

# "Manors at Lynstone Park"

Part of Lots 25,26 in Block 32, Lots 23, 24 in Block 33, Part of Lots 2-6, 43-44,  
All of Lots 39-42, in Block 43, Lots 1-7, 38-44 in Block 44 of Meacham Park

Plat Book 3 Page 33

Section 12, Township 44 North, Range 5 East  
City of Sunset Hills, St. Louis County, MO

## Site Improvement Plans

### PROPERTY OWNER/DEVELOPERS CERTIFICATION

EXECUTED CERTIFICATION STATING THE FOLLOWING:

"THE PROPERTY OWNER/DEVELOPER HEREBY CERTIFIES THAT HE IS FAMILIAR WITH THE SWPPP AND ASSUMES FULL RESPONSIBILITY FOR THE PERFORMANCE AND MAINTENANCE OF THE SWPPP AS STATED ON THE APPROVED PLANS. HE WILL ENSURE THAT ALL CONTRACTORS UNDERSTAND AND ARE FAMILIAR WITH THE SWPPP FOR THE SITE AND THAT EACH CONTRACTOR AGREES TO IMPLEMENT AND PROTECT ELEMENTS OF THE SWPPP AS THEY RELATE TO HIS WORK. THE PROPERTY OWNER/DEVELOPER'S ONSITE REPRESENTATIVE SHALL BE RESPONSIBLE FOR THE PERFORMANCE AND MAINTENANCE OF THE SWPPP. IN ADDITION, THE UNDERSIGNED OWNER/DEVELOPER ASSURES THAT ALL CITY PROPERTY OR ROADS WILL BE ADEQUATELY PROTECTED."

\_\_\_\_\_  
DATE: \_\_\_\_\_

Sal Vitale

DEVELOPER'S CONTACT PERSON

Deanna Thompson

PHONE: 314-791-5058

EMERGENCY CONTACT PERSON

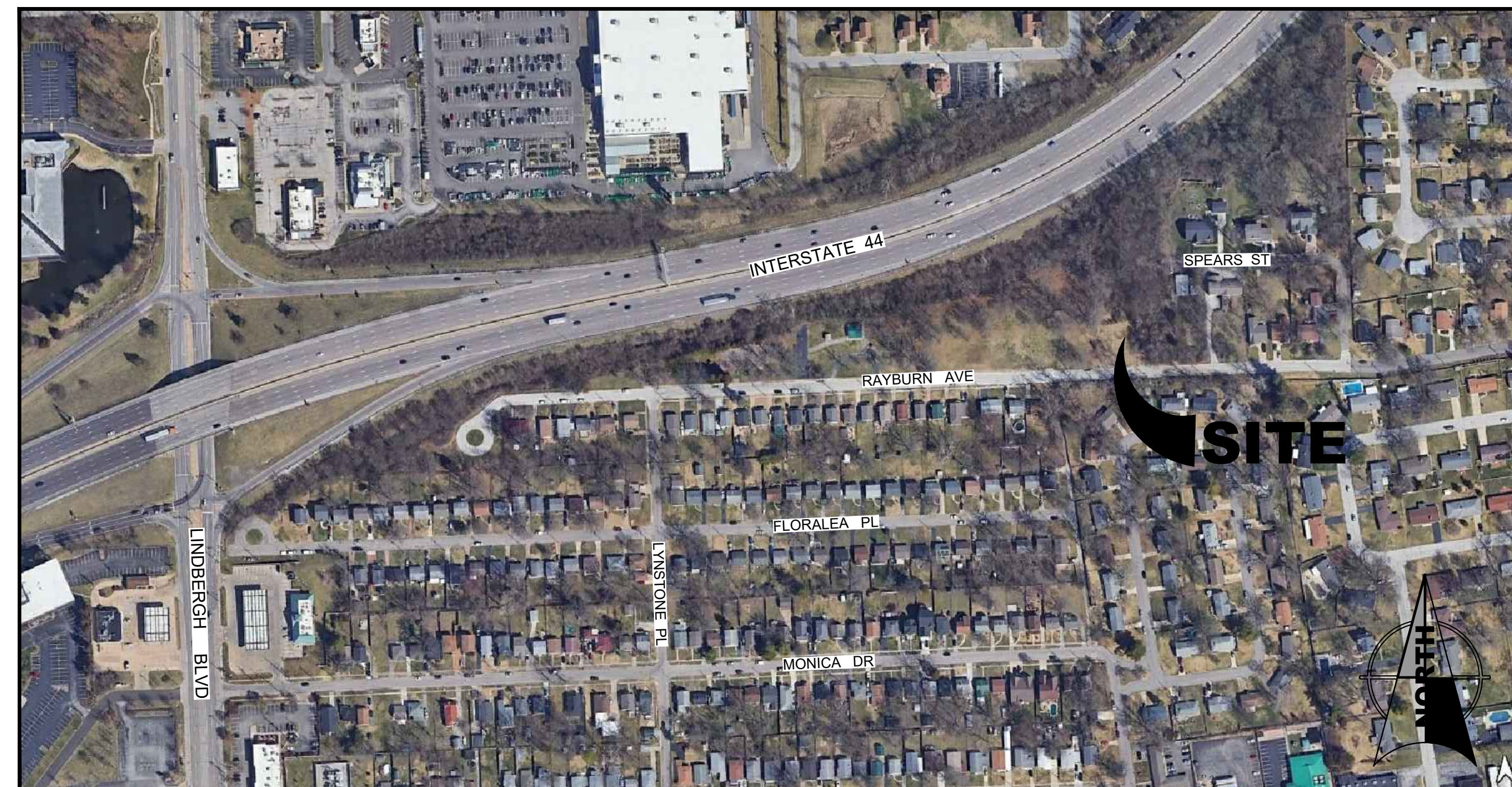
Sal Vitale

PHONE: 314-713-9721

SWPPP SPECIAL INSPECTOR

Mr. Bob Sudholt  
1-636-236-2806

CONTRACTOR'S INSURANCE (OFFSITE): 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, 2018 SECTION 10.090.



### VICINITY MAP

NO SCALE

PREPARED FOR :

## Manors at Lynstone Park, LLC

10025 OFFICE CENTER AVE. SUITE 114

ST. LOUIS, MO 63128

PREPARED BY :

## SITE DEVELOPMENT ENGINEERING, INC.

3512 YAEGER CROSSING COURT

ST. LOUIS, MO 63129

TEL 314-822-4800

sdr@sde-civil.com



1-800-DIG-RITE

### CAUTION!!!

CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EXCAVATION OPERATIONS TO AVOID AND PROTECT EXISTING UNDERGROUND UTILITIES.

The underground utilities shown herein have been plotted from available 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 underground 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.

### ST. LOUIS COUNTY BENCHMARK:

18485 NAVD83(SLC2011a) Elev = 662.67 FUS (or) 201 982 Meter NGVD29 Elev = 662.95 FUS Cut "L" on northeast corner of the northernmost end of the poured concrete retaining wall supporting the asphalt parking lot for the Holiday Inn #10705 Watson Road. Wall is northwest of and concentric to the ramp from southbound Kirkwood Road (a.k.a. Lindbergh Blvd) to Watson Road (State Route 366). Benchmark is on the north end of poured concrete wall adjoining the south end of a concrete block retaining wall, roughly 4' west of curb, 18.8' southeast of the southeast corner of Holiday Inn sign, 35' north of light standard, 26' south of utility pole, near north end of metal guard rail facing parking along top of concrete wall. SP MO East N=302195s E=258087z Meter - Estimated Rough NAD83 Lat=38.556413°(N°) Long=90.407215°(W°)

### PROJECT BENCHMARK:

This project was performed with the use of Global Positioning System (GPS) equipment and the use of a Continuous Operating Reference Station (CORS) as part of the Missouri Department of Transportation (MoDOT) Virtual Reference System (VRS) Network. Data was obtained with the use of a Trimble R10 GPS Receiver and a TSC7 Data Collector.

Horizontal Datum is Grid North, Missouri State Plane Coordinate System NAD'83 (2401), East Zone Vertical Datum is NAVD'88. Horizontal and Vertical data observation tolerance is 0.10 feet, horizontal and vertical Control point (CORS).

### SITE BENCHMARK:

Elevation = 631.41  
The "O" in OPEN on the fire hydrant S 84° 06' 42" E 99.04' from the southwest corner of #403 Rayburn.

### STORMWATER MANAGEMENT FUTURE DISTURBANCE NOTE:

Project Disturbance = 1.77 ACRES  
Project Runoff Differential = 1.44 CFS

Any future land disturbance and/or increase in impervious area on this site may require additional stormwater management per MSD regulations in place at that time (including total land disturbance and/or imperviousness added on this plan.)

### MSD STORMWATER MANAGEMENT NOTE:

ANY FUTURE LAND DISTURBANCE AND/OR INCREASE IN IMPERVIOUS AREA ON THIS SITE MAY REQUIRE ADDITIONAL STORM WATER MANAGEMENT PER MSD REGULATIONS IN PLACE AT THAT TIME INCLUDING TOTAL LAND DISTURBANCE AND/OR IMPERVIOUSNESS ADDED ON THIS PLAN 22MSD-00313

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TTP 1.1	TREE PROTECTION / MITIGATION AND PLANTING PLAN
L1.0	PLANTING PLAN

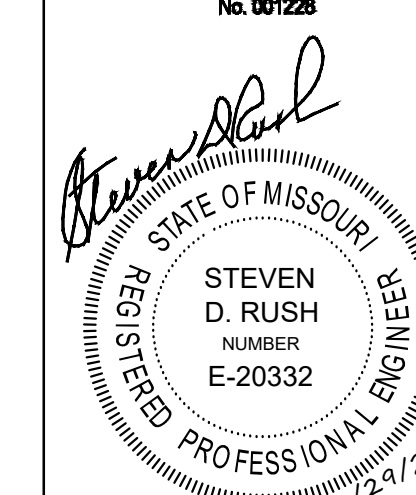
22MSD-00313

HT#8369

MSD BASE MAP NO. 25M

PROJECT SITE ADDRESS / LOCATION: SUNSET HILLS

SITE DEVELOPMENT ENGINEERING, INC.  
CORPORATE CERTIFICATE OF AUTHORITY  
No. 001208



Date: \_\_\_\_\_  
Steven D. Rush  
Civil Engineer  
License No. E-20332



SITE DEVELOPMENT ENGINEERING, INC.  
PLANNING • CONSULTING • CIVIL ENGINEERING

### Manors at Lynstone Park

DATE : 10/10/23  
JOB NO. : 222-205  
DRAWN BY : DWD  
CHECKED BY : SDR  
SCALE : As Shown

### TITLE SHEET

REV. : 01/03/24 MSD REVIEW 02/29/24 MSD Review SHEET : C1  
01/03/24 MSD SUBMITTAL 01/11/24 SLC SWPPP  
02/01/24 Agency Review

<b>GENERAL</b>
<p>THE UNDERGROUND UTILITIES SHOWN HEREIN HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, OR NONEXISTENCE, SIZE, TYPE, NUMBER, OR LOCATION OF THESE OR OTHER UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATIONS OF ALL UNDERGROUND 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.</p> <p>THE CONTRACTOR SHALL SECURE ALL REQUIRED PERMITS AND NOTIFY THE CITY OF SUNSET HILLS DEPARTMENT OF PUBLIC WORKS AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION.</p> <p>PRIOR TO SUBMITTAL OF CONSTRUCTION BIDS, THE CONTRACTOR SHALL BE REQUIRED TO VISIT THE SITE TO VERIFY EXISTING CONDITIONS AND PROPOSED IMPROVEMENTS.</p> <p>ALL ADJACENT PROPERTY OWNERS SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF CONSTRUCTION COMMENCEMENT.</p> <p>ALL CONSTRUCTION MATERIALS AND METHODS USED SHALL COMPLY WITH THE CURRENT CITY OF SUNSET HILLS STANDARDS AND CONSTRUCTION SPECIFICATIONS, ST. LOUIS COUNTY DEPARTMENT OF TRANSPORTATION OR THE METROPOLITAN ST. LOUIS SEWER DISTRICT AS APPLIES.</p> <p>ALL ELEVATIONS SHOWN ARE TO U.S.G.S. DATUM.</p> <p>THE CONTRACTOR SHALL BE RESPONSIBLE FOR FOR NOTIFICATION AND COORDINATION WITH ALL UTILITY COMPANIES. PRIOR TO ANY CONSTRUCTION.</p> <p>THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES IN THE PLANS.</p> <p>INSTALLATION OF LANDSCAPING AND ORNAMENTAL ENTRANCE MONUMENT OR IDENTIFICATION SIGNAGE, IF PROPOSED, SHALL BE REVIEWED BY THE CITY OF SUNSET HILLS, MO. FOR SIGHT DISTANCE CONSIDERATIONS, AND SHALL REQUIRE THEIR APPROVAL PRIOR TO INSTALLATION OR CONSTRUCTION.</p> <p>ADJACENT PROPERTIES DISTURBED BY CONSTRUCTION ACTIVITIES (IE: BUSHES, FENCES, MAILBOXES, ETC.) SHALL BE REPLACED OR RESTORED, IN KIND, AT THE DEVELOPER'S EXPENSE.</p>

<b>EROSION CONTROL</b>
<p>NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL EROSION CONTROL MEASURES HAVE BEEN INSTALLED.</p> <p>ALL EXPOSED AREAS SHALL BE SEEDED WITHIN 30 DAYS OF FINAL GRADING.</p> <p>SHOULD CONSTRUCTION STOP FOR LONGER THAN 15 DAYS, THE SITE SHALL BE SEEDED.</p> <p>MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN AND AT LEAST ONCE A WEEK.</p> <p>THESE NOTES SHALL NOT BE CONSIDERED ALL INCLUSIVE AS THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SOIL SEDIMENT FROM LEAVING THE SITE.</p> <p>CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL ORDINANCES THAT APPLY.</p> <p>ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED IF DEEMED NECESSARY BY ON SITE INSPECTION BY THE CITY OF SUNSET HILLS, MO.</p> <p>LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES.</p> <p>IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.</p> <p>ALL EXISTING STRUCTURES, FENCING, TREES, AND ETC., WITHIN CONSTRUCTION AREA SHALL BE REMOVED AND DISPOSED OF OFF SITE. ANY BURNING ON SITE SHALL BE SUBJECT TO LOCAL ORDINANCES.</p> <p>CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.</p>

<b>PAVING</b>
<p>ALL CONSTRUCTION WITHIN THE RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH THE LATEST PLANS AND SPECIFICATIONS OF THE CITY OF SUNSET HILLS</p> <p>THE CONTRACTOR SHALL PROVIDE ADEQUATE AND PROPER TRAFFIC CONTROL WHEN WORKING IN THE RIGHT-OF-WAY OF RAYBURN AVE. AND SPEARS ST. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE SAME.</p> <p>THE CONTRACTOR SHALL SECURE ALL REQUIRED PERMITS AND NOTIFY THE CITY OF SUNSET HILLS, MO AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION.</p> <p>CONSTRUCTION EQUIPMENT SHALL BE LOCATED ON THE PAVEMENT SURFACE SO AS TO MAINTAIN AT LEAST ONE LANE OF TRAFFIC DURING WORKING HOURS. SUCH EQUIPMENT SHALL BE SHIELDED WITH BARRICADES, CONES, ETC.</p> <p>ALL EXCAVATIONS WITHIN THE RIGHT-OF-WAY OF SPEARS STREET SHALL BE COVERED AND PROTECTED AT ALL TIMES OTHER THAN DURING WORKING HOURS.</p> <p>NO EXCAVATED MATERIALS SHALL BE STORED ON THE ROADWAY SURFACE OVERNIGHT. ROAD PAVEMENTS SHALL BE KEPT CLEAN AND FREE OF MUD, ROCK AND DEBRIS AT ALL TIMES.</p> <p>FOLLOWING COMPLETION OF CONSTRUCTION, ALL TEMPORARY MATERIALS SHALL BE REMOVED AND RIGHT-OF-WAY RESTORED TO ITS ORIGINAL CONDITION. EXISTING IMPROVEMENTS DAMAGED WITHIN THE RIGHT-OF-WAY SHALL BE REPLACED AS DIRECTED BY CITY OF SUNSET HILLS. ALL DISTURBED AREAS WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE SODDED.</p> <p>CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY 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 DRIVING CONDITIONS.</p>

<b>UTILITIES</b>
<p>THE UNDERGROUND UTILITIES SHOWN HEREIN HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, OR NONEXISTENCE, SIZE, TYPE, NUMBER, OR LOCATION OF THESE OR OTHER UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATIONS OF ALL UNDERGROUND 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.</p> <p>THE DEVELOPER IS ADVISED THAT UTILITY COMPANIES WILL REQUIRE COMPENSATION FOR RELOCATION OF THEIR FACILITIES WITHIN THE PUBLIC ROAD RIGHT-OF-WAY. UTILITY RELOCATION COSTS SHALL BE CONSIDERED THE DEVELOPER'S RESPONSIBILITY. THE DEVELOPER SHOULD 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.</p> <p>GAS, WATER, AND OTHER UTILITIES SHALL NOT CONFLICT WITH THE DEPTH OR HORIZONTAL LOCATION OF EXISTING AND PROPOSED SANITARY AND STORM SEWERS, INCLUDING HOUSE LATERALS. IT SHALL BE THE UTILITY COMPANIES' RESPONSIBILITY TO INSURE NO CONFLICTS ARISE.</p> <p>REMOVAL AND/OR DEMOLITION OF ALL EXISTING STRUCTURE(S), PAVEMENT, TREES AND UTILITIES SHALL BE COORDINATED WITH OWNER OR OWNER'S REPRESENTATIVE.</p> <p>THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION AND COORDINATION WITH ALL UTILITY COMPANIES.</p> <p>ALL UTILITIES SHALL BE INSTALLED UNDERGROUND.</p> <p>THIS SITE IS SERVED BY :</p> <p>A. AMEREN U.E. (ELECTRIC)  B. CHARTER COMMUNICATIONS (CABLE TV, DATA, TELEPHONE)  C. SPIRE (NATURAL GAS)  D. A.T. &amp; T. (FORMERLY SBC) (TELEPHONE)  E. MISSOURI AMERICAN WATER COMPANY (WATER)  F. METROPOLITAN ST. LOUIS SEWER DISTRICT (SEWER)</p>

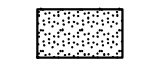
<b>SITE CONSTRUCTION NOTES ST. LOUIS COUNTY GENERAL NOTES</b>
<p><b>1. THE DEVELOPER OR MUNICIPALITY IS ADVISED THAT UTILITY COMPANIES MAY REQUIRE COMPENSATION FOR RELOCATION OF THEIR FACILITIES WITHIN THE PUBLIC ROAD RIGHT-OF-WAY. ST. LOUIS COUNTY SHALL BEAR NO RESPONSIBILITY FOR UTILITY RELOCATION OR ADJUSTMENT COSTS OR ASSOCIATED DELAYS.</b></p> <p><b>2. ALL SEDIMENT SHALL BE WASHED FROM ALL VEHICLES AT WASH-DOWN STATION PRIOR TO LEAVING THE SITE SO THAT NO SEDIMENT IS TRACKED ONTO COUNTY ROADS.</b></p> <p><b>3. INTERIM STORM WATER DRAINAGE CONTROL IN THE FORM OF SILTATION CONTROL MEASURES SHALL BE PROVIDED.</b></p> <p><b>4. NO SLOPE SHALL EXCEED 3:1 MAXIMUM.</b></p> <p><b>5. ADDITIONAL SILTATION CONTROL MAY BE REQUIRED BY ST. LOUIS COUNTY DEPARTMENT OF TRANSPORTATION.</b></p> <p><b>6. 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.</b></p> <p><b>7. ACCESS TO ALL PROPERTIES SHALL BE MAINTAINED AT ALL TIMES DURING THE CONSTRUCTION PROCESS.</b></p>

<b>CITY OF SUNSET HILLS NOTES</b>
<p>NOTIFY THE CITY OF SUNSET HILLS PLANNING &amp; DEVELOPMENT SERVICES DIVISION 48 HOURS PRIOR TO THE COMMENCEMENT OF GRADING AND/OR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.</p> <p>PARKING ON NON-SURFACES AREAS IS PROHIBITED IN ORDER TO ELIMINATE THE CONDITION WHEREBY MUD FROM CONSTRUCTION AND EMPLOYEE VEHICLES IS TRACKED ONTO THE PAVEMENT.</p> <p>THE STREETS SURROUNDING THIS DEVELOPMENT AND ANY STREET USED FOR CONSTRUCTION ACCESS THERETO SHALL BE KEPT FREE FROM MUD AND CONSTRUCTION DEBRIS AND SHALL BE CLEANED THROUGHOUT THE DAY.</p> <p>ALL FILLS PLACE UNDER PROPOSED STORM AND SANITARY SEWER LINES AND/OR PAVED AREAS, INCLUDING TRENCH BACKFILLS WITHIN AND OFF THE ROAD RIGHT-OF-WAY, SHALL BE COMPACTED TO 90% OF MAXIMUM DENSITY AS DETERMINED BY THE "MODIFIED AASHTO T-100 COMPACTION TEST" (ASTM D-1557) FOR THE ENTIRE DEPTH OF FILL. COMPACTED GRANULAR BACKFILL IS REQUIRED IN ALL TRENCH EXCAVATION WITHIN THE STREET RIGHT-OF-WAY AND UNDER ALL PAVED AREAS. ALL TESTS SHALL BE PERFORMED UNDER THE DIRECTION OF AND VERIFIED BY A LICENSED ENGINEER CONCURRENT WITH GRADING AND BACKFILLING OPERATIONS.</p> <p>SOFT SOILS OR SEDIMENT FROM EXISTING OR FORMER POND SITES OR TRIBUTARIES, OR ANY SEDIMENT BASINS OR TRAPS SHALL NOT BE PLACED IN PROPOSED PUBLIC RIGHT-OF-WAY LOCATIONS OR IN ANY STORM SEWER LOCATION.</p> <p>ALL TRASH AND DEBRIS ON-SITE, EITHER EXISTING OR FROM CONSTRUCTION, SHALL BE REMOVED AND PROPERLY DISPOSED OF OFF-SITE.</p> <p>DEBRIS AND FOUNDATION MATERIAL FROM ANY STRUCTURE WHICH IS SCHEDULED TO BE RAZED SHALL BE PROPERLY DISPOSED OF OFF-SITE.</p> <p>ALL EXCAVATIONS, CUTS OR FILLS SHALL HAVE A FINISHED GRADE NOT TO EXCEED A 3:1 SLOPE (33%), UNLESS SPECIFICALLY APPROVED OTHERWISE.</p> <p>NO EXCAVATION SHALL BE MADE IN A MANNER THAT MAY ENDANGER ANY ADJOINING PROPERTY OR ANY PUBLIC OR PRIVATE STREET, OR UTILITY.</p> <p>ALL DEVELOPED LOTS SHALL BE SEEDED AND MULCHED OR SODDED BEFORE OCCUPANCY AND IN A MANNER THAT IT MEETS OR EXCEEDS THE REQUIREMENTS OF THE CITY OF SUNSET HILLS.</p> <p>ANY WELLS OR CISTERNS SHALL BE LOCATED AND SEALED IN A MANNER ACCEPTABLE TO THE CITY OF SUNSET HILLS AND THE MoDNR.</p>

