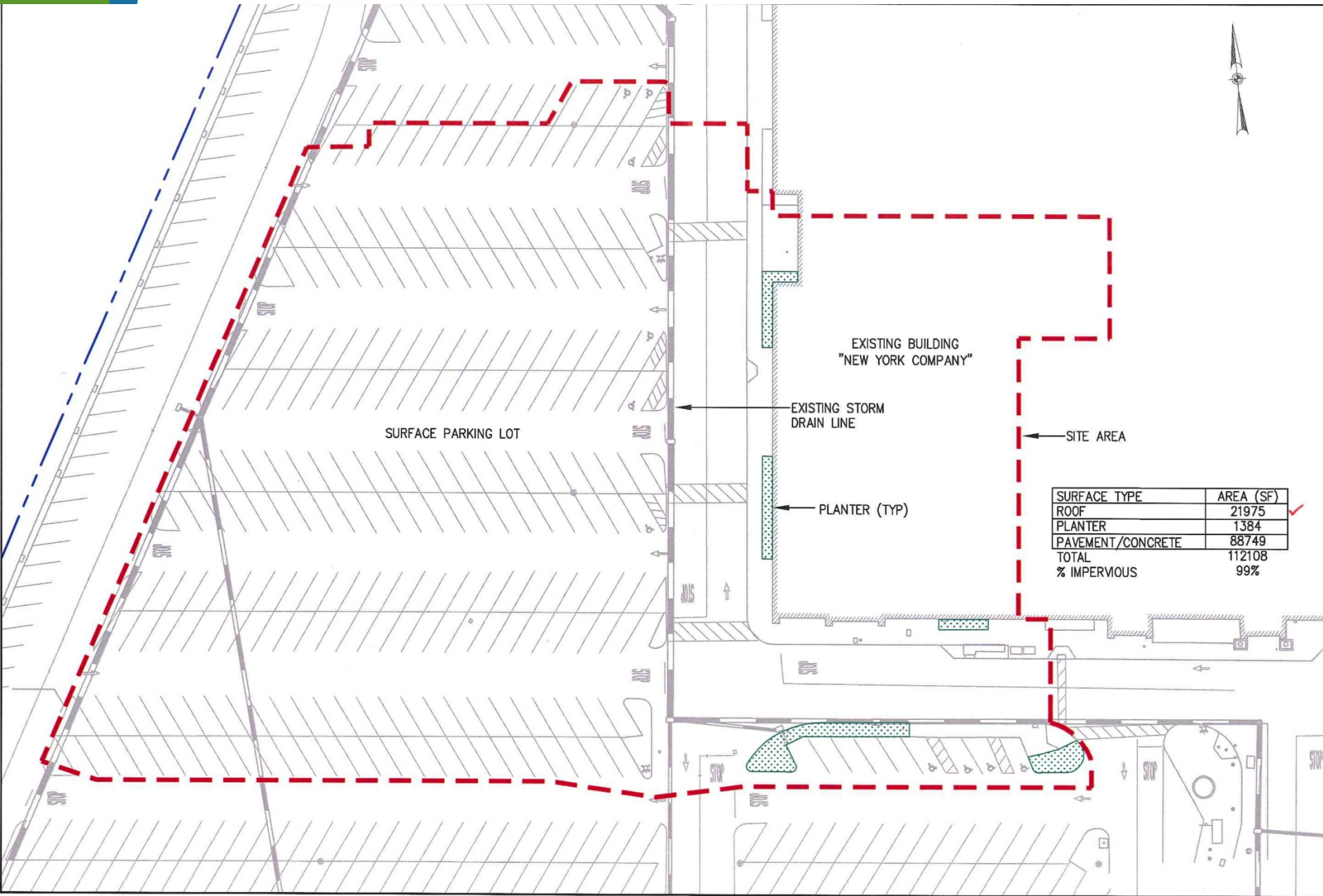
Outline of Presentation

- Project Data
- Review/Correction of C.3 Regulated Projects Checklist
- Review of Project Treatment Measures
- Other Project Issues
- Questions and Answers

