

Appendix E  
Hydrology Memorandum and Low Impact  
Development Plan

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## MEMORANDUM

To: City of Gardena  
From: Thomas Kim, P.E.  
Kimley-Horn and Associates, Inc.  
Date: March 10, 2022  
Subject: U-Haul Gardena – Hydrology Memorandum

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To whom this may concern:

This memorandum serves as a drainage summary for the U-Haul Gardena Site Improvements project located at 14206 Van Ness Avenue, Gardena, California 90249. The project is located at the existing U-Haul self-storage facility that is owned by Arec 11 LLC and U-Haul Real Estate Co. The site is currently being utilized as an existing U-Haul self-storage facility and parking lot. There are three existing buildings on-site (1 vacant, 2 self-storage/office facilities). As part of the proposed improvements, all 3 existing buildings will be demolished and replaced with 2 proposed buildings (1 self-storage facility, 1 showroom/office facility). Existing and proposed land use is commercial. The proposed disturbed areas and drainage areas are shown in Attachment 1a of the Project's Stormwater Quality Management Plan (SWQMP).

A PDP LID report for this project has been prepared to address stormwater quality. Stormwater from the proposed disturbed areas is expected to be collected in localized catch basins that will connect to the Modular Wetlands System BMPs. Overall, post-development drainage patterns will remain the same as existing drainage patterns. The percent of impervious cover for the proposed site will decrease from the existing condition. Based on these conditions, peak flows for the project will not increase.

Sincerely,

Thomas Kim, P.E.

***KIMLEY-HORN AND ASSOCIATES, INC.***



## Peak Flow Hydrologic Analysis

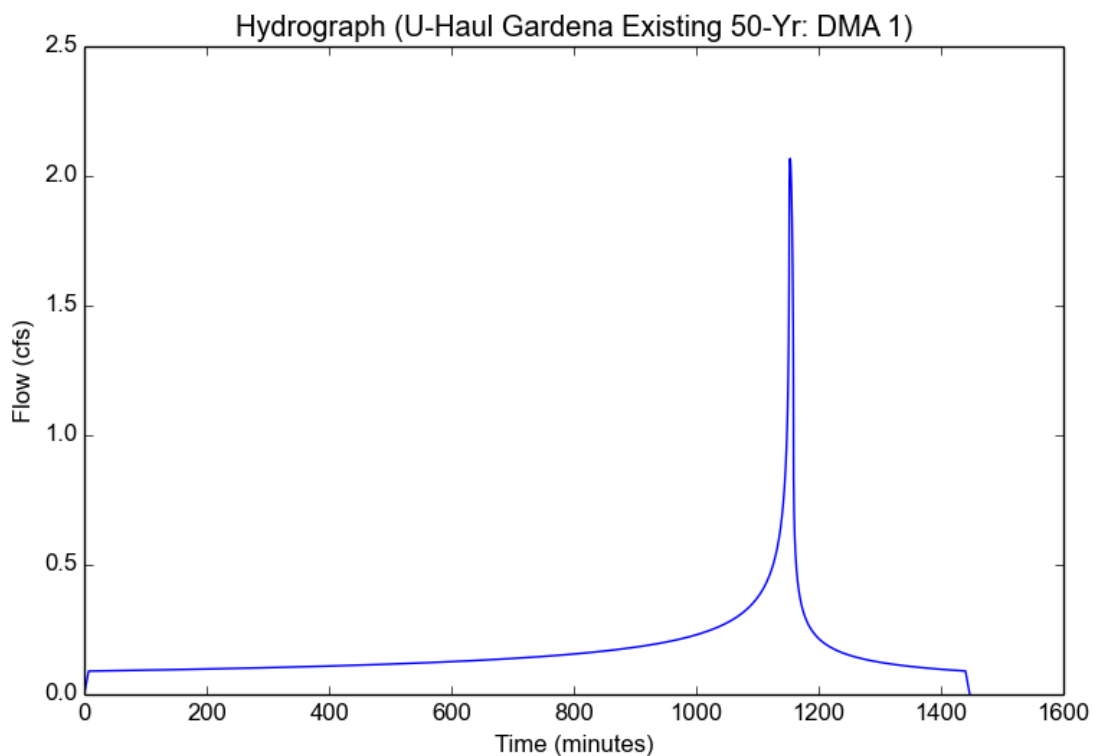
File location: C:/Users/thomas.kim/Desktop/U-Haul Gardena Existing 50-Yr - DMA 1.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	U-Haul Gardena Existing 50-Yr
Subarea ID	DMA 1
Area (ac)	0.82
Flow Path Length (ft)	362.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	5.5
Percent Impervious	1.0
Soil Type	9
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

### Output Results

Modeled (50-yr) Rainfall Depth (in)	5.5
Peak Intensity (in/hr)	2.8015
Undeveloped Runoff Coefficient (Cu)	0.8632
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	2.0675
Burned Peak Flow Rate (cfs)	2.0675
24-Hr Clear Runoff Volume (ac-ft)	0.3355
24-Hr Clear Runoff Volume (cu-ft)	14612.409



## Peak Flow Hydrologic Analysis

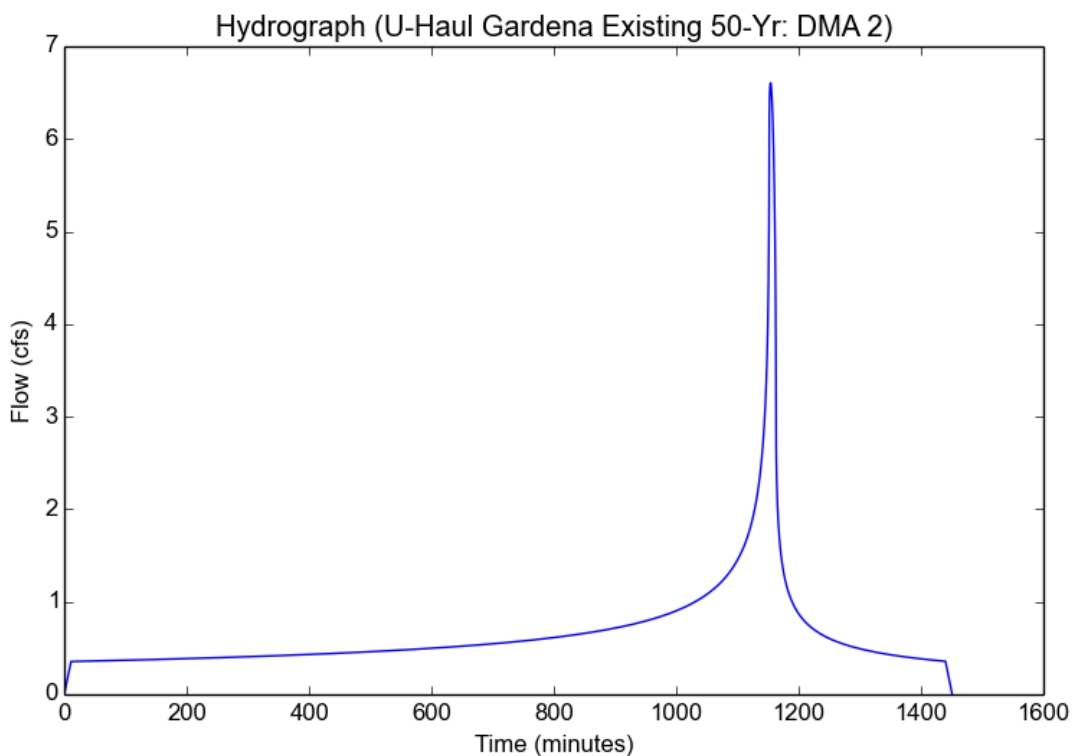
File location: C:/Users/thomas.kim/Desktop/U-Haul Gardena Existing 50-Yr - DMA 2.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	U-Haul Gardena Existing 50-Yr
Subarea ID	DMA 2
Area (ac)	3.24
Flow Path Length (ft)	866.0
Flow Path Slope (vft/hft)	0.006
50-yr Rainfall Depth (in)	5.5
Percent Impervious	1.0
Soil Type	9
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

### Output Results

Modeled (50-yr) Rainfall Depth (in)	5.5
Peak Intensity (in/hr)	2.2653
Undeveloped Runoff Coefficient (Cu)	0.805
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	6.6056
Burned Peak Flow Rate (cfs)	6.6056
24-Hr Clear Runoff Volume (ac-ft)	1.3255
24-Hr Clear Runoff Volume (cu-ft)	57736.888



## Peak Flow Hydrologic Analysis

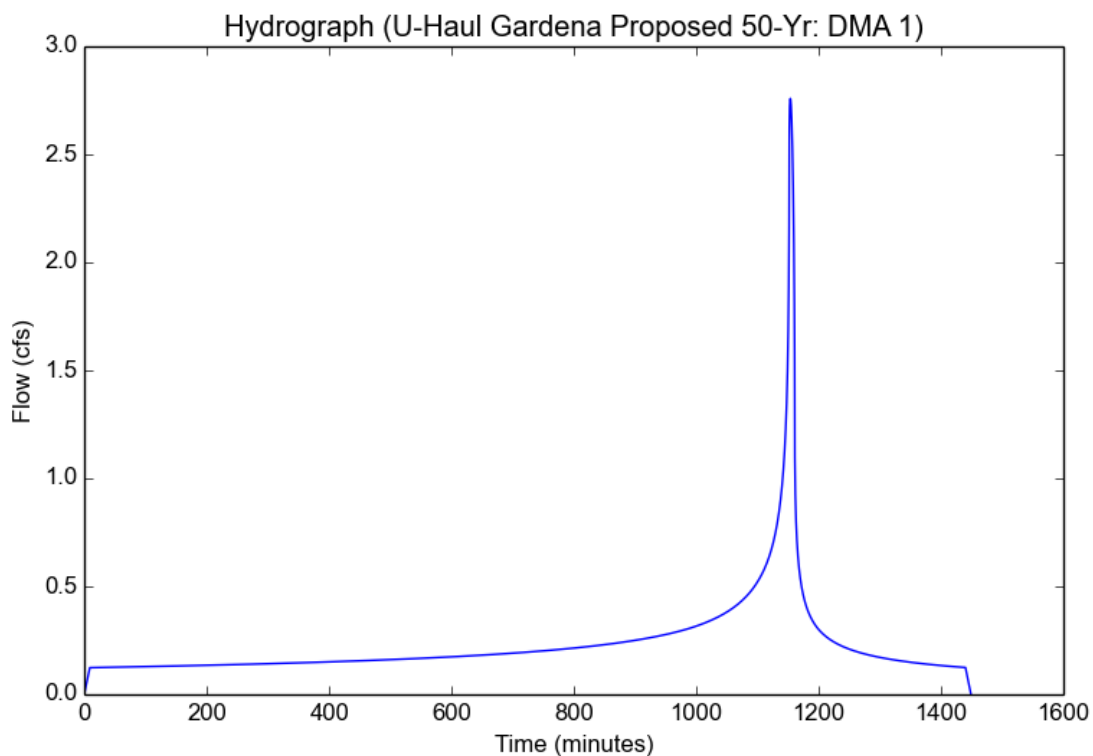
File location: C:/Users/thomas.kim/Desktop/U-Haul Gardena Proposed 50-Yr - DMA 1.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	U-Haul Gardena Proposed 50-Yr
Subarea ID	DMA 1
Area (ac)	1.24
Flow Path Length (ft)	597.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.9
Soil Type	9
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

### Output Results

Modeled (50-yr) Rainfall Depth (in)	5.5
Peak Intensity (in/hr)	2.4894
Undeveloped Runoff Coefficient (Cu)	0.8369
Developed Runoff Coefficient (Cd)	0.8937
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	2.7587
Burned Peak Flow Rate (cfs)	2.7587
24-Hr Clear Runoff Volume (ac-ft)	0.4679
24-Hr Clear Runoff Volume (cu-ft)	20379.5644



## Peak Flow Hydrologic Analysis

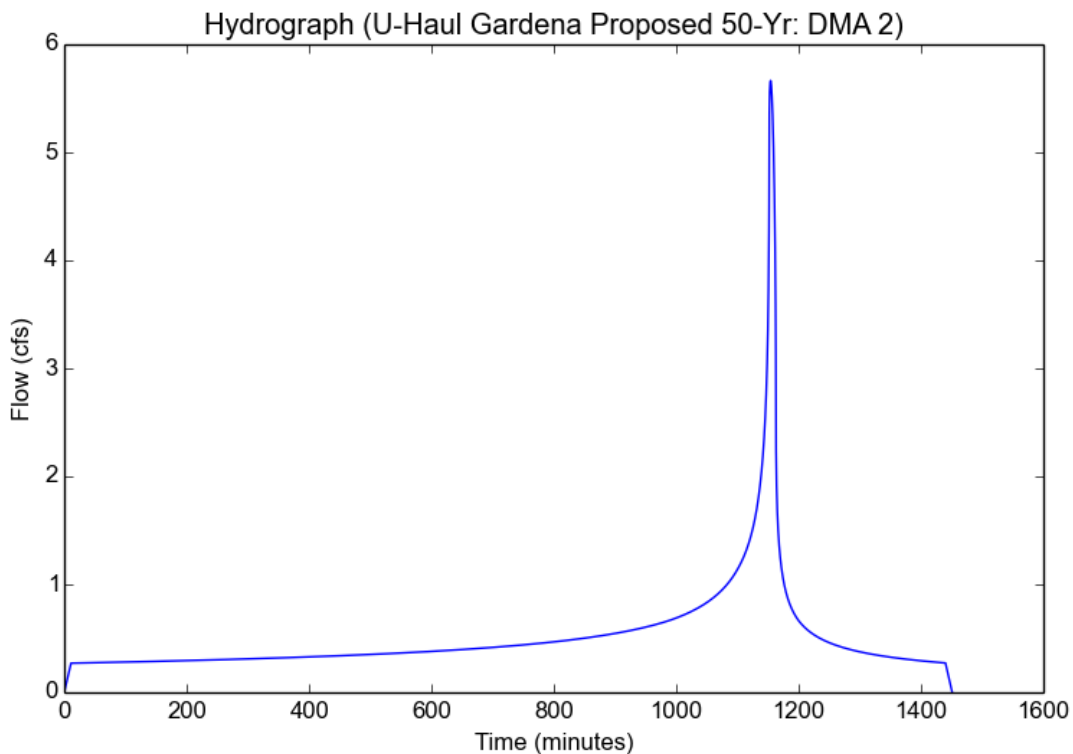
File location: C:/Users/thomas.kim/Desktop/U-Haul Gardena Proposed 50-Yr - DMA 2.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

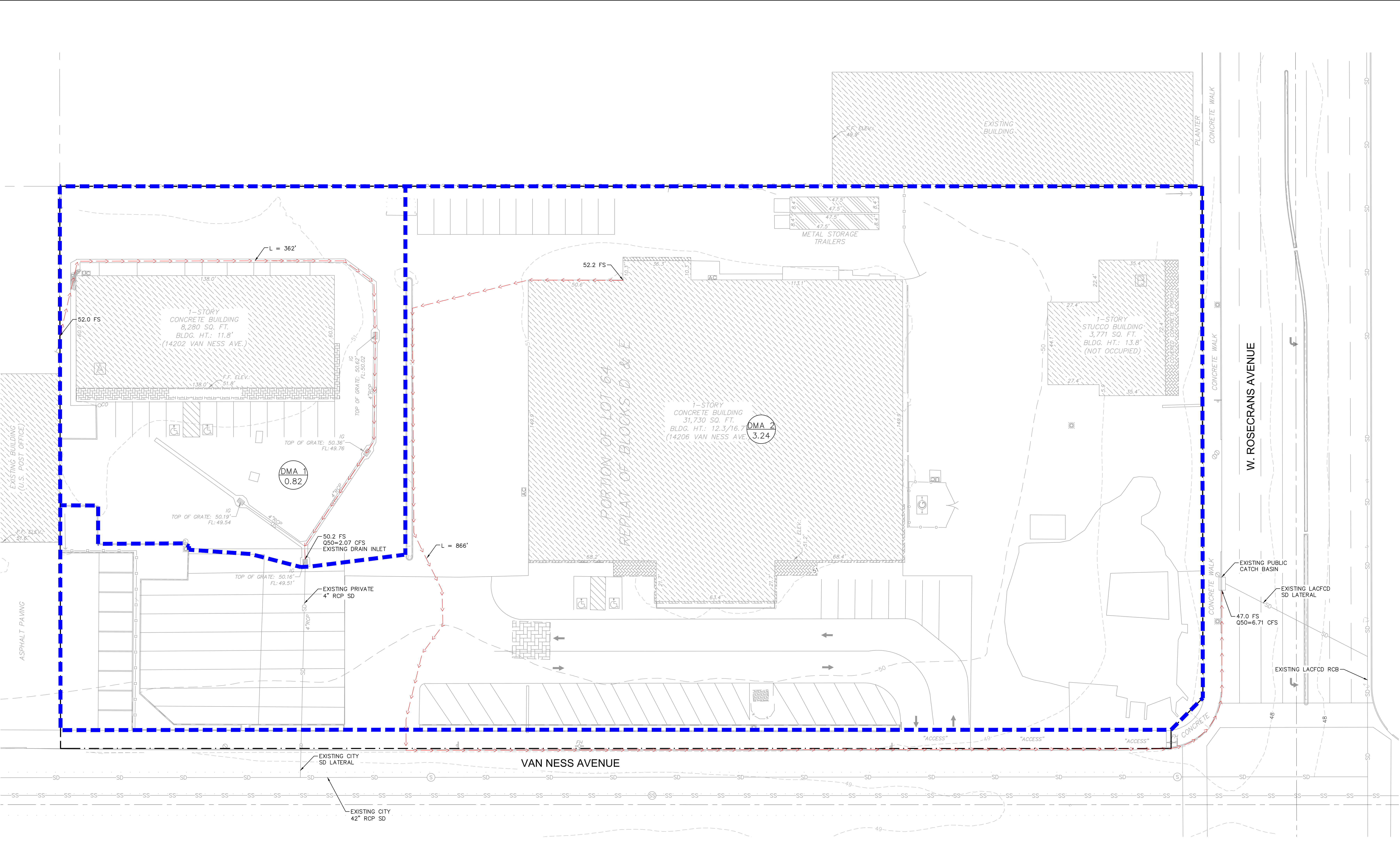
Project Name	U-Haul Gardena Proposed 50-Yr
Subarea ID	DMA 2
Area (ac)	2.82
Flow Path Length (ft)	739.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.86
Soil Type	9
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

### Output Results

Modeled (50-yr) Rainfall Depth (in)	5.5
Peak Intensity (in/hr)	2.2653
Undeveloped Runoff Coefficient (Cu)	0.805
Developed Runoff Coefficient (Cd)	0.8867
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	5.6644
Burned Peak Flow Rate (cfs)	5.6644
24-Hr Clear Runoff Volume (ac-ft)	1.028
24-Hr Clear Runoff Volume (cu-ft)	44779.5717

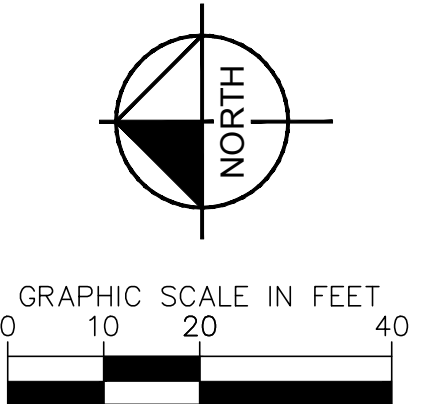


Plotted By: Kim, Thomas Sheet Set: KHA Layout: Sheet January 12, 2022 06:09:46pm K:\VORA\_DEVAU-Haul\XXXXXXXX - Gardena\CADD\Exhibits\Existing Hydro Exhibit.dwg  
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**LEGEND**

- |  |                         |  |                         |
|--|-------------------------|--|-------------------------|
|  | PROPERTY LINE           |  | HIGH POINT              |
|  | STREET CENTERLINE       |  | TOP OF CURB             |
|  | DMA LIMIT               |  | FINISHED SURFACE        |
|  | PROPOSED CONTOURS       |  | FLOWLINE                |
|  | EXISTING CONTOURS       |  | EXISTING GRADE          |
|  | PROPOSED RIDGE          |  | PROPOSED GRADE          |
|  | FLOW PATH               |  | PROPOSED SLOPE          |
|  | PROPOSED STORM DRAIN    |  | PROPOSED LANDSCAPE AREA |
|  | EXISTING STORM DRAIN    |  | PROPOSED ASPHALT        |
|  | EXISTING SANITARY SEWER |  |                         |
|  | FLOW LINE               |  |                         |
|  | DMA NAME                |  |                         |
|  | DMA AREA (IN ACRES)     |  |                         |

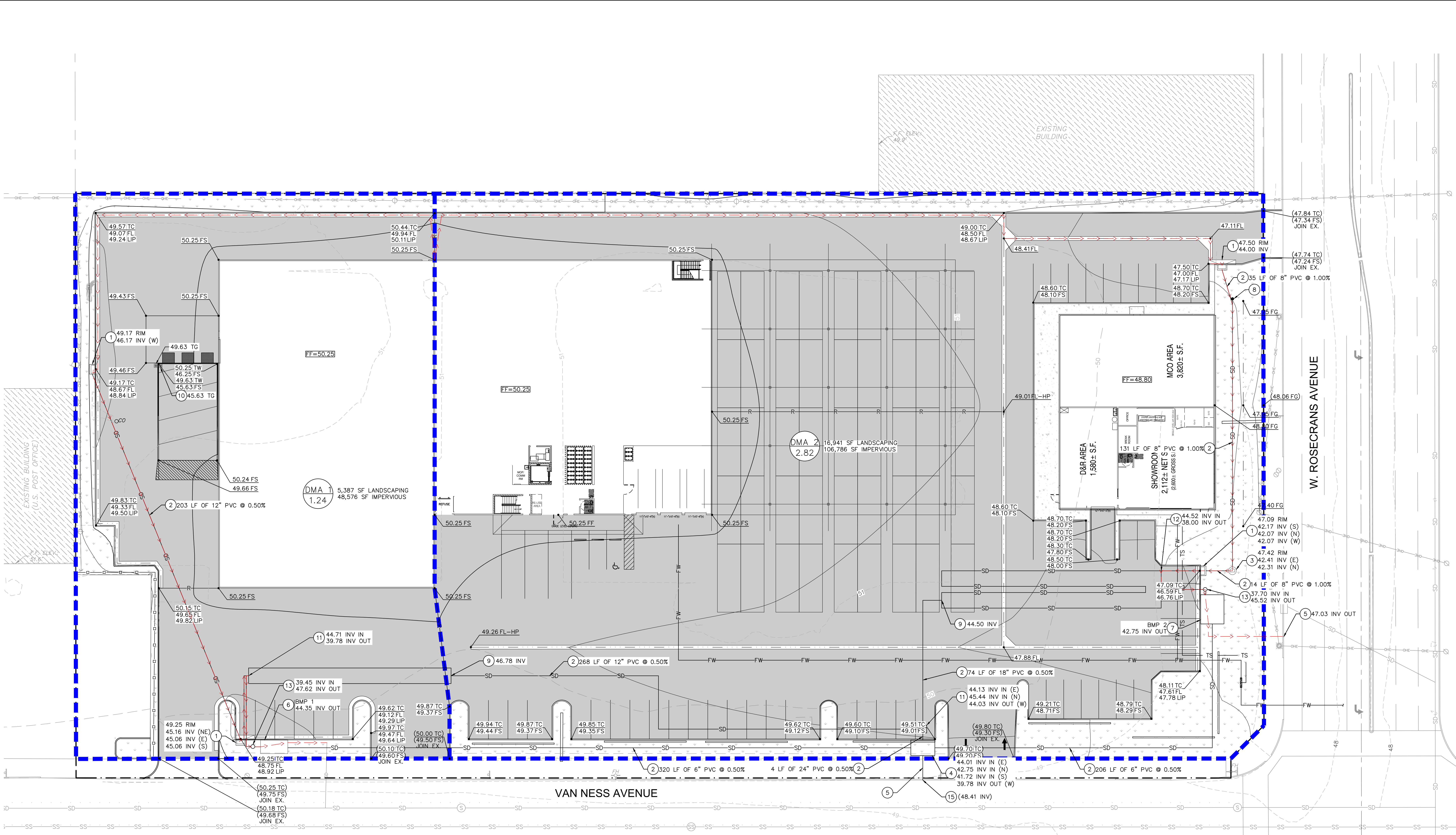


SCALE: 1" = 20'  
WHEN PRINTED AT FULL  
SIZE 30"x42"



<b>14206 VAN NESS AVENUE</b> PREPARED FOR <b>U-HAUL</b>	CITY OF GARDENA CA	<b>EXISTING HYDROLOGY</b> <b>EXHIBIT</b>	KHA PROJECT 194333003	DATE 8/20/2021	SCALE AS SHOWN	DESIGNED BY AZ	DRAWN BY TK	CHECKED BY JG
			© 2021 KIMLEY-HORN AND ASSOCIATES, INC. 1100 W TOWN AND COUNTRY RD. SUITE 700, GRANDE, CA 92869 PHONE: 714-938-1030 FAX: 714-938-9488 WWW.KIMLEY-HORN.COM		REVISIONS	No.	DATE	BY

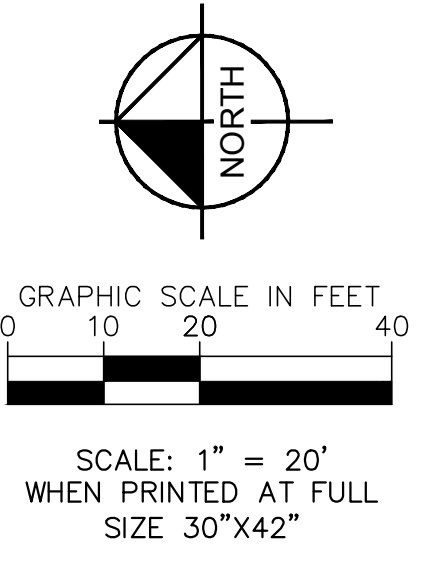
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**LEGEND**

	PROPERTY LINE		HIGH POINT
	STREET CENTERLINE		TOP OF CURB
	DMA LIMIT		FINISHED SURFACE
	PROPOSED CONTOURS		FLOWLINE
	EXISTING CONTOURS		EXISTING GRADE
	PROPOSED RIDGE		PROPOSED GRADE
	FLOW PATH		PROPOSED SLOPE
	PROPOSED STORM DRAIN		PROPOSED LANDSCAPE AREA
	EXISTING STORM DRAIN		DMA NAME
	EXISTING SANITARY SEWER		DMA AREA (IN ACRES)
	FLOW LINE		

- DRAINAGE NOTES**
1. INSTALL CURB OPENING CATCH BASIN.
  2. INSTALL HDPE STORM DRAIN LINE. SIZE PER PLAN.
  3. INSTALL 48" STORM DRAIN MANHOLE.
  4. PROPOSED SUMP PUMP STATION.
  5. INSTALL PARKWAY OVERFLOW DRAIN.
  6. PROPOSED BIOCLEAN WETLAND MOD (WETLANDMOD-6-13-5'-0"-V).
  7. PROPOSED BIOCLEAN WETLAND MOD (WETLANDMOD-11-14-5'-0"-V).
  8. PROPOSED STORM DRAIN CLEANOUT.
  9. PROPOSED OVERFLOW OUTLET.
  10. PROPOSED SUMP PUMP TO OUTLET TRUCK DOCK RUNOFF INTO BUBBLE UP BOX AND SPILL ONTO GRADE.
  11. PROPOSED CMP STORMWATER DETENTION TANK (96" DIA. X 104' LONG).
  12. PROPOSED CMP STORMWATER DETENTION TANK (96" DIA. X 113' LONG, 2 TYP.).
  13. PROPOSED WETLAND MOD FEED PUMP STATION.
  14. PROPOSED CISTERN OVERFLOW WEIR STRUCTURE.
  15. PROPOSED PARKWAY OUTFALL INTO EXISTING PUBLIC CURB AND GUTTER.



