

# DEPARTMENT OF ENERGY & THE ENVIRONMENT

## SEMI-FINAL DESIGN DRAWINGS FOR DPR PARKLAND STORMWATER RETROFITS III DAKOTA PARK LID RETROFITS

JANUARY 2024

SWM PLAN # XXXX  
33rd ST & S. DAKOTA AVE, NE  
WASHINGTON, DC 20018

CLIENT



DEPARTMENT OF ENERGY & ENVIRONMENT

ELAINE VIDAL, ENVIRONMENTAL PROTECTION SPECIALIST  
WATERSHED PROTECTION DIVISION  
DEPARTMENT OF ENERGY AND ENVIRONMENT  
GOVERNMENT OF THE DISTRICT OF COLUMBIA, 1200 FIRST ST, NE 5TH FLOOR, WASHINGTON DC, 20002



MAYOR MURIEL BOWSER

DATE	ISSUES / REVISIONS
02/21/2023	30% CONCEPT DESIGNS
01/05/2024	60% SEMI-FINAL DESIGNS

60% SEMI-FINAL DESIGN



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DAKOTA PARK LID RETROFITS

COVER SHEET

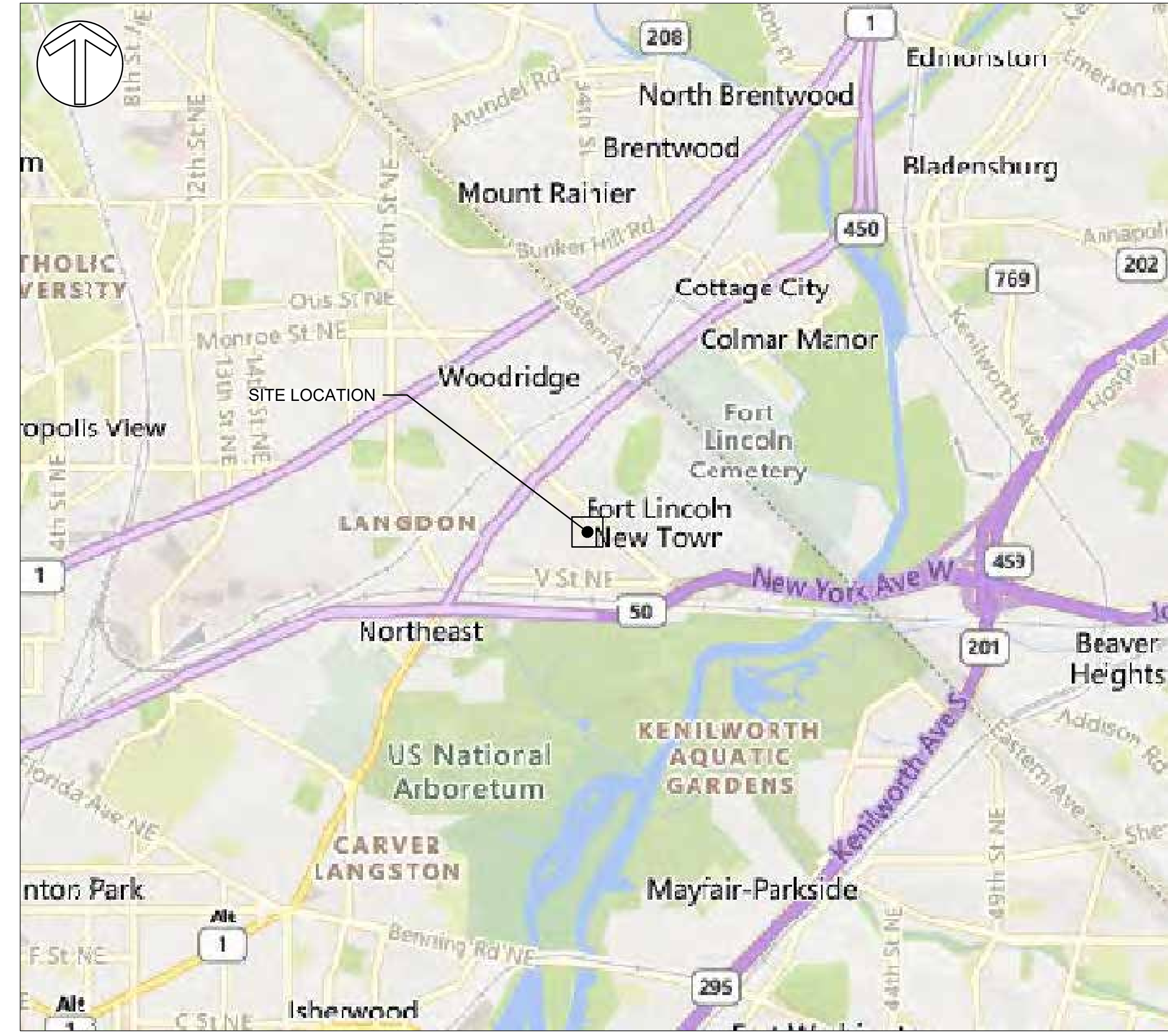
PROJECT NO.:	23014.01	SCALE:	AS SHOWN
SEAL:	BY: EM/SF	CHECK:	BA
	DWG. NO.:		

C001

### LEGEND

EXISTING	PROPOSED
--- LIMIT OF SURVEY	--- 425 --- MAJOR CONTOUR
--- MAJOR CONTOUR	--- 424 --- MINOR CONTOUR
--- MINOR CONTOUR	--- LOD --- LIMIT OF DISTURBANCE
--- PROPERTY LINE	--- UNDERDRAIN
--- STORM DRAIN (SURVEY)	--- TOP OF SWALE
--- STORM DRAIN (GIS)	--- BOTTOM OF SWALE
--- SS --- SS --- SANITARY SEWER LINE (SURVEY)	--- SF --- SF --- SILT FENCE
--- SS --- SS --- SANITARY SEWER LINE (GIS)	--- TPF --- TPF --- TREE PROTECTION FENCE
--- OHU --- OVERHEAD UTILITY LINE	--- BOF --- BLAZE ORANGE FENCE
--- UGP --- UNDERGROUND POWER LINE	--- RP --- RP --- ROOT PRUNING
--- W --- WATERLINE	--- TRENCH DRAIN
--- E --- E --- ELECTRIC	--- STORMTECH CHAMBERS
--- G --- GAS	--- CURB INLET PROTECTION
--- CURB AND GUTTER (CG-6)	--- TREE REMOVAL
--- HEADER CURB (CG-2)	--- STABILIZED CONSTRUCTION ENTRANCE
--- EDGE OF PAVEMENT	--- MULCH ACCESS ROAD
--- FENCE LINE	--- STAGING AND STOCKPILE AREA
--- EDGE OF LANDSCAPING	--- CRITICAL ROOT ZONE
--- ROAD/COURT STRIPING	
--- ROOF OVERHANG	
--- DECIDUOUS TREE	
--- CONIFEROUS TREE	
--- CONTROL POINT	
--- JERSEY BARRIERS	
--- LIGHT POLE	
--- SIGN	
--- FLAG POLE	
--- BASKETBALL GOAL	
--- SANITARY MANHOLE	
--- STORM MANHOLE	
--- ELECTRIC MANHOLE	
--- STORM GRATE	
--- FIRE HYDRANT	
--- WATER WELL	
--- WATER VALVE	
--- WATER FOUNTAIN	
--- SPRINKLER	
--- FITNESS STATION	
--- PLAYGROUND EQUIP.	
--- PARK BENCH	
--- TRASH CAN	
--- BOLLARD	
--- ELEC. TRANS/BOX	
--- UTILITY POLE	
--- GUY WIRE	
--- RECORD BOUNDARY CORNER (NO EVIDENCE FOUND)	
--- BICYCLE RACK	

### VICINITY MAP



LIMIT OF DISTURBANCE = 0.36 ACRES  
PROPERTY OWNER: DISTRICT OF COLUMBIA DEPARTMENT OF PARKS AND RECREATION  
SCALE: 1" = 2,000'

### PROJECT NARRATIVE

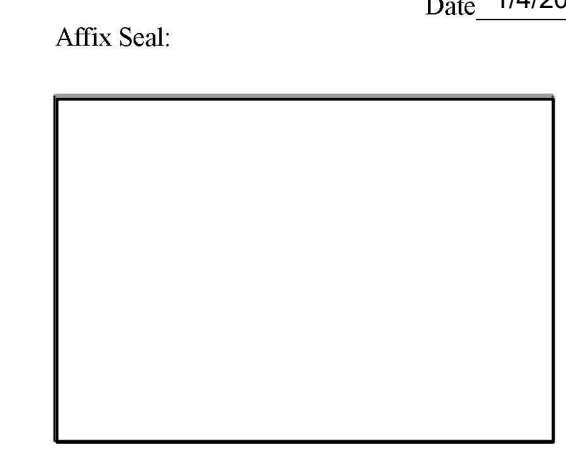
THE PROJECT AREA IS IN WARD 5, NEAR THE EASTERN BORDER OF THE DISTRICT OF COLUMBIA AT THE CORNER OF 33rd ST AND S. DAKOTA AVE NE. THE PROJECT SITE WAS IDENTIFIED THROUGH DOE'S DPR PARKLAND STORMWATER RETROFITS III TO DESIGN AND CONSTRUCT LOW IMPACT DEVELOPMENT RETROFITS.

THIS PROJECT INVOLVES THE INSTALLATION OF TWO BIORETENTION BASINS TO CAPTURE DRAINAGE FROM AN EXISTING ALLEYWAY AND BASKETBALL COURTS. REDUCE THE QUANTITY OF STORMWATER RUNOFF AND IMPROVE THE WATER QUALITY BEFORE RETURNING BACK TO THE CONVEYANCE SYSTEM.

### STATEMENT BY PROFESSIONAL ENGINEER REGISTERED IN THE DISTRICT OF COLUMBIA

This is to certify that the engineering features of all stormwater best management practices (BMPs), stormwater infrastructure, and land covers (collectively the "Facility") have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of stormwater pollutants. I further certify that the Facility has been designed in accordance with the specification required under Chapter 5 of Title 21 of the District of Columbia Municipal Regulations. It is also stated that the undersigned has furnished the applicant with a set of instructions for the maintenance and operation of the site's Facility.

BRYAN ARVAL, PROJECT MANAGER  
Name and Title (please type)  
2081 CLIPPER PARK RD, BALTIMORE, MD 21211  
Address  
Date: 1/4/2024 Phone No: 410.554.0156



### AS-BUILT CERTIFICATION BY PROFESSIONAL ENGINEER

Within 21 days after completion of construction of all stormwater best management practices (BMPs), stormwater infrastructure, and land covers (collectively the "Facility"), please send this page to the Watershed Protection Division of the District Department of the Environment.

- Facility Information:**  
Source Name: \_\_\_\_\_  
Source Location Street: \_\_\_\_\_  
City: \_\_\_\_\_  
DCRA Permit No.: \_\_\_\_\_  
Date Issued: \_\_\_\_\_

2. **As Built Certification**  
I hereby certify that all stormwater best management practices (BMPs), stormwater infrastructure, and land covers have been built substantially in accordance with the approved plans and specifications and that any deviations noted below will not prevent the system from functioning in compliance with the requirements Chapter 5 of Title 21 of the District of Columbia Municipal Regulations when properly maintained and operated. These determinations have been based upon on-site observation of construction, scheduled and conducted by me or by a project representative under my direct supervision. I have enclosed one set of as-built engineering drawings.

Signature of Engineer: \_\_\_\_\_ Name (Please Type) D.C. Reg. No. \_\_\_\_\_  
Affix Seal: \_\_\_\_\_ Company Name: \_\_\_\_\_  
Company Address: \_\_\_\_\_  
Date: \_\_\_\_\_ Phone No.: \_\_\_\_\_

Substantial deviations from the approved plans and specifications (attach additional sheets if required).  
\_\_\_\_\_  
\_\_\_\_\_

Sheet List Table	
Sheet Number	Sheet Title
C001	COVER SHEET
C010	GENERAL NOTES
C100	SITE PLAN
C110	EXISTING CONDITIONS PLAN
C120	TREE PROTECTION PLAN
C210	ESC AND GRADING PLAN
C300	STORMWATER MANAGEMENT PLAN
C310	STORMWATER MANAGEMENT PLAN
L150	PLANTING PLAN
L160	PLANTING PLAN
C500	DETAILS
C510	ESC DETAILS
C530	PLANTING DETAILS
C600	DA PLAN
C700	STORMWATER CALCULATIONS

**CONSTRUCTION NARRATIVE:**

THIS PROJECT INVOLVES THE INSTALLATION OF TWO BIORETENTION BASINS TO PROVIDE STORMWATER TREATMENT TO THE EXISTING ALLEYWAY AND BASKETBALL COURTS. TWO OF THE BIORETENTION BASINS WILL INCLUDE STORMCHAMBERS TO PROVIDE SLOW RELEASE OF RUNOFF INTO THE DOWNSTREAM BIORETENTION BASINS, REDUCING THE PEAK FLOW INTO THE BIORETENTION AND ALLOWING FOR A MORE CONTROLLED FLOW.

**SITE NOTES:**

Table with 2 columns: Property/Feature and District Department of Parks and Recreation details.

**DISTRICT OF COLUMBIA GENERAL CIVIL NOTES**

- 1. THE CONTRACTOR SHALL HAVE A SET OF APPROVED PERMITTED PLANS AT THE SITE AT ALL TIMES WHEN WORK IS BEING PERFORMED.
2. THE CONTRACTOR IS ENCOURAGED TO MAKE ON-SITE INSPECTIONS OF ALL LOCATIONS AND RELATED CONDITIONS PRIOR TO BIDDING THE CONTRACT.
...
27. PROVIDE A MINIMUM OF 5 FEET HORIZONTAL AND 2 FEET VERTICAL CLEARANCE BETWEEN 16" DIAMETER OR GREATER TRANSMISSION GAS FACILITIES AND PROPOSED FACILITIES.

**PROJECT CONTACTS:**

Table with 2 columns: Contact Name/Role and Contact Information (Address, Phone, Email).

Table with 2 columns: Surveyor/Group and Geotechnical Engineer/Consultants, Inc. details.

**PROJECT PERMITS:**

- 1. UNLESS PROVIDED AS PART OF THE CONSTRUCTION DOCUMENTS, THE CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR THIS PROJECT FROM THE LOCAL OR STATE AGENCIES AT THEIR OWN EXPENSE.
2. THE CONTRACTOR SHALL MAINTAIN A COPY OF ALL APPROVED PERMITS AT THE SITE AT ALL TIMES.
3. PROJECT PERMITS

**SURVEY NOTES:**

- 1. TOPOGRAPHIC DATA DEPICTED BASED ON A CURRENT FIELD SURVEY BY JEFFREY A. SMERALDO L.S. FROM TIMMONS GROUP, COMPLETED: SEPTEMBER 21, 2023.
2. THIS DRAWING IS NOT INTENDED TO ESTABLISH PROPERTY LINES AND THE BOUNDARY INFORMATION SHOWN HEREON CANNOT BE RELIED UPON FOR DESIGN OR CONSTRUCTION.
...
8. NO ATTEMPT HAS BEEN MADE TO SHOW THE LOCATION OF ALL ABANDONED UNDERGROUND UTILITIES.

**MISC UTILITY NOTES:**

THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" A MINIMUM OF 48 HOURS PRIOR TO COMMENCEMENT OF EXCAVATION AND/OR DEMOLITION. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL, DEMOLITION, RECONSTRUCTION, AND RECONNECTION OF EXISTING FACILITIES AS REQUIRED TO COMPLETE THE WORK.

CONTACT "MISS UTILITY" AT 1-800-257-7777

**UTILITY NOTES:**

- 1. UTILITY INFORMATION SHOWN HEREON IS BASED ON ABOVE-GROUND LOCATIONS AND PAINT MARKINGS.
2. UNDERGROUND UTILITY INFORMATION SHOULD BE VERIFIED IN THE FIELD.
3. THE UTILITIES SHOWN ON THE PLANS ARE BASED ON FIELD SURVEY DATA AND/OR RECORD DRAWINGS OF THEIR LOCATIONS.
...
8. THE CONTRACTOR SHALL COORDINATE WITH THE FOLLOWING UTILITY COMPANIES/CONTACTS AND OWNER ON THE REQUIREMENTS FOR AND LIMITS OF UTILITIES NOT DETAILED ON THE CIVIL PLANS.

Table listing utility types: SEWER, STORMDRAIN, WATER, GAS, ELECTRIC, TELECOM.

**TEST PIT NOTE:**

TEST PITS ARE REQUIRED AT ALL PROPOSED UTILITY CROSSINGS WITH ALL EXISTING UTILITY LINES TO DETERMINE THE EXACT HORIZONTAL LOCATIONS, ELEVATION AND ADD SIZE OF THE EXISTING UTILITIES.

**GRADING, PAVING, AND DRAINAGE NOTES:**

- 1. FOR ALL SITE GRADING, SMOOTH TRANSITIONS SHALL BE MADE BETWEEN CHANGES IN SLOPE. PARABOLIC ROUNDING SHALL APPLY TO ALL CUT AND FILL SECTIONS.
2. UNLESS OTHERWISE NOTED ON THE PLANS, THE CONTRACTOR IS REQUIRED TO MAINTAIN ALL DITCHES, PIPES, GUTTERS, AND OTHER DRAINAGE STRUCTURES FREE FROM OBSTRUCTION UNTIL WORK IS ACCEPTED BY THE OWNER.
...
8. THE SITE MUST BE GRADED AND PAVED SO THAT NO NEW LOW POINTS WITHOUT PROPER DRAINAGE ARE CREATED.

**DESIGN AND CONSTRUCTION STANDARDS:**

DC DEPARTMENT OF ENERGY AND ENVIRONMENT - STORMWATER MANAGEMENT GUIDELINES
DC DEPARTMENT OF ENERGY AND ENVIRONMENT - EROSION AND SEDIMENT CONTROL MEASURES

**DEMOLITION NOTES:**

- 1. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES FOR SHUTOFF, CAPPING AND CONTINUATION OF UTILITY SERVICES AS REQUIRED.
2. CONTRACTOR SHALL REMOVE AND TRANSPORT ALL DEBRIS, RUBBISH AND OTHER MATERIALS RESULTING FROM ALL DEMOLITION OPERATIONS TO A LEGAL DISPOSAL OFF SITE.
...
6. SEE EROSION & SEDIMENT CONTROL PLAN FOR ALL EXISTING TREES TO REMAIN AND BE PROTECTED.

- 7. NOTE PROXIMITY OF ADJACENT STRUCTURES AND UTILITY LINES AND MAINTAIN CONTINUED SERVICE DURING CONSTRUCTION.
8. EXISTING UTILITIES (STRUCTURES AND LINES) NOT REQUIRED FOR FUTURE SERVICE TO BE REMOVED TO FACILITATE CONSTRUCTION.
...
17. WHERE PORTIONS OF EXISTING BITUMINOUS OR CONCRETE PAVING ARE TO BE REMOVED, THE EXISTING PAVEMENT SHALL BE SAW-CUT.

**LANDSCAPING/PLANTING NOTES:**

- 1. ALL PLANTS PROVIDED BY CONTRACTOR SHALL MEET OR SURPASS THE SPECIFICATIONS GIVEN IN THE PLANT SCHEDULE AND IN THE PROJECT SPECIFICATIONS.
2. PLANTING SUBSTITUTIONS ARE TO BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO PLANTING.
...
11. MIXED GROUNDCOVER TO BE PLANTED IN GROUPS OF 3-5 AND LOCATED AS REQUIRED TO PROVIDE A GENERAL MIXING OF SPECIES.

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GOVERNMENT OF THE DISTRICT OF COLUMBIA, 1200 FIRST ST, NE 5TH FLOOR, WASHINGTON DC, 20002



MAYOR MURIEL BOWSER

Table with 2 columns: DATE and ISSUES / REVISIONS.

Table with 2 columns: DATE and DESIGN STATUS (60% SEMI-FINAL DESIGNS).

**60% SEMI-FINAL DESIGN**



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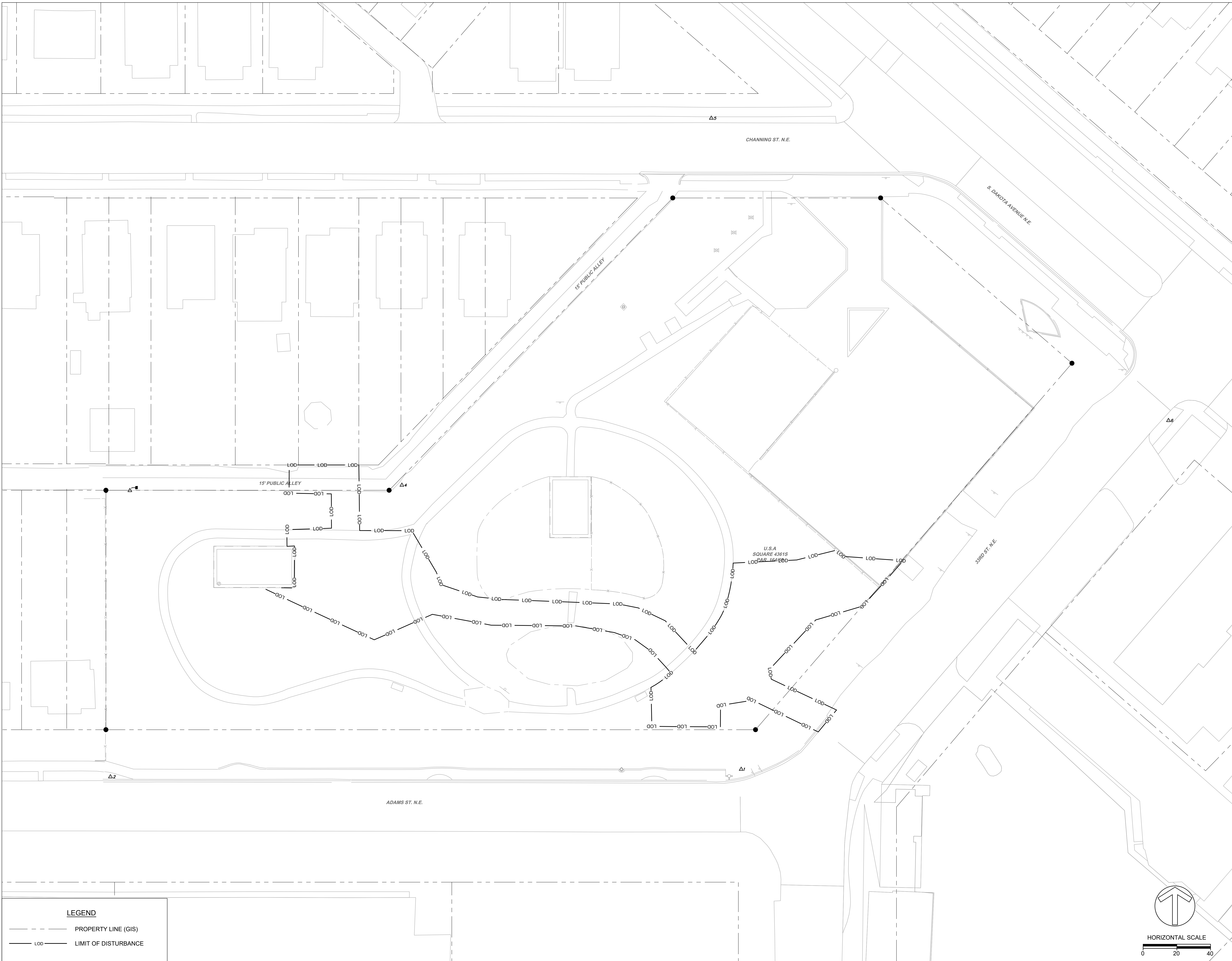
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**DAKOTA PARK LID RETROFITS**

**GENERAL NOTES**

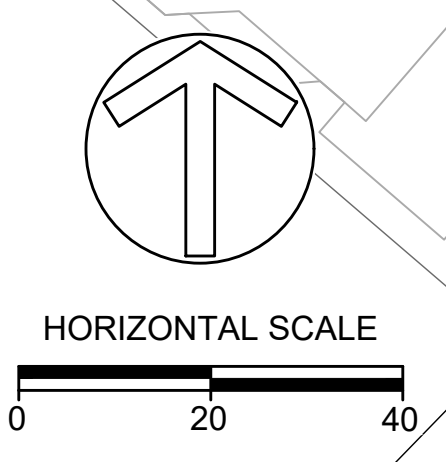
Table with 4 columns: PROJECT NO., SCALE, BY, CHECK.

