44 EAST
WATER QUALITY CALCULATIONS
4/5/2019

Summary Calculations

PROPOSED BMP: Stormwater Tank Capture fed to Filtration Bed

DRAINAGE AREA DATA		
Drainage Area to Control (DA)	0.6000 ac	
Drainage Area Impervious Cover (IC)	100 %	
Capture Depth (CD) = 0.5"+((IC-20)/10)*0.1	1.30 in.	

WATER QUALITY CONTROL CALCULATIONS		
Required Water Quality Treatment Volume	**Required**	**Provided**
Water Quality Volume (Req'd WQV_{tot} = CD*DA*3630)	2831 cf	2840 cf
Provided Water Quality Treatment Volume	**Required**	**Provided**
Filtration Bed Water Quality Treatment Volume		
Biofiltration Component, Water Quality Treatment Volume (see below for calculation)		2840 cf
Total Water Quality Volume Treated (i.e. treated on-site)	2831 cf	**2840** cf
Provided Water Storage Volume	**Required**	**Provided**
Required Storage For Onsite Water Quality Treatment (S_1)	21243 gal	
BMP Design Factor* per Figure 1.6.7.D-1 (For >48 Hr Feed, For 48 hr Factor = 1)		1
Additional Storage Volume For Filtration Bed Feed Times Exceeding 48 Hrs** (S_2)	0 gal	
Total Treatment Storage Volume (Required = $S_{WQ} = S_1 + S_2$) (Provided = Nominal Tank Size)	21243 gal	22000 gal
Total Water Storage Volume (Irrigation + Treatment Volume)		**22000** gal