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<p>KHA PROJECT: 194333003          DATE: 8/20/2021          SCALE: AS SHOWN          DESIGNED BY: AZ          DRAWN BY: TK          CHECKED BY: JG</p>	<p>REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>No.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> </tr> </table>	No.	DATE		
No.	DATE				
<p><b>BMP EXHIBIT</b></p>					
<p><b>14206 VAN NESS AVENUE</b>          PREPARED FOR  <b>U-HAUL</b></p>					
<p>CITY OF GARDENA CA</p>					
<p>SHEET NUMBER  <b>1</b></p>					



# **Low Impact Development Plan (LID Plan)**

**Project Name:**

**U-Haul Gardena  
14206 Van Ness Avenue  
Gardena, CA 90249**

**Prepared for:**

**Amerco Real Estate Company  
2727 N. Central Avenue  
Phoenix, AZ 85004  
(602) 263-6502**

**Prepared by:**

**Kimley-Horn & Associates, Inc.  
1100 W. Town and Country, Suite 700  
Orange, CA 92868  
(714) 786-6297**

**Date Prepared: August 25, 2021**


**Date Revised: March 10, 2022**

## **Project Owner's Certification**

I certify under penalty of law that this document and all attachments were prepared under my jurisdiction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathered the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner's Name:	Douglas Brumfield		
Owner's Title:	Marketing Company President		
Company:	Amerco Real Estate Company		
Address:	2727 N. Central Avenue, Phoenix, AZ 85004		
Email:	douglas_brumfield@uhaul.com		
Telephone No:	(424) 329-5295		
Signature:		Date:	

## Preparer (Engineer) Certification

Engineer's Name:	Thomas Kim		
Engineer's Title:	Civil Engineer		
Company:	Kimley-Horn & Associates, Inc.		
Address:	1100 W. Town and Country Road, Suite 700		
Email:	thomas.kim@kimley-horn.com		
Telephone No:	(714) 786-6297		
<p>I hereby certify that this Low Impact Development Plan is in compliance with, and meets the requirements set forth in, Order No. R4-2012-0175, of the Los Angeles Regional Water Quality Control Board.</p>			
Engineer's Signature		Date	4/21/2022
Place Stamp Here			



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Attachment F.....	Construction Plans

# 1. PROJECT DESCRIPTION

## 1.1. PROJECT CATEGORY

Category	YES	NO
1. Development <sup>a</sup> of a new project equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet of impervious area <sup>b</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Development <sup>a</sup> of a new industrial park with 10,000 square feet or more of surface area <sup>c</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Development <sup>a</sup> of a new commercial mall with 10,000 square feet or more surface area <sup>c</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Development <sup>a</sup> of a new retail gasoline outlet with 5,000 square feet or more of surface area <sup>c</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Development <sup>a</sup> of a new restaurant (SIC 5812) with 5,000 square feet or more of surface area <sup>c</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Development <sup>a</sup> of a new parking lot with either 5,000 ft <sup>2</sup> or more of impervious area <sup>b</sup> or with 25 or more parking spaces	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Development <sup>a</sup> of a new automotive service facility (SIC 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) with 5,000 square feet or more of surface area <sup>c</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Projects located in or directly adjacent to, or discharging directly to a Significant Ecological Area (SEA), <sup>d</sup> where the development will: a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and b. Create 2,500 square feet or more of impervious area <sup>b</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Redevelopment <sup>e</sup> of 5,000 square feet or more in one of the categories listed above <b>If yes, list redevelopment category here: Parking lot</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Redevelopment <sup>e</sup> of 10,000 square feet or more to a Single Family Home, without a change in landuse.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- a Development includes any construction or demolition activity, clearing, grading, grubbing, or excavation or any other activity that results in land disturbance.
- b Surfaces that do not allow stormwater runoff to percolate into the ground. Typical impervious surfaces include: concrete, asphalt, roofing materials, etc.
- c The surface area is the total footprint of an area. Not to include the cumulative area above or below the ground surface.
- d An area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and would be disturbed or degraded by human activities and developments. Also, an area designated by the City as approved by the Regional Water Quality Control Board.
- e Land-disturbing activities that result in the creation, addition, or replacement of a certain amount of impervious surface area on an already developed site. If the activity results in an alteration to more than 50% of the impervious surface area on the already developed site and the existing site was not subject to post-construction storm water quality control requirements, then the entire site must be mitigated.

## 1.2. PROJECT DESCRIPTION

Total Project Area (ft<sup>2</sup>): 176,935 SF

Total Project Area (Ac): 4.06 Acres

### EXISTING CONDITIONS

Condition	Area (ft <sup>2</sup> )	Percentage (%)
Pervious Area:	7,804	4.4%
Impervious Area:	169,131	95.6%

### PROPOSED CONDITIONS

Condition	Area (ft <sup>2</sup> )	Percentage (%)
Pervious Area:	22,328	12.6%
Impervious Area:	154,607	87.4%

### SITE CHARACTERISTICS

<p><b>DRAINAGE PATTERNS/CONNECTIONS</b></p>	<p>Existing:</p> <p>Runoff within the northern portion of the existing site drains through several existing concrete valley gutters that flow into grate inlets that routes stormwater through an underground storm drain system that ultimately outfalls into a public storm drain main within Van Ness Avenue.</p> <p>Runoff within the southern portion of the existing site sheet flows into existing public curb and gutter systems along Van Ness Avenue and W. Rosecrans Avenue, where it will ultimately outfall via pump into a public storm drain system.</p> <hr/> <p>Proposed:</p> <p>Runoff within the northern portion of the site will sheet flow into 2 proposed catch basins, where the proposed underground stormwater system will carry the runoff into underground stormwater treatment, detention system, and sump pump and ultimately outfall through a proposed parkway drain into the public curb and gutter along Van Ness Avenue.</p> <p>Runoff within the southern portion of the site will sheet flow into proposed concrete valley gutters, where they will carry runoff into proposed catch basins, where the proposed underground stormwater system will carry the runoff into underground stormwater treatment, detention system, and sump pump and ultimately outfall through a</p>
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**Low Impact Development Plan (LID Plan)**  
**U-Haul Gardena**

	proposed parkway drain into the public curb and gutter along Van Ness Avenue.
<b>NARRATIVE PROJECT DESCRIPTION:</b>	<p>The site is currently being utilized as an existing U-Haul self-storage facility and parking lot. There are three existing buildings on-site (1 vacant, 2 self-storage/office facilities). As part of the proposed improvements, all 3 existing buildings will be demolished and replaced with 2 proposed buildings (1 self-storage facility, 1 showroom/office facility). Existing and proposed land use is commercial. There are no existing flood or storm drain capacity issues that will be exacerbated by the proposed project.</p> <p><b>APPENDIX G – CEQA GUIDELINES STATEMENTS</b></p> <p>Project does not violate any water quality standards or waste discharge requirements, or substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume of groundwater table level. Existing drainage patterns are not significantly altered as part of the proposed improvements such that substantial erosion or runoff increases/changes would result as part of such improvements. No polluted runoff or excess runoff will be generated as part of this project. Water quality will not be substantially degraded. No housing is proposed as part of this project, and project does not fall within a 100-year flood hazard area. There is no significant risk of inundation by seiche, tsunami, mudflow, or risk of loss, injury, or death from failure of levee or dam.</p> <p>LA County Q Allowable</p> <p>As project does not tie into any LA County owned stormwater utilities, it is assumed that project is not subject to LA County’s Qallowable processes. Q-Allowable requirements will be confirmed as part of final engineering.</p>

<b>OFFSITE RUNON</b>	N/A; no offsite run-on in both existing and proposed conditions.
<b>UTILITY AND INFRASTRUCTURE INFORMATION</b>	Existing underground stormwater system and overhead electrical lines present on-site. Proposed buildings will require roof drains, and electrical, sewer, water, and telecommunications connections. No stormwater infiltration BMPs proposed. Detention pipes and treatment BMPs will not conflict with existing or proposed utility structures.
<b>SIGNIFICANT ECOLOGICAL AREAS (SEAs)</b>	No known SEAs.



### 1.3. HYDROMODIFICATION ANALYSIS

DOES THE PROPOSED PROJECT FALL INTO ONE OF THE FOLLOWING CATEGORIES? CHECK YES/NO.	YES	NO
1. <i>Project is a redevelopment that decreases the effective impervious area compared to the pre-project conditions.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Describe: Pervious ratio is increasing as a result of the proposed improvements.		
2. <i>Project is a redevelopment that increases the infiltration capacity of pervious areas compared to the pre-project conditions.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Describe: Project scope does not increase infiltration capacity of pervious areas.		
3. <i>Project discharges directly or via a storm drain to a sump, lake, area under tidal influence, into a waterway that has a 100-year peak flow (<math>Q_{100}</math>) of 25,000 cfs or more.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Describe: Project ultimately drains via engineered stormwater infrastructure within Van Ness Avenue and W. Rosecrans Avenue into the Dominguez Channel, where runoff ultimately outfalls into the Los Angeles Harbor.		
4. <i>Project discharges directly or via a storm drain into concrete or otherwise engineered (not natural) channels (e.g., channelized or armored with rip rap, shotcrete, etc.), which, in turn, discharge into receiving water that is not susceptible to hydromodification impacts.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Describe: Project ultimately drains via engineered stormwater infrastructure within Van Ness Avenue and W. Rosecrans Avenue into the Dominguez Channel.		

HYDROMODIFICATION ANALYSIS

Project is exempt from Hydromodification Control Measures.

## **1.4. PROPERTY OWNERSHIP/MANAGEMENT**

APN 4061-028-051 (Owned by Arc 11 LLC)

APN 4061-028-033 (Owned by U-Haul Real Estate Co.)

APN 4061-028-023 (Owned by U-Haul Real Estate Co.)

Currently, U-Haul operates on project property through a lease agreement. No infrastructure transfers to public agencies are expected to be required.

## 2. BEST MANAGEMENT PRACTICES (BMPs)

### 2.1. SITE DESIGN

85 <sup>TH</sup> PERCENTILE, 24-HOUR STORM DEPTH	0.95 in.
SITE DESIGN	Given subsurface soil conditions, infiltration has been determined to be infeasible. Project landscaping will not utilize grey water. Irrigation system will stub directly from domestic water main. Project will treat 150% of the SWQDv on-site. Project landscaping will not utilize grey water. Irrigation system will stub directly from domestic water main. Project is hydromodification exempt. Given these details, a treatment BMP has been determined to be the most appropriate BMP solution.

#### BMP LIST

DMA DESIGNATION	SQUARE FOOTAGE (SF)	ACREAGE (Ac)	STORM WATER QUALITY DESIGN VOLUME (SWQDv, CF)	ADJUSTED DESIGN VOLUME (CF) (1.5xSWQDv)	STORM WATER QUALITY DESIGN FLOWRATE (SWQDQ, CFS)	BMP TYPE	BMP SIZE PROVIDED (CF)	GPS COORDINATES
DMA 1	53,963	1.24	3,478	5,217	0.26	Wetland Mod + Underground Storage	5,217	33°54'13"N 118°19'03"W
DMA 2	122,972	2.84	7,623	11,435	0.52	Wetland Mod + Underground Storage	11,500	33°54'08"N 118°19'03"W

## 2.2. BMP SELECTION

### 2.2.1. INFILTRATION BMPs

NAME	INCLUDED
Bioretention without underdrains	<input type="checkbox"/>
Infiltration Trench	<input type="checkbox"/>
Infiltration Basin	<input type="checkbox"/>
Drywell	<input type="checkbox"/>
Proprietary Subsurface Infiltration Gallery	<input type="checkbox"/>
Permeable Pavement (concrete, asphalt, pavers)	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

DESCRIPTION	N/A – Given subsurface soil conditions, infiltration has been determined to be infeasible. Geotechnical consultant encountered clayey soils in the upper 5 feet of their boring. Given the Geotech’s experience with similar soils, it would be reasonable to assume a design infiltration rate ranging between 0.0 to 0.3 inches per hour. This is well below what is feasible for design. Geotechnical report will be prepared and available for final engineering. Infiltration will be implemented to the maximum extent feasible. This will be determined as part of final design.
CALCULATIONS	N/A

**2.2.2. RAINWATER HARVEST AND USE BMPs**

NAME	INCLUDED
Above-ground cisterns and basins	<input type="checkbox"/>
Underground detention	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

DESCRIPTION	Project landscaping will not utilize grey water. Irrigation system will stub directly from domestic water main. Harvest and use will be implemented to the maximum extent feasible. This will be determined as part of final design.
CALCULATIONS	N/A

### 2.2.3. ALTERNATIVE COMPLIANCE BMPs

**BIOFILTRATION BMPs**

*(If Infiltration BMPs and Rainwater Harvest and Use BMPs are Infeasible)*

NAME	INCLUDED
Bioretention with underdrains (i.e. planter box, rain garden, etc.)	<input type="checkbox"/>
Constructed Wetland	<input type="checkbox"/>
Vegetated Swale	<input type="checkbox"/>
Vegetated Filter Strip	<input type="checkbox"/>
Tree-Well Filter	<input type="checkbox"/>
Other: Proprietary Biotreatment	<input checked="" type="checkbox"/>
Other:	<input type="checkbox"/>

DESCRIPTION	N/A; Project will treat 150% of the SWQDv on-site. WetlandMod systems were selected based on required treatment volumes per Hydrocalc calculations. As there is insufficient above-ground landscaping for an above-ground treatment BMP, an underground treatment system is required.
CALCULATIONS	N/A

**Low Impact Development Plan (LID Plan)**  
**U-Haul Gardena**

**OFFSITE BMPs**

*(If Infiltration BMPs, Rainwater Harvest and Use BMPs, and Biofiltration BMPs are Infeasible)*

NAME	INCLUDED
Offsite Infiltration	<input type="checkbox"/>
Ground Water Replenishment Projects	<input type="checkbox"/>
Offsite Project - Retrofit Existing Development	<input type="checkbox"/>
Regional Storm Water Mitigation Program	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

DESCRIPTION	N/A; No feasible offsite location available to provide BMP that would sufficiently treat the SWQDv.
CALCULATIONS	N/A

### 2.2.4. TREATMENT CONTROL BMPs

NAME	INCLUDED
Media Filter	<input type="checkbox"/>
Filter Insert	<input type="checkbox"/>
CDS Unit	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

DESCRIPTION	



**2.2.5. HYDROMODIFICATION CONTROL BMPs**

NAME	INCLUDED
Infiltration System	<input type="checkbox"/>
Above-ground Cistern	<input type="checkbox"/>
Above-ground Basin	<input type="checkbox"/>
Underground Detention	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

DESCRIPTION	N/A – Project is hydromodification exempt.
CALCULATIONS	N/A

**2.2.6. NON-STRUCTURAL SOURCE CONTROL BMPs**

NAME	CHECK ONE	
	Included	Not Applicable
Education for Property Owners, Tenants and Occupants	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Activity Restrictions	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Common Area Landscape Management	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Common Area Litter Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Housekeeping of Loading Docks	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Common Area Catch Basin Inspection	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Street Sweeping Private Streets and Parking Lots	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**2.2.7. STRUCTURAL SOURCE CONTROL BMPs**

NAME	CHECK ONE	
	Included	Not Applicable
Provide storm drain system stenciling and signage	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Design and construct outdoor material storage areas to reduce pollution introduction	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Design and construct trash and waste storage areas to reduce pollution introduction	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Protect slopes and channels and provide energy dissipation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Loading docks	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Maintenance bays	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vehicle wash areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Outdoor processing areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Equipment wash areas/racks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fueling areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hillside landscaping	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# **Attachment A**

## **Calculations**

## Peak Flow Hydrologic Analysis

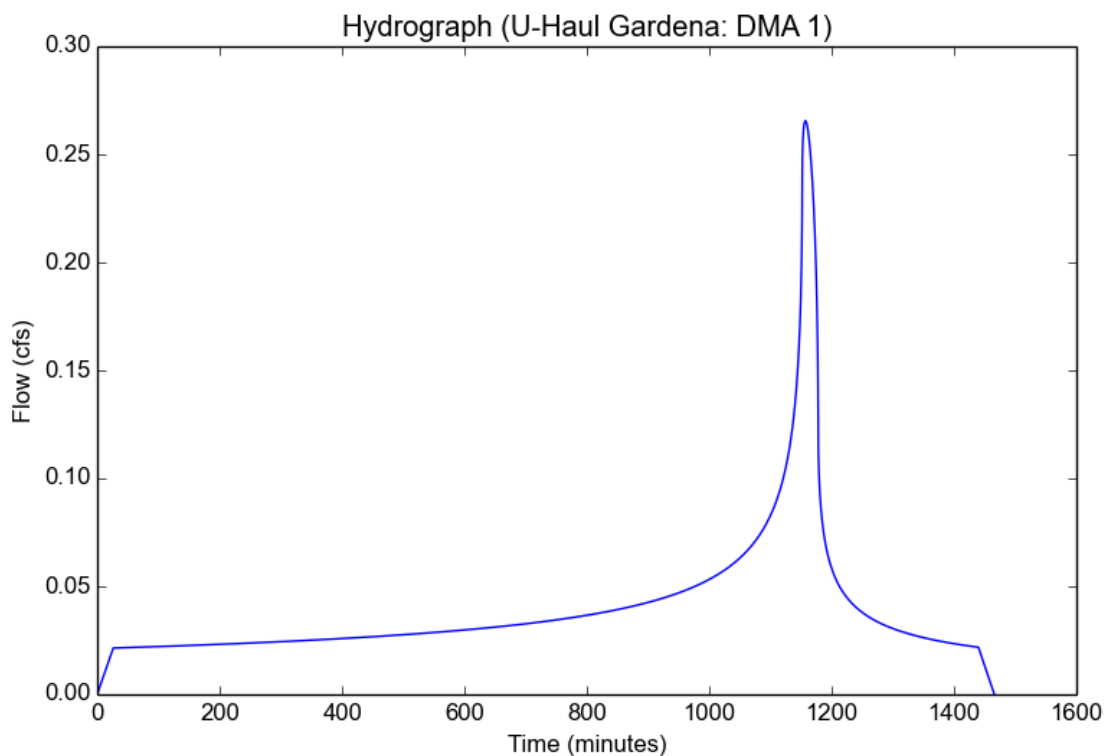
File location: K:/ORA\_LDEV/U-Haul/XXXXXXXX - Gardena/Reports/LID/Calculations/Hydrocalc/U-Haul Gardena - DMA 1.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	U-Haul Gardena
Subarea ID	DMA 1
Area (ac)	1.24
Flow Path Length (ft)	492.0
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.9
Soil Type	9
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.2612
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.82
Time of Concentration (min)	26.0
Clear Peak Flow Rate (cfs)	0.2655
Burned Peak Flow Rate (cfs)	0.2655
24-Hr Clear Runoff Volume (ac-ft)	0.0798
24-Hr Clear Runoff Volume (cu-ft)	3477.4859



## Peak Flow Hydrologic Analysis

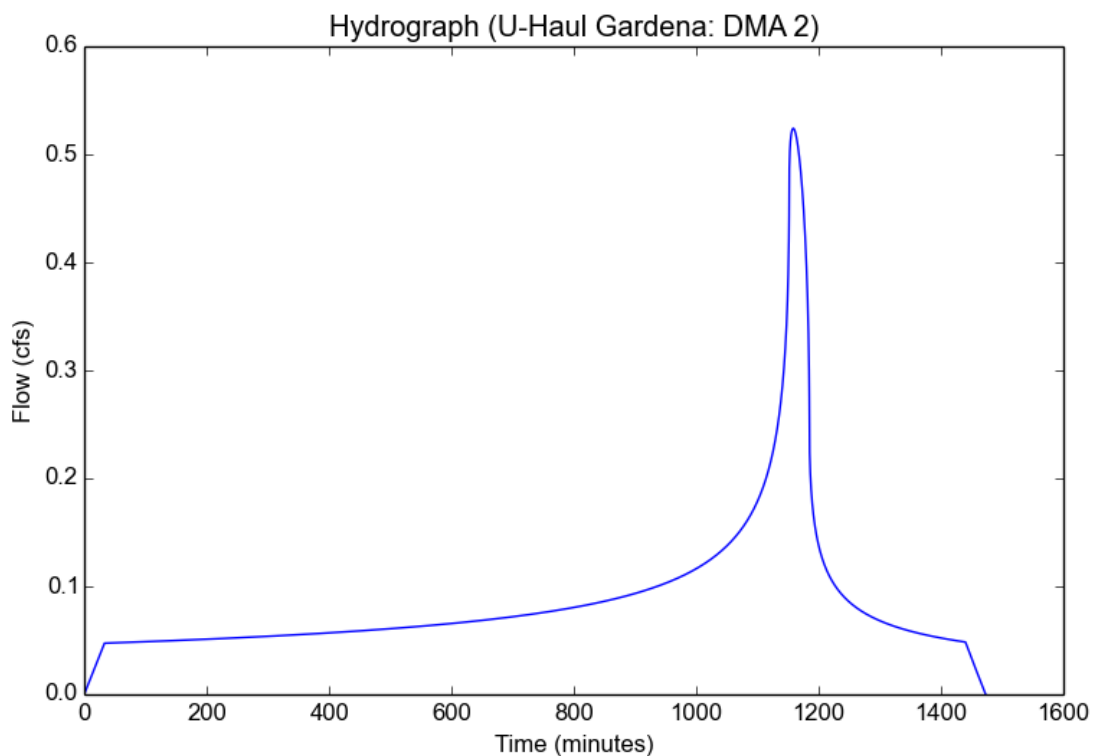
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Version: HydroCalc 1.0.3

### Input Parameters

Project Name	U-Haul Gardena
Subarea ID	DMA 2
Area (ac)	2.84
Flow Path Length (ft)	700.0
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.863
Soil Type	9
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.2335
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.7904
Time of Concentration (min)	33.0
Clear Peak Flow Rate (cfs)	0.5241
Burned Peak Flow Rate (cfs)	0.5241
24-Hr Clear Runoff Volume (ac-ft)	0.1762
24-Hr Clear Runoff Volume (cu-ft)	7677.104



# STORM WATER COLLECTION AND TREATMENT SYSTEM

## 14206 Van Ness Ave, Gardena, CA - 5,217 cu ft & 11,435 cu ft

### SPECIFICATION FOR CISTERN SYSTEM

THIS DOCUMENT WILL GOVERN THE FURNISHING AND INSTALLATION OF ALUMINIZED CORRUGATED METAL PIPE CISTERNS FOR UNDERGROUND WATER STORAGE FOR NOMINAL DIAMETERS 72" (750MM) THROUGH 120" (3000MM).

THE MANUFACTURER OF THE CISTERN SYSTEM SHALL BE ONE THAT HAS REGULARLY BEEN ENGAGED IN THE ENGINEERING DESIGN AND PRODUCTION OF THESE SYSTEMS AND WHICH HAS A HISTORY OF SUCCESSFUL PRODUCTION, ACCEPTABLE TO THE ENGINEER OF RECORD (EOR). IN ACCORDANCE WITH THE DRAWINGS, THE CISTERN SYSTEM SHALL BE SUPPLIED BY: SANTA FE WINWATER COMPANY, 10244 FREEMAN AVE, SANTA FE SPRINGS, CA 90670.  
TEL: 1-562-777-9724

SAMPLING, TESTING, AND INSPECTION OF MATERIALS USED FOR MANUFACTURING OF THE CISTERN SYSTEM SHALL BE IN ACCORDANCE WITH APPLICABLE ASTM SPECIFICATIONS. ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES UNLESS OTHERWISE NOTED.

THE CISTERN SHALL BE CAPABLE OF INSTALLATION IN SOIL WITH A pH RANGE OF 5 TO 9. FOR SOIL pH OUTSIDE THE RANGE OF 5 TO 9, CONSULT WITH SPECIFYING ENGINEER PRIOR TO ORDERING TO DETERMINE IF ADDITIONAL CISTERN COATING SYSTEM NEED BE CONSIDERED.

THE HYDRAULIC SYSTEM SHALL BE PRE-ASSEMBLED AND TESTED AT FACTORY PRIOR TO SHIPMENT. INSPECTION AND TESTING PROTOCOLS SHALL BE DECIDED BY THE SPECIFYING ENGINEER ACCORDING TO SYSTEM REQUIREMENTS. A COPY OF THE TEST REPORT MUST BE PROVIDED TO THE ENGINEER OF RECORD IF REQUESTED.

UPON REQUEST, THE CISTERN SYSTEM INLETS SHALL BE EQUIPPED WITH AN INLET CALMING DEVICE TO ALLOW INTRODUCTION OF WATER TO THE TANK WITH LITTLE TO NO TURBULENCE.

THE CISTERN SYSTEM SHALL BE FITTED WITH A MIN. 4" OUTLET OR PERFORATED MANHOLE COVERS FOR VENTING, DEPENDANT UPON SITE CONDITIONS AND DIRECTION BY SPECIFYING ENGINEER. OVERFLOW PIPE SHALL BE PROVIDED UPON REQUEST BY SPECIFYING ENGINEER.

SYSTEM TO MEET AASHTO HS20/HS25 LIVE LOADING, PER AASHTO LRFD SECTION 12.

ACCESS COVERS SHALL BE A MINIMUM OF 24-INCH DIAMETER TO PROVIDE ADEQUATE INSPECTION AND MAINTENANCE WITHOUT RESTRICTIONS AND OBSTRUCTIONS TO ENTRY INTO INTERIOR OF THE CISTERN. COVERS SHALL BE WATERTIGHT, DO NOT SLIDE, ROTATE, OR FLIP OPEN AND ARE CAPABLE OF SUPPORTING DESIGN LOADS.

PRIOR TO SHIPMENT, CISTERN SYSTEM MAY BE INSPECTED AT FACTORY BY OWNER'S AUTHORIZED REPRESENTATIVE UPON REQUEST.

### INSTALLATION

THE CONTRACTOR SHALL FOLLOW OCCUPATIONAL SAFETY AND HEALTH ASSOCIATION (OSHA) GUIDELINES FOR SAFE PRACTICES IN EXECUTING THE INSTALLATION PROCESS IN ACCORDANCE WITH THE MANUFACTURER/SUPPLIER INSTALLATION RECOMMENDATIONS.

A NON-WOVEN GEOTEXTILE FILTER FABRIC IS RECOMMENDED TO BE INSTALLED IN EXCAVATION, OR OTHER MEASURES SHOULD BE TAKEN, TO PREVENT NATIVE SOIL FROM MIGRATING INTO THE INITIAL BACKFILL MATERIAL, WHEN REQUIRED BY THE GEOTECHNICAL ENGINEER OR E.O.R.

TRENCH BOTTOM (FOUNDATION) WITH UNSTABLE OR UNYIELDING MATERIAL SHALL BE EXCAVATED TO A DEPTH DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE MATERIAL. FOR UNSTABLE MATERIALS, GEOTEXTILE MAY BE USED TO STABILIZE THE TRENCH BOTTOM, IF DIRECTED BY THE ENGINEER.

SUITABLE BEDDING MATERIAL SHALL BE CLASS I OR II, AS SPECIFIED BY ASTM D2321. MINIMUM BEDDING THICKNESS SHALL BE 4" (100 mm) AS MEASURED FROM OUTER PIPE DIAMETER.

INITIAL BACKFILL MATERIAL SHALL BE CLASS I OR II, AS SPECIFIED BY ASTM D2321. COMPACTION AND BACKFILL LIFTS SHALL BE IN ACCORDANCE WITH ASTM D2321. INITIAL BACKFILL SHALL EXTEND TO NOT LESS THAN 6" (150 mm) ABOVE THE TOP OF THE CISTERN.

MINIMUM COVER FOR UP TO H-25 TRAFFIC APPLICATIONS:  
- 12" FOR PIPE DIAMETER UP TO 72" DIAMETER  
- 18" FOR DIAMETER OVER 72".

MINIMUM COVER SHALL BE MEASURED FROM THE TOP OF THE PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO THE TOP OF RIGID PAVEMENT. ADDITIONAL COVER MAY BE REQUIRED FOR CONSTRUCTION LOADS, FOR VEHICLES OVER 75T (68 metric tons) OR TO PREVENT FLOATATION.