C010



**LEGEND**

	PROPERTY LINE (GIS)
	LIMIT OF DISTURBANCE



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**60% SEMI-FINAL DESIGN**

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**DAKOTA PARK LID RETROFITS**

<b>TITLE:</b>	
<b>SITE PLAN</b>	
PROJECT NO. : 23014.01	SCALE: 1"=20'
SEAL:	BY: EM/SF CHECK: BA
	DWG. NO. :
<b>C100</b>	

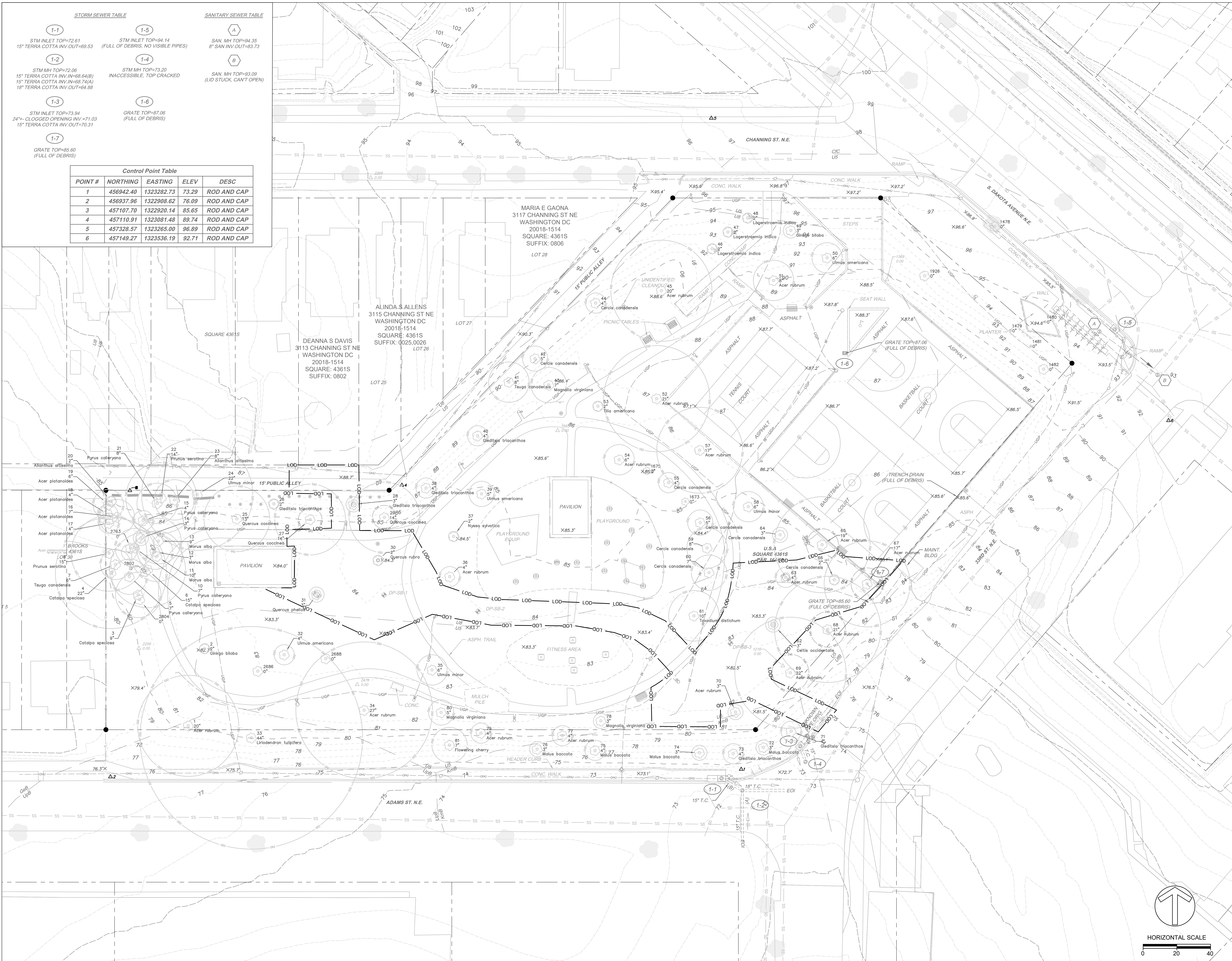
**STORM SEWER TABLE**

**SANITARY SEWER TABLE**

- 1-1 STM INLET TOP=72.61  
15" TERRA COTTA INV.OUT=69.53
- 1-2 STM MH TOP=72.06  
15" TERRA COTTA INV.IN=69.64(B)  
15" TERRA COTTA INV.IN=68.74(A)  
18" TERRA COTTA INV.OUT=64.88
- 1-3 STM INLET TOP=73.94  
24" CLOGGED OPENING INV.=71.03  
15" TERRA COTTA INV.OUT=70.31
- 1-4 STM INLET TOP=84.14  
(FULL OF DEBRIS, NO VISIBLE PIPES)
- 1-5 STM MH TOP=73.20  
INACCESSIBLE, TOP CRACKED
- 1-6 GRATE TOP=87.06  
(FULL OF DEBRIS)
- 1-7 GRATE TOP=85.60  
(FULL OF DEBRIS)

- A SAN. MH TOP=94.35  
8" SAN INV.OUT=83.73
- B SAN. MH TOP=83.09  
(LID STUCK, CAN'T OPEN)

POINT #	NORTHING	EASTING	ELEV	DESC
1	456942.40	1323282.73	73.29	ROD AND CAP
2	456937.96	1322908.62	76.09	ROD AND CAP
3	457107.70	1322920.14	85.65	ROD AND CAP
4	457110.91	1323081.48	89.74	ROD AND CAP
5	457328.57	1323265.00	96.89	ROD AND CAP
6	457149.27	1323536.19	92.71	ROD AND CAP



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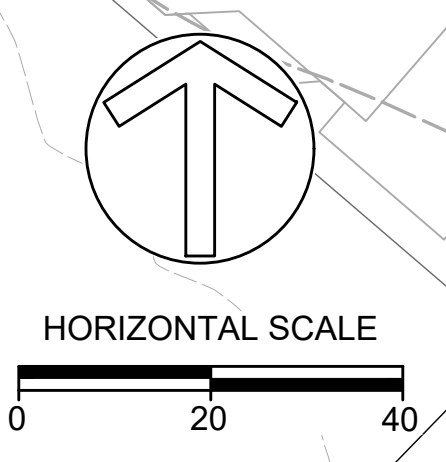
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**60% SEMI-FINAL DESIGN**

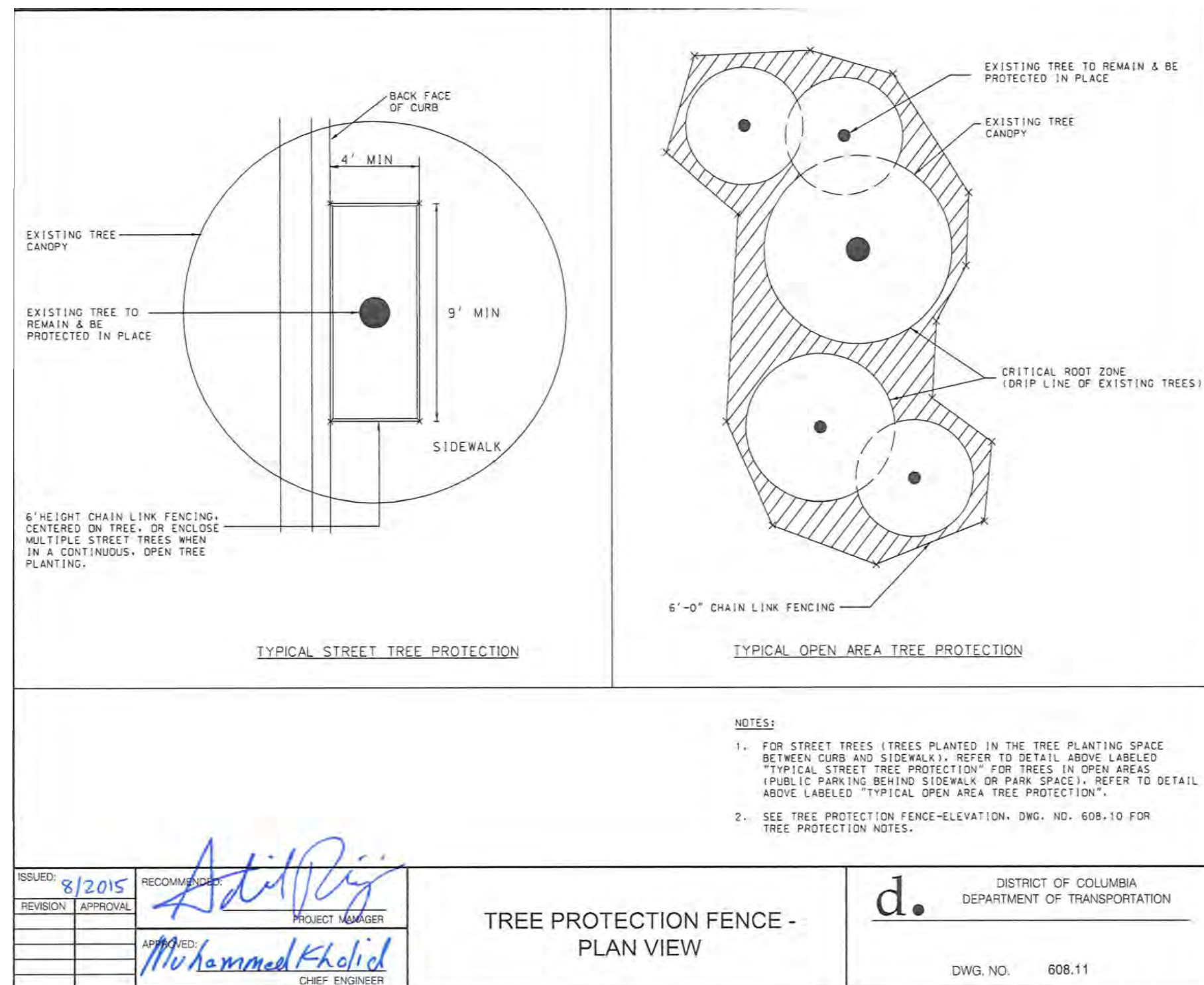
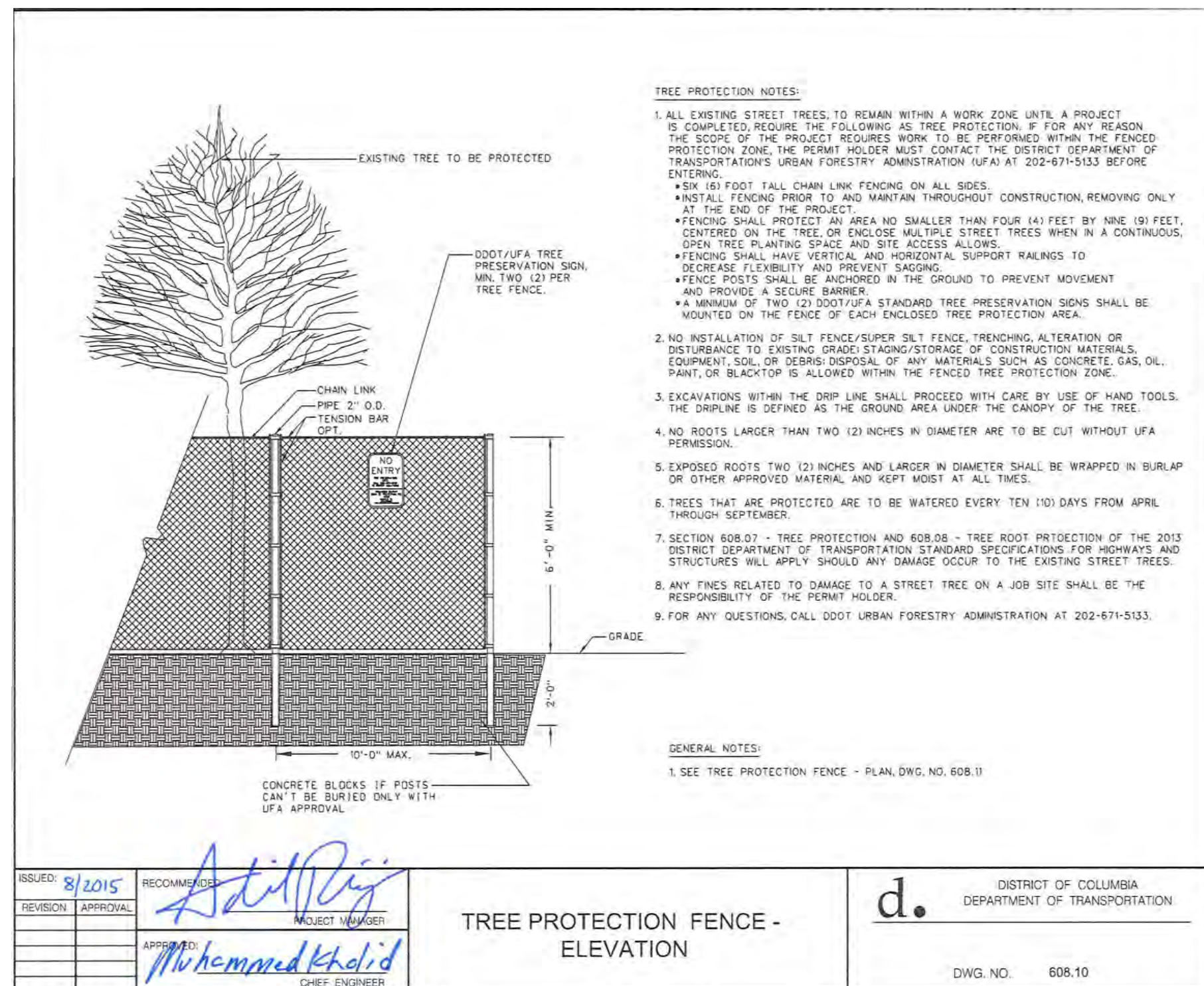
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**DAKOTA PARK LID RETROFITS**

TITLE	
<b>EXISTING CONDITIONS PLAN</b>	
PROJECT NO. : 23014.01	SCALE: 1"=20'
SEAL:	BY: EM/ISF CHECK: BA
	DWG. NO. :
<b>C110</b>	







**TREE PROTECTION NOTES:**

- ALL EXISTING STREET TREES TO REMAIN WITHIN A WORK ZONE UNTIL A PROJECT IS COMPLETED, REQUIRE THE FOLLOWING AS TREE PROTECTION. IF FOR ANY REASON THE SCOPE OF THE PROJECT REQUIRES WORK TO BE PERFORMED WITHIN THE FENCED PROTECTION ZONE, THE PERMIT HOLDER MUST CONTACT ROBERT CORLETTA OF THE DISTRICT DEPARTMENT OF TRANSPORTATION'S URBAN FORESTRY ADMINISTRATION (UFA) AT 202-527-4011 BEFORE ENTERING.
  - SIX (6) FOOT TALL CHAIN LINK FENCING ON ALL SIDES.
  - INSTALL FENCING PRIOR TO AND MAINTAIN THROUGHOUT CONSTRUCTION, REMOVING ONLY AT THE END OF THE PROJECT.
  - FENCING SHALL PROTECT AN AREA NO SMALLER THAN FOUR (4) FEET BY NINE (9) FEET, CENTERED ON THE TREE, OR ENCLOSE MULTIPLE STREET TREES WHEN IN A CONTINUOUS, OPEN TREE PLANTING SPACE AND SITE ACCESS ALLOWS.
  - FENCING SHALL HAVE VERTICAL AND HORIZONTAL SUPPORT RAILINGS TO DECREASE FLEXIBILITY AND PREVENT SAGGING.
  - FENCE POSTS SHALL BE ANCHORED IN THE GROUND TO PREVENT MOVEMENT AND PROVIDE A SECURE BARRIER.
  - A MINIMUM OF TWO (2) DOT/UFPA STANDARD TREE PRESERVATION SIGNS SHALL BE MOUNTED TO THE FENCE OF EACH ENCLOSED TREE PROTECTION AREA.
- NO INSTALLATION OF SILT FENCE/SUPER SILT FENCE, TRENCHING, ALTERATION OR DISTURBANCE TO EXISTING GRADE, STAGING/STORAGE OF CONSTRUCTION MATERIALS, EQUIPMENT, SOIL, OR DEBRIS; DISPOSAL OF ANY MATERIALS SUCH AS CONCRETE, GAS, OIL, PAINT, OR BLACKTOP IS ALLOWED WITHIN THE FENCED TREE PROTECTION ZONE.
- NO ROOTS LARGER THAN TWO (2) INCHES IN DIAMETER ARE TO BE CUT WITHOUT UFA PERMISSION.
- EXPOSED ROOTS TWO (2) INCHES AND LARGER IN DIAMETER SHALL BE WRAPPED IN BURLAP OR OTHER APPROVED MATERIAL AND KEPT MOIST AT ALL TIMES.
- TREES THAT ARE PROTECTED ARE TO BE WATERED EVERY TEN (10) DAYS FROM APRIL THROUGH SEPTEMBER.
- SECTIONS 608.07 - TREE PROTECTION AND REPLACEMENT AND 608.08 - TREE ROOT PROTECTION OF THE 2013 DISTRICT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAYS AND STRUCTURES WILL APPLY UNLESS ANY DAMAGE OCCUR TO THE EXISTING STREET TREES.
- ANY FINES RELATED TO DAMAGE TO A STREET TREE ON A JOB SITE SHALL BE THE RESPONSIBILITY OF THE PERMIT HOLDER.
- FOR ANY QUESTIONS, CALL ROBERT CORLETTA OF DDOT URBAN FORESTRY ADMINISTRATION AT 202-527-4011.

**TREE REMOVAL NOTES:**

- TREE REMOVALS: TREE #66 (CERCIS CANADENSIS) SHALL BE REMOVED BY CONTRACTOR.

**ARBORIST NARRATIVE:**

AS PER THE DDOT GUIDANCE, THIS ARBORIST NARRATIVE SUPPORTS THE ADVANCED TREE PRESERVATION PLAN FOR THE DDOT DPR II DAKOTA PARK LID STORMWATER MANAGEMENT RETROFIT PROJECT. THE FOLLOWING TEXT PRESENTS A DESCRIPTION OF THE PROJECT WITH PROPOSED TREE IMPACTS AND TREE PROTECTION MEASURES. THE ATTACHED SITE PLAN PROVIDES LOCATIONS OF TREES, LOCATIONS AND DETAILS FOR TREE PROTECTION MEASURES.

**PREPARING ARBORIST:**

BRYON W. SALLADIN  
 ISA CERTIFIED ARBORIST #MA-4478A  
 BIOHABITATS, INC.  
 2081 CLIPPER PARK RD  
 BALTIMORE, MD 21211  
 410-869-2676  
 BSALLADIN@BIOHABITATS.COM

**TREE INFORMATION**

A TREE INVENTORY WAS CONDUCTED BY BIOHABITATS CERTIFIED ARBORIST ON 08/08/2023 AND THE RESULTING DATA ARE PRESENT IN THE ACCOMPANYING ATTACHED TABLE. TREE LOCATIONS FOR EACH ASSOCIATED NUMBERED TREE ARE SHOWN ON THE ATTACHED SITE PLAN. IN TOTAL, 81 TREES WERE INVENTORIED OF WHICH THERE WERE 15 SPECIAL TREES (CIRCUMFERENCE 44'-99.9') AND 1 HERITAGE TREE (CIRCUMFERENCE 100' OR MORE) WITHIN THE INVENTORY AREA. THE COMPLETE INVENTORY IS SHOWN ON THE PROJECT PLAN SET.

**PROJECT DESCRIPTION**

THE DAKOTA PARK LID STORMWATER MANAGEMENT RETROFIT PROPOSES TO CONSTRUCT TWO VEGETATED BIOPRETENTION BASINS FOR THE PURPOSE OF TEMPORARILY CAPTURING AND TREATING STORMWATER RUN-OFF FROM THE UPSLOPE IMPERVIOUS SURFACES. TO ACHIEVE THIS, EXCAVATING BELOW AND FILLING ABOVE THE CURRENT GROUND SURFACE WILL BE NECESSARY WITHIN THE LIMITS OF DISTURBANCE (LOD). THE PROPOSED PROJECT LIMITS ARE SHOWN TO IMPACT GREATER THAN 25% OF THE CRITICAL ROOT ZONE (CRZ) OF 9 TREES AND ANY AMOUNT IMPACT TO THE STRUCTURAL ROOT ZONE (SRZ) OF 6 TREES WITHIN DAKOTA PARK. ONLY 1 TREE IS SHOWN TO BE REMOVED BASED ON THE PROPOSED PROJECT.

**TREE PROTECTION MEASURES**

TREE PROTECTION FENCING WITH SIGNAGE, ROOT PRUNING, ROOT PROTECTION MATTING AND HAND GRADING WITHIN THE CRZ/SRZ ARE METHODS PROPOSED FOR TREE PRESERVATION AND ARE PRESENTED IN THE ATTACHED PLAN SET.