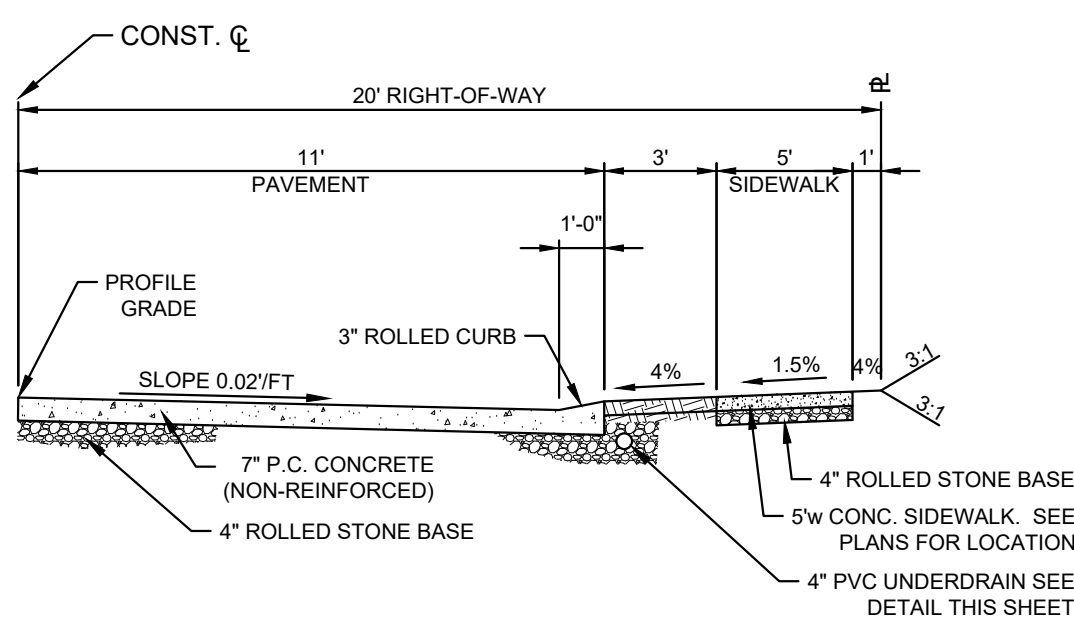
<b>STORM SEWERS</b>
<p>THE DEVELOPER IS REQUIRED TO PROVIDE ADEQUATE STORM WATER SYSTEMS IN ACCORDANCE WITH CITY OF SUNSET HILLS AND THE METROPOLITAN ST. LOUIS SEWER DISTRICTS' (MSD) STANDARDS.</p> <p>ALL CONCRETE PIPE SHALL BE REINFORCED AND CONFORM TO A.S.T.M. DESIGNATION C78-80 CLASS III, UNLESS OTHERWISE NOTED.</p> <p>TYPE "C" BEDDING PER MSD STANDARDS IN REQUIRED FOR PIPES IN ROCK.</p> <p>ALL TRENCHES UNDER AREAS TO BE PAVED AND UNDER EXISTING PAVING SHALL BE GRANULARLY FILLED WITH ¾" MINUS CRUSHED LIMESTONE ONLY. BACKFILL SHALL BE PLACED IN ACCORDANCE WITH MSD STANDARDS.</p> <p>JETTING IS NOT AN ACCEPTABLE METHOD OF ACHIEVING BACKFILL COMPACTION. ALL BACKFILL MATERIALS SHALL BE MECHANICALLY COMPACTED TO AT LEAST 95 PERCENT OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY.</p> <p>ALL STORM WATER SHALL BE DISCHARGED AT AN ADEQUATE NATURAL DISCHARGE POINT. SINKHOLES ARE NOT ADEQUATE DISCHARGE POINTS.</p> <p><b>STORMWATER MANAGEMENT NOTE:</b>  PROJECT DISTURBANCE = 1.75 AC.  PROJECT RUNOFF DIFFERENTIAL = 1.44 CFS  ANY FUTURE LAND DISTURBANCE AND/OR INCREASE IN IMPERVIOUS AREA ON THIS SITE MAY REQUIRE ADDITIONAL STORMWATER MANAGEMENT PER MSD REGULATIONS IN PLACE AT THAT TIME (INCLUDING TOTAL LAND DISTURBANCE AND/OR IMPERVIOUSNESS ADDED ON THIS PLAN)</p> <p>FINAL SITE STORMWATER DRAINAGE GENERATED FROM THIS SITE AND TRIBUTARY THROUGH THIS SITE ARE SUBJECT TO MSD REQUIREMENTS.</p>

<b>MSD NOTES</b>
<p><b>SEWER CONSTRUCTION AT ONE PERCENT (1%) OR LESS:</b></p> <p>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 DISTRICT INSPECTOR UPON REQUEST. THE CONTRACTOR WILL BE REQUIRED TO REMOVE AND REPLACE ANY SEWER REACH HAVING AN AS-BUILT GRADE FLATTER THAN THE DESIGN GRADE BY MORE THAN 0.1%. SEWERS WITH GRADES GREATER THE DESIGN GRADE MAY BE LEFT IN PLACE PROVIDED NO OTHER SEWER GRADE IS REDUCED BY THIS VARIANCE IN THE AS-BUILT GRADE.</p> <p>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 PARAGRAPHS.</p> <p>FIELD SURVEYED VERIFICATION MUST BE MADE UNDER THE DIRECTION OF THE LICENSED LAND SURVEYOR OR REGISTERED ENGINEER. THE SEWER CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COST ASSOCIATED WITH THE FIELD VERIFICATION OF THE SEWER GRADE, OR REMOVAL AND REPLACEMENT OF THE SEWER PIPE OR ASSOCIATED APPURTENANCES.</p> <p><b>TRENCH BACKFILL COMPACTION AND TESTING REQUIREMENTS:</b></p> <p>THE CONTRACTOR IS TO REFER TO SECTION H OF THE METROPOLITAN ST. LOUIS SEWER DISTRICT'S STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES, 2009 EDITION, TO ESTABLISH THE REQUIREMENTS FOR THE SPECIFIC TYPE OF BACKFILL BEING USED.</p> <p>PIPE JOINTS WITH ADAPTORS AND COUPLINGS SHALL BE SUPPLIED AND INSTALLED WITH 3/16 STAINLESS STEEL NUT AND BOLT CLAMPS (T-BOLT) CONFIGURATION; AND WITH STAINLESS STEEL SHEER BANDS, BEING A MINIMUM OF TWELVE (12) MILS (MSD ST. CONS. SPECS. PT. 2, SUBSECTION H-11) WORK DRIVE HOSE CLAMPS AND CONCRETE BACKFILLING (CAUSTICITY) WILL NO LONGER BE ALLOWED AT THOSE JOINTS. GRANULAR BACKFILL SHOULD BE USED, IF FLOWABLE FILL IS REQUIRED, THE CONTRACTOR SHALL WRAP AND TAPE THE ADAPTORS AND COUPLINGS WITH A SIX (6)-MIL POLYETHYLENE SHEET.</p> <p>ANY ABANDONED SEWERS SHALL BE REMOVED OR COMPLETELY GROUT FILLED. MSD PERMITS ARE REQUIRED PRIOR TO THE ABANDONMENT OR REMOVAL OF EXISTING SEWERS. TO RECEIVE MSD PERMITS THE PROJECT MUST HAVE MSD PLAN APPROVAL. NOTIFY MSD 48 HOURS PRIOR TO SEWER ABANDONMENT AND/OR REMOVAL.</p> <p>UNLESS NOTED OTHERWISE THE DETAIL DRAWINGS SHOWN ARE FOR PRIVATE CONSTRUCTION AND THE CONTRACTOR'S USE ONLY. REFER TO MSD SPECIFICATION AND STANDARD DETAILS FOR PUBLIC SEWER CONSTRUCTION.</p> <p>PROVIDE 6' DIAMETER FLAT AREA AROUND PUBLIC STRUCTURE TOPS FOR ACCESS.</p> <p>1. LIMITS OF DISTURBANCE:  the contractor shall stay within the limits of disturbance as shown on the plans and minimize disturbance within the work area wherever possible.</p> <p>2. PUBLIC SEWER MAINTENANCE:  maintenance of the sewers designated "public" shall be the responsibility of the metropolitan St. Louis sewer district upon dedication of the sewers to the district.</p> <p>3. REMOVE/REPLACE OR REHAB NOTE:  the removal and replacement, or rehabilitation of the 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.</p> <p>4. SEPTIC TANK ABANDONMENT:  septic tanks shall be abandoned in accordance with the metropolitan St. Louis sewer district standard construction specifications for sewer and drainage facilities, 2009.</p> <p>5. 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.  some recent changes concern plastic pipe materials and pipe field testing and performance, and include the following:</p> <p>PART 2 - MATERIALS OF CONSTRUCTION</p> <p>High Density Polyethylene (HDPE) pipe is not allowed for gravity sewers for storm, combined, or sanitary sewers that are "public" or "private under MSD inspection". Corrugated Polypropylene (PP) Pipe is allowed as follows for gravity sewers that are "public" or "private under MSD inspection":</p> <p>1. For use in sanitary and combined sewers 12 to 60 inches in diameter it shall conform to the requirements of ASTM F2764 "Standard Specification for 6 to 60 in. Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications." Pipe shall have a minimum stiffness of 46 psi when tested in accordance with ASTM D2412.</p> <p>2. For use in storm sewers 12 to 30 inches in diameter it shall conform to the requirements of ASTM F2881 "Standard Specification for 12 to 60 in. Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications;" or ASTM F2764 "Standard Specification for 6 to 60 in. Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications;" or for use in Storm Sewers 36 to 60 inches in diameter it shall conform to the requirements of ASTM F2764 "Standard Specification for 6 to 60 in. Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications." Pipe shall have a minimum stiffness of 46 psi when tested in accordance with ASTM D2412.</p> <p>3. Pipe for gravity sewer installations shall be installed in accordance with ASTM D2321 with the exception that initial Backfill shall be a minimum of 6 inches above the top of pipe as shown in the Standard Details of Sewer Construction. Consolidation by water (jetting or puddling) shall not be used. Consolidation shall be in accordance with MSD Standard Construction Specifications for trench backfill. Price for compacted backfill shall be included in pipe unit cost.</p> <p>A. A representative from the pipe manufacturer shall visit the site within the first 100 feet of pipe installation. Coordination of this site visit shall be arranged by the Contractor. The Contractor shall provide the MSD inspector at least 24 hours' notice of the planned date and time of the manufacturer's site visit.</p> <p>B. Following the site visit, the Contractor shall be required to provide a letter from the piping manufacturer summarizing their observations. At a minimum, the letter shall:</p> <p>I. Indicate the date the initial section of pipe was installed; and  II. Verify that the installation occurred in accordance with manufacturer's recommended procedures.</p> <p>4. Trench width shall be in accordance with manufacturer's installation recommendations. District standard payline widths based on the nominal inside pipe diameter shall apply.</p> <p>PART 4 - PIPE SEWER CONSTRUCTION</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>If Reinforced Concrete Pipe is used for sanitary or combined sewers larger than 27", all pipe AND joints shall conform to ASTM C 361. In addition, if the diameter is larger than 48", the joint type must include a gasket that is confined in a groove in the spigot of the pipe.</p>

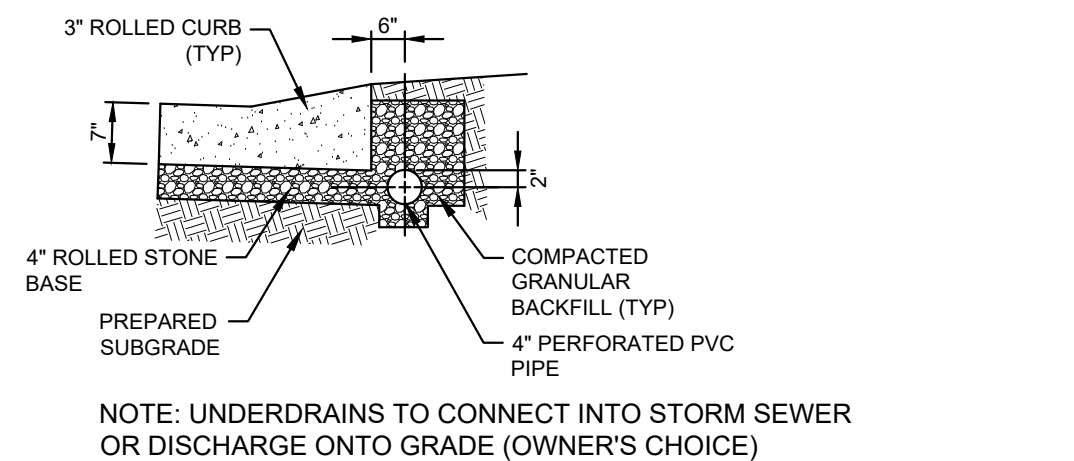
<b>BENCHMARK</b>
<p><b>ST. LOUIS COUNTY BENCHMARK:</b>  <b>18405 NAVD88(SLC2011a) Elev = 662.67 F(U.S.) or 201.982 Meter NGVD29 Elev = 662.95 F(U.S.)</b>  Cut "L" on northeast corner of the northernmost end of the poured concrete retaining wall supporting the asphalt parking lot for the Holiday Inn #10705 Watson Road. Wall is northwest of and concentric to the ramp from southbound Kirkwood Road (a.k.a. Lindbergh Blvd) to Watson Road (State Route 366).  Benchmark is on the north end of poured concrete wall adjoining the south end of a concrete block retaining wall, roughly 4' west of curb, 18.8' southeast of the southeast corner of Holiday Inn sign, 35' north of light standard, 20' south of utility pole, near north end of metal guard rail facing parking along top of concrete wall. SP MO East N=302195a E=258087a Meter - Estimated Rough NAD83 Lat=38.556413°±(N+) Long=90.407215°±(W-)</p> <p><b>PROJECT BENCHMARK:</b>  This project was performed with the use of Global Positioning System (GPS) equipment and the use of a Continuous Operating Reference Station (CORS) as part of the Missouri Department of Transportation (MoDOT) Virtual Reference System (VRS) Network. Data was obtained with the use of a Trimble R10 GPS Receiver and a TSC7 Data Collector.</p> <p>Horizontal Datum is Grid North, Missouri State Plane Coordinate System NAD'83 (2401), East Zone Vertical Datum is NAVD'88. Horizontal and Vertical data observation tolerance is 0.10 feet, horizontal and vertical Control point (CORS).</p> <p><b>SITE BENCHMARK:</b>  Elevation = 631.41  The "O" IN OPEN on the fire hydrant S 84° 06' 42" E 99.04' from the southwest corner of #403 Rayburn.</p>

<b>LEGEND</b>	
A.T.G.	Adjust to Grade
BM	Benchmark
B.O.C.	Back of Curb
C.M.P.	Corrugated Metal Pipe
C.I.	Curb Inlet
C.L.	Centerline
D.C.I.	Double Curb Inlet
D.G.I.	Double Grated Inlet
D.I.P.	Ductile Iron Pipe
C.O.	Clean Out
E.P.	End of Pipe
F.F.	Finished Floor Elevation
F.L.	Flow Line Elevation
-X-	Fence Line
F.H.	Fire Hydrant
G.I.	Grated Inlet
G.M.	Gas Meter
GV	Gas Valve
G.W.	Guy Wire
L.S.	Light Standard
MH	Manhole
RCP	Reinforced Concrete Pipe
U.C.P.	Ultra Flo Corrugated Pipe
U.P.	Utility Pole
W.M.	Water Meter
W.V.	Water Valve
-G-	Gas Line
-OE-	Overhead Electric
-OU-	Overhead Utilities
-T-	Telephone Line
TC	Top of Curb Elevation
TF	Top of Foundation
TH	Test Hole
-UE-	Underground Electric
-UT-	Underground Telephone Line
-W-	Water Line
U.I.P.	Use in Place
T.B.R.	To Be Removed
(TYP.)	Typical
— 500 —	Existing Contour
— 500 —	Proposed Contour
	Concrete Pavement
— — —	Disturbance Area Limits
— TP —	Tree Protection Fence

22MSD-00313	HT#8369	MSD BASE MAP NO. 25M
PROJECT SITE ADDRESS / LOCATION: SUNSET HILLS		
<p><b>SITE DEVELOPMENT ENGINEERING, INC.</b>  CORPORATE CERTIFICATE OF AUTHORITY  No. 02128</p> <p><b>SDE</b></p> <p>3512 Yaeger  Crossing Court  St. Louis, Missouri  63129  314-822-4800</p> <p>sd@sd-civil.com</p>		
<b>Manors at Lynstone Park</b>		
DATE : 10/10/23	JOB NO. : 222-205	DRAWN BY : DWD
CHECKED BY : SDR		SCALE : As Shown
<b>GENERAL NOTES</b>		
REV. : 01/03/24 MSD REVIEW	02/20/24 MSD Review	SHEET :
01/03/24 MSD SUBMITTAL	01/11/24 SLC SWPPP	<b>C2</b>
02/01/24 Agency Review		



**A PAVEMENT SECTION**  
NOT TO SCALE



**B UNDERDRAIN DETAIL**  
NOT TO SCALE

NOTE: UNDERDRAINS TO CONNECT INTO STORM SEWER OR DISCHARGE ONTO GRADE (OWNER'S CHOICE)

**LEGEND**

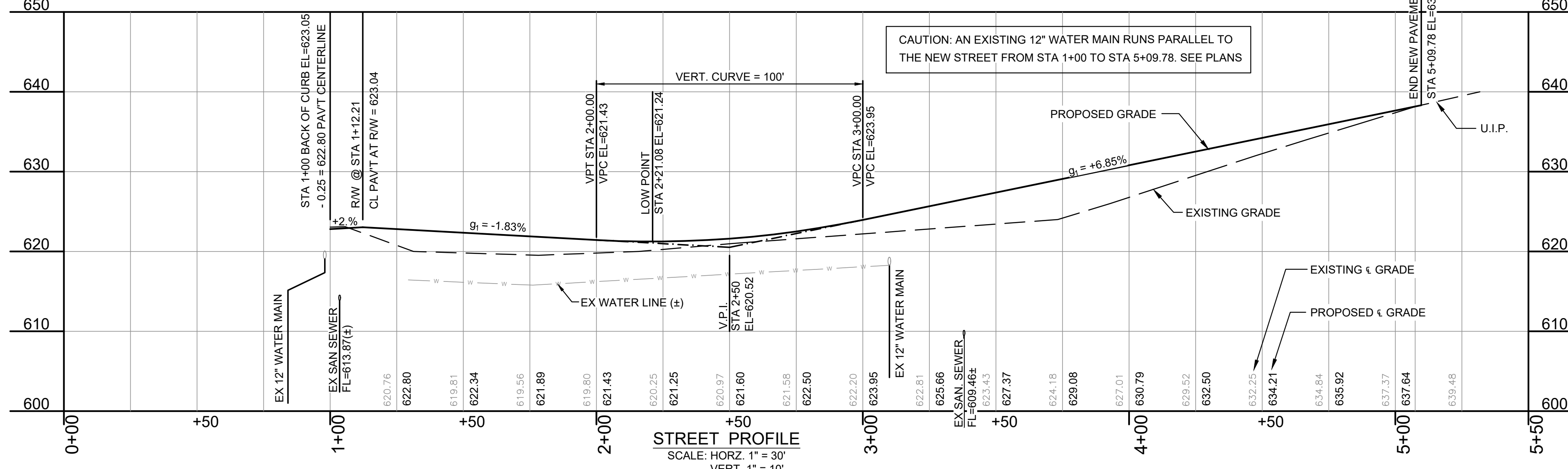
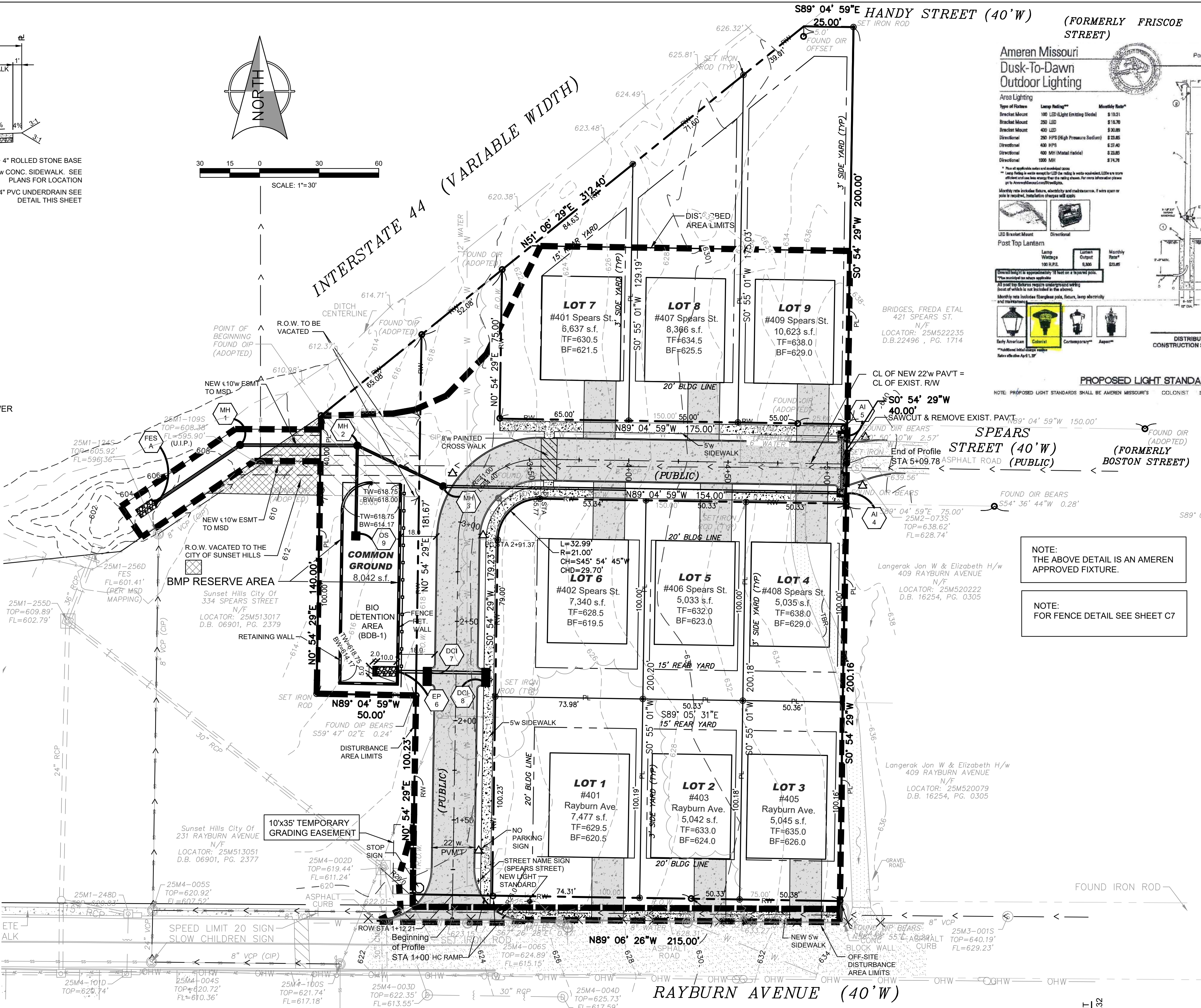
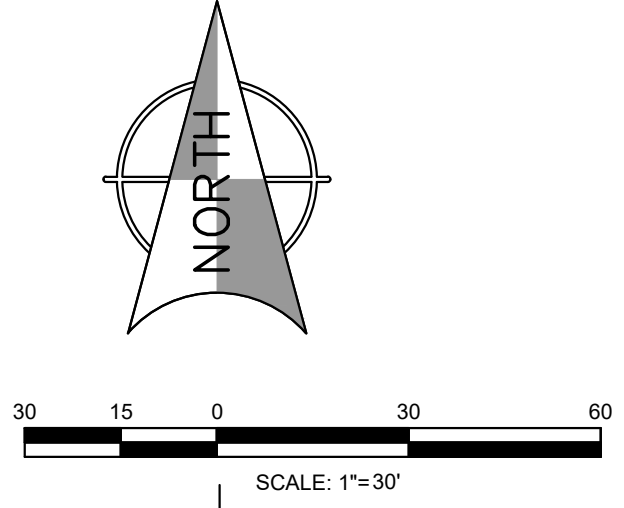
511	EXISTING CONTOUR
511.0	PROPOSED CONTOUR
511.0	PROPOSED GROUND ELEVATION
TF	TOP OF FOUNDATION
TW	TOP OF WALL
BW	BOTTOM OF WALL
EX	EXISTING
FF	FINISHED FLOOR
TW	TOP OF WALL
BF	BASEMENT FOUNDATION
TBR	TO BE REMOVED
C.O.	SANITARY CLEANOUT
DND	DO NOT DISTURB
■	PROPOSED STORM INLET
●	PROPOSED STORM MANHOLE
●	PROPOSED SANITARY MANHOLE
+	PROPOSED FIRE HYDRANT
■	NEW CONCRETE
W	PROPOSED RETAINING WALL
ST	PROPOSED WATER
S	PROPOSED STORM
S	PROPOSED SANITARY
○	RET. WALL FENCE
○	STOP SIGN
△	NO PARKING SIGN
PL	PROPERTY LINE
RW	RIGHT-OF-WAY
U.I.P.	USE IN PLACE
ATG	ADJUST TO GRADE AS NECESSARY



**1-800-DIG-RITE**

**CAUTION!!!**  
CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EXCAVATION OPERATIONS TO AVOID AND PROTECT EXISTING UNDERGROUND UTILITIES.