FINAL BACKFILL MATERIAL SHALL BE SUITABLE MATERIALS AS DIRECTED BY THE ENGINEER OR AS INDICATED BY MANUFACTURER. FOR AREAS SUBJECTED TO HEAVY TRAFFIC LOADING, A HIGHER DEGREE OF COMPACTION IS NECESSARY AND A SEPARATION LAYER OF NON-WOVEN GEOTEXTILE MAY BE REQUIRED. COMPACTION LEVELS AND/OR GEOTEXTILE MAY BE SPECIFIED AT THE DISCRETION OF THE DESIGN ENGINEER OR MANUFACTURER'S REPRESENTATIVE.

CONSULT THE INSTALLATION MANUAL FOR ADDITIONAL INFORMATION.

### GENERAL NOTES

PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR TO REVIEW MANUFACTURER'S INSTALLATION GUIDE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND/OR PROJECT ENGINEER TO ENSURE THAT ALL QUESTIONS ABOUT INSTALLATION ARE ADDRESSED PRIOR TO APPROVAL OF SYSTEM. ALL DETAILS FOR INSTALLATION ARE LOCATED IN THIS DRAWING PACKAGE, OR UPON REQUEST TO PIPING MANUFACTURER. ANY QUESTIONS CONCERNING THESE STANDARD DETAILS CAN BE ADDRESSED BY THE CISTERN MANUFACTURER'S REPRESENTATIVE PRIOR TO APPROVAL.

ALL ELEVATIONS, DIMENSIONS AND LOCATIONS OF RISERS AND INLETS SHALL BE VERIFIED BY THE ENGINEER OF RECORD.

PRIOR TO INSTALLATION OF THE SYSTEM, A PRE-CONSTRUCTION MEETING SHALL BE CONDUCTED. THOSE REQUIRED TO ATTEND ARE THE SUPPLIER OF THE SYSTEM, THE GENERAL CONTRACTOR, SUB-CONTRACTORS AND THE ENGINEER.

CONTRACTOR(S) SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS NECESSARY TO INSTALL THE CISTERN SYSTEM, APPURTENANCES AND INCIDENTALS IN ACCORDANCE WITH THE DRAWINGS AND AS SPECIFIED HEREIN.

A STORM WATER TREATMENT DEVICE UPSTREAM OF THE CISTERN SYSTEM IS RECOMMENDED AS THE APPROPRIATE MEANS OF PRETREATING TO EXTEND THE MAINTENANCE INTERVAL ON THE SYSTEM AND REDUCE LIFE CYCLE COSTS. BOTH ENGINEERED SOLUTIONS SHALL BE PROVIDED BY A SINGLE SUPPLIER/MANUFACTURER.

PRIOR TO SYSTEM START UP, ANY ACCUMULATED WATER AND DEBRIS SHALL BE REMOVED FROM THE CISTERN TANK(S) AND ANY ACCOMPANYING TREATMENT SYSTEMS AND PUMP VAULTS.

BELOW GRADE SYSTEM MARKING TAPE, IF REQUIRED BY LOCAL ORDINANCE, CAN BE SUPPLIED UPON REQUEST. CONTACT SFWW WITH REQUIREMENT DETAILS.

STORMWATER MANAGEMENT SYSTEM AS SHOWN ON THESE SHEETS SHALL BE SUPPLIED BY SANTA FE WINWATER COMPANY AS A COMPLETE SYSTEM. SUBSTITUTION OR OMISSION OF ANY COMPONENTS MAY VOID WARRANTY.



10244 Freeman Ave, Santa Fe Springs, CA 90670  
562-777-9724 / www.santafewinwater.com

<b>PROPRIETARY AND CONFIDENTIAL</b> THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF <b>SANTA FE WINWATER COMPANY</b> . ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SANTA FE WINWATER COMPANY IS PROHIBITED.		NAME	DATE	TITLE: 14206 Van Ness Av, Gardena, CA Stormwater Management System 5217 & 11435 Cu Ft
	DRAWN	CKL	3/3/22	
	CHECKED	MDF	3/3/22	
	ENG APPR.	CKL	3/3/22	SIZE <b>B</b>
	REV			SHEET 1 OF 11

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NOTES:

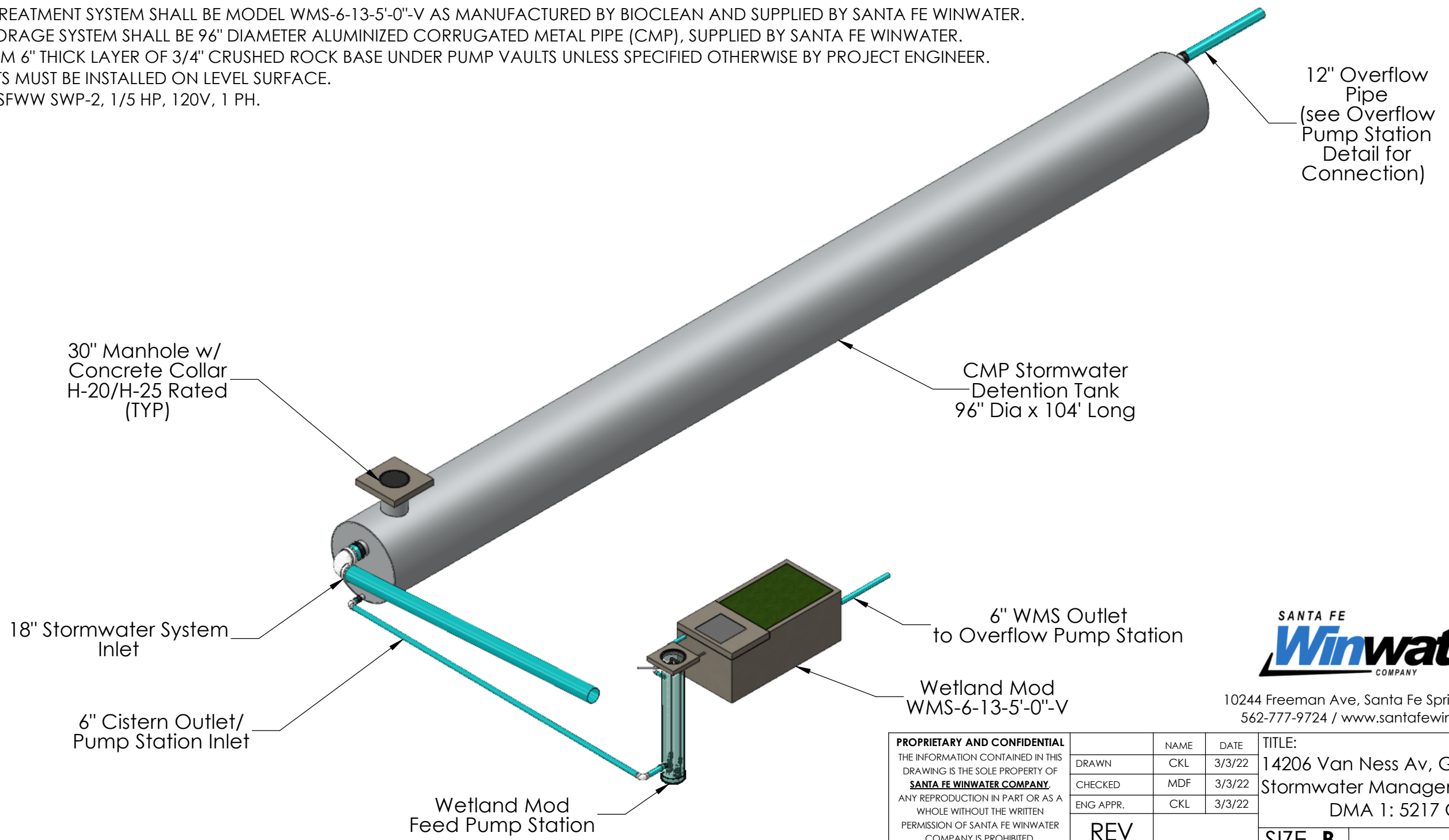
1. ALL DIMENSIONS AND ELEVATIONS SHOWN ARE NOMINAL DIMENSIONS. IT IS THE RESPONSIBILITY OF THE ON-SITE CONTRACTOR OR CUSTOMER TO VERIFY THE ACCURACY OF ANY CRITICAL DIMENSIONS OR ELEVATIONS PRIOR TO SETTING OR INSTALLING ANY EQUIPMENT.
2. ALL MATERIALS SHOWN ON THIS SHEET WILL BE SUPPLIED BY SANTA FE WINWATER COMPANY AS A COMPLETE SYSTEM. ANY OMISSIONS OR SUBSTITUTIONS MAY VOID WARRANTY.
3. VAULTS AND CISTERNS SHALL BE DELIVERED TO THE SITE AFTER EXCAVATIONS ARE COMPLETE AND SHORED. THE CONTRACTOR SHALL SUPPLY A CRANE OF SUFFICIENT SIZE TO HANDLE ALL PIECES SAFELY.
4. UPON ESTABLISHMENT OF PRIOR AGREEMENT, SANTA FE WINWATER COMPANY WILL PROVIDE A REPRESENTATIVE FOR TECHNICAL ASSISTANCE ON THE DAY OF INSTALLATION.
5. THE CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION. SANTA FE WINWATER COMPANY WILL NOT INSTALL ANY OF THE COMPONENTS.
6. MOUNT PUMP CONTROLLER IN LOCATION SPECIFIED BY OWNER. FOR LOCATIONS GREATER THAN 15 FEET FROM VAULT, CONSULT WITH SFWW TO DETERMINE NEED FOR ADDITIONAL CABLE AND/OR EQUIPMENT.
7. ALL COMPONENTS PROVIDED BY SANTA FE WINWATER SHALL BE SUITABLE FOR USE WITH OPERATIONAL AND ENVIRONMENTAL CONDITIONS. EQUIPMENT DOCUMENTATION SHALL BE PROVIDED FOR REVIEW UPON ACCEPTANCE OF PURCHASE ORDER.
8. ALL STRUCTURES TO BE H-20/H-25 TRAFFIC RATED FOR PARKING LOT SPEEDS.
9. CONFIGURATION OF VAULTS MAY VARY DEPENDANT UPON FINAL CIVIL DESIGN. CONFIRM PIPE INVERTS AND OVERALL VAULT DEPTH PRIOR TO ORDERING.
10. WETLAND MOD TREATMENT SYSTEM SHALL BE MODEL WMS-6-13-5'-0"-V AS MANUFACTURED BY BIOCLEAN AND SUPPLIED BY SANTA FE WINWATER.
11. STORMWATER STORAGE SYSTEM SHALL BE 96" DIAMETER ALUMINIZED CORRUGATED METAL PIPE (CMP), SUPPLIED BY SANTA FE WINWATER.
12. PROVIDE MINIMUM 6" THICK LAYER OF 3/4" CRUSHED ROCK BASE UNDER PUMP VAULTS UNLESS SPECIFIED OTHERWISE BY PROJECT ENGINEER. PUMP VAULT UNITS MUST BE INSTALLED ON LEVEL SURFACE.
13. PUMPS SHALL BE SFWW SWP-2, 1/5 HP, 120V, 1 PH.

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	DRAWN	CKL	3/3/22	14206 Van Ness Av, Gardena, CA
	CHECKED	MDF	3/3/22	Stormwater Management System
	ENG APPR.	CKL	3/3/22	DMA 1: 5217 Cu Ft
	REV			SIZE <b>B</b>
				SHEET 2 OF 11

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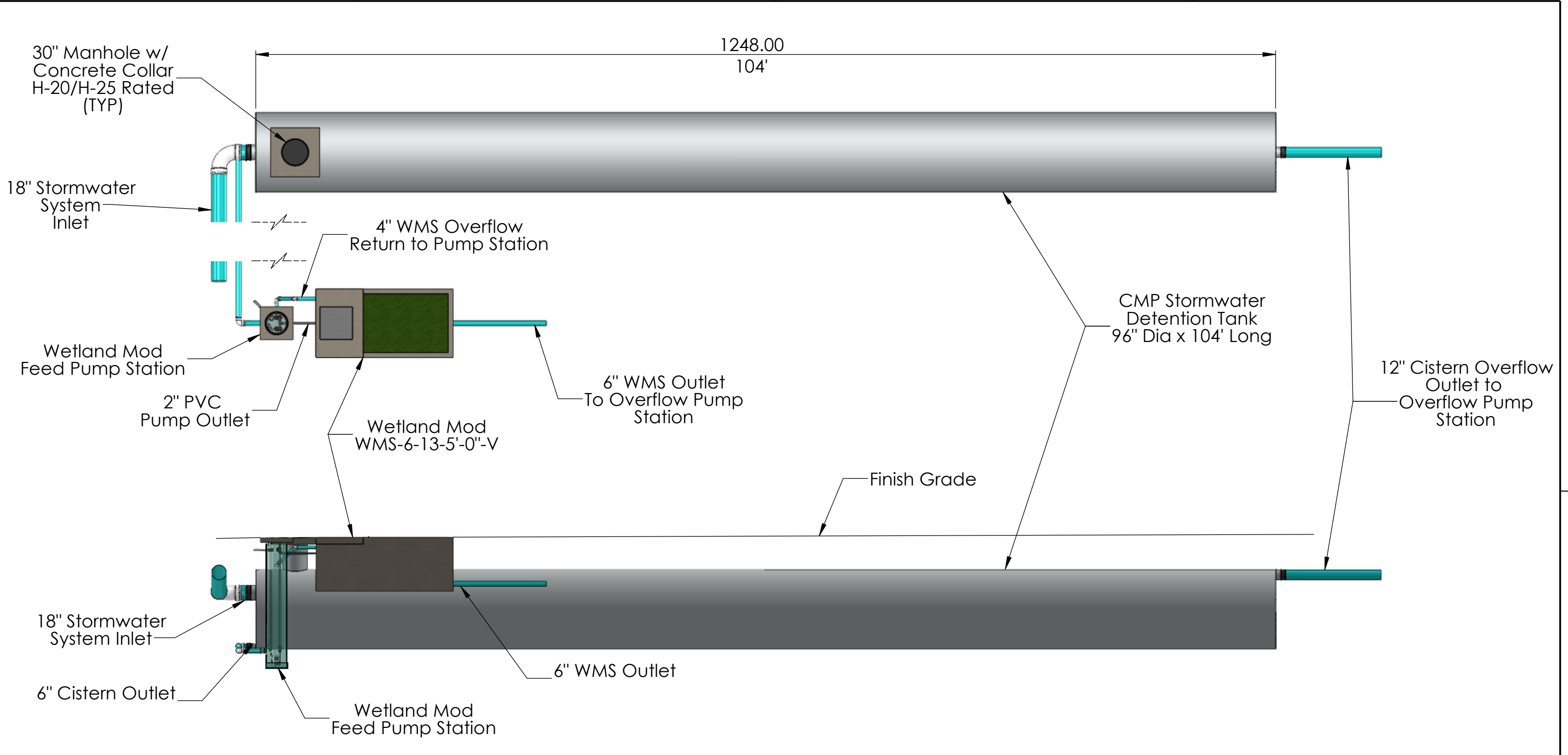
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1248.00  
104'

30" Manhole w/  
Concrete Collar  
H-20/H-25 Rated  
(TYP)

18" Stormwater  
System  
Inlet

4" WMS Overflow  
Return to Pump Station

Wetland Mod  
Feed Pump Station

2" PVC  
Pump Outlet

Wetland Mod  
WMS-6-13-5'-0"-V

6" WMS Outlet  
To Overflow Pump  
Station

CMP Stormwater  
Detention Tank  
96" Dia x 104' Long

12" Cistern Overflow  
Outlet to  
Overflow Pump  
Station

Finish Grade

18" Stormwater  
System Inlet

6" Cistern Outlet

Wetland Mod  
Feed Pump Station

6" WMS Outlet

- NOTES:
1. SEE CIVIL SHEETS TO CONFIRM LOCATIONS AND ELEVATIONS OF STORMWATER SYSTEM COMPONENTS AND PIPE CONNECTIONS.
  2. FLEXIBLE WATERTIGHT COUPLINGS WITH STAINLESS STEEL CLAMPS SHALL BE PROVIDED AT ALL CONNECTIONS BETWEEN CISTERNS AND ADJOINING PIPING.
  3. PIPING BETWEEN SYSTEM COMPONENTS SHALL BE PVC SDR35 PIPE UNLESS OTHERWISE NOTED.
  4. PROVIDE MINIMUM 12" COVER FROM TOP OF CISTERNS TO BOTTOM OF ASPHALT CEMENT OR TOP OF CONCRETE CEMENT.



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	ENG APPR.	CKL	3/3/22	DMA 1: 5217 Cu Ft
	REV			SIZE <b>B</b>
				SHEET 3 OF 11

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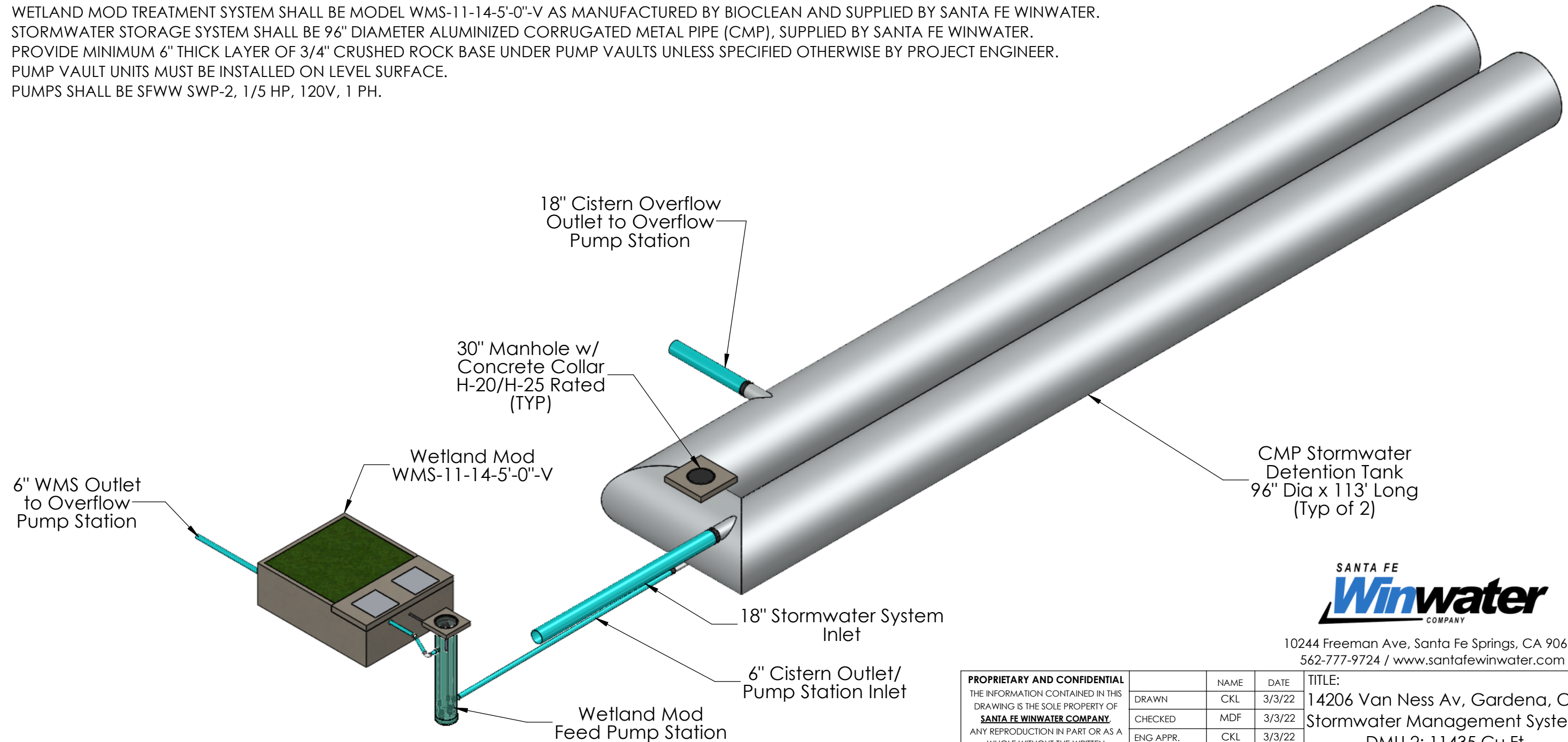
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NOTES:

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10. WETLAND MOD TREATMENT SYSTEM SHALL BE MODEL WMS-11-14-5'-0"-V AS MANUFACTURED BY BIOCLEAN AND SUPPLIED BY SANTA FE WINWATER.
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	CHECKED	MDF	3/3/22	Stormwater Management System
	ENG APPR.	CKL	3/3/22	DMU 2: 11435 Cu Ft
	REV			SIZE <b>B</b>
				SHEET 4 OF 11