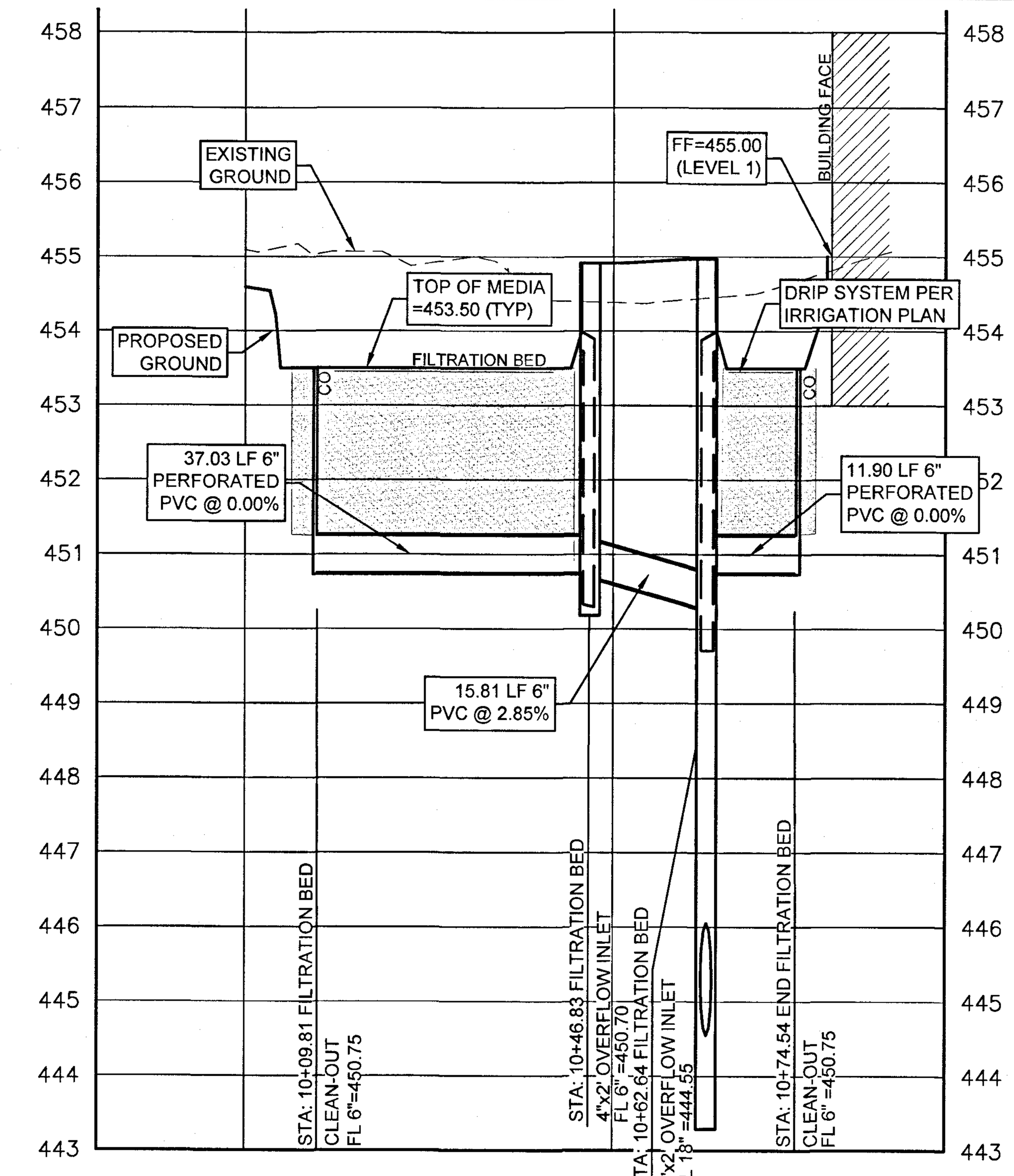
Detailed Calculations

FULL INFILTRATION BED		
General Filtration Bed Design	**Required**	**Provided**
Depth of Ponding, H	Maximum 1.0 ft	**0.0** ft
Depth of Filtration Media, L	Minimum 2.0 ft	**2.0** ft
Depth from Top of Media to Underdrain Invert, L_1	Minimum 1.2 ft	**2.0** ft
Depth of Media Below Underdrain Invert, L_2	Minimum 0.8 ft	**0.0** ft
Biofiltration Component	**Required**	**Provided**
Biofiltration Soil Hydraulic Conductivity, k_{RG} (Media Per 1.6.7.5.C.4)		4.0 ft/day
Filtration Bed Feed Rate, I_{RGF}	$I_{RGF} \leq K_{RG}/2$	2.0 ft/day
Draw Down Time, DDT_{RG}	48 - 120 hr	48.0 hr
Filtration Bed Area, A_F		**710** sf
Treated Water Quality Volume ($WQV_{RG} = A_F*DDT_{RG}/24*I_{RG}$)		**2840** cf
Biological Elements Calculations		
Filtration Pond Plantings (95% Coverage)	674.50 Plants	1065 Plants

Notes:

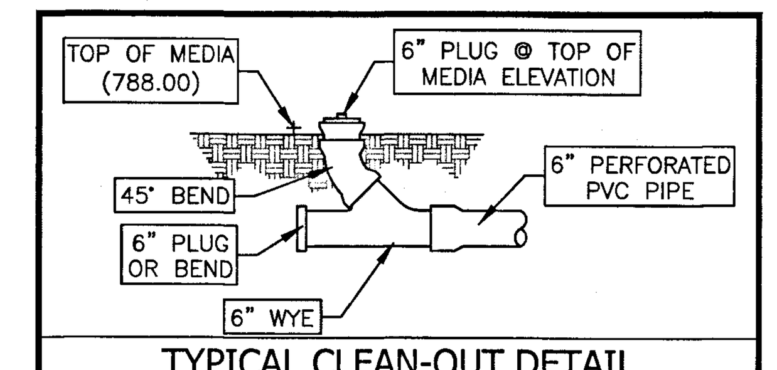
*The BMP Design Factor is linearly Interpolated when the draw down time falls between the draw down times shown on the figure.

**Used to calculate the additonal rainwater storage volume that is required when the feed time to the filtration bed exceeds 48 hrs.