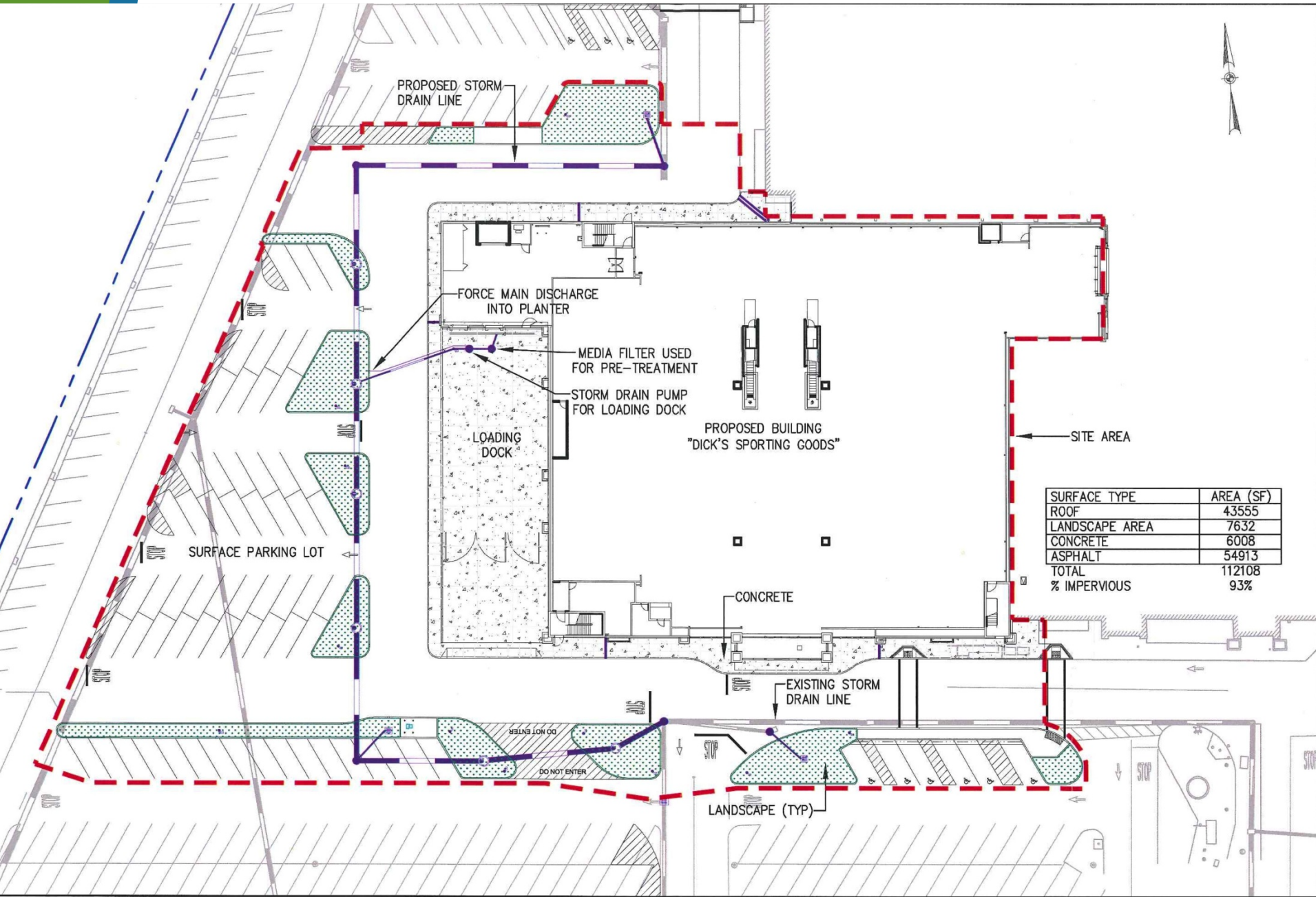
Project Data – Dick's Sporting Goods

- Existing site – shopping mall and associated surface parking
- Proposed project – construct new retail store, and regrade/pave parking lot
- Site size – 73 ac. (2.57 ac. disturbed)
- Store footprint – 43,555 sq. ft.
- Store floor area – 82,200 sq. ft. (2 levels)
- Site soil type – Soil group “C”
- Site slope – 2%

Existing Site Plan



Proposed Site Plan



Impervious Surface Table

I.B. Is the project a "C.3 Regulated Project" per MRP Provision C.3.b?

I.B.1 Enter the amount of impervious surface⁴ created and/or replaced by the project (if the total amount is 5,000 sq.ft. or more):

Table of Impervious and Pervious Surfaces

Type of Impervious Surface	a Pre-Project Impervious Surface (sq.ft.)	b Existing Impervious Surface to be Replaced ⁶ (sq.ft.)	c New Impervious Surface to be Created ⁶ (sq.ft.)	d Post-project landscaping (sq.ft.), if applicable
* <u>Roof area(s)</u> – excluding any portion of the roof that is vegetated ("green roof")	21,975 ✓	21,975 43,555	21,580	N/A
Impervious ⁴ sidewalks, patios, paths, driveways		6,008 ✓		
Impervious ⁴ uncovered parking ⁵	88,749 ✓	54,913 ✓	0	
Streets (public)				
Streets (private)				
Totals:	110,724 ✓	82,896 104,476	0 21,580	7,632 ✓
Area of Existing Impervious Surface NOT replaced			N/A	
Total New Impervious Surface (sum of totals for columns b and c):		104,476 ✓		

¹ Roadway projects that replace existing impervious surface are subject to C.3 requirements only if one or more lanes of travel are added.

