

PARADIGM OFFICE BUILDING

A TRACT OF LAND BEING PROPOSED LOT 3 OF SUNSET RIDGE AT MANCHESTER,
PB 363 PG 393, BEING PART OF THE SOUTHEAST QUARTER OF SECTION 28,
TOWNSHIP 45 NORTH, RANGE 5 EAST
ST. LOUIS COUNTY, MISSOURI

SITE IMPROVEMENT PLANS

LEGEND

EXISTING CONTOURS	---
PROPOSED CONTOURS	---
EXISTING SANITARY SEWERS	==
EXISTING STORM SEWERS	==
PROPOSED SANITARY SEWERS	==
PROPOSED STORM SEWERS	==
EXISTING RIGHT-OF-WAY	---
PROPOSED RIGHT-OF-WAY	---
CENTERLINE	---
EASEMENT	---
NON-REINFORCED CONCRETE PAVEMENT	---
REINFORCED CONCRETE PAVEMENT	---
EXISTING SPOT ELEVATION	+
PROPOSED SPOT ELEVATION	+
SWALE	---
TO BE REMOVED	T.B.R.
TO BE REMOVED & RELOCATED	T.B.R. & R.
TO BE USED IN PLACE	U.I.P.
BACK OF CURB	B.C.
FACE OF CURB	F.C.
TRASH ENCLOSURE	---
EXISTING LIGHT STANDARD	---
GAS MAIN	---
WATER MAIN	---
UNDERGROUND TELEPHONE	---
FIRE HYDRANT	---
POWER POLE	---
HAY BALE	---
SILTATION CONTROL	---

ABBREVIATIONS

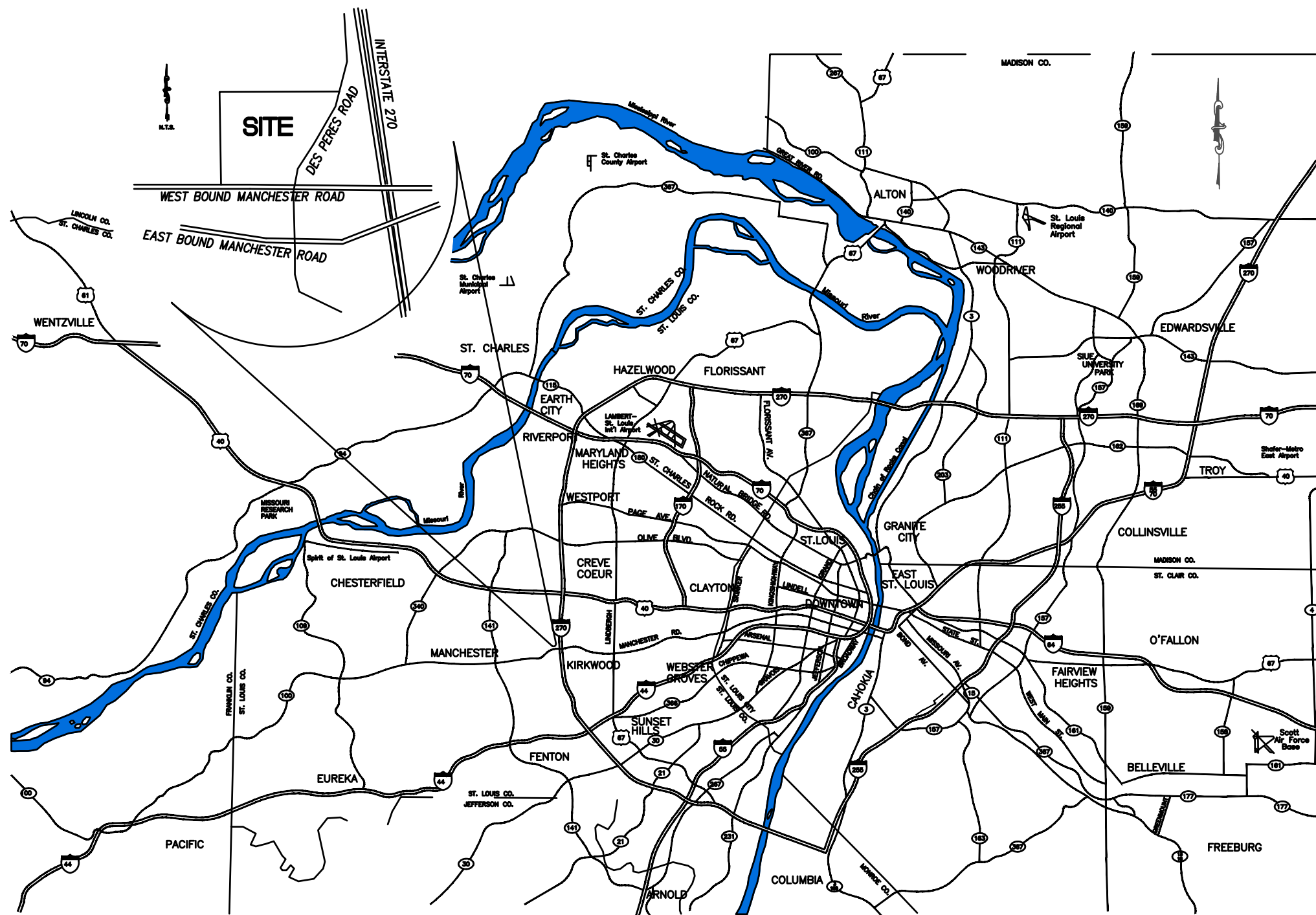
C.O.	-	CLEANOUT
DB.	-	DEED BOOK
E	-	ELECTRIC
FL	-	FLOWLINE
FT	-	FEET
FND.	-	FOUND
G	-	GAS
LOC.	-	LOCATOR NUMBER
M.H.	-	MANHOLE
N/F	-	NOW OR FORMERLY
PB.	-	PLAT BOOK
PG.	-	PAGE
P.V.C.	-	POLYVINYL CHLORIDE PIPE
R.O.W.	-	RIGHT-OF-WAY
R.C.P.	-	REINFORCED CONCRETE PIPE
SQ.	-	SQUARE
T	-	TELEPHONE CABLE
V.C.P.	-	VETRIFIED CLAY PIPE
W	-	WATER
(86'W)	-	RIGHT-OF-WAY WIDTH
(R)	-	REMOVED
(DND)	-	DO NOT DISTURB
(TBR)	-	TO BE REMOVED
(TBR&R)	-	TO BE REMOVED & REPLACED

MSD. BENCHMARK

BENCHMARK 110088 Elev = 536.07 NGVD29
On "1" on the top southeast edge of a round concrete base for traffic signal mast situated on a traffic island at the northwest corner of the intersection of Des Peres Road with Corporate Hill Drive from the east side and the ramps to and from Westbound Manchester Road on the west side, roughly 29 feet west of the centerline of Des Peres Road, 25 feet north of the centerline of the combined Manchester ramps, and 330 feet more or less north of the northern edge of the bridge for Westbound Manchester Road over Des Peres Road.

UTILITY NOTE:

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS, RECORDS AND INFORMATION, AND, THEREFORE DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NON-EXISTENCE, SIZE, TYPE, NUMBER, OR LOCATION OF THESE FACILITIES, STRUCTURES AND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS. THE UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY RELIEVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 319 RSMo.



LOCATION MAP

PERTINENT DATA:

SITE ACREAGE	=	0.916 ACRES ±
OWNER	=	LOCKWOOD DPR, LLC
LOCATOR No.	=	220530325
ZONING	=	MXD (ORD. NO. 27040)
FIRE DISTRICT	=	WEST COUNTY EMS & FIRE
SCHOOL DISTRICT	=	PARKWAY SCHOOL DISTRICT
SEWER DISTRICT	=	METROPOLITAN ST. LOUIS SEWER DIST.
WATER SERVICE	=	MISSOURI-AMERICAN WATER COMPANY
GAS SERVICE	=	SPIRE
ELECTRIC SERVICE	=	AMEREN UE ELECTRIC COMPANY
PHONE SERVICE	=	AT&T
STREET ADDRESS	=	12818 DAYLIGHT CIRCLE
ZIP CODE	=	63131
WUNNENBURG MAP	=	PG. 34 GRID W-24

SPECIAL INSPECTOR FOR SWPPP INSPECTION

JOSEPH FISCHER: 314.581.0414

EMERGENCY CONTACT

JIM REDING: 314.966.3400

CONTRACTOR NOTE:

PRIOR TO OBTAINING A CONSTRUCTION PERMIT FROM THE METROPOLITAN ST. LOUIS SEWER DISTRICT, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE THE DISTRICT WITH A COPY OF AN EXECUTED CERTIFICATE OF INSURANCE INDICATING THAT THE PERMITTEE HAS OBTAINED AND WILL CONTINUE TO CARRY COMMERCIAL GENERAL LIABILITY AND COMPREHENSIVE AUTO LIABILITY INSURANCE. THE REQUIREMENTS AND LIMITS SHALL BE AS STATED IN THE "RULES AND REGULATIONS AND ENGINEERING DESIGN REQUIREMENTS FOR SANITARY AND STORMWATER DRAINAGE FACILITIES", SECTION 10.090 (ADDENDUM).

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NOTICE TO CONTRACTOR:

THIS PROJECT INCLUDES RELOCATION, ALTERATION, OR RECONSTRUCTION OF EXISTING MSD FACILITIES. IN ACCORDANCE WITH MSD RESOLUTION 3263, THE DISTRICT REQUIRES THE WAGE RATE TO BE AT LEAST EQUAL TO THE MISSOURI PREVAILING WAGE RATE AT THE TIME OF CONSTRUCTION START. AN AFFIDAVIT CERTIFYING THAT THE MISSOURI PREVAILING WAGE RATE AT THE TIME OF CONSTRUCTION START HAS BEEN PAID FOR ALL WORK RELATED TO RELOCATION, ALTERATION, OR RECONSTRUCTION OF EXISTING MSD FACILITIES IS REQUIRED PRIOR TO MSD CONSTRUCTION APPROVAL OF THIS PROJECT.

ATTENTION SEWER CONTRACTOR:

FOR SEWER PIPE (STORM, SANITARY AND COMBINED) WITH A DESIGN GRADE LESS THAN ONE PERCENT (1%), VERIFICATION OF THE PIPE GRADE WILL BE REQUIRED FOR EACH INSTALLED REACH OF SEWER, PRIOR TO ANY SURFACE RESTORATION OR INSTALLATION OF ANY SURFACE IMPROVEMENTS. THE CONTRACTOR'S FIELD SUPERVISOR WILL BE REQUIRED TO PROVIDE DAILY DOCUMENTATION VERIFYING THAT THE AS-BUILT PIPE GRADE MEETS THE DESIGN GRADE THROUGH THE SUBMITTAL OF SIGNED CUT SHEETS TO THE MSD INSPECTOR UPON REQUEST.

FIELD SURVEYED VERIFICATION MUST BE MADE UNDER THE DIRECTION OF A LICENSED LAND SURVEYOR OR REGISTERED ENGINEER. THE CONTRACTOR WILL BE REQUIRED TO REMOVE AND REPLACE ANY SEWER REACH HAVING AN AS-BUILT GRADE WHICH IS FLATTER THAN THE DESIGN GRADE BY MORE THAN 0.1%. SEWERS WITH GRADE GREATER THAN THE DESIGN SLOPE MAY BE LEFT IN PLACE, PROVIDED NO OTHER SEWER GRADE IS REDUCED BY THIS VARIANCE IN THE AS-BUILT GRADE.

MSD ALSO RESERVES THE RIGHT TO REQUIRE THE CONTRACTOR TO REMOVE AND REPLACE ANY SEWER (AT ANY TIME PRIOR TO CONSTRUCTION APPROVAL) FOR WHICH THE AS-BUILT GRADE DOES NOT COMPLY WITH THE GRADE TOLERANCE STATED IN THE ABOVE PARAGRAPH.

THE SEWER CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COSTS ASSOCIATED WITH THE FIELD VERIFICATION OF THE SEWER GRADE, OR REMOVAL AND REPLACEMENT OF THE SEWER PIPE OR ASSOCIATED APPURTENANCES.

PROJECT DISTURBANCE = 0.916 ACRES
PROJECT RUNOFF DIFFERENTIAL = 0.70 CFS

Any future land disturbance and/or increase in impervious area on this site requires additional stormwater management per MSD regulations in place at that time.

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. AND THE UNDERSIGNED ENGINEERS HAVE NO RESPONSIBILITY FOR THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS HEREIN. THE UNDERSIGNED ENGINEER'S SEAL, APPROVAL, THE CONSTRUCTION METHOD AND MATERIALS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. NO RESPONSIBILITY TO VERIFY FIELD APPROVEDS AS SHOWN ON THE PLAN. THESE SPECIFICALLY DESIGNED AND AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

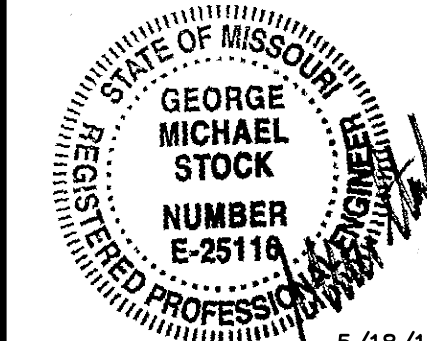
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SITE IMPROVEMENT PLANS

Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri
63131



GEORGE M. STOCK
CIVIL ENGINEER
DESIGN FIRM NO. 184-00365

REVISIONS:

MSD ISSUE 5/18/18

DRAWN BY: J.E.F. CHECKED BY: G.M.S.

DATE: 05/10/18 JOB NO.: 218-6257

MSD PR: - BASE MAP # 22-0

S.L.C. NAT # - NAT SURV # -

SEWER # - FIRM PANEL: 29188C0302K

SHEET TITLE:

TITLE SHEET

SHEET NO.:

C-1.0

GENERAL NOTES:

1. ALL UTILITIES SHOWN HAVE BEEN LOCATED BY THE ENGINEER FROM AVAILABLE RECORDS. THEIR LOCATION SHOULD BE CONSIDERED APPROXIMATE. THE CONTRACTOR HAS THE RESPONSIBILITY TO NOTIFY ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION, TO HAVE EXISTING UTILITIES FIELD LOCATED.
2. GRADING CONTRACTOR SHALL INSTALL SILTATION CONTROL PRIOR TO STARTING THE GRADING. ADDITIONAL SILTATION CONTROL DEVICES SHALL BE INSTALLED AS DIRECTED BY ST. LOUIS COUNTY.
3. ALL MATERIALS AND METHODS OF CONSTRUCTION TO MEET THE CURRENT STANDARDS AND SPECIFICATIONS OF ST. LOUIS COUNTY AND THE METROPOLITAN ST. LOUIS SEWER DISTRICT (MSD).
4. GRADING & STORM WATER PER 2009 M.S.D. STANDARD CONSTRUCTION SPECIFICATIONS AND DETAILS AND STANDARD SPECIFICATIONS.
5. ALL GRADED AREAS SHALL BE PROTECTED FROM EROSION BY EROSION CONTROL DEVICES AND/OR SEEDING AND MULCHING.
6. ALL FILLS AND BACKFILLS SHALL BE MADE OF SELECTED EARTH MATERIALS, FREE FROM BROKEN MASONRY, ROCK, FROZEN EARTH, RUBBISH, ORGANIC MATERIAL AND DEBRIS. SEE GEOTECHNICAL REPORT LOCATED IN THIS PLAN SET, SHEETS C21-1-C21-3.
7. GRADING CONTRACTOR SHALL KEEP EXISTING OFFSITE ROADWAYS CLEAN OF MUD AND DEBRIS AT ALL TIMES.
8. NO GRADE SHALL EXCEED 3:1 SLOPE, EXCEPT AS NOTED AND APPROVED PER PLAN.
9. ALL LANDSCAPE/SEED AND/OR SEED AREAS TO BE FILLED WITH A MINIMUM OF 6" OF TOPSOIL.
10. ALL LANDSCAPED AREAS DISTURBED BY OFF-SITE WORK SHALL BE IMMEDIATELY SEEDED OR SODDED.
11. ADEQUATE TEMPORARY OFF-STREET PARKING FOR CONSTRUCTION EMPLOYEES SHALL BE PROVIDED. PARKING ON NON-SURFACED AREAS SHALL BE PROHIBITED IN ORDER TO ELIMINATE THE CONDITION WHEREBY MUD FROM CONSTRUCTION AND EMPLOYEES' VEHICLES IS TRACKED ONTO THE PAVEMENT CAUSING HAZARDOUS ROADWAY AND DRIVEWAY CONDITIONS.
12. ALL PUBLIC SEWER CONSTRUCTION MUST CONFORM TO 2009 M.S.D. "STANDARD CONSTRUCTION SPECIFICATIONS AND DETAILS"
13. THE UNDERGROUND UTILITIES SHOWN HEREIN HAVE BEEN SHOWN FROM SURVEY AND RECORD INFORMATION AND DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NONEXISTENCE, SIZE, TYPE, NUMBER OR LOCATION OF THESE OR OTHER UTILITIES. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UTILITIES, SHOWN OR NOT SHOWN, AND SAID UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY ABSOLVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 319, RSMO.
14. CLEARING TECHNIQUES THAT RETAIN EXISTING VEGETATION TO THE MAXIMUM EXTENT PRACTICABLE SHALL BE USED AND THE TIME PERIOD FOR DISTURBED AREAS TO BE WITHOUT VEGETATIVE COVER SHALL BE MINIMIZED TO THE EXTENT PRACTICAL.
15. AREAS SHALL BE SEEDED AFTER CLEARING AND GRUBBING WHEN NO ACTIVITY WILL OCCUR WITHIN THIRTY DAYS.
16. ALL OFFSITE PROPERTY OWNERS SHALL BE GIVEN 48 HOURS NOTICE IN ADVANCE OF ANY WORK.
17. ANY DISTURBED OFF SITE PROPERTY (I.E. BUSHES, FENCES, MAILBOXES, ETC.) SHALL BE REPLACED IN KIND, AT THE DEVELOPER'S EXPENSE.
18. ALL NEW UTILITY FEEDS TO THE BUILDING AND RELOCATED PUBLIC UTILITIES WILL BE LOCATED UNDERGROUND.
19. ALL UTILITIES, OUTDOOR STORAGE, AND MECHANICAL EQUIPMENT SHALL BE SCREENED IN ACCORDANCE WITH ST. LOUIS COUNTY ZONING CODE.
20. ALL SIDEWALKS TO BE CONSTRUCTED TO ST. LOUIS COUNTY ADA STANDARDS.
21. DRIVEWAYS AND ENTRANCES PER ST. LOUIS COUNTY STANDARDS.

M.A.W.C. WATER LINE NOTES

1. The service connection will require the plumber to purchase a tap at least two weeks prior to when he needs it. As a general rule Missouri American Water Co. makes the taps in the order in which they are received, and cannot guarantee two weeks during a busy time of the year. Once the tap is purchased the plumber has to schedule it with the District Supervisor. The plumber has to have all required information, plus Missouri American Water requires two sets of a site plans showing the proposed layout and valving. Along with this Missouri American Water Co. can insure that they are able to provide the required flow. The only fee is the actual cost of the tap itself. The tapping fee is different for every combination of pipe size and tap size and is based on previous year's actual costs.
2. The footing of the building must be in before Missouri American Water Co. will make a tap. Missouri American Water does not make taps for vacant lots or previous to substantial building construction.
3. A minimum Class 52 ductile iron pipe, conforming to applicable AWWA standards, is required on any service line that is 4" or greater in size before a meter. Copper piping is required for smaller services from the main through the meter box. For services smaller than 4" in size, flexible Type "K" copper is required through the stop box. After the stop box, flexible or rigid Type "K" or "I" copper is required to four feet beyond the meter box. For larger services, ductile iron pipe should run from the main to a point at least six feet beyond the meter box. From the building foundation, copper or ductile iron pipe must extend a minimum of ten feet outside the building wall. Once a fire line is past a detector check meter it is considered to be metered and any materials can be used that comply with the local plumbing codes (C-900 PVC is the minimum). A "Master Service" would not metered.
4. The joints on copper service lines (excluding joints on pre-purchased "meter setters" shall be either flared, compression, or silver soldered.
5. Existing services will have to be destroyed at the main unless they are being reused. Permission to reuse a service (either permanently or temporarily) must come from the District Supervisor.
6. Missouri American Water does not own, operate, or maintain service lines. As a general rule St. Louis Co. Water does not run a water main extension on a project which can be served by a service line.
7. Missouri American Water Co. requires a detector check valve on all fire protection lines for sprinkler systems. They also require a detector check valve on fire hydrants, with the possible exception of hydrants that are immediately adjacent to and visible from public streets. Missouri American Water also requires valves on both fire and domestic lines after they split from a combined service. Thus a typical split service would have valves on both fire and domestic lines after a tee. Of course this would also require a valve on a line going to a fire hydrant that came off of a "Master Water Service".
8. All means and methods of construction shall be in accordance with M.A.W.C. construction specifications, current addition.

SANITARY SEWER NOTES

1. ALL MEANS AND METHODS OF CONSTRUCTION FOR SANITARY SEWERS SHALL BE IN ACCORDANCE WITH M.S.D. "STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES", 2009.
2. 6" AND 8" LATERAL JOINTS TO CONFORM TO A.S.T.M. STANDARD S.D.R.-35 AND C-900 THICKWALL COMPRESSION JOINT FOR P.V.C.
3. ALL LATERAL SEWER CONSTRUCTION METHODS TO CONFORM TO LATEST STANDARDS AND SPECIFICATIONS OF THE ST. LOUIS COUNTY PLUMBING CODE. ALL LATERALS SHALL HAVE A MINIMUM SLOPE OF 2%.
4. ALL TRENCHES UNDER AREAS TO BE PAVED SHALL BE GRANULARLY FILLED WITH 3/4" CRUSHED LIMESTONE. BACKFILL SHALL BE PLACED IN ACCORDANCE WITH METROPOLITAN ST. LOUIS SEWER DISTRICT STANDARDS.
5. CONTRACTOR TO START LAYING PIPE AT DOWNSTREAM MANHOLE AND WORK UPSTREAM.
6. TAILSTAKE ELEVATIONS ARE SHOWN ON SITE UTILITY PLAN.
7. CLEANOUTS SHALL BE LOCATED AT ALL HORIZONTAL AND VERTICAL CHANGES IN DIRECTION OF FLOW OF HOUSE LATERALS AND ANY SANITARY LATERAL OF 100 FEET OR LONGER.
8. TYPE "C" BEDDING PER M.S.D. STANDARDS REQUIRED FOR PIPES IN ROCK.
9. VERTICAL CLEARANCE BETWEEN SEWER AND WATER MAINS SHALL BE A MINIMUM OF 2' - 0".
10. ALL TRENCH BACKFILLS UNDER PAVEMENT WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE GRANULAR BACKFILL. TRENCH BACKFILLS UNDER PAVED AREAS, OUTSIDE OF PUBLIC RIGHT-OF-WAY SHALL BE GRANULAR BACKFILL IN LIEU OF THE EARTH BACKFILL COMPACTED TO 90 PERCENT OF THE MODIFIED AASHTO T-180 COMPACTION TEST A.S.T.M. D-1557.
11. JETTING IS NOT AN ACCEPTABLE METHOD OF ACHIEVING BACKFILL COMPACTION. ALL BACKFILL MATERIAL SHALL BE MECHANICALLY COMPACTED TO AT LEAST 95 PERCENT OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY.
12. MAINTENANCE OF THE SEWERS DESIGNATED AS "PUBLIC" SHALL BE THE RESPONSIBILITY OF THE METROPOLITAN ST. LOUIS SEWER DISTRICT UPON DEDICATION OF THE SEWERS TO THE DISTRICT.
13. SOILS ENGINEER WILL VERIFY THAT ALL COMPRESSIBLE MATERIAL HAS BEEN REMOVED PRIOR TO FILL PLACEMENT AND THAT FILLED AREAS INCLUDING TRENCH BACKFILLS, UNDER BUILDINGS, PROPOSED SANITARY AND STORM SEWER LINES, AND PAVED AREAS CONSTRUCTED ABOVE ORIGINAL GRADE, HAS BEEN COMPACTED TO 90% OF "MODIFIED PROCTOR". FILL IS TO BE PLACED IN A MAXIMUM OF 9" LIFTS. TESTS SHALL BE TAKEN AT A MAXIMUM OF 50 FOOT INTERVALS ALONG THE ROUTE OF THE PIPE, AT A MAXIMUM OF 2 FEET VERTICALLY, AND LATERALLY ON EACH SIDE OF THE PIPE AT A DISTANCE EQUAL TO THE DEPTH OF FILL OVER THE PIPE. A COPY OF THESE RESULTS WILL BE SUBMITTED TO MSD PRIOR TO CONSTRUCTION.
14. SEPTIC TANKS SHALL BE ABANDONED IN ACCORDANCE WITH THE METROPOLITAN ST. LOUIS SEWER DISTRICT STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWER AND DRAINAGE FACILITIES, 2009.
15. WHEN AN EXTERNAL GREASE TRAP IS REQUIRED, GREASE TRAP TO BE LOCATED IN AN ACCESSIBLE LOCATION FOR INSPECTION. GREASE TRAP TO PROVIDE MEANS FOR VISUAL INSPECTION FROM ABOVE FOR BOTH THE INFLUENT AND EFFLUENT SIDES. MSD SAMPLING MANHOLE TO BE LOCATED ON PRIVATE LATERAL IN AN ACCESSIBLE LOCATION. GREASE TRAP AND SAMPLING MANHOLE SHALL BE LOCATED DOWNSTREAM OF GREASE TRAP AND ALL OTHER COMMERCIAL SANITARY LATERALS TO FACILITATE MSD SAMPLING. GREASE TRAPS AND SAMPLING MANHOLES SHALL BE SHOWN ON THE PLANS AND SHALL NOT BE LOCATED IN DRIVE-THRU LANES OR WITHIN PARKING SPACES.
16. STRUCTURES NOTED TO BE ADJUSTED TO FINISH GRADE SHALL BE ADJUSTED BY EITHER REMOVAL OR PLACEMENT OF GRADE RINGS, BRICK WORK, OR MORTAR BEDDING BY SUCH METHODS AS APPROVED BY M.S.D. "STANDARD CONSTRUCTION SPECIFICATIONS", 2009.
17. ALL MANHOLE FRAMES AND COVERS SHALL BE M.S.D. STANDARD FRAME AND COVER.
18. THE REMOVAL AND REPLACEMENT, OR REHABILITATION OF THE EXISTING STRUCTURE(S) WILL BE DETERMINED BY THE MSD FIELD INSPECTOR. IF THE STRUCTURE IS DETERMINED TO REMAIN IN PLACE, THEN THE TOP SHALL BE ADJUSTED TO GRADE, IF NEEDED.
19. PARTIAL REMOVAL OR CONVERSION OF A STRUCTURE: THE PARTIAL REMOVAL, REPLACEMENT, AND CONVERSION OF THE EXISTING STRUCTURE(S) WILL BE DETERMINED BY THE MSD FIELD INSPECTOR. IF THE STRUCTURE IS DETERMINED TO REMAIN IN PLACE, AND THE TOP SECTION CAN BE CONVERTED AS PROPOSED AND STILL MEET MSD STANDARDS, THEN CONVERT AND ADJUST TO GRADE. OTHERWISE, THE ENTIRE STRUCTURE WILL BE REMOVED AND REPLACED WITH A NEW STRUCTURE.
20. ANY ABANDONED SEWERS SHALL BE REMOVED OR COMPLETELY GROUT FILLED.
21. NOTE - PIPE JOINTS WITH ADAPTERS AND COUPLINGS SHALL BE SUPPLIED AND INSTALLED WITH 311 STAINLESS STEEL NUT AND BOLT CLAMS (T-BOLT) CONFIGURATION; AND WITH STAINLESS STEEL SHEAR BANDS, BEING A MINIMUM TWELVE (12) MILS (MSD STD. CONST SPECS. PT 2, SUBSECTION H11). WORM DRIVE HOSE CLAMPS AND CONCRETE BACKFILLING (CAUSTICITY) WILL NO LONGER BE ALLOWED AT THESE JOINTS. GRANULAR BACKFILL SHOULD BE USED. IF FLOWABLE FILL IS REQUIRED, THE CONTRACTOR SHALL WRAP AND TAPE THE ADAPTERS AND COUPLINGS WITH A SIX (6) MIL POLYETHYLENE SHEET.
22. TRENCH BACKFILL COMPACTION AND TESTING REQUIREMENTS: THE CONTRACTOR IS TO REFER TO PART 4, SECTION H OF THE METROPOLITAN ST. LOUIS SEWER DISTRICT, STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES, 2009 EDITION, TO ESTABLISH THE REQUIREMENTS FOR THE SPECIFIC TYPE OF BACKFILL BEING USED.
23. WHEN A STORM PIPE CROSSES OVER A NEW SANITARY SEWER AND THE VERTICAL CLEARANCE IS LESS THAN TWO (2) FEET, THE SANITARY SEWER MUST BE ENCASED IN CONCRETE THROUGH THE CROSSING AND FOR TEN LINEAL FEET EACH SIDE OF THE CROSSING.
24. BACKFLOW PREVENTION WILL BE PROVIDED IN ACCORDANCE WITH COUNTY REQUIREMENTS.
25. SWIMMING POOL BACKWASH FILTER MUST BE CONNECTED TO THE SANITARY SEWER. DISCHARGE MUST NOT EXCEED FIFTY (50) GALLONS PER MINUTE.

ADDITIONAL SEWER NOTES

ALL STORM AND SANITARY SEWER STRUCTURES AND APPURTENANCES TO BE DEDICATED TO MSD, OR TO BE PRIVATE UNDER MSD INSPECTION, SHALL CONFORM TO THE METROPOLITAN ST. LOUIS SEWER DISTRICT, STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES, 2009. THAT WILL INCLUDE STANDARD DETAILS SHOWN THEREIN, AND SHALL INCLUDE ALL SUBSEQUENT CHANGES MADE THERETO.