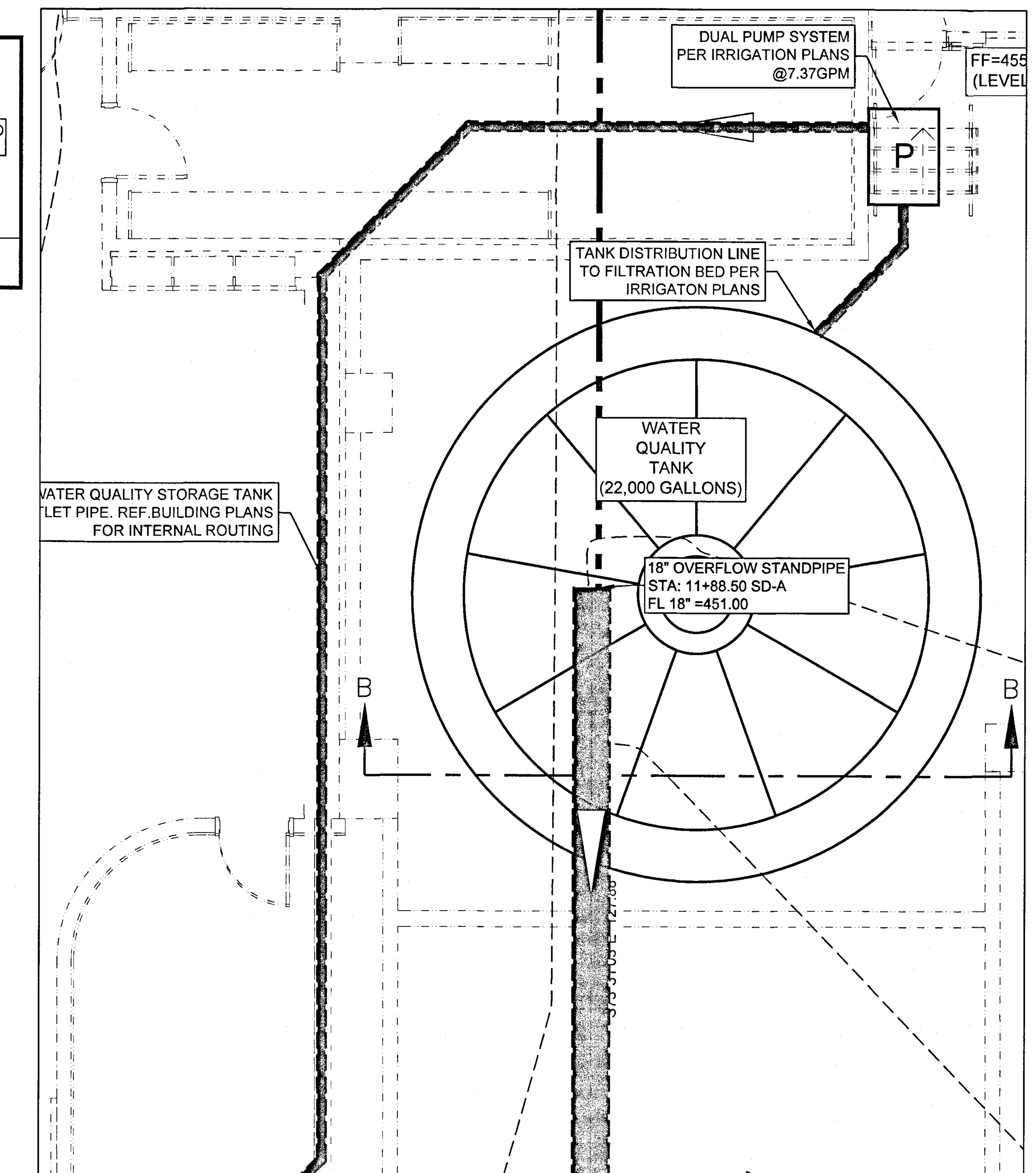


EXISTING GROUND
FF=455.00 (LEVEL 1)
BUILDING FACE
PROPOSED GROUND
TOP OF MEDIA =453.50 (TYP)
DRIP SYSTEM PER IRRIGATION PLAN
FILTRATION BED
37.03 LF 6" PERFORATED PVC @ 0.00%
11.90 LF 6" PERFORATED PVC @ 0.00%
15.81 LF 6" PVC @ 2.85%
STA: 10+09.81 FILTRATION BED CLEAN-OUT FL 6" =450.75
STA: 10+74.54 END FILTRATION BED CLEAN-OUT FL 6" =450.75
VERT. SCALE
HORIZ. SCALE