The underground utilities shown herein have been plotted from available 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 underground 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.



**Ameren Missouri Dusk-to-Dawn Outdoor Lighting**

**Area Lighting**

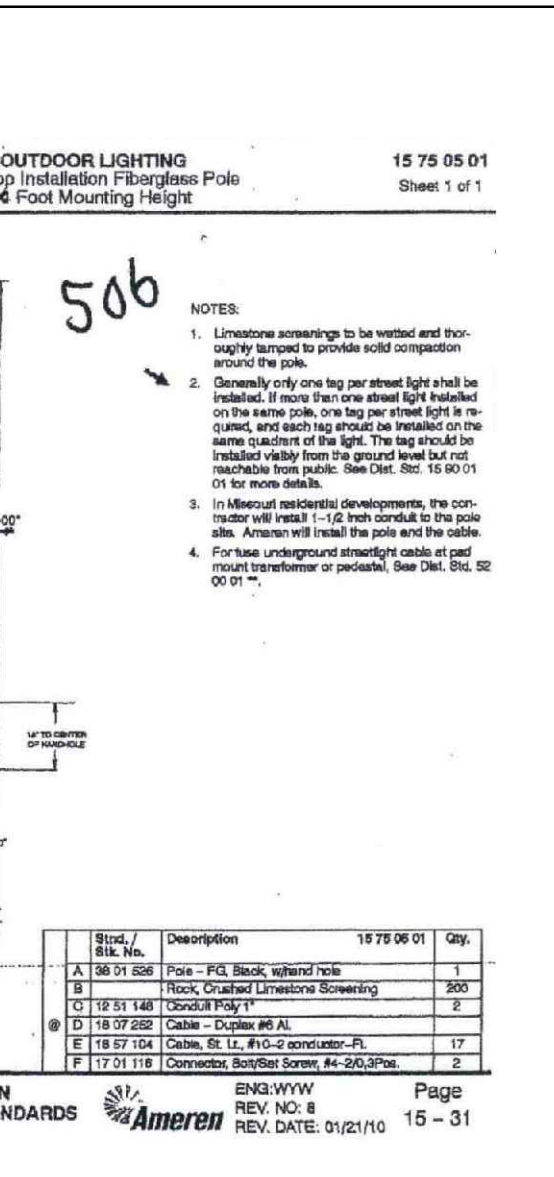
Type of Fixture	Lamp Rating	Monthly Base*
Bracket Mount	100 LED Light Emitting Diode	\$ 18.31
Bracket Mount	250 LED	\$ 18.70
Bracket Mount	400 LED	\$ 20.00
Directional	200 HPV (High Pressure Sodium)	\$ 22.00
Directional	400 HPV	\$ 23.40
Directional	600 HPV (Metal Halide)	\$ 25.00
Directional	800 HPV	\$ 27.70

**Post Top Lantern**

Lamp	Lamp	Monthly
White	Output	Base*
100 WATT	6000	\$21.00

**PROPOSED LIGHT STANDARD DETAIL**

NOTE: PROPOSED LIGHT STANDARDS SHALL BE AMEREN MISSOURI COLORIST STYLE AND THE LIGHT SHOULD NOT BE LESS THAN 18' ABOVE GRADE.



Item #	Description	Quantity
1	506' Pole, 18' Mount, 15' 05-01	1
2	100W LED Light	100
3	100W LED Light	100
4	100W LED Light	100
5	100W LED Light	100
6	100W LED Light	100
7	100W LED Light	100
8	100W LED Light	100
9	100W LED Light	100
10	100W LED Light	100
11	100W LED Light	100
12	100W LED Light	100
13	100W LED Light	100
14	100W LED Light	100
15	100W LED Light	100
16	100W LED Light	100
17	100W LED Light	100

**ROSCH ENGINEERING**

Date: 12-11-23

Re: Manors at Lynstone Park Retaining Wall 1

The street is not supported by the retaining wall.

If you have any questions or need further information, please call.

Sincerely,  
Brian Schaller, PE



**LOCATION MAP**

**PROJECT INFORMATION**

Address of Site	Locator Number
403 Rayburn Avenue	25M510047
405 Rayburn Avenue	25M520068
339 Spears Street	25M510344
340 Spears Street	25M510322
402 Spears Street	25M513073
408 Spears Street	25M520255
401 Spears Street	25M510355
407 Spears Street	25M520475
409 Spears Street	25M520411
411 Spears Street	25M520512
413 Handy Street	25M520541
415 Spears Street	
424 Handy Street	

**Note to Street Contractor:**  
Streets must be Portland cement concrete with doweled center joint, doweled transverse joints and a four-inch (4") rolled stone base. The mix design shall be at least a six-sack mix with five percent (5%) entrained air. Maximum slump shall be three inches (3"). The contractor shall be required to provide the City with the mix design. The base rock shall be compacted to ninety-five percent (95%) maximum compaction using the modified Proctor method. Compaction tests shall be performed by a firm chosen by the City and the City shall be provided with the results of said tests.

22MSD-00313 HT#8369 MSD BASE MAP NO. 25M

PROJECT SITE ADDRESS / LOCATION: SUNSET HILLS

**SDE SITE DEVELOPMENT ENGINEERING, INC.**  
PLANNING • CONSULTING • CIVIL ENGINEERING

**Manors at Lynstone Park**

DATE: 10/10/23 JOB NO.: 222-205 DRAWN BY: DWD  
CHECKED BY: SDR SCALE: As Shown

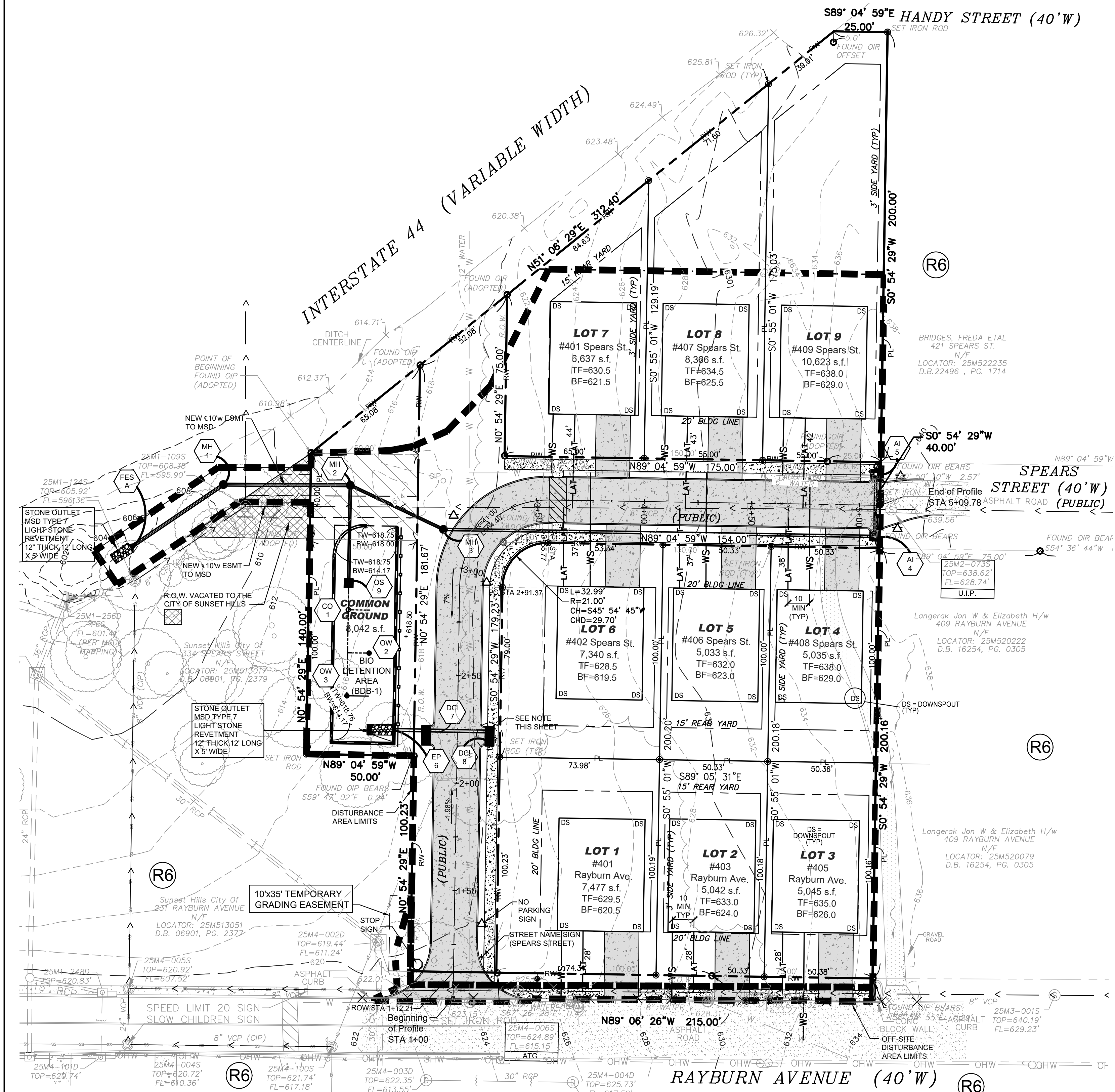
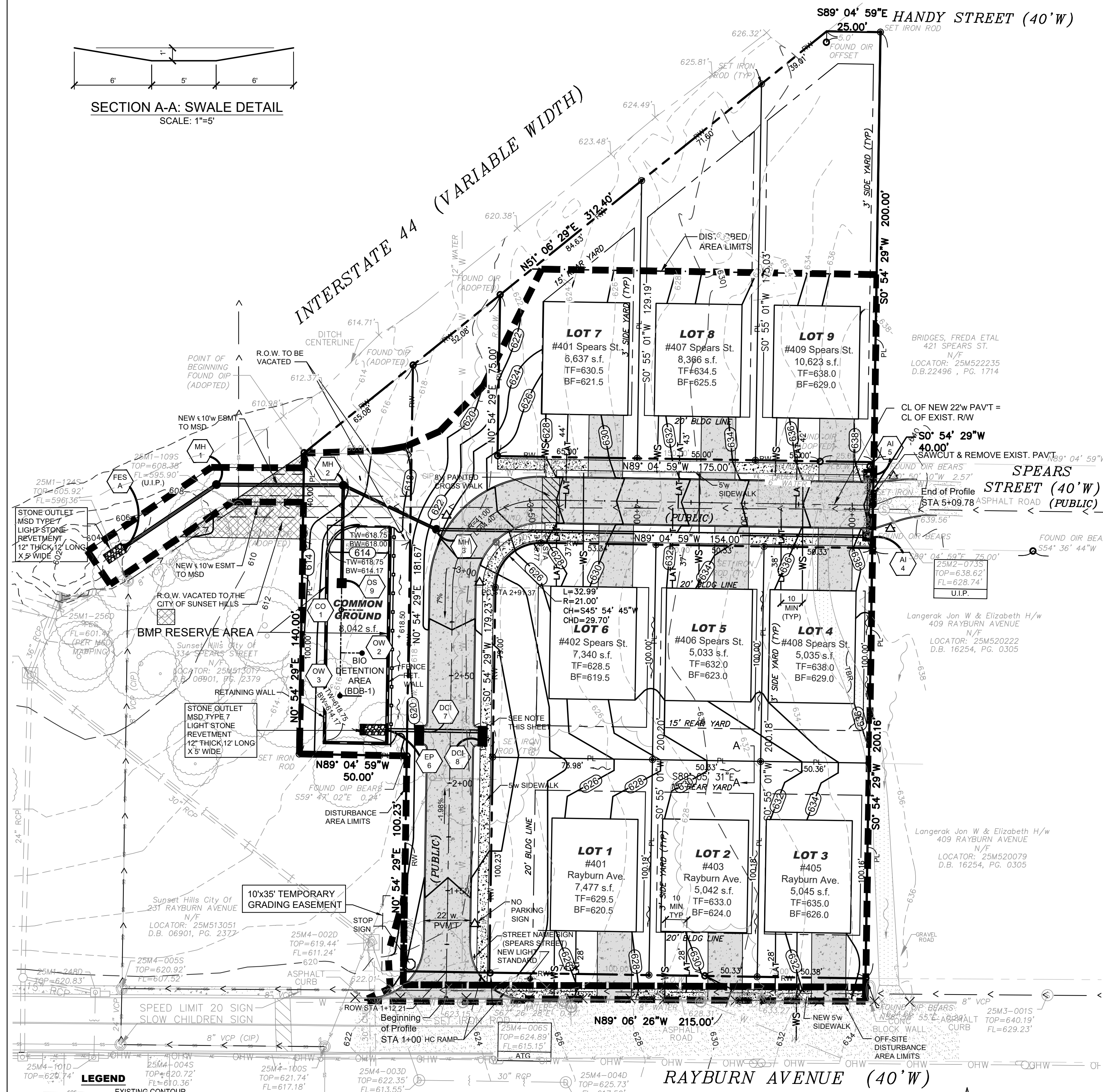
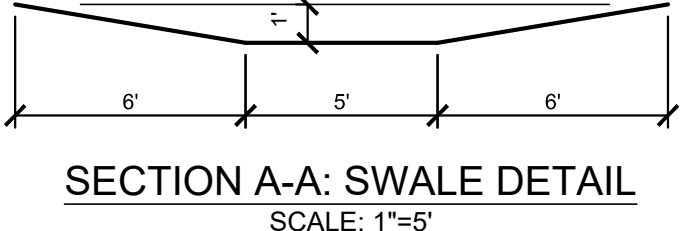
**SITE & PAVING PLAN**

REV: 01/03/24 MSD REVIEW 02/20/24 MSD REVIEW SHEET: C3

3512 Yaeger Crossing Court St. Louis, Missouri 63129 314-822-4800 sdr@sde-civil.com

STEVEN D. RUSH REGISTERED PROFESSIONAL ENGINEER No. E-20332

Date: Steven D. Rush Civil Engineer License No. E-20332



- LEGEND**
- 511.0 EXISTING CONTOUR
  - 511.0 PROPOSED CONTOUR
  - 511.0 PROPOSED GROUND ELEVATION
  - TF TOP OF FOUNDATION
  - TW TOP OF WALL
  - BW BOTTOM OF WALL
  - EX EXISTING
  - FF FINISHED FLOOR
  - TW TOP OF WALL
  - BF BASEMENT FOUNDATION
  - TBR TO BE REMOVED
  - C.O. SANITARY CLEANOUT
  - DND DO NOT DISTURB
  - DS DOWNSPOUT
  - PROPOSED STORM INLET
  - PROPOSED STORM MANHOLE
  - PROPOSED SANITARY MANHOLE
  - PROPOSED FIRE HYDRANT
  - NEW CONCRETE
  - PROPOSED RETAINING WALL
  - WS PROPOSED 1" WATER SERVICE
  - ST PROPOSED STORM
  - S PROPOSED SANITARY
  - PL PROPERTY LINE
  - RW RIGHT-OF-WAY
  - U.I.P. USE IN PLACE
  - ATG ADJUST TO GRADE AS NECESSARY

**BACKWATER VALVE NOTE:**  
A BACKWATER VALVE SHALL BE REQUIRED ON ALL BUILDING LATERALS PER LOCAL PLUMBING CODE.

**SANITARY LATERALS NOTE:**  
LATERALS TO BE 6-INCH PVC AND CONSTRUCTED AT 2% MINIMUM SLOPE

**CAUTION!!!**  
CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EXCAVATION OPERATIONS TO AVOID AND PROTECT EXISTING UNDERGROUND UTILITIES.

The underground utilities shown herein have been plotted from available 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 underground 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.

**GRADING PLAN**  
SCALE: 1" = 30'

**UTILITY PLAN**  
SCALE: 1" = 30'

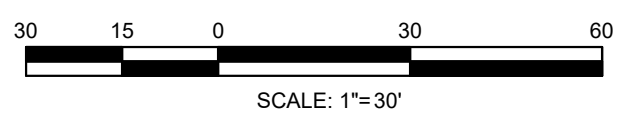
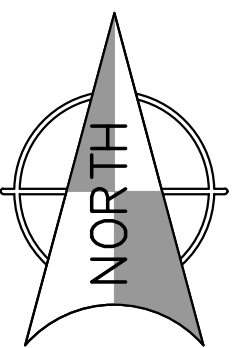
**ESTIMATED EARTHWORK \*:**

CUT: 1,500 CY  
FILL: 1,500 CY  
\* CONTRACTOR SHALL PROVIDE THEIR OWN EARTHWORK QUANTITIES. QUANTITIES ARE PROVIDED PER REQUEST OF ST. LOUIS COUNTY.

NOTE: SHOULD IT BE REQUIRED TO REMOVE EXTRANEOUS EARTHWORK AND SHOULD HAUL ROUTE INVOLVE ST. LOUIS COUNTY ROADWAYS, CONTRACTOR SHALL NOTIFY THE ST. LOUIS COUNTY DEPT. OF TRANSPORTATION AS REQUIRED.

NOTE: CONTRACTOR SHALL SHALE INLET STONE TO MATCH SIDEWALK TRANSVERSE AND SHALL INSURE SMOOTH WALKING SURFACE BETWEEN INLET AND SIDEWALK

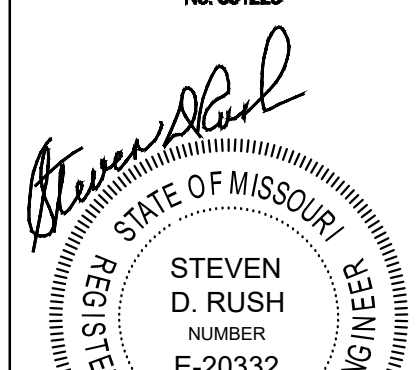
NOTE: THIS PROJECT WILL UTILIZE THE EXISTING WATER LINES AND SEWER LINES IN SPEARS STREET AND RAYBURN AVENUE TO SERVICE LOTS IN MANORS AT LYNSTONE PARK