SOME RECENT CHANGES CONCERN PIPE FIELD TESTING AND PERFORMANCE, AND INCLUDE THE FOLLOWING:

PART 4 - PIPE SEWER CONSTRUCTION

SECTION B, PIPE FIELD TESTS, PARAGRAPH 2, REACH INTEGRITY TESTING - DELETE THE FIRST SENTENCE AND THE FOLLOWING REPLACEMENT APPLIES:

ALL SANITARY AND COMBINED SEWERS SHALL SUSTAIN A MAXIMUM LEAKAGE LIMIT OF 100 GALLONS/INCH OF PIPE DIAMETER/MILE OF LINE/DAY, AS REQUIRED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES SPECIFICATIONS.

SECTION B, PIPE FIELD TESTS, PARAGRAPH 2, REACH INTEGRITY TESTING, SUBPARAGRAPH c, INFILTRATION/EXFILTRATION TESTING - DELETE THE SIXTH SENTENCE, CONCERNING LEAKAGE LIMITS, AND THE FOLLOWING REPLACEMENT APPLIES:

THE MEASUREMENT OF LEAKAGE SHALL NOT EXCEED 100 GALLONS/INCH OF PIPE DIAMETER/MILE OF LINE/DAY, AS REQUIRED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES SPECIFICATIONS.

SECTION B, PIPE FIELD TESTS, PARAGRAPH 4, MANHOLE TESTING, SUBPARAGRAPH a, VACUUM TESTING - AFTER THE FIRST SENTENCE THE FOLLOWING ADDITION APPLIES:

THE VACUUM TEST MUST BE PERFORMED PRIOR TO BACKFILLING AROUND THE MANHOLE UNLESS THE CONTRACTOR PROVIDES DOCUMENTATION FROM THE PRECAST MANHOLE MANUFACTURER STATING THAT THE MANHOLE MAY BE VACUUM TESTED AFTER BACKFILLING HAS TAKEN PLACE. THE CONTRACTOR MUST SUBMIT THIS DOCUMENTATION PRIOR TO BACKFILLING AROUND ANY MANHOLE.

SECTION B, PIPE FIELD TESTS, PARAGRAPH 4, MANHOLE TESTING, SUBPARAGRAPH b, EXFILTRATION TESTING - DELETE THE SECOND SENTENCE, CONCERNING LEAKAGE LIMITS, AND THE FOLLOWING ADDITION APPLIES:

FOR EXFILTRATION TESTING, THE ALLOWABLE LEAKAGE LIMIT IS 100 GALLONS/INCH OF PIPE DIAMETER/MILE OF LINE/DAY WHEN THE AVERAGE HEAD ON THE TEST SECTION IS THREE FEET (3') OR LESS.

STORM SEWER NOTES

1. ALL MEANS AND METHODS OF CONSTRUCTION FOR STORM SEWERS SHALL BE IN ACCORDANCE WITH M.S.D. "STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES", 2009.
2. ALL CONCRETE SHALL BE REINFORCED, AND CONFORM TO A.S.T.M. DESIGNATION C76-80 CLASS III UNLESS NOTED.
3. TYPE "C" BEDDING PER M.S.D. AND ST. LOUIS COUNTY STANDARDS IS REQUIRED FOR PIPES IN ROCK.
4. ALL TRENCHES UNDER AREAS TO BE PAVED AND UNDER EXISTING PAVING SHALL BE GRANULARLY FILLED WITH 3/4" MINUS CRUSHED LIMESTONE ONLY. BACKFILL SHALL BE PLACED IN ACCORDANCE WITH M.S.D. AND ST. LOUIS COUNTY STANDARDS.
5. ALL TRENCH BACKFILLS UNDER PAVEMENT WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE GRANULAR BACKFILLED. TRENCH BACKFILLS UNDER PAVED AREAS, OUTSIDE OF PUBLIC RIGHT-OF-WAY SHALL BE GRANULAR BACKFILL IN LIEU OF THE EARTH BACKFILL COMPACTED TO 90 PERCENT OF THE MODIFIED AASHTO T-180 COMPACTION TEST A.S.T.M. D-1557.
6. JETTING IS NOT AN ACCEPTABLE METHOD OF ACHIEVING BACKFILL COMPACTION. ALL BACKFILL MATERIAL SHALL BE MECHANICALLY COMPACTED TO AT LEAST 95 PERCENT OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY.
7. FOR SEWER PIPE (STORM, SANITARY AND COMBINED) WITH A DESIGN GRADE LESS THAN ONE PERCENT (1%), VERIFICATION OF THE PIPE GRADE WILL BE REQUIRED FOR EACH INSTALLED REACH OF SEWER, PRIOR TO ANY SURFACE RESTORATION OR INSTALLATION OF ANY SURFACE IMPROVEMENTS. THE CONTRACTOR'S FIELD SUPERVISOR WILL BE REQUIRED TO PROVIDE DAILY DOCUMENTATION VERIFYING THAT THE AS-BUILT PIPE GRADE MEETS THE DESIGN GRADE THROUGH THE SUBMITTAL OF SIGNED OUT SHEETS TO THE MSD INSPECTOR UPON REQUEST.
8. FIELD SURVEYED VERIFICATION MUST BE MADE UNDER THE DIRECTION OF A LICENSED LAND SURVEYOR OR REGISTERED ENGINEER. THE CONTRACTOR WILL BE REQUIRED TO REMOVE AND REPLACE ANY SEWER REACH HAVING AN AS-BUILT GRADE WHICH FLATTER THAN THE DESIGN GRADE BY MORE THAN 0.1%. SEWERS WITH GRADE GREATER THAN THE DESIGN SLOPE MAY BE LEFT IN PLACE, PROVIDED NO OTHER SEWER GRADE IS REDUCED BY THIS VARIANCE IN THE AS-BUILT GRADE.
9. MSD ALSO RESERVES THE RIGHT TO REQUIRE THE CONTRACTOR TO REMOVE AND REPLACE ANY SEWER (AT ANY TIME PRIOR TO CONSTRUCTION APPROVAL) FOR WHICH THE AS-BUILT GRADE DOES NOT COMPLY WITH THE GRADE TOLERANCE STATED IN THE ABOVE PARAGRAPH.
10. THE SEWER CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COSTS ASSOCIATED WITH THE FIELD VERIFICATION OF THE SEWER GRADE, OR REMOVAL AND REPLACEMENT OF THE SEWER PIPE OR ASSOCIATED APPURTENANCES.
8. MAINTENANCE OF THE SEWERS DESIGNATED AS "PUBLIC" SHALL BE THE RESPONSIBILITY OF THE METROPOLITAN ST. LOUIS SEWER DISTRICT UPON DEDICATION OF THE SEWERS TO THE DISTRICT.
9. STRUCTURES NOTED TO BE ADJUSTED TO FINISH GRADE SHALL BE ADJUSTED BY EITHER REMOVAL OR PLACEMENT OF GRADE RINGS, BRICK WORK, OR MORTAR BEDDING BY SUCH METHODS AS APPROVED BY M.S.D. "STANDARD CONSTRUCTION SPECIFICATIONS", 2009, AND ST. LOUIS COUNTY SPECIFICATIONS FOR STORM SEWERS.
10. SOILS ENGINEER WILL VERIFY THAT ALL COMPRESSIBLE MATERIAL HAS BEEN REMOVED PRIOR TO FILL PLACEMENT AND THAT FILLED AREAS INCLUDING TRENCH BACKFILLS, UNDER BUILDINGS, PROPOSED SANITARY AND STORM SEWER LINES, AND PAVED AREAS CONSTRUCTED ABOVE ORIGINAL GRADE, HAS BEEN COMPACTED TO 90% OF "MODIFIED PROCTOR". FILL IS TO BE PLACED IN A MAXIMUM OF 9" LIFTS. TESTS SHALL BE TAKEN AT A MAXIMUM OF 50 FOOT INTERVALS ALONG THE ROUTE OF THE PIPE, AT A MAXIMUM OF 2 FEET VERTICALLY, AND LATERALLY ON EACH SIDE OF THE PIPE AT A DISTANCE EQUAL TO THE DEPTH OF FILL OVER THE PIPE. A COPY OF THESE RESULTS WILL BE SUBMITTED TO MSD PRIOR TO CONSTRUCTION.
11. THE REMOVAL AND REPLACEMENT, OR REHABILITATION OF THE EXISTING STRUCTURE(S) WILL BE DETERMINED BY THE MSD FIELD INSPECTOR. IF THE STRUCTURE IS DETERMINED TO REMAIN IN PLACE, THEN THE TOP SHALL BE ADJUSTED TO GRADE, IF NEEDED.
12. PARTIAL REMOVAL OR CONVERSION OF A STRUCTURE: THE PARTIAL REMOVAL, REPLACEMENT, AND CONVERSION OF THE EXISTING STRUCTURE(S) WILL BE DETERMINED BY THE MSD FIELD INSPECTOR. IF THE STRUCTURE IS DETERMINED TO REMAIN IN PLACE, AND THE TOP SECTION CAN BE CONVERTED AS PROPOSED AND STILL MEET MSD STANDARDS, THEN CONVERT AND ADJUST TO GRADE. OTHERWISE, THE ENTIRE STRUCTURE WILL BE REMOVED AND REPLACED WITH A NEW STRUCTURE.
13. ANY ABANDONED SEWERS SHALL BE REMOVED OR COMPLETELY GROUT FILLED.
14. NOTE - PIPE JOINTS WITH ADAPTERS AND COUPLINGS SHALL BE SUPPLIED AND INSTALLED WITH 311 STAINLESS STEEL NUT AND BOLT CLAMPS (T-BOLT) CONFIGURATION; AND WITH STAINLESS STEEL SHEAR BANDS, BEING A MINIMUM TWELVE (12) MILS (MSD STD. CONST SPECS. PT 2, SUBSECTION H11). WORM DRIVE HOSE CLAMPS AND CONCRETE BACKFILLING (CAUSTICITY) WILL NO LONGER BE ALLOWED AT THESE JOINTS. GRANULAR BACKFILL SHOULD BE USED. IF FLOWABLE FILL IS REQUIRED, THE CONTRACTOR SHALL WRAP AND TAPE THE ADAPTERS AND COUPLINGS WITH A SIX (6) MIL POLYETHYLENE SHEET.
15. TRENCH BACKFILL COMPACTION AND TESTING REQUIREMENTS: THE CONTRACTOR IS TO REFER TO PART 4, SECTION H OF THE METROPOLITAN ST. LOUIS SEWER DISTRICT, STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES, 2009 EDITION, TO ESTABLISH THE REQUIREMENTS FOR THE SPECIFIC TYPE OF BACKFILL BEING USED.
16. WHEN A STORM PIPE CROSSES OVER A NEW SANITARY SEWER AND THE VERTICAL CLEARANCE IS LESS THAN TWO (2) FEET, THE SANITARY SEWER MUST BE ENCASED IN CONCRETE THROUGH THE CROSSING AND FOR TEN LINEAL FEET EACH SIDE OF THE CROSSING.

ST. LOUIS COUNTY NOTES

1. ALL SIDEWALKS TO BE CONSTRUCTED TO SAINT LOUIS COUNTY ADA STANDARDS WITHIN ST. LOUIS COUNTY R/W.
2. THE DEVELOPER IS REQUIRED TO PROVIDE ADEQUATE STORM WATER SYSTEMS IN ACCORDANCE WITH SAINT LOUIS COUNTY AND MSD STANDARDS.
3. ALL GRADING AND DRAINAGE TO BE IN CONFORMANCE WITH SAINT LOUIS COUNTY AND MSD STANDARDS.
4. NO SLOPES WITHIN ST. LOUIS COUNTY RIGHT-OF-WAY SHALL EXCEED 3 (HORIZONTAL) TO 1 (VERTICAL).
5. STORM WATER SHALL BE DISCHARGED AT AN ADEQUATE NATURAL DISCHARGE POINT. SINKHOLES ARE NOT ADEQUATE DISCHARGE POINTS.
6. ALL WORK WITHIN ST. LOUIS COUNTY RIGHT-OF-WAY SHALL BE TO COUNTY STANDARDS.
7. ALL DISTURBED EARTH AREAS WITHIN ST. LOUIS COUNTY RIGHT-OF-WAY SHALL BE SODDED.
8. INSTALLATION OF LANDSCAPING AND ORNAMENTAL ENTRANCE MONUMENT OR IDENTIFICATION SIGNAGE CONSTRUCTION, IF PROPOSED, SHALL BE REVIEWED BY THE DEPARTMENT OF HIGHWAYS AND TRAFFIC FOR SIGHT DISTANCE CONSIDERATIONS AND APPROVED PRIOR TO INSTALLATION OR CONSTRUCTION.
9. THE DEVELOPER IS ADVISED THAT UTILITY COMPANIES WILL REQUIRE COMPENSATION FOR RELOCATION OF THEIR FACILITIES WITHIN THE PUBLIC ROAD RIGHT-OF-WAY. ST. LOUIS COUNTY SHALL BEAR NO RESPONSIBILITY FOR UTILITY RELOCATION OR ADJUSTMENT COSTS OR ASSOCIATED DELAYS. UTILITY RELOCATION COST SHALL BE CONSIDERED THE DEVELOPER'S RESPONSIBILITY. THE DEVELOPER SHALL ALSO BE AWARE OF EXTENSIVE DELAYS IN UTILITY COMPANY RELOCATION AND ADJUSTMENTS. SUCH DELAYS WILL NOT CONSTITUTE A CAUSE TO ALLOW OCCUPANCY PRIOR TO COMPLETION OF ROAD IMPROVEMENTS.
10. PROVIDE ADEQUATE OFF-STREET PARKING FOR CONSTRUCTION EMPLOYEES. PARKING ON NON-SURFACED AREAS SHALL BE PROHIBITED IN ORDER TO ELIMINATE THE CONDITION WHEREBY MUD FROM CONSTRUCTION AND EMPLOYEE VEHICLES IS TRACKED ONTO THE PAVEMENT CAUSING HAZARDOUS ROADWAY AND DRIVEWAY CONDITIONS.
11. ADDITIONAL SILTATION CONTROL SHALL BE INSTALLED AS REQUIRED BY ST. LOUIS COUNTY DEPARTMENT OF HIGHWAYS AND TRAFFIC.
12. PERMIT WILL BE REQUIRED BY ST. LOUIS COUNTY DEPARTMENT OF PUBLIC WORKS FOR CONSTRUCTION OF RETAINING WALLS.
13. PERMIT WILL BE REQUIRED BY ST. LOUIS COUNTY DEPARTMENT OF PUBLIC WORKS FOR ROOF DRAIN CONNECTIONS.
14. ALL OFFSITE PROPERTY OWNERS SHALL BE GIVEN NOTICE 48 HOURS IN ADVANCE OF ANY WORK.
15. ANY DISTURBED OFF SITE PROPERTY (I.E. BUSHES, FENCES, MAILBOXES, ETC.) SHALL BE REPLACED, IN KIND, AT THE DEVELOPER'S EXPENSE.
16. INTERNAL (PRIVATE) STORM SEWERS WILL REQUIRE A SEPARATE DRAINAYER PERMIT FROM ST. LOUIS COUNTY DEPARTMENT OF PUBLIC WORKS.
17. TREES AND/OR SHRUBS SHALL NOT BE REMOVED OR DISTURBED WITHIN ST. LOUIS COUNTY RIGHT-OF-WAY WITHOUT PRIOR APPROVAL OF THE ST. LOUIS COUNTY DEPARTMENT OF HIGHWAYS AND TRAFFIC.
18. TRUCKS SHALL NOT EXCEED POSTED WEIGHT LIMITS FOR ST. LOUIS COUNTY BRIDGES DURING HAUL OPERATIONS.
19. SEDIMENT SHALL BE WASHED FROM ALL VEHICLES AT WASHDOWN STATION PRIOR TO LEAVING SITE. NO TRACKING OF MUD ONTO COUNTY ROADS SHALL BE ALLOWED.
20. INTERNAL STORM WATER DRAINAGE CONTROL IN THE FORM OF SILTATION CONTROL MEASURES ARE REQUIRED.
21. ALL CONSTRUCTION SHALL BE PER MOST CURRENT DETAILS LOCATED IN THE ST. LOUIS COUNTY DESIGN CRITERIA MANUAL AND/OR THE SEDIMENT AND EROSION CONTROL MANUAL.
22. ALL HYDRANTS, POWER POLES OR OTHER OBSTRUCTIONS WITHIN ST. LOUIS COUNTY ROAD RIGHT-OF-WAY SHALL HAVE A MINIMUM TWO FOOT SETBACK FROM FACE OF CURB OR EDGE OF SHOULDER OF THE ULTIMATE PAVEMENT SECTION AS DIRECTED BY ST. LOUIS COUNTY DEPARTMENT OF HIGHWAYS AND TRAFFIC.
23. RIGHT-OF-WAY DEDICATION SHALL BE COMPLETED PRIOR TO THE ISSUANCE OF A SPECIAL USE PERMIT. ROAD IMPROVEMENTS SHALL BE COMPLETED PRIOR TO THE ISSUANCE OF AN OCCUPANCY PERMIT. IF DEVELOPMENT PAVING IS ANTICIPATED, THE DEVELOPER SHALL COMPLETE ROAD IMPROVEMENTS, RIGHT-OF-WAY DEDICATION, AND ACCESS REQUIREMENTS OF EACH PHASE OF DEVELOPMENT AS DIRECTED BY THE DEPARTMENT OF HIGHWAYS AND TRAFFIC. THE DELAYS DUE TO UTILITY RELOCATION AND ADJUSTMENTS WILL NOT CONSTITUTE A CAUSE TO ALLOW OCCUPANCY PRIOR TO COMPLETION OF ROAD IMPROVEMENTS.
24. APPLICANT SHALL USE EXTREME CAUTION IN AREAS WHERE TRAFFIC SIGNAL FACILITIES ARE EXISTING. IT IS THE RESPONSIBILITY OF THE CONTRACTOR/DEVELOPER TO CONTACT THE ST. LOUIS COUNTY DEPARTMENT OF HIGHWAYS AND TRAFFIC AT (314) 615-0215 A MINIMUM OF 48 HOURS IN ADVANCE OF CONSTRUCTION WORK FOR LOCATING AND SPOTTING EXISTING TRAFFIC SIGNAL CONDUIT. IN THE EVENT THE CONTRACTOR DAMAGES ANY TRAFFIC SIGNAL FACILITIES, REPAIRS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE BY AN ELECTRICAL CONTRACTOR AS DIRECTED BY ST. LOUIS COUNTY.
25. THE CONTRACTOR SHALL NOTIFY THE ST. LOUIS COUNTY DIVISION OF OPERATIONS STRIPPING PERSONNEL AT (314) 615-0233, 24 HOURS IN ADVANCE OF ANY STRIPPING RELATED WORK. ALL GRINDING OF EXISTING STRIPING AND INSTALLATION OF TEMPORARY STRIPING AS REQUIRED BY ST. LOUIS COUNTY SHALL BE PERFORMED BY THE CONTRACTOR. ALL PERMANENT STRIPING WILL BE INSTALLED BY THE ST. LOUIS COUNTY DEPARTMENT OF HIGHWAYS AND TRAFFIC.
26. ANY ENTITY THAT PERFORMS WORK ON ST. LOUIS COUNTY MAINTAINED PROPERTY SHALL PROVIDE THE COUNTY WITH A CERTIFICATE OF INSURANCE (SHOWING GENERAL LIABILITY COVERAGE, BODY INJURY AND PROPERTY DAMAGE) IN THE AMOUNTS SPECIFIED AS THE LIMITS OF LIABILITY SET BY THE STATE FOR PUBLIC ENTITIES. SUCH CERTIFICATE SHALL INCLUDE "ST. LOUIS COUNTY" AS AN ADDITIONAL INSURED AND SHALL BE PROVIDED PRIOR TO THE ISSUANCE OF ANY PERMIT. CERTIFICATE SHALL PROVIDE FOR A 30 DAY POLICY CANCELLATION NOTICE TO ST. LOUIS COUNTY. UPON REQUEST, THE COUNTY WILL PROVIDE THE SPECIFIC AMOUNTS FOR BOTH PER PERSON AND PER OCCURRENCE LIMITS.
27. ALL SIDEWALKS, SIDEWALK TERMINATIONS, AND ASSOCIATED ACCESSIBILITY IMPROVEMENTS SHALL BE CONSTRUCTED TO ST. LOUIS COUNTY ADA STANDARDS, WITHIN ST. LOUIS COUNTY R/W.
28. PRIOR TO IMPROVEMENTS/CONSTRUCTION PLAN APPROVAL, THE ENGINEERS SHALL PROVIDE A SIGNED AND SEALED NOTE ON THE PLANS FOR BOTH RESIDENTIAL AND COMMERCIAL PROJECTS STATING THAT THE UNIMPROVED EXISTING SIDEWALK ALONG THE PROJECT FRONTAGE MEETS CURRENT ST. LOUIS COUNTY/ADA STANDARDS.

BULK EARTHWORK NOTES

ON-SITE QUANTITIES:

Out.....8,292.....± CUBIC YARDS
Fill.....19,957.....± CUBIC YARDS
NET.....11,666 (short).....± CUBIC YARDS

THE ENGINEER HAS CALCULATED THE ABOVE QUANTITIES OF EARTHWORK TO BE REGARDED AS AN ESTIMATE OF THE BULK MOVEMENT OR REDISTRIBUTION OF SOILS ON THIS PROJECT. AS AN ESTIMATE, THESE QUANTITIES ARE INTENDED FOR GENERAL USE AND THE ENGINEER ASSUMES NO LIABILITY FOR COST OVERRUNS DUE TO EXCESS EXCAVATED MATERIALS OR SHORTAGES OF FILL.

THE ENGINEER'S EARTHWORK ESTIMATE DOES NOT INCLUDE ANY OF THE FOLLOWING ITEMS REQUIRING EARTHWORK THAT MAY BE NECESSARY FOR COMPLETION OF THE PROJECT: MISCELLANEOUS UNDERGROUND CONDUITS, INCLUDING SEWER LINES AND WATER MAINS LESS THAN TWENTY-FOUR INCHES IN DIAMETER, STANDARD MANHOLES, PROCESS OR TRANSFER PIPING, ELECTRICAL OR TELEPHONE CONDUITS OR DUCT BANKS, BASES FOR LIGHT STANDARDS, BUILDING FOOTINGS AND FOUNDATIONS, RETAINING WALL, BACKFILL, ETC.

THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACTUAL SIZE OF THE FIELD EXCAVATIONS MADE FOR THE INSTALLATION OF UNDERGROUND STRUCTURES, AND AS SUCH, THE ACTUAL QUANTITIES OF EARTHWORK FROM SUCH ITEMS MAY VARY FROM THE ESTIMATE SHOWN ABOVE.

THE ENGINEER ASSUMES NO RESPONSIBILITY FOR COSTS INCURRED DUE TO REMOVAL OF UNSUITABLE MATERIAL FROM THE SITE.

IT IS THE RESPONSIBILITY OF THE GRADING CONTRACTOR TO PERFORM AN INDEPENDENT EARTHWORK ANALYSIS PRIOR TO SUBMISSION OF BID. IN THE EVENT A DISCREPANCY EXISTS THE GRADING CONTRACTOR SHALL NOTIFY ENGINEER OF DISCREPANCY PRIOR TO SUBMISSION OF BID.

AFTER CONTRACTOR RECEIVES AWARD AND NOTICE TO PROCEED (NTP), CONTRACTOR SHALL FIELD VERIFY EXISTING TOPOGRAPHY AND PERFORM EARTHWORK ANALYSIS PRIOR TO COMMENCING GRADING TO RE-CONFIRM BID QUANTITIES.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO APPLY THE RECOMMENDATIONS SUPPLIED IN THE MARCH 16, 2015 GEOTECHNICAL REPORT, TITLED "GEOTECHNICAL INVESTIGATION MT. JOE RD. 13905, THE RESIDENCES AT THE QUARRY, ST. LOUIS COUNTY, MISSOURI" PREPARED BY MIDWEST TESTING AND ANY ADDENDUM THERETO.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN "ALL" GEOTECHNICAL INVESTIGATIONS FROM THE "OWNER". CONTRACTOR SHALL REVIEW AND FAMILIARIZE THEMSELVES WITH RECOMMENDATIONS AS OUTLINED BY THE PROJECT GEOTECHNICAL ENGINEER AND INCORPORATE IT IN THEIR PROPOSED SCOPE OF WORK.

RE-USE OF EXISTING STOCKPILE MATERIALS AND EXCAVATION SPOILS ON-SITE SHALL BE VERIFIED AND COORDINATED WITH THE PROJECT GEOTECHNICAL ENGINEER.

CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ANY ROCK ENCOUNTERED. CONTRACTOR SHOULD FAMILIARIZE THEMSELVES WITH ALL THE GEOTECHNICAL REPORTS AVAILABLE AND REVIEW THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.

EARTHWORK ASSUMPTIONS:

12" PAVEMENT SUBGRADE
12" BUILDING SUBGRADE
13" POROUS PAVEMENT SUBGRADE
BIO-RETENTION SUBGRADE
100% NO SHRINKAGE ON FILL MATERIAL
4,000 CY SHRINKAGE FOR BUILDING PAD REMEDIATION OF ON-SITE SOILS
13,500 CY SPOILS FROM WATER, SANITARY, FOUNDATIONS, WALLS, AND STORM SEWERS
11,500 CY EXCESS MATERIAL TO BE PROVIDED FROM MASS GRADING OPERATIONS BY COLE

ADJUSTED QUANTITIES:

-11,666 CY (SHORT) + 3,500 CY SPOILS - 3,200 CY REMEDIATION + 11,500 CY FROM MASS GRADING = 132 CY LONG

NOTE:
NUMBERS DO NOT INCLUDE SITE ELECTRIC, OR UNDERSLAB UTILITY SPOILS.

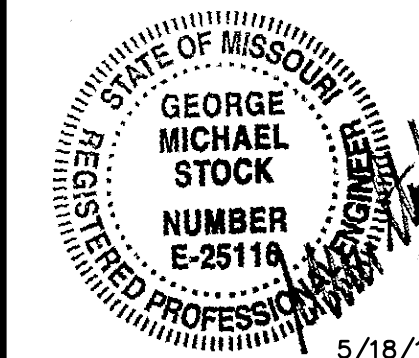
NO HAUL ON OR HAUL OFF EXPECTED

PREPARED BY:

SITE IMPROVEMENT PLANS

Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri
63131



GEORGE M. STOCK
CIVIL ENGINEER
DESIGN FIRM NO.
184-003965

REVISIONS:

- MSD ISSUE 5/18/18

DRAWN BY: J.E.F. CHECKED BY: G.M.S.

DATE: 05/10/18 JOB NO.: 218-6257

M.S.D. # - BASE MAP # 22-0

S.L.C. MAP # - NAT. S.D.P. # -

DESK # - FIRM PANEL: 29188C0302K

SHEET TITLE:

SPECIFICATION
SHEET

SHEET NO.:

C-1.1

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS HEREIN. THE UNDERSIGNED ENGINEER'S SEAL APPEARS. THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. THE UNDERSIGNED ENGINEER ASSUMES NO LIABILITY FOR COST OVERRUNS DUE TO EXCESS EXCAVATED MATERIALS OR SHORTAGES OF FILL. THE UNDERSIGNED ENGINEER ASSUMES NO RESPONSIBILITY TO VERIFY FIELD ADJUSTMENTS AS SHOWN ON THE PLAN. THESE MEASUREMENTS ARE NOT AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

1 1/2" (CLEARANCE TYP.)

Ø 3 REBAR Ø 6" O.C. @ MIDPOINT (FOR 2" PAD THICKNESS)

9 GAUGE WIRE HANDLE

6"x6" - 10 GAUGE WIRE MESH @ MIDPOINT (FOR 2" PAD THICKNESS)

2'-0"

NOTES:

- PAD THICKNESS = 2" OR 4"
- PROVIDE CERTIFICATION FOR REINFORCING WIRE AS REQUIRED.

MISSOURI AMERICAN WATER STANDARD CIVIL PRE-FABRICATED STEEL REINFORCED CONCRETE BLOCKING PAD DETAIL

MISSOURI AMERICAN WATER ENGINEERING 2701 OLIVE ST., SUITE 100 ST. LOUIS, MO 63101

DESIGN: J.M. 11-10-08 PROJECT: 0201-0601-S012

MISSOURI AMERICAN WATER STANDARD CIVIL PRE-FABRICATED STEEL REINFORCED CONCRETE BLOCKING PAD DETAIL

MISSOURI AMERICAN WATER ENGINEERING 2701 OLIVE ST., SUITE 100 ST. LOUIS, MO 63101

DESIGN: J.M. 11-10-08 PROJECT: 0201-0601-S012

SPECIFICATION SHEET

Series 800

Detector Check for Automatic Fire Sprinkler Systems

Size: 4" - 10" (100mm - 250mm)

The FEBCO Series 800 is used in the protection of potable water supplies from unauthorized water usage. This requires installation of the proper valve to measure water flow. The Series 800 Detector check is not a back-flow prevention assembly and should not be used as such.

Features

- UL listed and FM approved for horizontal or vertical installation.
- Spring-loaded swing check for reliability and minimum head loss.
- 250psi (17.2 bar) working pressure for superior strength.
- Ductile iron body for superior strength and lighter weight.
- Fully rubber encapsulated ductile iron disc for strength.
- Fusion epoxy coated, inside and out, for corrosion protection.
- Simple service procedures.
- Cast lifting ring for ease of installation.
- 4", 6", 8", and 10" sizes.
- ¾" standard bypass, optional sizes: 1", 1½", and 2".
- End Connections - Flanged ANSI B16.42, Class 150

Operation

In a non-flow condition, the mainline check and bypass check are closed and the meter is shut. At flow up to approximately 10 gpm will flow through the standard ¾" (20mm) bypass. The operation at low flow rates is accomplished by designing the differential pressure drop across the bypass line to be slightly less than the mainline check valve. Therefore, the mainline check valve remains closed so that low flows through the hydrant system are regulated by the bypass meter.

Flow in excess of approximately 10 gpm will open the mainline check valve causing flow to occur through the mainline assembly and the bypass line.

Specifications

Detector check shall consist of a single spring-loaded swing check in parallel with a bypass meter assembly. Seat rings shall be bronze, ballbed to the valve bodies with an elastomer seal.

The main check assembly shall be hinge guided. Head loss through the assembly shall not exceed 5psi (0.34 bar) at velocities from zero up to and including 10gpm (4 lpm).