TREE PROTECTION FENCING SHALL BE 6' TALL CHAIN LINK FENCE SUPPORTED ON 2" GALVANIZED POSTS MOUNTED IN PRE-FABRICATED CONCRETE FOOTERS ON THE EXISTING GROUND SURFACE ALONG THE ENTIRE LOD.

ROOT PRUNING WILL OCCUR ALONG THE LIMITS OF GRADING WITHIN THE CRZ'S. ANY AREA IN THE CRZ THAT HAS BEEN IDENTIFIED FOR ROOT PRUNING SHALL BE EXPOSED TO A PREDETERMINED LENGTH/DEPTH BY PNEUMATIC (AIR) EXCAVATION, HYDRAULIC (WATER) EXCAVATION OR HAND DIGGING. ANY ROOTS EXPOSED SHALL BE CLEANLY SEVERED BY USING A HAND SAW, CIRCULAR SAW, ROCK SAW, OR APPROVED EQUIVALENT.

HAND GRADING WILL OCCUR WITHIN THE SRZ OF THE INDIVIDUAL TREE BEING IMPACTED AFTER THE REMOVAL OF THE TREE PROTECTION FENCE.

ROOT PROTECTION MATTING WILL BE USED IN THE STABILIZED CONSTRUCTION ENTRANCE (SCE) AND UNGRADED AREAS WITHIN THE LOD WHERE TREE CRZ'S OCCUR. ROOT PROTECTION MATTING WILL CONSIST OF THE FOLLOWING: 1) 8" TO 12" OF WOOD CHIP MULCH ON GEOTEXTILE FABRIC WHERE THERE WILL BE LIGHT EQUIPMENT/ROOT TRAFFIC; 2) 1/2" MINIMUM THICKNESS PLYWOOD OR ALTERNATIVES OVER 6"-8" LAYER OF WOOD CHIP MULCH; OR 3) 6" OF GRAVEL OVER A TAUT, STAKED, GEOTEXTILE FABRIC WHERE HEAVY EQUIPMENT WILL BE OPERATED.

POST-CONSTRUCTION MONITORING OF PRESERVED TREES WILL OCCUR FOR 1 YEAR FOLLOWING THE COMPLETION OF THE PROJECT.

**TREE PROTECTION INSPECTION CHECKLIST:**

TASK	DATE	CONTRACTOR	NOTES	SIGNATURE
TREE PROTECTION FENCING & TREE SIGNAGE				
ROOT PRUNING				
SEDIMENT CONTROL DEVICES				
PRE-CON MEETING				
SOIL & ROOT PROTECTION MATTING				
MONITORING PROGRESSION OF PROJECT				
REMOVAL OF PROTECTION MEASURES				
FINAL HAND GRADING WITHIN SRZ				
1ST-YEAR POST CONSTRUCTION INSPECTION				

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 1200 FIRST STREET, NE 5TH FLOOR  
 WASHINGTON DC 20002

**CLIENT**

DEPARTMENT OF ENERGY & ENVIRONMENT

ELAINE VIDAL, ENVIRONMENTAL PROTECTION SPECIALIST  
 WATERSHED PROTECTION DIVISION  
 DEPARTMENT OF ENERGY AND ENVIRONMENT  
 GOVERNMENT OF THE DISTRICT OF COLUMBIA, 1200 FIRST ST. NE 5TH FLOOR,  
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MAYOR MURIEL BOWSER

DATE	ISSUES / REVISIONS
02/21/2023	30% CONCEPT DESIGNS
01/05/2024	60% SEMI-FINAL DESIGNS

60% SEMI-FINAL DESIGN

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DAKOTA PARK LID RETROFITS

TITLE:

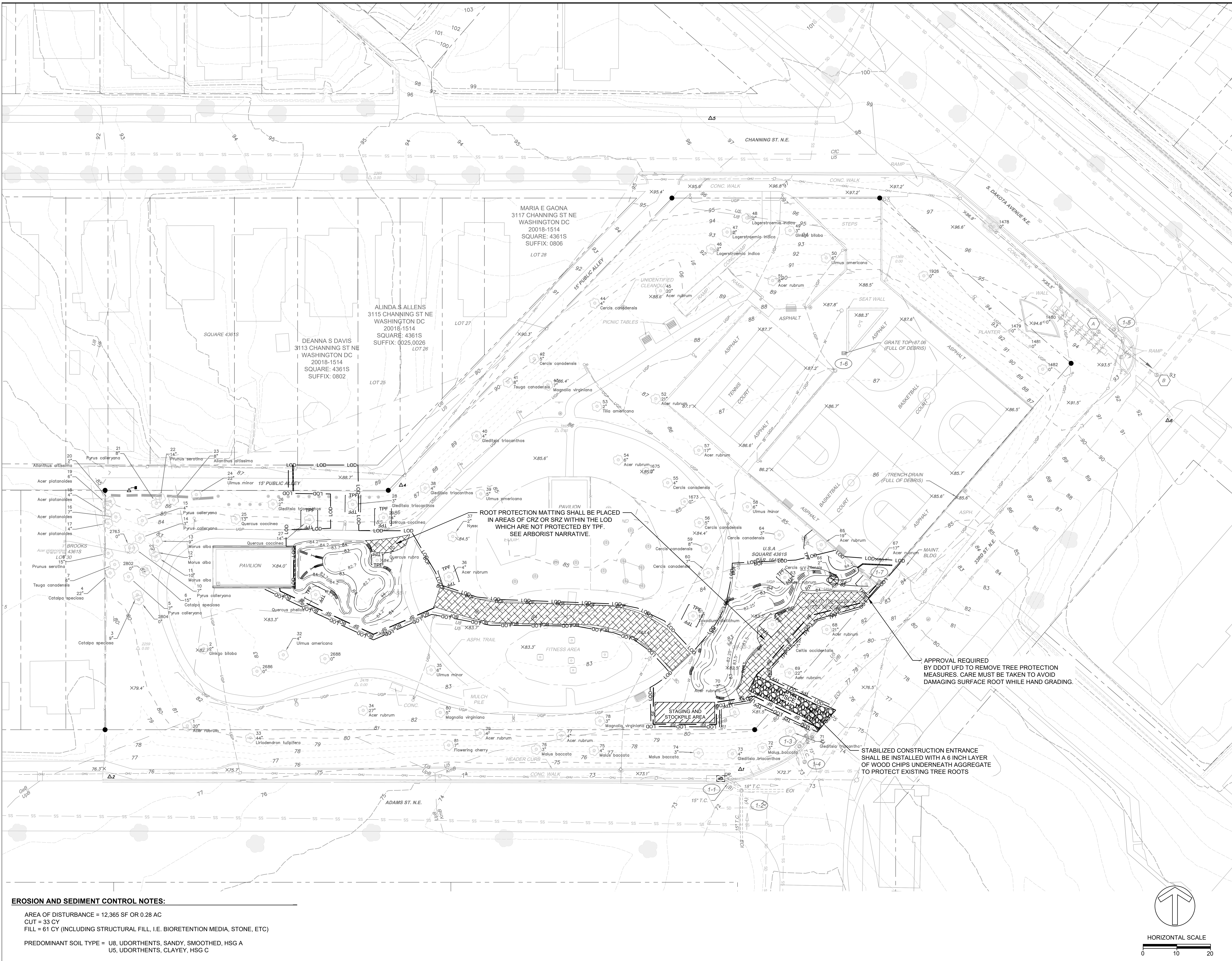
**TREE PROTECTION PLAN**

PROJECT NO.: 23014.01 SCALE: 1" = 20'

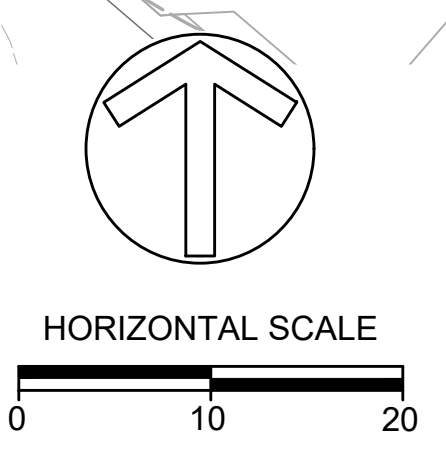
BY: EM/ISF CHECK: BA

DWG. NO.:

C121



**EROSION AND SEDIMENT CONTROL NOTES:**  
 AREA OF DISTURBANCE = 12,365 SF OR 0.28 AC  
 CUT = 33 CY  
 FILL = 61 CY (INCLUDING STRUCTURAL FILL, I.E. BIORETENTION MEDIA, STONE, ETC)  
 PREDOMINANT SOIL TYPE = U8, UDORTHERENTS, SANDY, SMOOTHED, HSG A  
 U5, UDORTHERENTS, CLAYEY, HSG C



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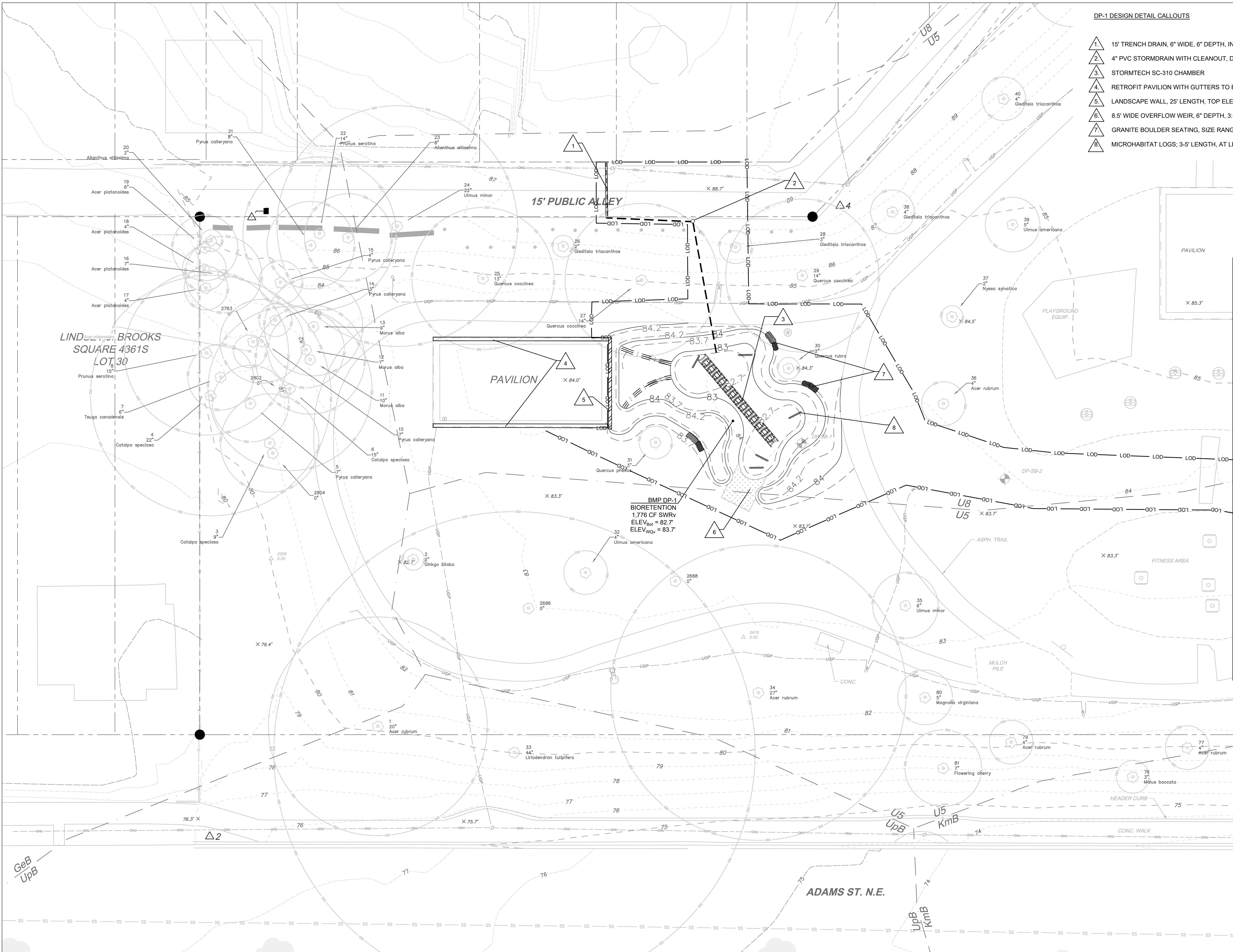
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DAKOTA PARK LID RETROFITS

ESC AND GRADING PLAN

PROJECT NO.:	23014.01	SCALE:	1" = 10'
SEAL:		BY:	EM/ISF
		CHECK:	BA
		DWG. NO.:	

C210



- DP-1 DESIGN DETAIL CALLOUTS**
- 1 15' TRENCH DRAIN, 6" WIDE, 6" DEPTH, INV OUT = 87.375
  - 2 4" PVC STORMDRAIN WITH CLEANOUT, DAYLIGHT AT INV = 82.7
  - 3 STORMTECH SC-310 CHAMBER
  - 4 RETROFIT PAVILION WITH GUTTERS TO BMP DP-1
  - 5 LANDSCAPE WALL, 25' LENGTH, TOP ELEV = 84.5
  - 6 8.5' WIDE OVERFLOW WEIR, 6" DEPTH, 3:1 SLOPES, INV ELEV = 83.7
  - 7 GRANITE BOULDER SEATING, SIZE RANGE 2'-4" WIDE X 2'-3" TALL
  - 8 MICROHABITAT LOGS; 3'-5' LENGTH, AT LEAST 6" DIAMETER

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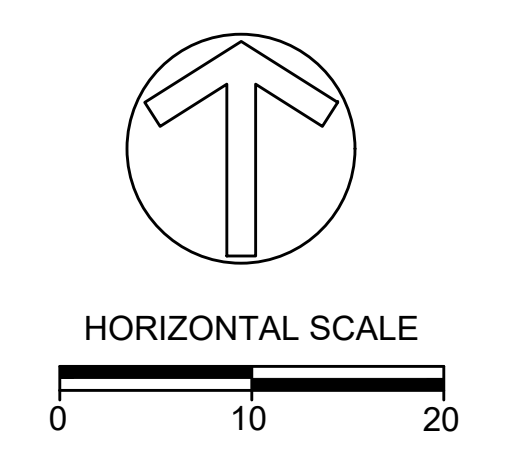
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**DAKOTA PARK LID RETROFITS**

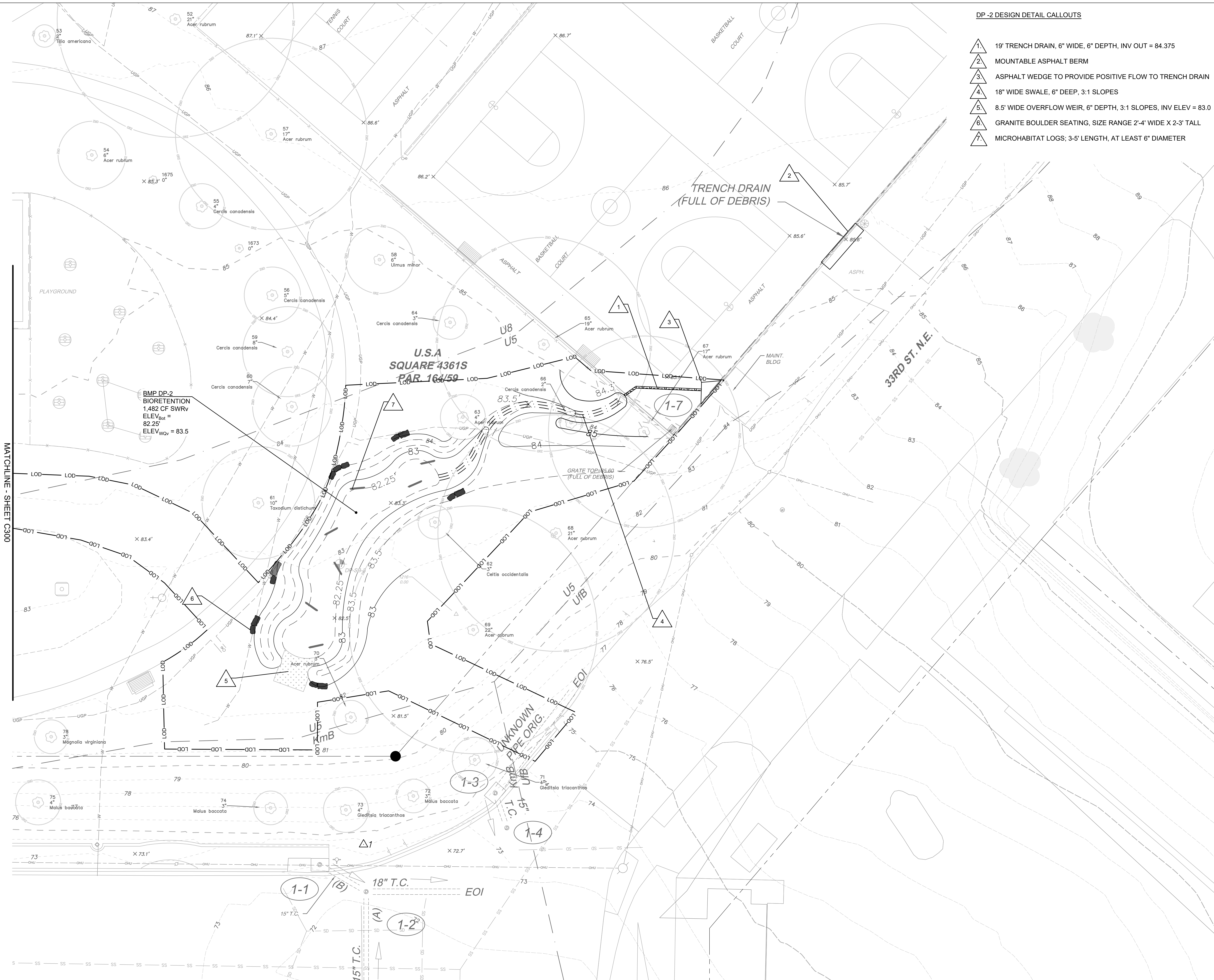
<b>TITLE: STORMWATER MANAGEMENT PLAN</b>	
PROJECT NO.: 23014.01	SCALE: 1"=10'
SEAL:	BY: EM/SF CHECK: BA
DWG. NO.:	C300

**STORMWATER MANAGEMENT PLAN NOTES:**

TYPE OF ACTIVITY:	UNREGULATED
DOB PERMIT:	xxx
DOES PERMIT:	xxx
SEWER AREA:	MS4
WATERSHED:	ANACOSTIA RIVER
SUBWATERSHED:	HICKEY RUN
AWDZ SITE (Y/N):	NO
100-YR FLOODPLAIN:	NO





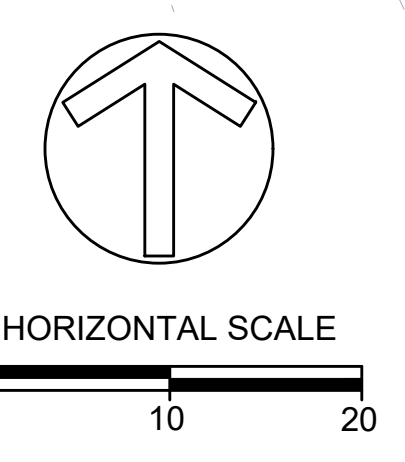


**DP-2 DESIGN DETAIL CALLOUTS**

- 1 19" TRENCH DRAIN, 6" WIDE, 6" DEPTH, INV OUT = 84.375
- 2 MOUNTABLE ASPHALT BERM
- 3 ASPHALT WEDGE TO PROVIDE POSITIVE FLOW TO TRENCH DRAIN
- 4 18" WIDE SWALE, 6" DEEP, 3:1 SLOPES
- 5 8.5' WIDE OVERFLOW WEIR, 6" DEPTH, 3:1 SLOPES, INV ELEV = 83.0
- 6 GRANITE BOULDER SEATING, SIZE RANGE 2'-4' WIDE X 2'-3' TALL
- 7 MICROHABITAT LOGS: 3'-5' LENGTH, AT LEAST 6" DIAMETER

**STORMWATER MANAGEMENT PLAN NOTES:**

TYPE OF ACTIVITY:	UNREGULATED
DOB PERMIT:	xxx
DOES PERMIT:	xxx
SEWER AREA:	MS4
WATERSHED:	ANACOSTIA RIVER
SUBWATERSHED:	HICKEY RUN
AWDZ SITE (Y/N):	NO
100-YR FLOODPLAIN:	NO



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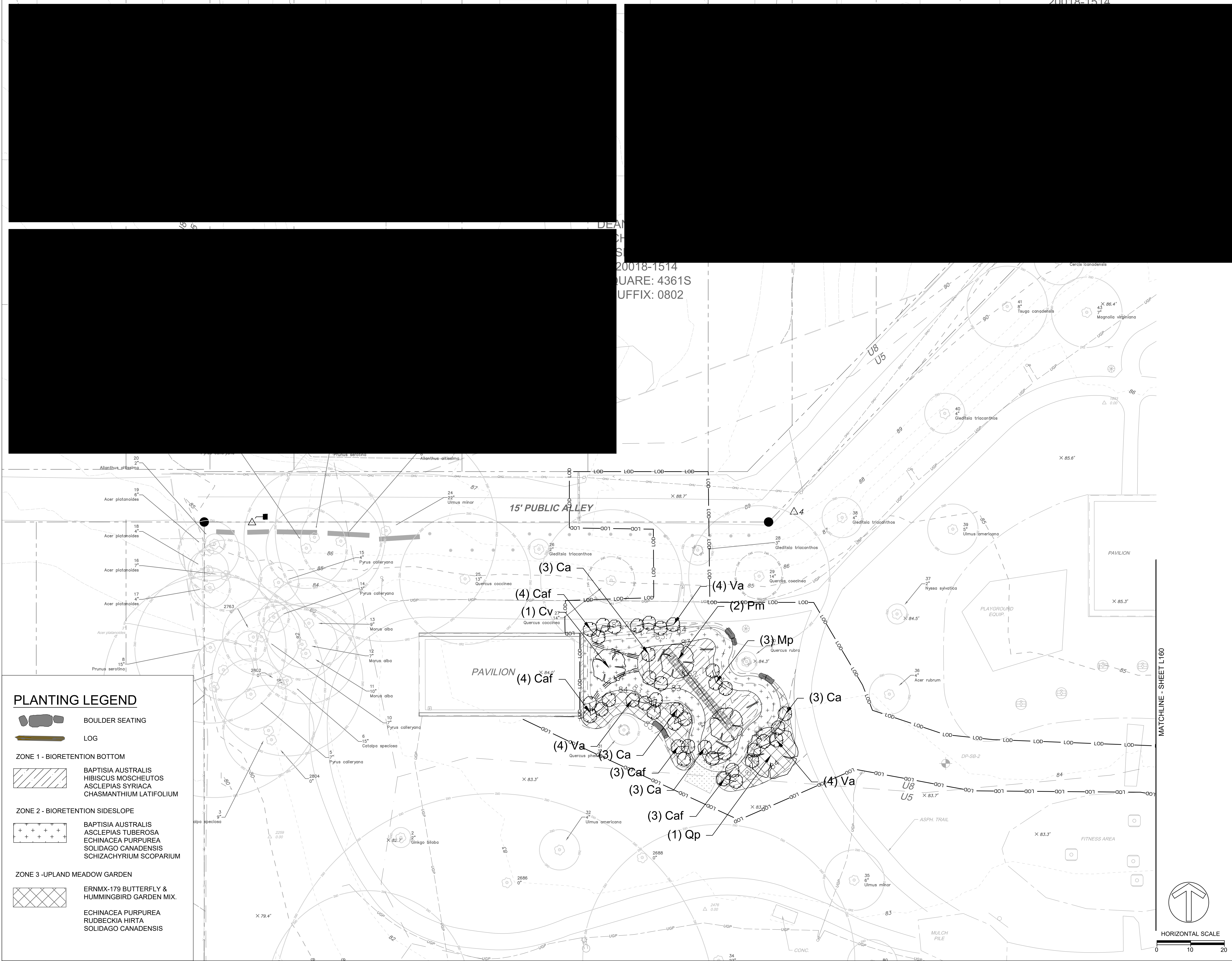
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**DAKOTA PARK LID RETROFITS**