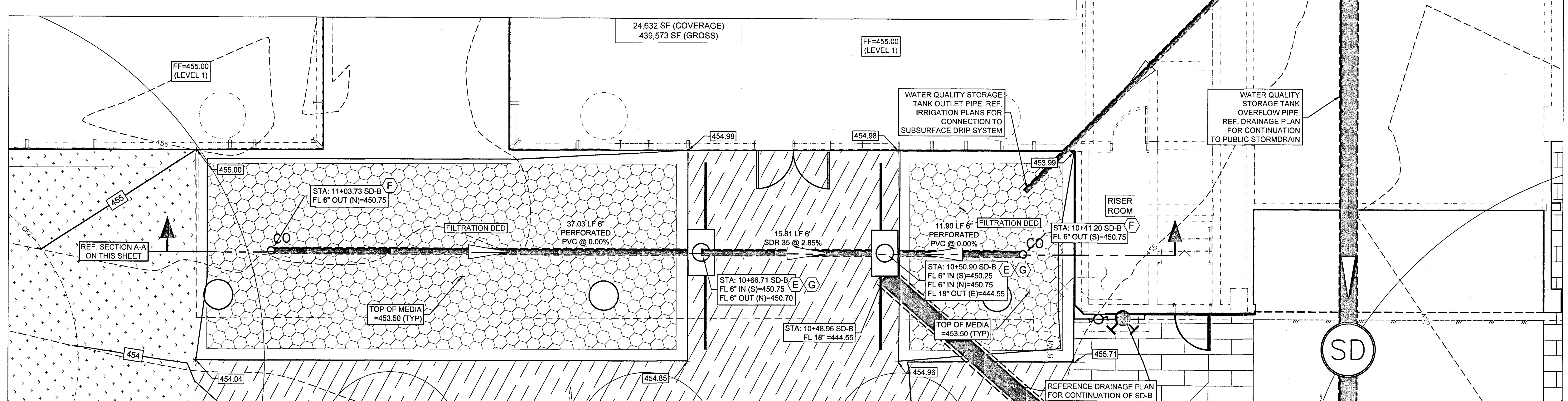
FILTRATION BED SECTION A-A



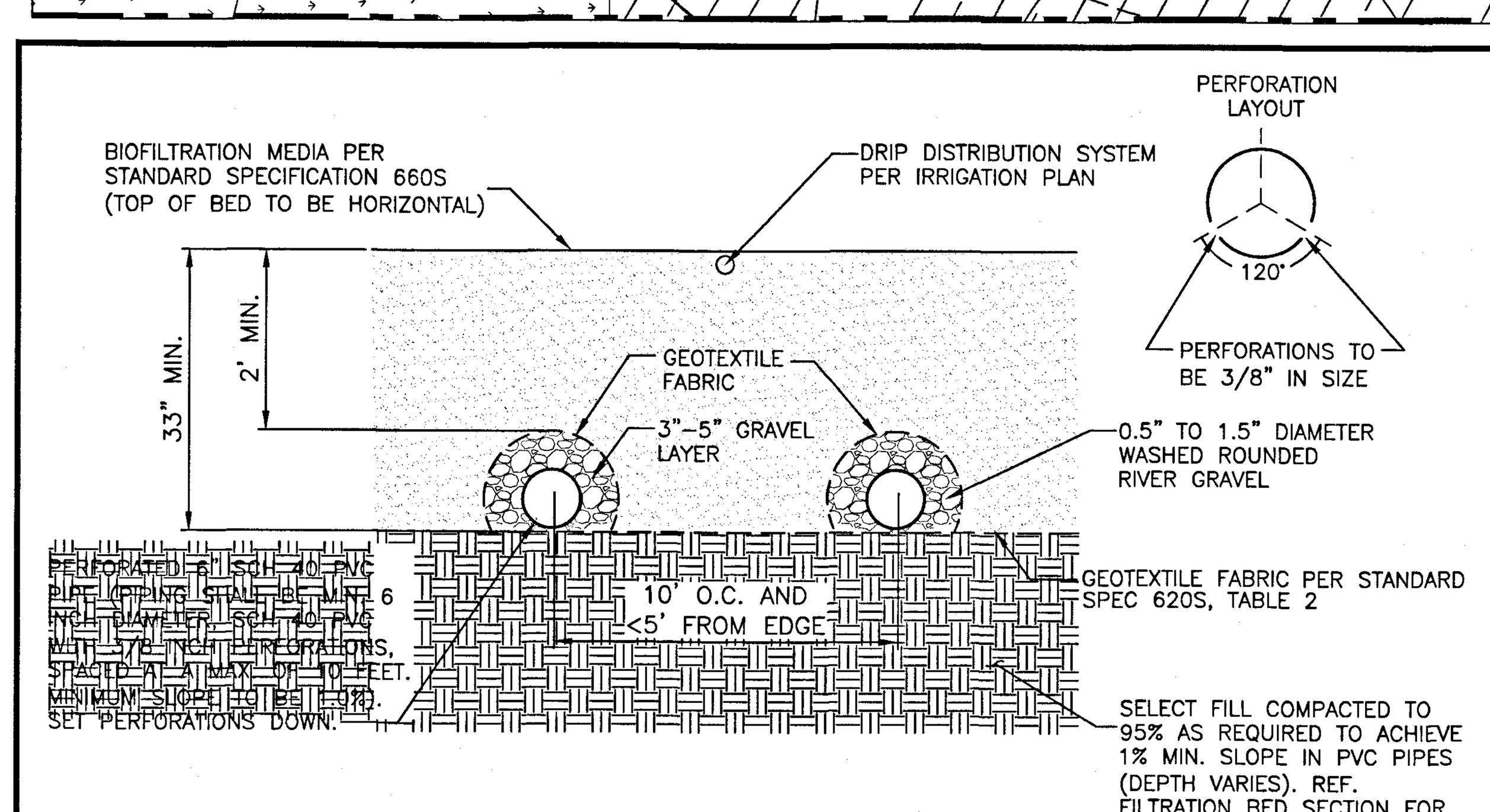
TYPICAL CLEAN-OUT DETAIL
NOT TO SCALE



DUAL PUMP SYSTEM PER IRRIGATION PLANS @7.37GPM
TANK DISTRIBUTION LINE TO FILTRATION BED PER IRRIGATON PLANS
WATER QUALITY TANK (22,000 GALLONS)
18" OVERFLOW STANDPIPE STA: 11+88.50 SD-A FL 18" =451.00
WATER QUALITY STORAGE TANK OUTLET PIPE. REF. BUILDING PLANS FOR INTERNAL ROUTING



24,632 SF (COVERAGE)
439,573 SF (GROSS)
FF=455.00 (LEVEL 1)
WATER QUALITY STORAGE TANK OUTLET PIPE. REF. IRRIGATION PLANS FOR CONNECTION TO SUBSURFACE DRIP SYSTEM
WATER QUALITY STORAGE TANK OVERFLOW PIPE. REF. DRAINAGE PLAN FOR CONTINUATION TO PUBLIC STORMDRAIN
REF. SECTION A-A ON THIS SHEET
STA: 11+03.73 SD-B FL 6" OUT (N)=450.75
FILTRATION BED
37.03 LF 6" PERFORATED PVC @ 0.00%
15.81 LF 6" SDR 35 @ 2.85%
11.90 LF 6" PERFORATED PVC @ 0.00%
STA: 10+41.20 SD-B FL 6" OUT (S)=450.75
STA: 10+66.71 SD-B FL 6" IN (S)=450.75 FL 6" OUT (N)=450.70
STA: 10+50.90 SD-B FL 6" IN (S)=450.25 FL 6" IN (N)=450.75 FL 18" OUT (E)=444.55
STA: 10+48.96 SD-B FL 18" =444.55
TOP OF MEDIA =453.50 (TYP)
RISER ROOM
REFERENCE DRAINAGE PLAN FOR CONTINUATION OF SD-B