Mainline check body and cover shall be manufactured of Ductile Iron ASTM A536 Grade 6545-12. Ductile iron bodies shall be flanged ANSI B16.42, Class 150 and fusion epoxy coated 8 mils minimum to meet AWWA C550-90. Detector check shall be rated at 250psi (17.2 bar) working pressure and be UL listed and FM approved for both horizontal and vertical installation. Disc shall be rubber encapsulated ductile iron.

Detector check shall meet or exceed requirements of Underwriters Laboratory and Factory Mutual Research Corporation. Detector check shall be FEBCO Series 800 or prior approved equal.

Pressure - Temperature

Maximum working pressure: 250psi (17.2 bar)
Hydrostatic test pressure: 500psi (34.5 bar)
Temperature range: 32°F to 180°F (0°C to 90°C)

Materials

Main valve body: Ductile Iron Grade 65-42
Fusion Epoxy coated
Internal and External
AWWA C550-90

Seat: Bronze
Elastomer: Spring
Bypass meter: Stainless Steel

Tooling type GPMCFM 1/2" x 3/4"

Job Name _____

Job Location _____

Engineer _____

Approval _____

Contractor _____

Approval _____

Contractor's P.O. No. _____

Representative _____

FEBCO product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact FEBCO/FEBCO reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on FEBCO products previously or subsequently sold.

ADJUSTABLE INDICATOR POST FOR 4"-14" VALVES

Mueller Co. UL / FM

FIRE PROTECTION PRODUCTS

A-20806: Adjustable Type Indicator Post

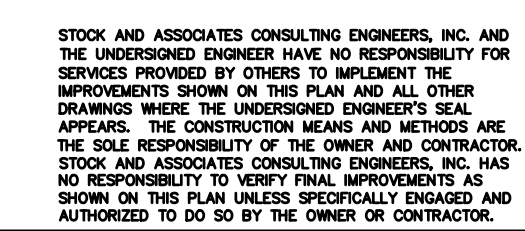
UL Listed ULC Listed FM Approved

PARTS LIST

Catalog Part No.	Description	Material	Material Standard
P208	SHUT Target	Plastic	Nylon
P209	OFFEN Target	Plastic	Nylon
P217	Coiler Pin (short)	Brass	ASTM B21
P218	Coiler Pin (long)	Brass	ASTM B21
P219	Coiler Pin (short)	Brass	ASTM B21
P220	Coiler Pin (long)	Brass	ASTM B21
P221	Coiler Pin (short)	Brass	ASTM B21
P222	Coiler Pin (long)	Brass	ASTM B21
P223	Coiler Pin (short)	Brass	ASTM B21
P224	Coiler Pin (long)	Brass	ASTM B21
P225	Coiler Pin (short)	Brass	ASTM B21
P226	Coiler Pin (long)	Brass	ASTM B21
P227	Coiler Pin (short)	Brass	ASTM B21
P228	Coiler Pin (long)	Brass	ASTM B21
P229	Coiler Pin (short)	Brass	ASTM B21
P230	Coiler Pin (long)	Brass	ASTM B21
P231	Coiler Pin (short)	Brass	ASTM B21
P232	Coiler Pin (long)	Brass	ASTM B21
P233	Coiler Pin (short)	Brass	ASTM B21
P234	Coiler Pin (long)	Brass	ASTM B21
P235	Coiler Pin (short)	Brass	ASTM B21
P236	Coiler Pin (long)	Brass	ASTM B21
P237	Coiler Pin (short)	Brass	ASTM B21
P238	Coiler Pin (long)	Brass	ASTM B21
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P240	Coiler Pin (long)	Brass	ASTM B21
P241	Coiler Pin (short)	Brass	ASTM B21
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P269	Coiler Pin (short)	Brass	ASTM B21
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P281	Coiler Pin (short)	Brass	ASTM B21
P282	Coiler Pin (long)	Brass	ASTM B21
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P489	Coiler Pin (short)	Brass	ASTM B21



EXISTING SITE RESOURCES SUMMARY TABLE		
NATURAL RESOURCE	PRESENCE <input type="checkbox"/>	ADDITIONAL INFORMATION
WETLANDS	NO	NONE IDENTIFIED ON SITE.
STREAMS AND FLOODPLAIN	NO	THIS PROPERTY IS IN ZONE "C" DEFINED AS AREAS DETERMINED TO BE OUTSIDE THE 100 YEAR FLOOD PLAIN AS PER FEMA MAP NUMBER 2280B-01-0007 EFFECTIVE DATE FEBRUARY 4, 2015.
KARST	NO	NOT IDENTIFIED ON SITE.
PONDS	NO	NOT IDENTIFIED ON SITE.



SHEET NO.:

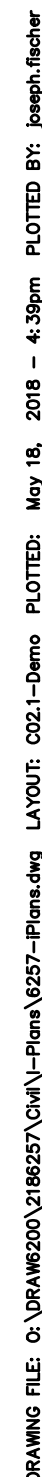
C-1.4

Stock & Associates
Consulting Engineers, Inc.

257 Chesterfield Business Parkway
St. Louis, MO 63015
PH: (636) 550-9100
FAX: (636) 550-9130
e-mail: general@stockassoc.com
Web: www.stockassoc.com

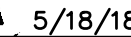


1. ALL TREES THAT ARE NOT NOTED TO BE REMOVED (TBR) AND LOCATED OUTSIDE AND ADJACENT TO THE DISTURBED AREAS (AS INDICATED ON DEMO PLAN) SHALL REMAIN AND BE PROTECTED. SEE DRAWINGS AND SPECIFICATIONS FOR TREE PROTECTION DETAILS.
2. DEMOLITION INCLUDES ALL MATERIAL WITHIN THE LIMITS OF CONSTRUCTION LINE SHOWN ON PLANS, UNLESS OTHERWISE NOTED ON SHEET.
3. CONTRACTOR IS RESPONSIBLE TO FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES AND/OR IRRIGATION SYSTEMS ADJACENT TO THE PROPERTY PRIOR TO ANY DIGGING OR EARTH MOVING.
4. THE CONTRACTOR SHALL STAY WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON THE PLANS AND MINIMIZE DISTURBANCE WITHIN THE WORK AREA WHEREVER POSSIBLE.



STOCK & ASSOCIATES
Consulting Engineers, Inc.
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St. Louis, MO 63005
PH: (636) 530-9100
FAX: (636) 530-9120
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Web: www.stockclass.com

12818 Daylight Circle
St. Louis County, Missouri
63131



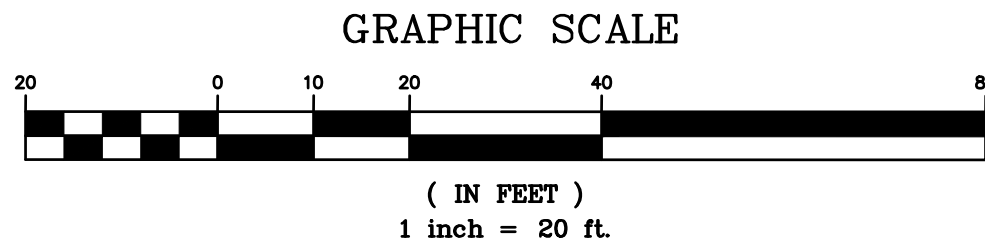
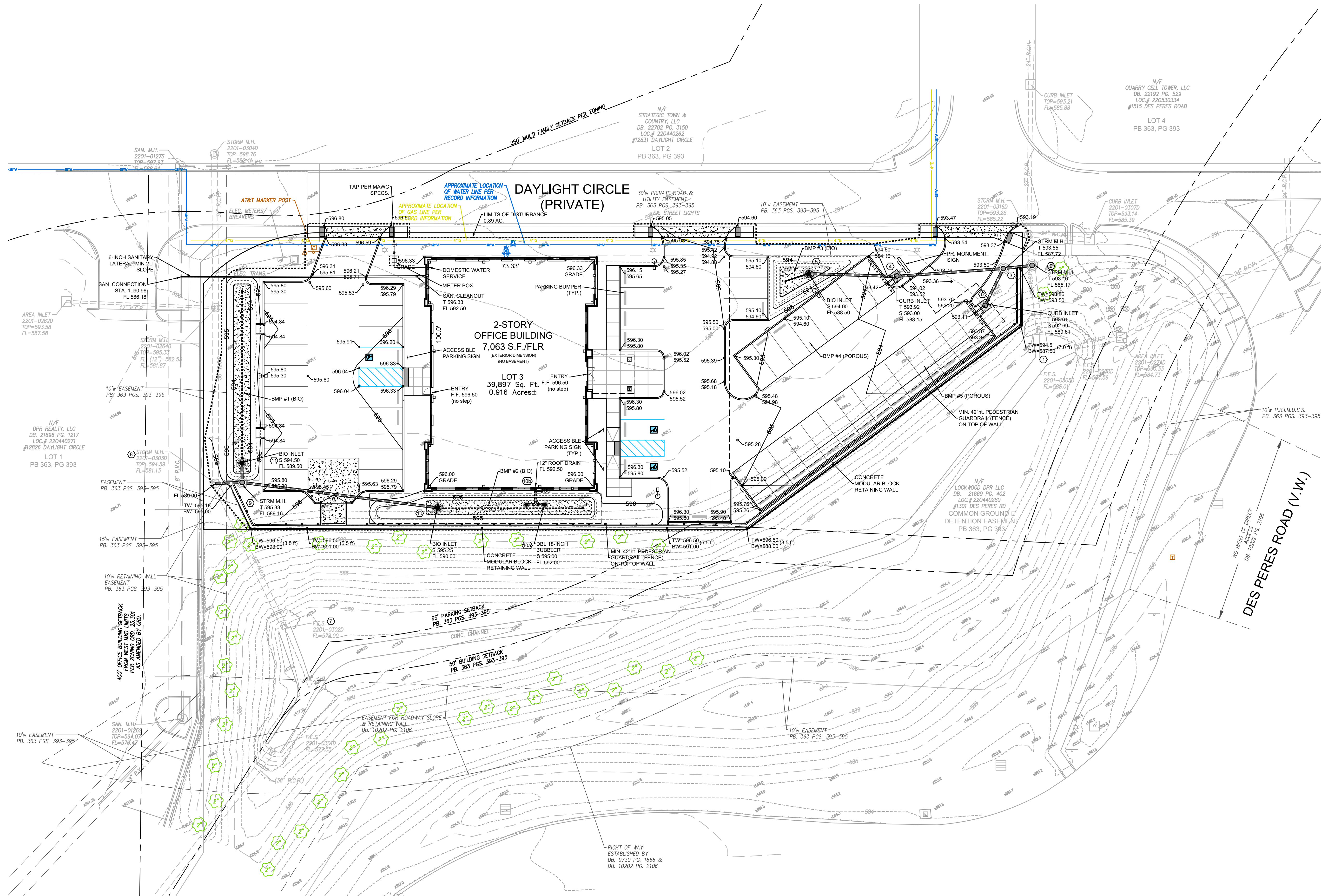
REVISIONS:

DRAWN BY: J.E.F.		CHECKED BY: G.M.S.	
DATE: 05/10/18		JOB NO.: 218-6257	
W.S.D. # -		BASE MAP # 22-0	
S.L.C. H&T # -		H&T SUP. # -	
M.O.N.R. # MO-00		FIRM PANEL: 29189C0302	

SHEET NO.:

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. A THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY SERVICES PROVIDED BY OTHERS TO IMPLEMENT THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS WHERE THE UNDERSIGNED ENGINEER'S SEAL APPEARS. THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. HAS NO RESPONSIBILITY TO VERIFY FINAL IMPROVEMENTS AS SHOWN ON THIS PLAN UNLESS SPECIFICALLY ENGAGED AND AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

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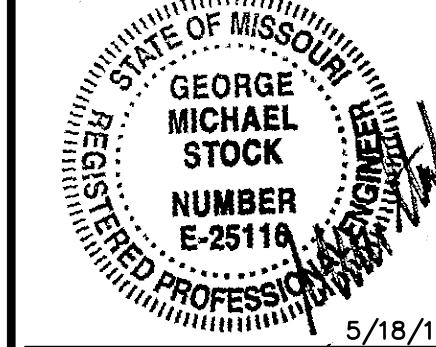


PREPARED BY:

Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri
63131

SITE IMPROVEMENT PLANS



GEORGE M. STOCK
CIVIL ENGINEER
DESIGN FIRM NO.
184-00395

REVISIONS:

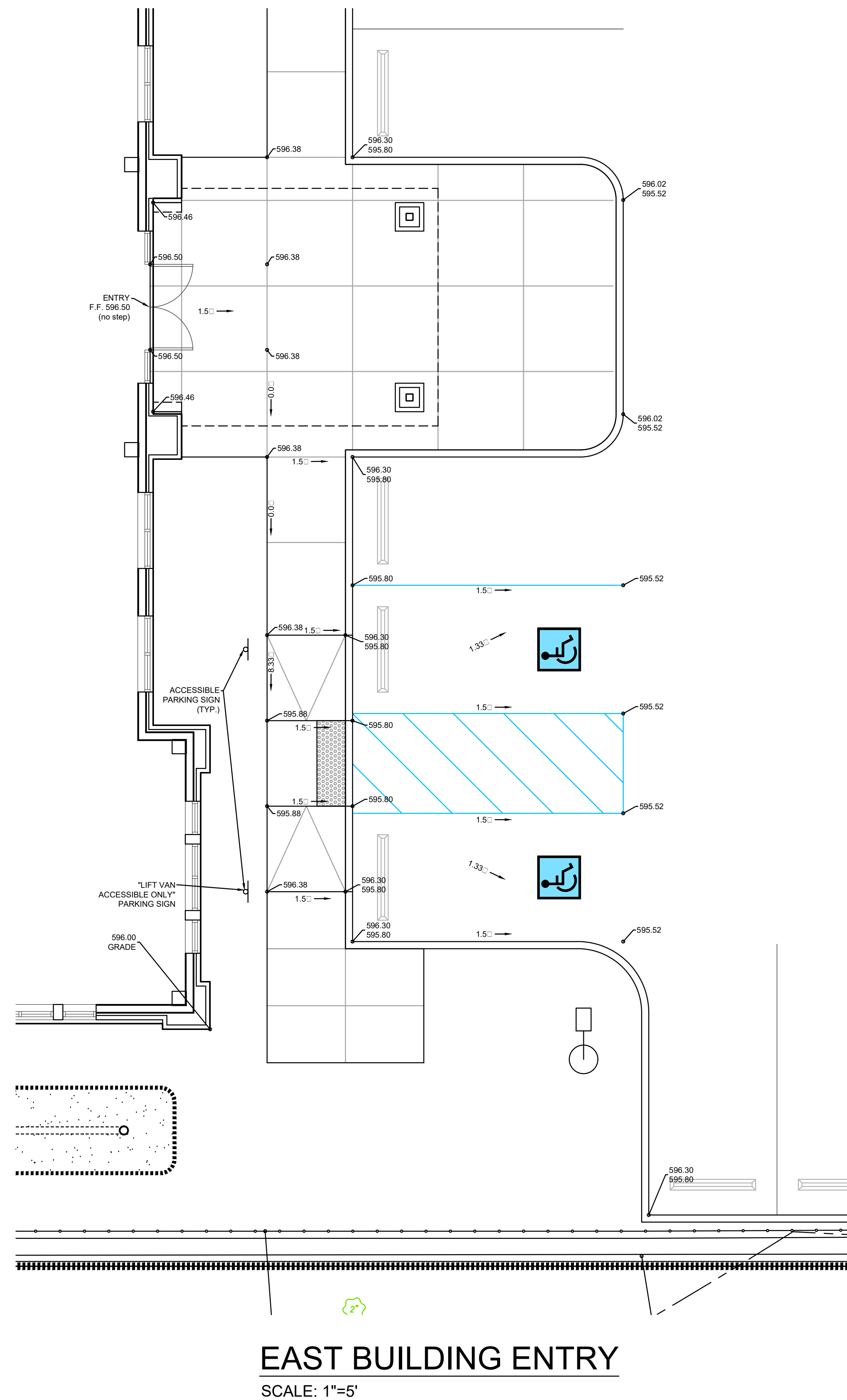
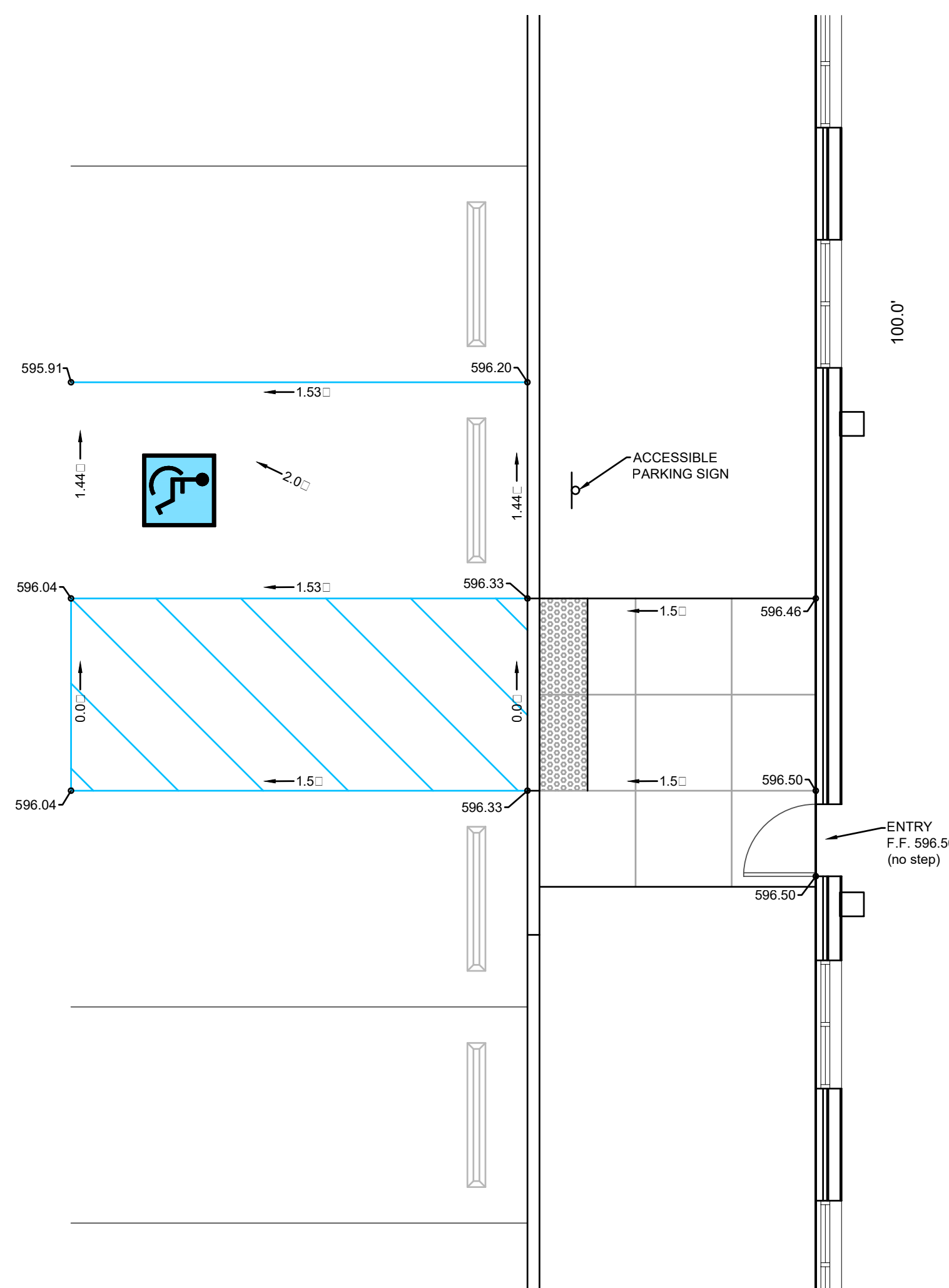
MSD ISSUE 5/18/18

DRAWN BY: J.E.F. CHECKED BY: G.M.S.
DATE: 05/10/18 JOB NO.: 218-6257
MSD: PE - BASE MAP: 22-0
SHEET NO.: 29188C0302K

SHEET TITLE:
SITE & GRADING
PLAN

SHEET NO.:
C-4.0

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION SHOWN ON THIS PLAN AND ALL OTHER INFORMATION SHOWN HEREON. THE UNDERSIGNED ENGINEER'S SEAL, APPROVAL, THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. HAS NO RESPONSIBILITY TO VERIFY THE INFORMATION SHOWN ON THIS PLAN. THE UNDERSIGNED ENGINEER HAS NO AUTHORITY TO DO SO BY THE OWNER OR CONTRACTOR.



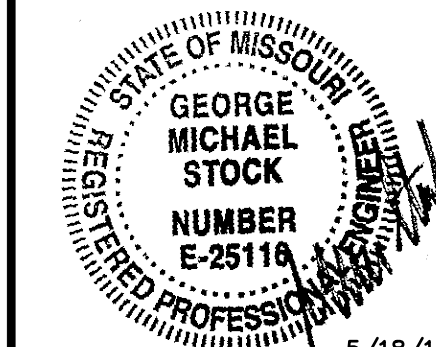
PREPARED BY:

STOCK & ASSOCIATES
Consulting Engineers, Inc.

Paradigm Office Building

SITE IMPROVEMENT PLANS

12818 Daylight Circle
St. Louis County, Missouri
63131



GEORGE M. STOCK PE 062-047-54
CIVIL ENGINEER
DESIGN FIRM NO.

REVISIONS:

-	MSD ISSUE	5/18/1
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DRAWN BY: J.E.F.	CHECKED BY: G.M.S.
DATE: 05/10/18	JOB NO.: 218-6257
W.S.D. P# —	BASE MAP # 22-0
S.L.C. H&T # —	H&T S.U.P. # —
M.O.N.R. # MO-00	FRM PANEL: 29189C0302

ENLARGED
GRADING
PLAN

SHEET NO.:
C-4.1

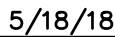
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SITE IMPROVEMENT PLANS

Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri
63131



REVISIONS:

IN BY: J.E.F.	CHECKED BY: G.M.S.
DATE: 05/10/18	JOB NO: 218-6257
BASE MAP: -	22-0
H&T: -	H&T S.U.P.: -
LR: MO-00	FIRM PANEL: 29189C0302K

SHEET NO.:

C-5.0

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR SERVICES PROVIDED BY OTHERS TO IMPLEMENT THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS WHERE THE UNDERSIGNED ENGINEER'S SEAL APPEARS. THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. HAS NO RESPONSIBILITY TO VERIFY FINAL IMPROVEMENTS AS SHOWN ON THIS PLAN UNLESS SPECIFICALLY ENGAGED AND AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

PREPARED BY:

SITE IMPROVEMENT PLANS

Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri
63131

ATTENTION SEWER CONTRACTOR

For Sewer Pipe (storm, sanitary and combined) with a design grade less than one percent (1%), verification of the pipe grade will be required for each installed reach of sewer, prior to any surface restoration or installation of any surface improvements. The Contractor's field supervisor will be required to provide daily documentation verifying that the as-built pipe grade meets the design grade through the submittal of signed cut sheets to the MSD Inspector upon request.

Field surveyed verification must be made under the direction of a licensed land surveyor or registered engineer. The Contractor will be required to remove and replace any sewer reach having an as-built grade which is flatter than the design grade by more than 0.1%. Sewers with grade greater than the design slope may be left in place, provided no other sewer grade is reduced by this variance in the as-built grade.

MSD also reserves the right to require the Contractor to remove and replace any sewer (at any time prior to construction approval) for which the as-built grade does not comply with the grade tolerance stated in the above paragraph.

The Sewer Contractor shall be responsible for any costs associated with the field verification of the sewer grade, or removal and replacement of the sewer pipe or associated appurtenances.

NOTES:

MAINTENANCE OF THE SEWERS DESIGNATED AS "PUBLIC" SHALL BE THE RESPONSIBILITY OF THE METROPOLITAN ST. LOUIS SEWER DISTRICT UPON DEDICATION OF THE SEWERS TO THE DISTRICT.

NOTES:

MANHOLES MAY BE RAISED USING COURSES OF BRICK OR APPROVED GRADE RING(S), PROVIDED THE TOTAL ADJUSTMENT OF THE MANHOLE DOES NOT EXCEED 12 INCHES (INCLUDING EXISTING RINGS OR COURSES OF BRICK). FOR MANHOLES WHICH EXCEED THE MAXIMUM OF 12 INCHES, THE TRANSITION SECTION OF THE STRUCTURE SHALL BE REMOVED AND THE BOTTOM SECTION RAISED USING THE SAME MATERIAL AS THE EXISTING STRUCTURE.

MANHOLES MAY BE LOWERED BY REMOVING THE TRANSITION SECTION, AND LOWERING THE EXISTING BOTTOM SECTION BY SAWCUTTING THE EXISTING CAST-IN-PLACE CONCRETE, REMOVING THE REQUIRED COURSES OF BRICK, OR BY REMOVING THE PRE-CAST RISER SECTION, AS APPROPRIATE.

STANDARD MANHOLE SPLITTER NOTE:

CONTRACTOR MUST VERIFY THE DIMENSIONS BETWEEN THE DIVERSION PIPE AND THE OVERFLOW PIPE PRIOR TO BACKFILL OF THE STRUCTURE AND NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCY WITH THE DIMENSIONS ON THE APPROVED PLANS. STRUCTURES BUILT INCORRECTLY WILL REQUIRE REMOVAL AND REPLACEMENT.

STANDARD CONSTRUCTION:

ALL STORM AND SANITARY SEWER STRUCTURES AND APPURTENANCES TO BE DEDICATED TO MSD, OR TO BE PRIVATE UNDER MSD INSPECTION, SHALL CONFORM TO THE METROPOLITAN ST. LOUIS SEWER DISTRICT STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES, 2009. THAT WILL INCLUDE STANDARD DETAILS SHOWN THEREIN, AND SHALL INCLUDE ALL SUBSEQUENT CHANGES MADE THERETO.

REVISIONS:

MSD ISSUE 5/18/18

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MANHOLES MAY BE RAISED USING COURSES OF BRICK OR APPROVED GRADE RING(S), PROVIDED THE TOTAL ADJUSTMENT OF THE MANHOLE DOES NOT EXCEED 12 INCHES (INCLUDING EXISTING RINGS OR COURSES OF BRICK). FOR MANHOLES WHICH EXCEED THE MAXIMUM OF 12 INCHES, THE TRANSITION SECTION OF THE STRUCTURE SHALL BE REMOVED AND THE BOTTOM SECTION RAISED USING THE SAME MATERIAL AS THE EXISTING STRUCTURE.

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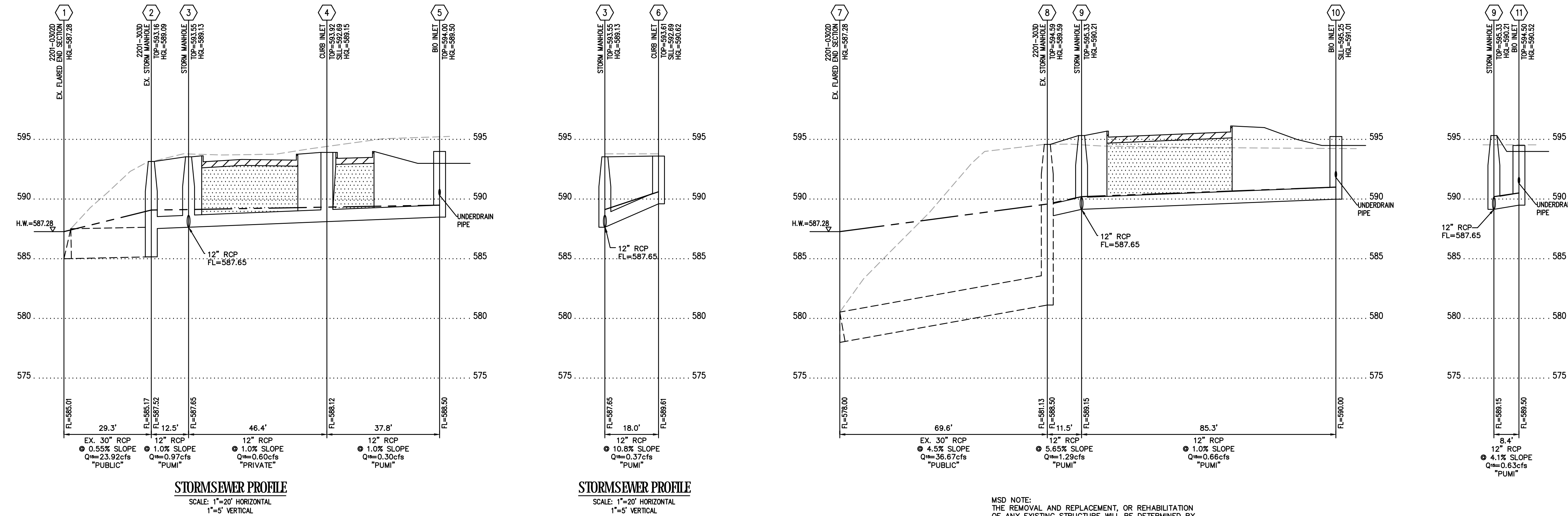
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STANDARD CONSTRUCTION:

ALL STORM AND SANITARY SEWER STRUCTURES AND APPURTENANCES TO BE DEDICATED TO MSD, OR TO BE PRIVATE UNDER MSD INSPECTION, SHALL CONFORM TO THE METROPOLITAN ST. LOUIS SEWER DISTRICT STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES, 2009. THAT WILL INCLUDE STANDARD DETAILS SHOWN THEREIN, AND SHALL INCLUDE ALL SUBSEQUENT CHANGES MADE THERETO.