1-800-DIG-RITE

22MSD-00313 HT#8369 MSD BASE MAP NO. 25M

SITE DEVELOPMENT ENGINEERING, INC.  
CORPORATE CERTIFICATE OF AUTHORITY  
No. 012028



Date: Steven D. Rush  
Civil Engineer  
License No. E-20332



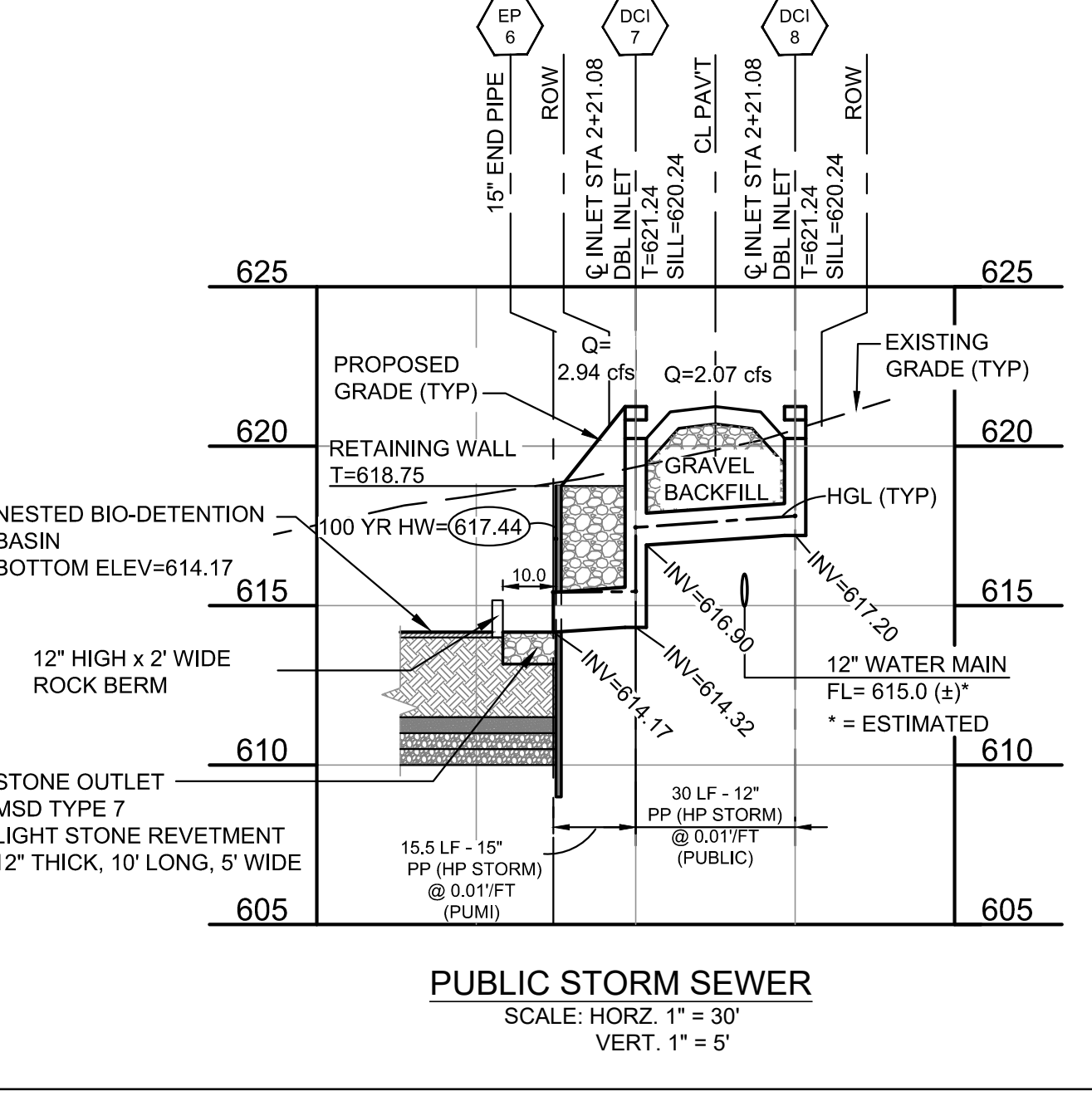
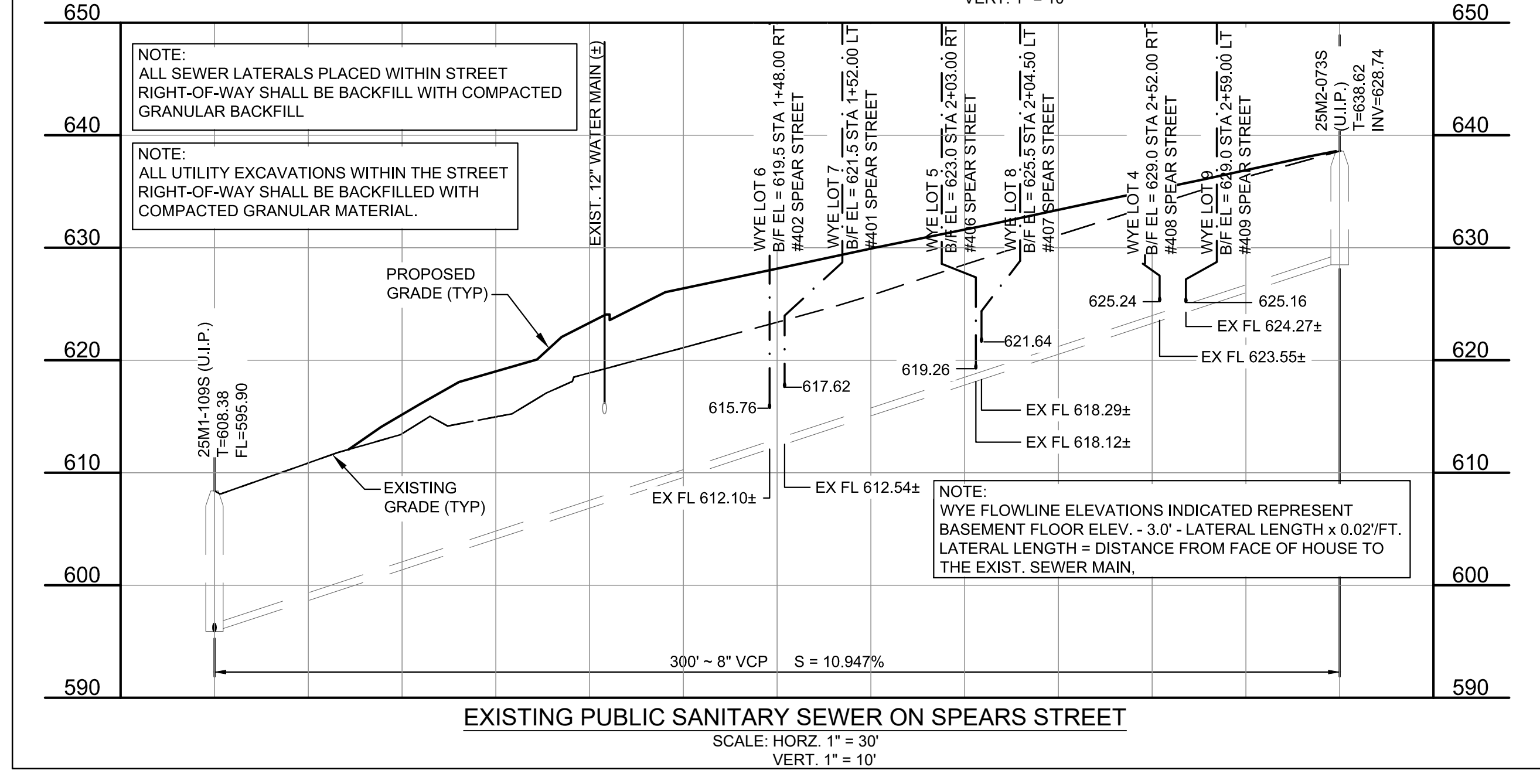
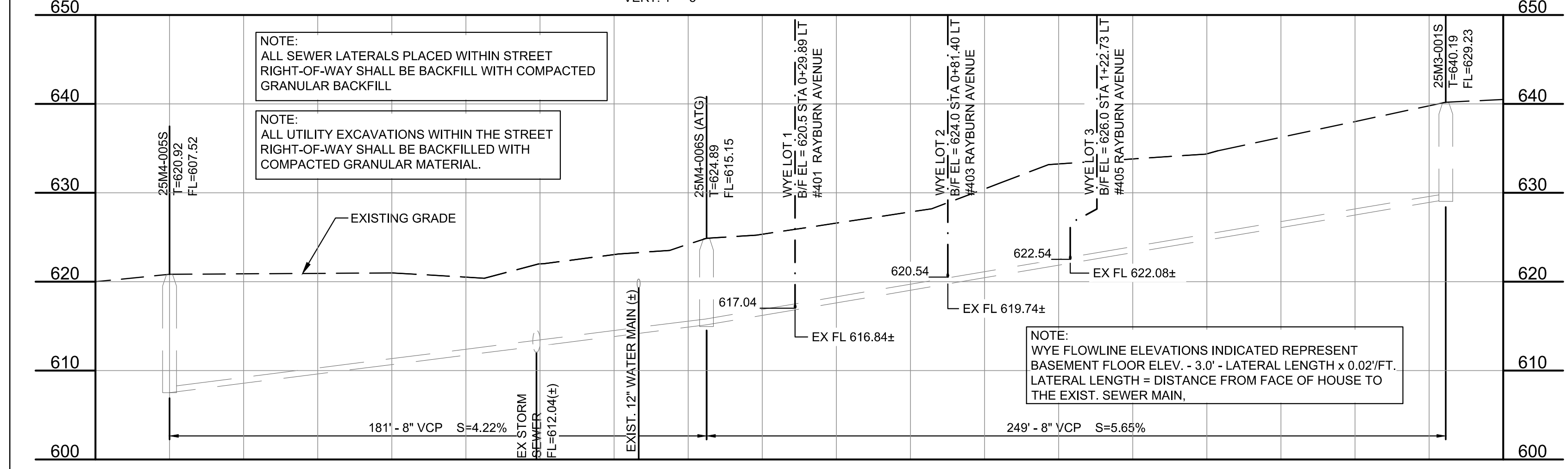
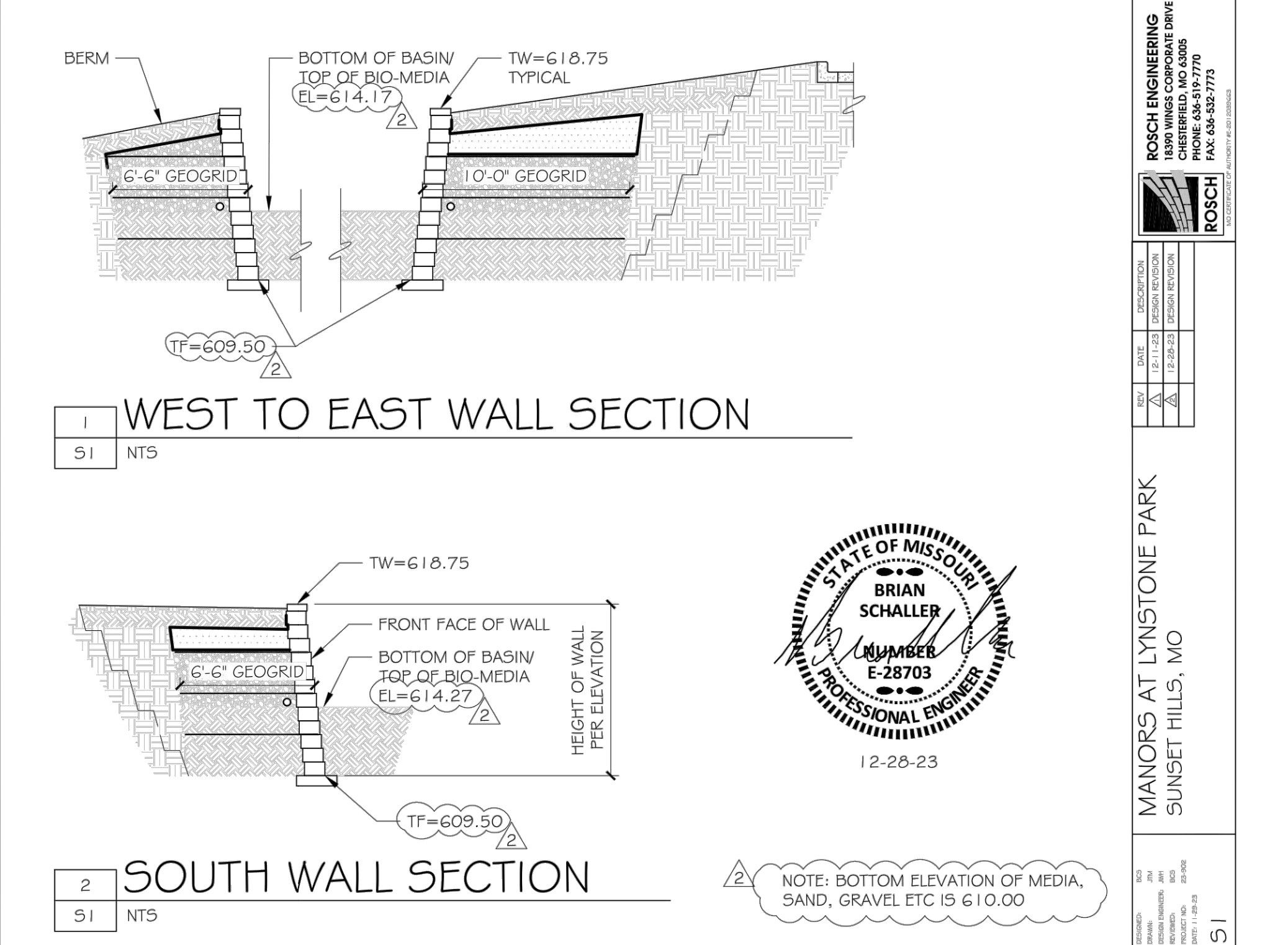
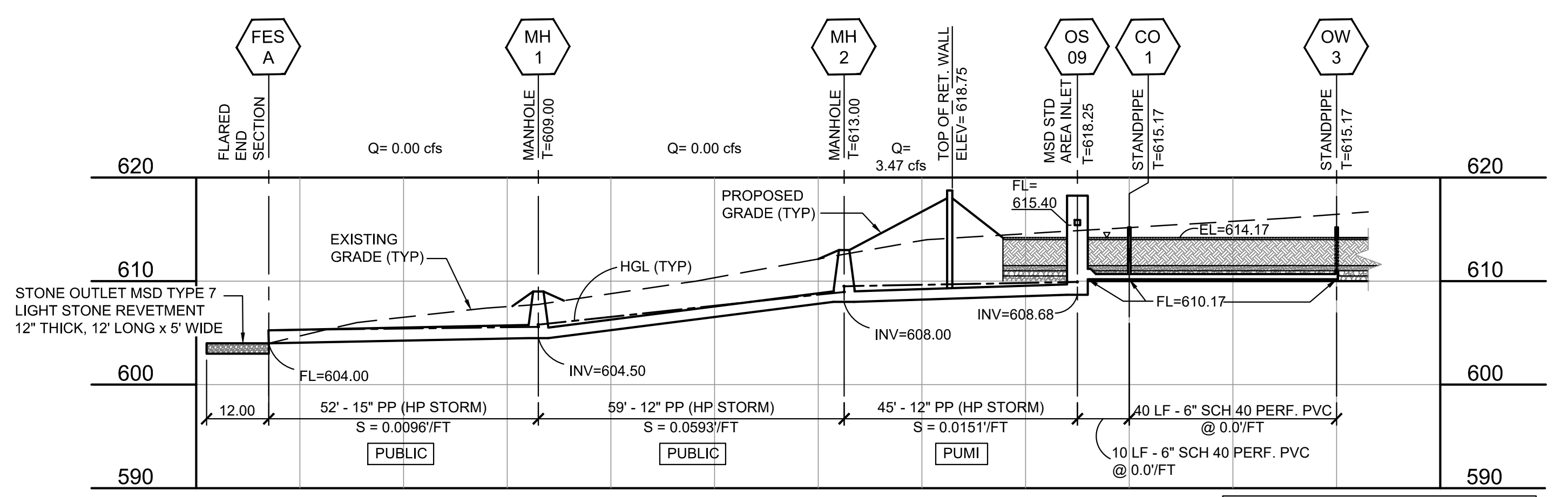
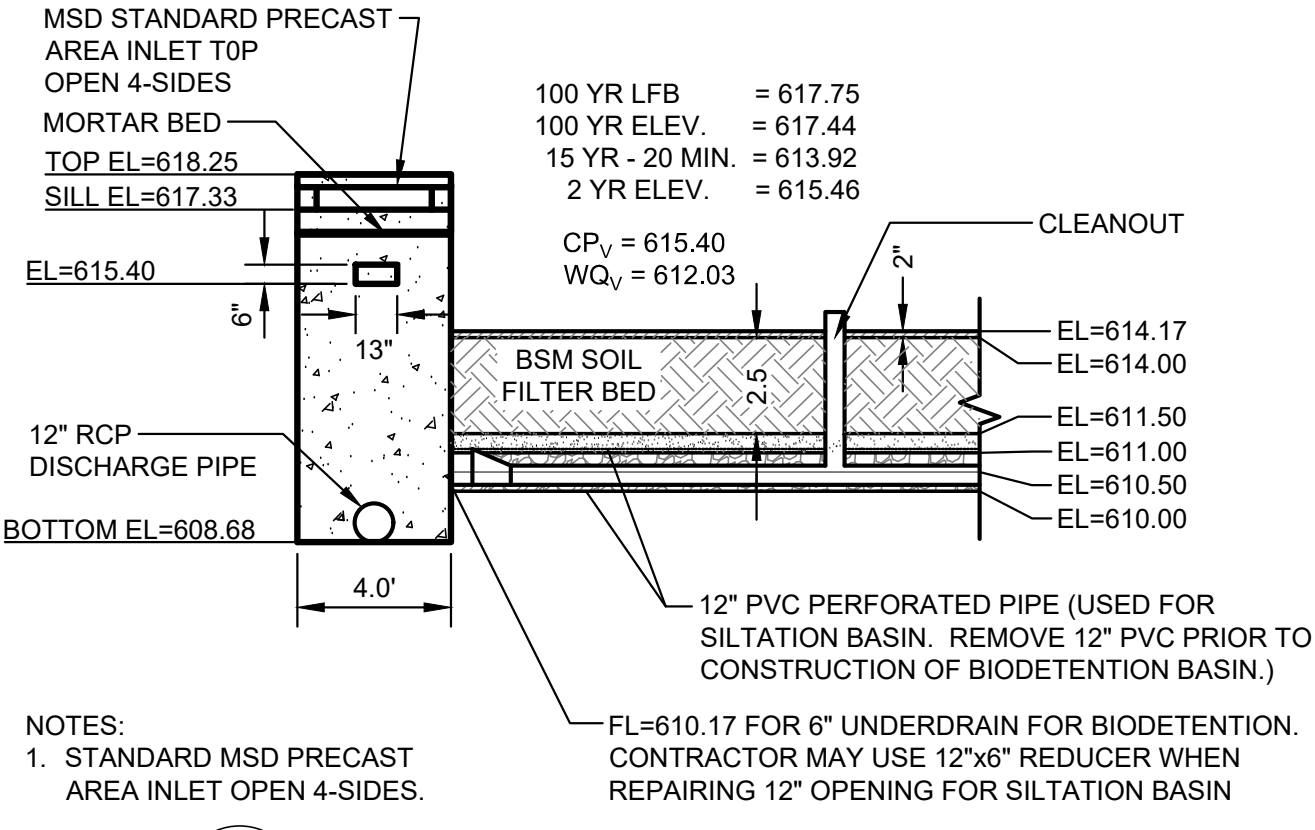
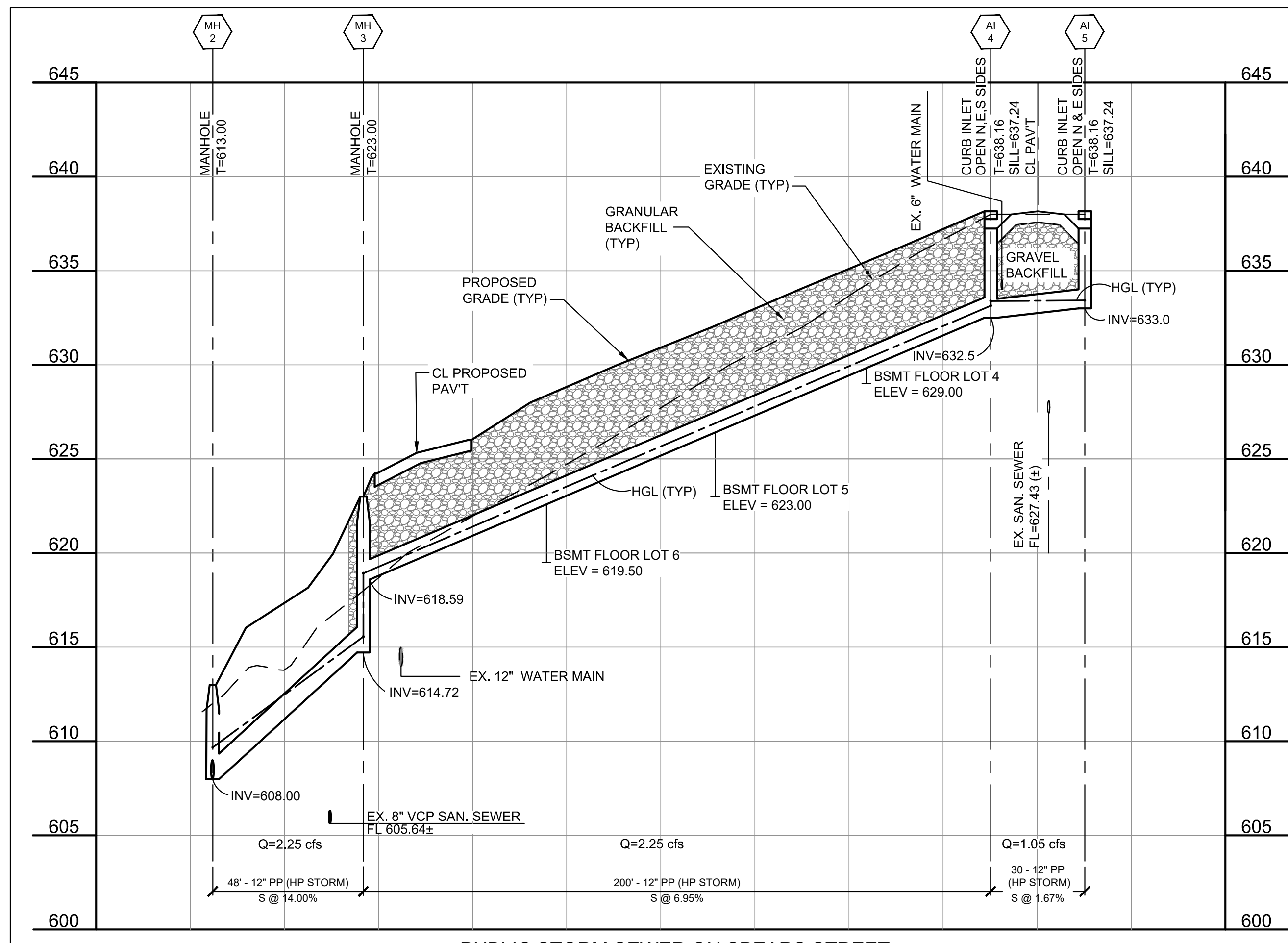
**SITE DEVELOPMENT ENGINEERING, INC.**  
PLANNING • CONSULTING • CIVIL ENGINEERING

**Manors at Lynstone Park**

DATE: 10/10/23 JOB NO.: 222-205 DRAWN BY: DWD  
CHECKED BY: SDR SCALE: As Shown

**GRADING & UTILITY PLAN**

REV.: 01/03/24 MSD REVIEW 02/20/24 MSD REVIEW SHEET: C4



Line No.	Line ID	Intr Q (cfs)	Line Length (ft)	Flow Rate (cfs)	Line Size (in)	Line Slope (%)	Vel Ave (ft/s)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim Elev Up (ft)	Gnd/Rim Elev Dn (ft)	HGL Up (ft)	HGL Dn (ft)	n-value	Defl. Angle (Deg)	Capacity Full (cfs)	Energy Loss (ft)	Free Board (ft)
1	FES-A to MH-1	0.00	52.00	5.72	15	0.96	4.87	604.50	604.00	609.00	605.25	605.58	605.25	0.013	0.0	6.33	0.392	3.20
2	MH-1 to MH-2	0.00	59.00	5.72	12	5.93	7.36	608.00	604.50	613.00	609.00	608.95	605.80	0.013	30.0	8.67	1.420	3.50
3	MH-2 to MH-3	3.47	45.00	3.47	12	1.51	4.42	608.68	608.00	616.50	613.00	609.93	609.50	0.013	90.0	4.38	0.427	6.57
4	MH-3 to MH-4	0.00	48.00	2.25	12	14.00	3.57	614.72	608.00	623.00	613.00	615.36	609.68	0.013	25.0	13.32	0.274	4.07
5	MH-4 to AI-4	1.20	200.00	2.25	12	6.95	7.00	632.50	618.59	638.16	623.00	633.14	618.93	0.013	-25.0	9.39	7.538	4.77
6	AI-4 to AI-5	1.05	30.00	1.05	12	1.67	2.31	633.00	632.50	638.16	638.16	633.43	633.39	0.013	-90.0	4.60	0.097	4.73
7	EP-6 to DCI-7	0.87	15.00	2.94	12	1.00	3.74	614.32	614.17	620.24	615.32	616.59	616.49	0.013	0.0	3.56	0.102	2.79
8	DCI-7 to DCI-8	2.07	30.00	2.07	12	1.00	4.39	617.20	616.90	620.24	620.24	617.81	617.45	0.013	0.0	3.56	0.254	2.43