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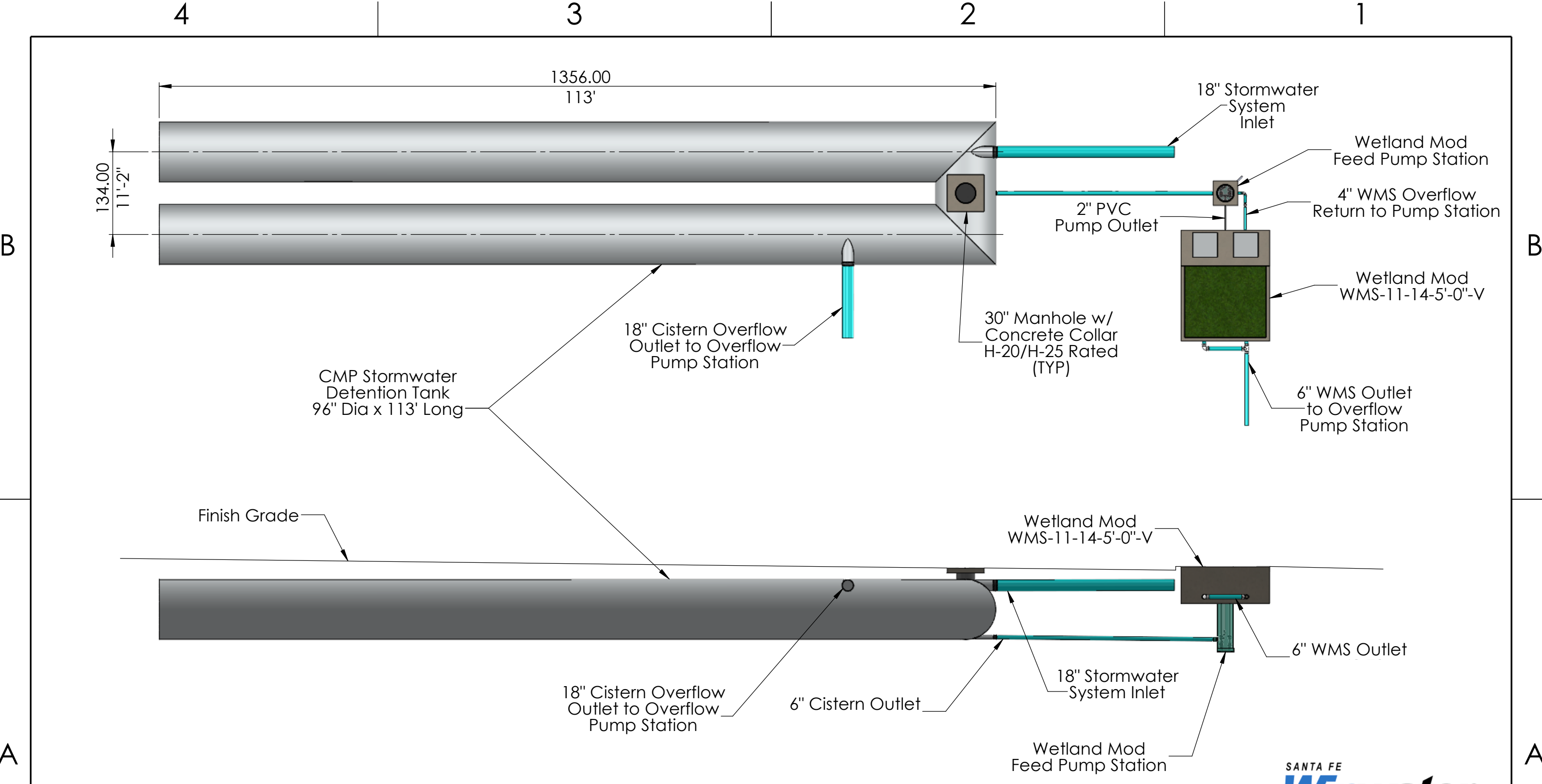
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- NOTES:
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  2. FLEXIBLE WATERTIGHT COUPLINGS WITH STAINLESS STEEL CLAMPS SHALL BE PROVIDED AT ALL CONNECTIONS BETWEEN CISTERNS AND ADJOINING PIPING.
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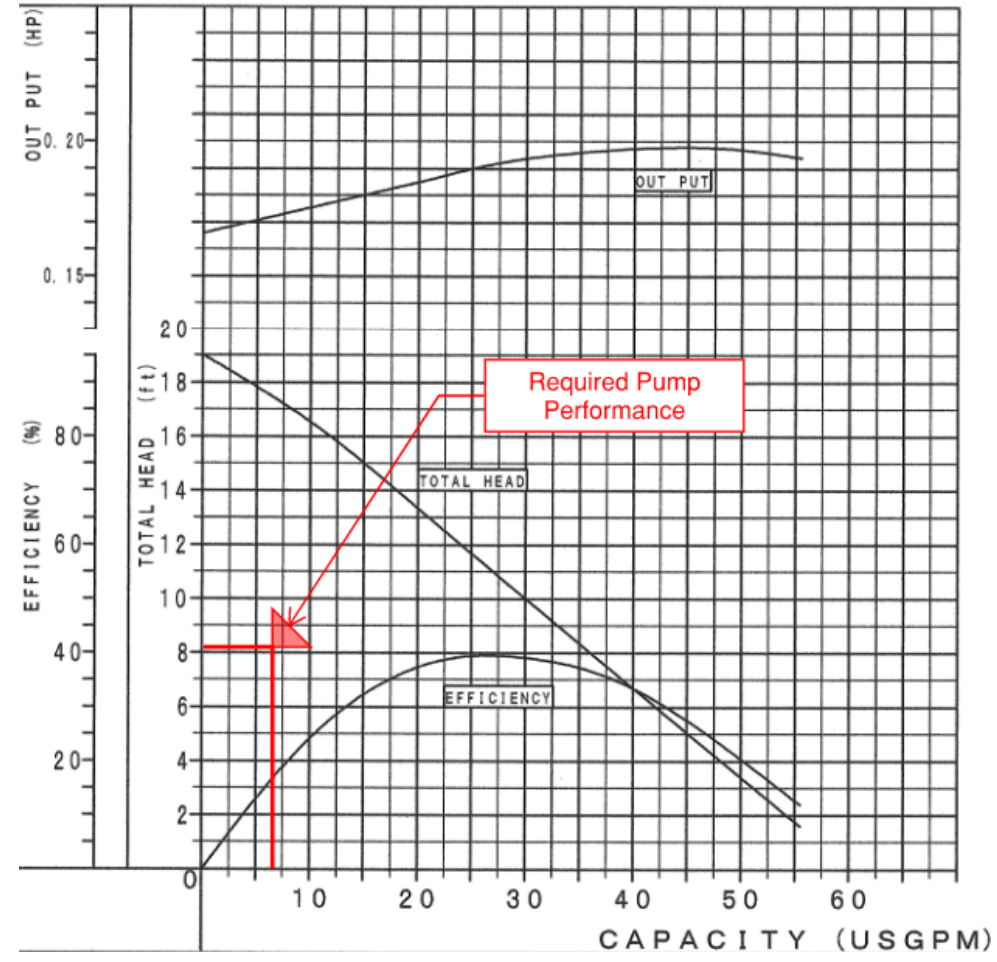
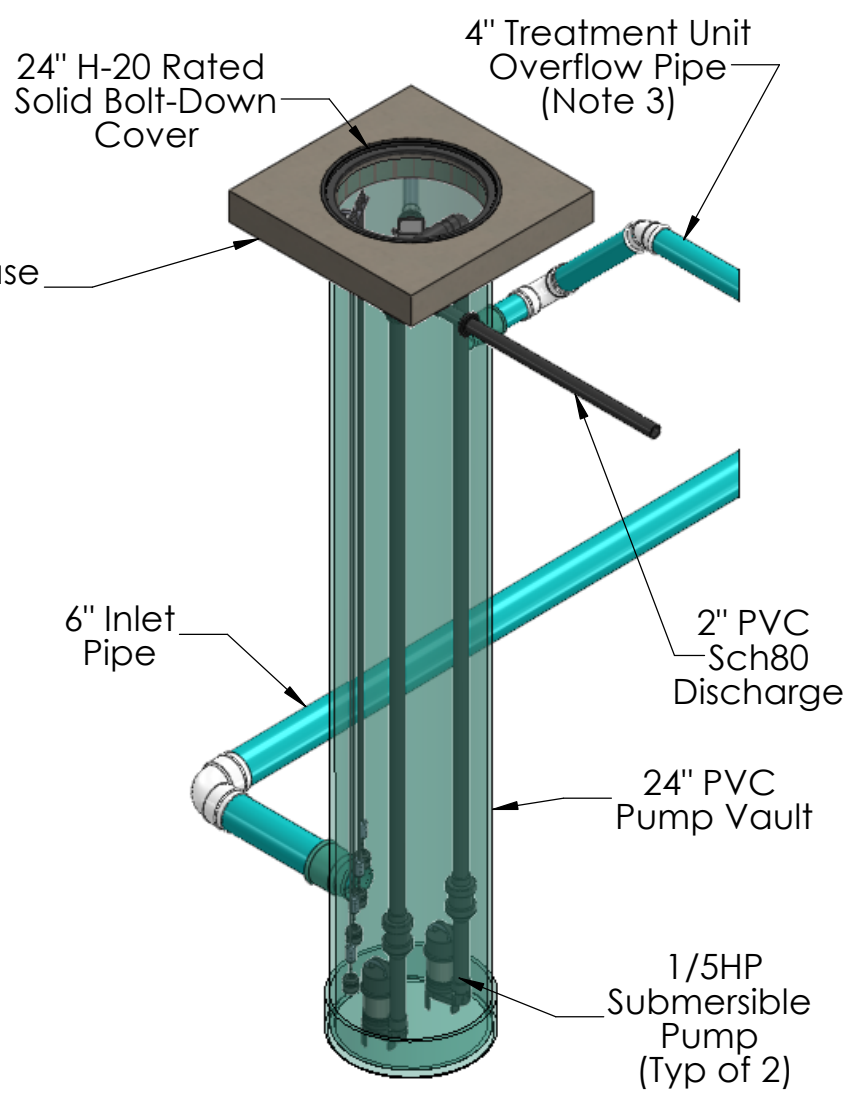
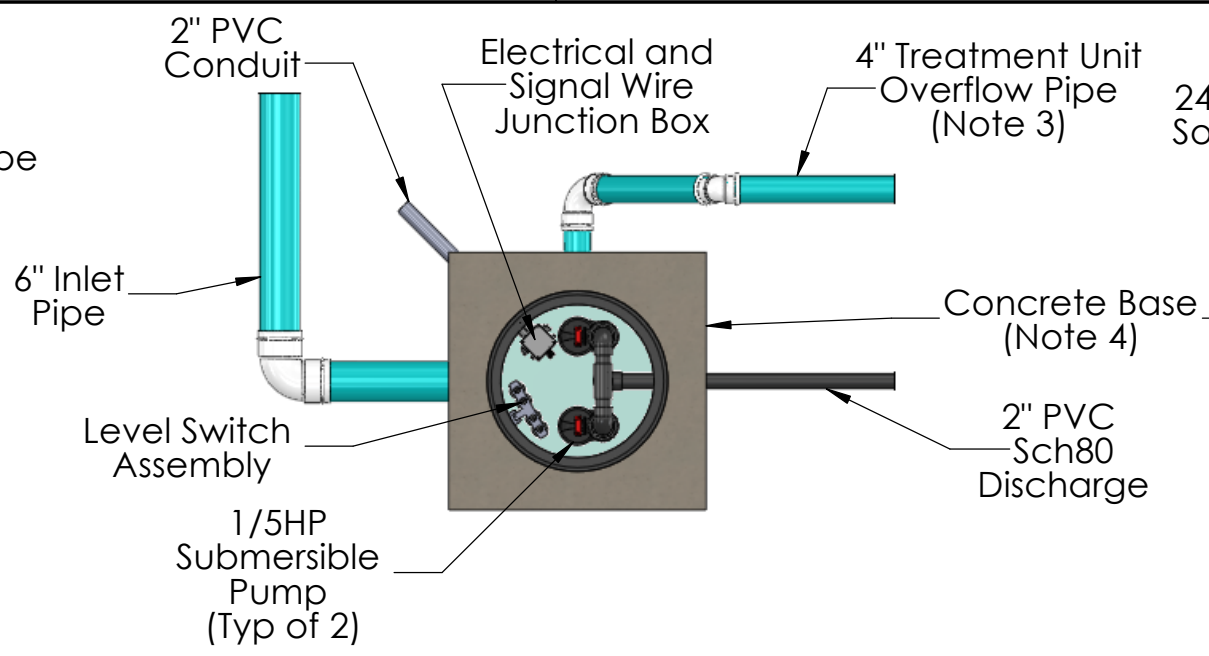
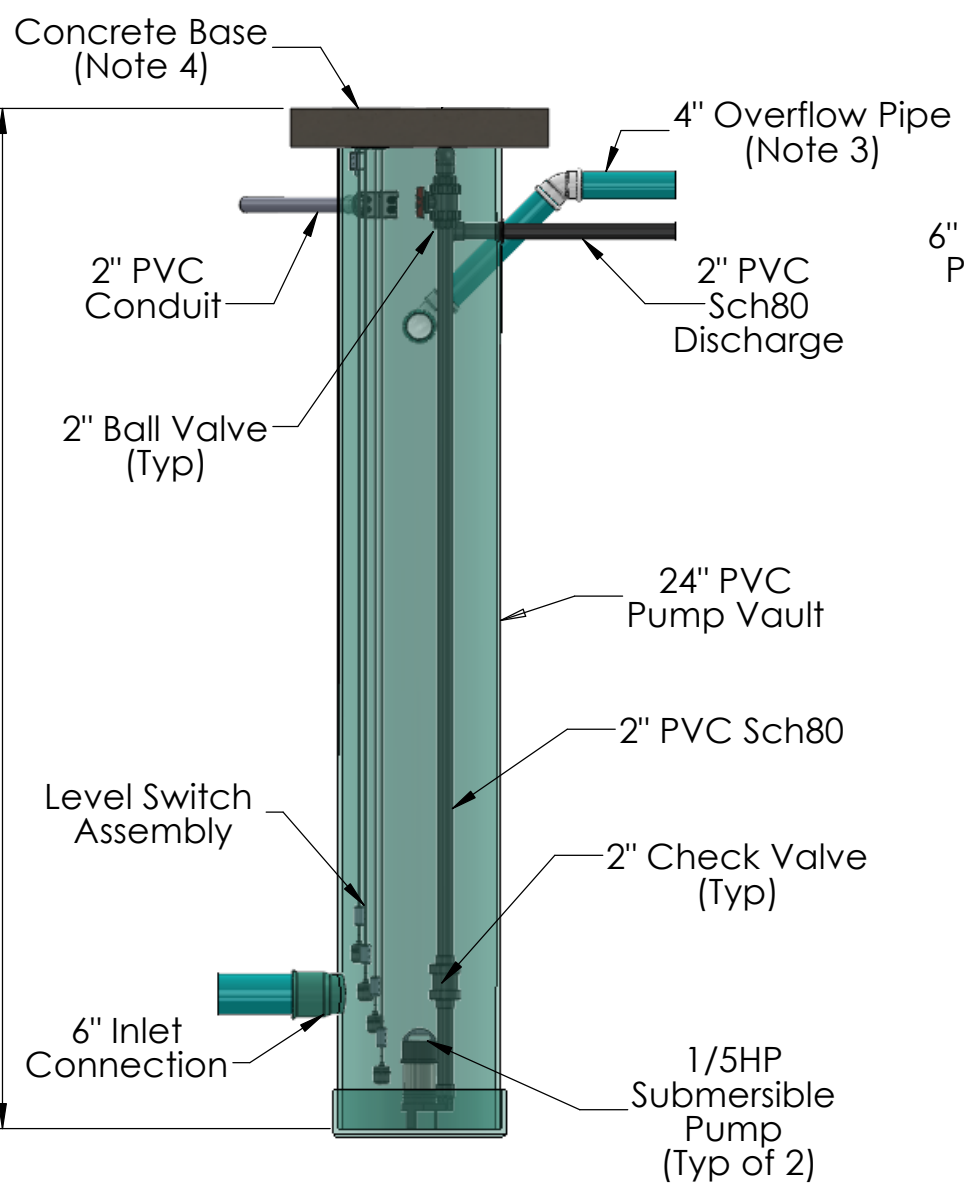
<b>PROPRIETARY AND CONFIDENTIAL</b> THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF <b>SANTA FE WINWATER COMPANY</b> . ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SANTA FE WINWATER COMPANY IS PROHIBITED.		NAME	DATE	TITLE:
	DRAWN	CKL	3/3/22	14206 Van Ness Av, Gardena, CA
	CHECKED	MDF	3/3/22	Stormwater Management System
	ENG APPR.	CKL	3/3/22	DMU 2: 11435 Cu Ft
	REV			SIZE <b>B</b>
				SHEET 5 OF 11

4

3

2

1



- NOTES:
1. All materials shown on this sheet shall be supplied by Santa Fe WinWater Company, Santa Fe Springs, CA, except where noted. Pumps shall be SFWW SWP-2, 115v, 3A. Substitution of any component may void warranty.
  2. Locate Pump Controller as required for site conditions or Owner direction. Route power and signal cable conduit to vault from controller accordingly. Connections shall be provided by Contractor.
  3. Route 2" pump system outlet and 4" Overflow pipe as shown on Civil Sheets.
  4. Contractor to provide concrete collar around manhole cover suitable for surface loading conditions.
  5. Anti-Floatation flange to be provided on pump vault where required for groundwater conditions.
  6. Pump performance requirements based on 96 hour drawdown of 5217 cu ft = 6.8 gpm.

Headloss Calculations		
Fitting	Qty / Length	Headloss
Pipe (2")	13.5	0.02'
Check Valve	1	0.02'
90 Elbow	2	0.01'
Tee	1	0.02'
Exit	1	0.01'
Elevation Head		8.0'
Total Headloss @ 6.8 gpm		8.08'



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REV	NAME	DATE	TITLE:
	CKL	3/3/22	14206 Van Ness Av, Gardena, CA
	MDF	3/3/22	Stormwater Management System
	CKL	3/3/22	DMU 1 Feed Pump Station
			SIZE <b>B</b>
			SHEET 6 OF 11

4

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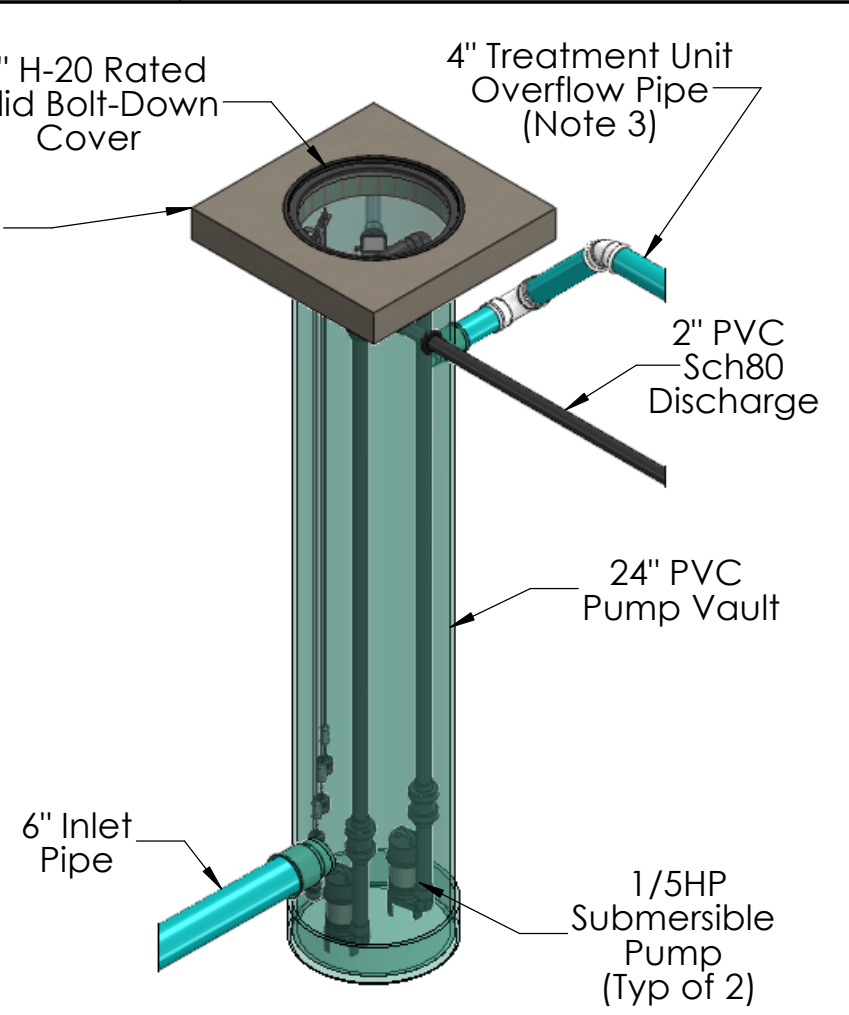
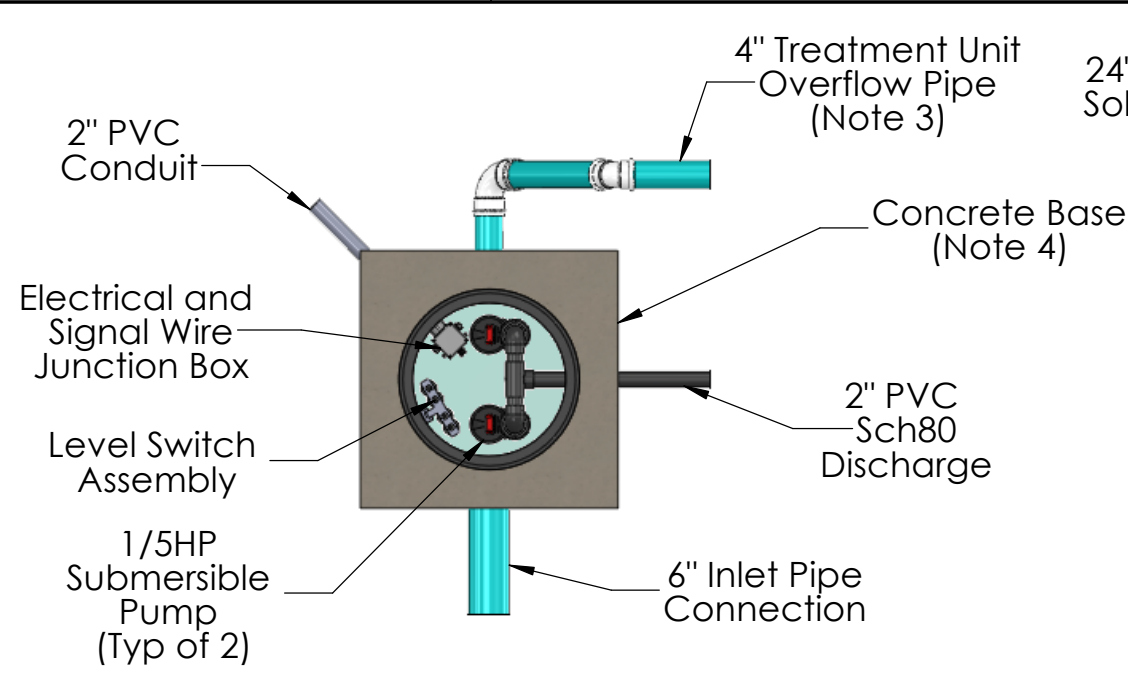
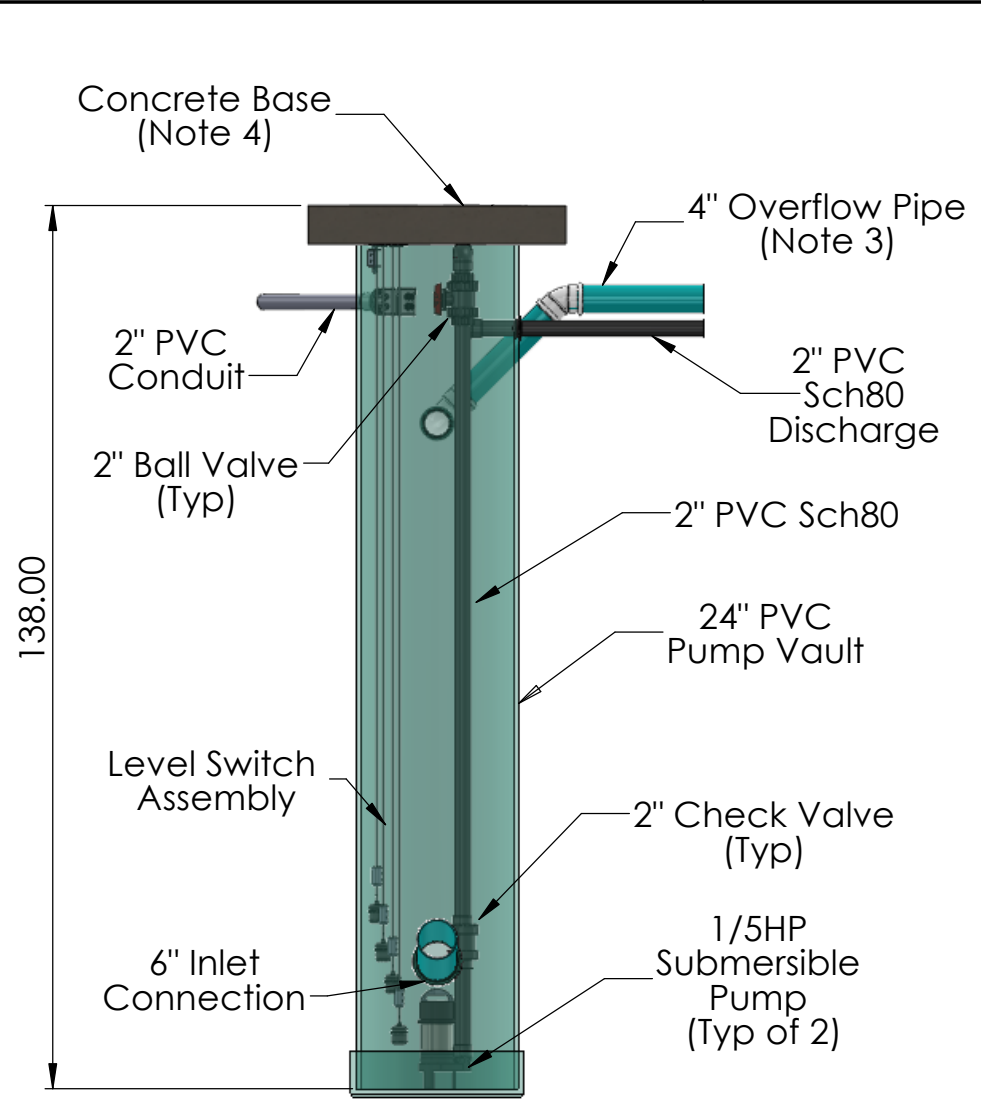
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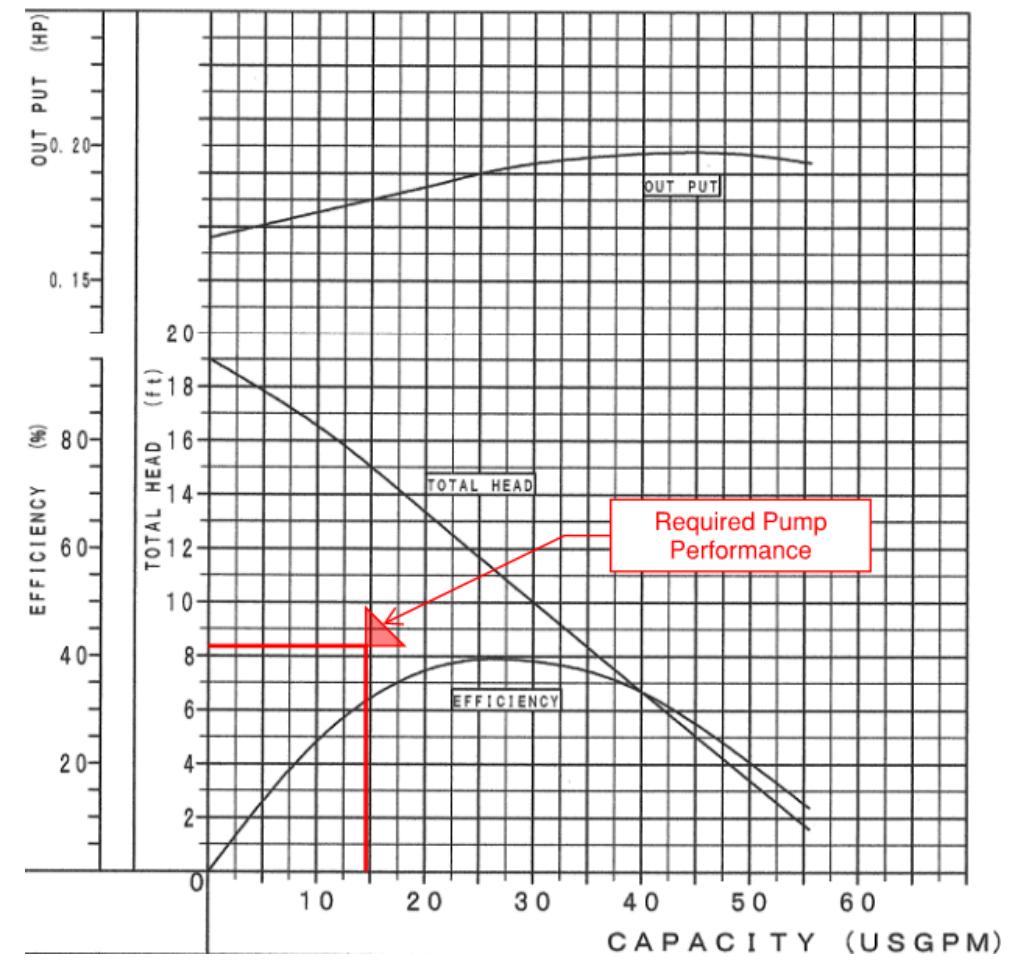
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B

B



- NOTES:
- All materials shown on this sheet shall be supplied by Santa Fe WinWater Company, Santa Fe Springs, CA, except where noted. Pumps shall be SFWW SWP-2, 115v, 3A. Substitution of any component may void warranty.
  - Locate Pump Controller as required for site conditions or Owner direction. Route power and signal cable conduit to vault from controller accordingly. Connections shall be provided by Contractor.
  - Route 2" pump system outlet and 4" Overflow pipe as shown on Civil Sheets.
  - Contractor to provide concrete collar around manhole cover suitable for surface loading conditions.
  - Anti-Floatation flange to be provided on pump vault where required for groundwater conditions.
  - Pump performance requirements based on 96 hour drawdown of 11435 cu ft = 14.9 gpm.



Headloss Calculations		
Fitting	Qty / Length	Headloss
Pipe (2")	13.5	0.09'
Check Valve	1	0.10'
90 Elbow	2	0.06'
Tee	1	0.07'
Exit	1	0.04'
Elevation Head		8.00'
Total Headloss @ 14.9 gpm		8.36'



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REV	NAME	DATE	TITLE:
	CKL	3/3/22	14206 Van Ness Av, Gardena, CA
	MDF	3/3/22	Stormwater Management System
	CKL	3/3/22	DMU 2 Feed Pump Station
			SIZE <b>B</b>
			SHEET 7 OF 11

4

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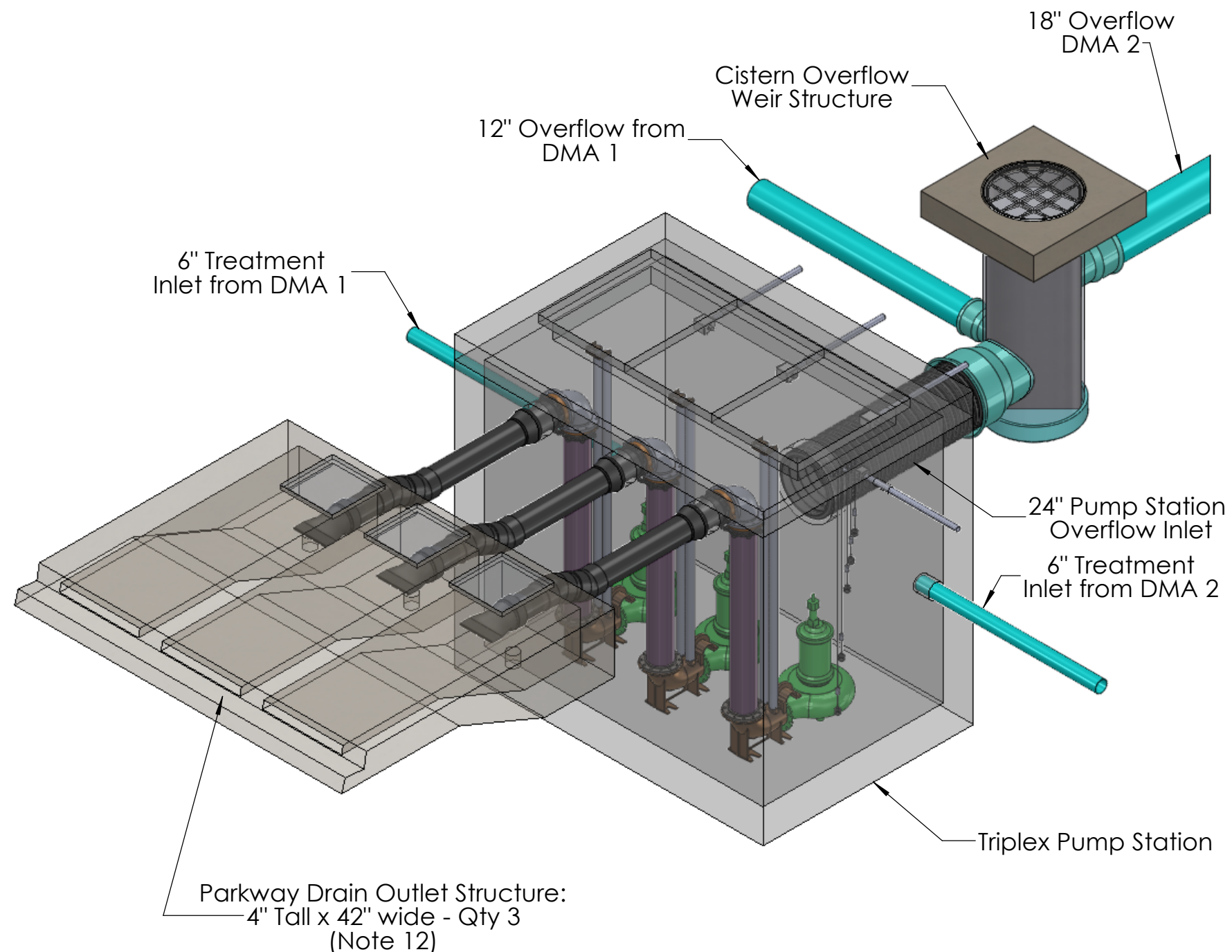
A

A

# GARDENA U-HAUL STORMWATER PUMP STATION

### NOTES:

1. ALL DIMENSIONS AND ELEVATIONS SHOWN ARE NOMINAL DIMENSIONS. IT IS THE RESPONSIBILITY OF THE ON-SITE CONTRACTOR OR CUSTOMER TO VERIFY THE ACCURACY OF ANY CRITICAL DIMENSIONS OR ELEVATIONS PRIOR TO ORDERING, SETTING AND INSTALLING ANY EQUIPMENT.
2. ALL MATERIALS SHOWN ON THESE SHEETS SHALL BE SUPPLIED BY SANTA FE WINWATER COMPANY AS A COMPLETE SYSTEM, EXCEPT WHERE NOTED "BY OTHERS". ANY EXCLUSIONS OR SUBSTITUTIONS MAY VOID WARRANTY.
3. SYSTEM COMPONENTS SHALL BE DELIVERED TO THE SITE AFTER EXCAVATIONS HAVE BEEN EXCAVATED AND SHORED. THE CONTRACTOR SHALL SUPPLY A CRANE OF SUFFICIENT SIZE TO LOWER ALL PIECES INTO THE HOLE SAFELY. THE CONTRACTOR SHALL INSTALL ALL COMPONENTS.
4. UPON ESTABLISHMENT OF PRIOR AGREEMENT, SANTA FE WINWATER COMPANY WILL PROVIDE A REPRESENTATIVE FOR TECHNICAL ASSISTANCE ON THE DAY OF INSTALLATION TO ANSWER ANY QUESTIONS THAT MAY ARISE.
5. TRIPLEX PUMPS TO BE SFWW 7365N-861-1J-30N, 10HP, 870rpm, 3PH, 460V, 15.1A, INVERTER DUTY, 8" DISCHARGE.
6. PUMP CONTROLLER (STAINLESS STEEL, NEMA 4X) TO BE SFWW HTRT-33-10-SFT-SS4, 480VAC, 32A MAX.
7. MOUNT PUMP CONTROLLER IN LOCATION SPECIFIED BY OWNER. FOR LOCATIONS GREATER THAN 40 FEET FROM VAULT, CONSULT WITH SFWW TO DETERMINE NEED FOR ADDITIONAL CABLE AND/OR EQUIPMENT.
8. ALL COMPONENTS PROVIDED BY SANTA FE WINWATER SHALL BE SUITABLE FOR USE WITH OPERATIONAL AND ENVIRONMENTAL CONDITIONS. EQUIPMENT DOCUMENTATION SHALL BE PROVIDED FOR REVIEW UPON ACCEPTANCE OF PURCHASE ORDER.
9. ALL STRUCTURES TO BE H-20/H-25 TRAFFIC RATED FOR PARKING LOT SPEEDS.
10. APPROPRIATE SIZED KWIK-SEAL OR CAST-IN SEAL SHALL BE USED FOR PLASTIC OR METAL PIPE PENETRATIONS INTO VAULTS. CONCRETE PIPE PENETRATIONS SHALL BE GROUTED.
11. PARKWAY DRAIN SHALL BE CONSTRUCTED BY CONTRACTOR AND FOLLOW CITY OR COUNTY DETAILS OF CONSTRUCTION FOR DECK THICKNESS, REBAR PLACEMENT, STEEL LIP PLACEMENT, ETC. STRUCTURE SHALL BE CAST IN PLACE BY CONTRACTOR. DETAILED DESIGN DRAWINGS TO BE PROVIDED UPON ORDER.
12. CONFIGURATION OF VAULTS MAY VARY DEPENDANT UPON FINAL CIVIL DESIGN. CONFIRM PIPE INVERTS AND OVERALL VAULT DEPTH PRIOR TO ORDERING.
13. PROVIDE MINIMUM 6" THICK LAYER OF 3/4" CRUSHED ROCK BASE UNDER PUMP VAULTS UNLESS SPECIFIED OTHERWISE BY PROJECT ENGINEER. PUMP VAULT UNITS MUST BE INSTALLED ON LEVEL SURFACE.