BIOFILTRATION MEDIA PER STANDARD SPECIFICATION 660S (TOP OF BED TO BE HORIZONTAL)
DRIP DISTRIBUTION SYSTEM PER IRRIGATION PLAN
PERFORATION LAYOUT
120°
PERFORATIONS TO BE 3/8" IN SIZE
GEOTEXTILE FABRIC
3"-5" GRAVEL LAYER
0.5" TO 1.5" DIAMETER WASHED ROUNDED RIVER GRAVEL
33" MIN.
2' MIN.
10' O.C. AND <5' FROM EDGE
GEOTEXTILE FABRIC PER STANDARD SPEC 620S, TABLE 2
SELECT FILL COMPACTED TO 95% AS REQUIRED TO ACHIEVE 1% MIN. SLOPE IN PVC PIPES (DEPTH VARIES). REF. FILTRATION BED SECTION FOR PIPE FLOW LINES.

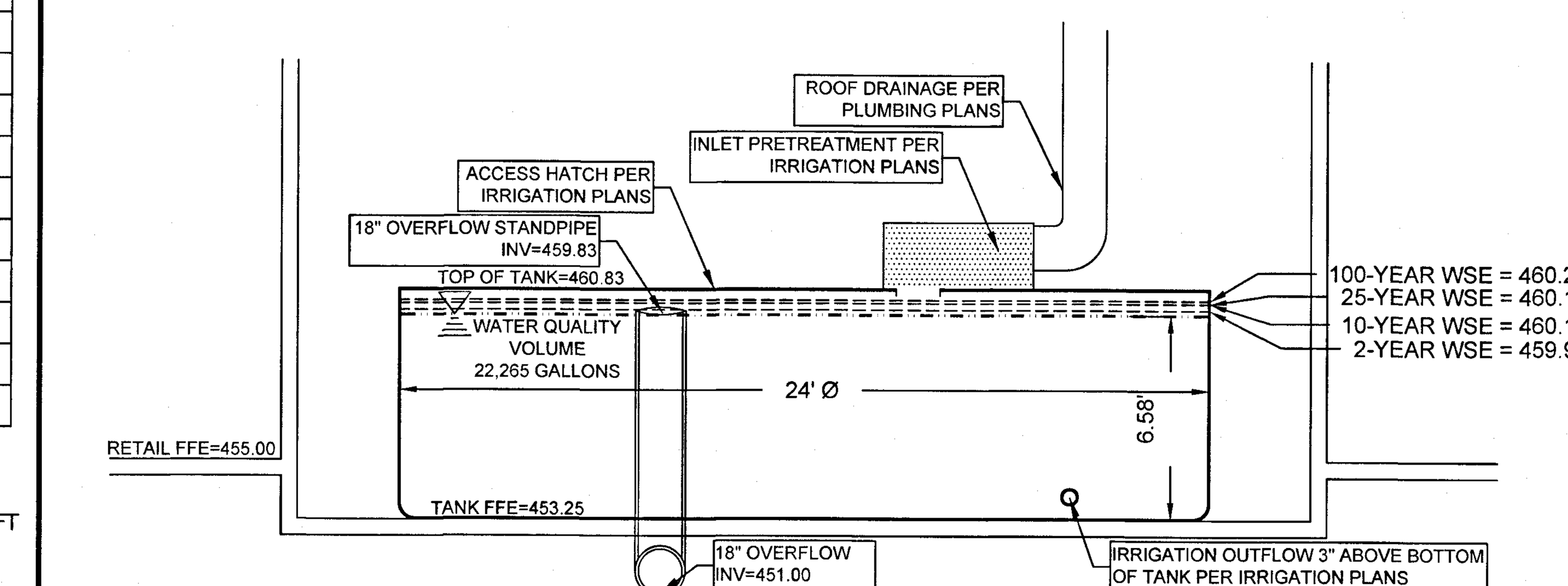
FILTRATION BED DETAIL
NOT TO SCALE

STAGE STORAGE TABLE	
ELEVATION	STORAGE (CF)
453.25	0
454.25	452.39
455.25	904.78
456.25	1357.17
457.25	1809.56
458.25	2261.95
459.25	2714.34
WQE 459.83	2976.73
460.25	3166.73
460.83	3429.12