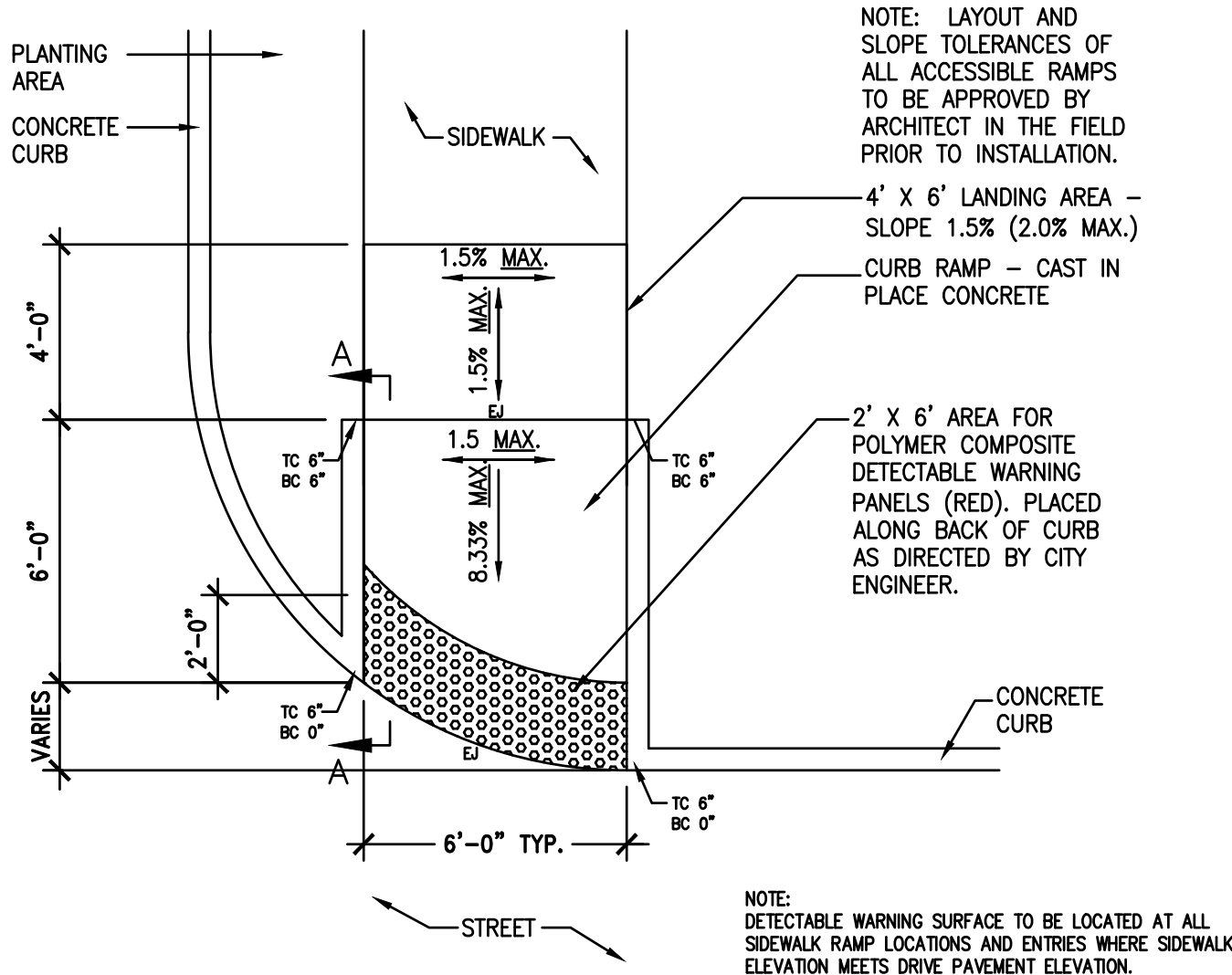
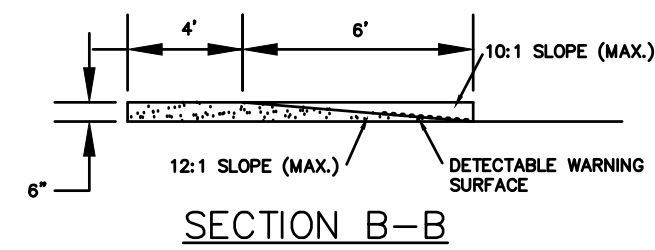
SHEET NO.:

C-6.0

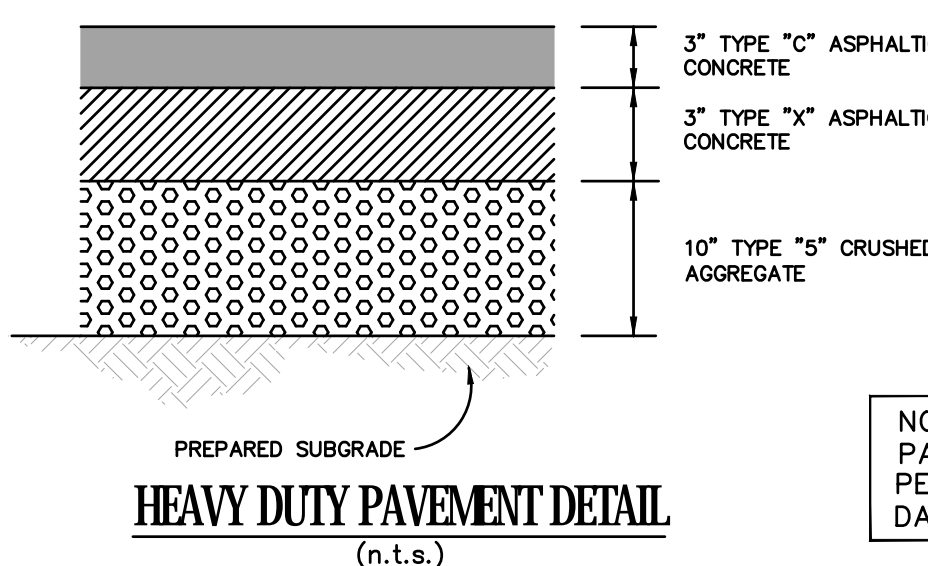
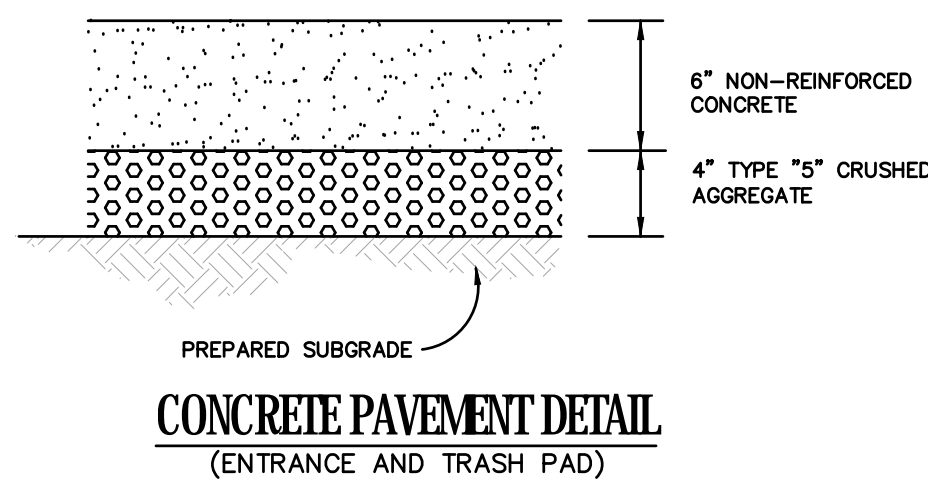
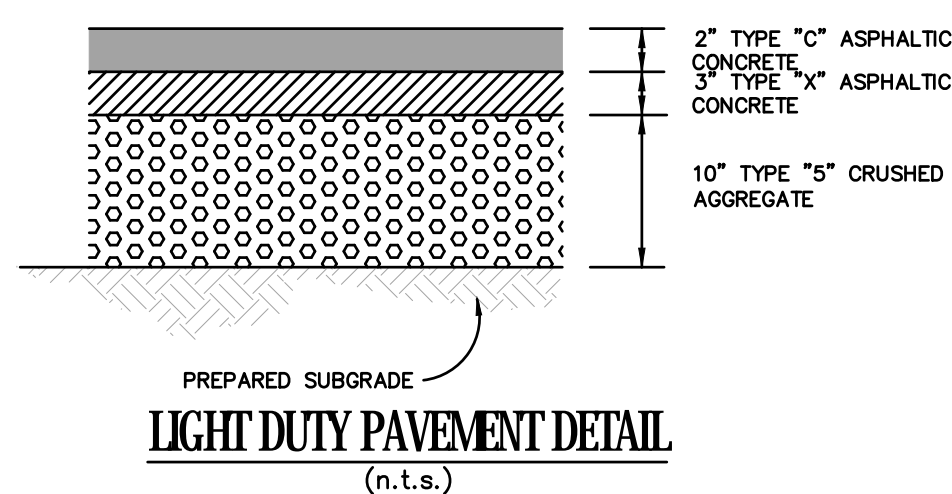
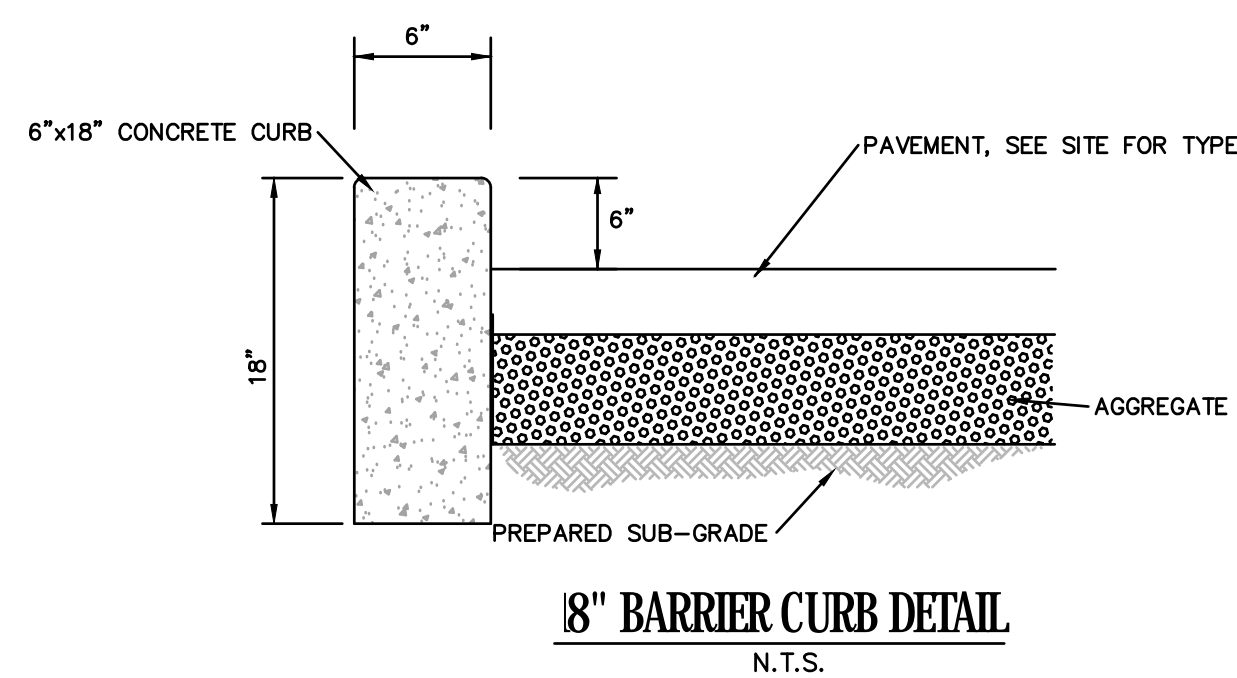


MSD NOTE:
THE REMOVAL AND REPLACEMENT, OR REHABILITATION
OF ANY EXISTING STRUCTURE WILL BE DETERMINED BY
THE MSD FIELD INSPECTOR. IF THE STRUCTURE IS
DETERMINED TO REMAIN IN PLACE, THEN THE TOP SHALL
BE ADJUSTED TO GRADE, IF NEEDED.

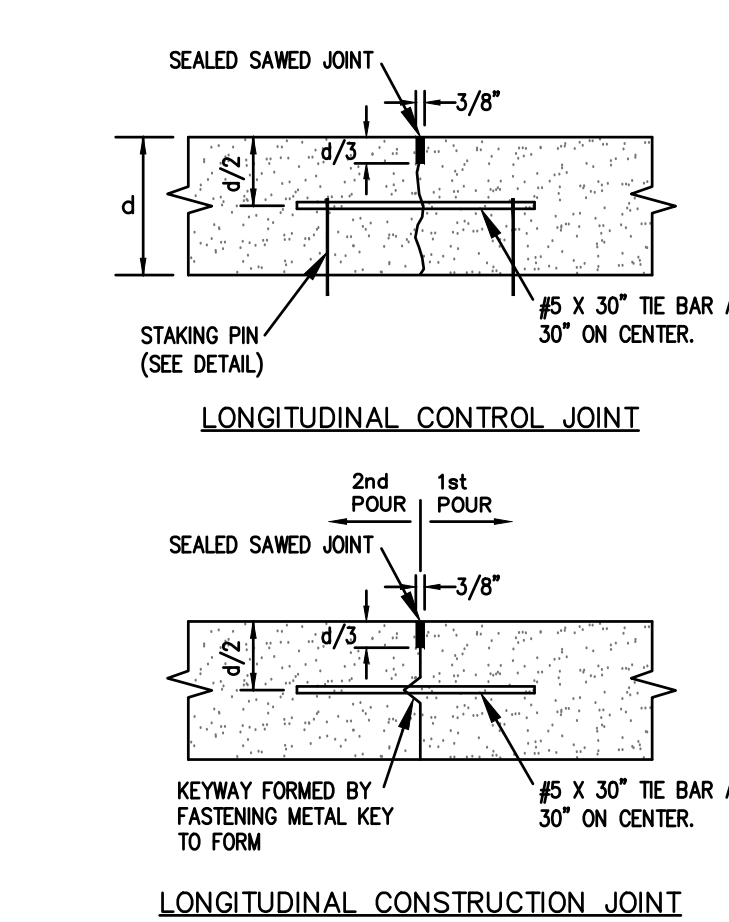
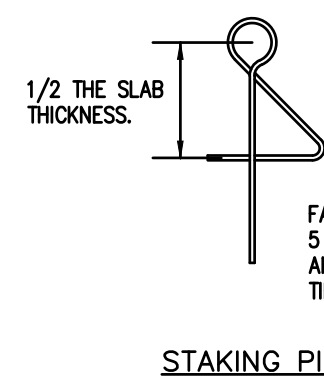
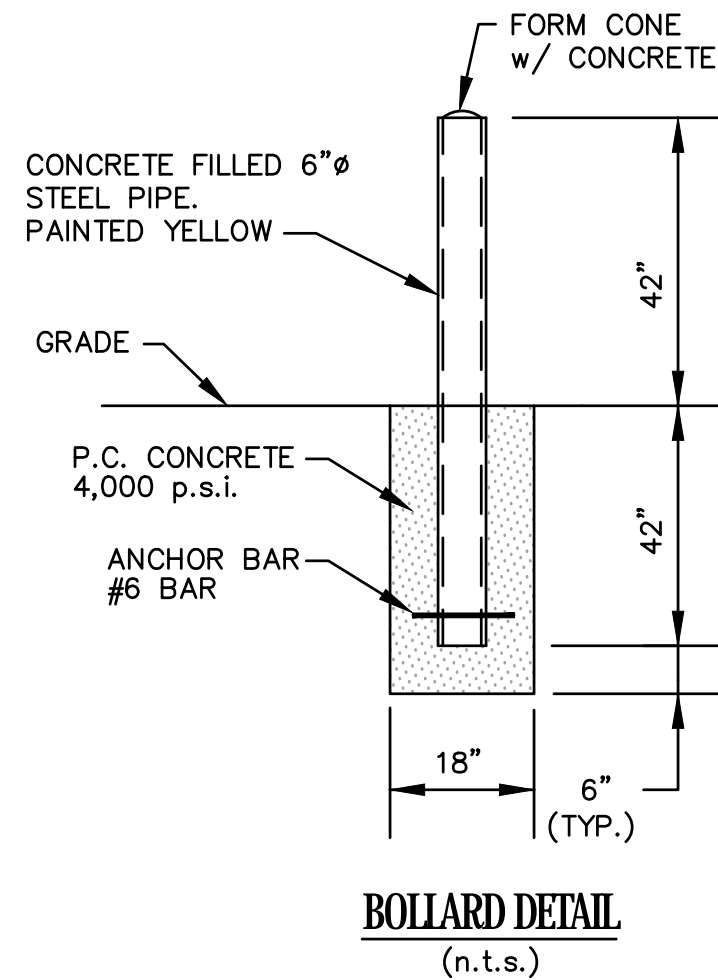
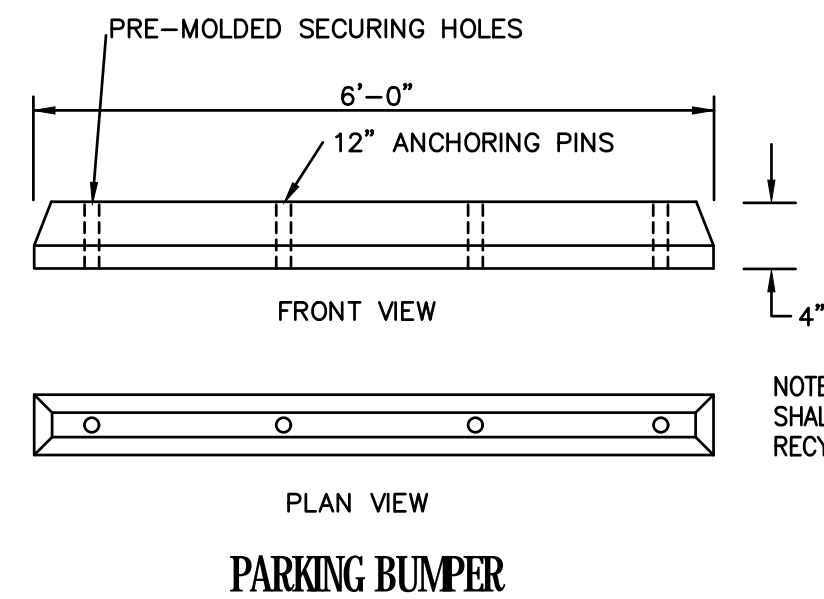
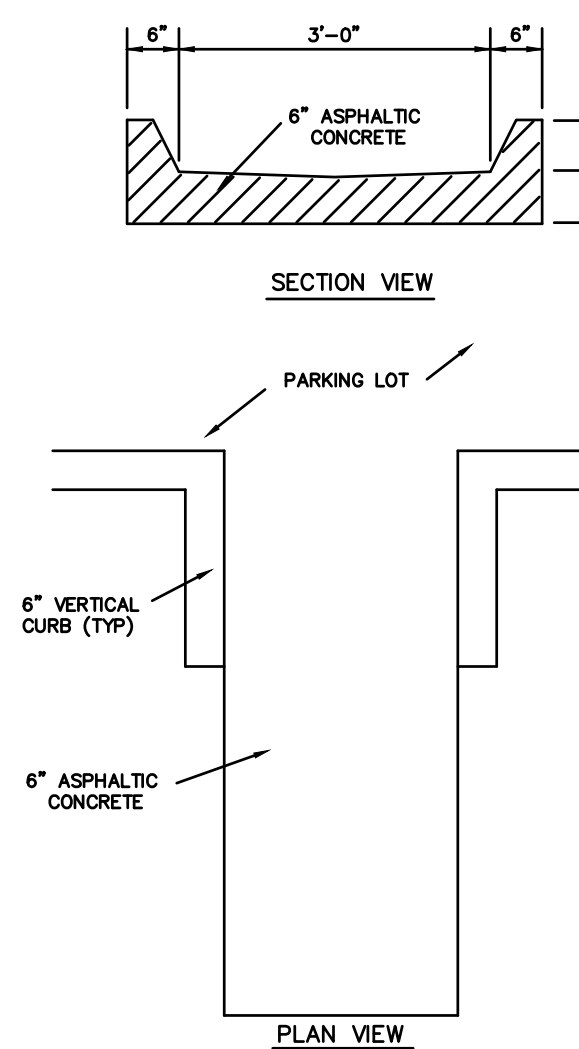
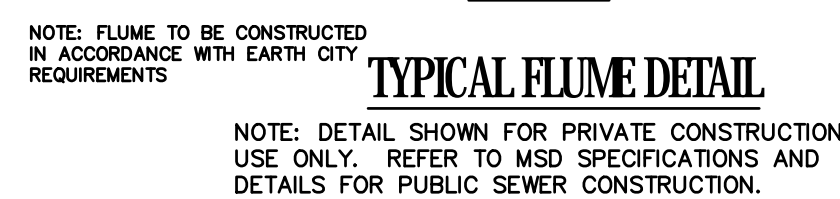
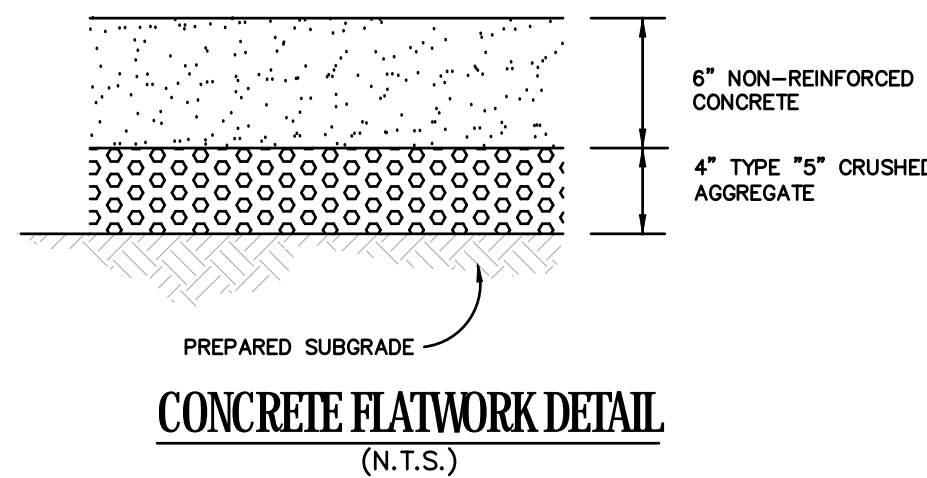
15Yr - 20 min Storm																										
Project name: Paradigm						Calculated By: J.E.F.																				
Project number: 218-6257						Checked By: G.M.S.																				
Project Location: Frontenac, MO						Date: 5/15/2018																				
								Bend Coefficients :																		
								$s^4 = 0.06$ $20^0 = 0.24$ $35^0 = 0.4$ $50^0 = 0.50$ $65^0 = 0.57$ $80^0 = 0.65$																		
								$10^0 = 0.11$ $25^0 = 0.30$ $40^0 = 0.43$ $55^0 = 0.52$ $70^0 = 0.60$ $85^0 = 0.67$																		
								$15^0 = 0.18$ $30^0 = 0.35$ $45^0 = 0.47$ $60^0 = 0.55$ $75^0 = 0.62$ $90^0 = 0.70$																		
LINE						FLOW LINE ELEVATIONS																				
Structure Number	Upper structure	Lower structure	Upper structure	Lower structure	Length (ft)	Flowline Grade R/F	Pipe Size (in.)	Full Flow Cap. (cfs)	Total Q (cfs)	Mean Full Flow Vel.(V) (ft/s)	Bend Coef.	Velocity Head (Vv) (ft)	QVv (ft³/s)	Pipe Coef. (n)	HEAD LOSS			Hydraulic Elevations				Structure Upper H.E. + H _u	TOP Structure Elevation	Free Board	Structure Number	
															Hr (ft)	Junction (ft)	Bend (ft)	Total H _u	Upper E. + Dia.	Lower H.E. +Hr	Lower H.E.					
5	5	4	588.50	588.12	37.80	0.0101	12	3.58	0.30	38.58	0.00	0.00	0.00	0.013	0.00	0.00	0.00	0.00	589.50	589.15	589.15	589.50	594.00	4.50	5	
4	4	3	588.12	587.65	46.40	0.0101	12	3.60	0.60	0.76	0.24	0.01	0.01	0.013	0.01	0.01	0.00	0.01	589.12	589.14	589.13	589.15	593.92	4.77	4	
3	3	2	587.65	587.52	12.50	0.0104	12	3.64	0.97	1.24	0.11	0.02	0.02	0.013	0.01	0.02	0.00	0.03	588.65	589.10	589.09	589.13	593.55	4.42	3	
2	2	1	585.17	585.01	29.30	0.0055	30	30.39	23.92	4.87	0.70	0.70	16.74	0.013	0.10	0.93	0.49	1.42	587.67	587.61	587.51	589.09	593.16	4.07	2	
1	1		585.01										HYDRAULIC GRADE = 100YR HIGH WATER (PW21821-03)										587.28			1
6	6	3	589.61	587.65	18.00	0.1089	12	11.79	0.37	0.47	0.47	0.00	0.00	0.013	0.00	0.00	0.00	0.01	590.61	589.13	589.13	590.62	593.61	2.99	6	
3	3		587.65										HYDRAULIC GRADE										589.13			3
10	10	9	590.00	589.15	85.30	0.0100	12	3.57	0.66	0.84	0.00	0.01	0.01	0.013	0.03	0.01	0.00	0.01	591.00	590.24	590.21	591.01	595.25	4.24	10	
9	9	8	589.15	588.50	11.50	0.0565	12	8.49	1.29	1.64	0.30	0.04	0.05	0.013	0.02	0.05	0.01	0.06	590.15	589.61	589.59	590.21	595.33	5.12	9	
8	8	7	581.13	578.00	69.60	0.0450	30	87.22	36.67	7.47	0.70	0.87	31.78	0.013	0.56	1.15	0.61	1.76	583.63	587.84	587.28	589.59	594.59	5.00	8	
7	7		578.00										HYDRAULIC GRADE = 100YR HIGH WATER (PW21821-03)										587.28			7
11	11	9	589.50	589.15	8.50	0.0417	12	7.29	0.63	0.80	0.70	0.01	0.01	0.013	0.00	0.01	0.01	0.02	590.50		590.21	590.52	594.33	3.81	11	
9	9		589.15										HYDRAULIC GRADE										590.21			9
MEAN FULL FLOW VELOCITY = Q_{ACT}/A_{PIPE}								JUNCTION LOSSES (JUNC.) = $[\sum (Q_{in}V_{h,out} - \sum (Q_{in}V_{in})] x 1.33 / [Q_{out}]$								Note: 1. IF MORE THAN ONE INCOMING LINE, CALC. EACH BEND LOSS AND ADD TOGETHER. 2. NO STRUCTURE LOSSES TO BE CALCULATED AT A DROP 3. IF $QV_{(in)} > QV_{(out)}$, NO JUNCTION LOSSES TO BE CALCULATED.										
FRICTION LOSS (H _f) : $H_f = 2.97 \text{ n}^2 (L/V^5) d^{1.35}$																										
VELOCITY HEAD : $V_h = V^2/2g$																										



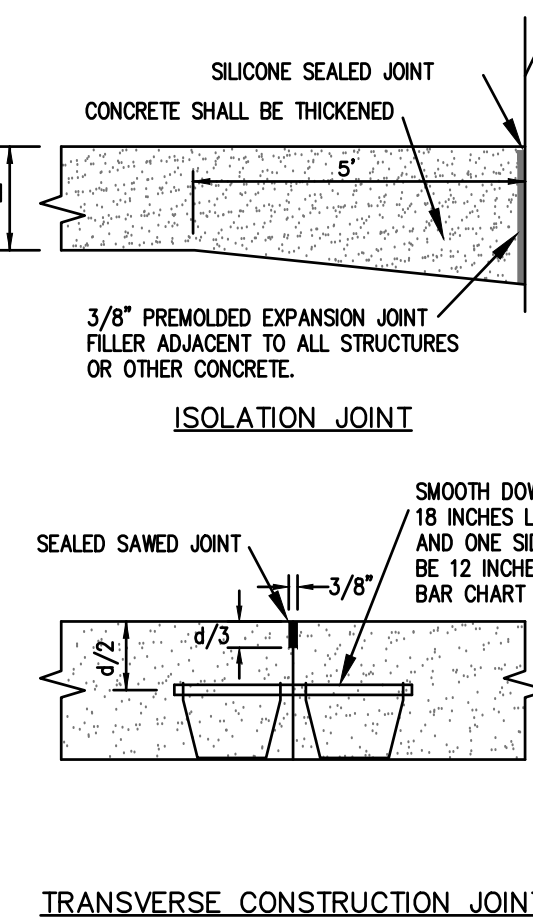
HANDICAP RAMP DETAIL
(n.t.s.)



NOTE: PAVEMENT SECTIONS PER GEOTECH REPORT DATED 6/12/17.