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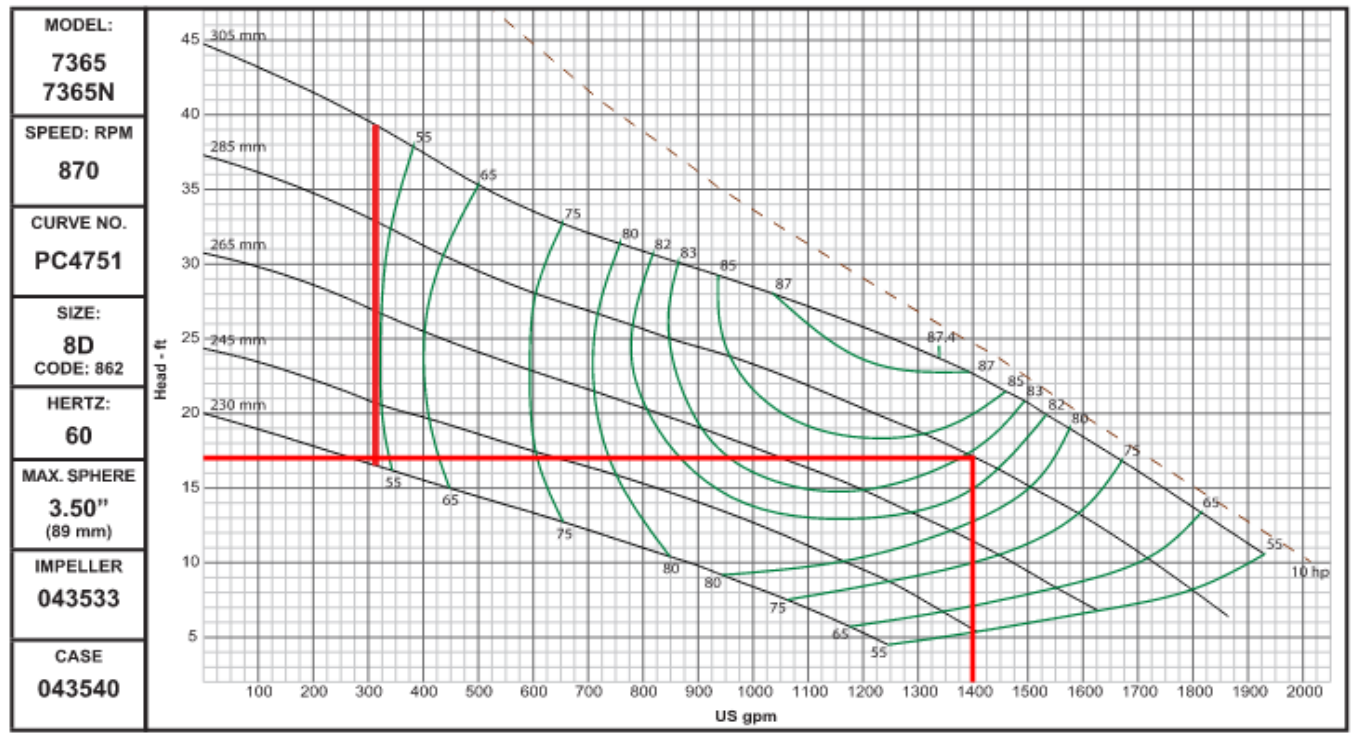
<b>PROPRIETARY AND CONFIDENTIAL</b> THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF <b>SANTA FE WINWATER COMPANY</b> . ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SANTA FE WINWATER COMPANY IS PROHIBITED.		NAME	DATE	<b>TITLE:</b> Gardena U-Haul Stormwater Overflow and Treatment Pump Station 4,207 gpm (9.375 cfs)
	DRAWN	CKL	3/3/22	
	CHECKED	MDF	3/3/22	
	ENG APPR.	CKL	3/3/22	<b>SIZE B</b>
REV				SHEET 8 OF 11

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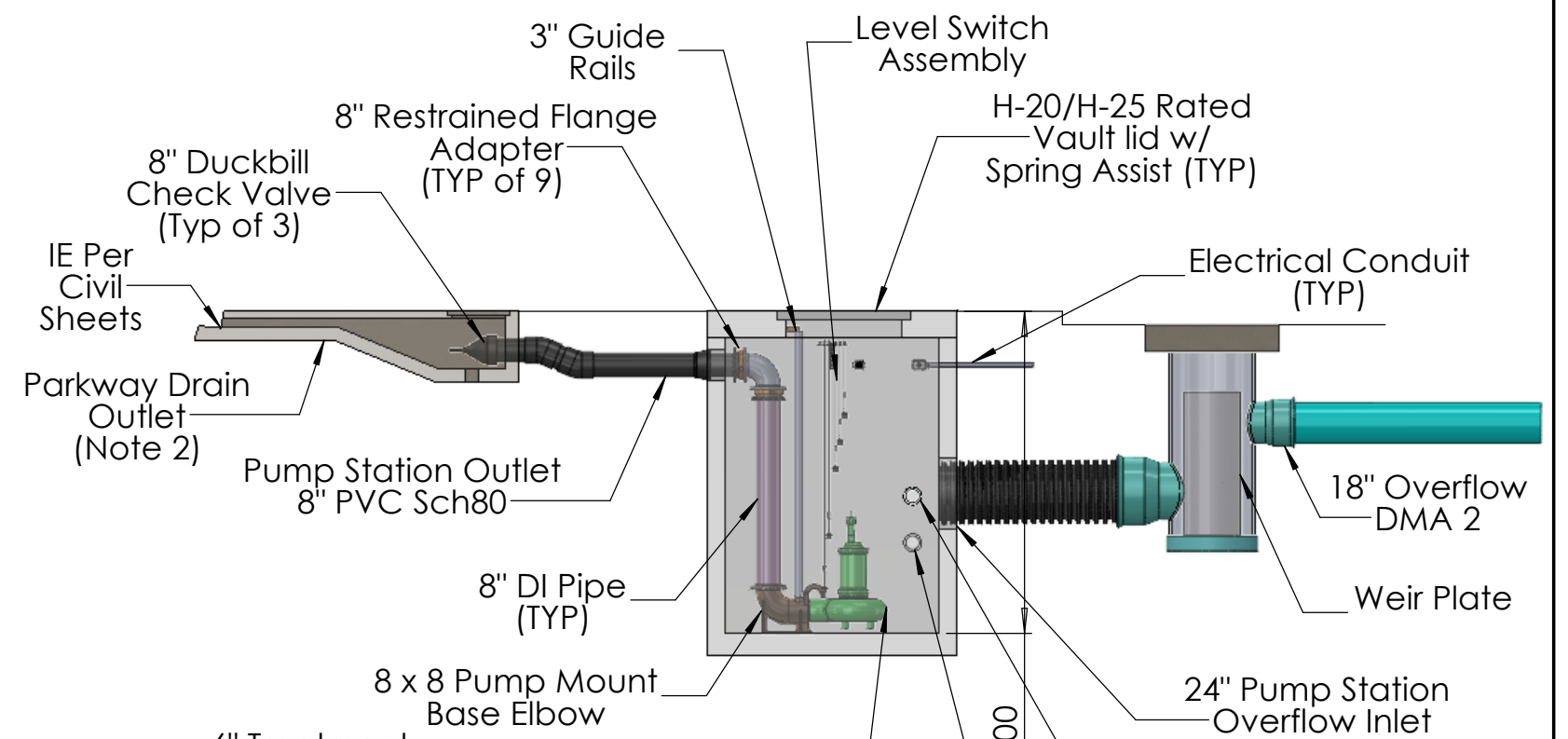
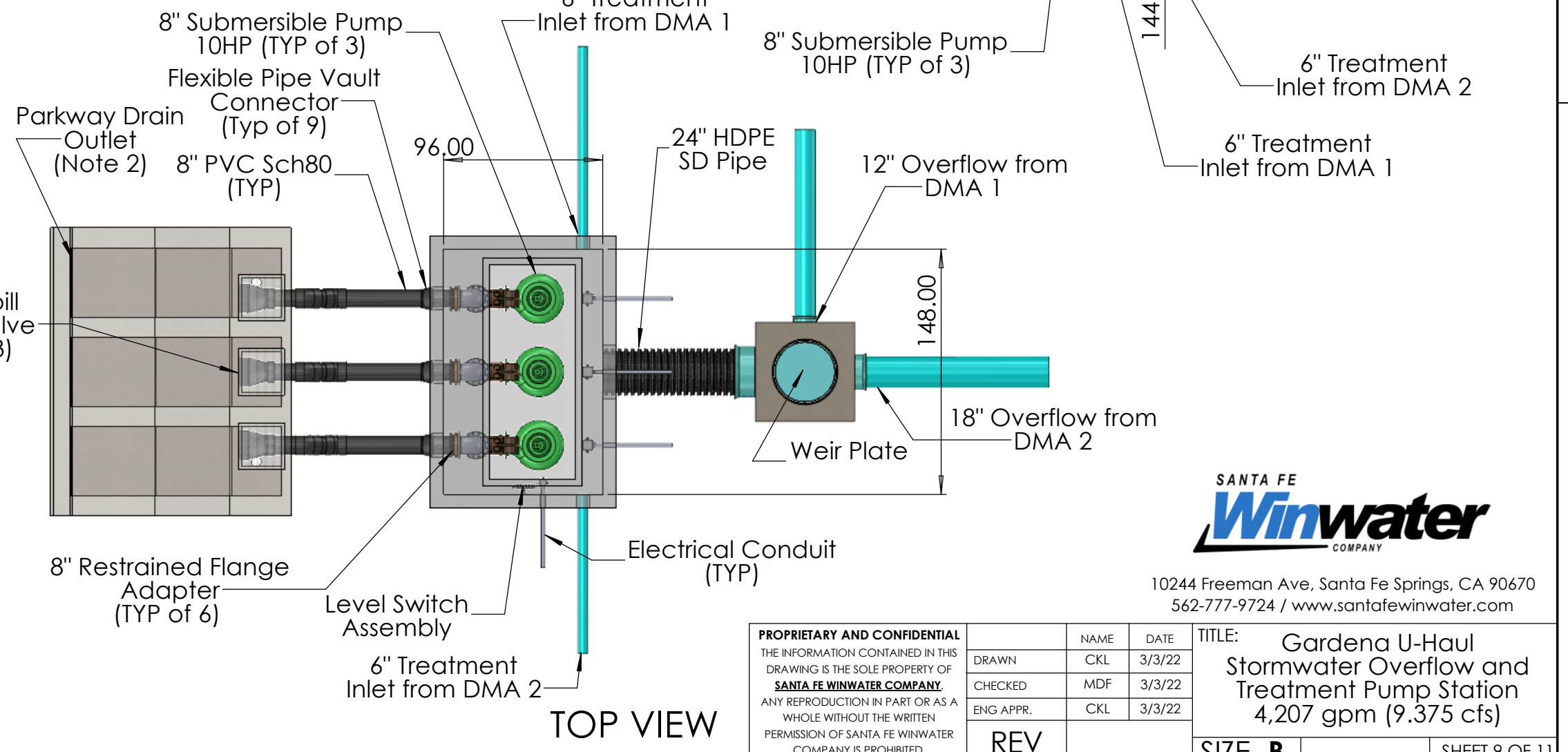
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Headloss Calculations		
Fitting	Qty / Length (ft)	Headloss (ft w.c.)
Pipe (8")	18'	0.38
Check Valve	1	1.90
90 Elbow	2	1.06
22.5 Elbow	2	0.60
Exit	1	3.01
Elevation Head		10
<b>Total Headloss @ 1402 gpm</b>		<b>16.95' w.c.</b>

- NOTES:
1. Pump Controller (not shown) to be mounted in the field at a location determined by the Contractor or Owner. For distances greater than 15' from Pump Station, contact SFWW to determine additional power and level switch cable required.
  2. Parkway drain shall be constructed by Contractor and follow city or county details of construction. Structure shall be cast-in-place by Contractor. Detailed design drawings shall be supplied upon order.

8" Duckbill Check Valve (Typ of 3)



TOP VIEW



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	DRAWN	CKL		3/3/22
	CHECKED	MDF		3/3/22
	ENG APPR.	CKL	3/3/22	REV
SIZE <b>B</b>			SHEET 9 OF 11	

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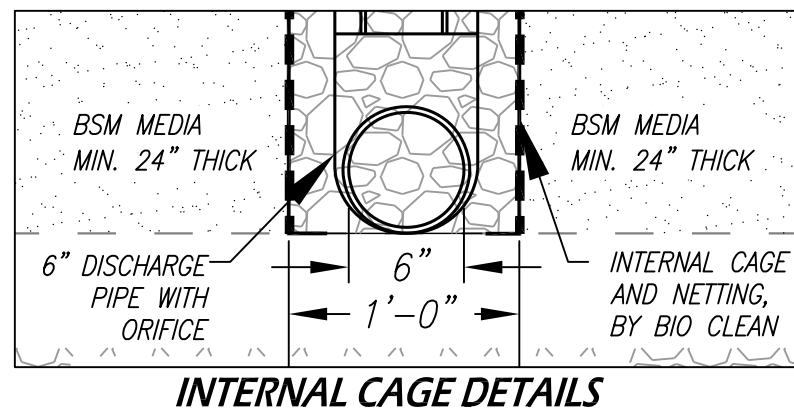
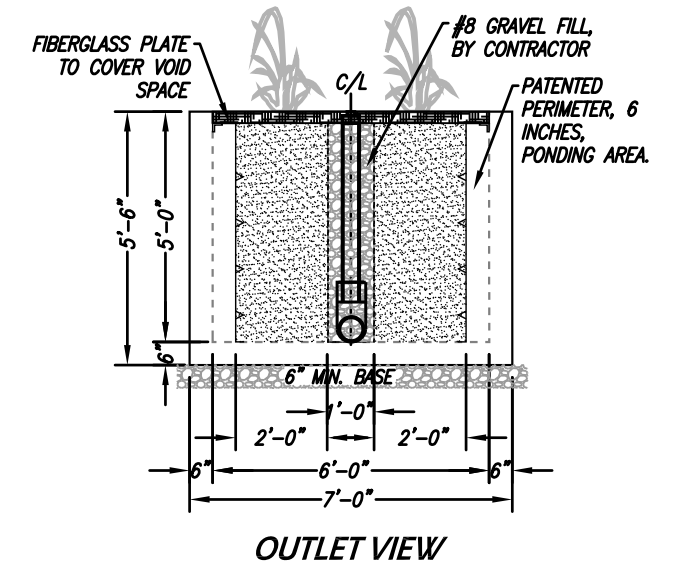
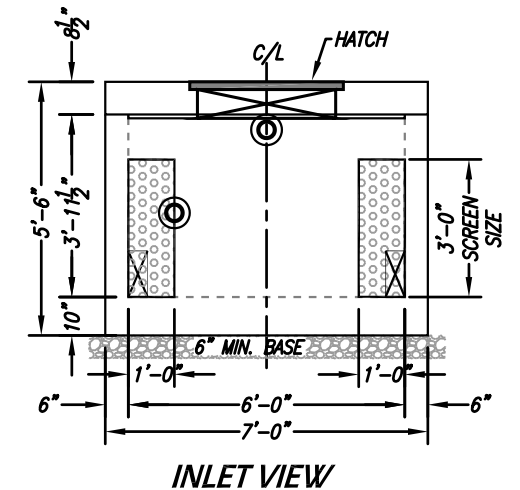
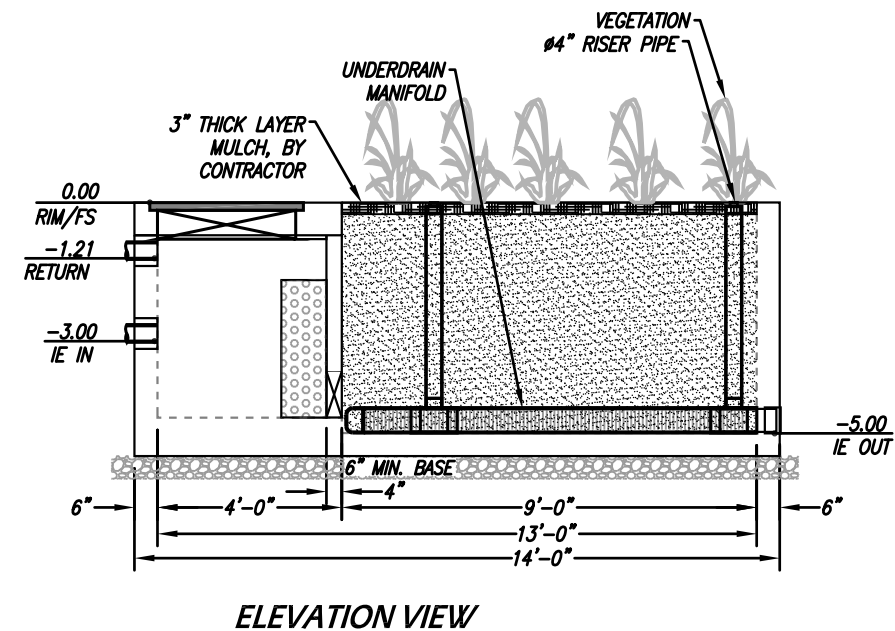
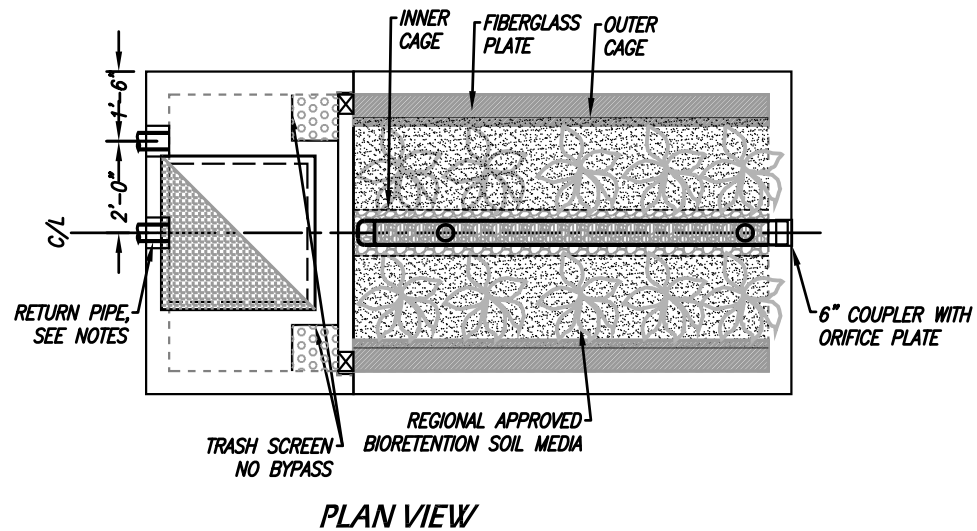
SITE SPECIFIC DATA			
PROJECT ID	14541.00		
PROJECT NAME	U-HAUL GARDENA		
PROJECT LOCATION	GARDENA, CA		
STRUCTURE ID	DMA 1		
TREATMENT REQUIRED			
VOLUME BASED (CF)	FLOW BASED (CFS)		
5217	---		
TREATMENT HGL AVAILABLE (FT)	---		
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE	OFFLINE		
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE	-3.00	PVC	4"
RETURN PIPE	-1.21	PVC	4"
OUTLET PIPE	-5.00	PVC-SDR35	6"
	PRETREATMENT	BIOFILTRATION	N/A
RIM ELEVATION	0.00	0.00	N/A
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	N/A
FRAME & COVER	36" X 36"	N/A	N/A
LA COUNTY MEDIA MIX VOLUME (CY)	5.63		
GRAVEL LAYER WITHIN MEDIA CHAMBER (CY)	1.10		
ORIFICE DIAMETER (IN)	ø0.56"		
NOTES: PRELIMINARY, NOT FOR CONSTRUCTION.			

**INSTALLATION NOTES**

- CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
- UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
- ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURER'S STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
- CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
- CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
- DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

**GENERAL NOTES**

- MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
- ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.



REQUIRED HORIZ. MEDIA THICKNESS (INCHES)	24
TREATMENT VOLUME (CF)	5217
TARGETED DRAINDOWN DURATION (HR)	96
WETLAND MEDIA INFILTRATION RATE (IN/HR)	12
WETLAND MEDIA LOADING RATE (GPM/SF)	OR 0.12
DISCHARGE RATE (CFS)	0.015
REQUIRED TOTAL MEDIA SURFACE AREA (SF)	56.46
PROVIDED TOTAL MEDIA SURFACE AREA (SF)	61.00
NUMBER OF ROW(S)	1

THE PRODUCT DESCRIBED MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

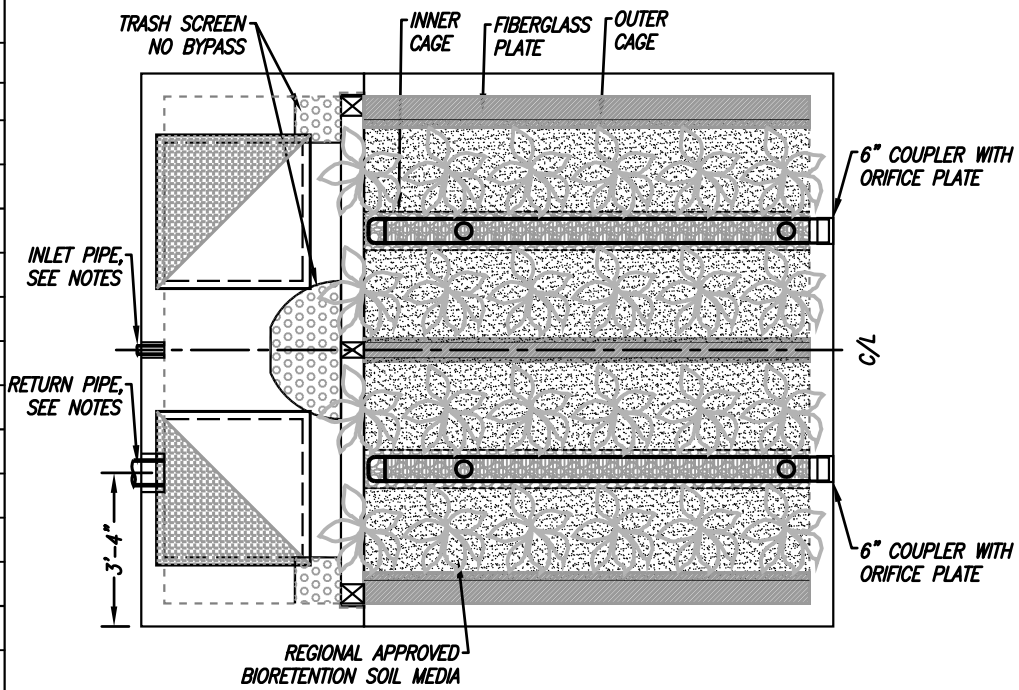
PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MODULAR WETLANDS SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MODULAR WETLANDS SYSTEMS IS PROHIBITED.