<b>TITLE: STORMWATER MANAGEMENT PLAN</b>	
PROJECT NO.: 23014.01	SCALE: 1" = 10'
SEAL:	BY: EM/SF CHECK: BA
	DWG. NO.: C310

20018-1514  
 SQUARE: 4361S  
 SUFFIX: 0802



**PLANTING LEGEND**

- BOULDER SEATING
- LOG
- ZONE 1 - BIORETENTION BOTTOM**
  - BAPTISIA AUSTRALIS  
HIBISCUS MOSCHEUTOS  
ASCLEPIAS SYRIACA  
CHASMANTHIUM LATIFOLIUM
- ZONE 2 - BIORETENTION SIDESLOPE**
  - BAPTISIA AUSTRALIS  
ASCLEPIAS TUBEROSA  
ECHINACEA PURPUREA  
SOLIDAGO CANADENSIS  
SCHIZACHYRIUM SCOPARIUM
- ZONE 3 - UPLAND MEADOW GARDEN**
  - ERNMX-179 BUTTERFLY & HUMMINGBIRD GARDEN MIX.  
ECHINACEA PURPUREA  
RUDBECKIA HIRTA  
SOLIDAGO CANADENSIS

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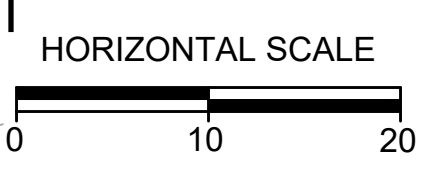
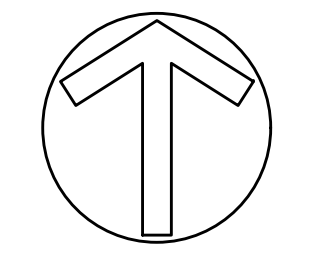


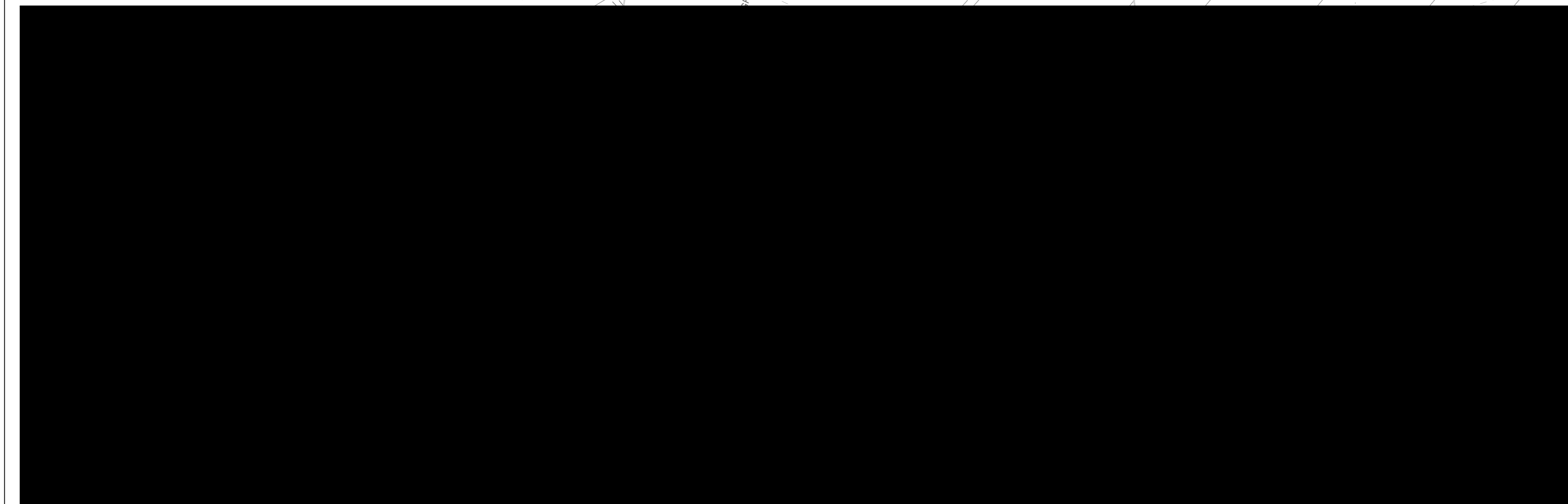
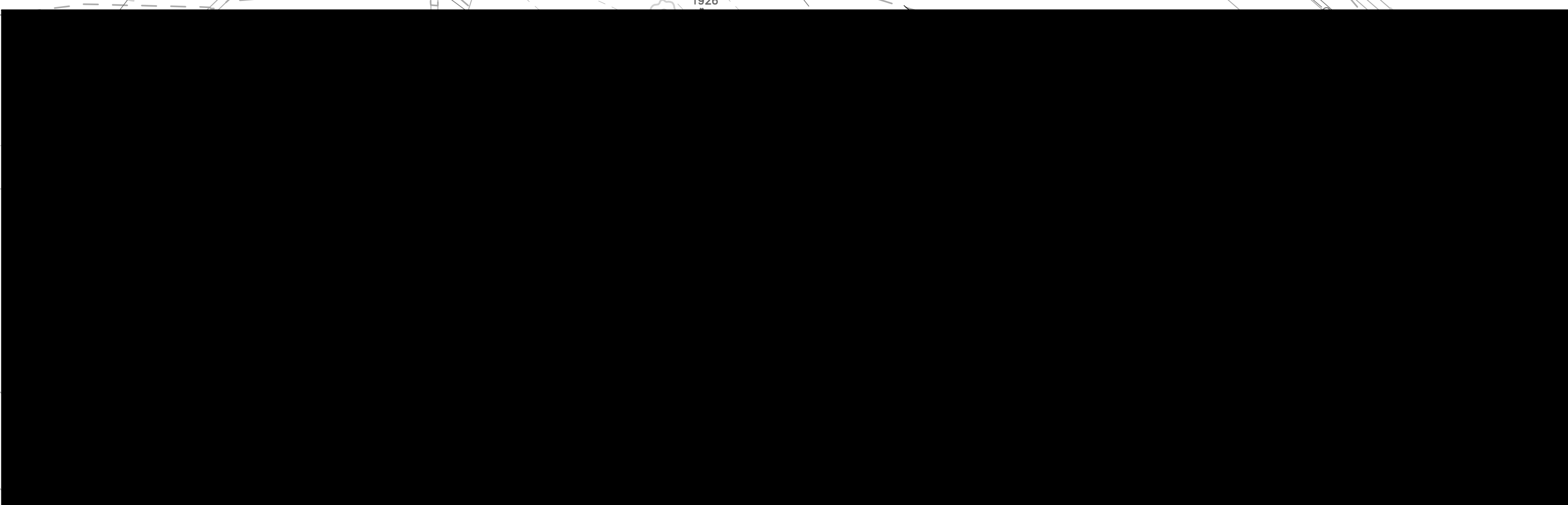
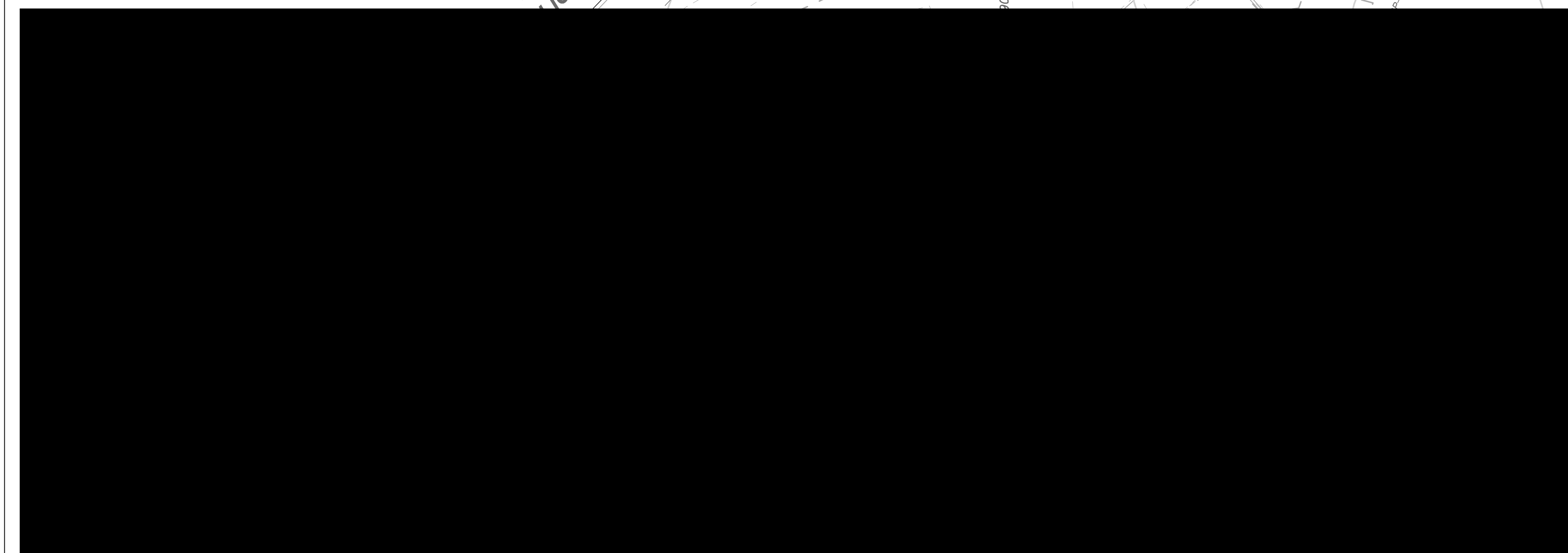
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**DAKOTA PARK LID RETROFITS**

**PLANTING PLAN**

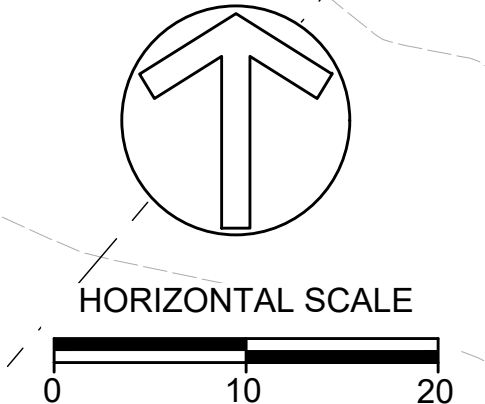
PROJECT NO.:	23014.01	SCALE:	1"=10'
SEAL:		BY:	EM/SF
		CHECK:	BA
		DWG. NO.:	L150





**PLANTING LEGEND**

- BOULDER SEATING
- LOG
- ZONE 1 - BIORETENTION BOTTOM**
  - BAPTISIA AUSTRALIS
  - HIBISCUS MOSCHEUTOS
  - ASCLEPIAS SYRIACA
  - CHASMANTHIUM LATIFOLIUM
- ZONE 2 - BIORETENTION SIDESLOPE**
  - BAPTISIA AUSTRALIS
  - ASCLEPIAS TUBEROSA
  - ECHINACEA PURPUREA
  - SOLIDAGO CANADENSIS
  - SCHIZACHYRIUM SCOPARIUM
- ZONE 3 - UPLAND MEADOW GARDEN**
  - ERNMX-179 BUTTERFLY & HUMMINGBIRD GARDEN MIX.
  - ECHINACEA PURPUREA
  - RUDBECKIA HIRTA
  - SOLIDAGO CANADENSIS



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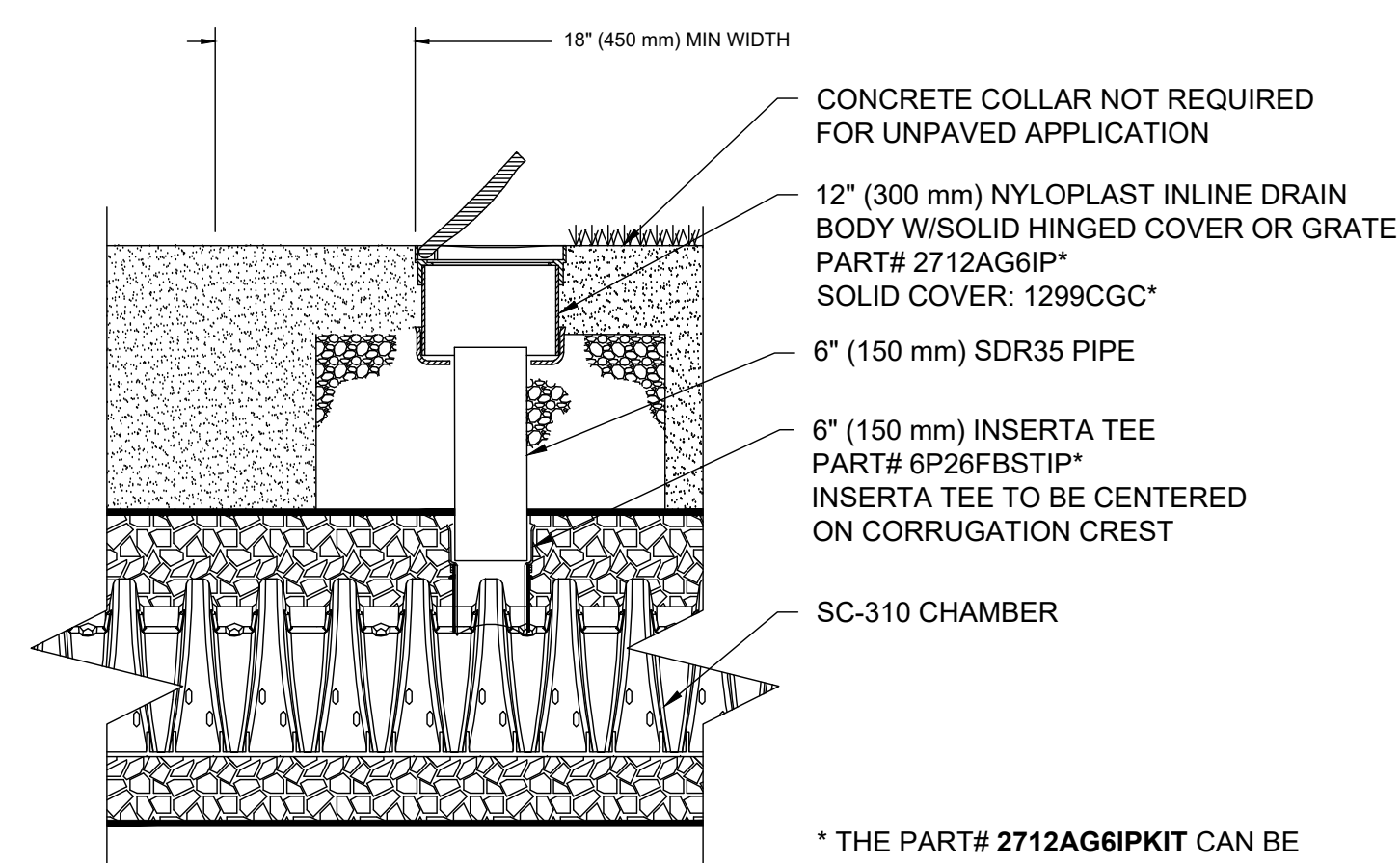
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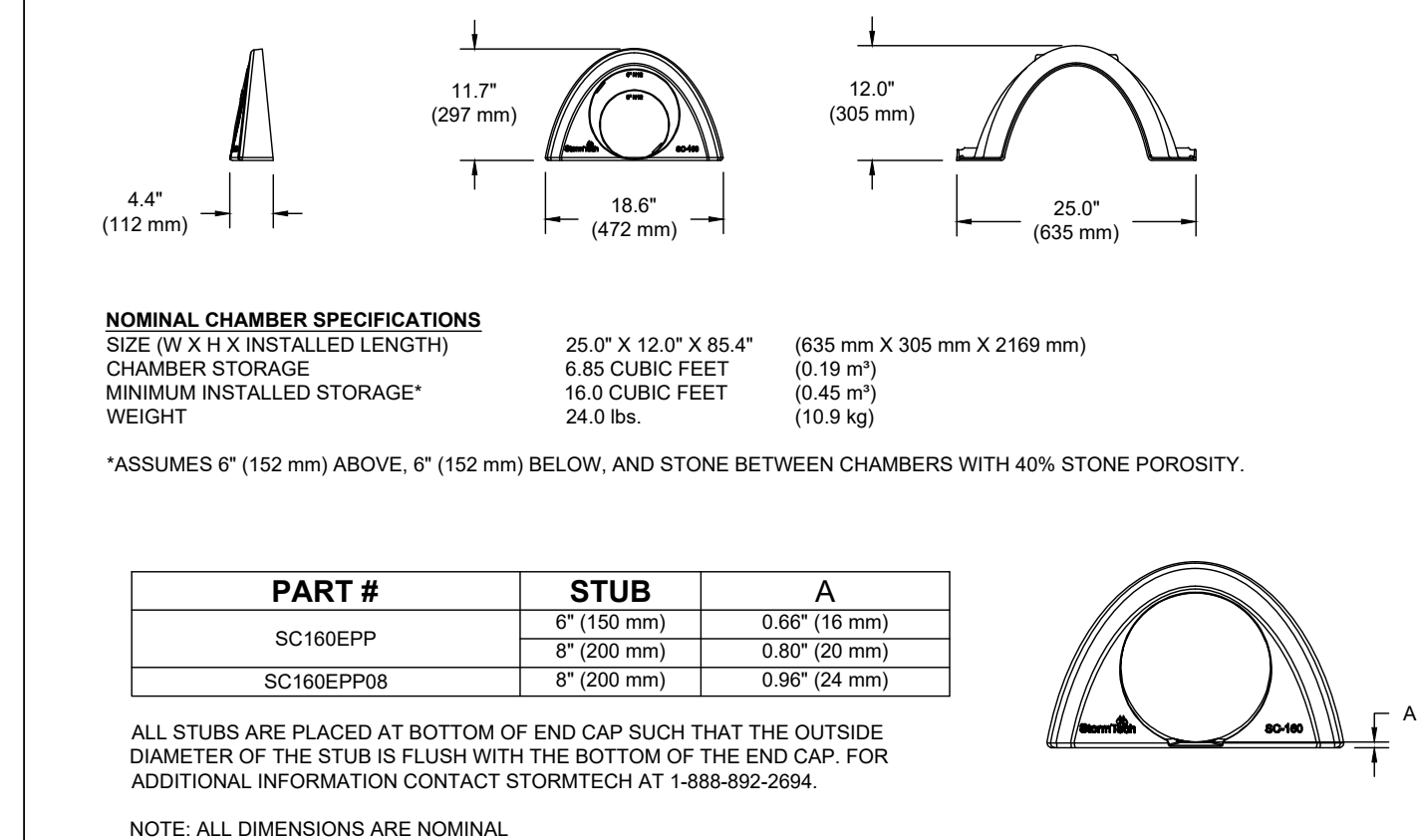
DAKOTA PARK LID RETROFITS

PLANTING PLAN

PROJECT NO.:	23014.01	SCALE:	1"=10'
SEAL:	BY: EM/SF	CHECK:	BA
DWG. NO.:	L160		



SC-310 6" (150 mm) INSPECTION PORT DETAIL  
NTS



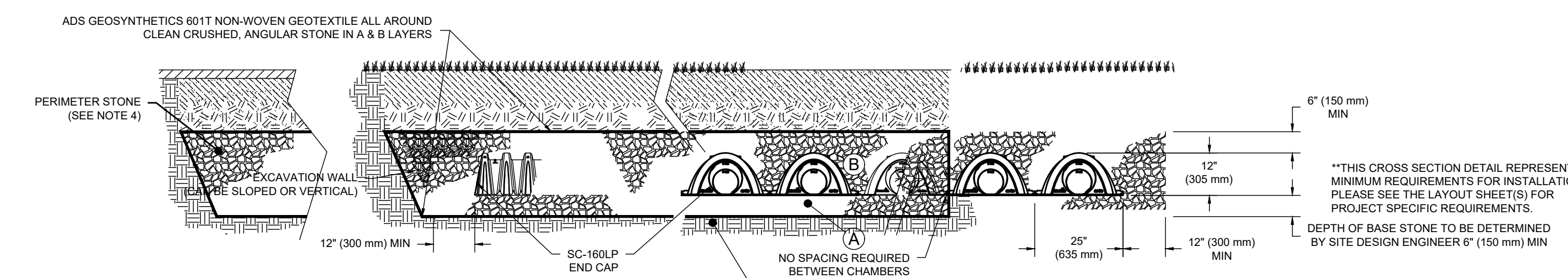
SC-160LP TECHNICAL SPECIFICATIONS

UNDERDRAIN DETAIL

ACCEPTABLE FILL MATERIALS: STORMTECH SC-160LP CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
B EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE LAYER TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 3, 397.4, 467.5, 56, 57	NO COMPACTION REQUIRED.
A FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 3, 397.4, 467.5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>

- PLEASE NOTE:
- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE."
  - STORMTECH COMPACTION REQUIREMENTS ARE MET FOR ALL LOCATIONS MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) MAX LIFTS USING TWO FULL COVERS WITH A VIBRATORY COMPACTOR.
  - WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
  - ONCE LAYER 'C' IS PLACED, ANY SOLID MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 1.5".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/IN. AND 3) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