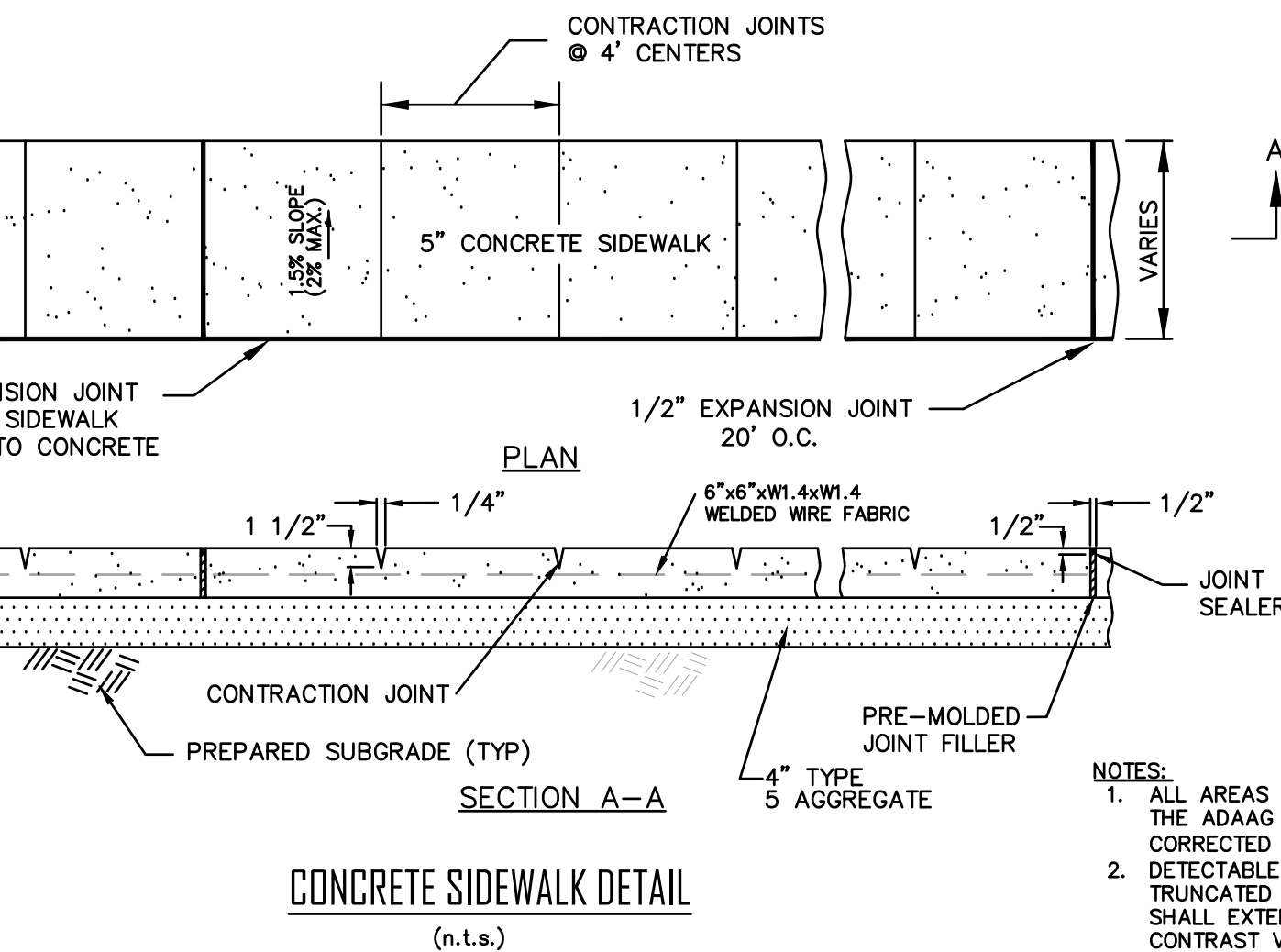


JOINT DETAILS
(n.t.s.)

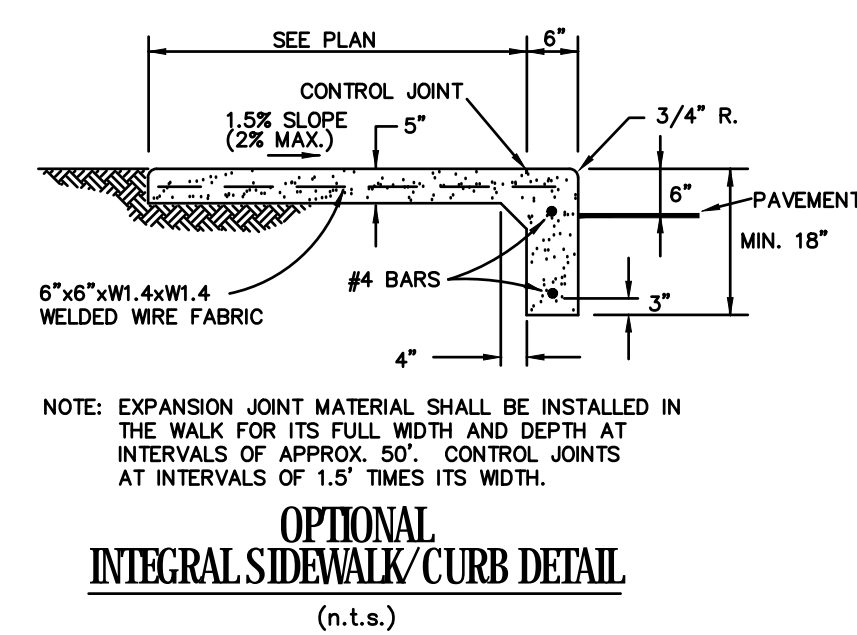


DOWEL BARS - EPOXY COATED		
PAVEMENT THICKNESS	DIAMETER	LENGTH
7 INCHES	1 INCH	18 INCHES
8 INCHES	1 INCH	18 INCHES
9 INCHES	1-1/4 INCHES	18 INCHES
10 INCHES	1-1/4 INCHES	18 INCHES
11 INCHES or <	1-1/2 INCHES	18 INCHES

- NOTE:
- CONSTRUCTION JOINTS ARE REQUIRED BETWEEN ALL POURS SEPARATED BY MORE THAN 90 MINUTES TIME.
 - PLACE LONGITUDINAL CONSTRUCTION JOINT AT CENTERLINE OF ROADWAYS.
 - FIFTEEN FOOT (15) SPACING BETWEEN CONTROL JOINTS.
 - FILL JOINTS TO WITHIN 1/2\"/>

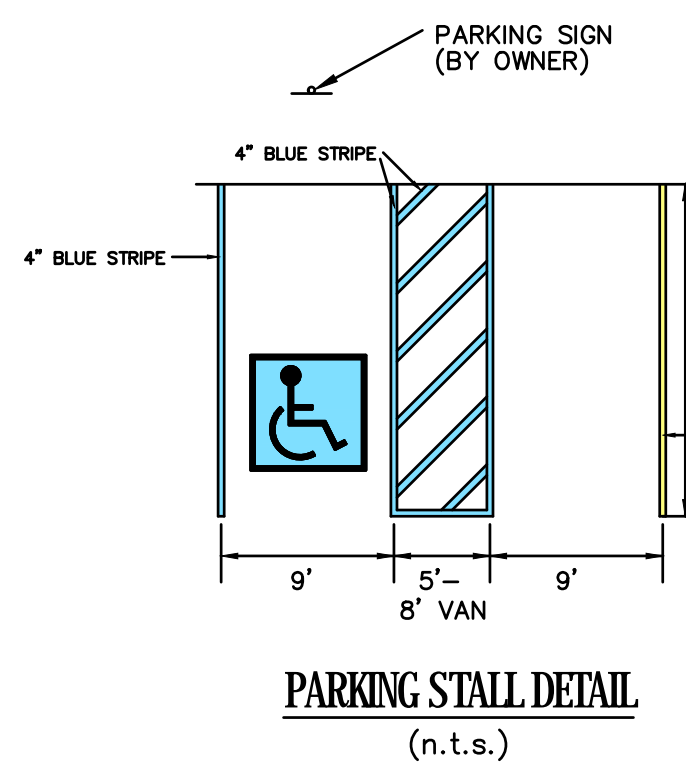


CONCRETE SIDEWALK DETAIL
(n.t.s.)

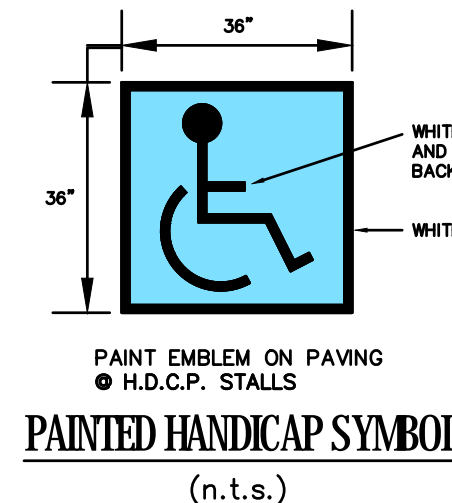


OPTIONAL INTEGRAL SIDEWALK/CURB DETAIL
(n.t.s.)

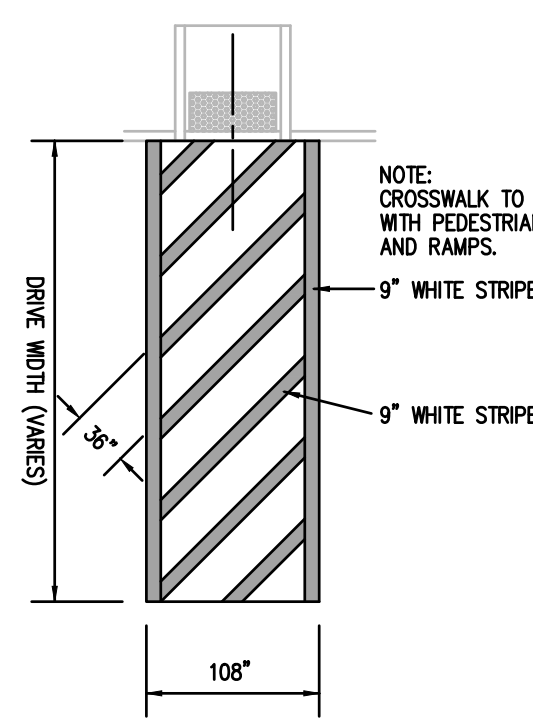
- NOTES:
- ALL AREAS OF THE PEDESTRIAN ACCESS ROUTE MUST BE COMPLIANT WITH THE ADAAG GUIDELINES. AREAS OF NON-COMPLIANCE SHALL BE REMOVED AND CORRECTED AT THE CONTRACTOR'S EXPENSE.
 - DETECTABLE WARNING SURFACE (DWS) SHALL CONSIST OF A SURFACE OF TRUNCATED DOMES ALIGNED IN A SQUARE OR RADIAL GRID PATTERN. THE DWS SHALL EXTEND 24 INCHES IN THE DIRECTION OF TRAVEL. THE DWS SHALL CONTRAST VISUALLY WITH THE RAMP, LANDING AND SHALL BE DARK-ON-LIGHT.



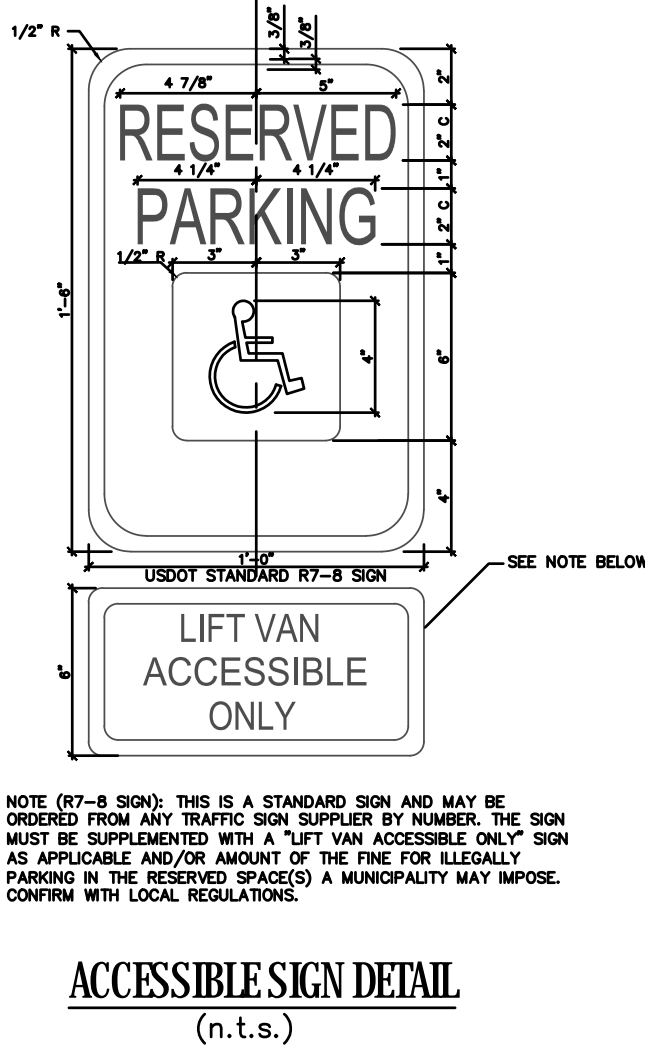
PARKING STALL DETAIL
(n.t.s.)



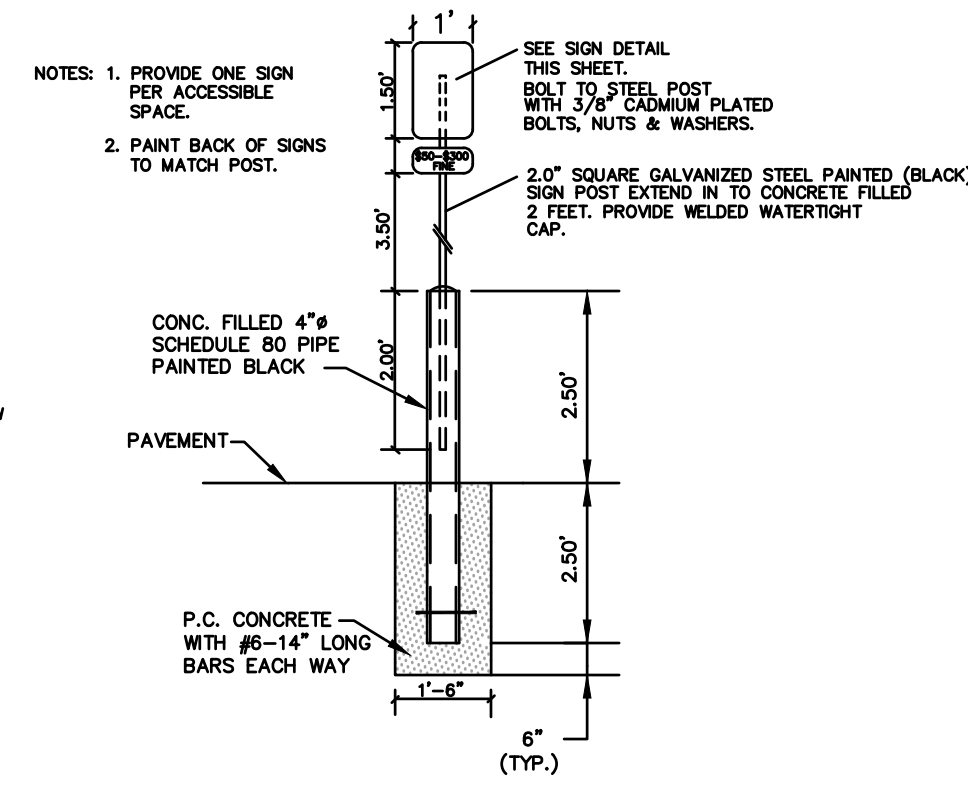
PAINTED HANDICAP SYMBOL
(n.t.s.)



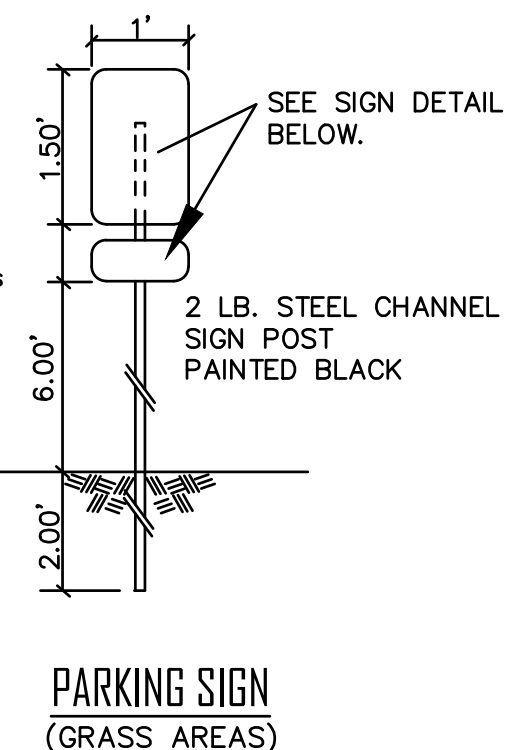
PEDESTRIAN CROSSWALK
(n.t.s.)



ACCESSIBLE SIGN DETAIL
(n.t.s.)



PARKING SIGN (PAVEMENT AREAS)
(n.t.s.)



PARKING SIGN (GRASS AREAS)
(n.t.s.)

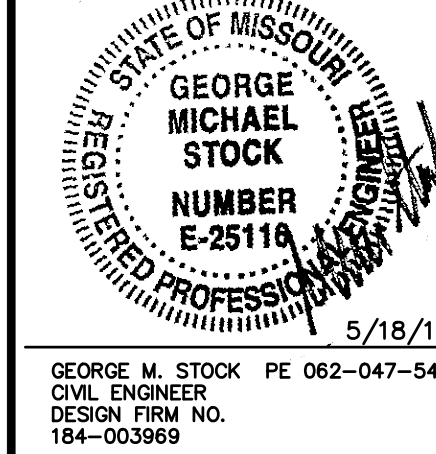
Paradigm Office Building

SITE IMPROVEMENT PLANS

12818 Daylight Circle
St. Louis County, Missouri
63131

PREPARED BY:

Stock & Associates
Consulting Engineers, Inc.
257 Chesterfield Business Parkway
St. Louis, MO 63103
PH (636) 530-9100
FAX (636) 530-9103
Email: general@stockeng.com
Web: www.stockeng.com



REVISIONS:

NO.	DATE	BY	DESCRIPTION
1	05/10/18	J.E.F.	MSD ISSUE

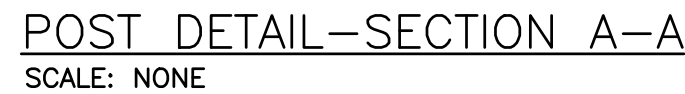
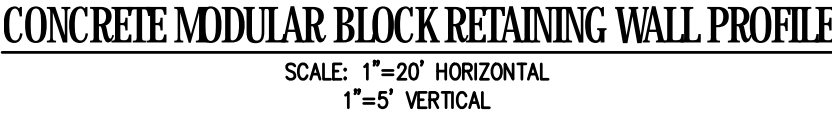
DRAWN BY: J.E.F. CHECKED BY: G.M.S.
DATE: 05/10/18 JOB NO.: 218-6257
MSD: PE BASE MAP: 22-0
SHEET: MO-00 TOTAL SHEETS: 2918BC0302K

SHEET TITLE:
CONSTRUCTION DETAILS

SHEET NO.:
C-6.2

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS MADE BY OTHERS TO MATCH THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS. THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. HAS NO RESPONSIBILITY TO VERIFY FIELD APPROVEDS AS SHOWN ON THE PLAN. THESE IMPROVEMENTS ARE AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

DRAWING FILE: C:\Users\jstock\OneDrive\Documents\Paradigm\218-6257\Paradigm.dwg PLOTTED: May 18, 2018 - 4:30pm PLOTTED BY: Joseph Stach

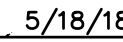


- 1.) ALL CONSTRUCTION SHALL BE PER THE MANUFACTURERS RECOMMENDATION.
- 2.) SHOP DRAWINGS BEARING THE SEAL OF A REGISTERED ENGINEER IN THE STATE OF MISSOURI TO BE SUPPLIED TO THIS ENGINEER FOR APPROVAL.
- 3.) ACCEPTED ALTERNATE WALL SYSTEM: KEYSTONE OR HERCULES
- 4.) TW= TOP OF RETAINING WALL, BW= GRADE AT BASE OF WALL.
- 5.) RETAINING WALL DESIGN WILL BE SUBMITTED TO THE GOVERNING AGENCY.
- 6.) THE WALL PROFILE INFORMATION IS FOR CONCEPT ONLY. ACTUAL DESIGN OF RETAINING WALL SHALL BE BY A LICENSED PROFESSIONAL ENGINEER & SUBMITTED TO STOCK AND ASSOCIATES FOR GENERAL COMPLIANCE W/ GRADING PLAN.
- 7.) THE WALL DESIGNER SHALL INCLUDE A "GLOBAL STABILITY ANALYSIS" WITH THE SUBMISSION OF PERMIT PLANS.

SITE IMPROVEMENT PLANS

Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri
63131



GEORGE M. STOCK PE 062-047-544
CIVIL ENGINEER
DESIGN FIRM NO.

-	MSD ISSUE	5/18/18
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DRAWN BY: I E F	CHECKED BY: C M S
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DATE: 05/10/10	JOB NO: 010 0055
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05/10/18	218-6257
W.S.D. P#	RASE MAP #

—	22-0
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S.L.C. H&I #	H&I S.O.P. #
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M.D.N.R. # MO-00	FIRM PANEL: 29189C0302
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SHEET TITLE:

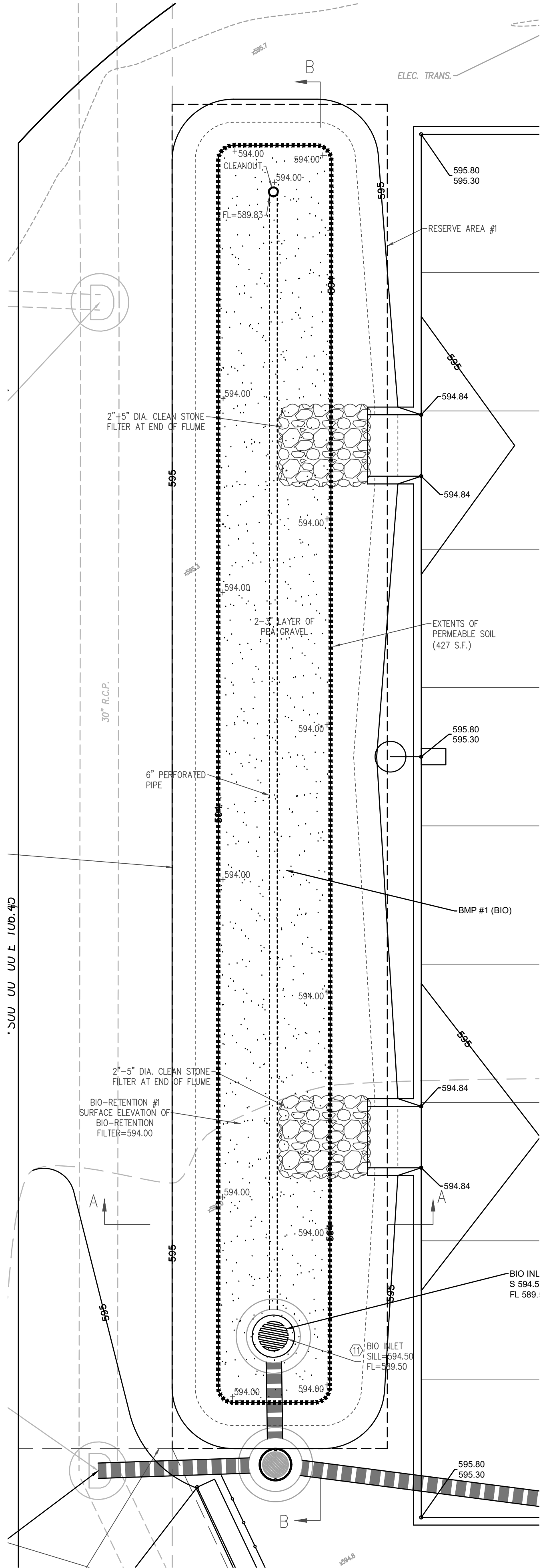
RETAINING WALL DETAILS

SHEET NO.:

C-6.3

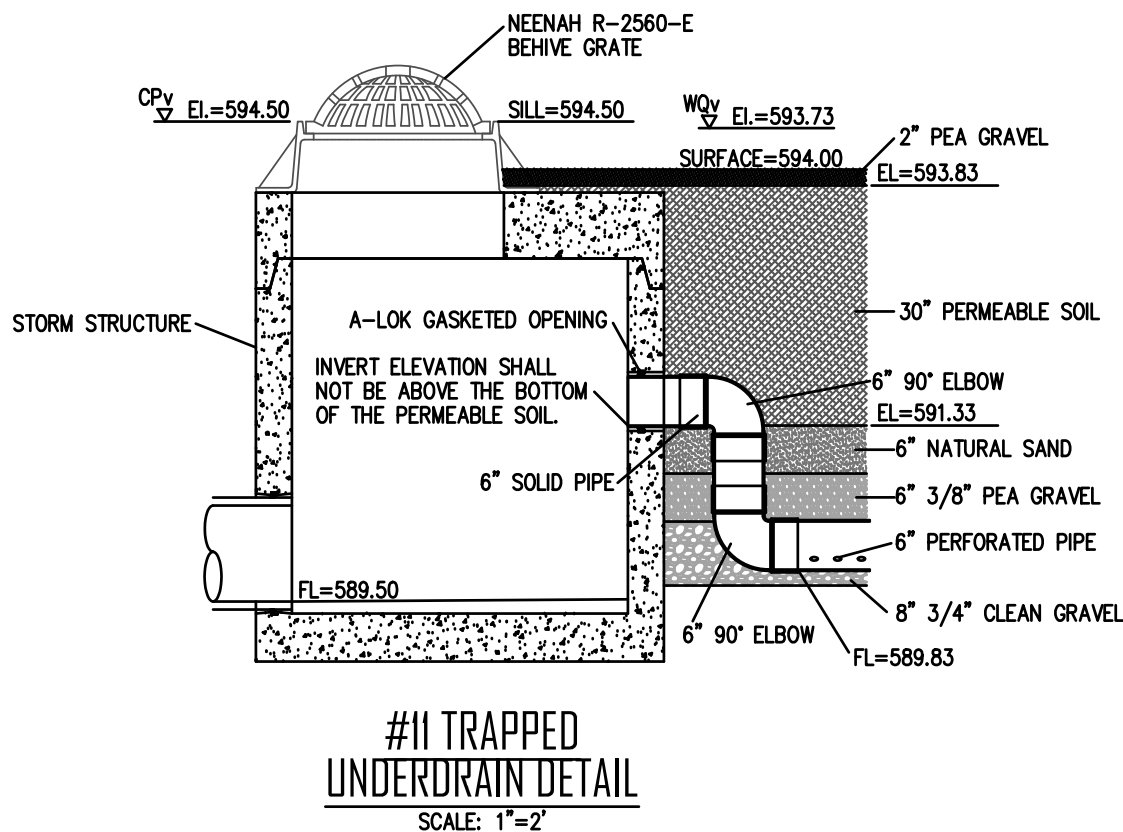
STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS WHERE THE UNDERSIGNED ENGINEER'S SEAL APPEARS. THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. HAS NO RESPONSIBILITY TO VERIFY FINAL IMPROVEMENTS AS SHOWN ON THIS PLAN UNLESS SPECIFICALLY ENGAGED AND AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

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BIO-RETENTION #1

SCALE: 1"=5'



SHOP DRAWINGS MUST BE SUBMITTED TO MSD FOR THE BIORETENTION SOIL AND MATERIALS PRIOR TO CONSTRUCTION.
MSD CONTACT: BRIAN DUNN (314) 335-2072.

- NOTES:
- SEE MSD LANDSCAPE GUIDE FOR BIORETENTION SOIL SPECIFICATIONS.
 - AS SHOWN, MAXIMUM DRAINAGE AREA=0.5 AC. ADDITIONAL PRETREATMENT (FOREBAY OR VERTICAL SAND LAYER AND COBBLE DIAPHRAGM) REQUIRED FOR LARGER DRAINAGE AREAS.
 - VEGETATION NOT SHOWN FOR CLARITY. SEE MSD LANDSCAPE GUIDE FOR MULCH AND SUGGESTED PLANT LIST. SEE PREPARED AND MSD APPROVED LANDSCAPE PLAN IF SUPPLIED.
 - ALL SAND AND GRAVEL TO BE NATURAL, UNCRUSHED.
 - SLOPES SHOWN ARE MAXIMUM. 12" WIDE BENCHES ARE ALLOWED IN LIEU OF 1:1 SUBGRADE SIDE SLOPE.
 - MUST BE PROVIDED WITH OVERFLOW INLET OR OVERLAND FLOW PATH (WIER).

- NOTES:
- DURING CONSTRUCTION SITE RUNOFF SHALL NOT FLOW INTO BIORETENTION AND PERVIOUS ASPHALT AREAS. ALL STORMWATER FLOW TO BIORETENTION AREAS SHALL BE DIVERTED, PLUGGED, OR DISCONNECTED UNTIL THE CONSTRUCTION SITE IS STABLE AND THE MSD INSPECTOR PROVIDES APPROVAL TO PLACE THE BMP'S ONLINE.
 - SEE MSD LANDSCAPE GUIDELINES FOR DETAILS ON PLANTINGS TO BE PROVIDED IN BIORETENTION AREAS.

NOTE:

1. CONSTRUCTION SITE RUNOFF SHALL NOT FLOW INTO BMP AREAS. ALL STORMWATER FLOW TO BMP AREAS SHALL BE DIVERTED, PLUGGED OR DISCONNECTED UNTIL THE CONSTRUCTION SITE IS STABLE AND THE MSD DEDICATION INSPECTOR PROVIDES APPROVAL TO PLACE THE BMP ON-LINE.

Bioretention Basin Design and As-Built Verification Information Table									
Basin ID	Design Filter Surface Area (ft ²)	Required Filter Surface Area (ft ²)	As-built Filter Surface Area (ft ²)	Design Filter Surface Elev. (ft.)	As-built Filter Surface Elev. (ft.)	Design Sill Elev. (ft.)	As-built Sill Elev. (ft.)	Design Bypass/Spill Point Elev. (ft.)	As-built Bypass/Spill Point Elev. (ft.)
NW-03	1,372	648		607.00	607.75	607.75	609.00	2,568	2241
SE-01	726	275		606.00	607.25	607.25	609.00	1,715	1074

* Overflow Sill Elevation = Maximum Water Quality Storage Elevation.
** Bypass/Spill Point Elevation = Lowest adjacent elevation on the basin perimeter where overland flow would be directed.
As-Built portion of table to be certified by a Professional Engineer or Professional Land Surveyor licensed in Missouri.

CONSTRUCTION NOTES:

IT IS IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF BIORETENTION AREAS ARE EXCAVATED USING A LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO RESTRUCTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE DESIGN OR GEOTECHNICAL ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

THE PERMEABLE SOIL USED IN THE BIORETENTION FACILITY SHOULD BE TESTED BEFORE PLACING IT IN THE FIELD TO ENSURE IT MEETS THE PERFORMANCE SPECIFICATIONS OUTLINED IN THE PLANS AND STORMWATER MANAGEMENT FACILITIES REPORT. THE PERMEABLE SOIL MUST HAVE AN INFILTRATION RATE OF 2 FEET/DAY. FURTHERMORE, AND INFILTRATION TEST MUST BE PERFORMED ONCE THE SOIL IS PLACED IN THE BIORETENTION FACILITY TO CONFIRM THAT THE INFILTRATION RATE DID NOT GO DOWN.