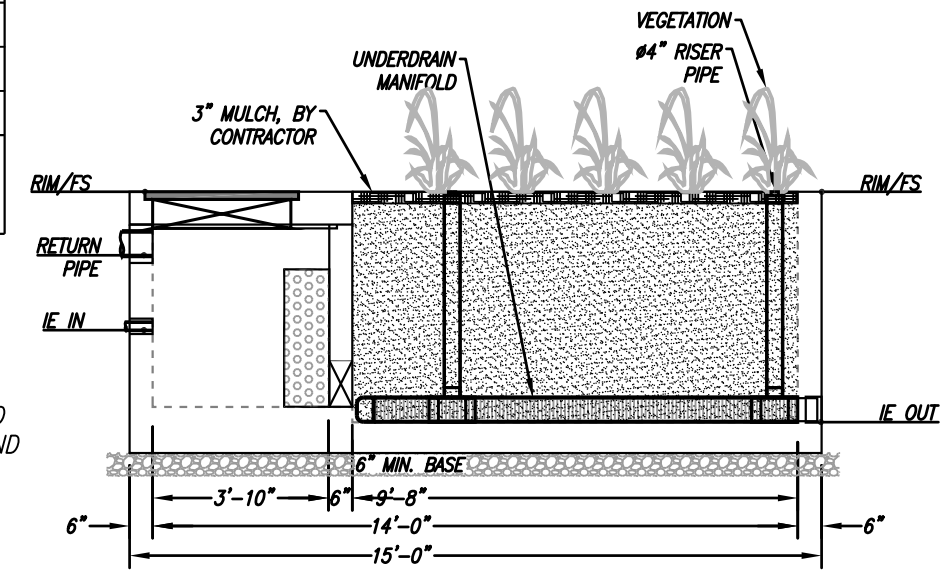
**WetlandMOD-6-13-5'-0"-V**  
STORMWATER BIOFILTRATION SYSTEM  
STANDARD DETAIL SHEET 10 OF 11



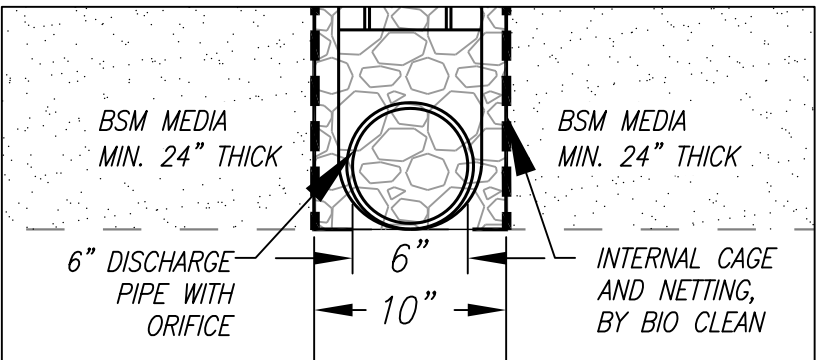
SITE SPECIFIC DATA			
PROJECT ID	14541.00		
PROJECT NAME	U-HAUL GARDENA		
PROJECT LOCATION	GARDENA, CA		
STRUCTURE ID	DMA 2		
TREATMENT REQUIRED			
VOLUME BASED (CF)	FLOW BASED (CFS)		
11500	---		
TREATMENT HGL AVAILABLE (FT)	---		
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE	OFFLINE		
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE	-3.00	N/K	2"
RETURN PIPE	-1.38	N/K	6"
OUTLET PIPE	-5.00	PVC-SDR35	6"
	PRETREATMENT	BIOFILTRATION	N/A
RIM ELEVATION	0.00	0.00	N/A
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	N/A
FRAME & COVER	(2) 36"X36"	N/A	N/A
LA COUNTY MEDIA MIX VOLUME (CY)	12.67		
GRAVEL LAYER WITHIN MEDIA CHAMBER (CY)	2.64		
ORIFICE DIAMETER (IN)	ø0.59"		
NOTES: PRELIMINARY, NOT FOR CONSTRUCTION.			



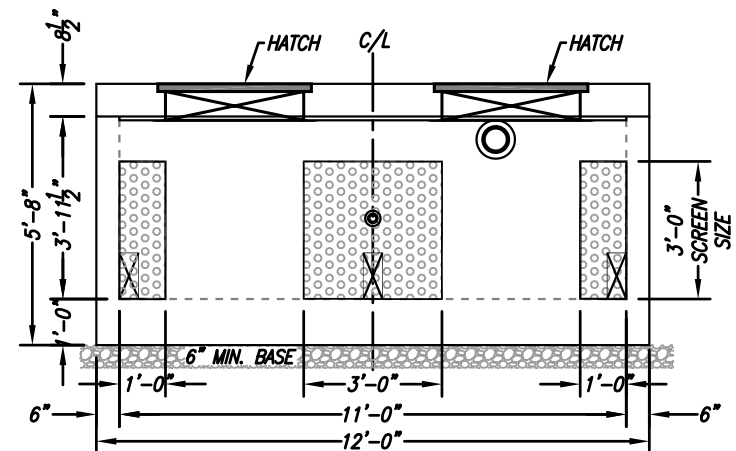
PLAN VIEW



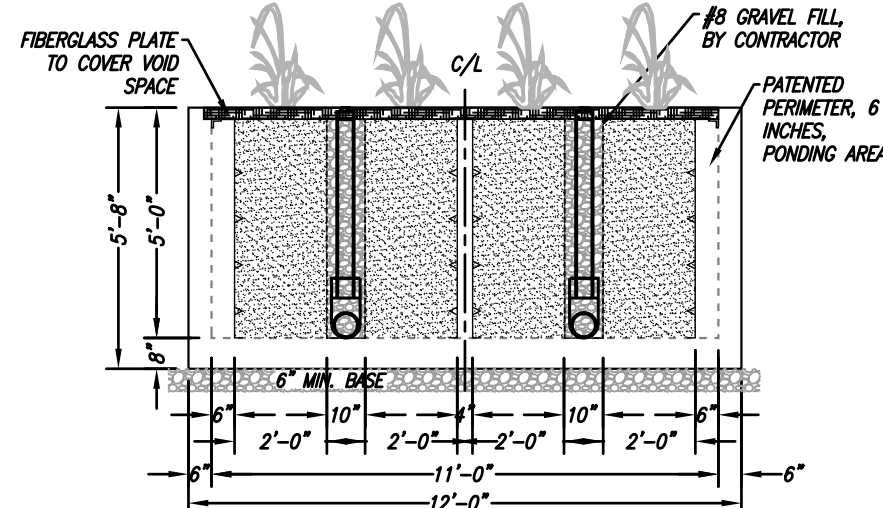
ELEVATION VIEW



INTERNAL CAGE DETAILS



INLET VIEW



OUTLET VIEW

INSTALLATION NOTES

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- UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
- ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURER'S STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
- CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
- CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
- DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

GENERAL NOTES

- MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
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REQUIRED HORIZ. MEDIA THICKNESS (INCHES)	24
TREATMENT VOLUME (CF)	11500
TARGETED DRAINDOWN DURATION (HR)	96
WETLAND MEDIA INFILTRATION RATE (IN/HR)	12
WETLAND MEDIA LOADING RATE (GPM/SF)	OR 0.12
DISCHARGE RATE (CFS)	0.033
REQUIRED TOTAL MEDIA SURFACE AREA (SF)	124.45
PROVIDED TOTAL MEDIA SURFACE AREA (SF)	65.00
NUMBER OF ROW(S)	2

WetlandMOD-11-14-5'-0"-V  
STORMWATER BIOFILTRATION SYSTEM  
STANDARD DETAIL SHEET 11 OF 11

12/20/21CSINGH

# **Attachment B**

## **Geotechnical Investigation**

# **Attachment C**

## **City Forms**

# **Attachment D**

## **Master Covenant Agreement (MCA)**

# **Attachment E**

## **Operations and Maintenance (O&M) Plan**

**U-Haul Gardena**  
**14206 Van Ness Avenue,**  
**Gardena, CA 90249**  
**APN 4061-028-051, 4061-028-033, 4061-028-023**

**REQUIRED PERMITS**

This section must list any permits required for the implementation, operation, and maintenance of the BMPs. Possible examples are:

- Permits for connection to sanitary sewer
- Permits from California Department of Fish and Game
- Encroachment permits

If no permits are required, a statement to that effect should be made.

**RECORDKEEPING**

All records must be made available for review upon request.

**RESPONSIBLE PARTY**

The owner is aware of the maintenance responsibilities of the proposed BMPs. A funding mechanism is in place to maintain the BMPs at the frequency stated in the LID Plan. The contact information for the entity responsible is below:

Name: \_\_\_\_\_  
Company: \_\_\_\_\_  
Title: \_\_\_\_\_  
Address 1: \_\_\_\_\_  
Address 2: \_\_\_\_\_  
Phone Number: \_\_\_\_\_  
Email: \_\_\_\_\_

BMP Name	BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
<b>Non-Structural Source Control BMPs</b>			
<b>Education for Property Owners, Tenants and Occupants</b>	For developments with no Property Owners Association (POA) <sup>1</sup> or with POAs of less than fifty (50) dwelling units, practical information materials will be provided to the first residents/occupants/tenants on general good housekeeping practices that contribute to protection of storm water quality initially these materials will be provided by the developer. Thereafter such materials will be available through the Permittees' education program. Different materials for residential, office commercial, retail commercial, vehicle-related commercial, and industrial uses will be involved.	Annually	Owner
<b>Activity Restriction</b>	If a POA is formed, conditions, covenants, and restrictions shall be prepared by the developer for the purpose of surface water quality protection. Alternatively, use restrictions may be developed by a building operator through lease terms, etc.	Annually	Owner
<b>Common Area Landscape Management</b>	Ongoing maintenance consistent with County Water Conservation Resolution or city equivalent, plus fertilizer and pesticide usage consistent with County Management Guidelines for Use of Fertilizers and Pesticides (DAMP Appendix F), or city equivalent.	Weekly	Owner



<b>BMP Name</b>	<b>BMP Implementation, Maintenance, and Inspection Procedures</b>	<b>Implementation, Maintenance, and Inspection Frequency and Schedule</b>	<b>Person or Entity with Operation &amp; Maintenance Responsibility</b>
<b>Common Area Litter Control</b>	For developments with POAs, the POA will be required to implement trash management and litter control procedures in the common areas aimed at reducing pollution of drainage water. The Associations may contract with their landscape maintenance firms to provide this service during regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles in common areas, and noting trash disposal violations by homeowners or businesses and reporting the violations to the Association for investigation.	Weekly	Owner
<b>Housekeeping of Loading Docks</b>	Loading docks for grocery, drug and discount stores and warehouse type commercial and industrial loading docks must be kept in a clean and orderly condition through a regular program of sweeping and litter control and immediate cleanup of spills and broken containers.	Weekly	Owner
<b>Common Area Catch Basin Inspection</b>	For developments with POAs and privately maintained drainage systems, require the Association to have privately owned catch basins inspected and, if necessary, cleaned prior to the storm season, no later than October 15th each year.	Annually	Owner
<b>Street Sweeping Private Streets and Parking Lots</b>	For developments with POAs and privately owned streets and parking lots, require the streets and parking lots be swept prior to the storm season, no later than October 15 each year.	Annually	Owner

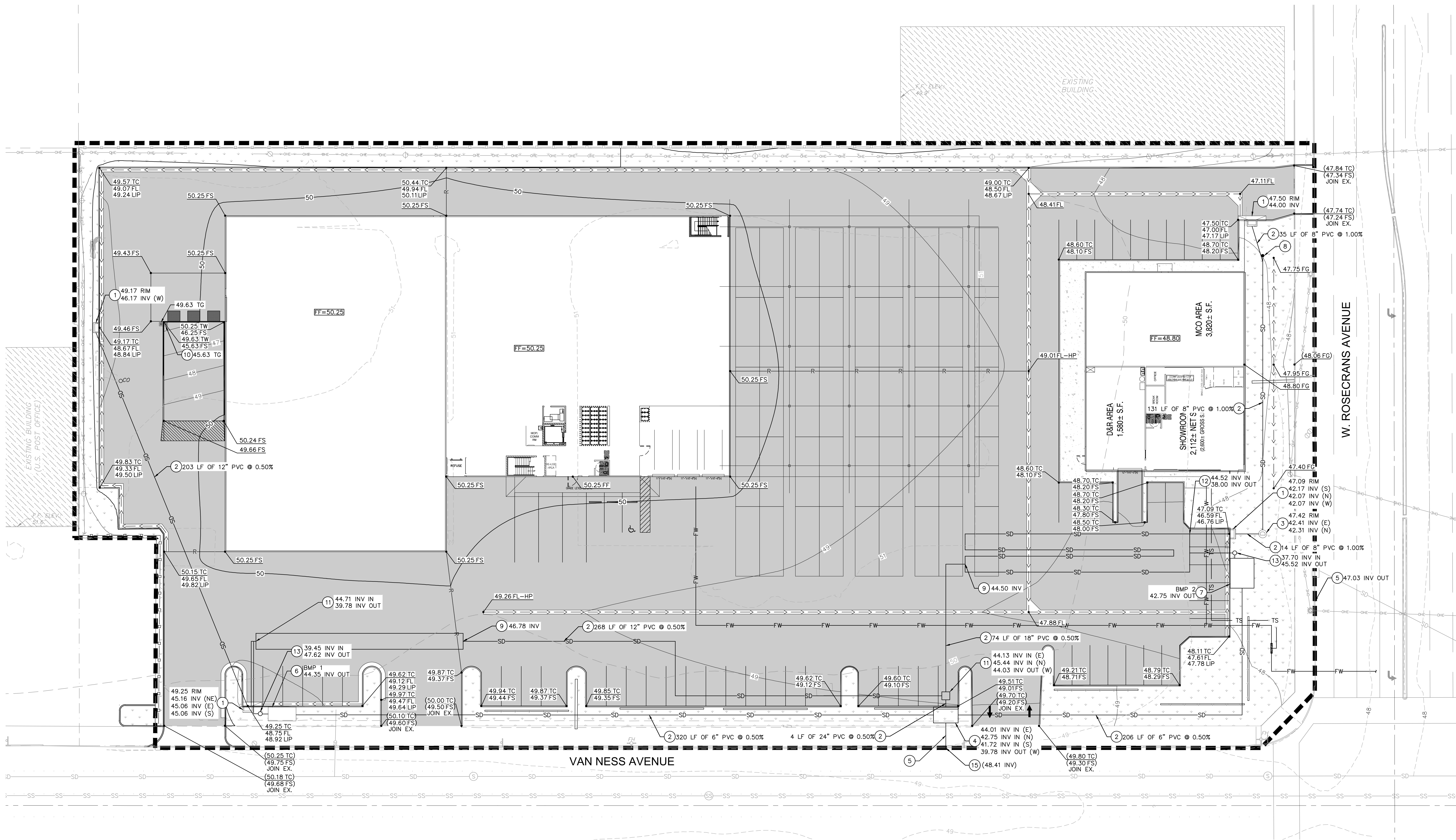
BMP Name	BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
<b>Structural Source Control BMPs</b>			
Provide Storm Drain System Stenciling and Signage	Phrase “No Dumping – Drains to Ocean” or equally effective phrase to be stenciled on catch basins to alert the public to the destination of pollutants discharged into stormwater.	Annually	Owner
Design and Construct Trash and Waste Storage Areas to Reduce Pollutant Introduction	Trash container (dumpster) areas to have drainage from adjoining roofs and pavements diverted around the area(s).	Per Design	Owner
Use Efficient Irrigation Systems & Landscape Design	Physical implementation of landscape plan consistent with County Water Conservation Resolution or city equivalent, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.	Annually	Owner
Loading Docks	In designs for maintenance bays and loading docks, containment is encouraged. Preventative measures include overflow containment structures and dead-end sumps. However, in the case of loading docks from grocery stores and warehouse/distribution centers, engineered infiltration systems may be considered.	Per Design	Owner
<b>Treatment Control BMPs</b>			
Bioclean Stormwater Biofiltration System	Units must undergo maintenance per manufacturer’s recommendations. Refer to the manufacturer’s specifications and Appendix 5, maintenance materials for additional maintenance.	Annually	Owner

<b>BMP Name</b>	<b>BMP Implementation, Maintenance, and Inspection Procedures</b>	<b>Implementation, Maintenance, and Inspection Frequency and Schedule</b>	<b>Person or Entity with Operation &amp; Maintenance Responsibility</b>
<b>Bioclean Underground Detention System</b>	Units must undergo maintenance per manufacturer's recommendations. Refer to the manufacturer's specifications and Appendix 5, maintenance materials for additional maintenance.	Annually	Owner

# **Attachment F**

## **Plans**

Plotted By: Kim, Thomas Sheet Set: KHA Layout: GRADING PLAN March 09, 2022 07:29:42pm K:\ORA\_LDEV\U-Haul\XXXXXXX - Gardena\CADD\Exhibits\Prelim Grading Conceptual Grading Plan.dwg  
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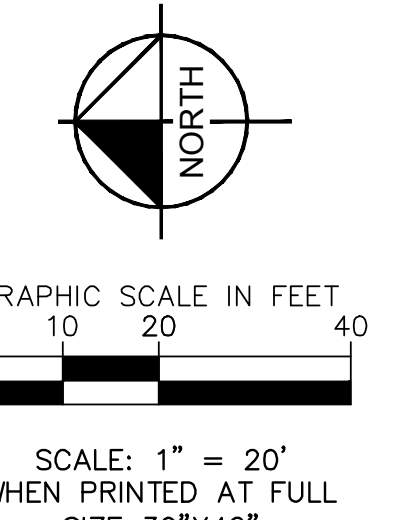


**LEGEND**

- |  |                         |  |                         |
|--|-------------------------|--|-------------------------|
|  | PROPERTY LINE           |  | HIGH POINT              |
|  | STREET CENTERLINE       |  | TOP OF CURB             |
|  | CIVIL LIMITS OF WORK    |  | FINISHED SURFACE        |
|  | PROPOSED CONTOURS       |  | FLOWLINE                |
|  | EXISTING CONTOURS       |  | EXISTING GRADE          |
|  | PROPOSED RIDGE          |  | PROPOSED GRADE          |
|  | FLOWLINE                |  | PROPOSED SLOPE          |
|  | PROPOSED STORM DRAIN    |  | PROPOSED LANDSCAPE AREA |
|  | EXISTING STORM DRAIN    |  | PROPOSED ASPHALT        |
|  | EXISTING SANITARY SEWER |  |                         |

**DRAINAGE NOTES**

- 1 INSTALL CURB OPENING CATCH BASIN.
- 2 INSTALL HDPE STORM DRAIN LINE. SIZE PER PLAN.
- 3 INSTALL 48" STORM DRAIN MANHOLE.
- 4 PROPOSED SUMP PUMP STATION.
- 5 INSTALL PARKWAY OVERFLOW DRAIN.
- 6 PROPOSED BIOCLEAN WETLAND MOD (WETLANDMOD-6-13-5'-0"-V).
- 7 PROPOSED BIOCLEAN WETLAND MOD (WETLANDMOD-11-14-5'-0"-V).
- 8 PROPOSED STORM DRAIN CLEANOUT.
- 9 PROPOSED OVERFLOW OUTLET.
- 10 PROPOSED SUMP PUMP TO OUTLET TRUCK DOCK RUNOFF INTO BUBBLE UP BOX AND SPILL ONTO GRADE.
- 11 PROPOSED CMP STORMWATER DETENTION TANK (96" DIA. X 104' LONG).
- 12 PROPOSED CMP STORMWATER DETENTION TANK (96" DIA. X 113' LONG, 2 TYP.).
- 13 PROPOSED WETLAND MOD FEED PUMP STATION.
- 14 PROPOSED CISTERN OVERFLOW WEIR STRUCTURE.
- 15 PROPOSED PARKWAY OUTFALL INTO EXISTING PUBLIC CURB AND GUTTER.