² See Standard Industrial Classification (SIC) codes [here](#)

³ Project description examples: 5-story office building, industrial warehouse, residential with five 4-story buildings for 200 condominiums, etc.

⁴ Per the MRP, pavement that meets the following definition of pervious pavement is NOT an impervious surface. Pervious pavement is defined as pavement that stores and infiltrates rainfall at a rate equal to immediately surrounding unpaved, landscaped areas, or that stores and infiltrates the rainfall runoff volume described in Provision C.3.d.

⁵ Uncovered parking includes top level of a parking structure.

⁶ "Replace" means to install new impervious surface where existing impervious surface is removed. "Construct" means to install new impervious surface where there is currently no impervious surface.

NEW BLDG = 43,555 SF (FOOTPRINT) ∴ $43,555 - 21,975 = \boxed{21,580 \text{ SF}}$

1 ↑ New Roof
↑ replaced roof
Update approved December 4, 2012

NEW ROOF CREATED

Site Design Measures Review

- Checklist provided:
 - Direct roof runoff to vegetated areas
 - Direct sidewalk runoff to vegetated areas
 - Direct parking lot runoff to vegetated areas
- Missing items:
 - None

Source Control Measures Review

- Checklist provided:
 - On-site storm drain inlet marking
 - Landscaping measures
 - Loading dock runoff control (will be pumped to stormwater treatment measure, with pretreatment)
 - Fire sprinkler test water discharge to landscaping
- Missing items:
 - Refuse area controls? (Assume mall does refuse facility management)

Construction BMP Review

- Checklist provided:
 - Temporary erosion control
 - Construction notes, specifications, attachments
 - Protect storm drain inlets
 - Trap sediment onsite
 - No cleaning/fueling/maintaining vehicles onsite
 - Store/handle/dispose of materials properly
 - Train employees/subcontractors on BMPs
 - Control/prevent discharges of pollutants and non-stormwater

Construction BMP Review, cont.

- Missing items:
 - Attach SMCWPPP BMP Plan Sheet
 - Limit/stabilize construction access routes

Rainwater Harvesting Feasibility

- Need to evaluate feasibility of harvesting and using rainwater from building roof
- Roof area = 43,555 sq. ft. (1.0 ac.)
- Feasibility of use for landscape irrigation:
 - Onsite landscaping = 7,632 sq. ft. (0.2 ac.)
 - Required area of landscaping = 3.2 times the potential rainwater capture area = 3.2 ac.
 - Is onsite landscaping less than required?
 - YES – harvest/use for irrigation is infeasible

Rainwater Harvesting Feasibility, continued

- Roof area = 43,555 sq. ft. (1.0 ac.)
- Feasibility of indoor non-potable use:
 - Building floor area = 82,200 sq. ft.
 - Divide floor area by potential rainwater capture area (roof area) = 82,200 sq. ft. per acre
 - Is this amount < 84,000 sq. ft. per acre*?
 - YES – harvest/use for indoor use is infeasible

*Note that this feasibility criterion is based on the toilet flushing demand of a commercial office building, so it is not appropriate for a retail store.