22MSD-00313 HT#8369 MSD BASE MAP NO. 25M

PROJECT SITE ADDRESS / LOCATION: SUNSET HILLS

**SDE** SITE DEVELOPMENT ENGINEERING, INC.  
PLANNING • CONSULTING • CIVIL ENGINEERING

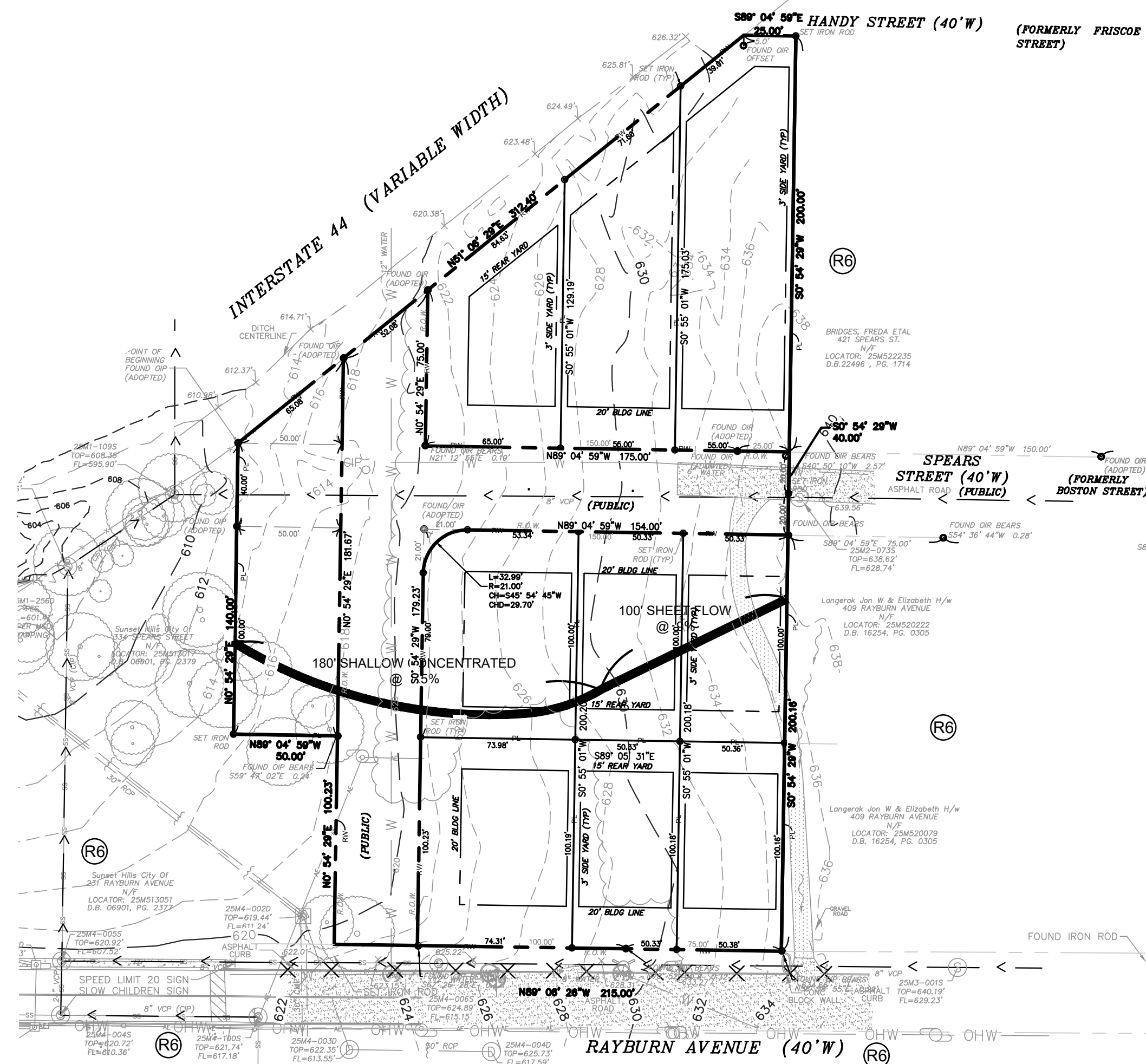
**Manors at Lynstone Park**

DATE: 10/10/23 JOB NO.: 222-205 DRAWN BY: DWD  
CHECKED BY: SDR SCALE: As Shown

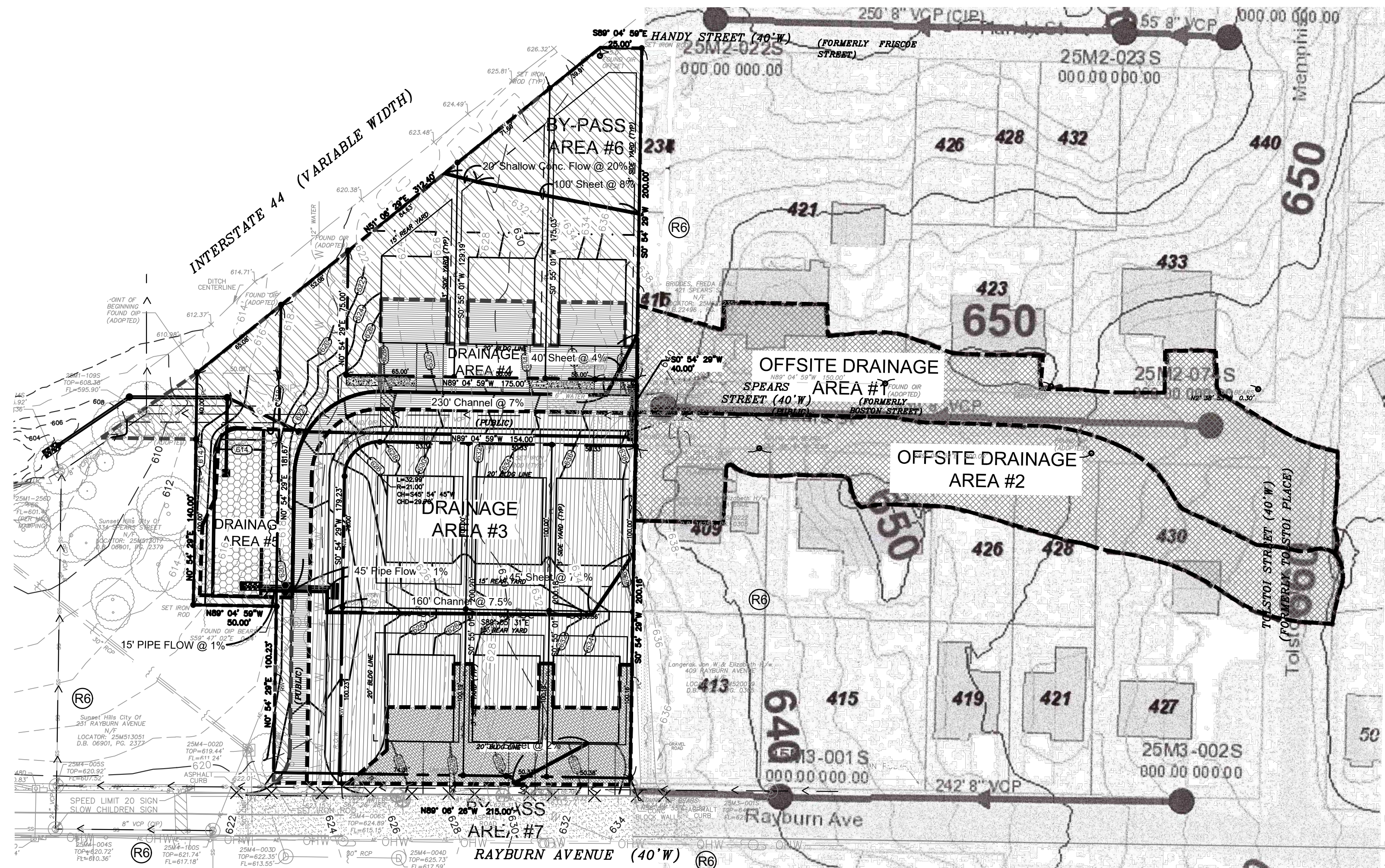
**PROFILE & DETAIL SHEET**

REV: 01/03/24 MSD REVIEW 02/20/24 MSD REVIEW  
01/11/24 SLC SWPPP 02/01/24 Agency Review

SHEET: **C5**



EXISTING DRAINAGE PATTERN AREA MAP  
SCALE: 1" = 50'



PROPOSED DRAINAGE PATTERN MAP & FLOW PATHS  
SCALE: 1" = 50'

**Project Stormwater Differential**

Existing Conditions: Area = 87,648 sf = 2.01 acres  
Existing Impervious area = 0.02 ac.  
Existing Pervious area = 1.99 acres

Proposed Conditions: Area = 87,648 sf = 2.01 acres  
Proposed Impervious area = 0.80 ac.  
Existing Pervious area = 1.21 acres

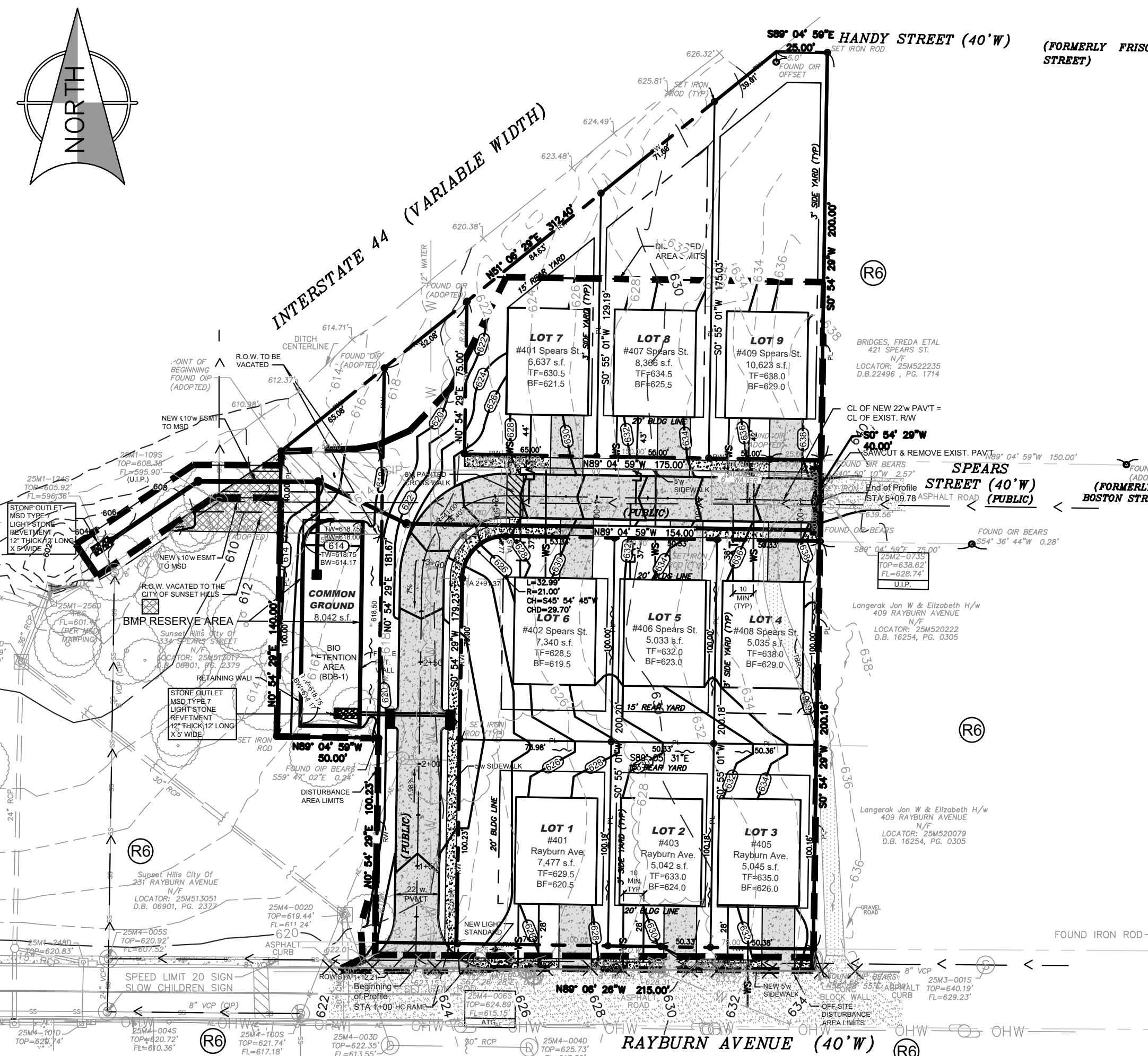
**Differential Runoff: Area = 87,648 sf = 2.01 acres**

Existing Runoff:  
Impervious area = 0.02 ac. x 3.54 cfs/ac = 0.07 cfs  
Pervious area = 1.99 ac. x 1.70 cfs/ac = 3.38 cfs  
Total existing runoff = 3.45 cfs

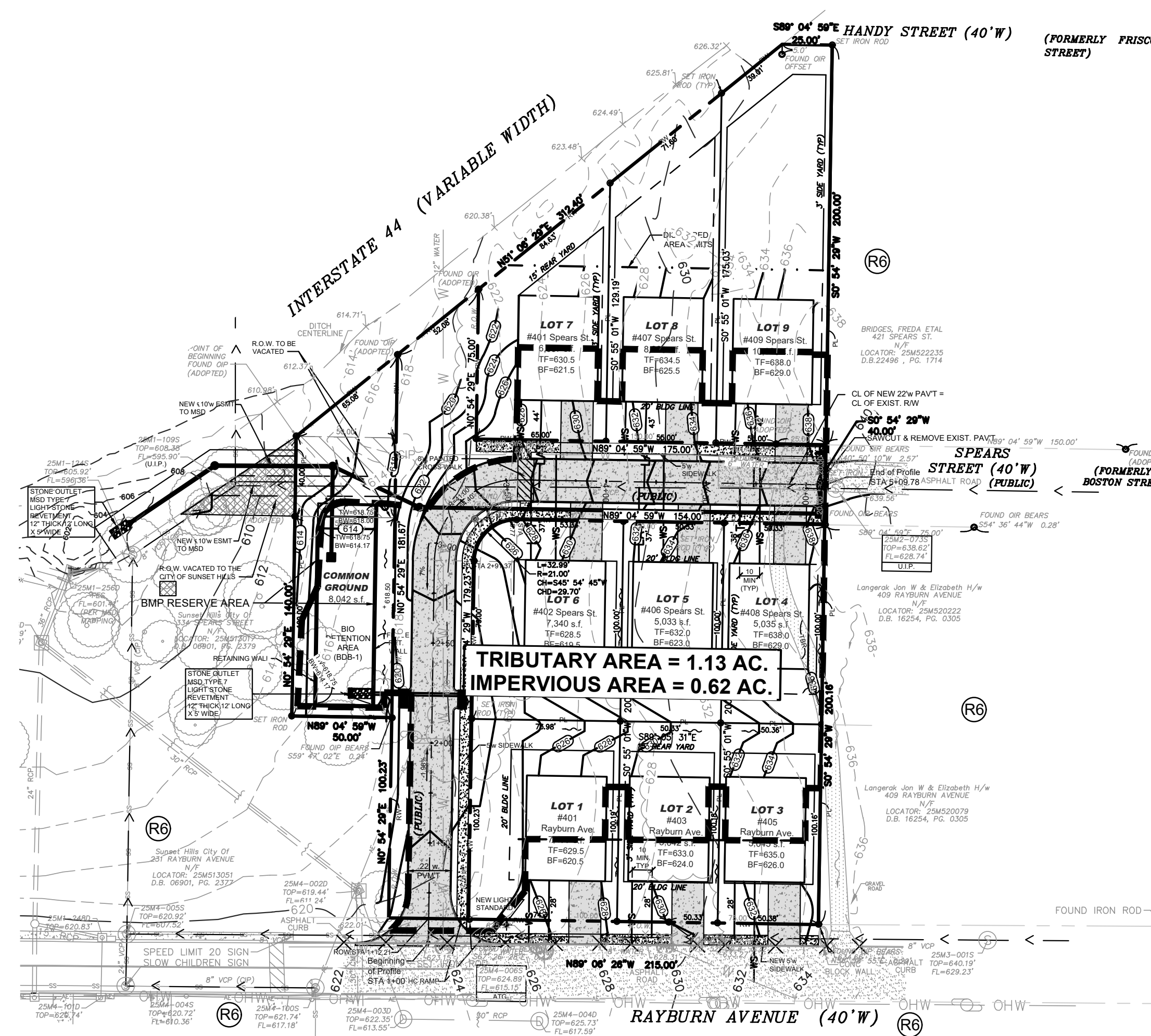
**Proposed Runoff:**

Impervious area = 0.80 ac. x 3.54 cfs/ac = 2.83 cfs  
Pervious area = 1.21 ac. x 1.70 cfs/ac = 2.06 cfs  
Total proposed runoff = 4.89 cfs

Differential Runoff: 4.89 cfs - 3.45 cfs = 1.44 cfs



DISTURBANCE AREA MAP  
SCALE: 1" = 50'



WATER QUALITY BMP DRAINAGE AREA MAP  
SCALE: 1" = 50'

**Drainage Areas with Runoff**

**Offsite Drainage Area #1**  
Pervious Area = 0.27 ac. x 1.70 cfs/ac = 0.46 cfs  
Impervious Area = 0.21 ac x 3.54 cfs/ac = 0.74 cfs  
0.48 ac 1.20 cfs

**Offsite Drainage Area #2**  
Pervious Area = 0.37 ac. x 1.70 cfs/ac = 0.63 cfs  
Impervious Area = 0.12 ac x 3.54 cfs/ac = 0.42 cfs  
0.49 ac 1.05 cfs

**Drainage Area #4 (to DCI-7)**  
Pervious Area = 0.05 ac. x 1.70 cfs/ac = 0.09 cfs  
Impervious Area = 0.22 ac x 3.54 cfs/ac = 0.78 cfs  
0.27 ac 0.87 cfs

**Drainage Area #3 (to DCI-8)**  
Pervious Area = 0.39 ac. x 1.70 cfs/ac = 0.65 cfs  
Impervious Area = 0.40 ac x 3.54 cfs/ac = 1.42 cfs  
0.79 ac 2.07 cfs

**Drainage Area #5 (to nested bioretention basin)**  
Pervious Area = 0.07 ac. x 1.70 cfs/ac = 0.12 cfs  
Impervious Area = 0.00 ac x 3.54 cfs/ac = 0.00 cfs  
0.07 ac 0.12 cfs

**Drainage Area #6 (bypass)**  
Pervious Area = 0.64 ac. x 1.70 cfs/ac = 1.09 cfs  
Impervious Area = 0.07 ac x 3.54 cfs/ac = 0.25 cfs  
0.71 ac 1.34 cfs

**Drainage Area #7 (bypass)**  
Pervious Area = 0.06 ac. x 1.70 cfs/ac = 0.10 cfs  
Impervious Area = 0.11 ac x 3.54 cfs/ac = 0.39 cfs  
0.17 ac 0.49 cfs

**NOTE : THIS PLAN IS FOR THE CALCULATION OF DRAINAGE AREAS ONLY, AND IS NOT TO BE USED AS A CONSTRUCTION PLAN!!!!**

22MSD-00313 HT#8369 MSD BASE MAP NO. 25M

PROJECT SITE ADDRESS / LOCATION: SUNSET HILLS

SITE DEVELOPMENT ENGINEERING, INC.  
CORPORATE CERTIFICATE OF AUTHORITY  
No. 012028

**SDE** SITE DEVELOPMENT ENGINEERING, INC.  
PLANNING • CONSULTING • CIVIL ENGINEERING

3512 Yaeger  
Crossing Court  
St. Louis, Missouri  
63129  
314-822-4800  
sdr@sde-civil.com

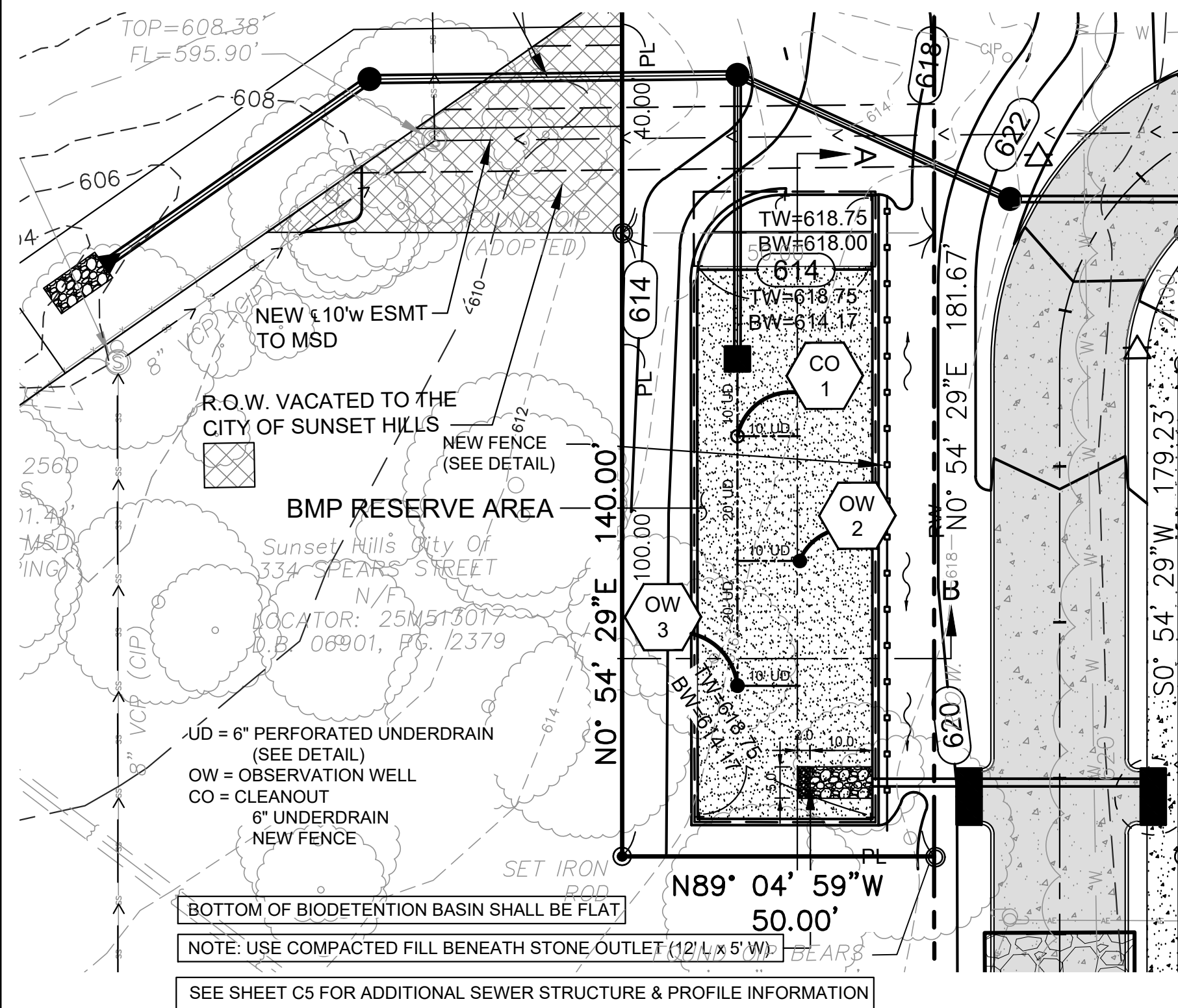
**Manors at Lynstone Park**

DATE: 10/10/23 JOB NO.: 222-205 DRAWN BY: DWD  
CHECKED BY: SDR SCALE: As Shown

**Drainage Area Maps**

REV.: 01/03/24 MSD REVIEW 02/29/24 MSD REVIEW 01/11/24 SLC SWPPP 02/01/24 Agency Review SHEET: **C6**

Steven D. Rush  
REGISTERED PROFESSIONAL ENGINEER  
No. E-20332  
Date: Steven D. Rush  
Civil Engineer  
License No. E-20332