NO.	REVISIONS	DATE	BY

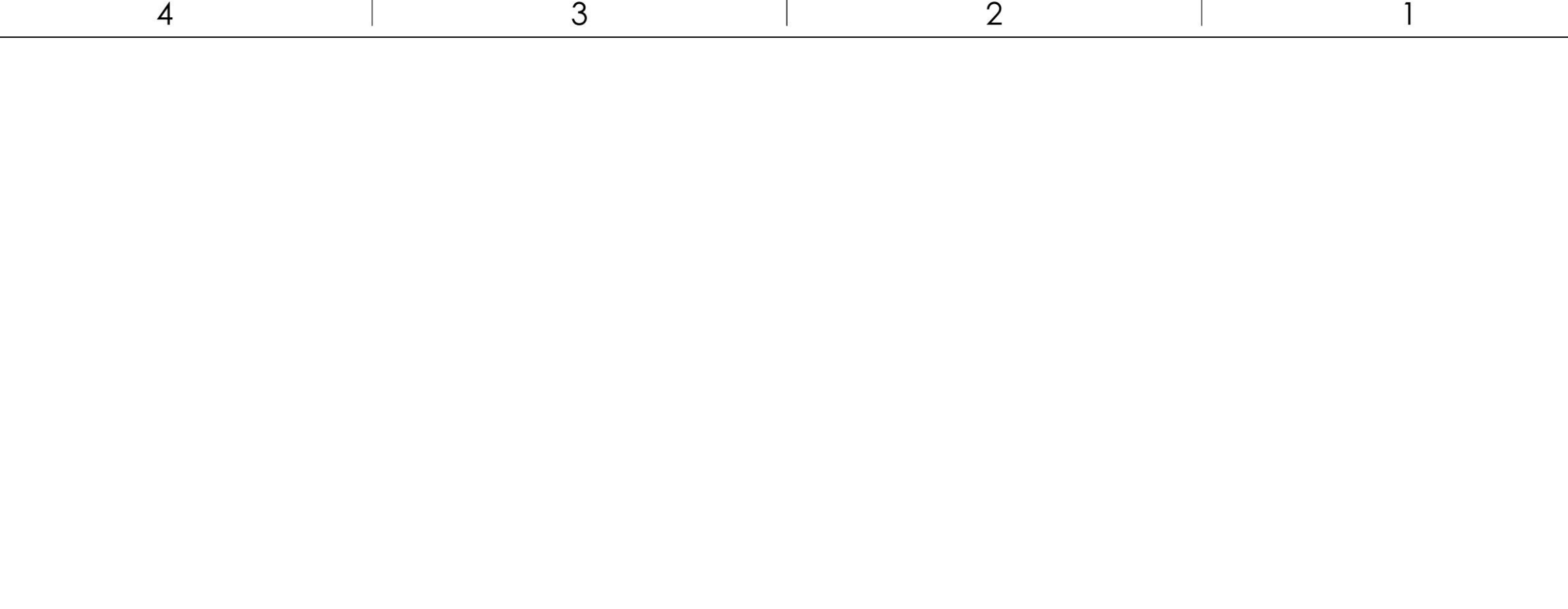
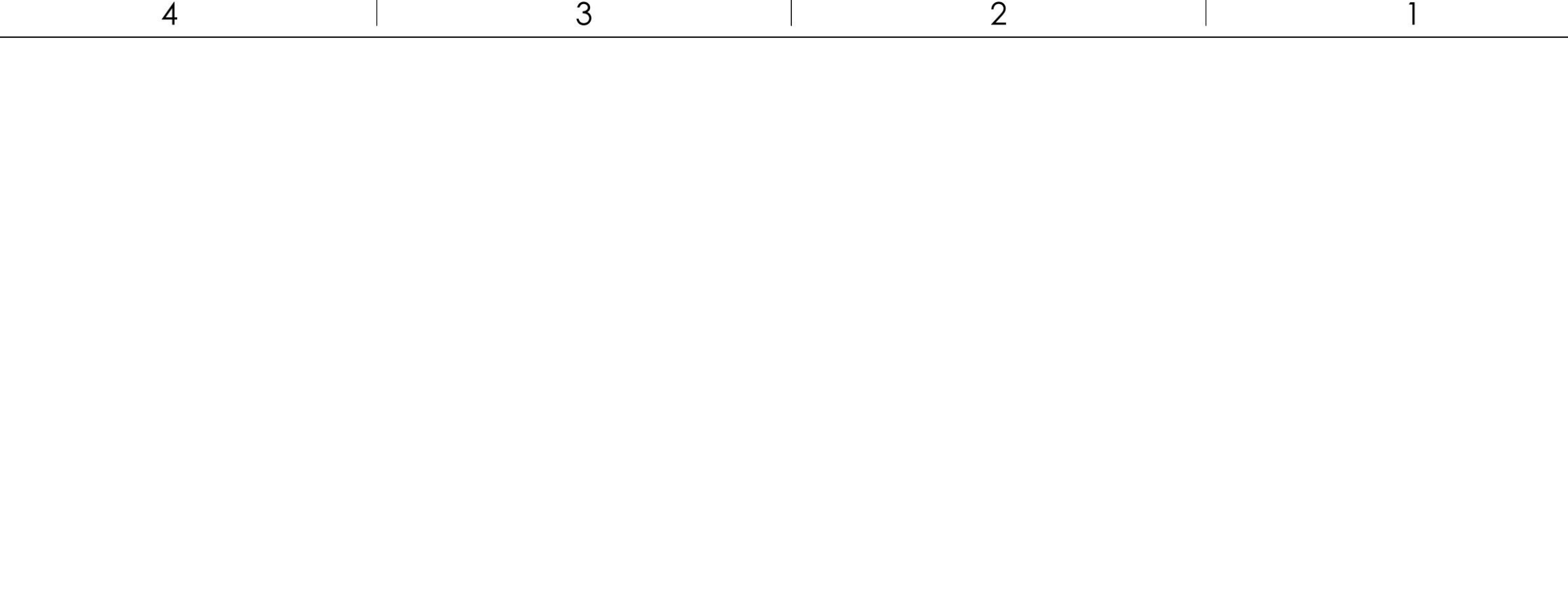
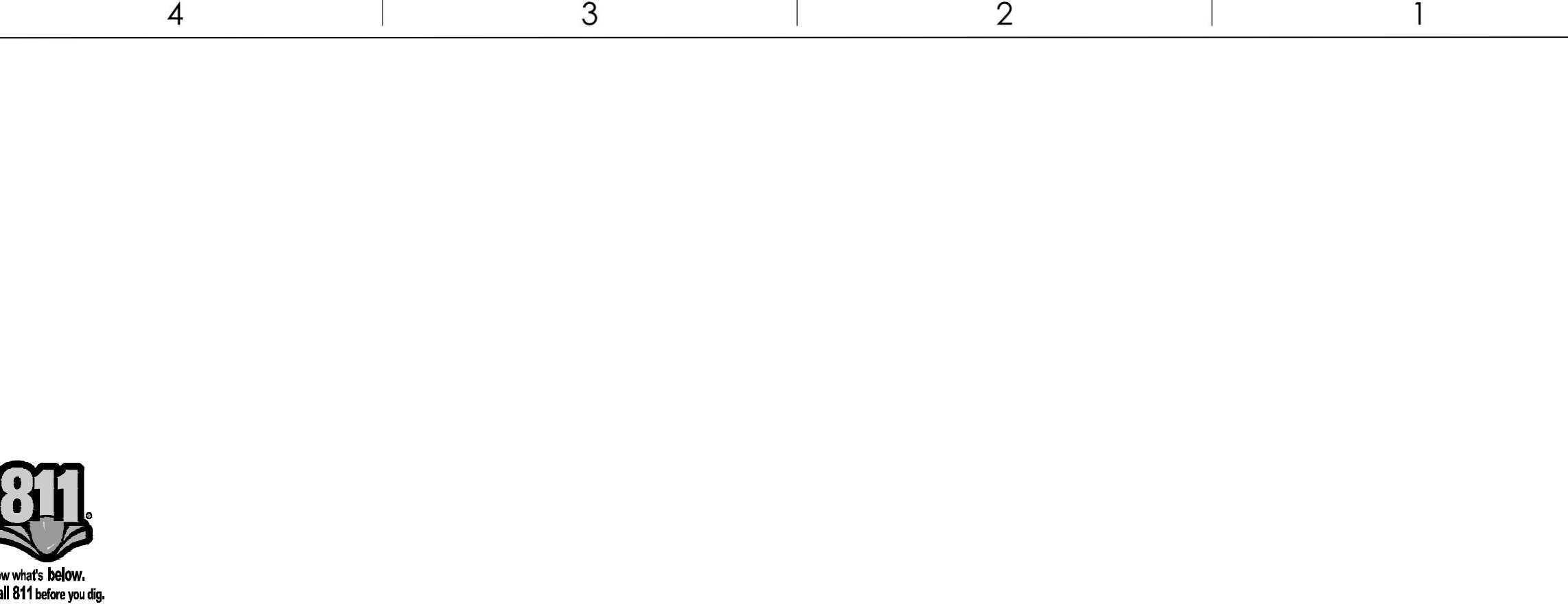
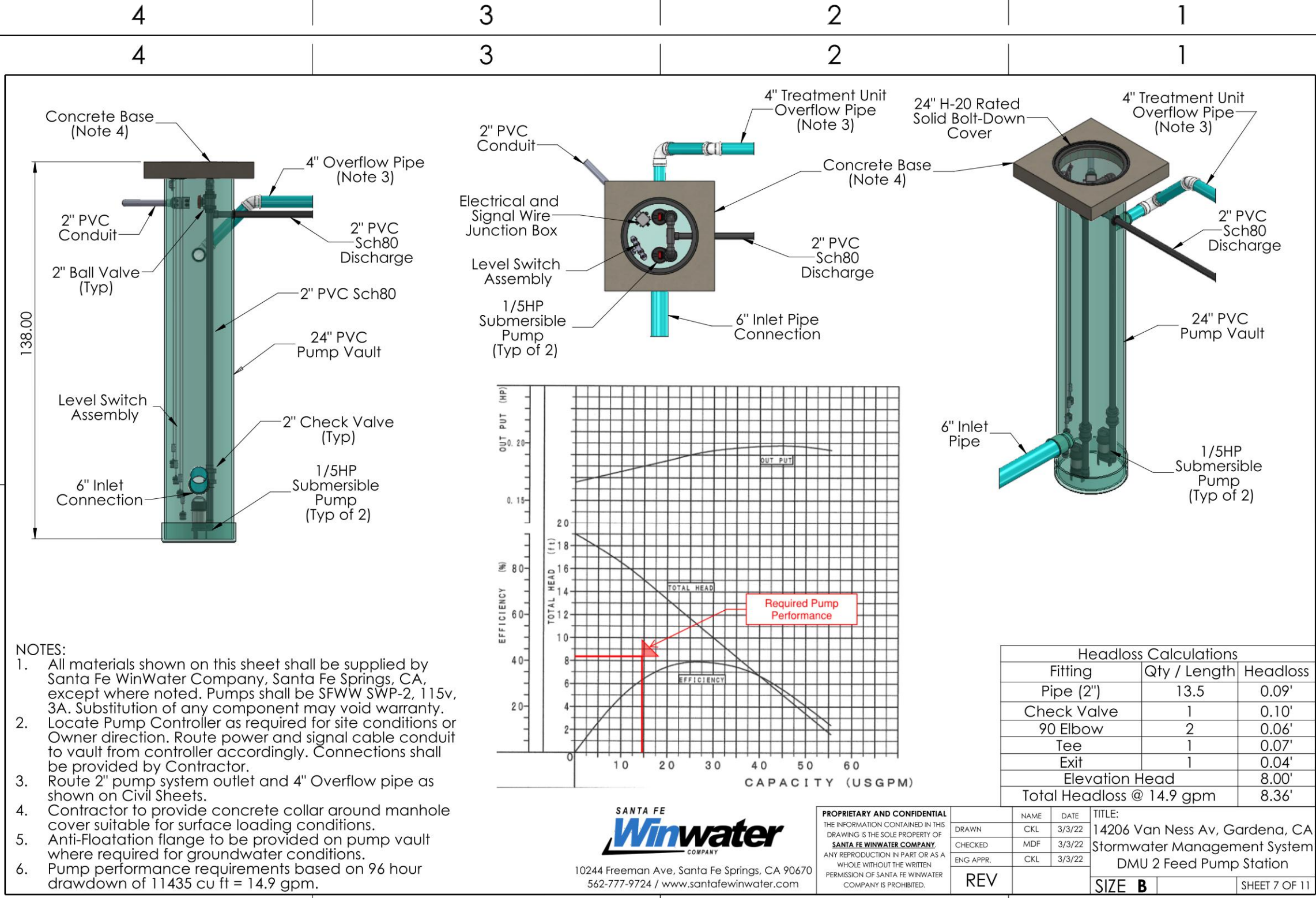
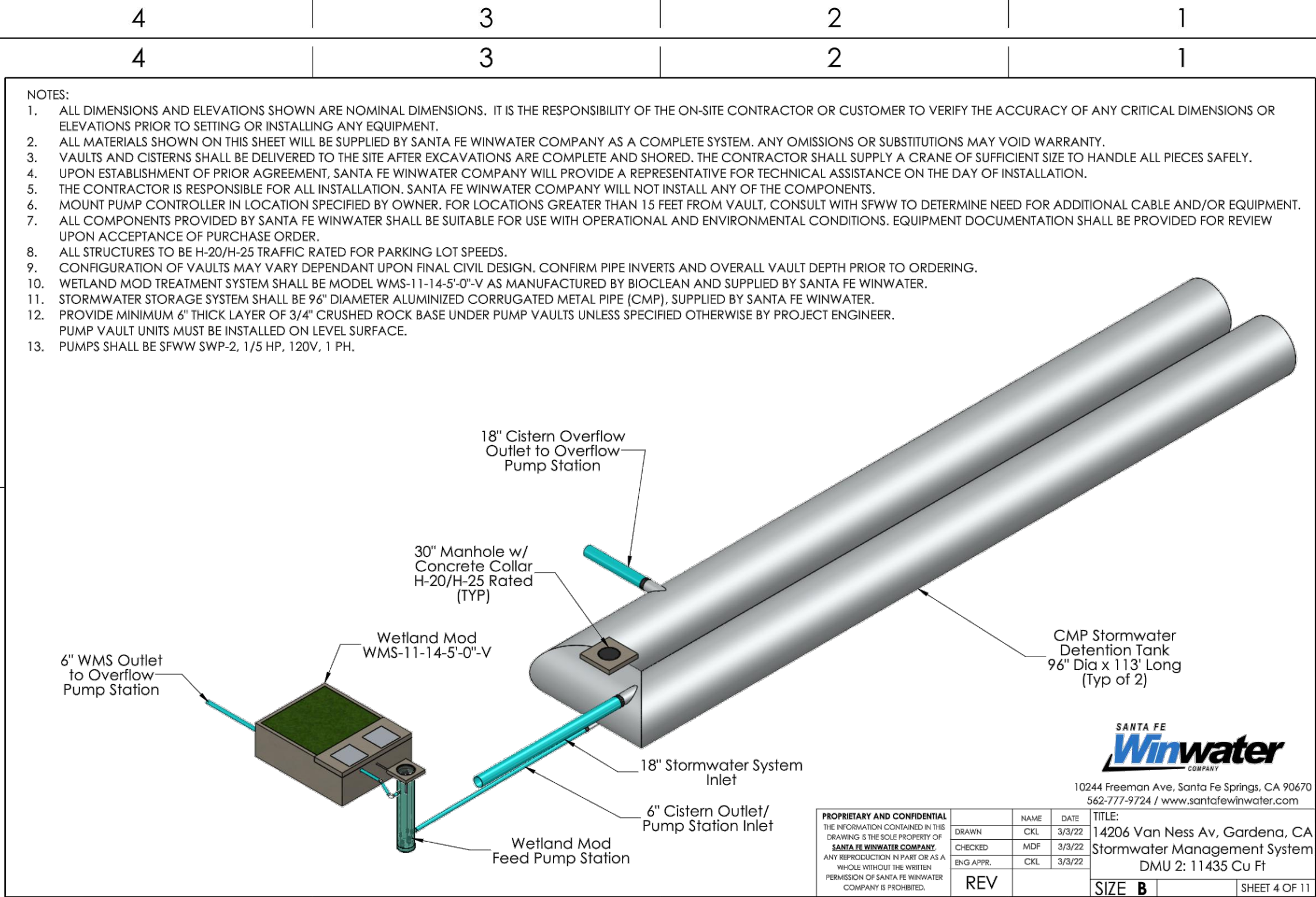
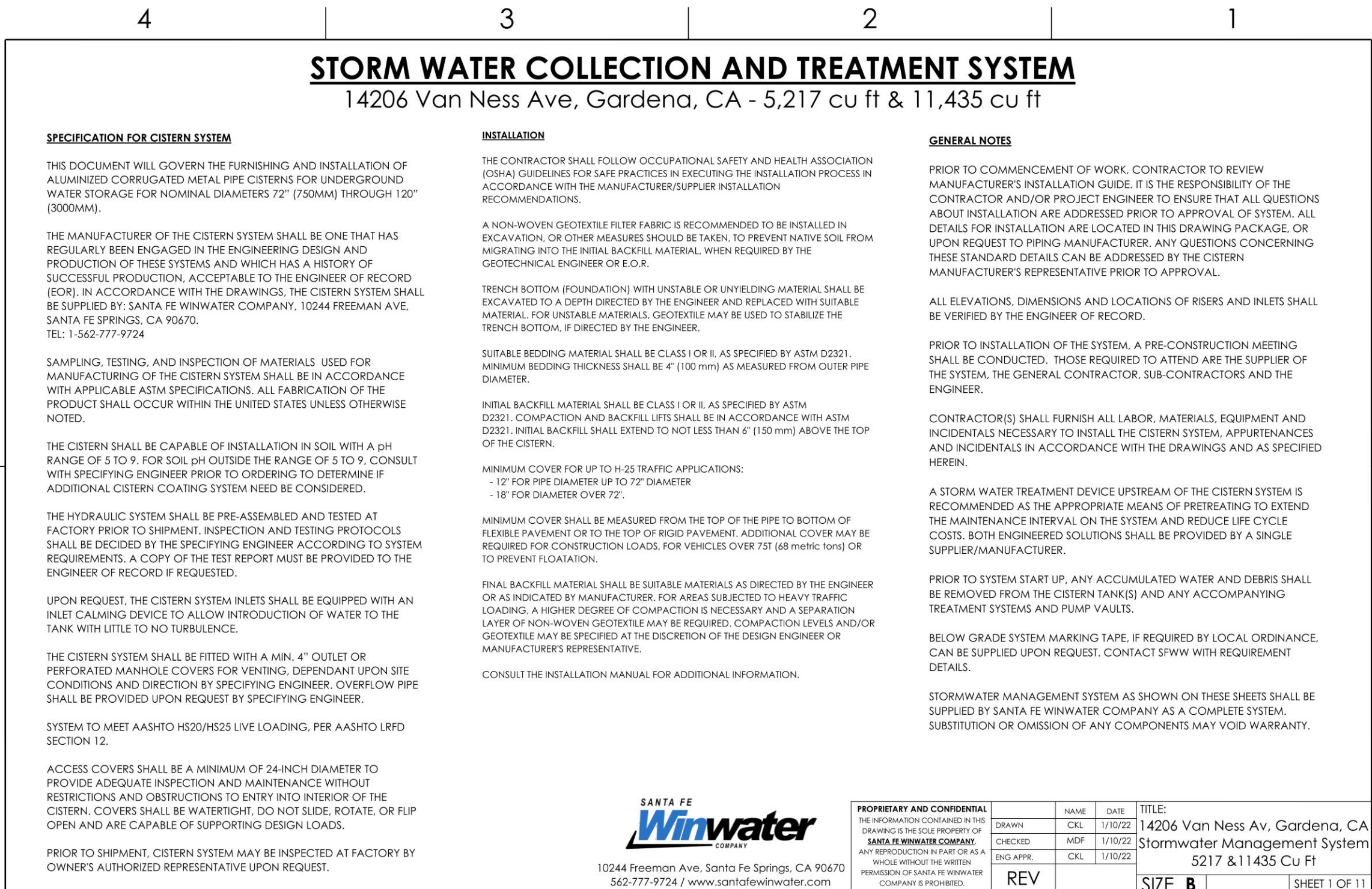
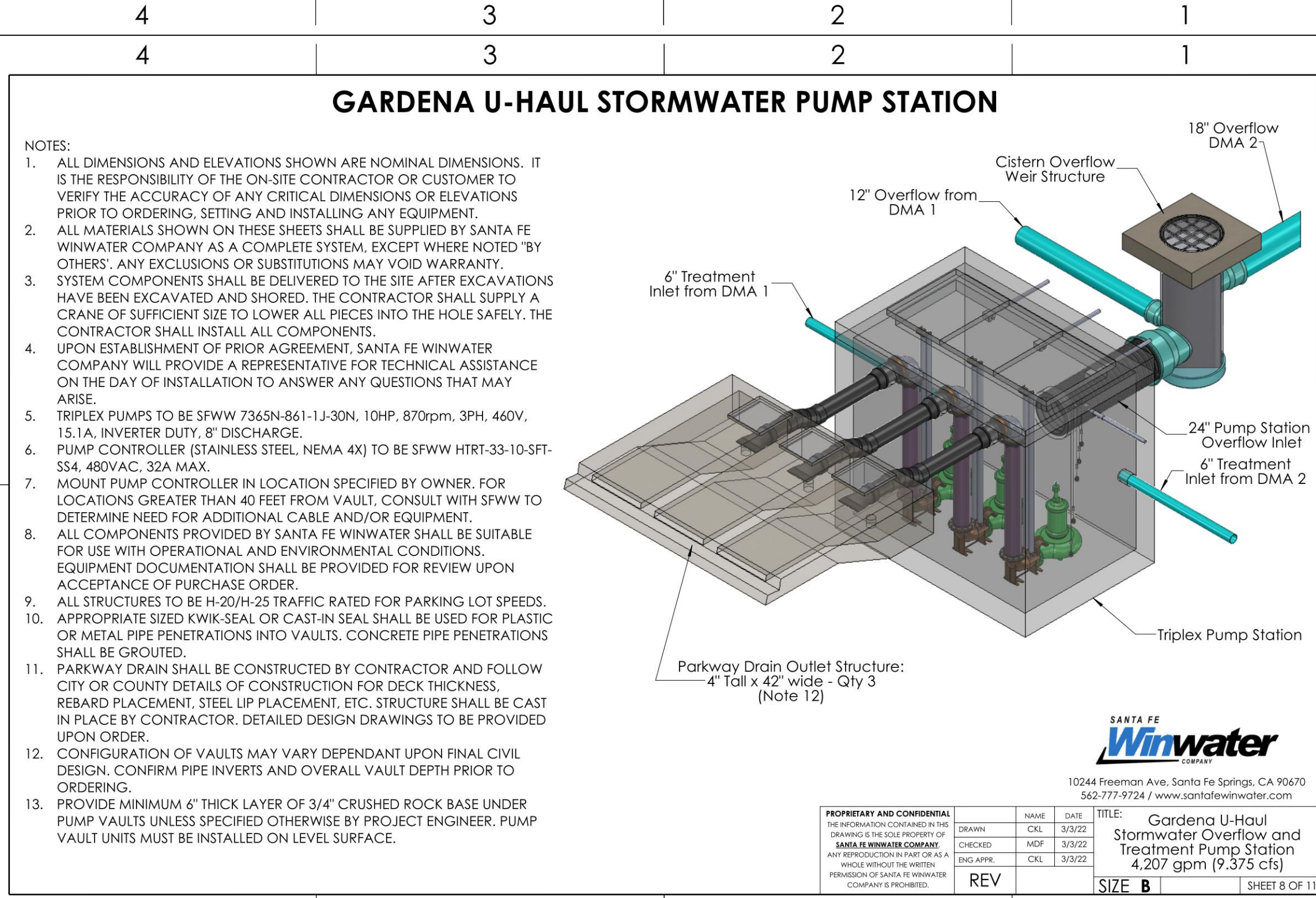
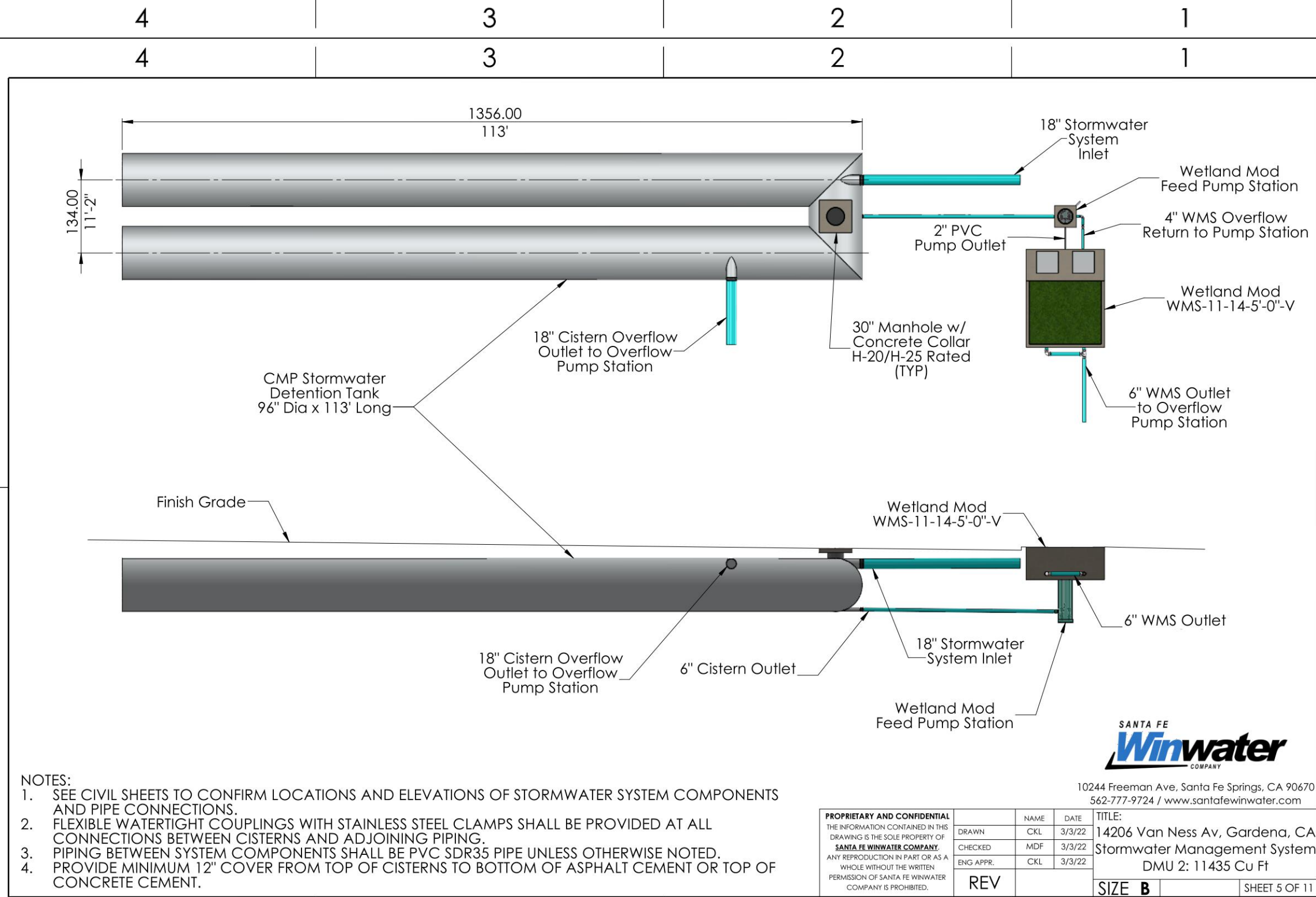
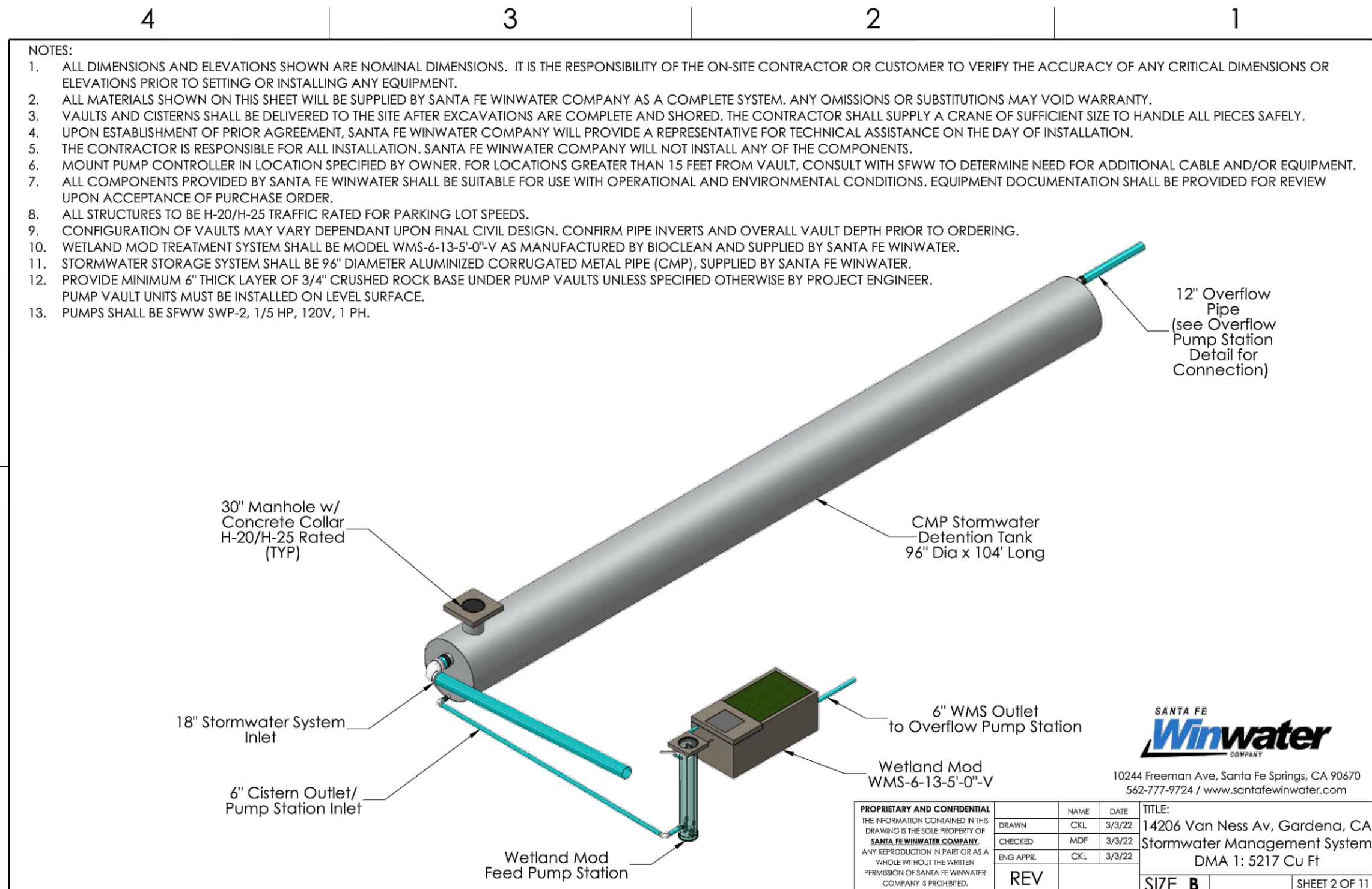
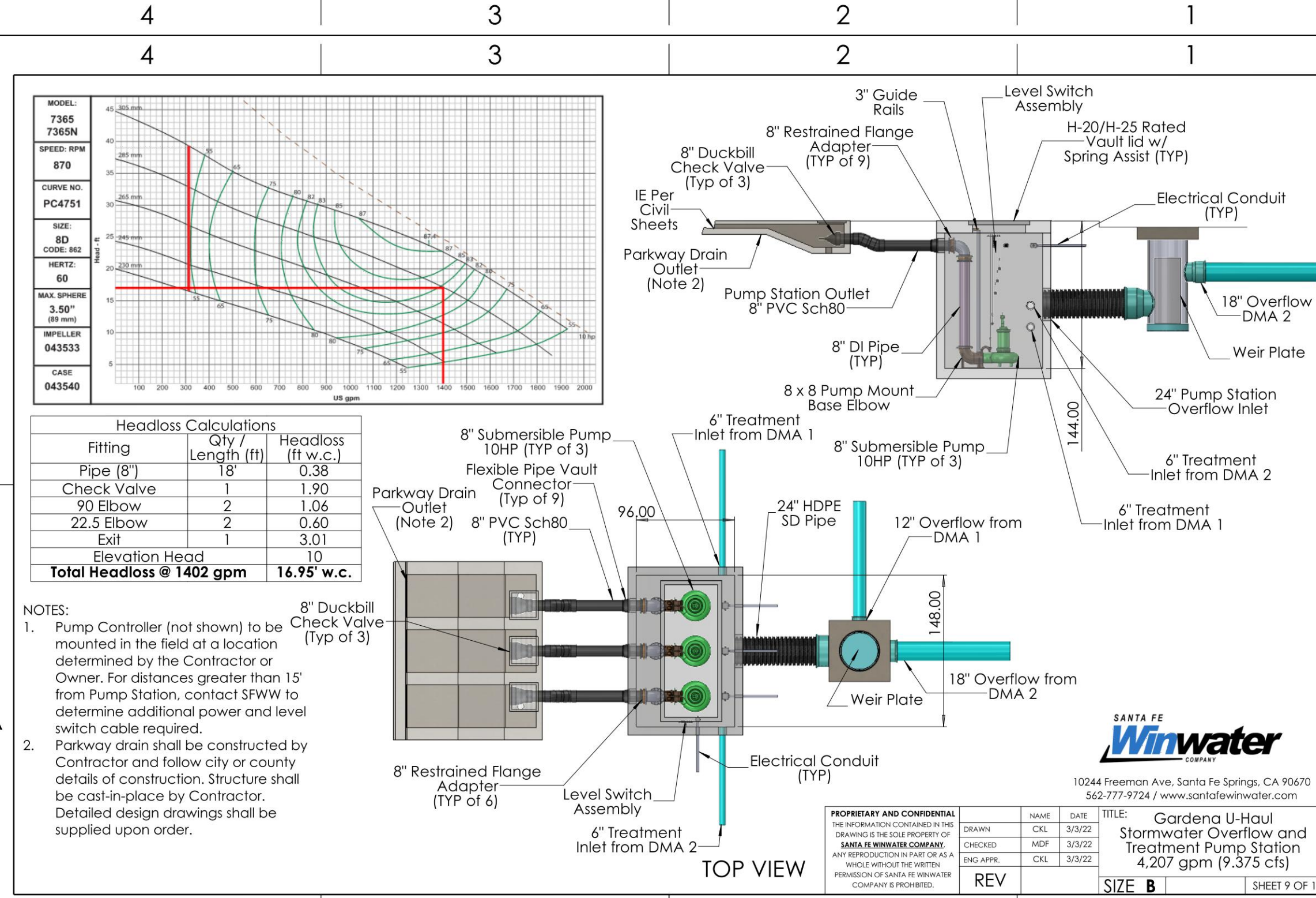
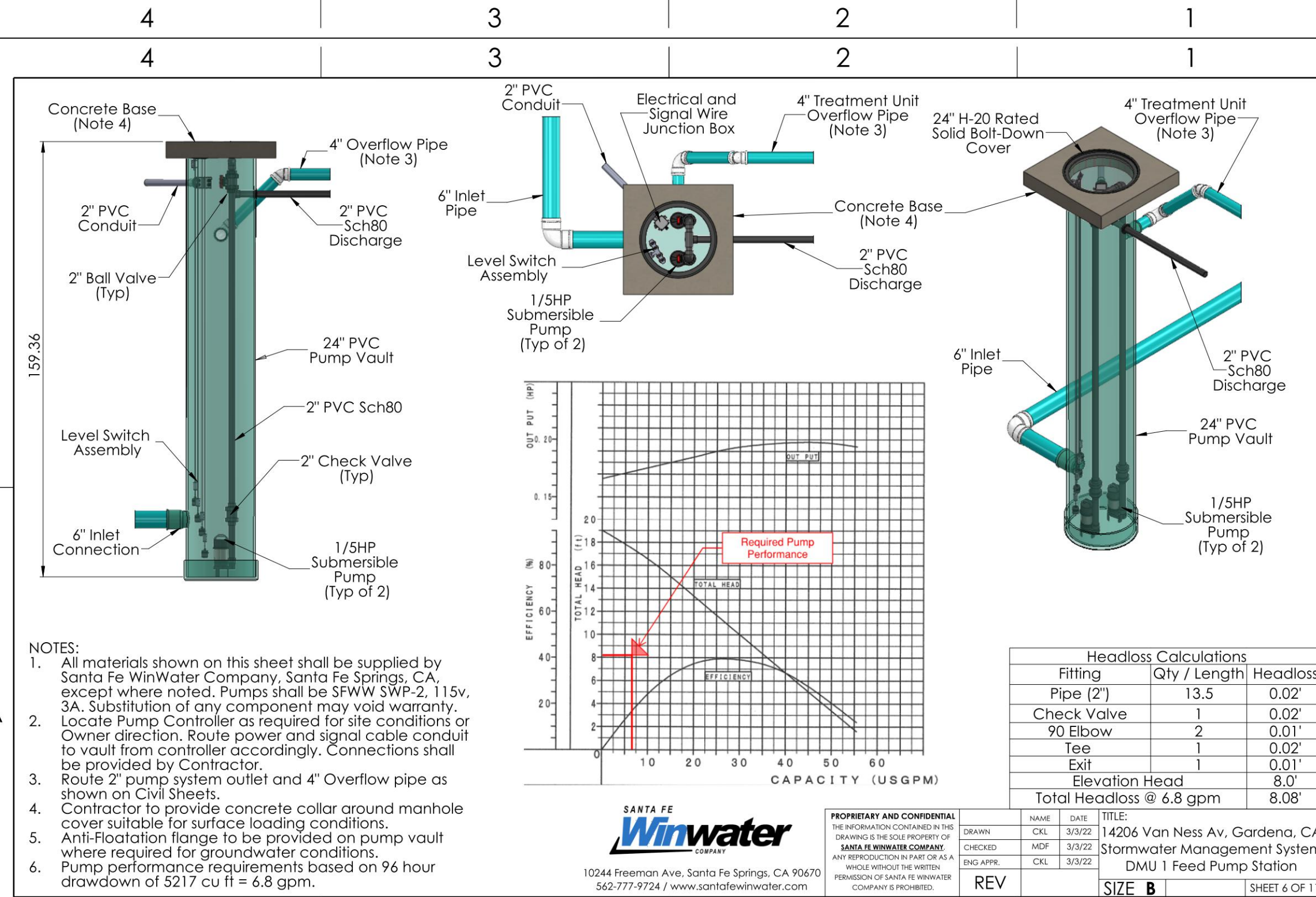
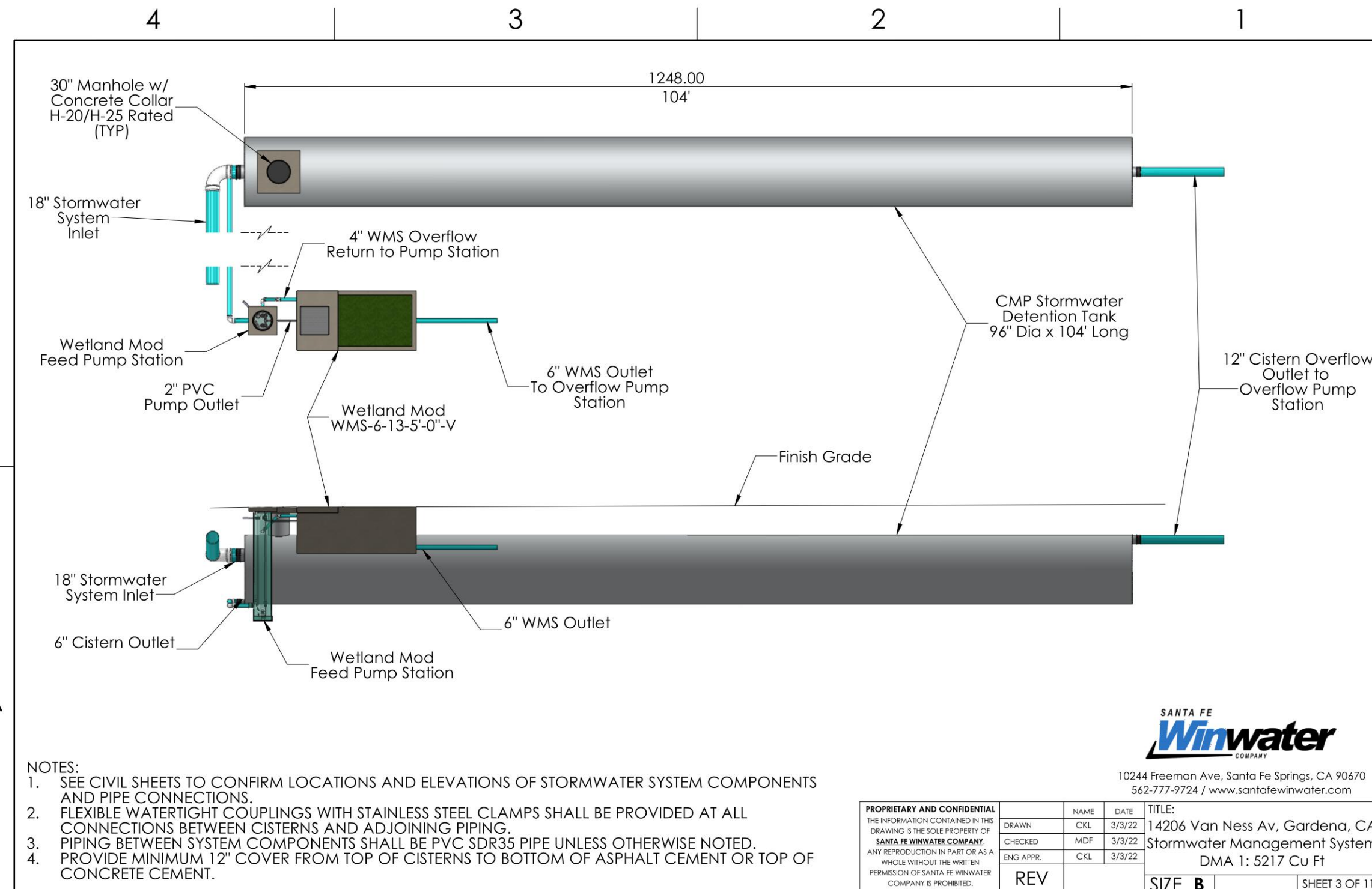
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 WWW.KIMLEY-HORN.COM