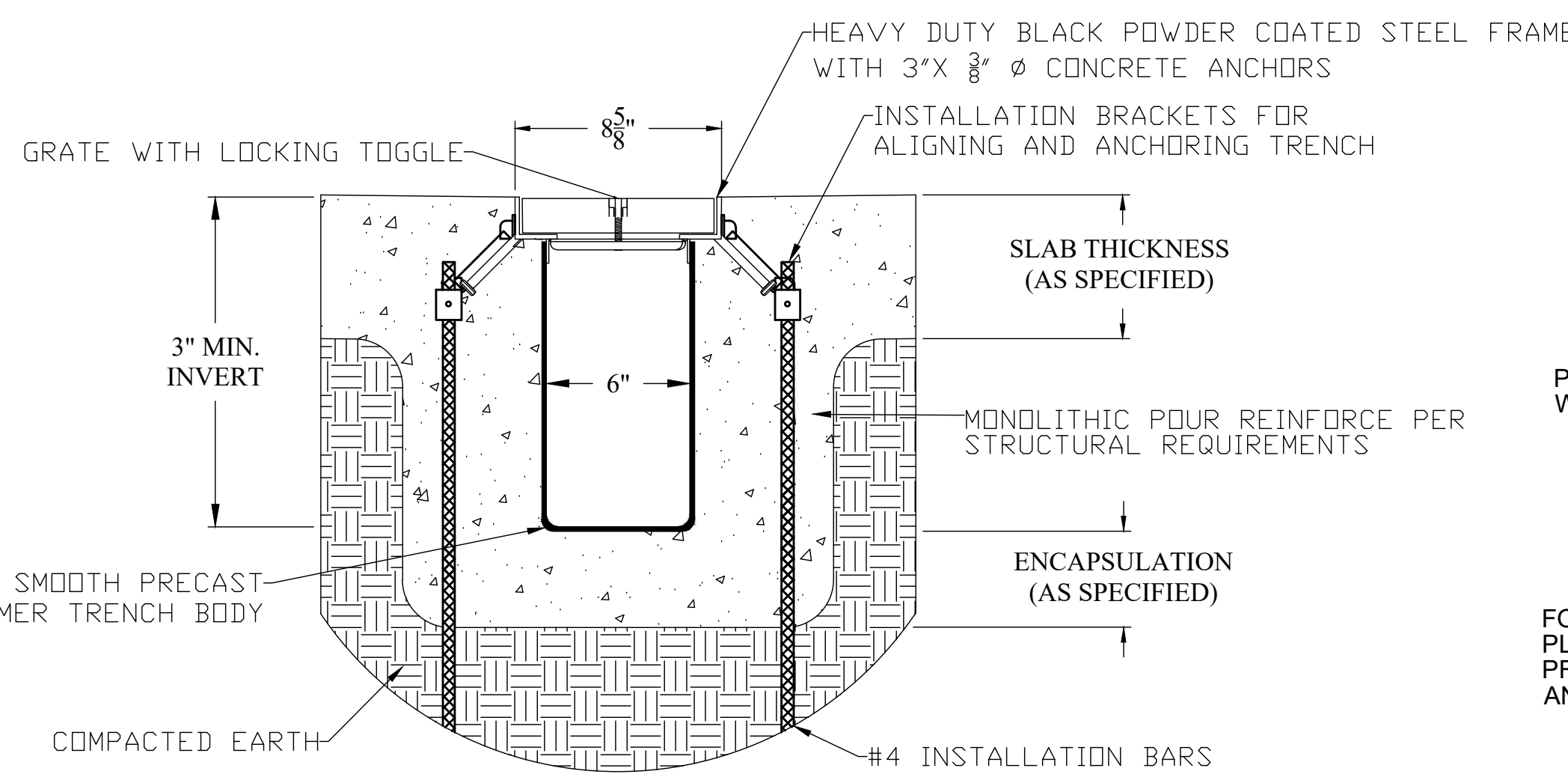
SC-160LP CROSS SECTION DETAIL

SC-160LP STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH SC-160LP.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LEB3 BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 1.5".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/IN. AND 3) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION BEFORE DESTRUCTIVE CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
  - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
  - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD. THE MINIMUM AND MAXIMUM FACTORS SHALL BE 12.0 OF THE AASHTO LEB3 BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
  - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-160LP SYSTEM

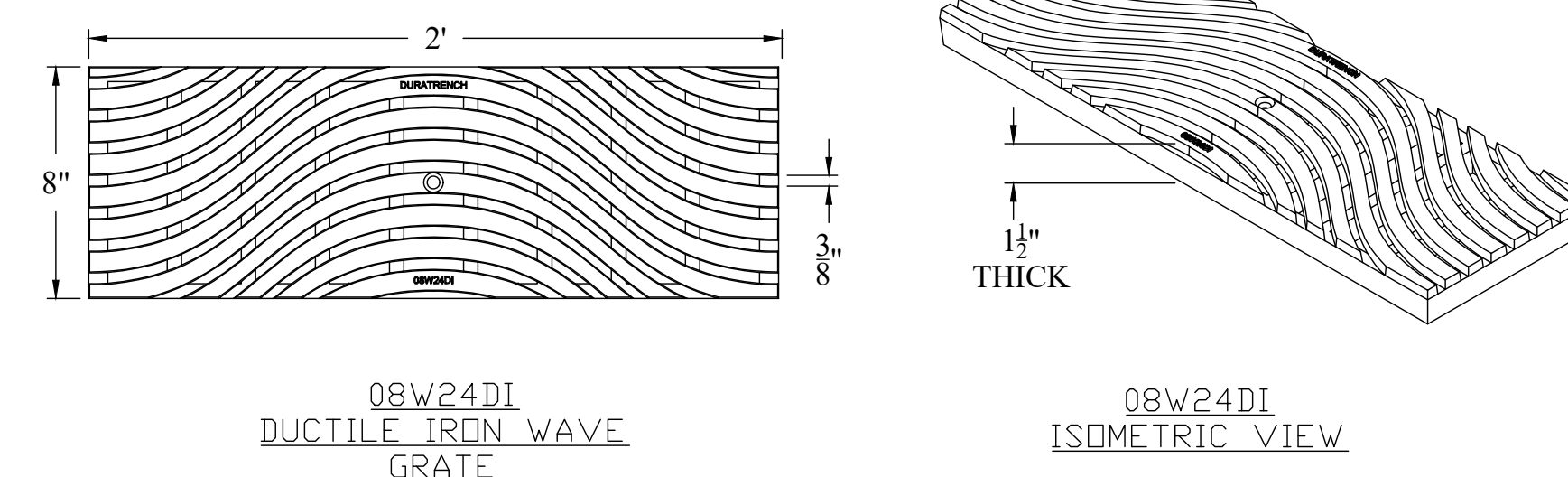
- STORMTECH SC-160LP CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
  - STORMTECH SC-160LP CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-160LP CONSTRUCTION GUIDE".
  - FOUNDATION STONE AND EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE: AASHTO M43 #3, 397.4, 467.5, 56, 57.
  - THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
  - THE DEPTH OF FOUNDATION STONE SHALL BE DETERMINED BASED ON THE SUBGRADE BEARING CAPACITY PROVIDED BY THE SITE DESIGN ENGINEER.
  - THE CONTRACTOR MUST REPORT ANY DISCREPANCIES CONCERNING CHAMBER FOUNDATION DESIGN AND SUBGRADE BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
  - JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
  - CHAMBERS SHALL BE INSTALLED "TOE TO TOE". NO ADDITIONAL SPACING BETWEEN ROWS IS REQUIRED.
  - STORMTECH RECOMMENDS 3 BACKFILL METHODS:
    - STONE/ROOTER LOCATED OFF THE CHAMBER BED.
    - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
    - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
  - ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.
- NOTES FOR CONSTRUCTION EQUIPMENT**
- THE USE OF CONSTRUCTION EQUIPMENT OVER SC-160LP CHAMBERS IS LIMITED:
    - NO EQUIPMENT IS ALLOWED ON THE CHAMBERS.
    - NO RUBBER Tired LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-160LP CONSTRUCTION GUIDE".
    - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-160LP CONSTRUCTION GUIDE".
  - FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.
- CONTACT STORMTECH AT 1-888-892-2684 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.



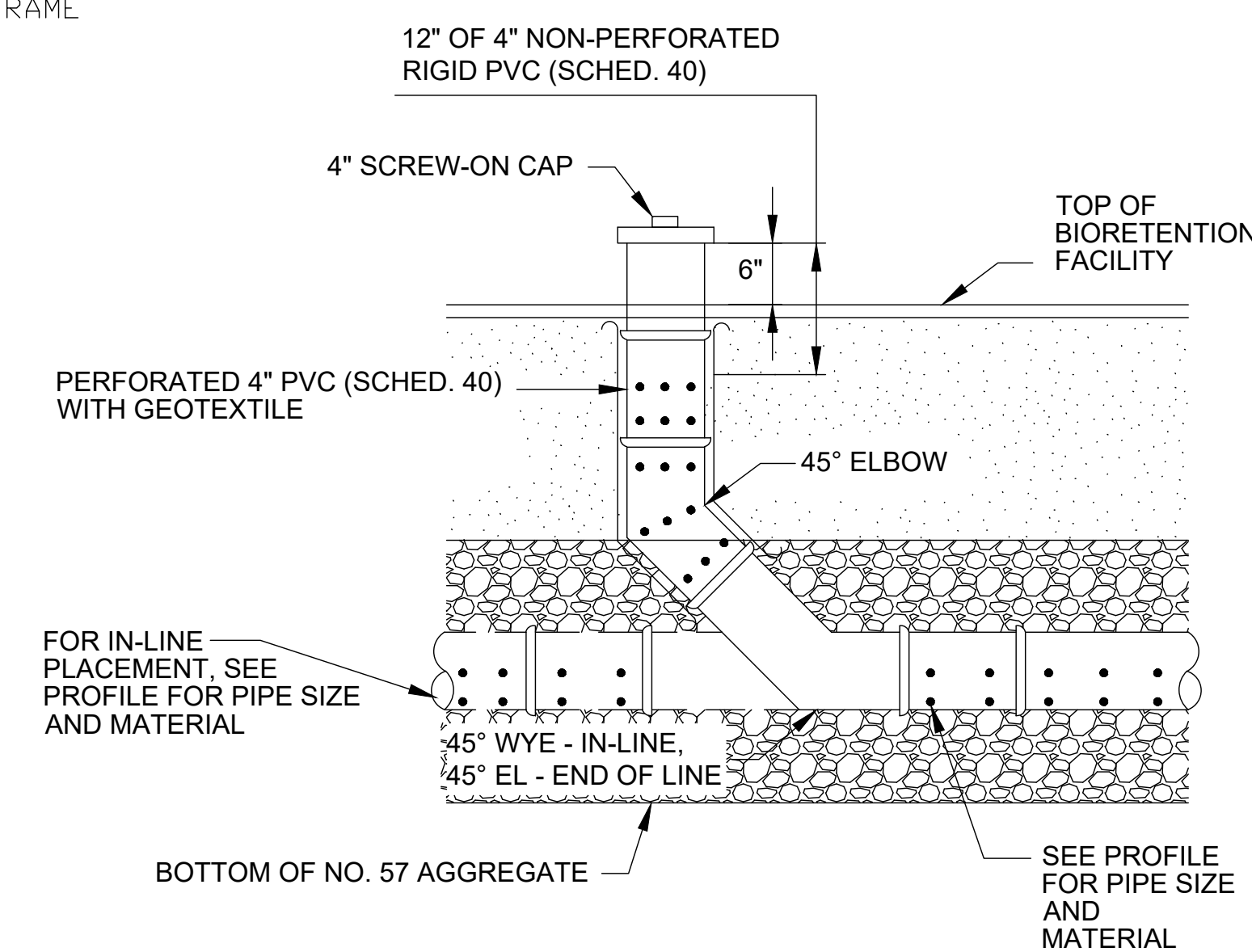
- NOTES:
- STANDARD SLOPE IS 0.5% UNLESS OTHERWISE SPECIFIED
  - REINFORCE ACCORDING TO STRUCTURAL REQUIREMENTS
  - TRENCH DRAIN MUST BE 3/8" BELOW FINISHED CONCRETE GRADE

TYPICAL DTRPF6-HDBPR15TSA (RADIUS) TRENCH SECTION

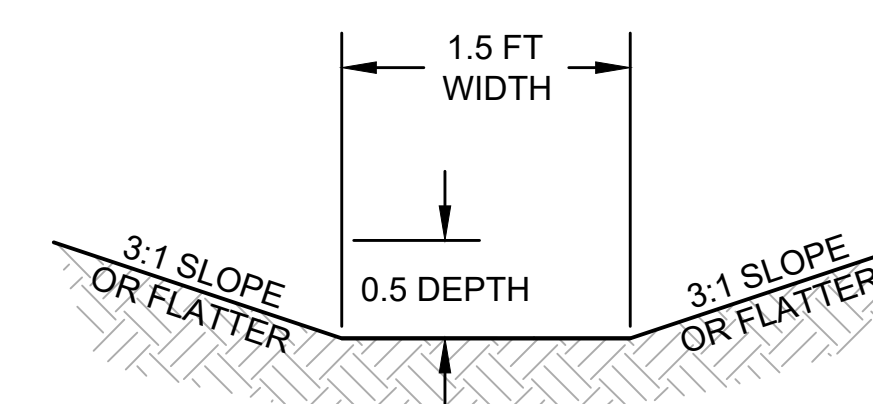
- NOTES:
- GRATE MATERIAL IS DUCTILE IRON 65-45-12
  - GRATES ARE LOAD CLASS E
  - GRATES ARE ADA COMPLIANT AND HEEL PROOF
  - GRATES ARE E-COATED BLACK



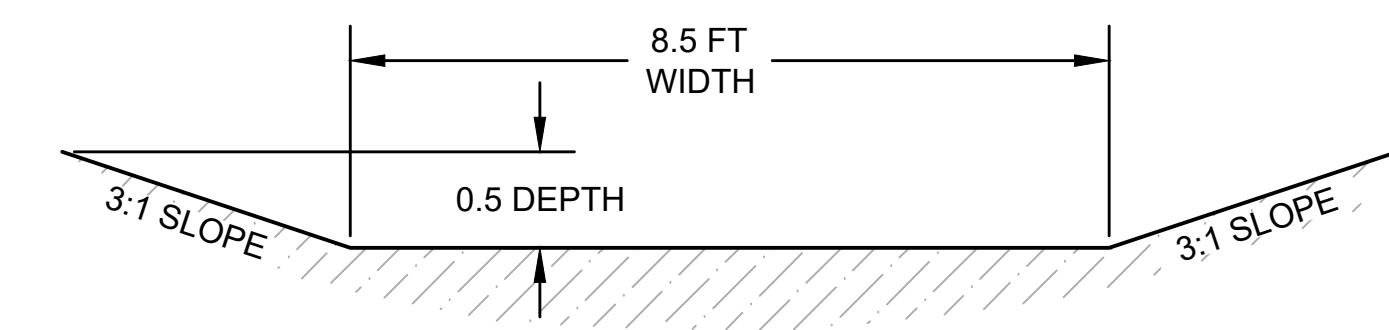
6" TRENCH DRAIN AND GRATE



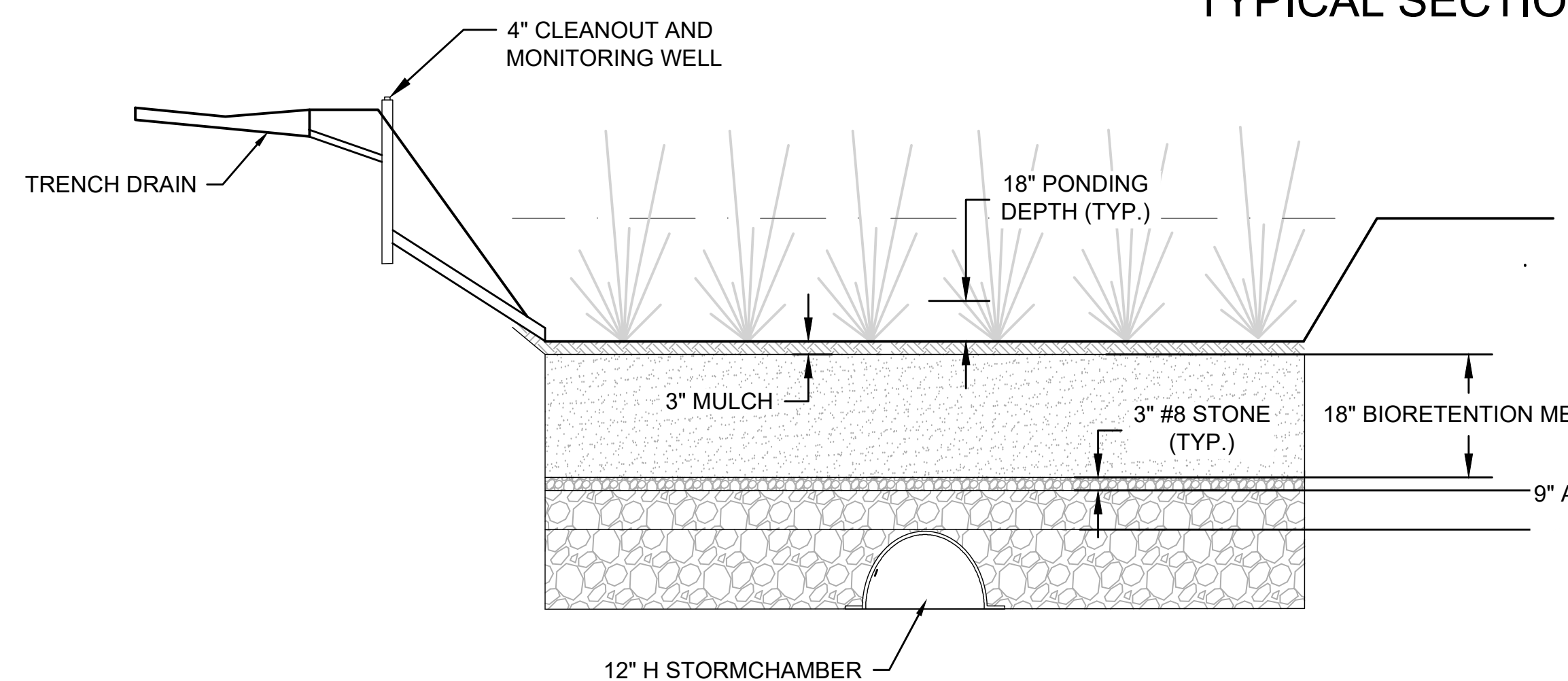
4" CLEANOUT AND MONITORING WELL DETAIL



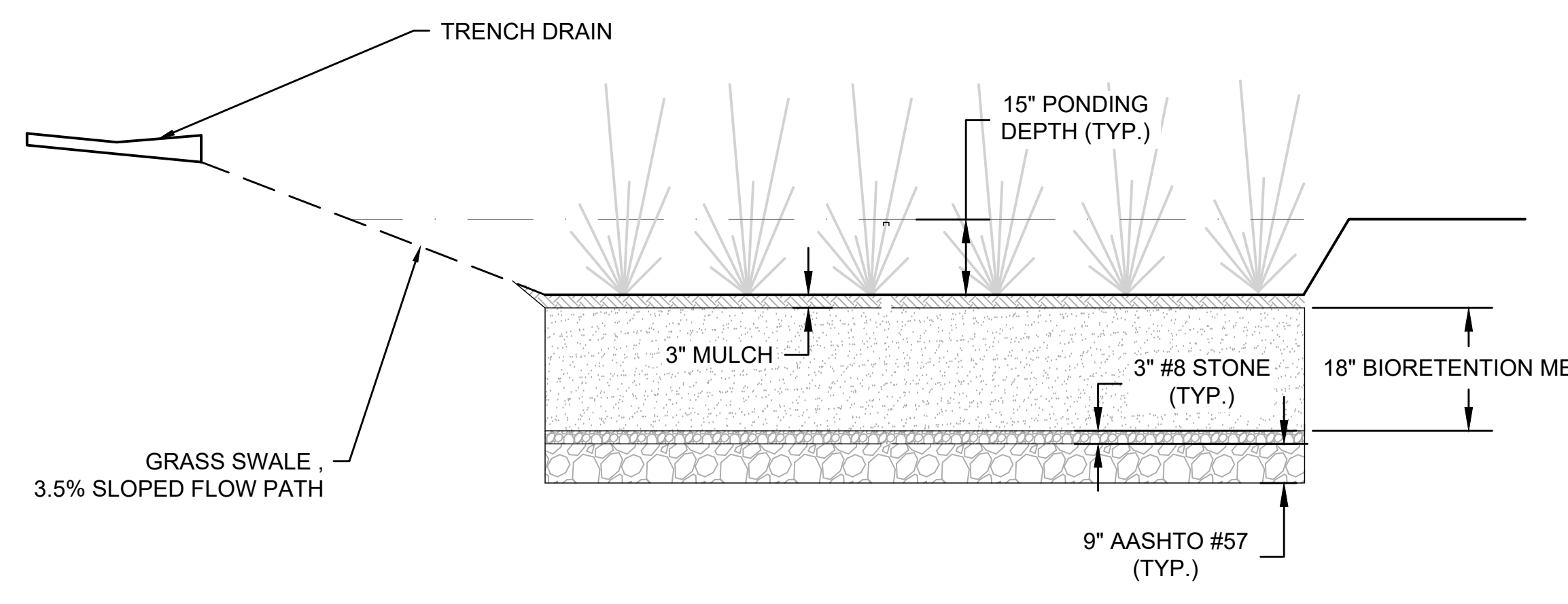
GRASS SWALE TYPICAL SECTION



OVERFLOW WEIR TYPICAL SECTION



BIORETENTION DP-1 TYPICAL SECTION



BIORETENTION DP-2 TYPICAL SECTION

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DATE	ISSUES / REVISIONS
02/21/2023	30% CONCEPT DESIGNS
01/05/2024	60% SEMI-FINAL DESIGNS