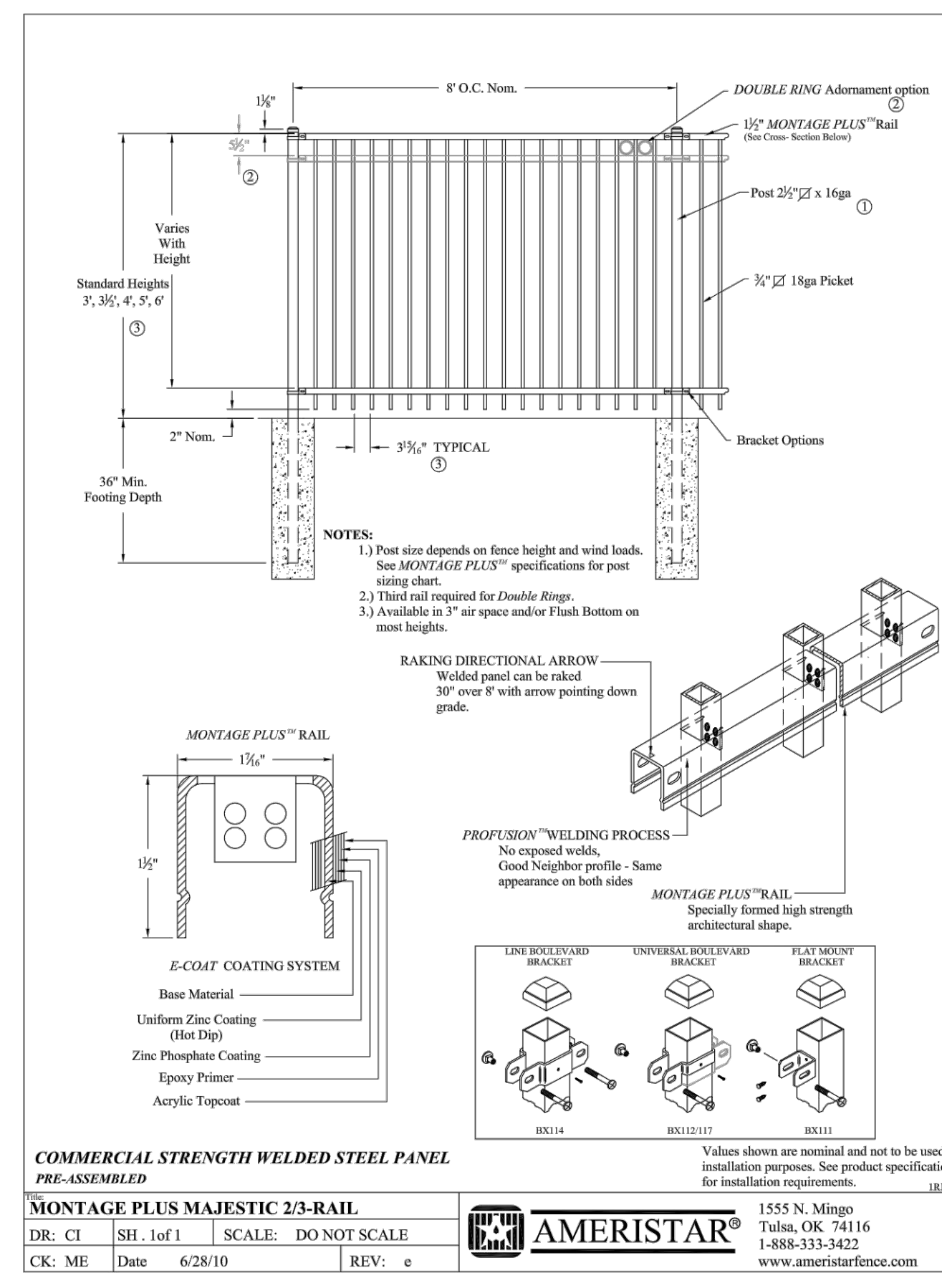


INFILTRATION TESTING - FOR WHEN UTILIZING ONSITE SOILS AND/OR MIXING ONSITE FOR PLANTING SOIL:

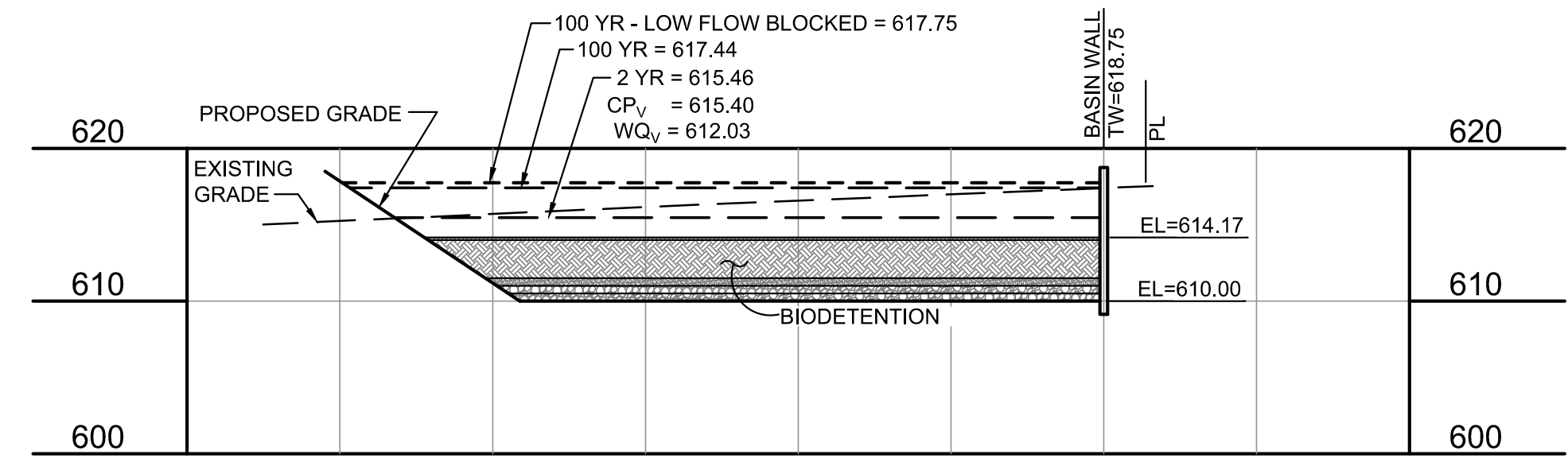
THE IN-PLACE PERMEABILITY OF THE PLANTING SOIL SHALL BE 2.0 TO 3.5 FT/DAY, AND VERIFIED BY AND INFILTRATION TEST PERFORMED PER THE MARYLAND STORMWATER MANUAL, APPENDIX D.1. "INFILTRATION TESTING REQUIREMENTS (FIELD TESTING REQUIRED)". A MINIMUM OF ONE PERCOLATION TEST SHALL BE PERFORMED PER FACILITY. THE MSD FIELD INSPECTOR SHALL BE ALLOWED TO SELECT THE LOCATION OF PERCOLATION TESTS. THE MSD FIELD INSPECTOR SHALL BE PROVIDED A COPY OF ALL TEST RESULTS, SIGNED AND SEALED BY A MISSOURI PROFESSIONAL ENGINEER. TEST RESULTS SHALL REPORT IN UNITS OF FT/DAY. RESULTS SHALL DEMONSTRATE ACCEPTABLE PERMEABILITY PRIOR TO CONSTRUCTION APPROVAL. NOTE THESE TESTS ARE NOT REQUIRED IF UTILIZING PREMIXED PLANTING SOIL SUPPLIED BY A LOCAL MSD APPROVED SOILS SUPPLIER.

SHOP DRAWINGS FOR BMPs:

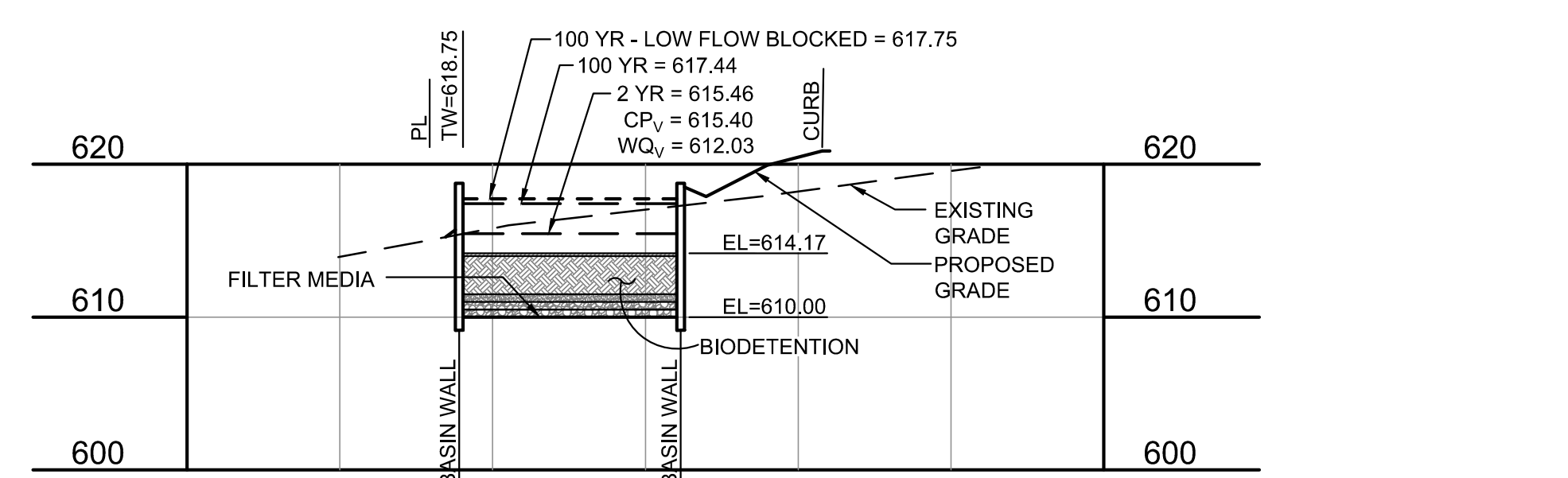
MSD SHOP DRAWING SUBMITTAL REQUIRED FOR BMP AND ITS COMPONENTS PRIOR TO CONSTRUCTION.  
MSD CONTACT: PLEASE CONTACT THE DISTRICT'S CONSTRUCTION MANAGEMENT DIVISION AT (314) 335-2072 FOR QUESTIONS.



FENCE DETAIL  
NOT TO SCALE



SECTION A-A  
SCALE: HORZ. 1" = 20'  
VERT. 1" = 10'



SECTION B-B  
SCALE: HORZ. 1" = 20'  
VERT. 1" = 10'

BIODETENTION BASIN (BDB-1)  
SCALE: 1" = 20'

NOTE:  
BOTTOM OF BIODETENTION BASIN SHALL BE FLAT.

UD = 6" PERFORATED UNDERDRAIN (SEE DETAIL)  
OW = OBSERVATION WELL  
CO = CLEANOUT  
--- = 6" UNDERDRAIN

BIO-DETENTION BASIN

Drainage Area: 1.13 ac. (Drainage areas 3,4 and 5)  
Roof and paved area = 0.62 acres

Water Quality: WQv

$WQv = P \cdot Rv \cdot A$   $P = 1.14"$   
 $Rv = 0.05 + 0.009(I)$   $I = 0.62ac/1.13 ac = .55$   $A = 1.13 ac$   
 $Rv = 0.05 + (0.009)(.55) = 0.05 + 0.50 = 0.55$

$WQv = (1.14)(0.55)(1.13 ac.) = 0.059 ac.ft = 2,565 cu.ft.$   
 $WQv = 2,565 cu.ft.$

Total WQv required = 2,565 cu. ft. x 0.75 = 1,924 cu. ft.  
Total WQv provided = 3,895 cu. ft. \*

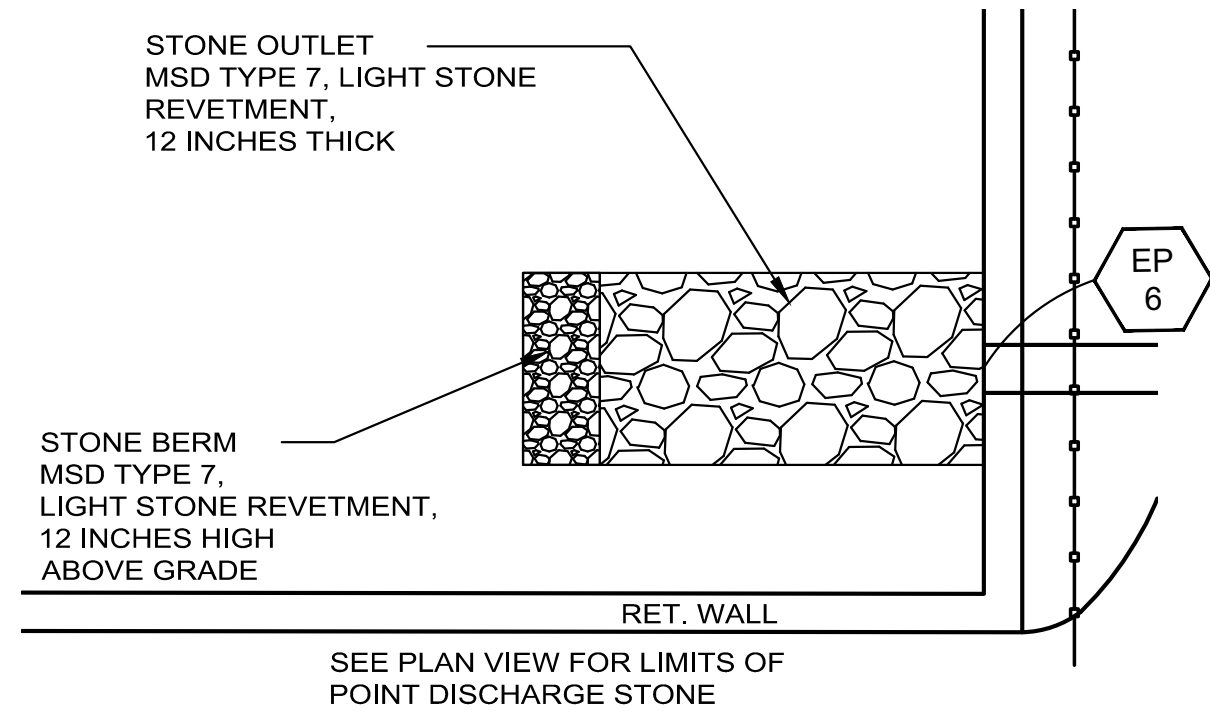
\* Volume does not include area under stone outlet EP-6

NOTICE TO CONTRACTOR:  
FAILURE OF THE CONTRACTOR TO FOLLOW THE PROPER CONSTRUCTION SEQUENCING COULD RESULT IN REJECTION OF THE COMPLETED BIODETENTION BASIN(S) (PERMANENT BMP) BY THE MSD DEDICATION INSPECTOR. REJECTION OF THE COMPLETED BMP BY THE MSD DEDICATION INSPECTOR COULD REQUIRE PARTIAL OR COMPLETE REMOVAL AND RECONSTRUCTION OF THE BIODETENTION BASIN(S) (PERMANENT BMP) AT THE CONTRACTOR'S SOLE EXPENSE.

CONSTRUCTION OF THE BIODETENTION BASIN COMPONENTS; IE: EXCAVATION AND REMOVAL OF MATERIAL FOR FILTER BEDS, INSTALLATION OF GEOTEXTILE, FILTER BED BASE LAYER, PERFORATED UNDERDRAIN PIPING, FILTER BED UPPER LAYERS AND FINAL LANDSCAPING SHALL BE DELAYED UNTIL SUCH TIME AS ALL UPSTREAM AREAS TRIBUTARY TO THEM HAVE BEEN CONSTRUCTED AND PERMANENT SOIL STABILIZATION HAS BEEN ACHIEVED (FULLY STABILIZED).

PRIOR TO BEGINNING CONSTRUCTION OF THE BIODETENTION BASINS, THE TEMPORARY BMP'S ESTABLISHED AS PART OF THE SWPPP SHALL BE TAKEN OFFLINE. SEDIMENT TRAPS CLEANED OUT AND BIODETENTION BASIN DESIGN GRADES RE-ESTABLISHED AS NECESSARY.

CONTRACTOR IS ADVISED TO CONSULT WITH THE MSD DEDICATION INSPECTOR PRIOR TO COMMENCING WITH CONSTRUCTION OF THE BIODETENTION BASIN AND FOREBAY AREAS.

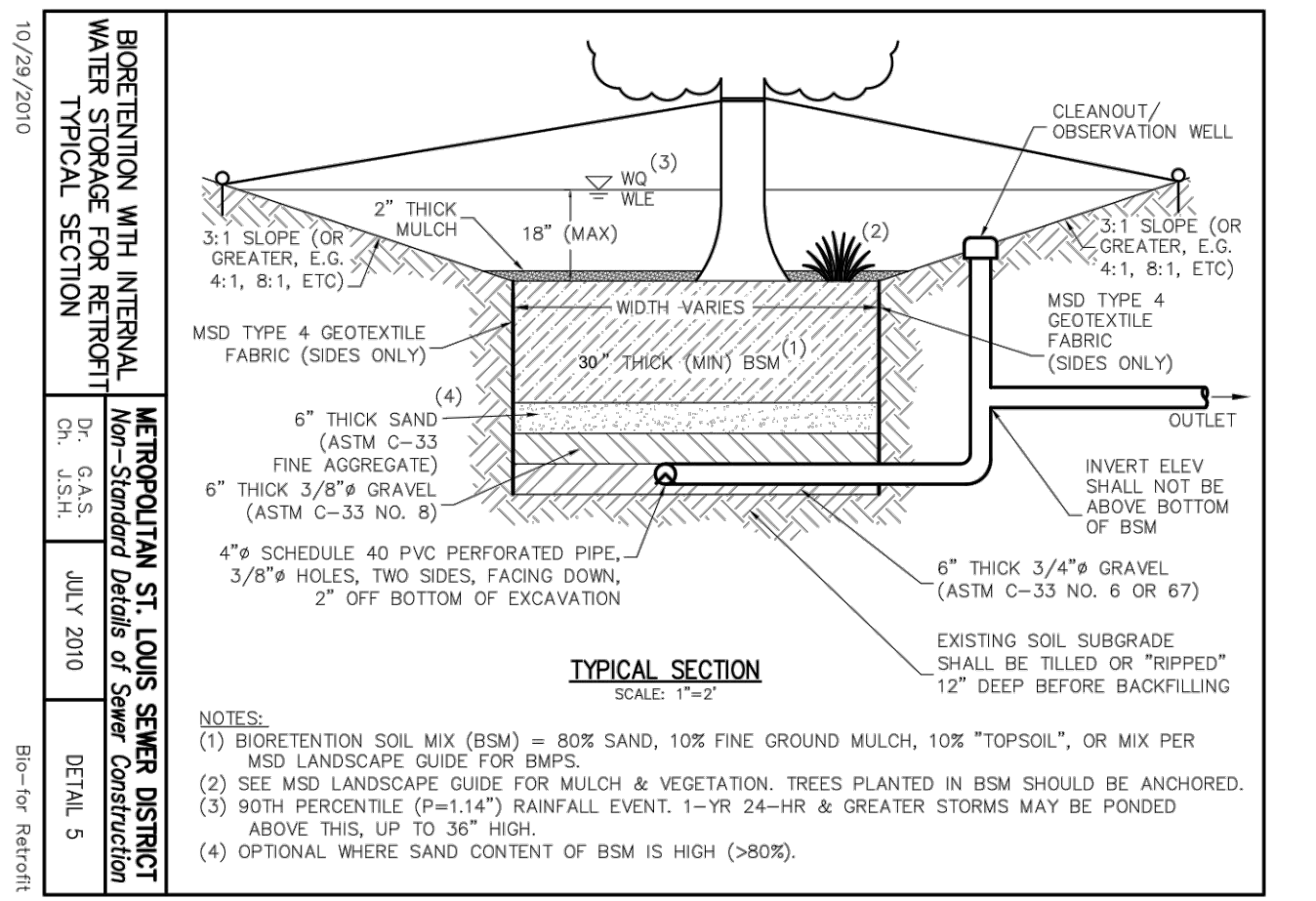


POINT DISCHARGE STONE  
SCALE: 1" = 5'-0"

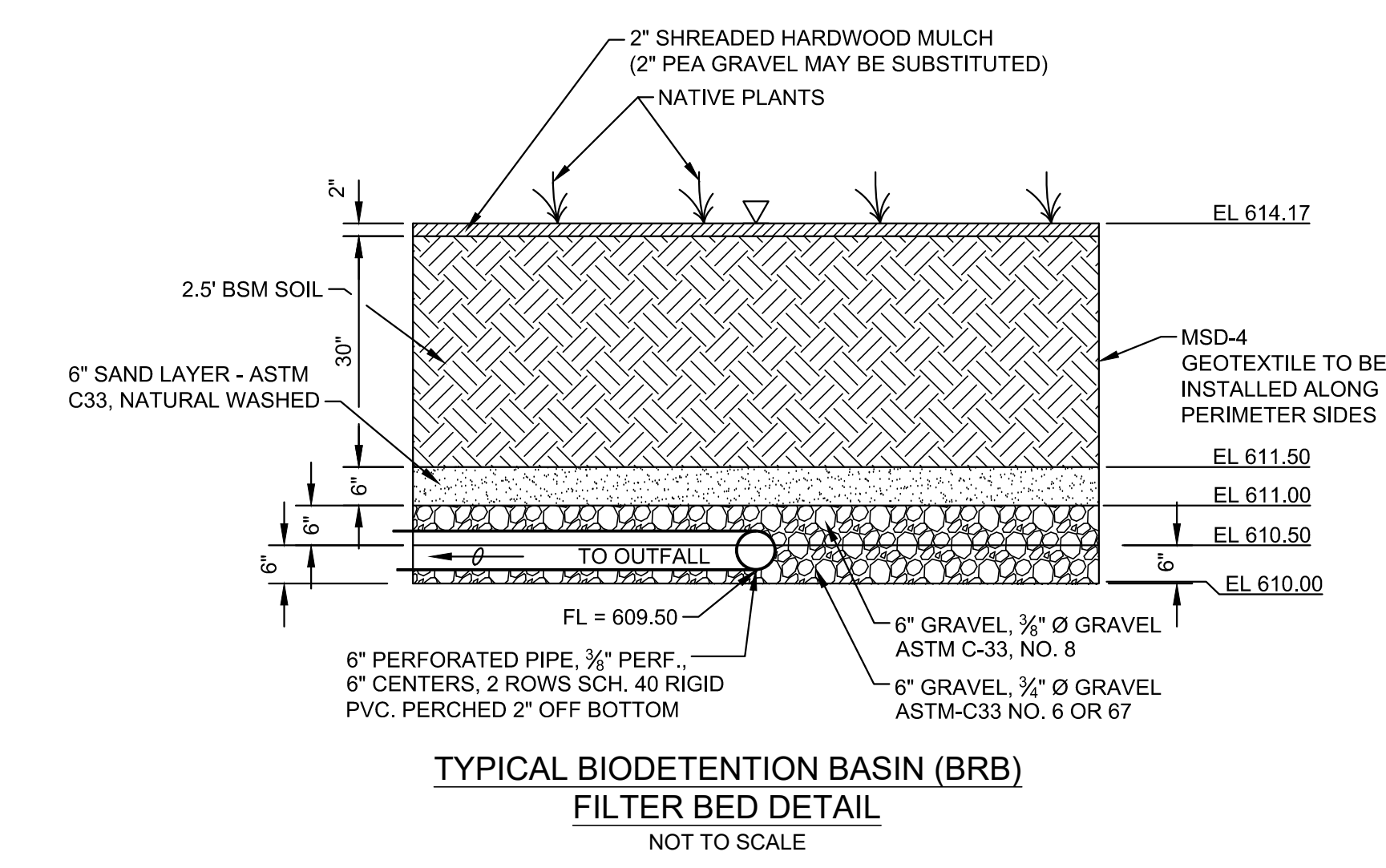
The planting soil should be a sandy loam or loamy sand (should contain a minimum of 60 percent sand, by volume). The clay content for these soils should be less than 10 percent by volume. A saturated hydraulic conductivity of at least 1.0 feet per day (0.5 inches per hour) is required. (Without post-construction 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, nutcase 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 presented in the following table.