HEAD REQUIRED TO PASS 100 YEAR (6.87CFS) THROUGH 1.5' DIAMETER STANDPIPE:

$H_{min}=(Q/3*(2\pi r))^{0.67}= (6.87/14.14)^{0.67}=0.62FT$

$H_{provided}= 460.83-459.83 = 1'$



ROOF DRAINAGE PER PLUMBING PLANS
ACCESS HATCH PER IRRIGATION PLANS
INLET PRETREATMENT PER IRRIGATION PLANS
18" OVERFLOW STANDPIPE INV=459.83
TOP OF TANK=460.83
WATER QUALITY VOLUME 22,265 GALLONS
100-YEAR WSE = 460.25
25-YEAR WSE = 460.15
10-YEAR WSE = 460.15
2-YEAR WSE = 459.95
24' Ø
6.58'
RETAIL FFE=455.00
TANK FFE=453.25
18" OVERFLOW INV=451.00
IRRIGATION OUTFLOW 3" ABOVE BOTTOM OF TANK PER IRRIGATION PLANS

SECTION B-B
WATER QUALITY TANK DETAIL
NOT TO SCALE

LEGEND

- BOUNDARY / RIGHT OF WAY
- CURB / EDGE OF PAVEMENT
- XXX EXISTING GRADE ELEVATIONS
- XXX PROPOSED GRADE ELEVATIONS
- RETAINING WALL
- EXIST. STORM DRAIN LINE
- PROP. STORM DRAIN LINE
- WL WATER LINE
- WW WASTEWATER LINE
- OU OVERHEAD UTILITY
- G GAS LINE
- UE ELECTRIC DUCT BANK
- CO CLEAN-OUT
- WW WASTEWATER MANHOLE
- WATER METER VAULT
- WATER VALVE
- FIRE HYDRANT
- STORM DRAINAGE INLET
- SD STORM DRAIN MANHOLE
- FL FLOW LINE ELEVATION
- FF FINISHED FLOOR ELEVATION

B	INSTALL 4' DIA. STORM DRAIN MANHOLE PER COA DETAILS 506S-3 & 503S-5S
	OVERFLOW. REF. FILTRATION BED SECTION A-A
D	INSTALL CLEAN-OUT AND AS SHOWN IN PLAN VIEW
E	END PVC PIPE AND BEGIN PERFORATED PVC PIPE
F	PERFORATED PVC DRAIN LINES FOR TREE WELL PER COA DETAIL 432S-7B
G	END STORM DRAIN SD-A AND TIE TO WATER QUALITY STORAGE TANKS.

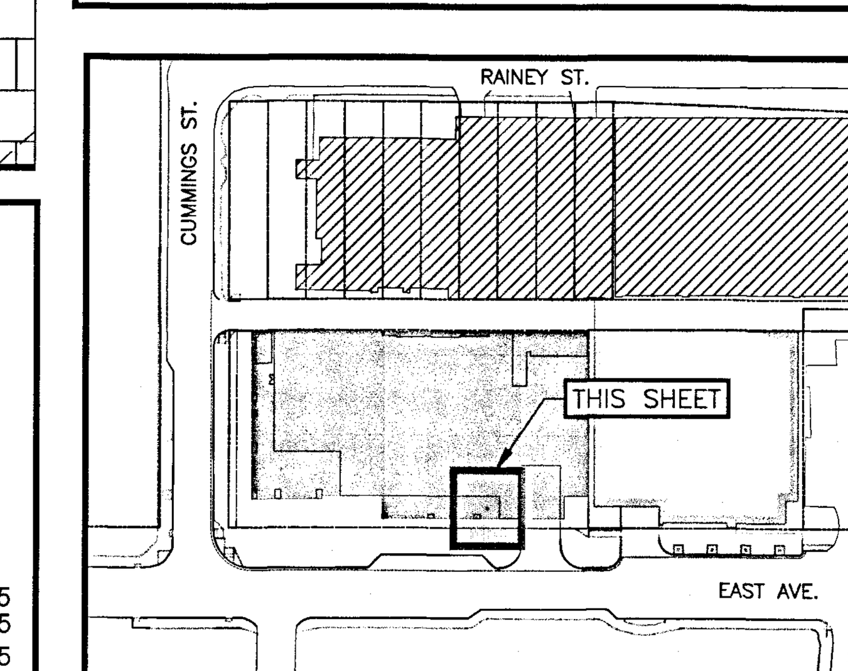
CAUTION:
CONTRACTOR TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. CONTRACTOR TO NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