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS OF 12 TO 18 INCHES. DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS. THE LANDSCAPER AND OR GEOTECHNICAL ENGINEER SHOULD BE PRESENT ON SITE DURING THE CONSTRUCTION OF THE BIORETENTION FACILITIES TO ENSURE QUALITY CONTROL.

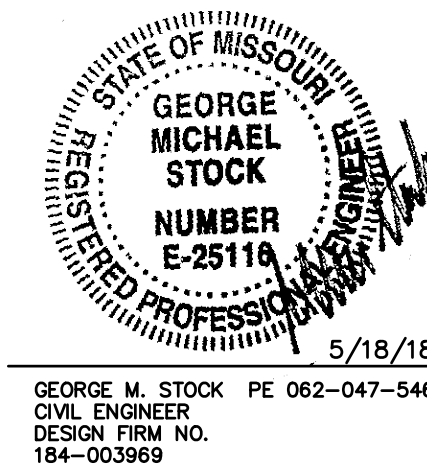
THE PLANTING SOIL SHOULD BE A SANDY LOAM OR LOAMY SAND (SHOULD CONTAIN A MINIMUM OF 60 PERCENT SAND, BY VOLUME). THE CLAY CONTENT FOR THESE SOILS SHOULD BE LESS THAN 10 PERCENT BY VOLUME. A SATURATED HYDRAULIC CONDUCTIVITY OF AT LEAST 1.0 FEET PER DAY (0.5 INCHES PER HOUR) IS REQUIRED. (WITHOUT POST-CONSTRUCTION VERIFICATION, A CONSERVATIVE DEFAULT VALUE OF 0.5 FEET PER DAY IS ACCEPTABLE. THE DESIGN RATE MAY BE INCREASED TO 2 FEET/DAY IF FIELD OBSERVATION, POST-CONSTRUCTION INFILTRATION TESTING, OR OTHER EQUIVALENT TESTING (AS DETERMINED BY THE DISTRICT) IS PROVIDED TO CONFIRM THE DESIGN RATE IS ACHIEVED.) THE SOIL SHOULD BE FREE OF STONES, STUMPS, ROOTS, OR OTHER WOODY MATERIAL OVER 1 INCH IN DIAMETER. FOR BEST RESULTS, BRUSH OR SEEDS FROM NOXIOUS WEEDS, SUCH AS JOHNSON GRASS, MUGWORT, NUTSEDGE AND CANADIAN THISTLE SHOULD NOT BE PRESENT IN THE SOILS. PLACEMENT OF THE PLANTING SOIL SHOULD BE IN LIFTS OF 12 TO 18 INCHES, LOOSELY COMPACTED (RUBBER WHEELED HEAVY EQUIPMENT AND MECHANICAL TAMPING DEVICES ARE NOT RECOMMENDED FOR COMPACTION). THE SPECIFIC CHARACTERISTICS ARE PRESENT IN THE FOLLOWING TABLE.

Planting Soil Characteristics	
Parameter	Value
pH range	5.2 to 8.00
Organic matter	1.5 to 5.0 %
Magnesium	35 lbs. per acre, minimum
Phosphorous (P2O5)	75 lbs. per acre, minimum
Potassium (K2O)	85 lbs. per acre, minimum
Soluble salts	≤ 500 ppm

PREPARED BY:

SITE IMPROVEMENT PLANS
Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri
63131



REVISIONS:

MSD ISSUE	5/18/18
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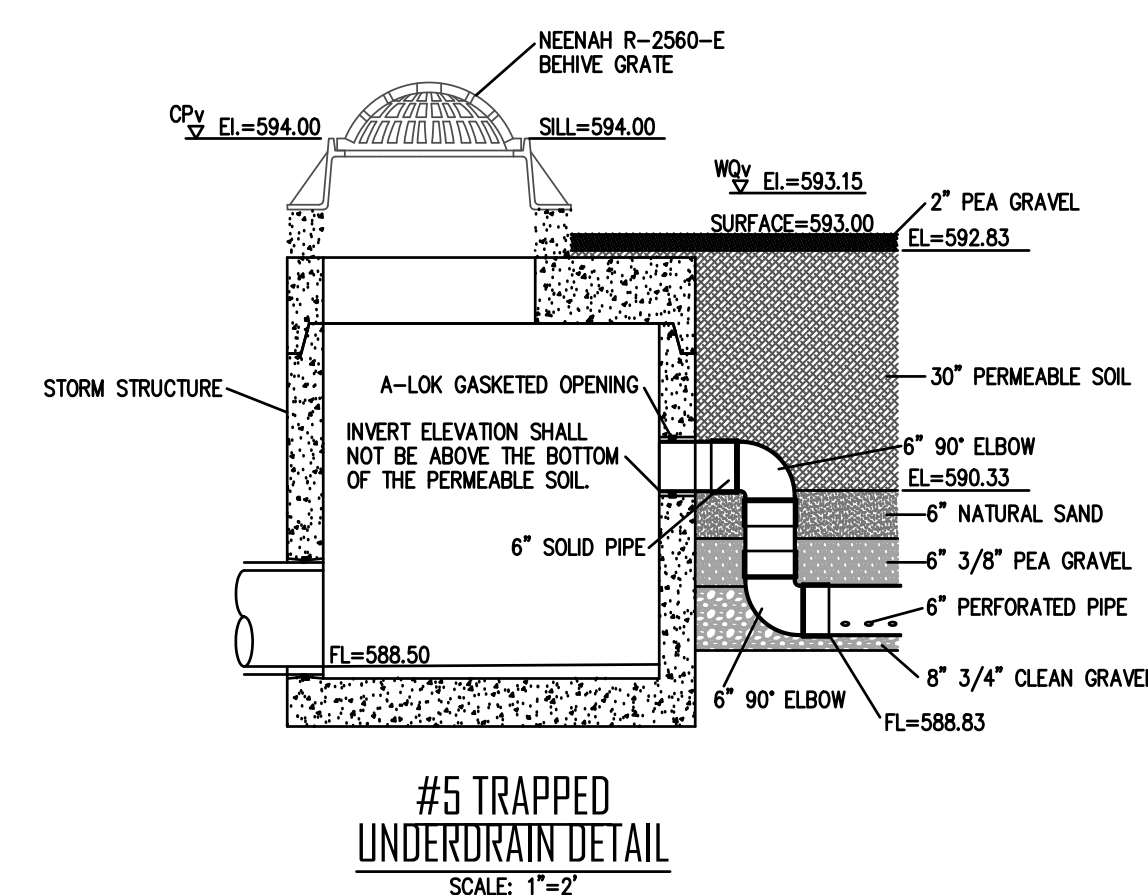
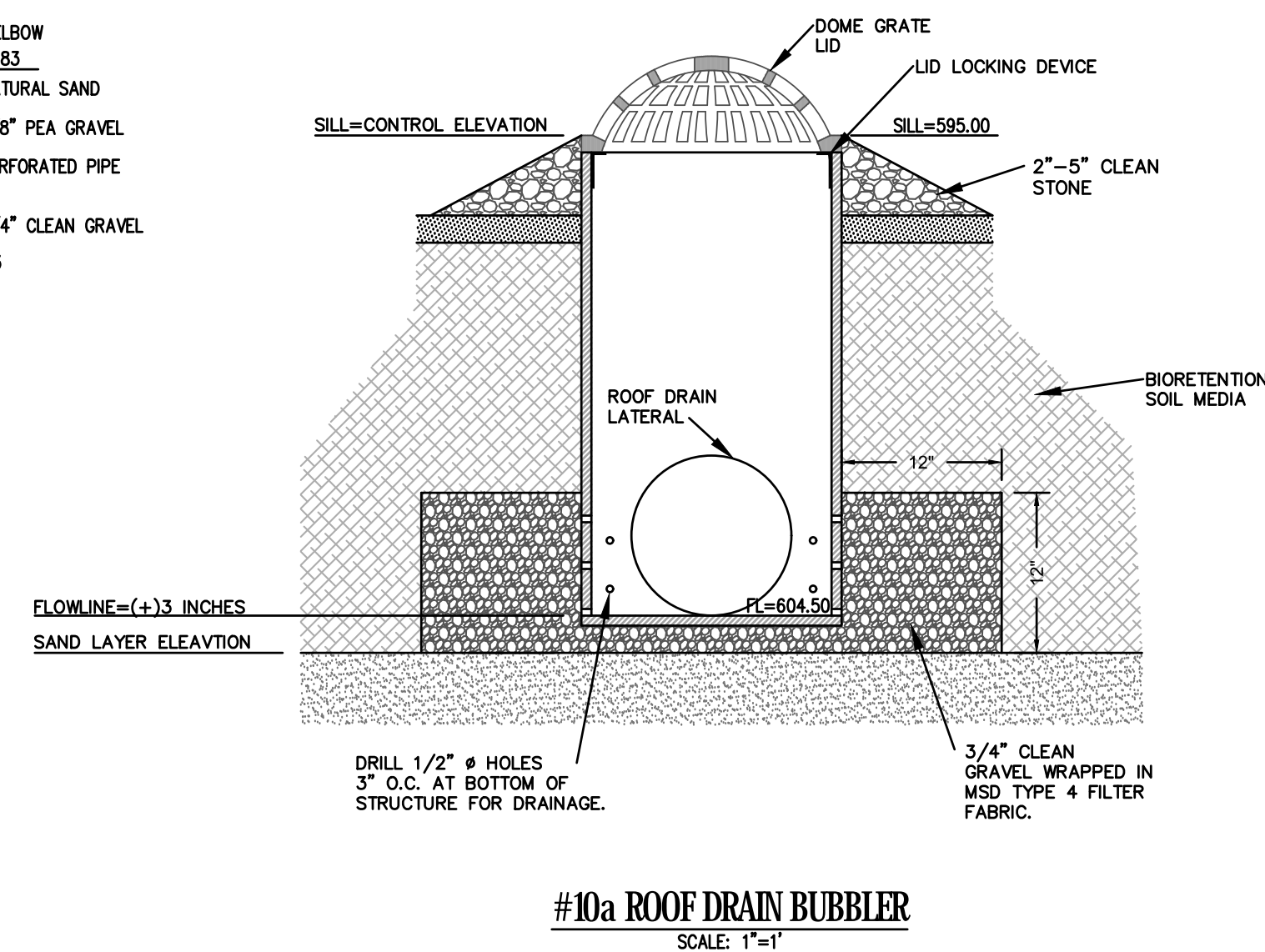
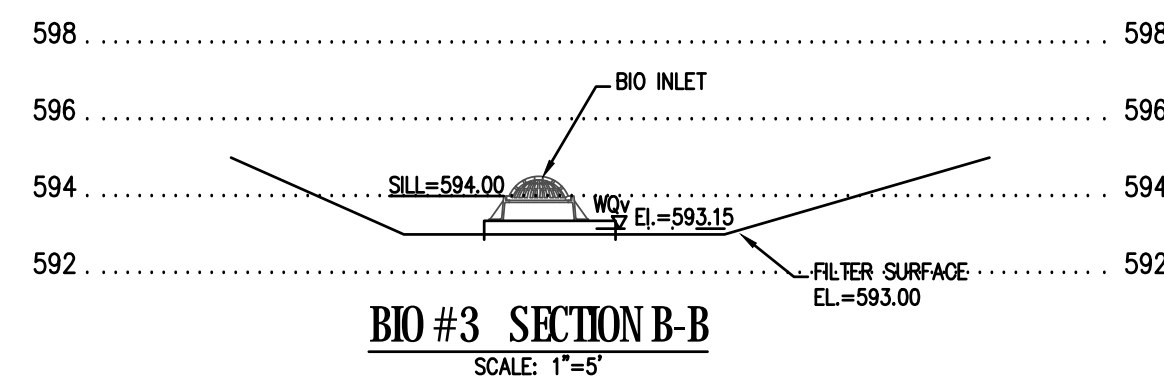
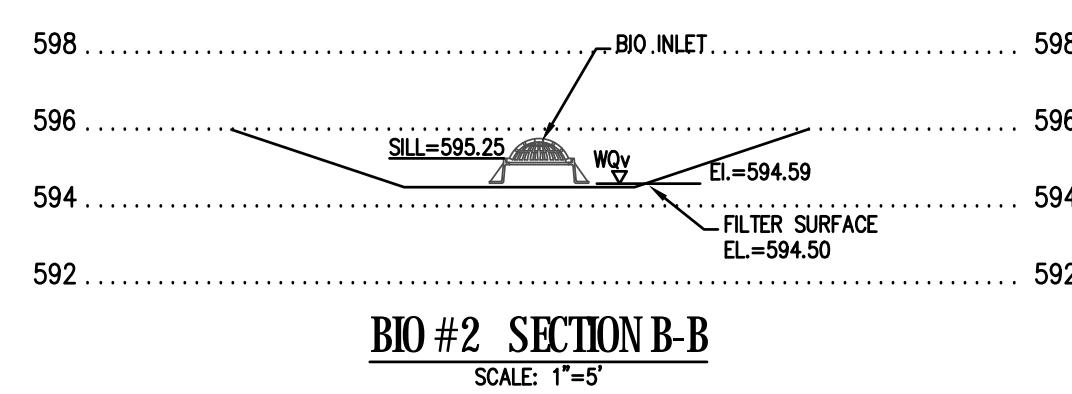
DRAWN BY:	J.E.F.	CHECKED BY:	G.M.S.
DATE:	05/10/18	APP. NO.:	218-6257
MSD PR.	-	MSD MP #	22-0
SLC NAT #	-	NAT SUP. #	-
SEAL #	MO-00	PRN PANEL:	29188C0302K

SHEET TITLE:
**BMP
DETAILS**

SHEET NO.:

C-7.0

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR ANY CHANGES OR MODIFICATIONS TO THE ORIGINAL DESIGN OR ANY IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS HEREIN. THE UNDERSIGNED ENGINEER'S SEAL, APPROVAL, THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. HAS NO RESPONSIBILITY TO VERIFY FINAL APPROVALS AS SHOWN ON THIS PLAN. THESE PROFESSIONALLY ENGINEERED AND AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.



NOTE:

1. CONSTRUCTION SITE RUNOFF SHALL NOT FLOW INTO BMP AREAS. ALL STORMWATER FLOW TO BMP AREAS SHALL BE DIVERTED, PLUGGED OR DISCONNECTED UNTIL THE CONSTRUCTION SITE IS STABLE AND THE MSD DEDICATION INSPECTOR PROVIDES APPROVAL TO PLACE THE BMP ON-LINE.

Bioretention Basin Design and As-Built Verification Information Table											
	Design Filter	Required Filter	As-built Filter	Design Filter	As-built Filter	Design Overflow	As-built Overflow	Design Bypass/Spill Point	As-built Bypass/Spill Point	Designed Volume	Required Volume
Basin ID	Area (ft ²)	Area (ft ²)	Area (ft ²)	Surface Elev. (ft.)	Surface Elev. (ft.)	Surface Elev. (ft.)	Surface Elev. (ft.)	Elev. (ft)**	Elev. (ft)**	(ft ³)	(ft ³)
NW-03	1,372	648		607.00		607.75		609.00		2,568	2241
SE-01	726	275		606.00		607.25		609.00		1,715	1074

* Overflow Sill Elevation = Maximum Water Quality Storage Elevation.

** Bypass/Spill Point Elevation = Lowest adjacent elevation on the basin perimeter where overflow flow would be directed.

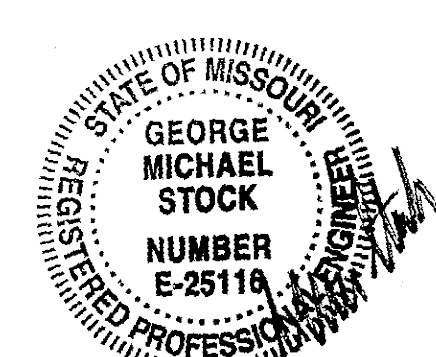
As-Built portion of table to be certified by a Professional Engineer or Professional Land Surveyor licensed in Missouri.

PREPARED BY:

Paradigm Office Building

SITE IMPROVEMENT PLANS

12818 Daylight Circle
St. Louis County, Missouri
63131



5/18/18
GEORGE M. STOCK PE 062-047-546
CIVIL ENGINEER
DESIGN FIRM NO.
184-003969

REVISIONS:

-	MSD ISSUE	5/18/18
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DRAWN BY:	CHECKED BY:
J.E.F.	G.M.S.

DATE: 05/10/18	JOB NO.: 218-6257
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U.S.D. P#	BASE MAP #
-	22-0

S.L.C. H&T \$	H&T SUP. \$
—	—

M.D.N.R. #	FRM PANEL:
MO-00	29189C0302K

SHEET TITLE:

BMP

DETAILS

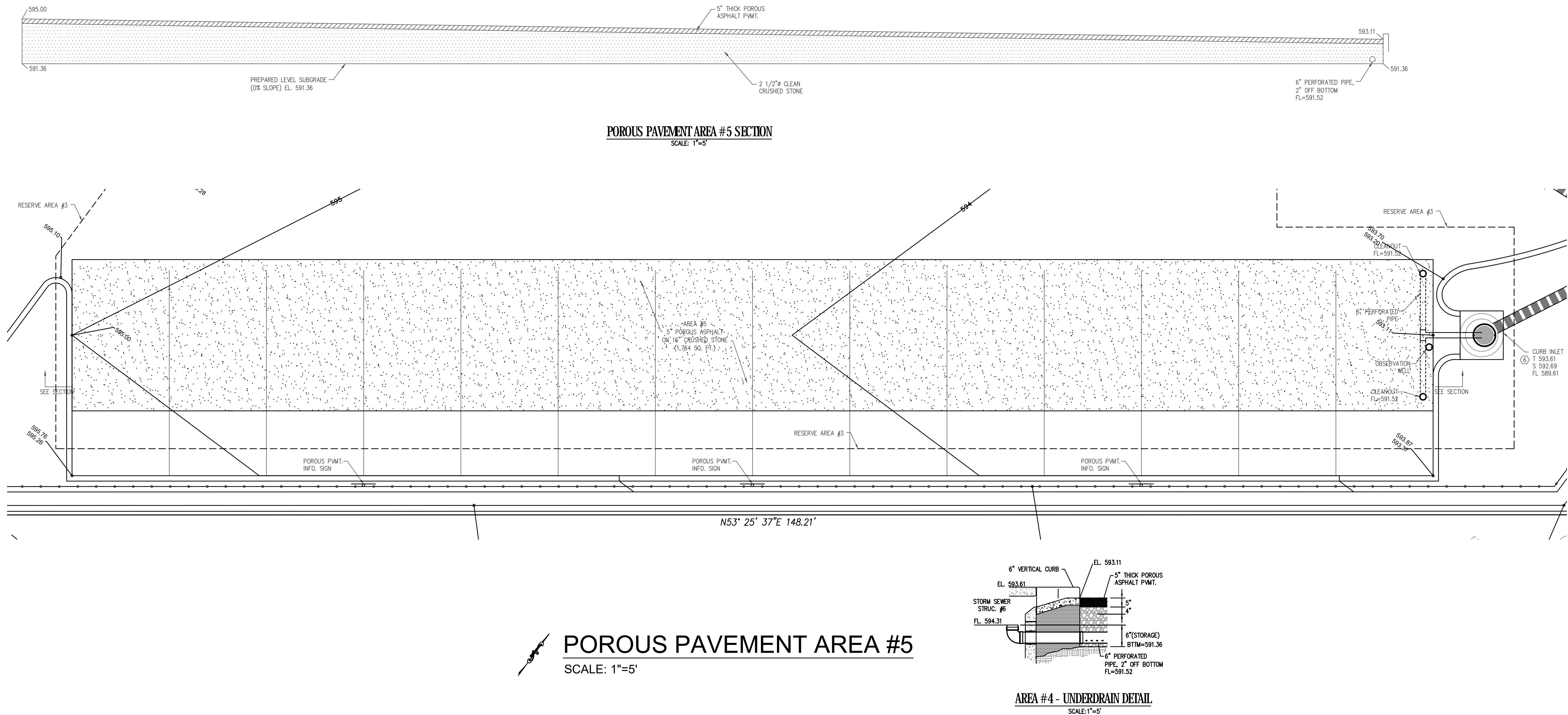
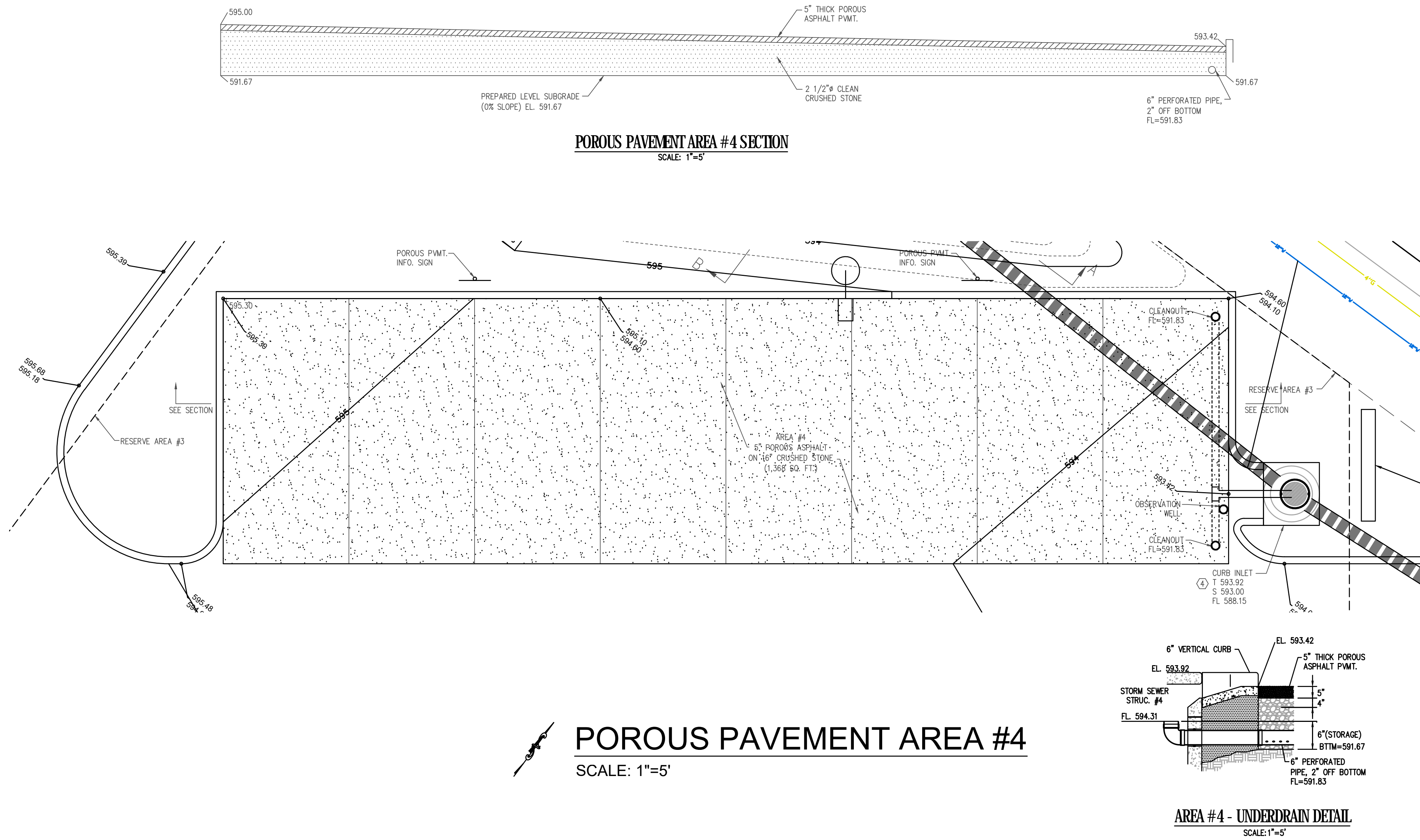
SHEET NO.:

C 7.1

C-7.1

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR THE SERVICES PROVIDED BY OTHERS TO IMPLEMENT THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS WHERE THE UNDERSIGNED ENGINEER'S SEAL APPEARS. THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. HAS NO RESPONSIBILITY TO VERIFY FINAL IMPROVEMENTS AS SHOWN ON THIS PLAN UNLESS SPECIFICALLY ENGAGED AND AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

DRAWING FILE: C:\Users\jstock\OneDrive\Documents\Projects\2018\18-0000\18-0000.dwg PLOTTED BY: jstock Date: 05/10/2018 4:49pm PLOTTED: 05/10/2018 4:49pm LAYOUT: 0012-1800-1800.dwg



Porous Asphalt Producer's Prequalification:
The Porous Asphalt manufacturer shall be responsible for establishing and maintaining a quality control program. Prior to use on projects requiring MSD approval, the manufacturer shall submit five (5) copies of a completed previous paving application as well as documentation describing the quality control program. The completed application and other documentation shall be submitted to:

MSD BMP Committee
Metropolitan St. Louis Sewer District
2350 Market Street
St. Louis, Missouri 63103-2555

Material Certification and Quality Control:
The contractor shall obtain the Porous Asphalt manufacturer's certification that the Porous Asphalt has been approved by MSD. This certification shall be provided to the MSD Division Inspector. The certification shall include the manufacturer's name, and state that the Porous Asphalt has been approved by MSD and that the paving materials meet all requirements as evaluated under the manufacturer's quality control program.

Contractor Prequalification:
Prior to obtaining a construction permit from MSD to construct the Porous Asphalt for a given project, the engineer providing as-built certification shall verify that the installing contractor has past history demonstrating experience and/or training in installing Porous Asphalt.

As-Built Certification:
At completion of the project, prior to final dedication, an as-built certification, signed and sealed by a Missouri Professional Engineer, shall be provided certifying:

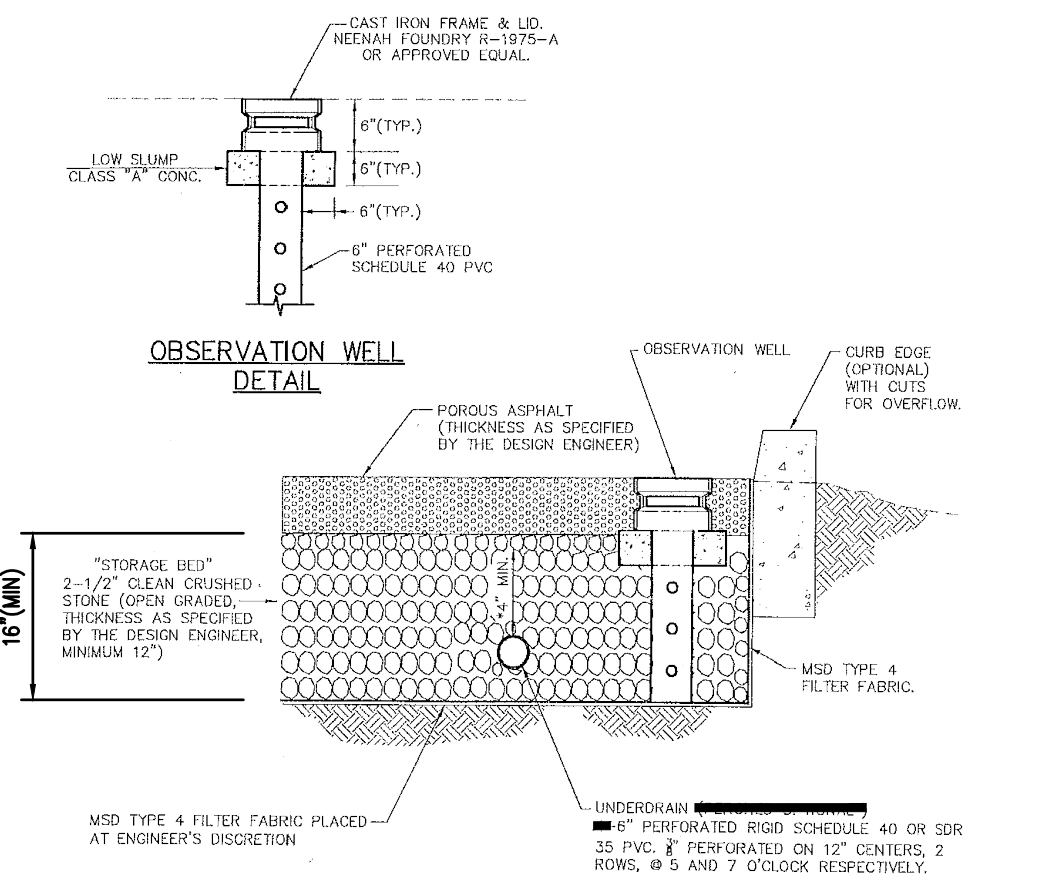
- The Porous Asphalt system was built as designed.
- The Porous Asphalt system was installed by a qualified contractor.
- The Porous Asphalt system installation was witnessed by the certifying engineer or a representative under his direct supervision.