Table 1: Planting Soil Characteristics. Source: Maryland Stormwater Manual

Parameter	Value
pH range	5.2 to 8.00
Organic matter	1.5 to 5.0%
Magnesium	35 lbs. per acre, minimum
Phosphorus (P <sub>2</sub> O <sub>5</sub> )	75 lbs. per acre, minimum
Potassium (K <sub>2</sub> O)	85 lbs. per acre, minimum
Soluble salts	≤ 500 ppm



THIS SHEET IS NOT FOR ST. LOUIS COUNTY APPROVAL



22MSD-00313 HT#8369 MSD BASE MAP NO. 25M

PROJECT SITE ADDRESS / LOCATION: SUNSET HILLS

SITE DEVELOPMENT ENGINEERING, INC.  
CORPORATE CERTIFICATE OF AUTHORITY No. 021208

STEVEN D. RUSH  
REGISTERED PROFESSIONAL ENGINEER  
E-20332  
02/29/24

3512 Yaeger  
Crossing Court  
St. Louis, Missouri  
63129  
314-822-4800  
sdr@sde-civil.com

SDE  
SITE DEVELOPMENT ENGINEERING, INC.  
PLANNING • CONSULTING • CIVIL ENGINEERING

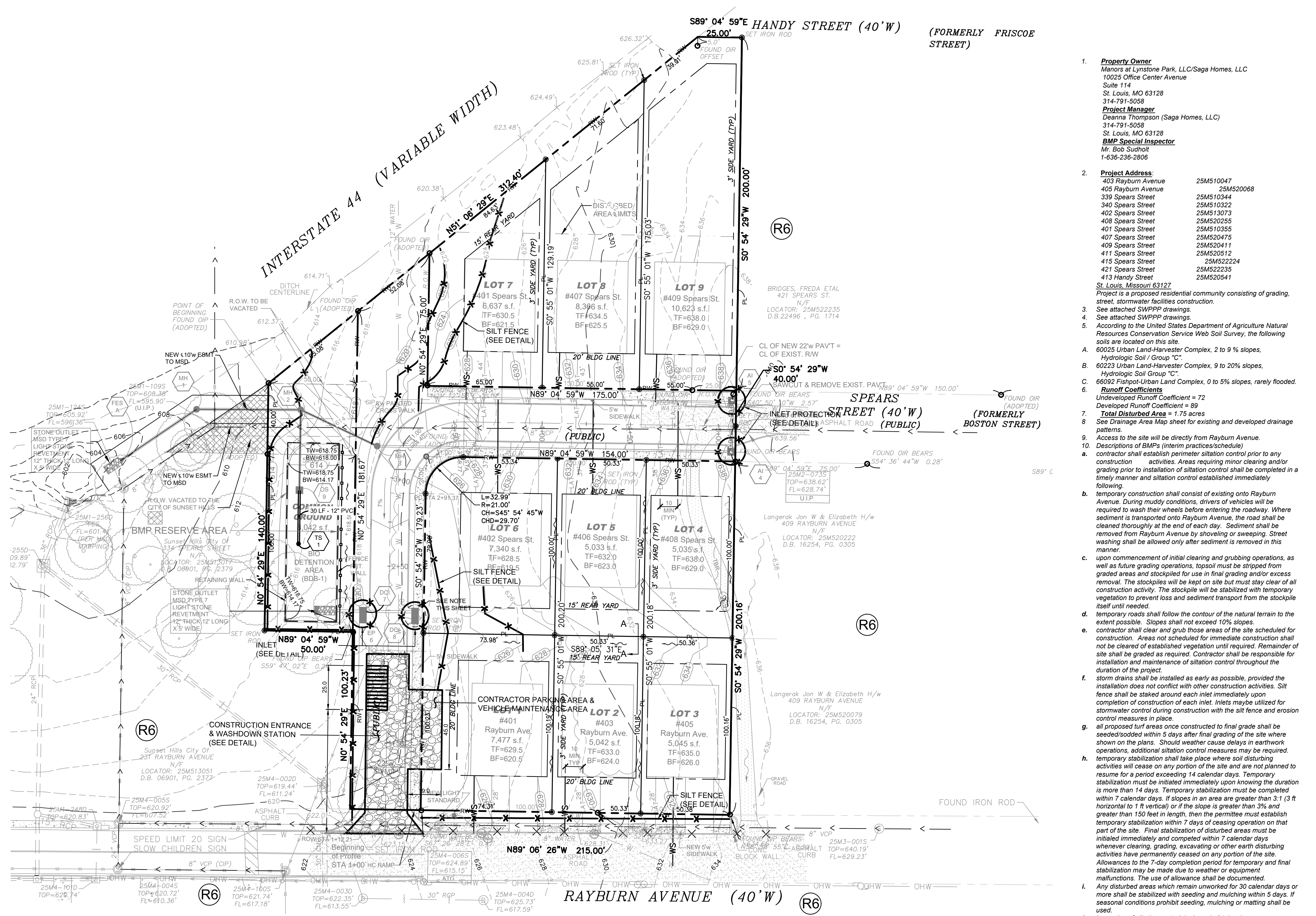
Manors at Lynstone Park

DATE: 10/10/23  
CHECKED BY: SDR  
JOB NO.: 222-205  
DRAWN BY: DWD  
SCALE: As Shown

Bioretention Basin

REV: 01/03/24 MSD REVIEW 02/29/24 MSD REVIEW  
01/03/24 MSD SUBMITTAL 01/11/24 SLC SWPPP 02/01/24 Agency Review

SHEET: C7



**LEGEND**

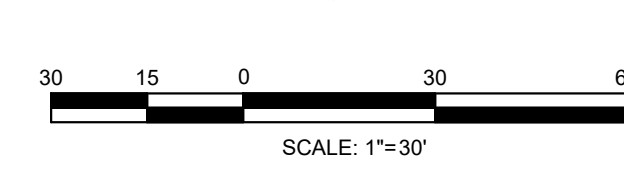
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED GROUND ELEVATION
- TF TOP OF FOUNDATION
- TW TOP OF WALL
- BW BOTTOM OF WALL
- EX EXISTING
- FF FINISHED FLOOR
- TW TOP OF WALL
- TRB TO BE REMOVED
- C.O. SANITARY CLEANOUT
- DND DO NOT DISTURB
- PROPOSED STORM INLET
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED FIRE HYDRANT
- NEW CONCRETE
- PROPOSED RETAINING WALL
- PROPOSED WATER
- PROPOSED STORM
- PROPOSED SANITARY
- PROPERTY LINE
- RIGHT-OF-WAY

**Table of BMP Quantities**

BMP Description	Temporary	Permanent	Quantity
Construction Entrance	X		1 ea.
Wash Down Station	X		1 ea.
Inlet Protection	X		4 ea.
Siltation Basin	X		1 ea.
Silt Fence	X		790 l.f.
Sod (BMP Reserve Area)	X	X	250 s.f.

**ESTIMATED CONSTRUCTION SCHEDULE**

Silt Fence: 3 days  
 Rough grading/biodetention basin: 10 days  
 Site Utilities: 30 days  
 Backfill/finish grading: 5 days  
 Street sub base: 5 days  
 Street paving: 21 days  
 Backfill street: 7 days  
 Inspections: 3 days  
 Estimated Start Date: May 1, 2024



NOTE:  
 1. THERE ARE NO KNOWN SINKHOLES ON THIS SITE.  
 2. THERE ARE NO EXISTING OR PROPOSED BATTLE PLANTS ON SITE.  
 3. LOCATE STATE AND COUNTY LAND DISTURBANCE PERMITS, BMP INSPECTION REPORTS, ETC. WITH THE SWPPP.

- Property Owner**  
Manors at Lynstone Park, LLC/Saga Homes, LLC  
10025 Office Center Avenue  
Suite 114  
St. Louis, MO 63128  
314-791-5058  
**Project Manager**  
Deanna Thompson (Saga Homes, LLC)  
314-791-5058  
St. Louis, MO 63128  
**BMP Special Inspector**  
Mr. Bob Sudhof  
1-636-236-2806
- Project Address:**  
403 Rayburn Avenue 25M510047  
405 Rayburn Avenue 25M510344  
339 Spears Street 25M510322  
340 Spears Street 25M510322  
402 Spears Street 25M513073  
408 Spears Street 25M520255  
401 Spears Street 25M510355  
407 Spears Street 25M520475  
409 Spears Street 25M520411  
411 Spears Street 25M520512  
415 Spears Street 25M522224  
421 Spears Street 25M522235  
413 Handy Street 25M520541  
St. Louis, Missouri 63127  
Project is a proposed residential community consisting of grading, street, stormwater facilities construction.
- See attached SWPPP drawings.
- See attached SWPPP drawings.
- According to the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey, the following soils are located on this site:  
A. 60025 Urban Land-Harvester Complex, 2 to 9% slopes, Hydrologic Soil Group "C".  
B. 60223 Urban Land-Harvester Complex, 9 to 20% slopes, Hydrologic Soil Group "C".  
C. 66092 Fishpond-Urban Land Complex, 0 to 5% slopes, rarely flooded.
- Underdeveloped Runoff Coefficient = 72  
Developed Runoff Coefficient = 89  
Total Disturbed Area = 1.75 acres
- See Drainage Area Map sheet for existing and developed drainage patterns.
- Access to the site will be directly from Rayburn Avenue.
- Descriptions of BMPs (interim practices/schedule)  
a. contractor shall establish perimeter siltation control prior to any construction activities. Areas requiring minor clearing and/or grading prior to installation of siltation control shall be completed in a timely manner and siltation control established immediately following.  
b. temporary construction shall consist of existing onto Rayburn Avenue. During muddy conditions, drivers of vehicles will be required to wash their wheels before entering the roadway. Where sediment is transported onto Rayburn Avenue, the road shall be cleaned thoroughly at the end of each day. Sediment shall be removed from Rayburn Avenue by shoveling or sweeping. Street washing shall be allowed only after sediment is removed in this manner.  
c. upon commencement of initial clearing and grubbing operations, as well as future grading operations, topsoil must be stripped from graded areas and stockpiled for use in final grading and/or excess removal. The stockpiles will be kept on site but must stay clear of all construction activity. The stockpile will be stabilized with temporary vegetation to prevent loss and sediment transport from the stockpile itself until needed.  
d. temporary roads shall follow the contour of the natural terrain to the extent possible. Slopes shall not exceed 10% slopes.  
e. contractor shall clear and grub those areas of the site scheduled for construction. Areas not scheduled for immediate construction shall not be cleared of established vegetation until required. Remainder of site shall be graded as required. Contractor shall be responsible for installation and maintenance of siltation control throughout the duration of the project.  
f. all proposed turf areas once constructed to final grade shall be seeded/sodded within 5 days after final grading of the site where shown on the plans. Should weather cause delays in earthwork operations, additional siltation control measures may be required. temporary stabilization shall take place where soil disturbing activities will cease on any portion of the site and are not planned to resume for a period exceeding 14 calendar days. Temporary stabilization must be initiated immediately upon knowing the duration is more than 14 days. Temporary stabilization must be completed within 7 calendar days. If slopes in an area are greater than 3:1 (3 ft horizontal to 1 ft vertical) or if the slope is greater than 2% and greater than 150 feet in length, then the permittee must establish temporary stabilization within 7 days of ceasing operation on that part of the site. Final stabilization of disturbed areas must be initiated immediately and completed within 7 calendar days whenever clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site. Allowances to the 7-day completion period for temporary and final stabilization may be made due to weather or equipment malfunctions. The use of allowance shall be documented.  
g. Any disturbed areas which remain unworked for 30 calendar days or more shall be stabilized with seeding and mulching within 5 days. If seasonal conditions prohibit seeding, mulching or matting shall be used.  
h. Inspection of siltation control devices shall take place once every seven days and within 24 hours of any heavy rain event. Any siltation control in need of repair shall be repaired immediately, all grading operations are subject to the recommendations of the geotechnical engineering report if one has been prepared for this project.  
i. sedimentation controls shall only be removed after the site is completely stabilized, vegetation is well established and all pavement areas are installed.  
11. Description of BMPs to prevent potential pollutants (construction wastes, toxic or hazardous substances, petroleum products, pesticides, herbicides, site filler, sanitary wastes, etc.)  
a. solid non-hazardous construction wastes: dispose of in trash dumpsters or approved equivalent in a location approved by the owner. Potentially soluble or leachable solid waste shall be stored off the ground and in covered lead-proof containers. Solid waste shall be properly disposed of off-site on a regular basis.
- hazardous waste: hazardous waste shall be segregated from non-hazardous construction site debris. Liquid or semi-liquid hazardous waste shall be stored in appropriate containers (close drums or similar) and shall be kept under cover. Granular, soluble or leachable hazardous waste materials shall be stored off the ground and in covered lead-proof containers. The owner shall properly approve any hazardous waste storage area locations.  
c. hazardous waste shall be properly disposed of off-site on a regular basis by a reputable, licensed hazardous waste hauler.  
d. it is not the intent of this SWPPP to supersede or replace normal site assessment and attention to detail concerning hazardous materials. Significant spill and/or containment warrant an immediate response by trained professionals. Suspected job site contamination should immediately be reported to regulatory authorities and protective measures taken.  
e. fresh concrete waste and concrete equipment washdowns shall be contained and shall be stored away from drainage ditches, swales, and drainage structures. Where appropriate, containment berms shall be placed around waste storage areas.  
f. on-site fueling facilities are required to adhere to all applicable federal and state regulations concerning storage and dispensers.  
g. toilet facilities are available to serve the number of workers on-site.  
12. A nested biodetention basin is being provided as a permanent BMP.  
13. For location of off-street parking and washdown areas, see sheet SWPPP-1. No onsite relieving, asphalt plants or concrete plants or other similar temporary facilities are anticipated.  
14. The site is anticipated to be a balanced site. Should additional soil need to be removed, the adjacent City of Sunset Hills' Lynstone Park could use the additional material. No travel on City streets would be anticipated.  
15. The major land disturbance schedule see sheet SWPPP-1.  
16. The proposed land disturbance permit holder shall provide a qualified professional (special inspector) to conduct regular inspections of land disturbance sites, including air erosion and sediment and other pollutant control measures, outfall, and off-site receiving water in accordance with the inspection schedule outlined in the approved SWPPP.  
The special inspector shall be selected from St. Louis County's approved list of special inspectors. Regular inspections must be conducted and reported at least once per week. In addition, special inspections may be required at any time in response to a significant rainfall event that causes storm water runoff on site and as related to other special land disturbance concerns. NOTE: general contractor shall notify special inspector on the same day (during business hours) when stormwater runoff occurs on construction site. If stormwater occurs after business hours, the general contractor shall notify the special inspector on the next business day.  
All reports shall be submitted on the forms prescribed by the County, or City of Sunset Hills as applies. All inspections shall be documented in written form on the forms prescribed by the County, or City of Sunset Hills as applies. All reports shall be submitted to the Department(s) of Public Works or City of Sunset Hills at the time interval specified in permit. Permit-holder inspection reports must include the following minimum information:  
1. Inspector's name and signature  
2. Date of inspection  
3. Observations relative to the effectiveness of the BMPs.  
4. Actions taken or necessary to correct deficiencies.  
5. A listing of areas where land disturbance operations have permanently or temporarily stopped.  
The permit holder shall notify the site contractor(s) responsible for any deficiencies identified so that deficiencies can be corrected within seven calendar days of the weekly inspection report. If weather conditions make it impossible to copy the problem within seven calendar days, a detailed report of the problem (including pictures) shall be filed with the regular inspection reports. The purpose of the special inspector is to ensure proper installation, operation and maintenance of BMPs and to determine the overall effectiveness of the SWPPP as well as the need for additional control measure to the County. The major land disturbance (MLD) permit and their special inspector shall also be responsible to:  
a. notify the site contractor(s) responsible for any deficiencies identified so that deficiencies can be corrected within seven calendar days of the weekly inspection report. Such weekly inspection reports shall identify deficiencies as well as progress in correcting deficiencies.  
b. notify the site contractors and other entities (including utility crews, county employees, or their agents) that will perform work at the site, of the existence of the SWPPP and what actions or precautions shall be taken while on site to minimize the potential for erosion and the potential for damaging any BMPs.  
c. determine the need for and establish training program to ensure that all site workers have been trained, at a minimum, in erosion control, material handling and storage, and housekeeping.  
d. provide copies of the SWPPP to all parties who are responsible for installation, operation or maintenance of any BMPs.  
e. maintain a current copy of the SWPPP and permit inspection card on the site at all times and made available upon request. I conditions are not favorable to maintain a current copy of the SWPPP on site, install a sign at the entrance to the site, plainly visible to the traveling public, listing information pertinent to the SWPPP's location and the 24 hour a day / 7 days a week phone number of the person in charge of the SWPPP.  
f. to obtain inspections, a permit holder shall notify the department(s) of Public Works or Sunset Hills at least two working days before the following:  
a) start of construction, b) installation of sediment and erosion control measures, c) completion of site clearing, d) completion of rough grading, e) completion of final grading, f) close of the construction season, g) completion of landscaping.  
17. See sheet SWPPP-1 for seeding mixtures and rates and specifications for sod or seeding practices. It is anticipated all yards and most of the common ground will be sodded.  
18. For maintenance of control facilities, see above item 16.
- Planned response to loss of contained sediment:  
a. BMPs shall be repaired and/or replaced immediately, as required, to stabilize and contain sediment laden runoff. Holder shall be required to provide documentation of the BMP failure. Permit holder shall be required to provide documentation of the BMP measures installed and scheduled maintenance and repairs. Documentation of actions and mandatory reporting are required to be provided to St. Louis County Department of Public Works or City of Sunset Hills.  
b. contractor is responsible for installing additional BMP measures beyond those shown if conditions dictate or current measure are insufficient.  
20. For schedules and procedures for routine inspections, see above item 16.  
21. A nested biodetention basin is being employed during development of the site to control pollutants after site is completed.  
22. Non-stormwater discharges:  
Non-stormwater discharges include construction wash down areas and concrete washout areas. Contractor shall use every effort to minimize upstream runoff from entering these areas. Temporary berms shall be used to assist in containing runoff.  
List of EPA allowable non-storm water discharges (Jan 2011). The following non-storm water discharges are authorized by the EPA provided it has been determined that the permittee that they are not significant contributors of pollutants to the municipal separate storm sewer system (MS4). Implementation of pollution prevention measures for non-storm water discharges is required for significant contributors.  
n. water line flushing k. water form crawl space pumps  
o. landscaping irrigation l. footing drains  
p. diverted stream flows m. lawn watering  
q. rising ground waters n. individual resident car washing  
r. uncontaminated ground water o. flow from riparian habitats  
s. infiltration (as defined at 40 CFR 35.2005(20)) and wetlands  
t. dechlorinated pumped ground water p. dechlorinated swimming pool  
u. discharge from potable water sources discharge  
v. foundation drains q. street wash water  
w. air conditioning condensation r. residential building wash water  
x. irrigation water, springs (without detergents)  
Anticipated dewatering methods (subject to contractor's means and methods)  
a. contractor to use care when pumping water from construction excavations and attention shall be paid to the final destination of this water. Sediment contained in the water must first be removed. Once it is pumped out of the excavation, this water must then be prevented from eroding soil.  
b. an oil/water separator or other suitable filtration method will be required prior to the discharge if the collected water has been contaminated with petroleum products, oil or grease. A licensed transporter will be required to both contain and to transport the collected water away from the construction site if it has been contaminated by hazardous or toxic chemicals. In the case of contaminated water being trucked from the construction site, the requirements of federal, state and local agencies must be adhered to.  
c. the dewatering methods of excavated areas anticipated to be used to remove water from the construction site: bucket connected to specific pieces of construction equipment to mechanically scoop the water from the excavations.
- Prior to any major land disturbance permit, a land disturbance permit from the State of Missouri Department of Natural Resources will be required.  
24. Any land clearing, construction, or development involving the movement of earth shall be in accordance with the stormwater pollution prevention plan (SWPPP), and the person issued a land disturbance permit assumes and acknowledges responsibility for compliance with the St. Louis County Land Disturbance Code and the approved SWPPP at the site of the permitted activity.  
25. The contractor shall refer to the most current edition of St. Louis County's Model Best Management Practices (BMP) for Land Disturbance Sediment and Erosion Control Handbook or details and specifications.  
26. Sediment shall be washed from all vehicles at washdown station prior to leaving the site. No tracking of mud onto City of Sunset Hills' roads shall be allowed.  
27. No placement of material off site is proposed into jurisdictional waters of the United States therefore neither a 401 Water Quality Certification nor a Federal 404 Permit is required.  
28. No endangered species were identified on-site nor is the site listed on the National Register of Historic Places.  
29. The contractor shall provide, install, maintain and remove a public notification sign, per pages 42-43 of the St. Louis County Sediment and Erosion Control Manual.

**SWPPP CERTIFICATION**

I certify under penalty of law that this Storm Water Pollution Prevention Plan (SWPPP) has been prepared in accordance with the requirements and regulation of the City of Sunset Hills, Missouri and the Missouri Department of Natural Resources. To the best of my knowledge and belief, the information contained in this plan is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: *Steven D. Rush*  
Steven D. Rush, P.E.  
Date: 03/09/24

22MSD-00313 HT#8369 MSD BASE MAP NO. 25M

PROJECT SITE ADDRESS / LOCATION: SUNSET HILLS

**SITE DEVELOPMENT ENGINEERING, INC.**  
CORPORATE CERTIFICATE OF AUTHORITY  
No. 001208

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**STEVEN D. RUSH**  
REGISTERED PROFESSIONAL ENGINEER  
No. E-20332  
02/29/24

**Manors at Lynstone Park**

DATE: 10/02/23 JOB NO.: 222-205 DRAWN BY: DWD  
 CHECKED BY: SDR SCALE: As Shown

**SWPPP-1**

REV: 01/03/24 MSD REVIEW 02/29/24 MSD REVIEW  
 01/03/24 MSD SUBMITTAL 01/11/24 SLC SWPPP 02/01/24 Agency Review

SHEET: **C8**

**SILT FENCE**

**PHYSICAL DESCRIPTION** - Sil t fences are used as temporary perimeter controls, appropriate to the BMP, at sites where construction activities will disturb the soil. They can also be used on the interior of the site. A sil t fence consists of a length of filter fabric stretched between anchoring posts spaced at regular intervals along the site at low and down slope areas. The filter fabric should be entrenched in the ground. When installed correctly and inspected frequently, sil t fence can be an effective barrier to silt leaving the site in storm water runoff.

**WHERE BMP IS TO BE INSTALLED** - Sil t fences apply to construction sites with relatively small drainage areas. They are appropriate in areas where runoff will occur as low-level flow, not exceeding 0.5 c.f.s. The drainage area for all fences should not exceed 0.25 acre per 100-foot fence length (100 square feet per foot of fence). The slope length above the fence should not exceed 100 feet (NABR, 1995). The fence should be designed to withstand the runoff from a 10-year peak storm event.

**CONDITIONS FOR EFFECTIVE USE OF BMPs** - Spacing of parallel lengths of sil t fence along slopes is relative to slope steepness as follows:

Type of Flow:	Sheet flow only.
Contributing Slope Length:	30-foot maximum for 3:1 slopes. 50-foot maximum for slopes between 3:1 and 10:1. 100-foot maximum for slopes under 10%.

For additional information see Section 806.70 of St. Louis County's Standard Specification for Road and Bridge Construction.

**WHEN BMP IS TO BE INSTALLED** - Prior to disturbance of natural vegetation and at intervals during construction of fill slopes. Install on the perimeter of the site (where storm water exits the site) prior to disturbance of natural vegetation, around material stockpiles and interior to the site along slopes. At the base of slopes and at intervals during construction of slopes.

**INSTALLATION / CONSTRUCTION PROCEDURES**

- Drive post for fence line.
- Dig trench to required dimensions in front of posts for fabric burial.
- Attach mesh to posts.
- Attach fabric to posts, allowing required length below ground level to run fabric along bottom of trench.
- Backfill and compact soil in trench to protect and anchor fabric.

If a standard-strength fabric is used, it can be reinforced with mesh behind the filter fabric. This increases the effective life of the fence. The maximum life expectancy for synthetic fabric sil t fences is about 6 months, depending on the amount of rainfall and runoff.

The stakes used to anchor the filter fabric should be wood or metal. Wooden stakes should have minimum dimensions of 2 by 2 inches if a hardwood like oak is used. Stakes from soft woods like No. 2 Southern Pine, should have minimum dimensions of 4 by 4 inches. When using steel (standard U, T, L or C shape sections) posts in place of wooden stakes, they should weigh no less than 1.0 billion-foot. If metal posts are used, attachment points are needed for fastening the filter fabric with wire ties. Posts should be least 5 feet long and driven or placed at a slight upstream angle into the ground to a

minimum depth of 18 inches. Depth shall be increased to a minimum of 22 inches if fence is placed on a slope of 3:1 or greater. When the post embedment depth is insufficient to obtain, the posts shall be adequately secured to prevent overturning of the fence due to sediment loading.