60% SEMI-FINAL DESIGN

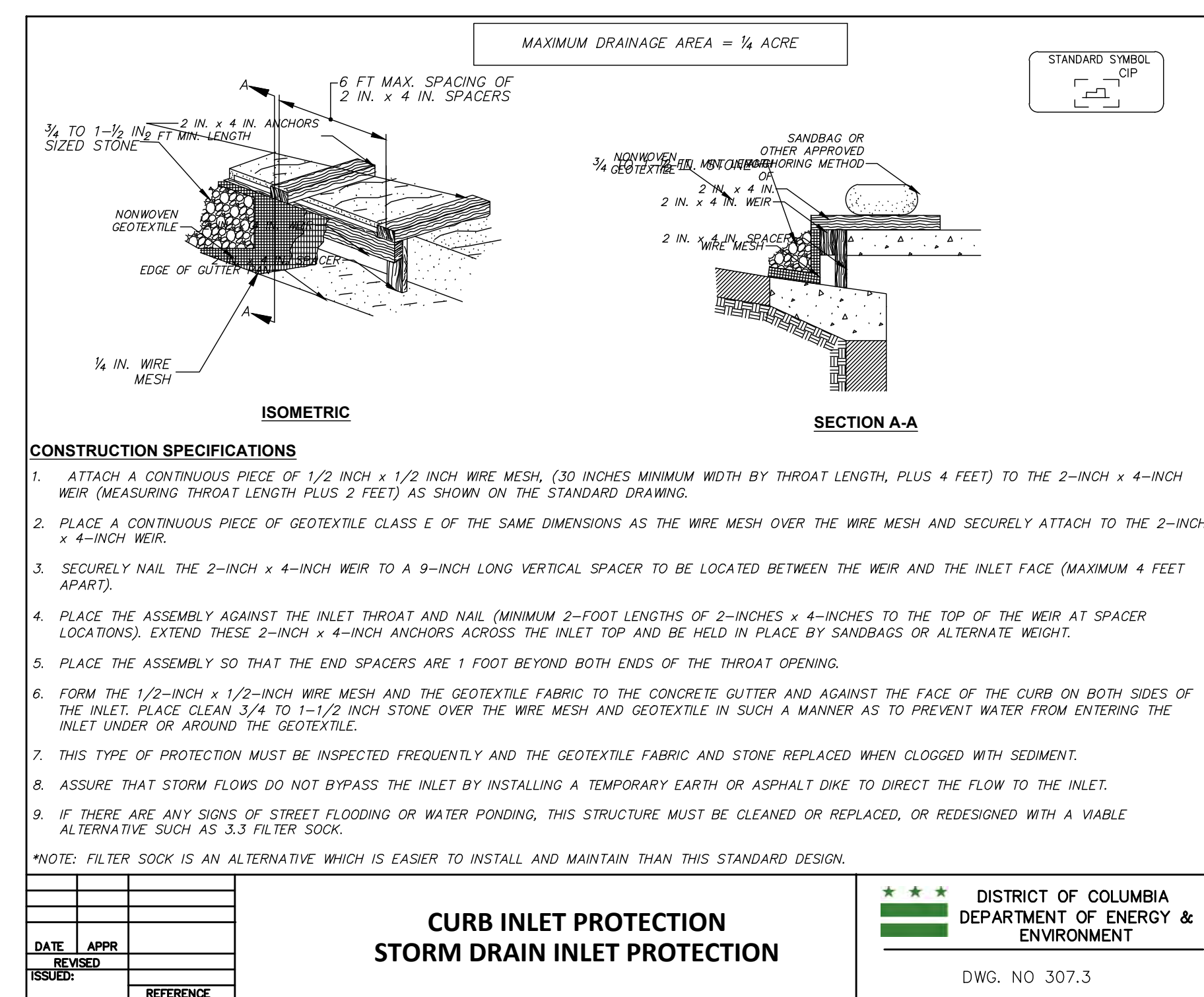
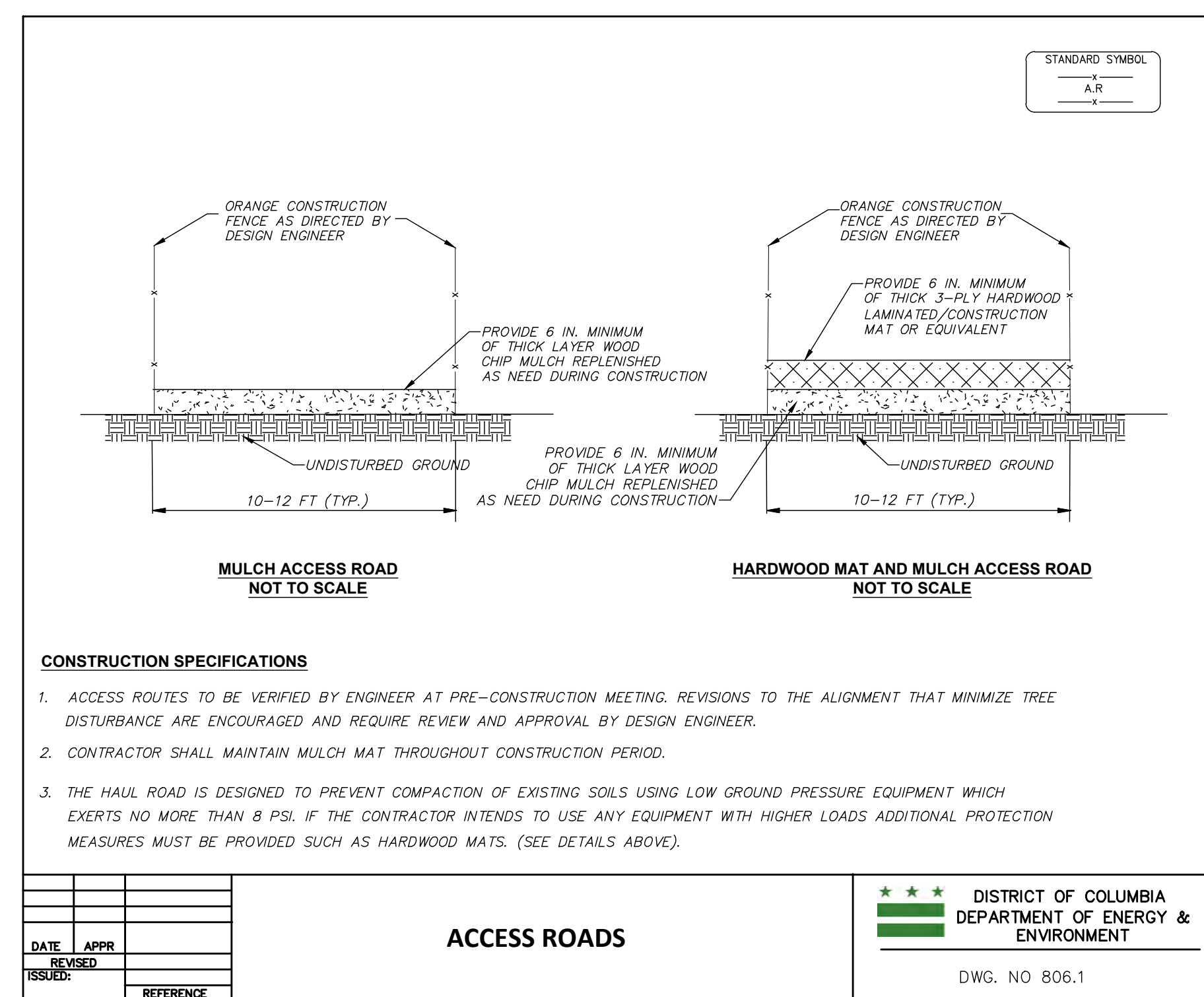
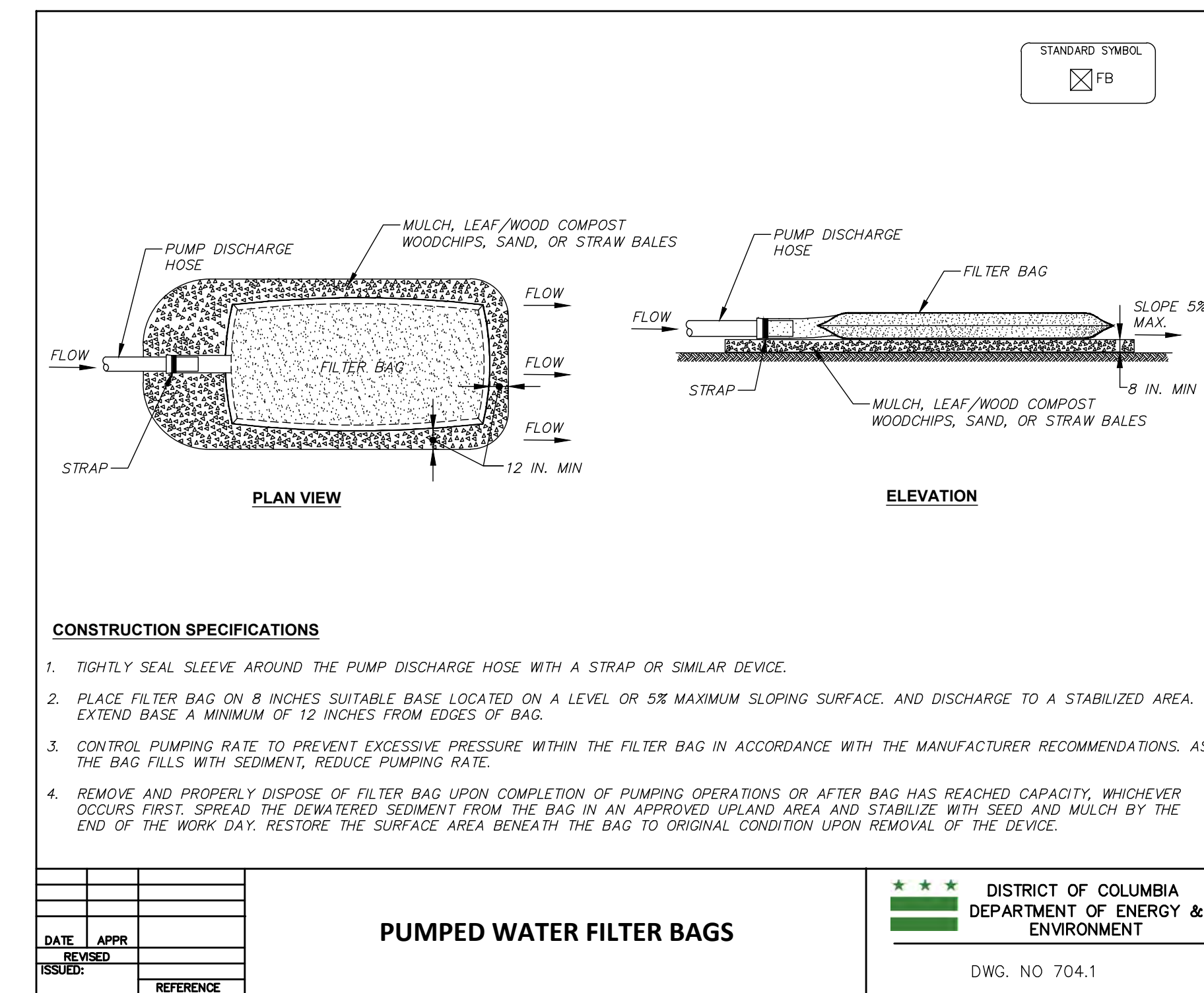
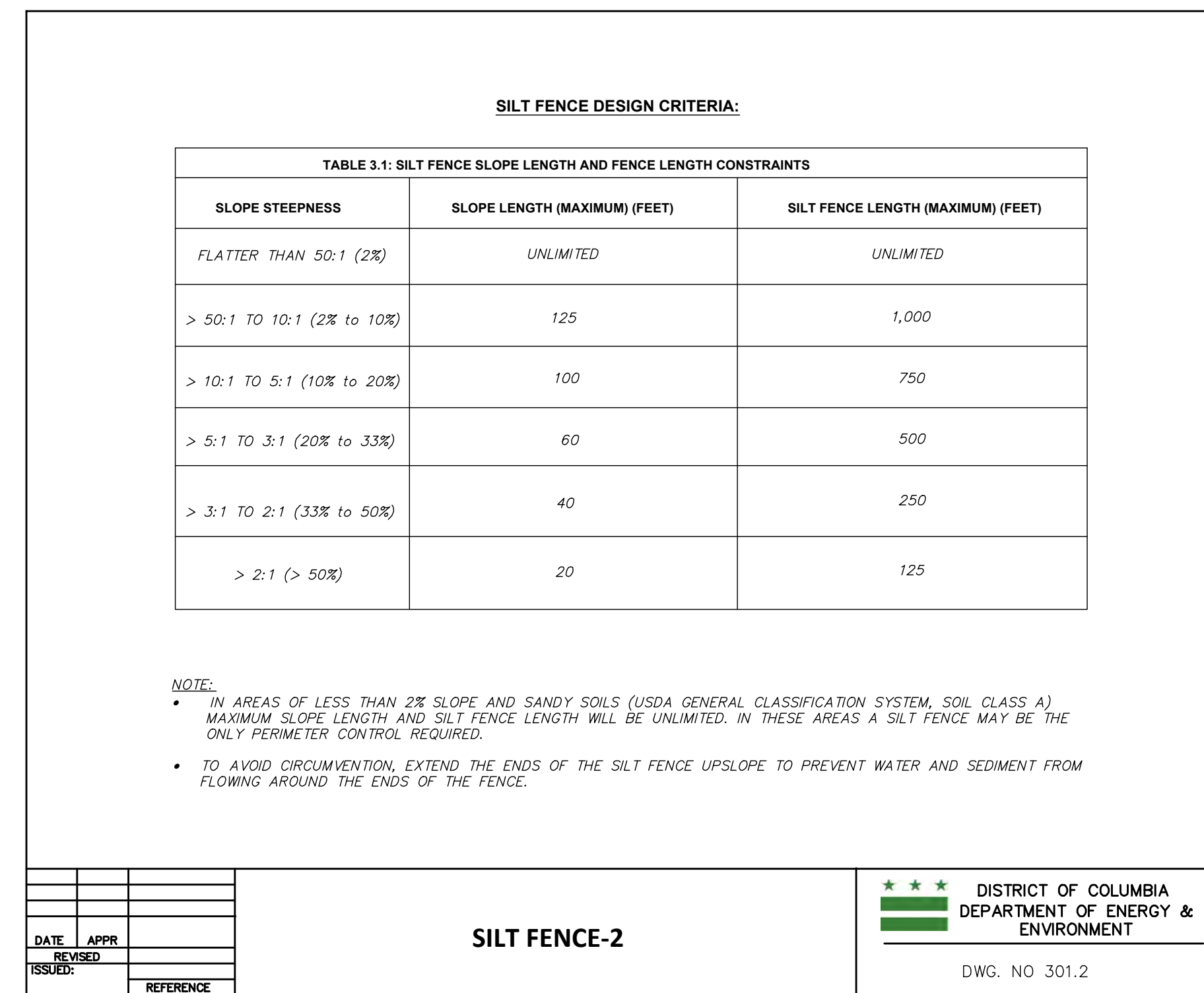
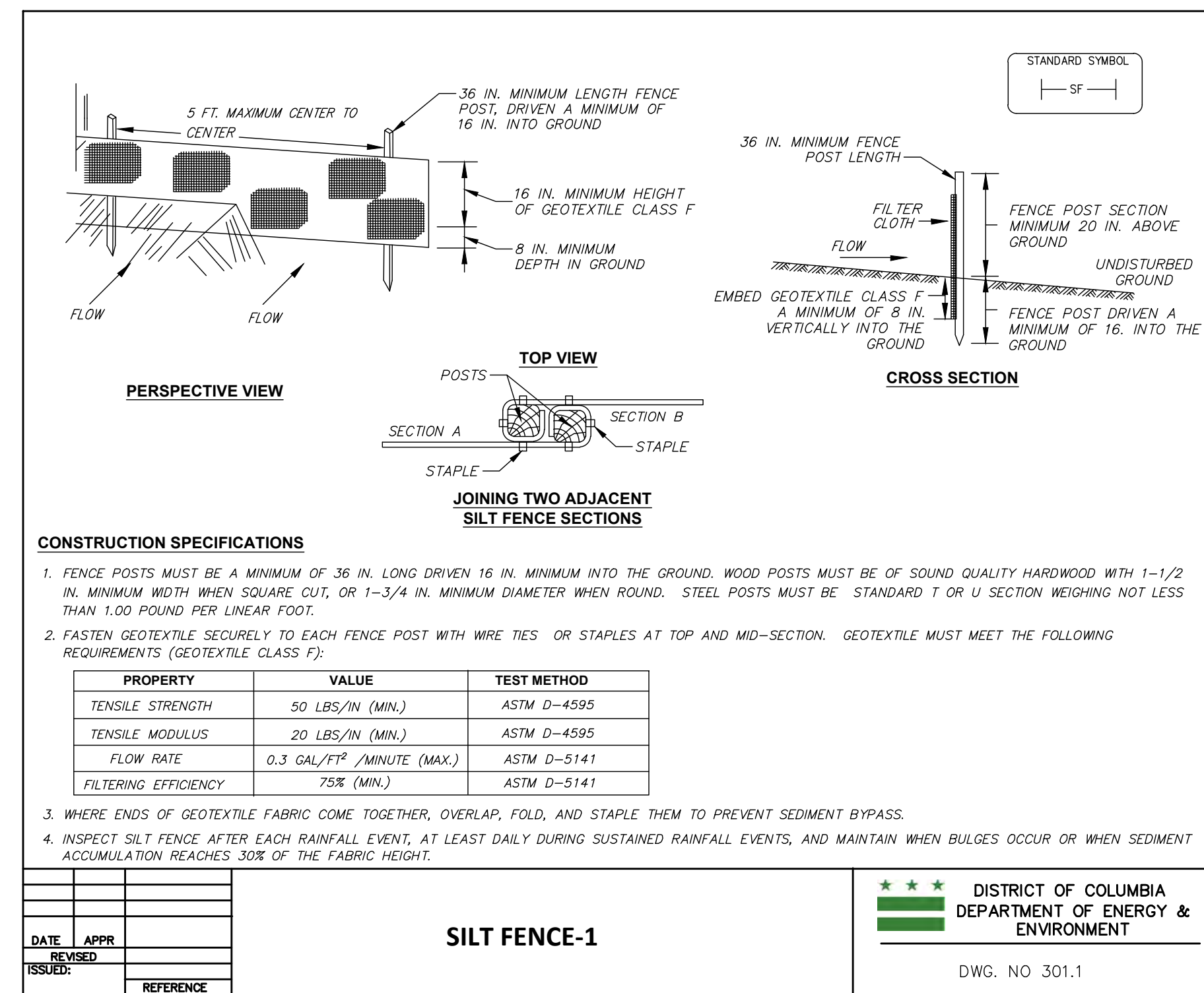
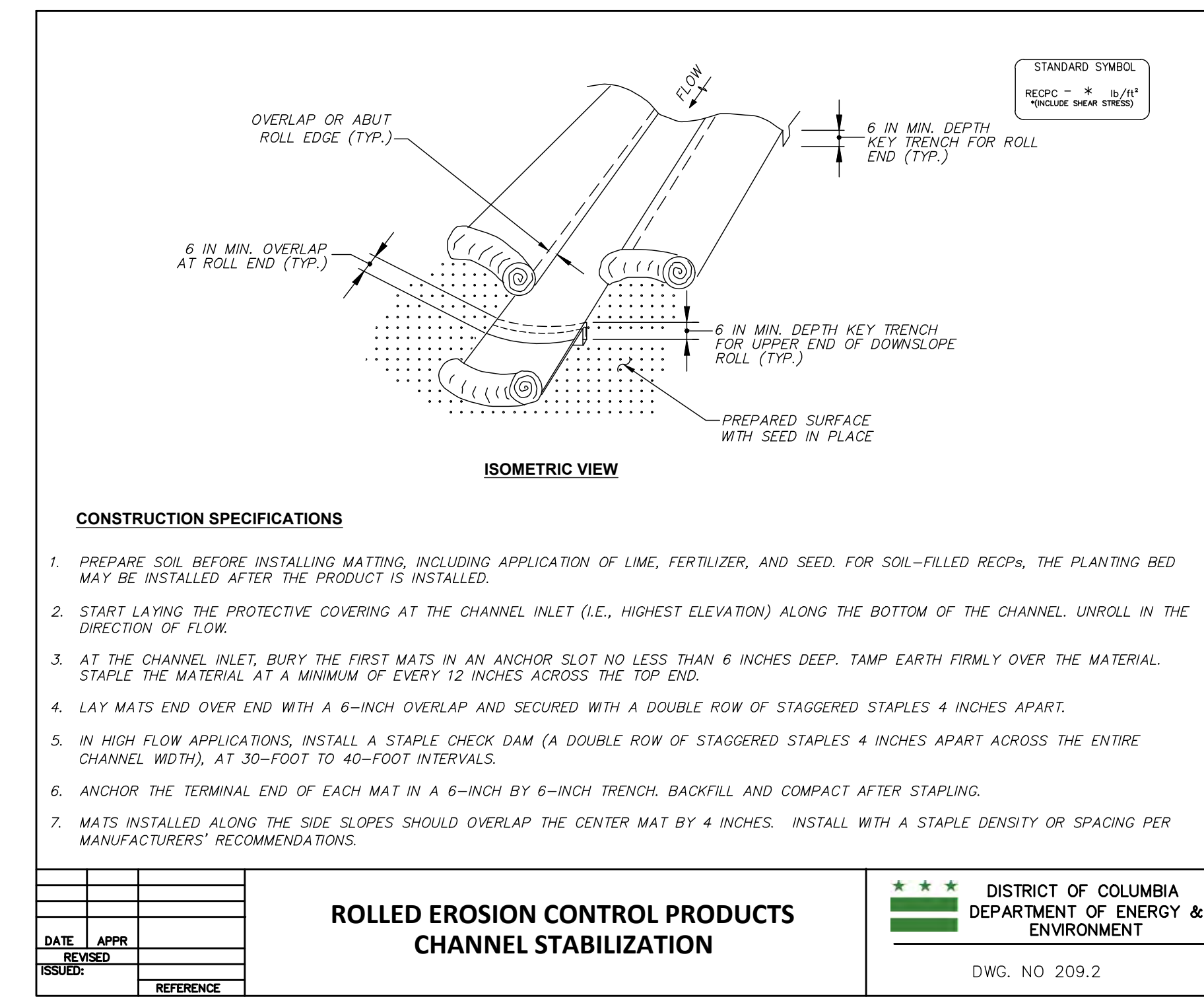
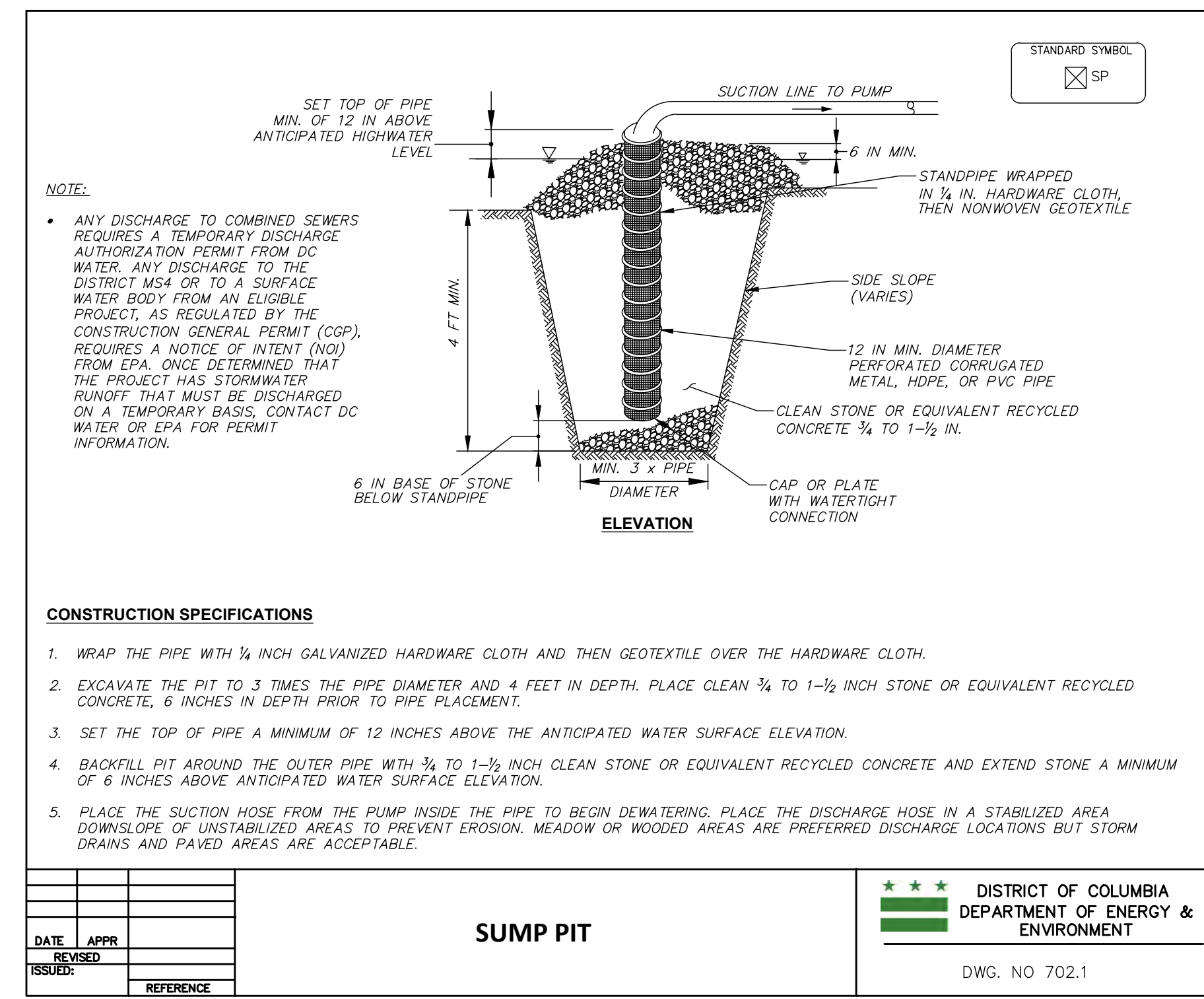
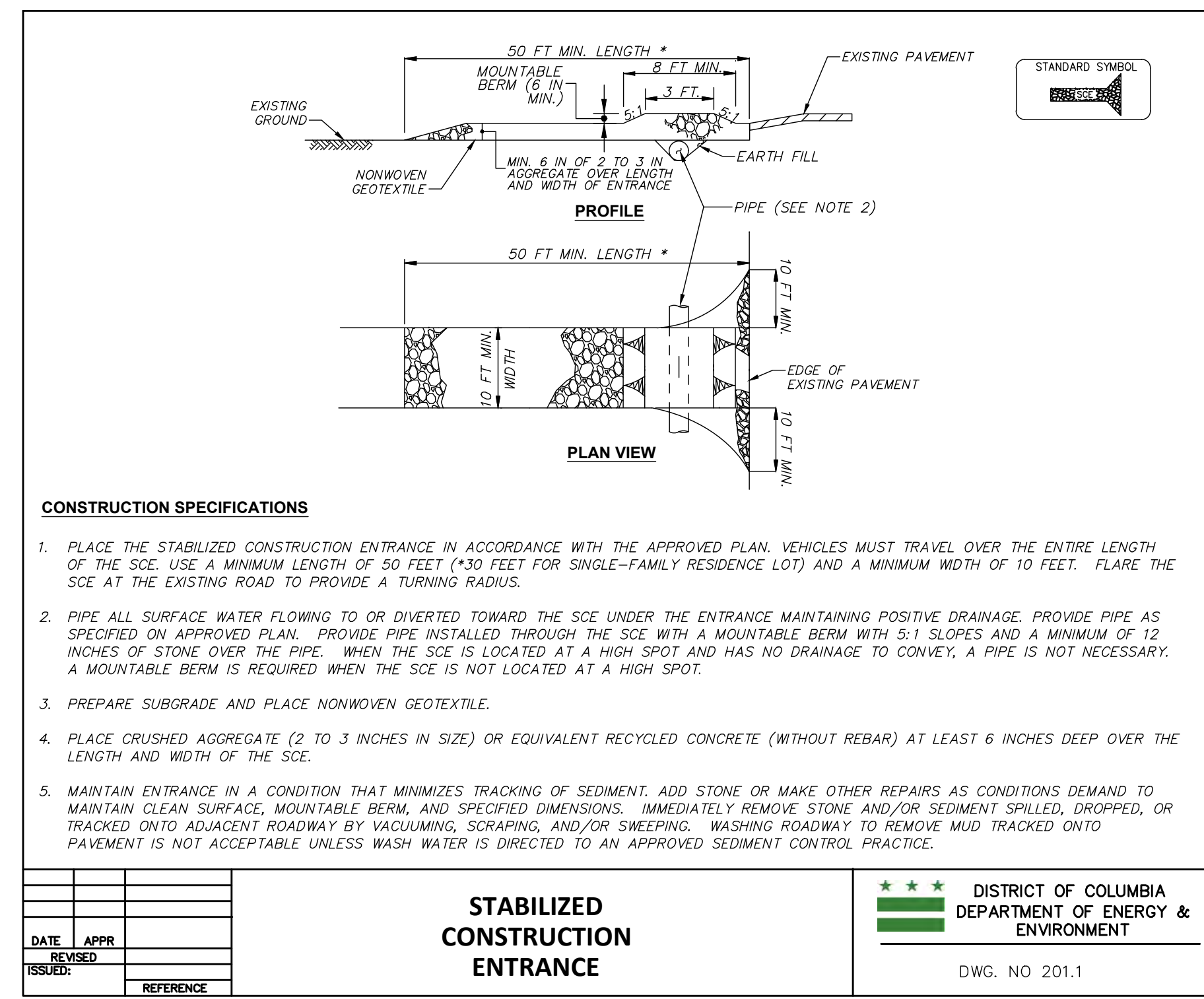
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DAKOTA PARK LID RETROFITS