NOTES:

1. REFERENCE OVERALL GRADING & DRAINAGE PLAN & STORM DRAIN PLAN & PROFILE SHEETS FOR CONTINUATION OF STORM DRAIN SYSTEM & ON-SITE GRADING.
2. ALL ITEMS ARE TO BE FURNISHED & INSTALLED BY CONTRACTOR. REFERENCE CONSTRUCTION DETAILS SHEETS FOR ADDITIONAL INFORMATION.
3. ALL GRAVITY LINES ARE TO BE INSTALLED FROM DOWNSTREAM TO UPSTREAM.
4. ALL DIMENSIONS ARE TO FACE OF BUILDING OR WALL, CENTER LINE OF PIPE AND PROPERTY LINE/R.O.W. UNLESS OTHERWISE NOTED.
5. ALL PVC PIPE SHALL BE SCH-40 PVC. ALL PVC UNDERDRAIN PIPE SHALL BE 6-INCHES IN DIAMETER. PERFORATED PVC PIPE SHALL HAVE 3/8 INCH PERFORATIONS SPACED AT A MAXIMUM OF 10 FEET.

RAIN GARDEN MAINTENANCE:

1. ACCUMULATED PAPER, TRASH AND DEBRIS SHOULD BE REMOVED EVERY SIX (6) MONTHS OR SOONER AS NECESSARY.
2. VEGETATION WITHIN THE BASIN SHOULD NOT BE ALLOWED TO EXCEED EIGHTEEN (18) INCHES IN HEIGHT AT ANY TIME.
3. CORRECTIVE MAINTENANCE IS REQUIRED ANY TIME DRAW-DOWN DOES NOT OCCUR WITHIN FORTY-EIGHT (48) HOURS AFTER THE RAIN GARDEN HAS EMPTIED.
4. THE BASIN(S) SHOULD BE INSPECTED ANNUALLY AND REPAIRS SHOULD BE MADE AS NECESSARY.



SHEET KEY
NO SCALE

SITE PLAN APPROVAL SHEET 22 OF 72
FILE NUMBER: SP-2018-0472C APPLICATION DATE: 10-5-18
APPROVED BY COMMISSION ON 9 UNDER SECTION 112 OF CHAPTER 25-5 OF THE CITY OF AUSTIN CODE.
EXPIRATION DATE (25-5-81, LDC) 9-27-22 CASE MANAGER A.Johnson

DIRECTOR, DEVELOPMENT SERVICES DEPARTMENT
RELEASED FOR GENERAL COMPLIANCE: 9-27-19 ZONING CBD
REV. 1 ____ CORRECTION 1 ____
REV. 2 ____ CORRECTION 2 ____
REV. 3 ____ CORRECTION 3 ____
FINAL PLAT MUST BE RECORDED BY THE PROJECT EXPIRATION DATE, IF APPLICABLE. SUBSEQUENT SITE PLANS WHICH DO NOT COMPLY WITH THE CODE CURRENT AT THE TIME OF FILING, AND ALL REQUIRED BUILDING PERMITS AND/OR A NOTICE OF CONSTRUCTION (IF A BUILDING PERMIT IS NOT REQUIRED) MUST ALSO BE APPROVED PRIOR TO THE PROJECT EXPIRATION DATE.

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WATER QUALITY PLAN AND PROFILES

SHEET
CG203
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SP-2018-0472C