**PRELIMINARY GRADING PLAN**

**14206 VAN NESS AVENUE**  
 PREPARED FOR  
**U-HAUL**

CITY OF GARDENA CA  
 SHEET NUMBER  
**C1.0**



**14206 VAN NESS AVENUE**  
PREPARED FOR  
**U-HAUL**

CITY OF GARDENA

SHEET NUMBER  
**C2.0**

Plotted By: Kim, Thomas  
Sheet Set: KHA\_Layout\_Details  
Date: 07/29/2022  
Time: 07:29:42pm  
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Plotted By: Kim, Thomas Sheet: KHA\_Layout: DETAILS (2) March 09, 2022 07:29:45pm K:\ORA\_LDEV\U-Haul\XXXXXXX - Gardena\CADD\Exhibits\Prelim Grading\Conceptual Grading Plan.dwg  
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SITE SPECIFIC DATA	
PROJECT ID	14541.00
PROJECT NAME	U-HAUL GARDENA
PROJECT LOCATION	GARDENA, CA
STRUCTURE ID	DMA 2
TREATMENT REQUIRED	---
VOLUME BASED (CF)	11500
FLOW BASED (CFS)	---
TREATMENT HGL AVAILABLE (FT)	---
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE	OUTLINE
PIPE DIA	12" MATERIAL DIAMETER
INLET PIPE	-3.00 N/A 2"
RETURN PIPE	-1.38 N/A 6"
OUTLET PIPE	-5.00 PVC-SORBS 6"
PRETREATMENT	BIOFILTRATION N/A
RIM ELEVATION	0.00 0.00 N/A
SURFACE LOAD	PEDESTRIAN OPEN PLANTER N/A
FRAME & COVER (C) 36"X36"	N/A
1A COUNTY MEDIA BED VOLUME (CY)	12.87
GRAVEL LAYER WITHIN MEDIA CHAMBER (CY)	2.64
ORIFICE DIAMETER (IN)	#0.59"

NOTES: PRELIMINARY, NOT FOR CONSTRUCTION.

**INSTALLATION NOTES**

- CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCENTIVES REQUIRED TO INSTALL AND INITIAL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
- UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 4" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
- ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. PIPES CANNOT INTERSECT BEFORE FLOW. INLET OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED TIGHT WITH A NON-SHINK GROUT PER MANUFACTURER'S STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
- CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE. GROUT OR SLOTTED BRICKWORK REQUIRED ON ALL UNITS WITH VEGETATION.
- CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
- GROUT OR SLOTTED BRICKWORK REQUIRED ON ALL UNITS WITH VEGETATION.

**GENERAL NOTES**

- MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
- ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND QUANTITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND MANUFACTURER, PLEASE CONSULT MANUFACTURER.

**INTERNAL CAGE DETAILS**

REQUIRED HORIZ. MEDIA THICKNESS (INCHES) 24  
 TREATMENT VOLUME (CY) 11500  
 TARGETED REMEDIATION DURATION (MO) 36  
 WETLAND/MEDIA INFILTRATION RATE (IN/HR) 0.12  
 WETLAND/MEDIA LOADING RATE (GPM/CF) 0.12  
 DISCHARGE RATE (CFS) 0.033  
 REQUIRED TOTAL MEDIA SURFACE AREA (SF) 124.45  
 PROVIDED TOTAL MEDIA SURFACE AREA (SF) 65.00  
 NUMBER OF ROWS 2

**INTERNAL CAGE DETAILS**

6" DISCHARGE PIPE WITH ORIFICE  
 10" INTERNAL CAGE AND NETTING BY BIO CLEAN

**Winwater**  
 SANTA FE  
 PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF WINWATER. NO PART OF THIS DRAWING IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.

**Bio Clean**  
 A Forterra Company  
**WetlandMOD-11-14-5'-0" V**  
 STORMWATER BIOFILTRATION SYSTEM  
 STANDARD DETAIL (SHEET 13 OF 13)

SITE SPECIFIC DATA	
PROJECT ID	14541.00
PROJECT NAME	U-HAUL GARDENA
PROJECT LOCATION	GARDENA, CA
STRUCTURE ID	DMA 1
TREATMENT REQUIRED	---
VOLUME BASED (CF)	5217
FLOW BASED (CFS)	---
TREATMENT HGL AVAILABLE (FT)	---
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE	OUTLINE
PIPE DIA	12" MATERIAL DIAMETER
INLET PIPE	-3.00 PVC 4"
RETURN PIPE	-1.21 PVC 4"
OUTLET PIPE	-5.00 PVC-SORBS 6"
PRETREATMENT	BIOFILTRATION N/A
RIM ELEVATION	0.00 0.00 N/A
SURFACE LOAD	PEDESTRIAN OPEN PLANTER N/A
FRAME & COVER (C) 36" X 36"	N/A
1A COUNTY MEDIA BED VOLUME (CY)	5.63
GRAVEL LAYER WITHIN MEDIA CHAMBER (CY)	1.10
ORIFICE DIAMETER (IN)	#0.56"

NOTES: PRELIMINARY, NOT FOR CONSTRUCTION.

**INSTALLATION NOTES**

- CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCENTIVES REQUIRED TO INSTALL AND INITIAL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
- UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 4" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
- ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. PIPES CANNOT INTERSECT BEFORE FLOW. INLET OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED TIGHT WITH A NON-SHINK GROUT PER MANUFACTURER'S STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
- CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
- GROUT OR SLOTTED BRICKWORK REQUIRED ON ALL UNITS WITH VEGETATION.

**GENERAL NOTES**

- MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
- ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND QUANTITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND MANUFACTURER, PLEASE CONSULT MANUFACTURER.

**INTERNAL CAGE DETAILS**

REQUIRED HORIZ. MEDIA THICKNESS (INCHES) 24  
 TREATMENT VOLUME (CY) 5217  
 TARGETED REMEDIATION DURATION (MO) 36  
 WETLAND/MEDIA INFILTRATION RATE (IN/HR) 0.12  
 WETLAND/MEDIA LOADING RATE (GPM/CF) 0.12  
 DISCHARGE RATE (CFS) 0.015  
 REQUIRED TOTAL MEDIA SURFACE AREA (SF) 56.46  
 PROVIDED TOTAL MEDIA SURFACE AREA (SF) 67.00  
 NUMBER OF ROWS 1

**INTERNAL CAGE DETAILS**

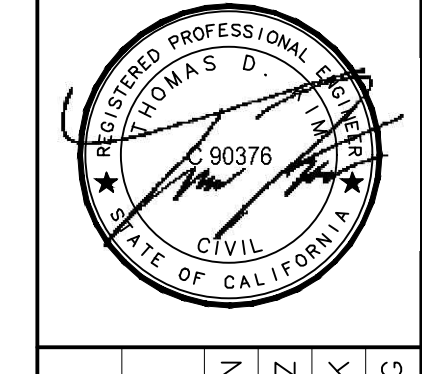
6" DISCHARGE PIPE WITH ORIFICE  
 10" INTERNAL CAGE AND NETTING BY BIO CLEAN

**Winwater**  
 SANTA FE  
 PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF WINWATER. NO PART OF THIS DRAWING IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.

**Bio Clean**  
 A Forterra Company  
**WetlandMOD-6-13-5'-0" V**  
 STORMWATER BIOFILTRATION SYSTEM  
 STANDARD DETAIL (SHEET 13 OF 13)

NO.	REVISIONS	DATE	BY

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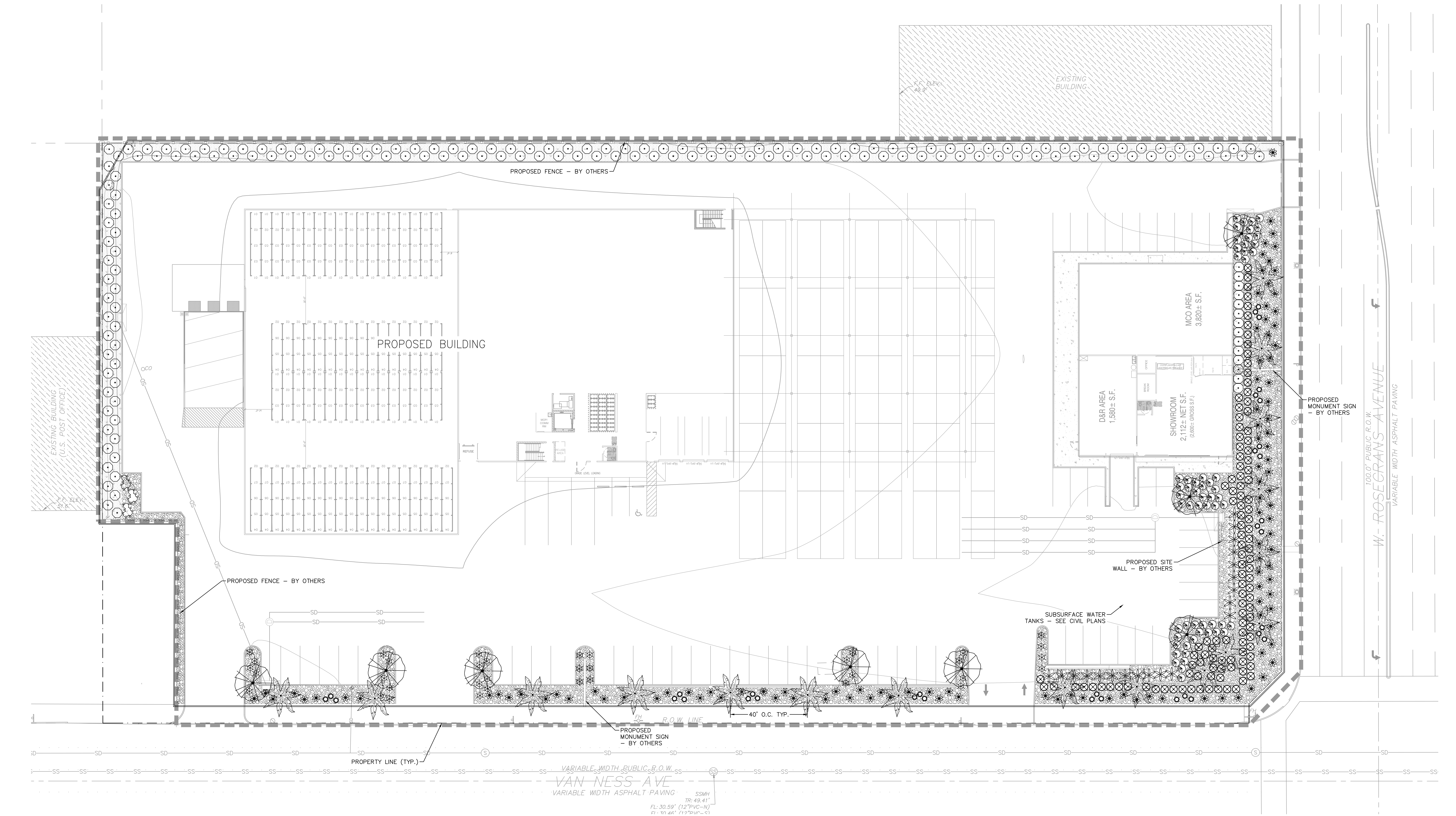


KHA PROJECT 194333003  
 DATE 8/20/2021  
 SCALE AS SHOWN  
 DESIGNED BY AZ  
 DRAWN BY TK  
 CHECKED BY JG

# GRADING DETAILS 2

14206 VAN NESS AVENUE  
 PREPARED FOR U-HAUL  
 CITY OF GARDENA, CA  
 SHEET NUMBER C3.0

Plotted By: Kim, Thomas Sheet Set: KHA\_Layout\_Sheet August 25, 2021 06:07:56pm K:\ORA\_LDEV\U-Haul\XXXXXXX - Gardena\CADD\Exhibits\Conceptual Landscape Plan.dwg  
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**PLANT SCHEDULE**

TREES	QTY	BOTANICAL / COMMON NAME	CONT	WUCOLS	GROUND COVERS	QTY	BOTANICAL / COMMON NAME
	8	FICUS MICROCARPA NITIDA / INDIAN LAUREL FIG	24" BOX	MODERATE		9,731 SF	CRUSHED ROCK / 4" DEPTH MIN. COLOR TO BE BAJA CRESTA RUBBLE FROM SOUTHWEST BOULDER AND STONE. SIZE: 1" - 3"
	17	SYAGRUS ROMANZOFFIANA / QUEEN PALM	14" B.T.H. MIN.	MODERATE		4,550 SF	WOOD BARK MULCH / TRIPLE-SHREDDED HARDWOOD MULCH 3" DEPTH MIN.
	110	AGAVE ATTENUATA / FOXTAIL AGAVE	5 GAL.	LOW			
	33	ECHINOCACTUS GRUSONII / GOLDEN BARREL CACTUS	5 GAL.	VERY LOW			
	36	HESPERALOE PARVIFLORA / RED YUCCA	5 GAL.	VERY LOW			
	115	MUHLBERGIA CAPILLARIS / PINK MUHLY GRASS	5 GAL.	LOW			
	59	MUHLBERGIA DUBIA / PINE MUHLY	5 GAL.	LOW			
	174	OLEA EUROPAEA 'LITTLE OLLIE' TM / LITTLE OLLIE OLIVE	5 GAL.	LOW			
	20	PHORMIUM TENAX 'RADIANCE' / NEW ZEALAND FLAX	5 GAL.	LOW			
	3	PORTULACARIA AFRA / ELEPHANT BUSH	5 GAL.	VERY LOW			

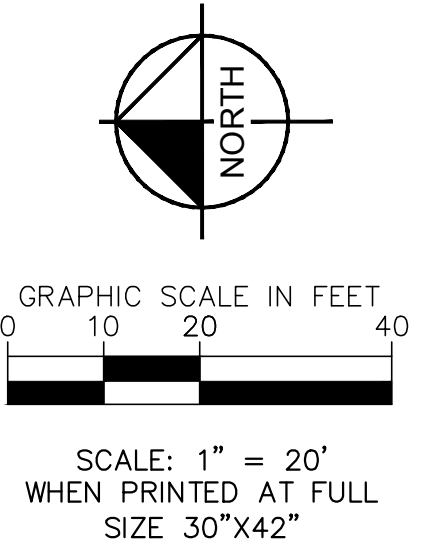
**LANDSCAPE NOTE:**  
 THE SELECTION OF PLANT MATERIAL IS BASED ON CULTURAL, AESTHETIC, AND MAINTENANCE CONSIDERATIONS. ALL PLANTING AREAS SHALL BE PREPARED WITH APPROPRIATE SOIL AMENDMENTS, FERTILIZERS AND APPROPRIATE SUPPLEMENTS BASED UPON A SOILS REPORT FROM AN AGRICULTURAL SUITABILITY SOIL SAMPLE TAKEN FROM THE SITE. DECOMPOSED GRANITE SHALL FILL IN BETWEEN SHRUBS TO SHIELD THE SOIL FROM THE SUN, EVAPOTRANSPIRATION, AND RUN-OFF. ALL SHRUB BEDS SHALL BE MULCHED TO A 3" DEPTH TO HELP CONSERVE WATER, LOWER SOIL TEMPERATURE, AND REDUCE WEED GROWTH. THE SHRUBS SHALL BE ALLOWED TO GROW IN THEIR NATURAL FORMS. ALL LANDSCAPE IMPROVEMENTS SHALL FOLLOW THE GUIDELINES SET FORTH BY THE CITY OF GARDENA MUNICIPAL CODE.

**IRRIGATION NOTE:**  
 AN AUTOMATIC IRRIGATION SYSTEM SHALL BE INSTALLED TO PROVIDE 100% COVERAGE FOR ALL PLANTING AREAS SHOWN ON THE PLAN. THE WATER SUPPLY FOR THIS SITE IS A POTABLE WATER CONNECTION AND A DEDICATED IRRIGATION METER WILL BE PROVIDED. LOW VOLUME EQUIPMENT SHALL PROVIDE SUFFICIENT WATER FOR PLANT GROWTH WITH NO WATER LOSS DUE TO WATER CONTROLLERS, AND OTHER NECESSARY IRRIGATION EQUIPMENT. ALL POINT SOURCE SYSTEM SHALL BE ADEQUATELY FILTERED AND REGULATED PER THE MANUFACTURER'S RECOMMENDED DESIGN PARAMETERS. ALL IRRIGATION IMPROVEMENTS SHALL FOLLOW THE GUIDELINES SET FORTH BY THE CITY OF GARDENA MUNICIPAL CODE.

I HAVE COMPLIED WITH THE CRITERIA OF THE ORDINANCE AB-1881 AND APPLIED THEM FOR THE EFFICIENT USE OF WATER IN THE LANDSCAPE DESIGN PLAN.

*Christopher L. Frey*  
 CHRISTOPHER L. FREY, LLA 6623

LANDSCAPE REQUIREMENTS	
REQUIRED	PROVIDED
1 TREE PER EVERY 10 PARKING SPACES 60 PARKING SPACES / 10 = 6 TREES	8



**PRELIMINARY LANDSCAPE PLAN**

**14206 VAN NESS AVENUE**  
 PREPARED FOR  
**U-HAUL**

CITY OF GARDENA CA

**Kimley-Horn**

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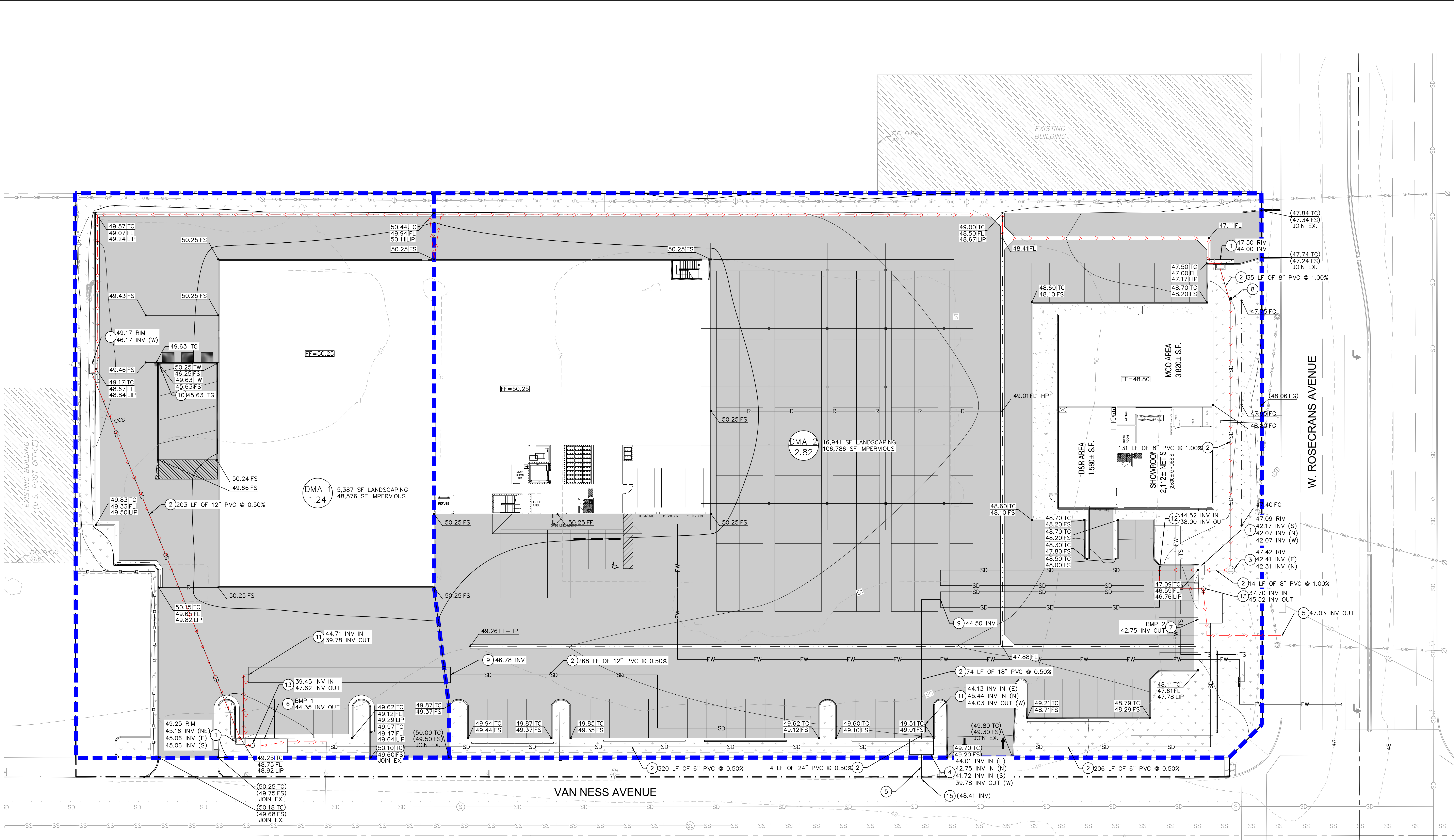
NO.	REVISIONS	DATE	BY

KHA PROJECT 194333003  
 DATE 8/20/2021  
 SCALE AS SHOWN  
 DESIGNED BY AZ  
 DRAWN BY TK  
 CHECKED BY JG

SHEET NUMBER  
**L1.0**

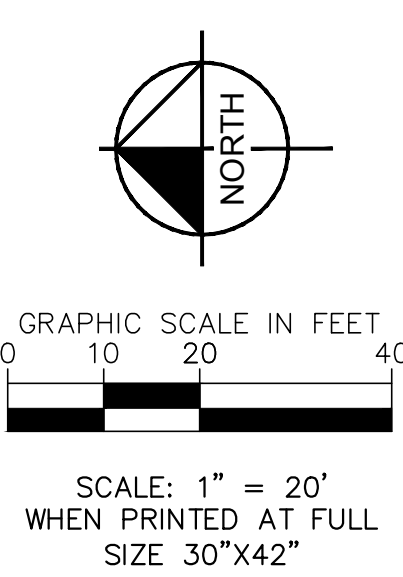


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LEGEND	
	PROPERTY LINE
	STREET CENTERLINE
	DMA LIMIT
	PROPOSED CONTOURS
	EXISTING CONTOURS
	PROPOSED RIDGE
	FLOW PATH
	PROPOSED STORM DRAIN
	EXISTING STORM DRAIN
	EXISTING SANITARY SEWER
	FLOW LINE
	DMA NAME
	DMA AREA (IN ACRES)
	HP HIGH POINT
	TC TOP OF CURB
	FS FINISHED SURFACE
	FL FLOWLINE
	EXISTING GRADE
	PROPOSED GRADE
	PROPOSED SLOPE
	PROPOSED LANDSCAPE AREA
	PROPOSED ASPHALT

- DRAINAGE NOTES**
- INSTALL CURB OPENING CATCH BASIN.
  - INSTALL HDPE STORM DRAIN LINE. SIZE PER PLAN.
  - INSTALL 48\"/>



14206 VAN NESS AVENUE  
PREPARED FOR  
U-HAUL

CITY OF GARDENA

KHA PROJECT  
194333003

DATE  
8/20/2021

SCALE AS SHOWN  
AZ

DESIGNED BY  
TK

DRAWN BY  
JK

CHECKED BY  
JC

REVISIONS

No.

DATE

1

SHEET NUMBER

**Kimley-Horn**

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**BMP EXHIBIT**