Review of Project Treatment Measures

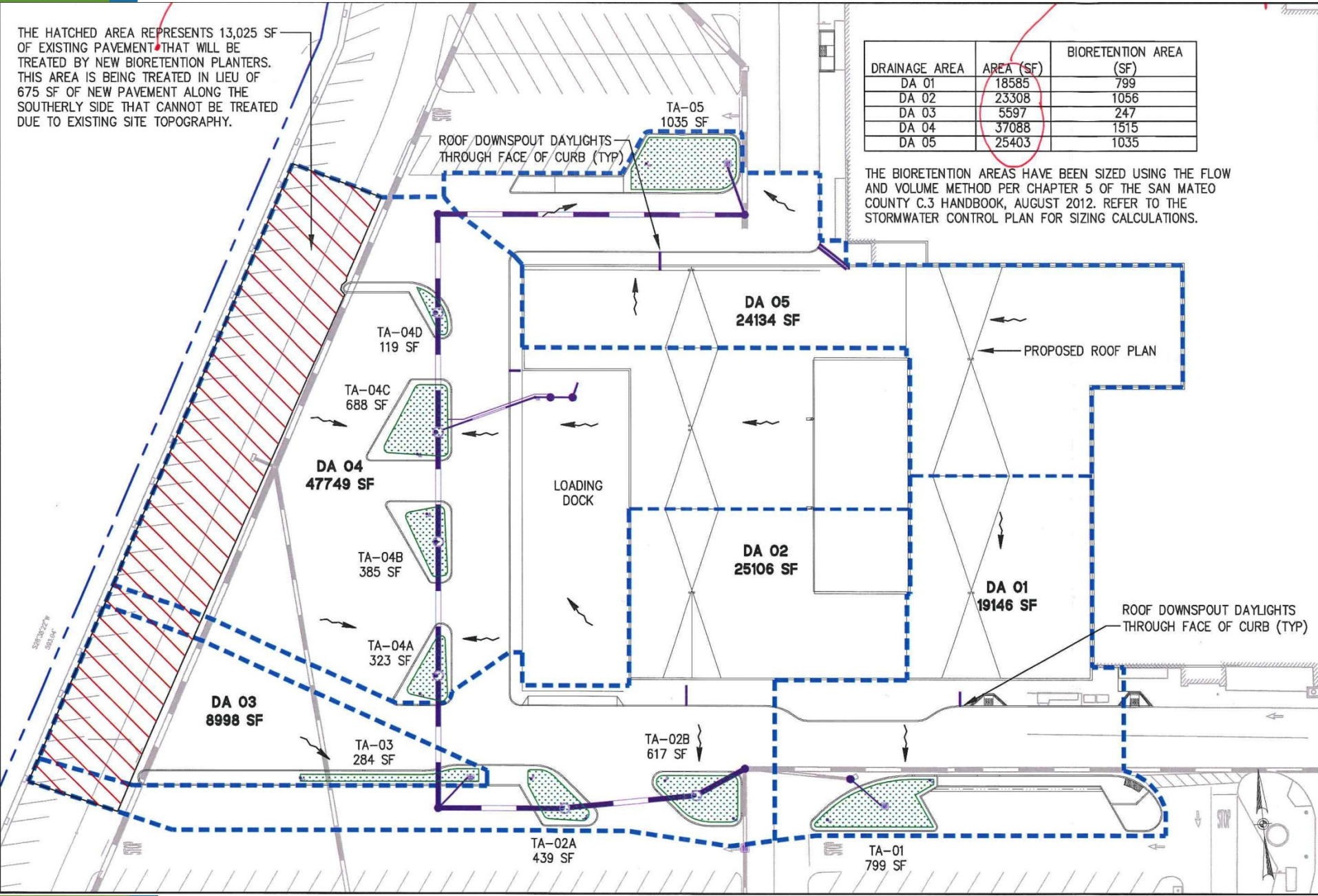
- Project will include 9 bioretention areas distributed around the building (sized using combination flow & volume method)
- Runoff will sheet flow across parking lot and enter bioretention through curb cuts
- Roof drains will daylight at curb
- Project will treat 13,025 sq. ft. of existing drive aisle in lieu of treating 625 sq. ft. of new pavement

Stormwater Treatment Plan

THE HATCHED AREA REPRESENTS 13,025 SF OF EXISTING PAVEMENT THAT WILL BE TREATED BY NEW BIORETENTION PLANTERS. THIS AREA IS BEING TREATED IN LIEU OF 675 SF OF NEW PAVEMENT ALONG THE SOUTHERLY SIDE THAT CANNOT BE TREATED DUE TO EXISTING SITE TOPOGRAPHY.

DRAINAGE AREA	AREA (SF)	BIORETENTION AREA (SF)
DA 01	18585	799
DA 02	23308	1056
DA 03	5597	247
DA 04	37088	1515
DA 05	25403	1035