- POROUS ASPHALT CONSTRUCTION NOTES:**
- The contractor shall verify that the porous asphalt producer that will supply the Porous Asphalt for this project has been prequalified by MSD. The name of the producer and their facility location shall be provided to the MSD Division Inspector prior to construction.
 - If porous pavement area is used for temporary sediment basin during construction, the bed shall be excavated at least one foot above the final elevation of the bed. After the sediment is removed, the bed shall be excavated to final grade before the installation of the porous pavement system.
 - Construct porous pavement late in the project schedule so that all of the dirty work such as grading and landscaping is completed first. Porous pavement and the stone bed shall not be installed until all areas tributary to it are established.
 - Porous pavements must be protected from sediment during and after the paving process. At no time shall sediment or other material capable of clogging the surface be allowed to contact the pavement.
 - Any grade adjusting requiring fill shall be done using an open-graded material, such as the stone sub-base.
 - MSD Type 4 filter fabric shall be used on the sides of the stone bed and between the sub-base and the storage bed to prevent sediment entry. The filter fabric shall not be installed between layers of aggregate.
 - Stone for storage bed shall be 2.5" clean crushed stone with minimum 12" thick storage bed.
 - Place aggregate for the stone recharge bed with care (not to damage the filter fabric). Aggregate should be dumped at the edge of the bed and placed in layers of 8 to 12 inches using track equipment. Compact each lift with a single pass of a static steel wheel roller. Vibrator plate compactor may be used for areas that cannot be compacted with the steel wheel roller.
 - A thin choker course layer evenly placed over the storage bed is optional. The gradation of the choker course should be selected based on the gradation of the storage bed. If AASHTO No. 3 is used for the storage bed, then AASHTO No. 57 is acceptable for the choker course.
 - Porous asphalt shall be transported in covered, clean dump beds that have been sprayed with a non-petroleum release agent or soap solution to prevent the mixture from adhering to the dump beds. Mineral filler, fine aggregate, slag dust, etc. shall not be used to dust truck beds.
 - Haul distances shall be limited such that porous asphalt shall be placed within 90 minutes of being loaded.
 - The porous asphalt is placed in 2-inch to 4-inch thick lifts using track pavers and normally compacted with only a few (1-4) passes of a 10-ton static roller.
 - Traffic shall be restricted for the first 48 hours or until the placed material has been allowed to cool below 100 F. Use of water to cool the pavement is not permitted.
 - Porous asphalt shall not be placed when the ambient air temperature of the pavement site in the shade away from artificial heat is below 60 F or when the actual ground temperature is below 50 F. The contractor shall not pave on days when rain is forecasted.
 - The full permeability of the pavement surface shall be tested by application of clean water at the rate of 5 gpm over the surface, using a hose or other distribution device. All applied water shall infiltrate directly without large puddle formation or surface runoff and shall be observed by the certifying engineer or his representative.
 - Do not clean the Porous Asphalt pavement surface with high pressure hoses or abrasives. When cleaning is necessary, combination cleaning machines that combine a wet spray and vacuum process has been found to be effective.
 - A permanent sign shall be posted warning that care should be taken during snow plowing; and prohibit the following: resurfacing, the use of sand abrasives for winter tire traction, and the use of power washers.
 - At completion of the project, prior to final dedication, an as-built certification, signed and sealed by a Missouri Professional Engineer shall be provided.

POROUS ASPHALT PAVEMENT
POWER WASHING, RESURFACING AND THE USE OF SAND ABRASIVES FOR WINTER TIRE TRACKING ARE PROHIBITED. CARE SHALL BE TAKEN DURING SNOW PLOWING.

STANDARD 18"x12"x0.080" ALUMINUM SIGN
FACE WITH BLACK 0.025" SERIES 2000 STANDARD ALPHABET ON WHITE BACKGROUND GALVANIZED STEEL POST 9'-6" LONG. SET BOTTOM OF SIGN 5'-0" ABOVE GRADE. SET BOTTOM OF POST 3'-0" BELOW GRADE.

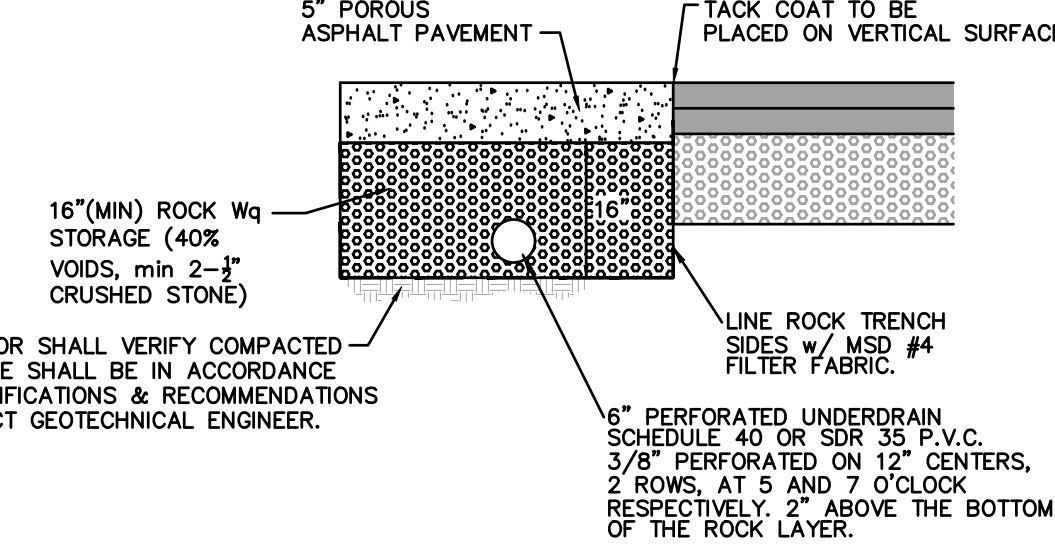
POROUS PAVEMENT INFORMATION SIGN
(n.t.s.)
(See plan for locations)



OBSERVATION WELL DETAIL

SHOP DRAWINGS MUST BE SUBMITTED TO MSD FOR THE POROUS ASPHALT PRIOR TO CONSTRUCTION. MSD CONTACT: BRIAN DUNN (314) 335-2072.

NOTE: A QUALIFIED ENGINEER MUST BE PRESENT DURING THE INSTALLATION OF THE POROUS ASPHALT TO CERTIFY THE INSTALLATION.



POROUS ASPHALT PAVEMENT DETAIL
(n.t.s.)

NOTE:
1. CONSTRUCTION SITE RUNOFF SHALL NOT FLOW INTO BMP AREAS. ALL STORMWATER FLOW TO BMP AREAS SHALL BE DIVERTED, PLUGGED OR DISCONNECTED UNTIL THE CONSTRUCTION SITE IS STABLE AND THE MSD DEDICATION INSPECTOR PROVIDES APPROVAL TO PLACE THE BMP ON-LINE.

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC.
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PREPARED BY:

SITE IMPROVEMENT PLANS

Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri
63131

STATE OF MISSOURI
GEORGE MICHAEL STOCK
NUMBER E-25118
REGISTERED PROFESSIONAL ENGINEER
5/18/18

GEORGE M. STOCK
CIVIL ENGINEER
DESIGN FIRM NO. 184-003965
PE 062-047-546

REVISIONS:

NO.	DESCRIPTION	DATE
1	MSD ISSUE	5/18/18

DRAWN BY: J.E.F. **CHECKED BY:** G.M.S.
DATE: 05/10/18 **REV NO.:** 218-6257
MSD PR: - **BASE MAP:** 22-0
SLC NAT #: - **NAT SUP #:** -
MEAS #: MO-00 **TRM PANEL:** 29188C0302K

SHEET TITLE:
BMP DETAILS

SHEET NO.:
C-7.2

Stock & Associates
Consulting Engineers, Inc.
257 Chesterfield Business Parkway
St. Louis, MO 63103
PH (314) 335-2072
FAX (314) 335-2073
Email: gstock@stockandassociates.com
Web: www.stockandassociates.com



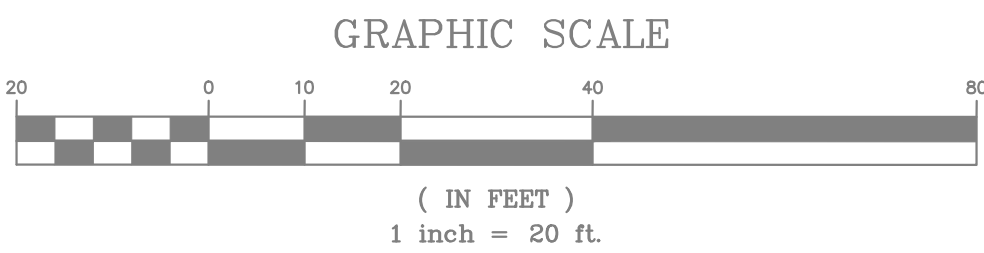
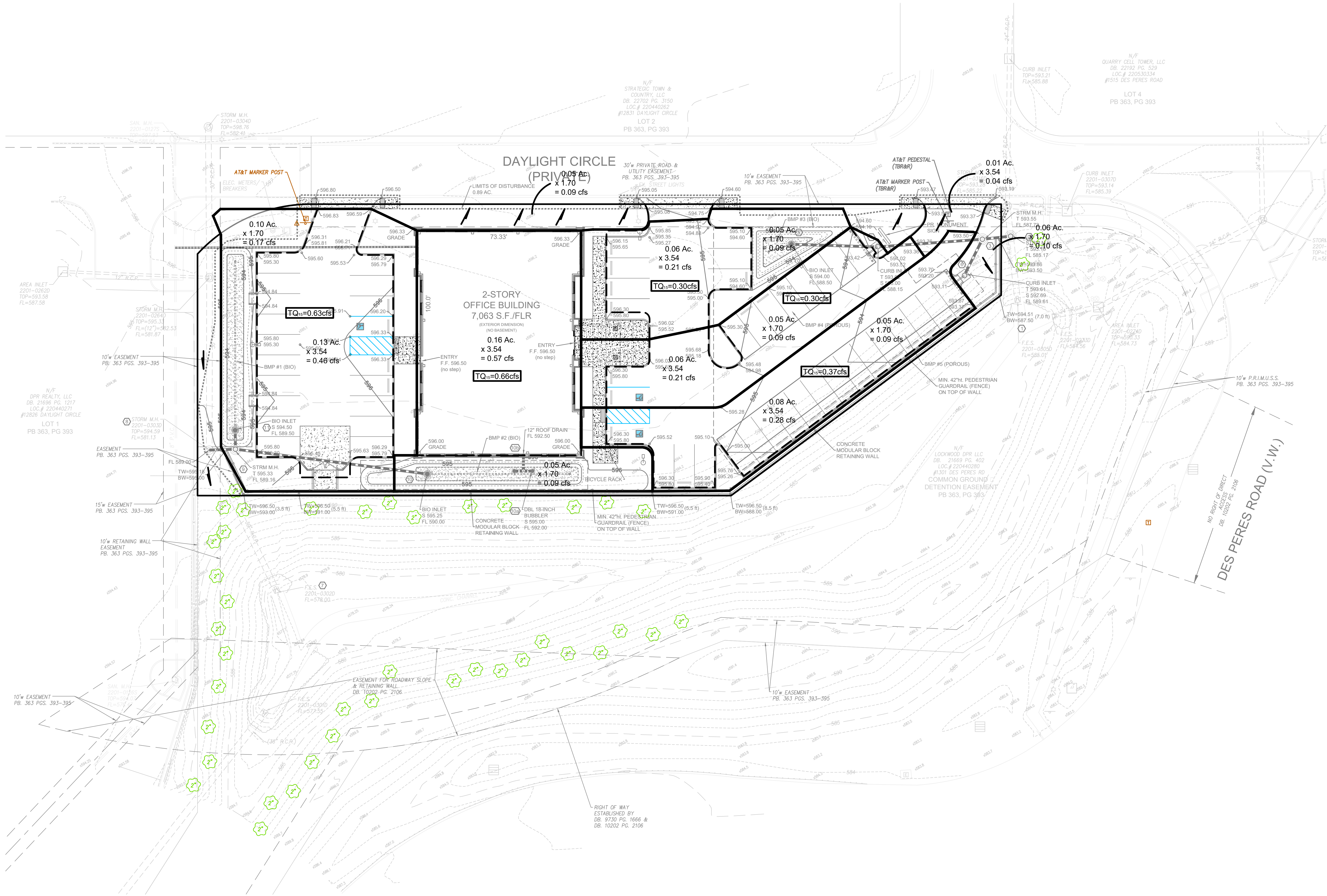
SCALE: 1"=20

SCALE: 1"=20'

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C-8.0

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PROJECT DISTURBANCE = 0.916 ACRES
PROJECT RUNOFF DIFFERENTIAL = 0.70 CFS

Any future land disturbance and/or increase in impervious area on this site requires additional stormwater management per MSD regulations in place at that time.

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER IMPROVEMENTS NOT SHOWN ON THIS PLAN ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC. HAS SHOWN ON THIS PLAN THE RESULTS OF A PRELIMINARY CHECK AND AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

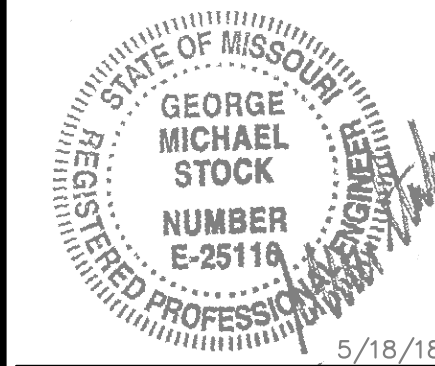
PREPARED BY:

STOCK & ASSOCIATES
Consulting Engineers, Inc.
257 Chesterfield Business Parkway
St. Louis, MO 63103
PH: (636) 530-9000
FAX: (636) 530-9030
Email: gstock@stockeng.com
Web: www.stockeng.com

Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri
63131

SITE IMPROVEMENT PLANS



GEORGE M. STOCK
CIVIL ENGINEER
DESIGN FIRM NO.
184-003965

REVISIONS:
MSD ISSUE 5/18/18

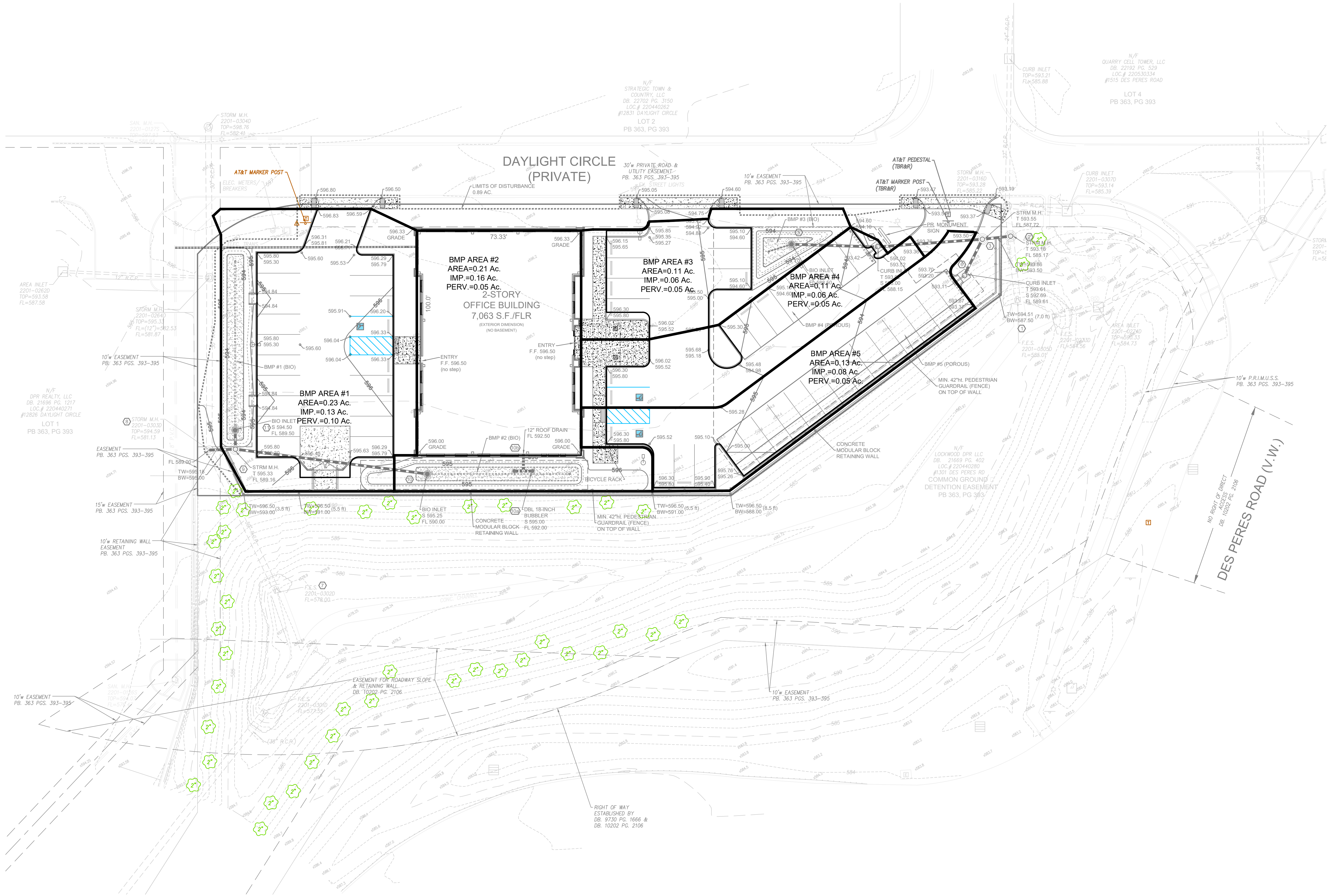
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DATE:	05/10/18	JOB NO.:	218-6257
MSD PR:	-	BASE MAP:	22-0
SHEET NO.:	-	DATE:	-
SCALE:	MO-00	DATE:	29/18C0302K

SHEET TITLE:
**HYDRAULIC
DRAINAGE AREA
MAP**

SHEET NO.:

C-8.1

DRAWING FILE: C:\Users\jstock\OneDrive\Documents\Paradigm Office Building\Paradigm Office Building.dwg PLOT DATE: 05/10/18 PLOT BY: jstock



BMP SUMMARY TABLE									
AREA	TOTAL ACRES	IMPERVIOUS AC.	PERVIOUS AC.	DESCRIPTION OF AREA	BMP	WQv REQUIRED	WQv PROVIDED	SURFACE ELEV.	SURFACE AREA
						(CU. FT.)	(CU. FT.)	(FT.)	(S.F.)
1	0.23	0.13	0.10	PVMT, GRASS	BIO	399	994	594.00	608
2	0.21	0.16	0.05	BLDG, GRASS	BIO	480	730	594.50	427
3	0.11	0.06	0.05	PVMT, GRASS	BIO	185	256	593.00	153
4	0.11	0.06	0.05	PVMT, GRASS	POROUS PVMT	-	-	-	-
5	0.13	0.08	0.05	PVMT, GRASS	POROUS PVMT	-	-	-	-
TOTALS	0.79	0.49	0.30			1,064	1,980		

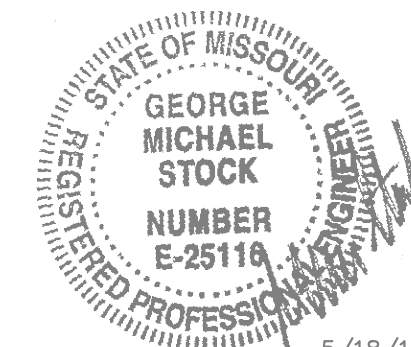
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PREPARED BY:

SITE IMPROVEMENT PLANS

Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri
63131



GEORGE M. STOCK
CIVIL ENGINEER
DESIGN FIRM NO.
184-003951

REVISIONS:
MSD ISSUE 5/18/18

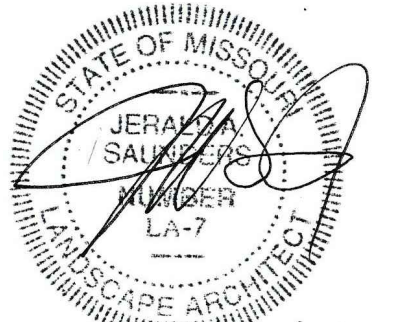
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DATE: 05/10/18 JOB NO.: 218-6257
MSD: PE BASE MAP: 22-0
SHEET NO.: 29188C0302K

SHEET TITLE:
BMP
DRAINAGE AREA
MAP

SHEET NO.:
C-8.2

257 Chesterfield Business Parkway
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PH: (636) 530-9000
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Email: gstock@stockandassociates.com
Web: www.stockandassociates.com

STOCK & ASSOCIATES
Consulting Engineers, Inc.

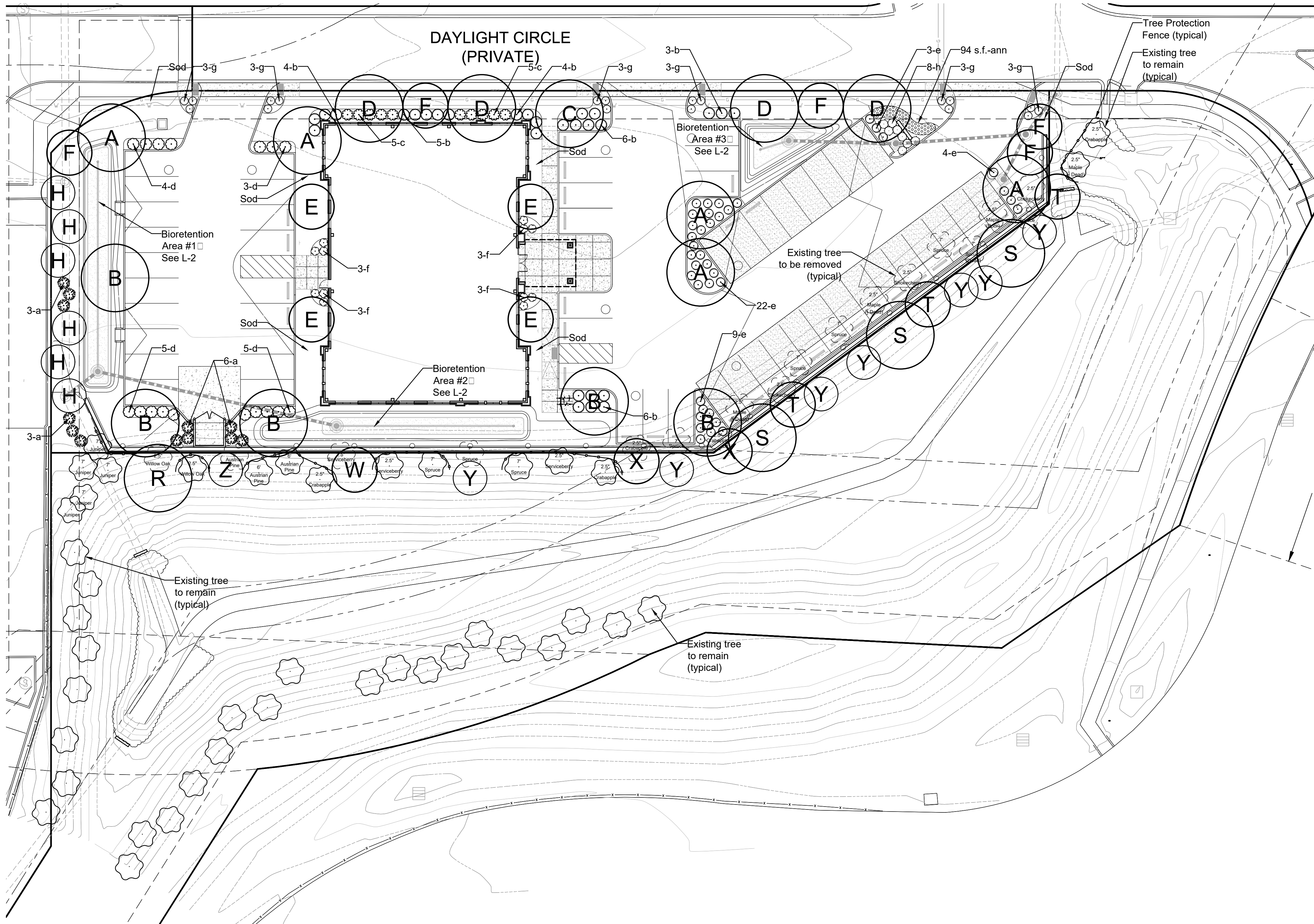


Jerald Saunders - Landscape Architect
MO License # LA-007

Consultants:

Paradigm Office Building

12818 Daylight Circle
St. Louis County, Missouri 63131



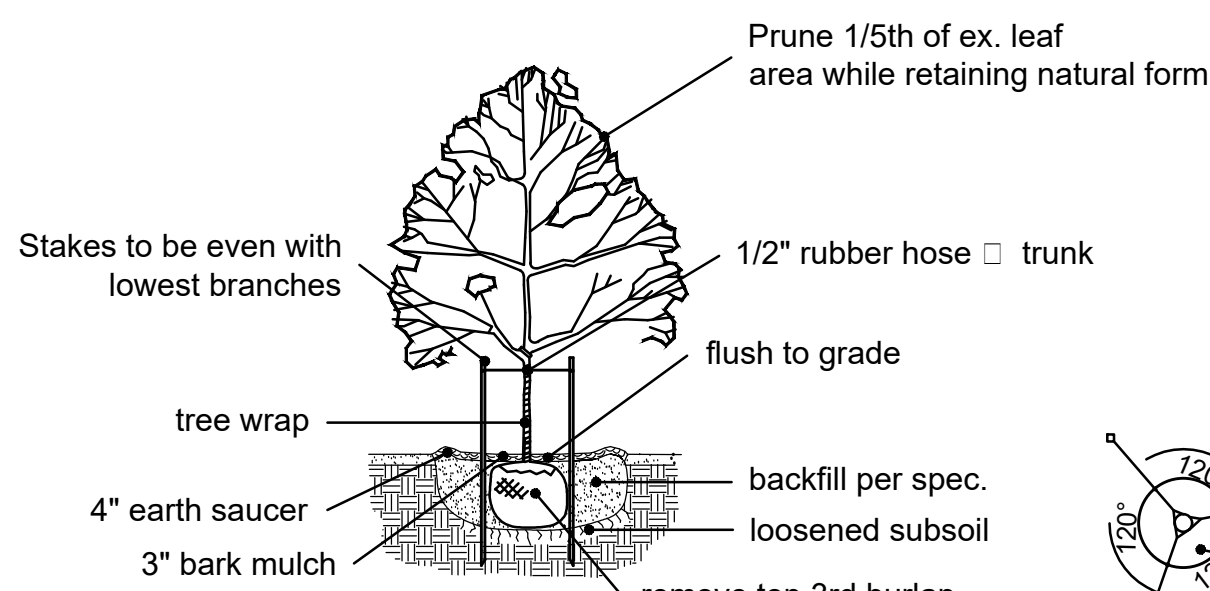
PLANTING SCHEDULE (REPLACEMENT TREES)					
SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
CANOPY-SHADE TREES					
R	1	Quercus phellos	Willow Oak	2.5" cal.	B-B
S	3	Acer saccharum	Sugar Maple	2.5" cal.	B-B
UNDERSTORY-ORNAMENTAL TREES					
T	3	Prunus virginiana	Chokecherry	2.5" cal.	B-B
W	1	Amelanchier arborea	Serviceberry	2.5" cal.	B-B
X	2	Malus 'Spring Snow'	Spring Snow Crabapple (fruitless)	2.5" cal.	B-B
EVERGREEN TREES					
Y	7	Picea glauca	White Spruce	6' h.	B-B
Z	1	Pinus nigra	Austrian Pine	6' h.	B-B

PLANTING SCHEDULE					
SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
CANOPY-SHADE TREES					
A	5	Quercus alba	White Oak	2.5" cal.	B-B
B	5	Quercus bicolor	Swamp White Oak	2.5" cal.	B-B
C	1	Quercus x warei 'Long' Regal Prince	Regal Prince Oak	2.5" cal.	B-B
D	4	Gleditsia triacanthos f. inermis 'Skycole' Skyline	Skyline Honeylocust (thornless)	2.5" cal.	B-B
UNDERSTORY-ORNAMENTAL TREES					
E	4	Malus 'Spring Snow'	Spring Snow Crabapple (fruitless)	2.5" cal.	B-B
F	2	Amelanchier arborea	Serviceberry	2.5" cal.	B-B
G	3	Cercis canadensis 'Forest Pansy'	Forest Pansy Redbud	2.5" cal.	B-B
EVERGREEN TREES					
H	6	Juniperus virginiana	Eastern Red Cedar	6' h.	B-B
SHRUBS-GRASSES-PERENNIALS-ANNUALS-GROUNDCOVER					
a	12	Juniperus x pfitzeriana 'Sea Green'	Sea Green Juniper	24"	Container
b	28	Buxus sempervirens 'Vardar Valley'	Vardar Valley Boxwood	24"	Container
c	10	Rhododendron 'Autumn Angel'	Autumn Angel Azalea	24"	Container
d	17	Viburnum dentatum 'Christom' Blue Muffin	Blue Muffin Viburnum	24"	Container
e	38	Rhus aromatica 'Gro-low'	Gro-low Fragrant Sumac	24"	Container
f	12	Weigela florida 'Bramwell' Fine Wine	Fine Wine Weigela	24"	Container
g	18	Juniperus horizontalis 'Plumosa'	Plumosa Creeping Juniper	1 gal.	Container
h	8	Pennisetum alopecuroides 'Hameln'	Hameln Fountain Grass	1 gal.	Container
ann	94 s.f.	Annuals	To be selected	2" c.p.	12" o.c.

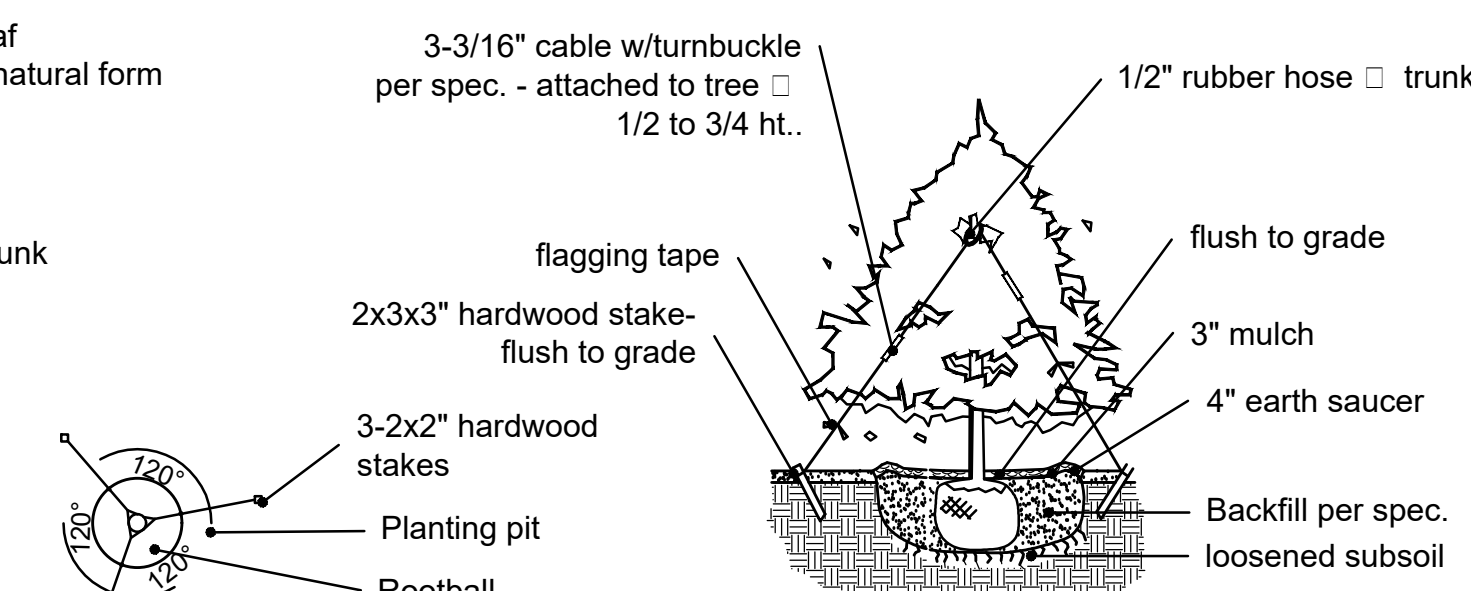
Notes:
1. Refer to L-2 for Bioretention Planting Plan.
2. Sod to be turf-type Fescue.