TITLE:		SCALE:	
DETAILS		NTS	
PROJECT NO.:	23014.01	SCALE:	NTS
SEAL:		BY:	EM/5F
		CHECK:	BA
		DWG. NO.:	C500



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DEPARTMENT OF ENERGY AND ENVIRONMENT  
GOVERNMENT OF THE DISTRICT OF COLUMBIA, 1200 FIRST ST. NE 5TH FLOOR, WASHINGTON DC, 20002



DATE	ISSUES / REVISIONS
02/21/2023	30% CONCEPT DESIGNS
01/05/2024	60% SEMI-FINAL DESIGNS

**60% SEMI-FINAL DESIGN**

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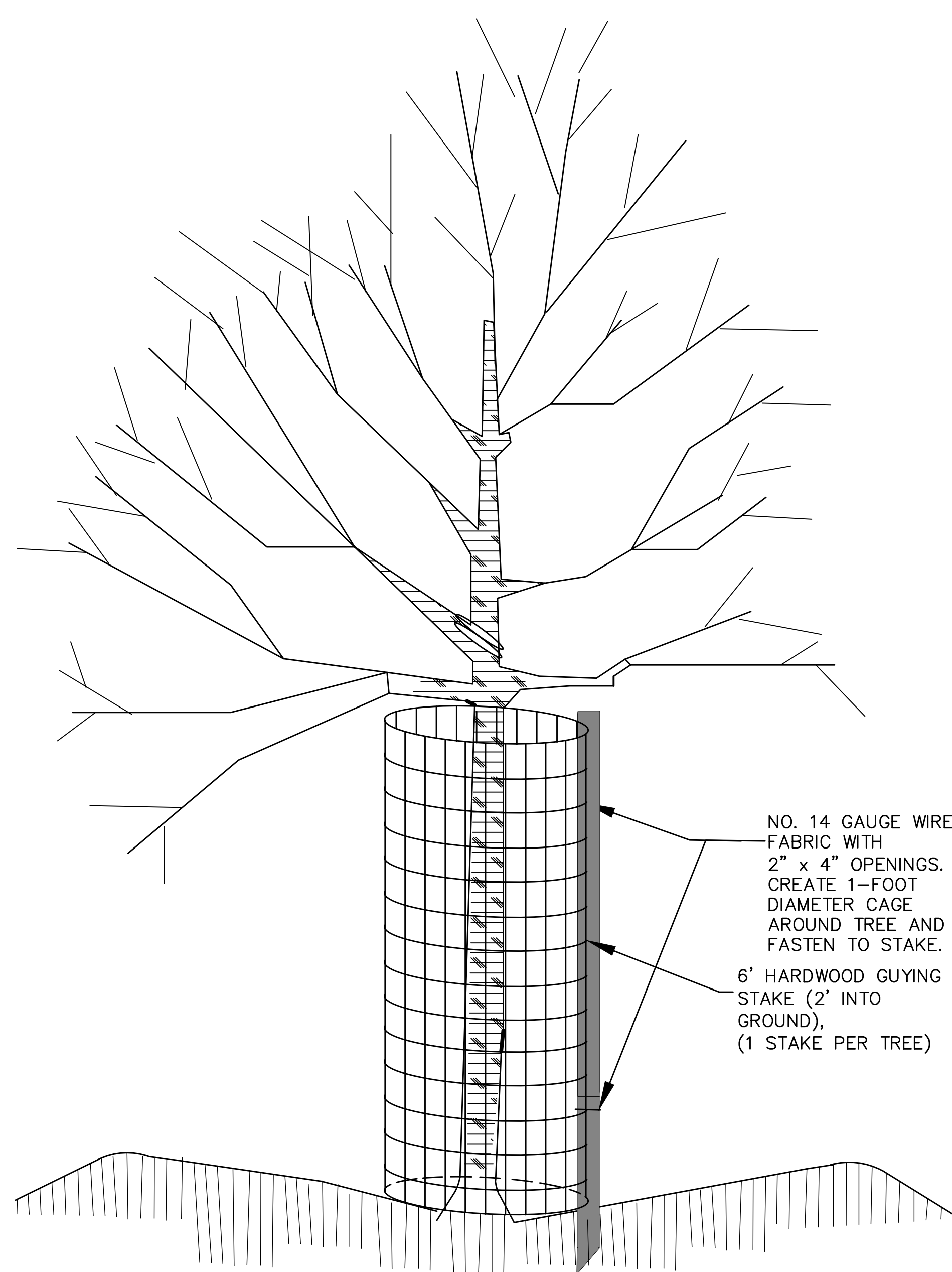
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**DAKOTA PARK LID RETROFITS**

**ESC DETAILS**

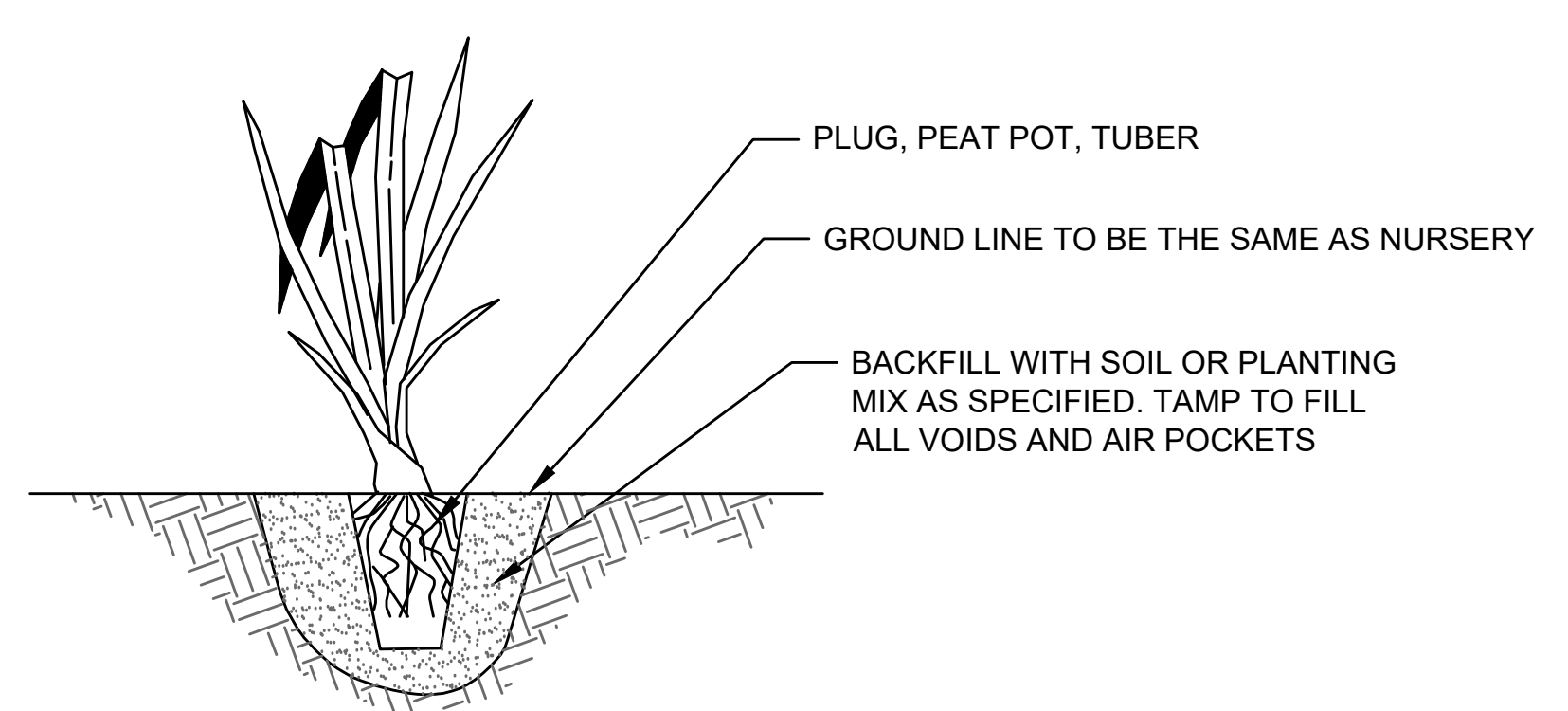
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SEAL:	BY: EM/ISF CHECK: BA	DWG. NO.:	

C510

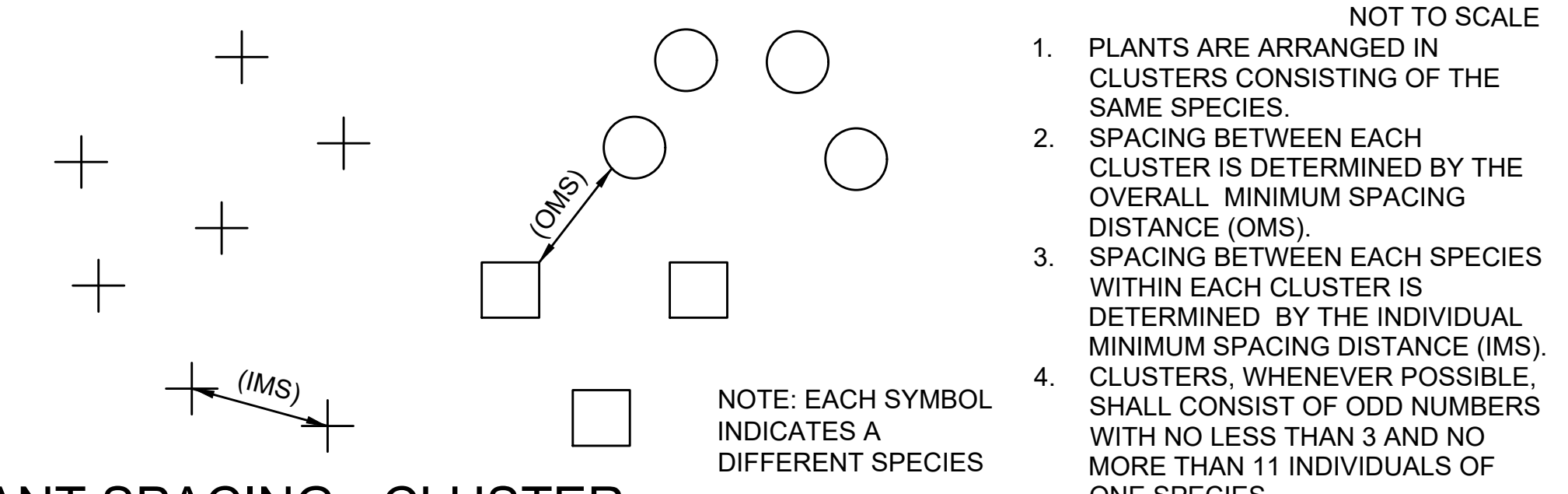


- NOTES:
1. DEER PROTECTION CAGES TO BE INSTALLED AROUND ALL PLANTED TREES AND SHRUB CLUSTERS AS DIRECTED BY LANDSCAPE ARCHITECT.
  2. HEIGHT OF CAGE SHALL BE 4-FEET (MIN.)
  3. CAGE SHALL BE FASTENED TO STAKE WITH TWO (MIN.) 11-INCH RELEASABLE CABLE TIES (ONE AT TOP AND ONE 6" (MIN.) ABOVE THE GROUND.
  4. DO NOT DAMAGE TREE DURING INSTALLATION.
  5. DEER BARK PROTECTORS (ITEM #bg48, BY A.M. LEONARD, OR EQUAL) MAY BE SUBSTITUTED FOR TREES GREATER THAN 3/4" CALIPER. ALL OTHER SUBSTITUTIONS MUST BE APPROVED BY FOREST ECOLOGIST.
  6. CAGES TO BE REMOVED AT DIRECTION OF FOREST ECOLOGIST.
  7. ENSURE CAGE IS SECURE TO GROUND TO PREVENT UPLIFT BY DEER.

**DEER PROTECTION CAGE** NOT TO SCALE

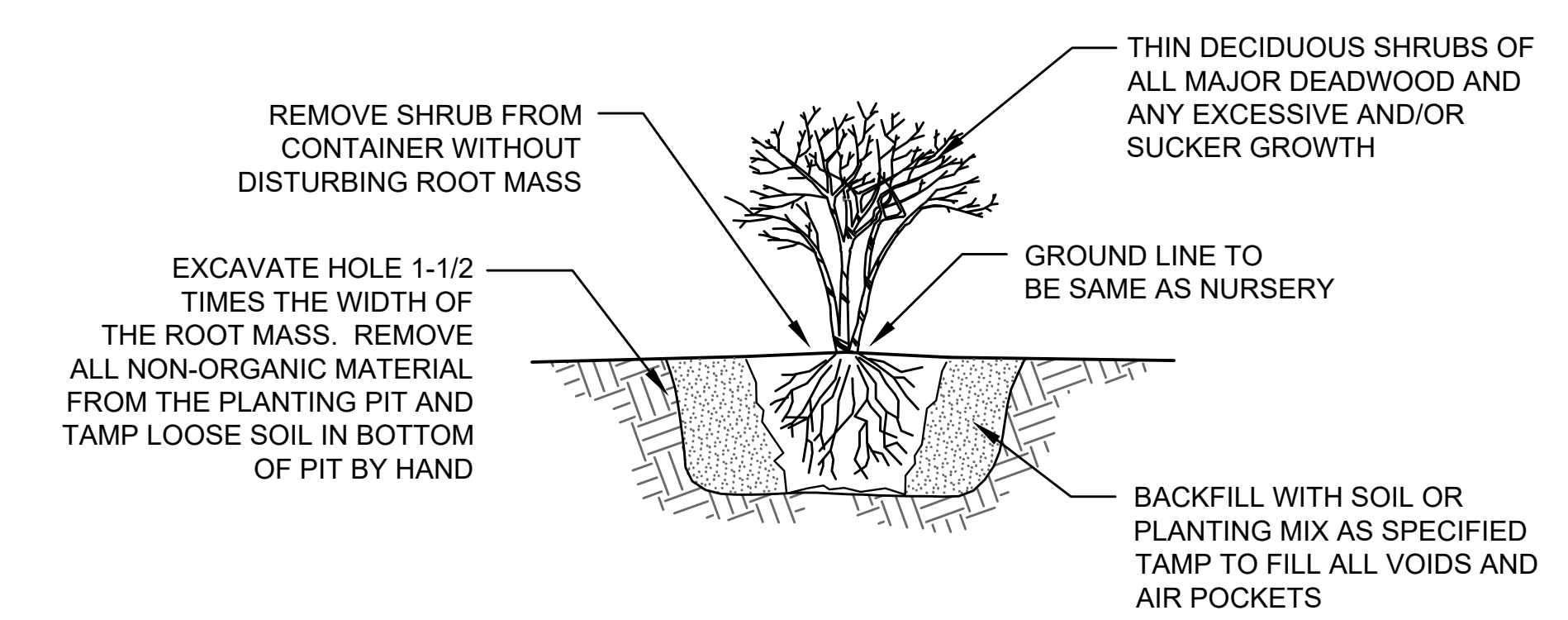


**HERBACEOUS PLANTING - QUARTS**

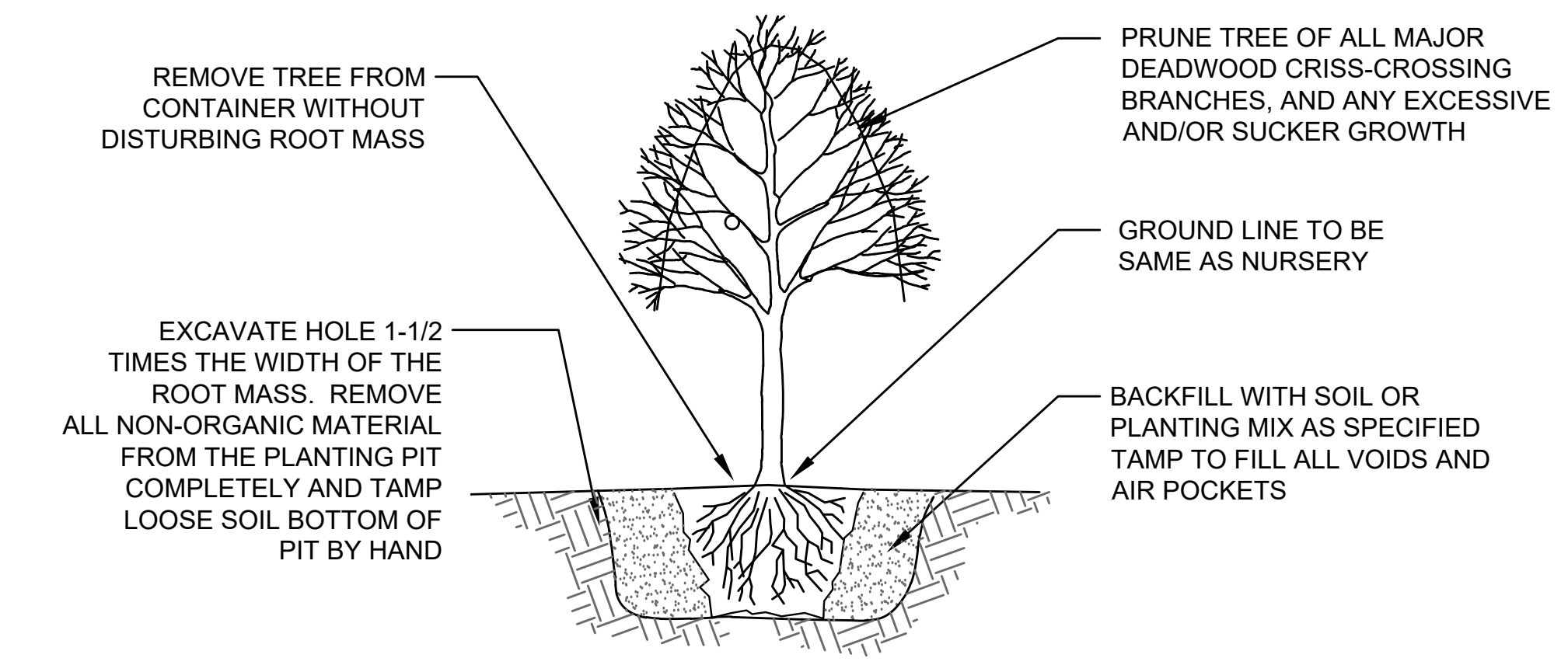


**PLANT SPACING - CLUSTER** NOT TO SCALE

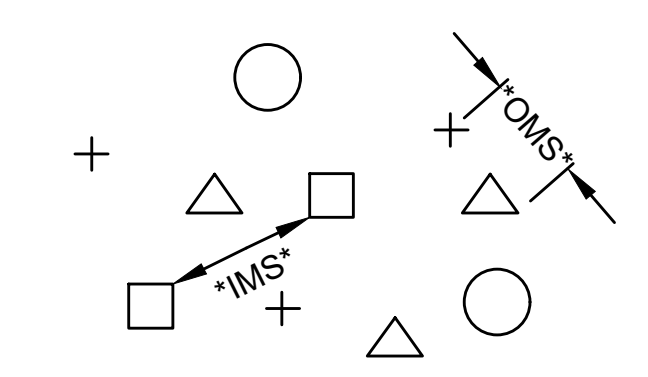
- NOT TO SCALE
1. PLANTS ARE ARRANGED IN CLUSTERS CONSISTING OF THE SAME SPECIES.
  2. SPACING BETWEEN EACH CLUSTER IS DETERMINED BY THE OVERALL MINIMUM SPACING DISTANCE (OMS).
  3. SPACING BETWEEN EACH SPECIES WITHIN EACH CLUSTER IS DETERMINED BY THE INDIVIDUAL MINIMUM SPACING DISTANCE (IMS).
  4. CLUSTERS, WHENEVER POSSIBLE, SHALL CONSIST OF ODD NUMBERS WITH NO LESS THAN 3 AND NO MORE THAN 11 INDIVIDUALS OF ONE SPECIES.
- NOTE: EACH SYMBOL INDICATES A DIFFERENT SPECIES