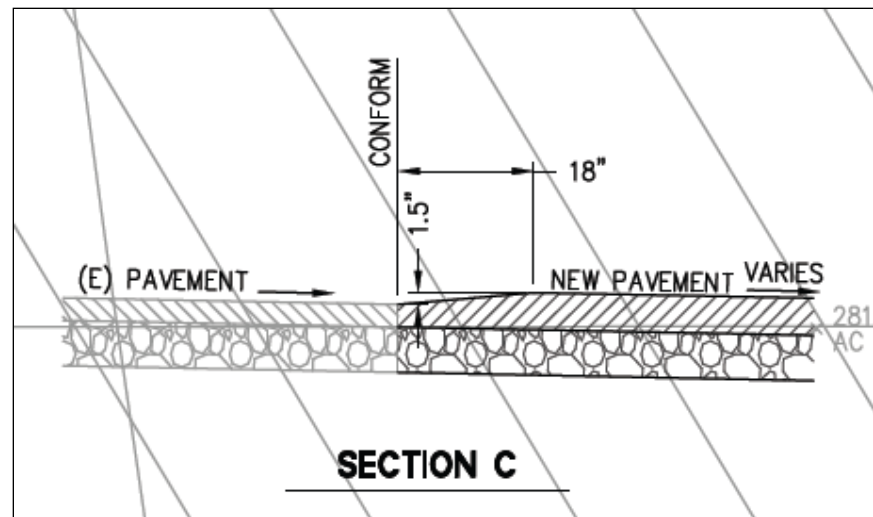
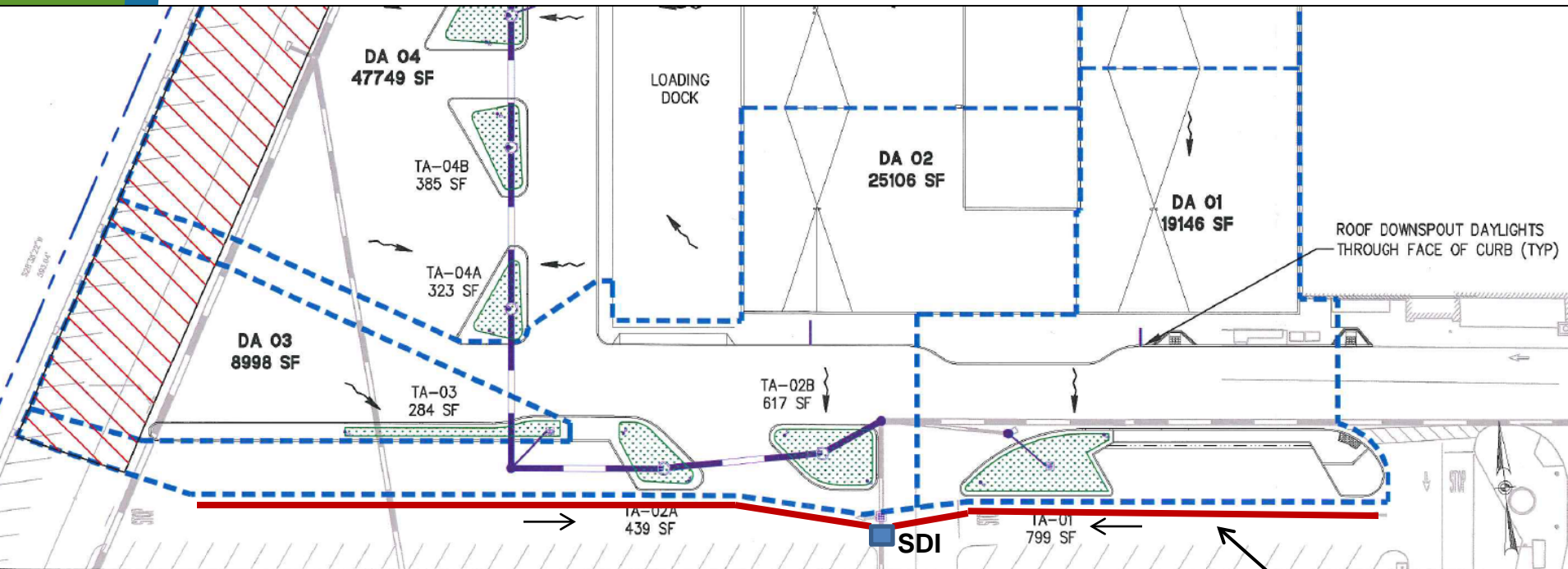
THE BIORETENTION AREAS HAVE BEEN SIZED USING THE FLOW AND VOLUME METHOD PER CHAPTER 5 OF THE SAN MATEO COUNTY C.3 HANDBOOK, AUGUST 2012. REFER TO THE STORMWATER CONTROL PLAN FOR SIZING CALCULATIONS.



Other Project Issues

- Engineer did not delineate the drainage management area and provide sizing calculations for each treatment measure
 - Grouped 4 bioretention areas into 1 DMA
- Engineer did not account for drainage from existing parking lot into treatment measures along southern project limit
 - Added AC swale to collect runoff from existing lot and direct to storm drain inlet
 - Needed to provide “in-lieu” treatment for the swale area

Other Project Issues



AC swale
at conform

Questions?

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Thanks to Jeannie Naughton (Daly City)
and Sophie Truong (CSG) for providing
information for this example project!