St. Louis County Municipal Code
Section 1003.162 Landscaping Regulations.
7. Tree protection during construction. Tree protection and retention is as approved on the site development plan. If tree preservation is proposed, the developer shall take responsibility for protecting trees during construction.
(1) Owner's responsibility. During development, the owner or developer shall be responsible for the erection of any and all barriers necessary to protect any existing or installed trees from damage both during and after construction in accordance with the standards of this subsection.
(2) Tree protection fencing.
(a) All significant trees intended for tree protection shall be fenced in accordance with this subsection before grading or other land-disturbing activity begins. Fencing shall extend at least one (1) foot in distance from the edge of the tree for each inch of diameter at breast height (DBH) to a maximum of ten (10) feet, but in no case closer than five (5) feet to the trunk. The director shall consider existing site conditions in determining the exact location of any tree protection fencing.
(b) The developer shall erect a plastic mesh fence, chain link fence or similar product, a minimum of four (4) feet in height at the drip line around each tree or group of trees to prevent the placement of debris or fill within the drip line of any tree.
(c) The tree protection fencing shall be clearly shown on the site plan or the sketch plan associated with the land disturbance permit. No construction, land disturbance, equipment or material storage, or any other activity shall be allowed within the fenced area.

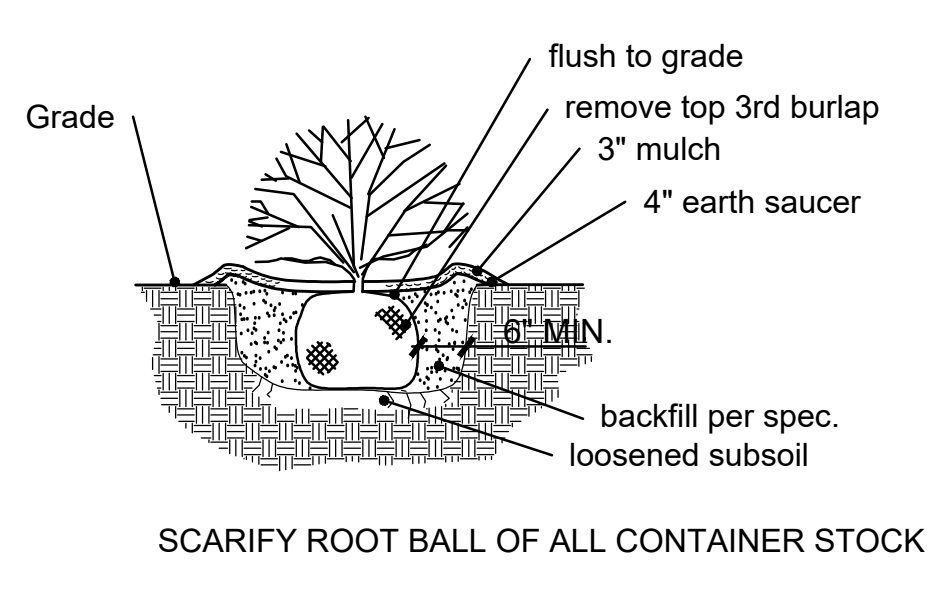
Landscape Plan
SCALE 1"=20'



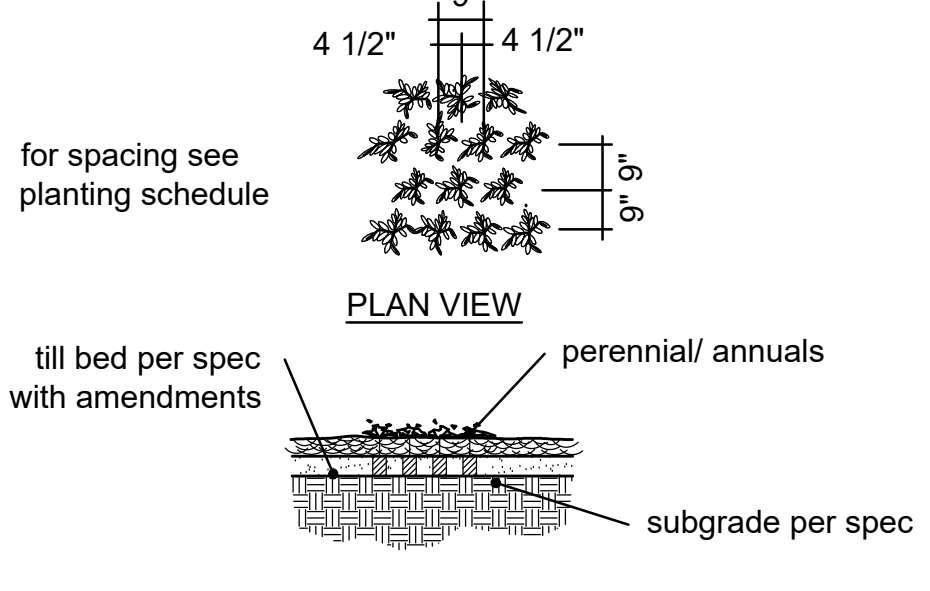
CANOPY TREE PLANTING



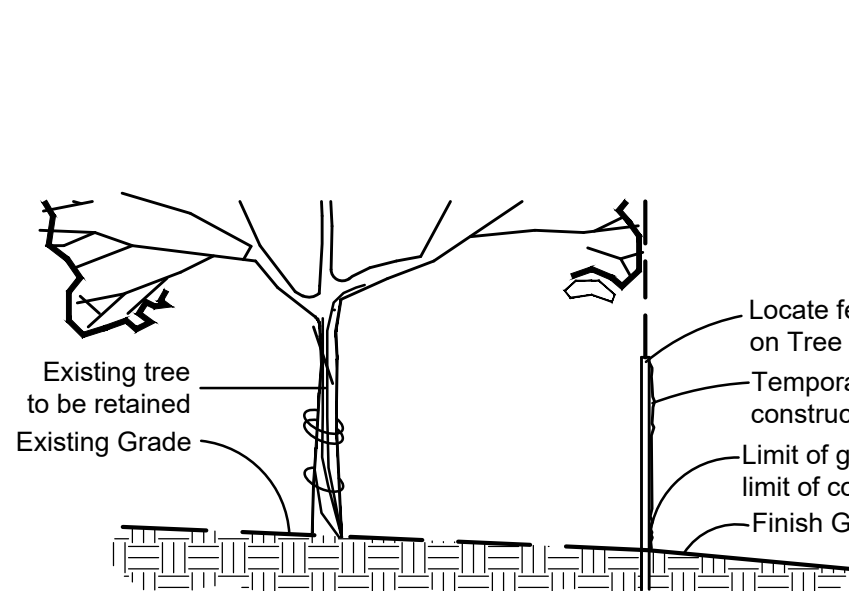
TYPICAL EVERGREEN PLANTING



TYPICAL SHRUB PLANTING



TYPICAL PERENNIAL PLANTING



TREE PROTECTION DETAIL

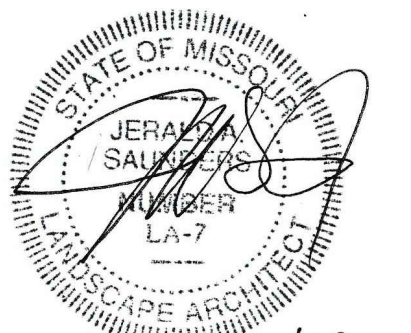
LEGEND:	
Symbol	Description
	Tree Protection Fence
	Existing Individual Tree To Be Removed
	Existing Individual Tree To Remain
	Canopy Tree
	Understory Tree
	Evergreen Tree

Revisions:		
Date	Description	No.

Drawn: KP
Checked: RS

loomisAssociates
landscapearchitects/planners
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Sheet Title: Landscape Plan
Sheet No: L-1
Date: 5/11/18
Job #: 813.072

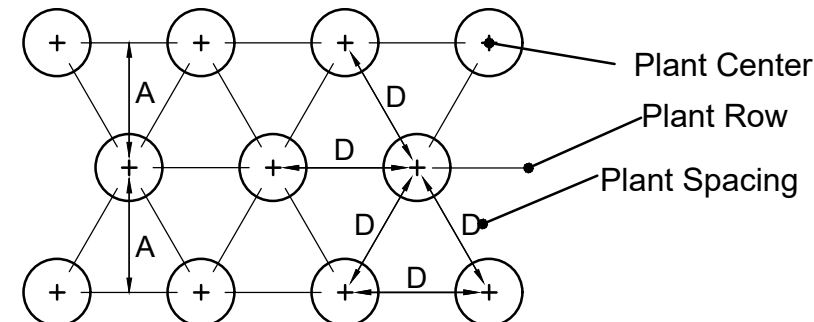
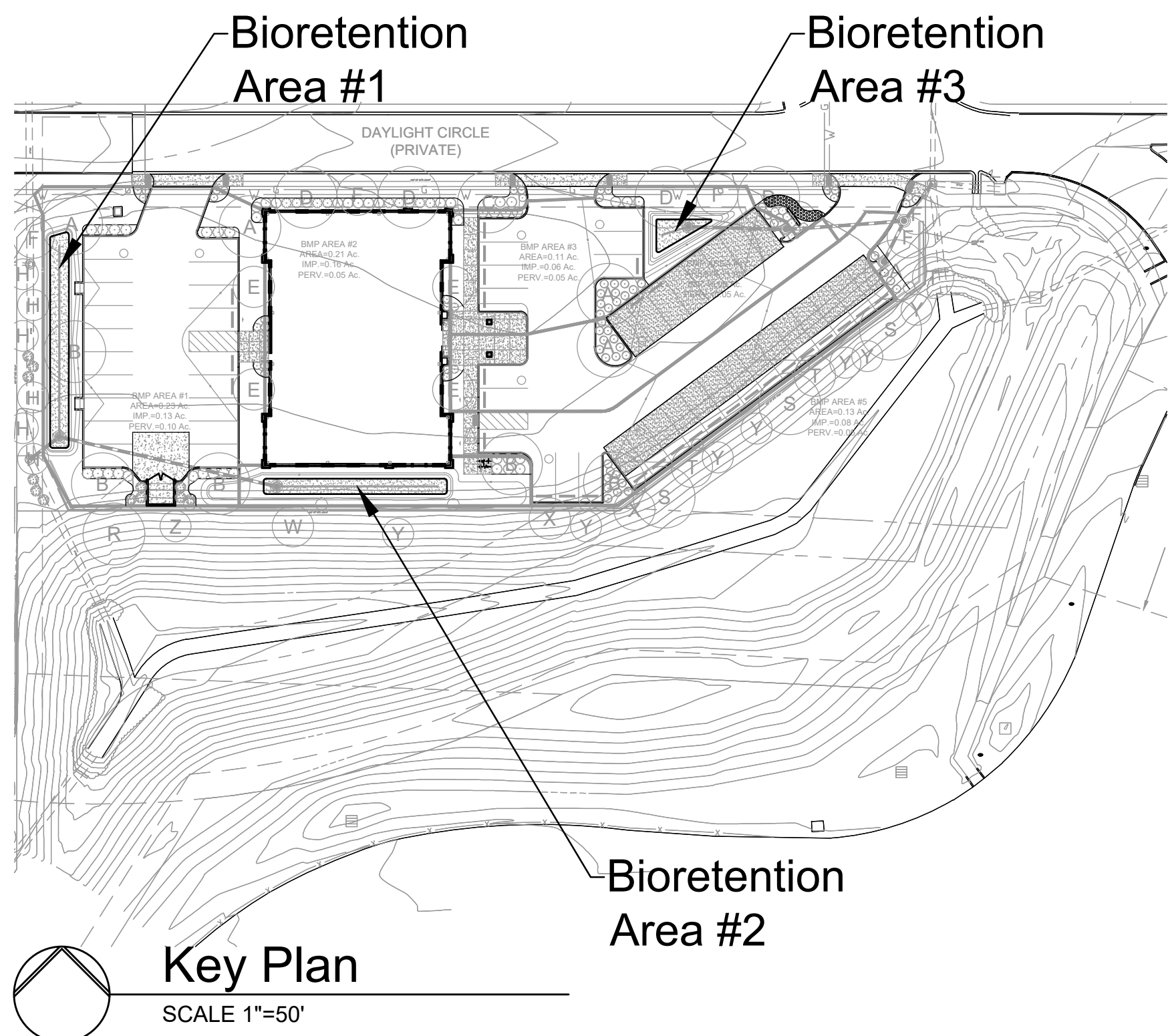
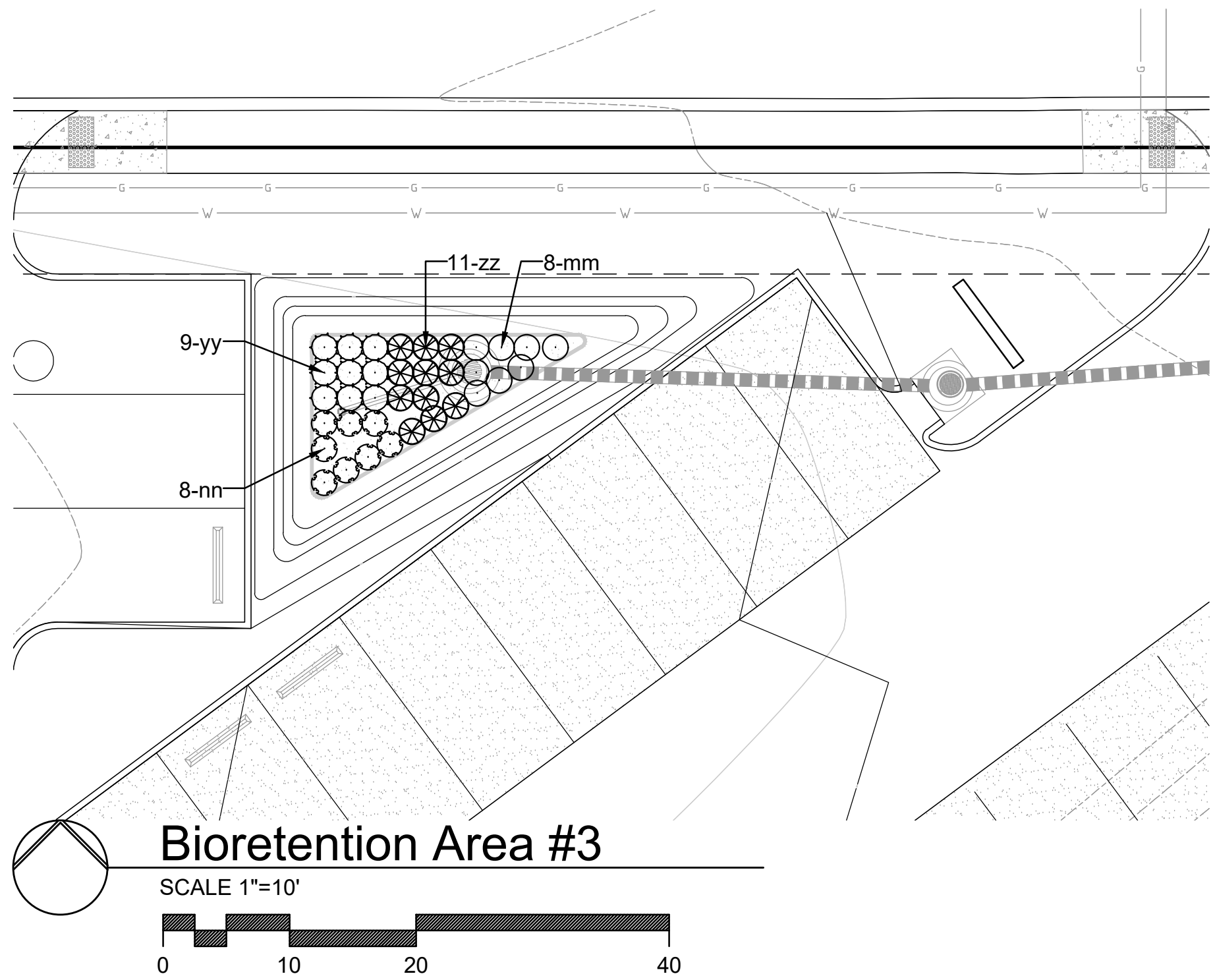
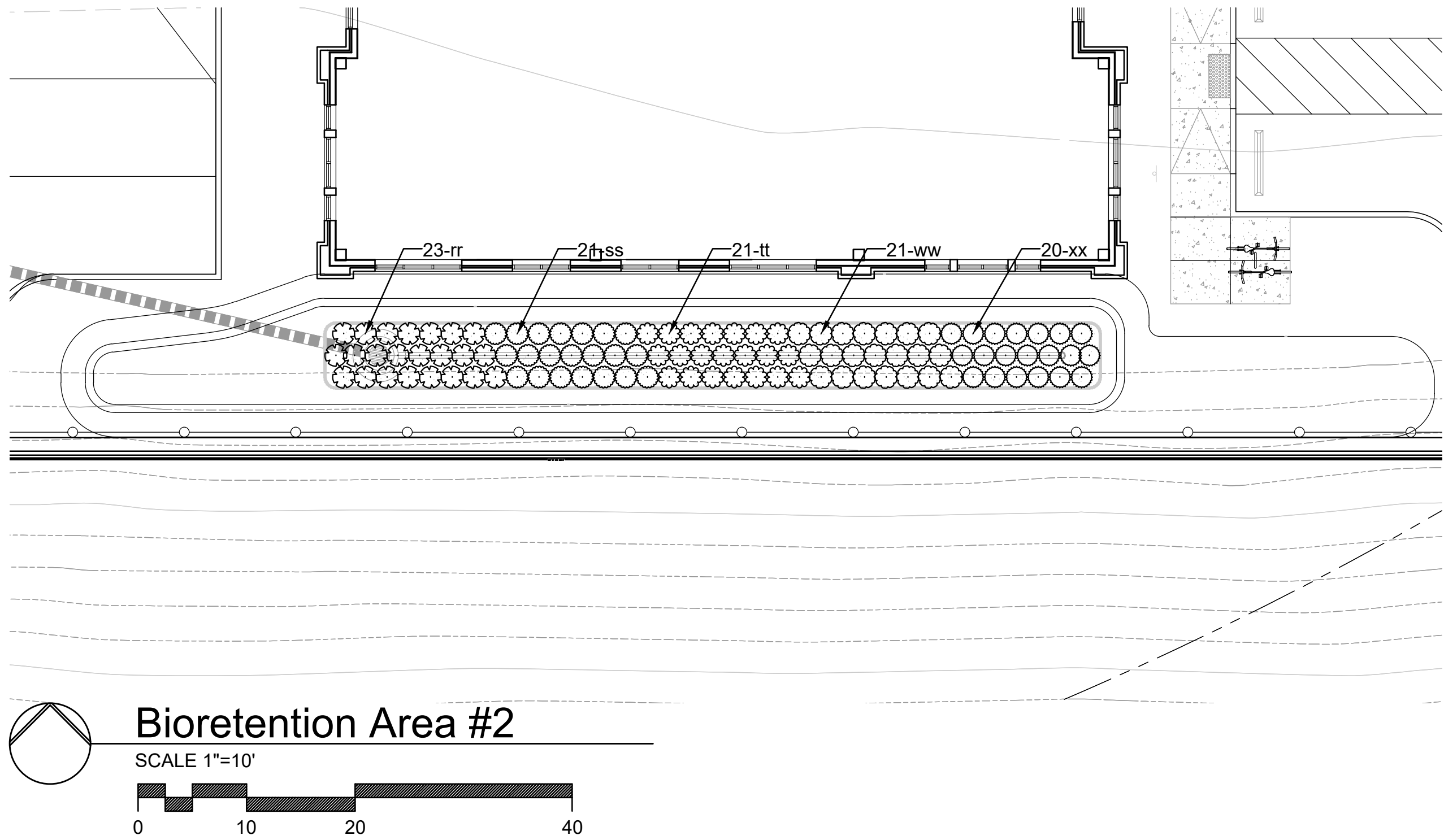
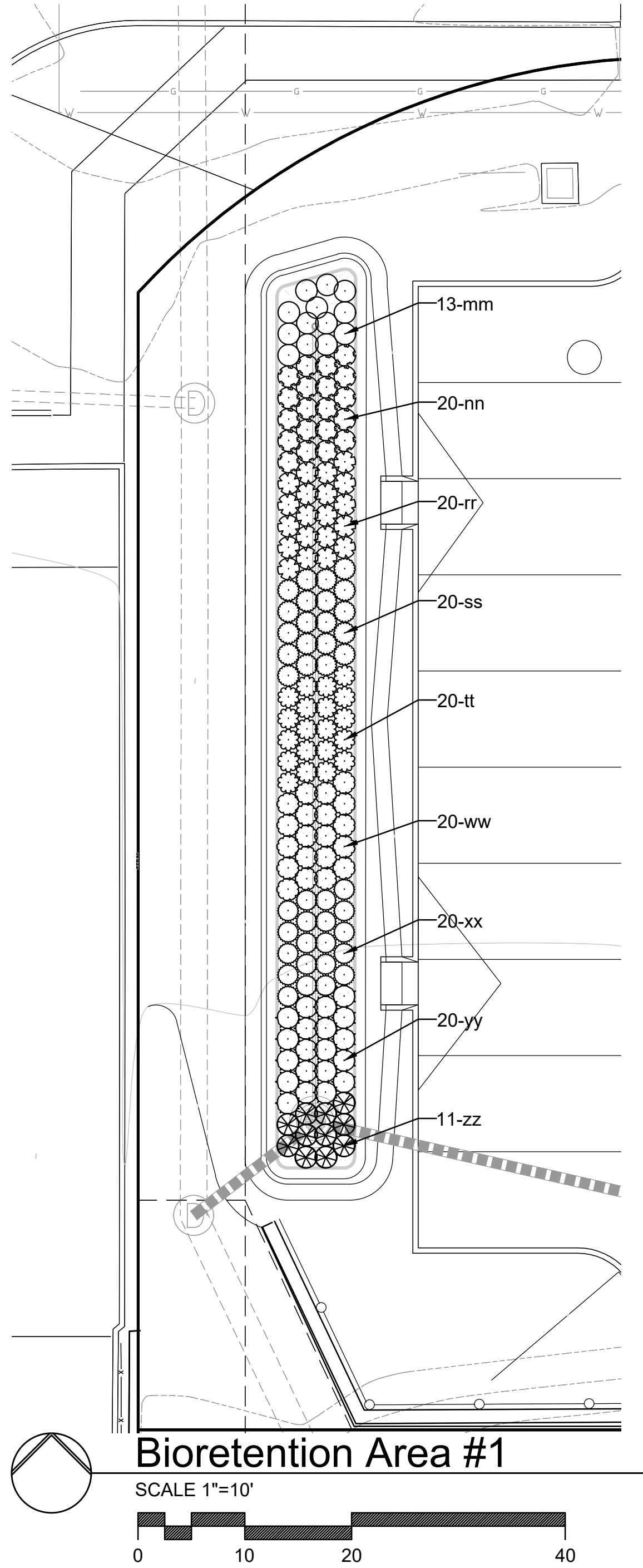


Jerald Saunders - Landscape Architect
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Consultants:

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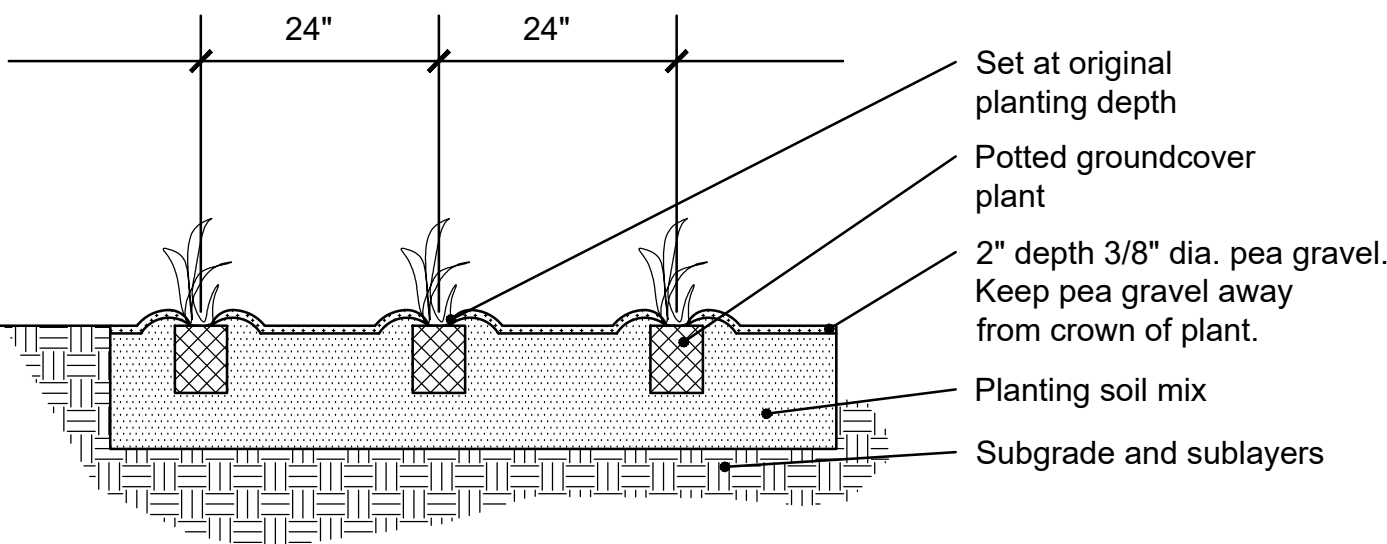


BIORETENTION PLANT SPACING

PLANT SPACING TABLE

SPACING 'D'	ROW 'A'	NUMBER OF PLANTS/SQ. FT.
30"	26"	.16
24"	20.8"	.25
18"	15.6"	.45
15"	13"	.64
12"	10.4"	1.00
10"	8.66"	1.44
8"	6.93"	2.25

Note: Plant quantities to be determined by multiplying area (sq.ft.) by number of plants/sq.ft. for required spacing. Table and diagram taken from "Landscape Guide for Stormwater Best Management Practice Design" by MSD with a revised date of May 2, 2012.



- Notes:
- Remove spent flowers prior to planting.
 - Loosen root mass at bottom of rootball.
 - Top of rootball stripped of 1/4" surface growing media and covered with 1/4" landscape bed mix plus surface mulch.
 - See Planting Schedule for plant spacing

BIORETENTION PLANT SPACING SECTION

TABLE 1: PLANTING, WATER, AND MULCH REQUIREMENTS

WATER AVAILABILITY	REQUIRED PLANTING PERIOD	MINIMUM CONTAINER SIZE	WATER REQUIREMENT FIRST 3 WEEKS	WATER REQUIREMENT AFTER 3 WEEKS*	MAXIMUM MULCH DEPTH****
No ability to water after initial planting	Late Feb.-April only	2.25"x3.75" or larger (plug)	Water each plug immediately after planting		1.5" for plugs
Manual watering with standard sprinkler	Late Feb.-Early June Sept.-October	4.5"x5" (quart) or larger in summer and fall	1" (60 min) every 4 days	1" (60 min) every 7 days until plants established***	1.5" for plugs 2.5" for quarts
Automatic irrigation (set to water more frequently than normal during first two months after planting)	Late Feb.-Early Oct.	2.25"x3.75" (plug) or larger in spring 4.5"x5" (quart) or larger in summer and fall	1" (60 min) every 4 days in spring and fall 1" (60 min) every 3 days in summer)	1" (60 min) every 7 days until plants established***	1.5" for plugs 2.5" for quarts

*This water amount includes natural rainfall. If you get a 1/2 inch of natural rain, then you will need to add a 1/2 inch of water to meet the 1 inch requirement.
**Requires transport of water to the planting site in large containers and pouring enough water onto each plant (after planting) to moisten the entire planting pit.
***Plants are established when roots have grown out of the container soil and into the native soil by 3-5 inches. This normally takes 3-4 months for most perennials and grasses and up to 6-7 months for trees and shrubs.
****Shredded leaf compost is recommended for use with perennials and grasses. Mulch is recommended for tree and shrub plantings at a depth of 3 inches.

PLANTING SCHEDULE					
SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
BIORETENTION PLANTS					
mm	21	Carex vulpinoidea	Fox Sedge	Type 38 DCP	24" o.c.
nn	28	Carex muskumensis	Palm Sedge	Type 38 DCP	24" o.c.
rr	43	Echinacea pallida	Pale Purple Coneflower	Type 38 DCP	24" o.c.
ss	41	Schizachyrium scoparium	Little Bluestem	Type 38 DCP	24" o.c.
tt	41	Eryngium yuccifolium	Rattlesnake Master	Type 38 DCP	24" o.c.
ww	41	Andropogon virginicus	Broomsedge	Type 38 DCP	24" o.c.
xx	40	Rudbeckia fulgida	Orange Coneflower	Type 38 DCP	24" o.c.
yy	29	Sporobolus heterolepis	Prairie Dropseed	Type 38 DCP	24" o.c.
zz	22	Bouteloua curtipendula	Sideoats grama	Type 38 DCP	24" o.c.

Note:
Refer to L-1 for Landscape Plan.

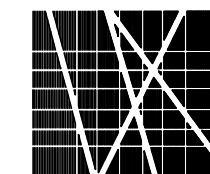
Revisions:

Date	Description	No.

Drawn: KP
Checked: RS

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Sheet Title: Bioretention Planting Plan

Sheet No:

L-2

Date: 5/11/18
Job #: 813.072