**SHRUB PLANTING - CONTAINER GROWN** NOT TO SCALE



**TREE PLANTING - CONTAINER GROWN** NOT TO SCALE



- OMS- AN OVERALL MINIMUM SPACING DISTANCE "OMS" IS ASSIGNED TO THE PLANTING CONFIGURATION "SEE PLANT SCHEDULE"
- IMS- AN INDIVIDUAL MINIMUM SPACING DISTANCES "IMS" IS ASSIGNED TO EACH INDIVIDUAL SPECIES "SEE PLANT SCHEDULE"

**PLANT SPACING - RANDOM** NOT TO SCALE

**PLAN VIEW**

NOTE: EACH SYMBOL INDICATES A DIFFERENT SPECIES

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**60% SEMI-FINAL DESIGN**

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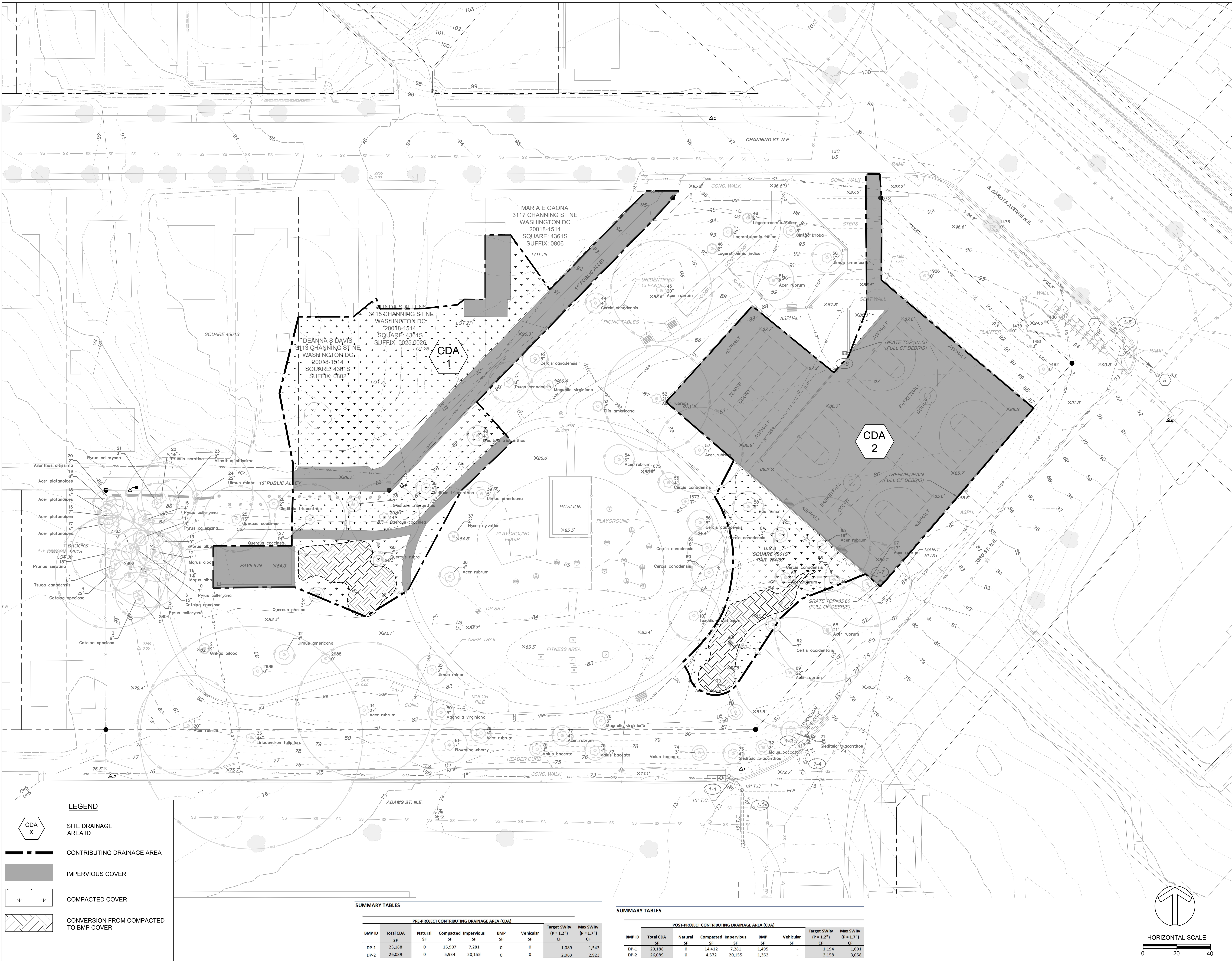
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**DAKOTA PARK LID RETROFITS**

**PLANTING DETAILS**

PROJECT NO. : 23014.01	SCALE: NTS
SEAL:	BY: EM/ISF CHECK: BA
DWG. NO. : C530	



**LEGEND**

- SITE DRAINAGE AREA ID
- CONTRIBUTING DRAINAGE AREA
- IMPERVIOUS COVER
- COMPACTED COVER
- CONVERSION FROM COMPACTED TO BMP COVER

**SUMMARY TABLES**

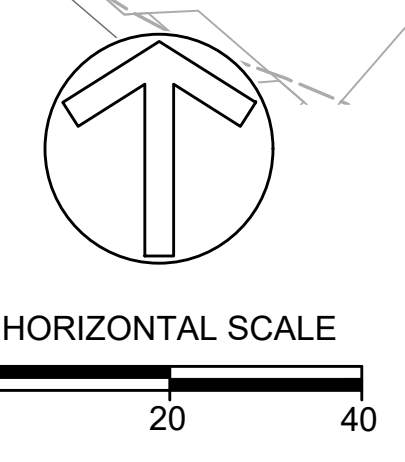
PRE-PROJECT CONTRIBUTING DRAINAGE AREA (CDA)

BMP ID	Total CDA SF	Natural SF		Compacted Impervious SF		Vehicular SF	Target SWIR <sub>v</sub> (P=1.2*) CF	Max SWIR <sub>v</sub> (P=1.7*) CF
		Natural	Impervious	Compacted	Impervious			
DP-1	23,188	0	15,907	7,281	0	0	1,089	1,543
DP-2	26,089	0	5,934	20,155	0	0	2,063	2,923

**SUMMARY TABLES**

POST-PROJECT CONTRIBUTING DRAINAGE AREA (CDA)

BMP ID	Total CDA SF	Natural SF		Compacted Impervious SF		BMP SF	Vehicular SF	Target SWIR <sub>v</sub> (P=1.2*) CF	Max SWIR <sub>v</sub> (P=1.7*) CF
		Natural	Impervious	Compacted	Impervious				
DP-1	23,188	0	14,412	7,281	1,495	0	1,194	1,691	
DP-2	26,089	0	4,572	20,155	1,362	0	2,158	3,058	



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DATE: 02/21/2023  
 ISSUES / REVISIONS: 30% CONCEPT DESIGNS

01/05/2024 60% SEMI-FINAL DESIGNS

**60% SEMI-FINAL DESIGN**

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**DAKOTA PARK LID RETROFITS**

**DA PLAN**

PROJECT NO.: 23014.01 SCALE: 1"=20'  
 SEAL: BY: EM/SF CHECK: BA  
 DWG. NO.: C600

**BMP SUMMARY CALCULATIONS:**

BMP	Bioretention Version	CDA	SWR <sub>v</sub>			Areas			Depths			Infiltration Sump	Retention Volume Provided %	Retention Volume Provided CF	
			(P = 1.2")	(P = 1.7")	(P = 1.7")	SA <sub>top</sub>	SA <sub>bottom</sub>	SA <sub>average</sub>	d <sub>ponding</sub>	d <sub>media</sub>	Gravel Underdrain				
			CF	CF	CF	SF	SF	SF	IN	IN	IN				
DP-1	Standard	1	1,089	1,543	2,063	1,495	340	918	18	18	12	12	1,776	60%	1,065
DP-2	Standard	2	2,063	2,923	3,152	1,362	537	950	15	18	12	0	1,603	60%	962
<b>Total</b>												<b>3,379</b>		<b>2,027</b>	

**BMP TREATMENT VOLUME CALCULATIONS:**

**Calculations**

**BMP 1**

Step 1: Determine Max. Filter Depth from SACDA & RvCDA (Table 3.21)

SA<sub>CDA</sub> = 1495.23188  
 SA<sub>RvCDA</sub> = 64%

R<sub>vCDA</sub> = (A<sub>comp</sub>\*0.25 + A<sub>impervious</sub>\*0.95 + 0\*A<sub>natural</sub>) / A<sub>total</sub>  
 R<sub>vCDA</sub> = 0.45

From DDOE Table 3.21 for SA<sub>CDA</sub> & RvCDA Above  
 Max. Filter Media Depth = NA inches

Step 2: Select Ponding & Media Depths, based on Site Constraints  
 Note: Gravel Depth layer to the Underdrain (d<sub>under</sub>) has been capped at 12" during treatment

d<sub>ponding</sub> = 18.0 inches  
 d<sub>media</sub> = 18.0 inches  
 d<sub>gravel UG</sub> = 12.0 inches  
 d<sub>gravel sum</sub> = 12.0 inches  
 d<sub>gr</sub> = 42.0 inches

Step 3: Calculate Storage Volume

S<sub>v</sub> = SA<sub>bottom</sub> \* [(d<sub>media</sub> \* η<sub>media</sub>) + (d<sub>stone</sub> \* η<sub>stone</sub>)] + [(SA<sub>bottom</sub> + SA<sub>top</sub>) / 2 \* d<sub>ponding</sub> \* η<sub>soil</sub>]  
 S<sub>v</sub> = 340 \* [(1.5 \* 0.25) + (2 \* 0.4)] + [(1495 + 340) / 2 \* 1.5]  
 S<sub>v</sub> = 1,776 cubic feet

Step 4: Check S<sub>v</sub> vs SWR<sub>v</sub> of Drainage Area

S<sub>v</sub> / SWR<sub>v</sub> = 1776 / 1089  
 S<sub>v</sub> / SWR<sub>v</sub> = 163%

**OVERFLOW WEIR SPILLWAY CALCULATIONS:**

**BIORETENTION OVERFLOW SPILLWAY WEIR CALCULATIONS**

**WEIR FLOW DEPTH CALCULATIONS:**

$$Q = 3.33H^{1.5}(L - 0.2H)$$

where:  
 Q = Flowrate [cfs]  
 H = Hydraulic head above the bottom of the weir [ft]  
 L = Length of weir crest [ft]

**H.1 Weirs**

Rectangular:  $Q = 3.33H^{1.5}(L - 0.2H)$   
 60° V-notch:  $Q = 1.43L^{2.5}$   
 90° V-notch:  $Q = 2.49L^{2.48}$

where:  
 Q = flow through the weir (cfs)  
 H = hydraulic head above the bottom of the weir (ft)  
 L = length of the weir crest (ft)

Weir Invert (elev) = 83.70 FT NAVD88  
 Weir Width (L) = 8.5 ft  
 Weir Depth = 6 inch  
 Weir Flow Depth (H) = 2.31 inch  
 0.19 ft

Calculated Q<sub>v</sub> = 2.38 cfs  
 Required 15-Year Q<sub>v</sub> = 2.38 cfs \*from TR-55 model

15-yr WSE = 83.89

**WEIR OVERFLOW VELOCITY CALCULATIONS:**

Manning's Equation:  
 $Q = VA = \left(\frac{1.49}{n}\right) AR^{2/3} \sqrt{S}$  [U.S.]

where:  
 Q = Flowrate [cfs]  
 V = Velocity [ft/s]  
 A = Flow Area [ft<sup>2</sup>]  
 n = Manning's roughness constant  
 R = Hydraulic Radius (ft)  
 S = Channel Slope (ft/ft)

Required 15-Year Q<sub>v</sub> = 2.38 cfs  
 n = 0.03 (From Table 8.1 of DOEE ESC Manual)  
 S = 0.01 ft/ft

Flow depth (d) = 6 in  
 A = 4.25 sf  
 V = 2.91 ft/s

**DESIGN FLOW CALCULATIONS:**

**Hydrologic Drainage Areas**

Hydrologic DA ID	Total DA SF	Natural SF	Compacted SF	Impervious SF	BMP SF	Vehicle SF	Target SWR <sub>v</sub> (P = 1.2") CF	Max SWR <sub>v</sub> (P = 1.7") CF	Provided SWR <sub>v</sub> CF
DP-1	23,188	-	14,412	7,281	1,495.0	-	1,052	1,490	1,714.82
DP-2	26,089	-	4,572	20,155	1,362.5	-	2,029	2,874	1,576.86

$$CN = \frac{1000}{10 + 5P + 10Q - 10(Q^2 + 1.25Q \cdot P)^{0.5}}$$

where:  
 CN = Adjusted Curve Number  
 P = Rainfall (in.) (typically 1.2 in, adjusted to equivalent rainfall depth provided by retrofit BMP)  
 Q<sub>v</sub> = runoff volume (watershed inches), equal to SWR<sub>v</sub> divided by drainage area

**ADJUSTED CURVE NUMBERS**

DP-1	DP-2
P = 1.96	P = 0.93
Q <sub>v</sub> [watershed in] = 0.89	Q <sub>v</sub> [watershed in] = 0.73
DA [sf] = 23,188	DA [sf] = 26,089
CN = 87.28	CN = 98.00

$q_{pSWRv} = q_u \times A \times Q_u$

where:  
 q<sub>pSWRv</sub> = Stormwater Retention Volume peak discharge (cfs)  
 q<sub>u</sub> = unit peak discharge (cfs/mi<sup>2</sup>·in.)  
 A = drainage area (mi<sup>2</sup>)  
 Q<sub>u</sub> = runoff volume (watershed inches = SWR<sub>v</sub>/A)

**STORMWATER RETENTION PEAK DISCHARGE**

DP-1	DP-2
l <sub>a</sub> = 0.29	l <sub>a</sub> = 0.04
T <sub>c</sub> [hr]** = 0.1	T <sub>c</sub> [hr]** = 0.10
q <sub>u</sub> [cfs/ac/in]** = 1.5	q <sub>u</sub> [cfs/ac/in]** = 1.6
DA [AC] = 0.53	DA [AC] = 0.60
q <sub>pSWRv</sub> [cfs] = 0.71	q <sub>pSWRv</sub> [cfs] = 0.70

\* Time of concentration calculations were performed using WinTR-55. Due to the small watersheds and impervious cover, T<sub>c</sub> values for both athletic courts and the pipe drainage areas fell beneath the minimum 6 minute value. For the Channel drainage area, see the WinTR-55 calculations below.  
 \*\* q<sub>u</sub> values taken from NRCS exhibit 2-II Unit peak discharge (q<sub>u</sub>) for SCS Type II rainfall distribution

Time of Concentration Details

Flow Type	Length (ft)	Slope (ft/ft)	Surface (Manning's n)	n	Area (ft <sup>2</sup> )	WP (ft)	Velocity (ft/s)	Time (hr)
Sheet	46	0.0002	Grass Range, Skirt (0.15)	0.059	-	-	-	0.046
Shallow Concentrated	299	0.0002	Grass	0.059	-	-	-	0.039
Channel	121	0.0002	Grass	0.059	0.80	1.97	2.056	0.051
Channel	190	0.0002	Grass	0.059	0.82	2.00	2.074	0.054
Total	657	-	-	-	-	-	1.936	0.110

**Exhibit 2-II—Unit peak discharge (q<sub>u</sub>) for SCS Type II rainfall distribution**

Stormwater Retention Volume Peak Discharge Calculations - 1 |

**Calculations**

**BMP 1**

Step 1: Determine Max. Filter Depth from SACDA & RvCDA (Table 3.21)

SA<sub>CDA</sub> = 1362.26089  
 SA<sub>RvCDA</sub> = 5.2%

R<sub>vCDA</sub> = (A<sub>comp</sub>\*0.25 + A<sub>impervious</sub>\*0.95 + 0\*A<sub>natural</sub>) / A<sub>total</sub>  
 R<sub>vCDA</sub> = 0.78

From DDOE Table 3.21 for SA<sub>CDA</sub> & RvCDA Above  
 Max. Filter Media Depth = NA inches

Step 2: Select Ponding & Media Depths, based on Site Constraints  
 Note: Gravel Depth layer to the Underdrain (d<sub>under</sub>) has been capped at 12" during treatment

d<sub>ponding</sub> = 15.0 inches  
 d<sub>media</sub> = 18.0 inches  
 d<sub>gravel UG</sub> = 12.0 inches  
 d<sub>gravel sum</sub> = 0.0 inches  
 d<sub>gr</sub> = 30.0 inches

Step 3: Calculate Storage Volume

S<sub>v</sub> = SA<sub>bottom</sub> \* [(d<sub>media</sub> \* η<sub>media</sub>) + (d<sub>stone</sub> \* η<sub>stone</sub>)] + [(SA<sub>bottom</sub> + SA<sub>top</sub>) / 2 \* d<sub>ponding</sub> \* η<sub>soil</sub>]  
 S<sub>v</sub> = 537 \* [(1.5 \* 0.25) + (1 \* 0.4)] + [(1362 + 537) / 2 \* 1.25]  
 S<sub>v</sub> = 1,603 cubic feet

Step 4: Check S<sub>v</sub> vs SWR<sub>v</sub> of Drainage Area

S<sub>v</sub> / SWR<sub>v</sub> = 1603 / 2063  
 S<sub>v</sub> / SWR<sub>v</sub> = 78%

**BIORETENTION OVERFLOW SPILLWAY WEIR CALCULATIONS**

**WEIR FLOW DEPTH CALCULATIONS:**

$$Q = 3.33H^{1.5}(L - 0.2H)$$

where:  
 Q = Flowrate [cfs]  
 H = Hydraulic head above the bottom of the weir [ft]  
 L = Length of weir crest [ft]

**H.1 Weirs**

Rectangular:  $Q = 3.33H^{1.5}(L - 0.2H)$   
 60° V-notch:  $Q = 1.43L^{2.5}$   
 90° V-notch:  $Q = 2.49L^{2.48}$

where:  
 Q = flow through the weir (cfs)  
 H = hydraulic head above the bottom of the weir (ft)  
 L = length of the weir crest (ft)

Weir Invert (elev) = 83.00 FT NAVD88  
 Weir Width (L) = 8.5 ft  
 Weir Depth = 6 inch  
 Weir Flow Depth (H) = 3.06 inch  
 0.26 ft

Calculated Q<sub>v</sub> = 3.62 cfs  
 Required 15-Year Q<sub>v</sub> = 3.63 cfs \*from TR-55 model

15-yr WSE = 83.26

**WEIR OVERFLOW VELOCITY CALCULATIONS:**

Manning's Equation:  
 $Q = VA = \left(\frac{1.49}{n}\right) AR^{2/3} \sqrt{S}$  [U.S.]

where:  
 Q = Flowrate [cfs]  
 V = Velocity [ft/s]  
 A = Flow Area [ft<sup>2</sup>]  
 n = Manning's roughness constant  
 R = Hydraulic Radius (ft)  
 S = Channel Slope (ft/ft)

Required 15-Year Q<sub>v</sub> = 3.63 cfs  
 n = 0.03 (From Table 8.1 of DOEE ESC Manual)  
 S = 0.01 ft/ft

Flow depth (d) = 6 in  
 A = 4.25 sf  
 V = 2.91 ft/s

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**DAKOTA PARK LID RETROFITS**

**STORMWATER CALCULATIONS**

PROJECT NO.:	23014.01	SCALE:	NA
SEAL:	BY: EM/SF	CHECK:	BA
DWG. NO.: C700			