✓ Repair unstable or broken posts.  
✓ Stabilize any areas susceptible to undermining.  
✓ Extend fence or add additional rows if necessary to provide adequate protection.

Erect sil t fence in a continuous fashion from a single roll of fabric to eliminate gaps in the fence. If a continuous roll of fabric is not available, overlap the fabric from both directions only at stakes or posts. Overlap at least 6 inches.

The Geosynthetic filter fabric and wire mesh (when applicable) shall be no less than 30 inches above ground and are stapled or trenched to the top of the post. Staples should be a 17-gauge wire and 1/2 inch long. Excavate a trench to bury the bottom of the fabric fence in a "U" configuration at least 6 inches below the ground surface. The trench shall be backfilled with native soil and the soil compacted over the geotextile. This helps to prevent gaps from forming near the ground surface. Gaps would make the fence useless as a sediment barrier.

The height of the fence posts should be 38 inches (22-inch embedment) to 42 inches (18-inch embedment) above the original ground surface. If standard-strength fabric is used with 14-gauge steel wire with a mesh spacing of 6 inches by 6 inches (or a prefabricated polymeric mesh of equivalent strength), space the posts no more than 4 feet apart. If extra-strength fabric is used without wire mesh reinforcement, space the posts no more than 4 feet apart with woven or 6 feet apart with non-woven geosynthetic.

Alternate Construction: Install fence by sliding it into ground with specialized equipment. Install posts at required spacing indicated on detail.

**LIMITATIONS** - Do not install sil t fences along areas where rocks or other hard surfaces will prevent you from uniformly anchoring the fence posts and entrenching the filter fabric. Installing fences in such an area greatly reduces their effectiveness and can create runoff channels leading offsite. Sil t fences are not suitable for areas where large amounts of concentrated runoff are likely. Fence shall not be used when slopes are 1:1 or greater and water flow rates exceed 2 cubic feet per minute. Open, windy areas present a maintenance challenge, too, because high winds can make the filter fabric deteriorate faster. Do not install sil t fences across streams, ditches, or waterways (Smolen et al., 1988).

When the pores of the fence fabric become clogged with sediment, pools of water are likely to form on the up side of the fence. Setting and design of the sil t fence should account for this. Take care to avoid unnecessarily diverting stormwater from these pools, causing further erosion damage.

**MAINTENANCE CONSIDERATIONS** - Inspect sil t fences regularly and frequently, as well as after each rainfall event, to make sure that they are intact and that there are no gaps where the fence meets the ground or tears along the length of the fence. If you find gaps or tears, repair or replace the fabric immediately. Remove accumulated sediments from the fence base when the sediment reaches one-third to one-half the fence height. Remove sediment more frequently if accumulated sediment is creating noticeable strain on the fabric and the fence might fail from a sudden storm event. When you remove the sil t fence, remove the accumulated sediment, dress the area disturbed to give it a pleasing appearance and reseed all bare areas as well.

**O&M PROCEDURES**

- Inspect every week and after every storm.
- Remove sediment buildup deeper than 1/4 the fence height or 12", whichever is less.
- Replace torn or clogged fabric; repair loose fabric.

**SILTING AND DESIGN CONSIDERATIONS** - The material for sil t fences should be a previous shade of synthetic fabric such as polypropylene, nylon, and polyester or polyethylene yarn. Choose the material based on the minimum synthetic fabric requirements shown in Table 1 below.

**Table 1 - Temporary Sil t Fence Property Requirements**

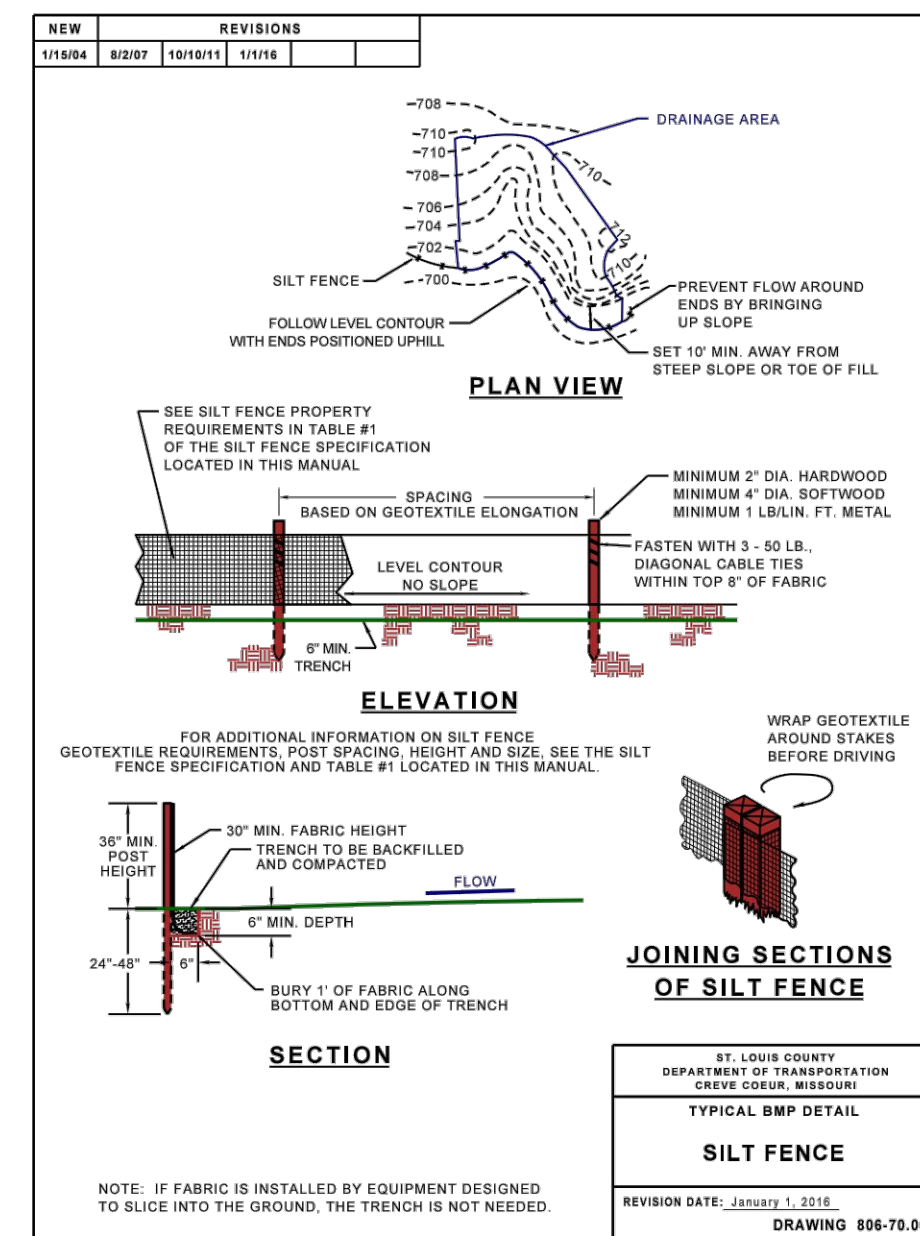
Physical Property	Test Method	Units	MARV Geotextile Requirements		
			Supported Sil t Fence	Unsupported Sil t Fence	Non-Woven
Post Spacing (Maximum)		feet	4	4	6
Height of Wire / Polymer Fence (Minimum)		inches	30	—	—
Machine Direction	ASTM D 4632	pounds	90	125	125
Cross Machine Direction			90	100	100
Permeability (Minimum)	ASTM D 4491	sec <sup>-1</sup>	0.05	0.05	0.05
Apparent Opening Size (ACS)	ASTM D 4751	Sieve Number	30	30	30
Ultraviolet Stability (Minimum (retained strength))	ASTM D 4355		70% after 500 h of exposure		

**Notes:**

- MARV Minimum Average Roll Value
- Elongation measured in accordance with ASTM D 4632
- Sil t Fence Support - 14-gauge steel wire with a mesh spacing of 6 inches by 6 inches (or a prefabricated polymeric mesh of equivalent strength)
- Maximum Average Roll Value

**SITE CONDITIONS FOR REMOVAL** - After permanent vegetation of slope is established. Remove fence and post, re-grade trench area and vegetate.

**TYPICAL DETAIL** - 806-70.0



**FIBER ROLLS AND FILTER ROLLS**

**PHYSICAL DESCRIPTION** - A fiber roll, also known as a wattle, consists of straw, flax, coconut fiber (coir), rice straw or other similar materials bound in a light photodegradable or biodegradable tubular roll or filter sock. A filter roll consists of a biodegradable, coarse composed or filter material bound in a light photodegradable or biodegradable tubular roll or filter sock. They intercept runoff, reduce flow velocity, remove sediment from the runoff, and reduce soil erosion. Fiber rolls and filter rolls must be prefabricated.

**WHERE BMP IS TO BE INSTALLED** - Installed on erodible slopes, at top of and toe of slopes, around the perimeter of the site, and around temporary stockpiles, as final barrier to sediment being carried off site. Spacing of rolls along slopes is relative to slope. Filter rolls and fiber rolls may also be used at drain inlets, swales and other concentrated flow areas to prevent sediment, silt, and other solids in storm water runoff from entering the storm sewer system. Rolls may also be used as mini check dams in unlined ditches and swales.

**CONDITIONS FOR EFFECTIVE USE OF BMPs**

Type of Flow: Sheet flow and concentrated flow  
Contributing Slope: For slopes, use the following row spacing:  
2:1 (H:V) or steeper: 10 feet  
Between 2:1 and 4:1 (H:V): 15 feet  
4:1 (H:V) or flatter: 20 feet

**WHEN BMP IS TO BE INSTALLED** - Prior to disturbance of natural vegetation and at intervals during construction of fill slopes. Fiber rolls and filter rolls should not be used on slopes subject to creep, slumping or landslides. Rolls are difficult to move once saturated.

**INSTALLATION / CONSTRUCTION PROCEDURES**

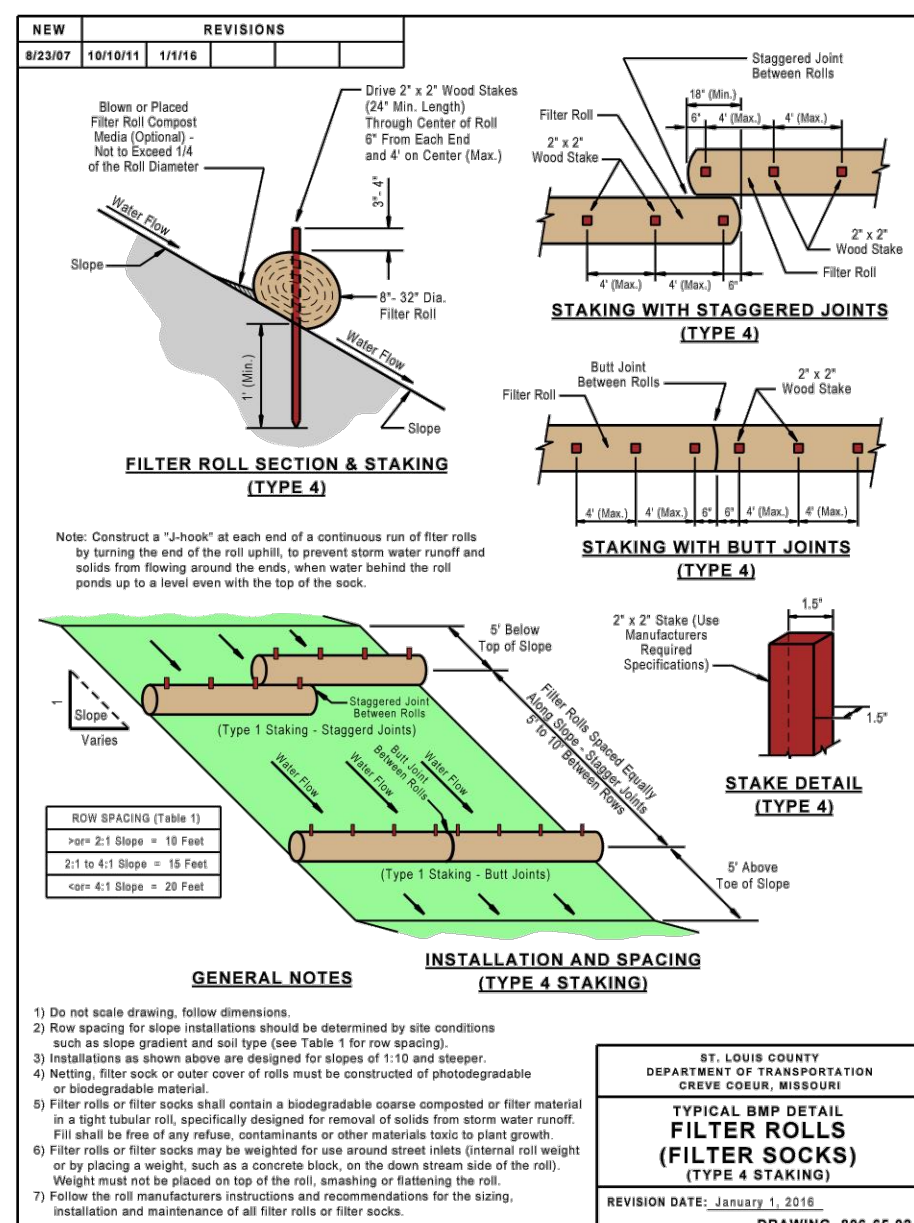
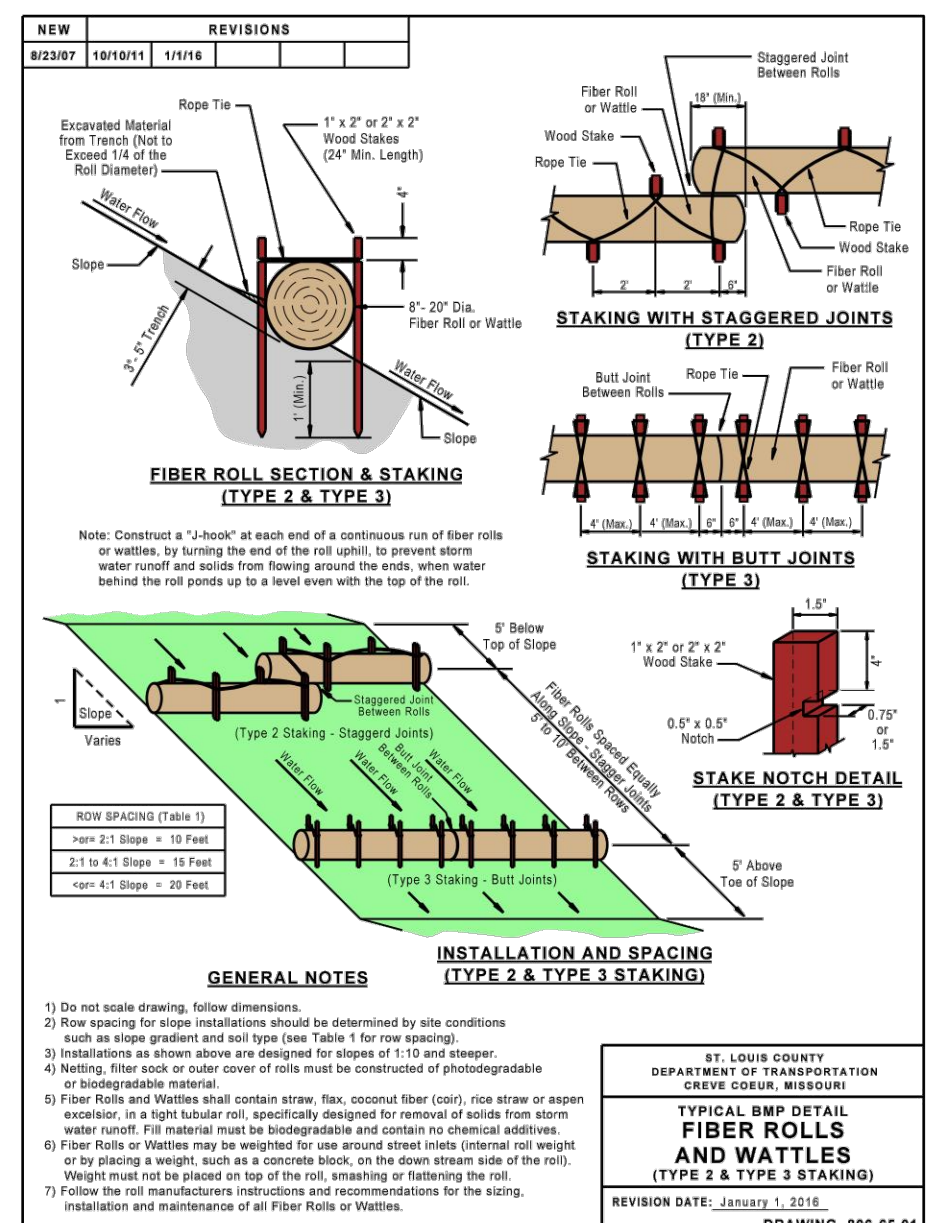
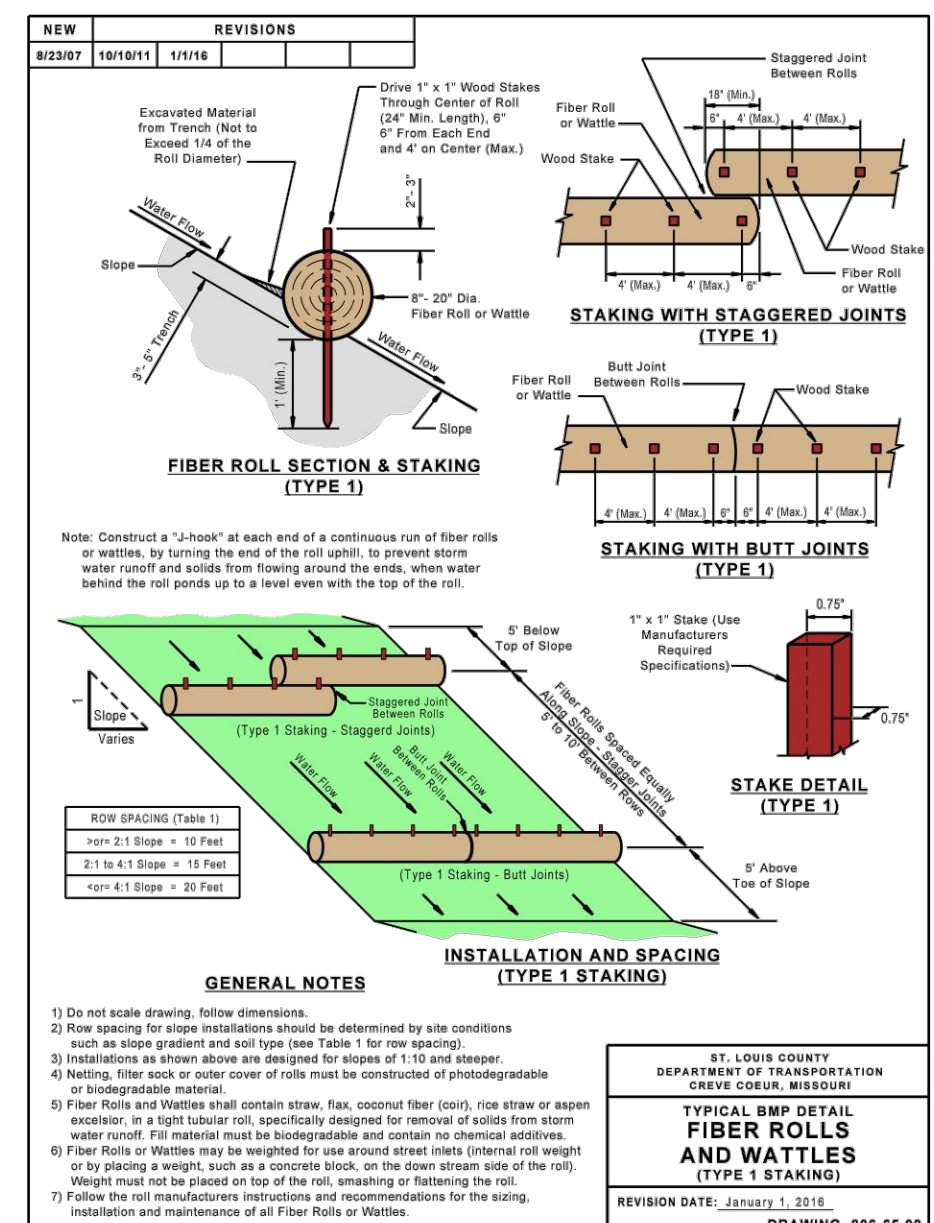
- Calculate required roll diameter, length and row spacing based on slope and the manufacturer's recommendations.
- Dig trench to required depth for fiber rolls (filter rolls do not require trench).
- Place fiber rolls in trench or filter rolls directly on slope.
- Stake the fiber rolls or filter rolls as shown on detail drawings.
- Place excavated soil (or filter roll material) along the upslope of rolls as shown on detail drawings, not to exceed 1/4 of the roll diameter.

**O&M PROCEDURES**

- Inspect every week and after every storm.
- Remove sediment buildup deeper than 1/4 the exposed roll height.
- Replace or repair split, torn, unraveling, slumping or damaged rolls.
- Repair or replace unstable or broken wood stakes.
- Stabilize any areas susceptible to undermining.
- Extend rows or add additional rolls if necessary to provide adequate protection.

**SITE CONDITIONS FOR REMOVAL** - After permanent vegetation of slope is established, remove rolls, collect and dispose of sediment accumulation, re-grade trench area to blend with adjacent ground, and vegetate. Rolls do not have to be removed if approved construction or grading plans call for rolls to permanently be left in place (must be fully biodegradable).

**TYPICAL DETAILS** - 806-65.00  
806-65.01  
806-65.02



**ROCK OUTLET / EMBANKMENT PROTECTION / PAVED DITCH**

**PHYSICAL DESCRIPTION** - A rock apron installed over a geotextile fabric at a point of concentrated discharge, designed to slow the velocity of flow and protect the receiving area from erosion.

Follow guidelines shown in the St. Louis County Standard Specifications for Road and Bridge Construction concerning use of related BMPs such as:

- Light Stone Revetment;
- Heavy Stone Revetment;
- Articulating Cellular Concrete Erosion Control System;
- Concrete Slope Protection;
- Gabions;
- Reno Mattresses;
- Type 2 Rock Blanket;
- Ditch Liner;
- Rock Lining.

**WHERE BMP IS TO BE INSTALLED** - Installed at BMP outlets, for example, at the end of pipe slope drains, the emergency overflow or outlet pipe of a sediment basin.

**CONDITIONS FOR EFFECTIVE USE OF BMPs**

Type of Flow: Concentrated flow  
Flow at Outlet: Maximum velocity of 10 fps

**WHEN BMP IS TO BE INSTALLED** - With the construction of the upstream BMP that creates the concentrated discharge.

**INSTALLATION / CONSTRUCTION PROCEDURES**

- Grade subgrade of rock blanket to required section.
- Place filter fabric, providing enough slack to assure that rock will not tear the fabric when it is placed.
- Install rock with uniform profile and cross section.

**O&M PROCEDURES:**

- Inspect every week and after every storm during construction.
- Remove sediment and trash accumulation.
- Replace displaced rock - larger rock may be required.
- Stabilize eroded areas - extend if necessary.

**CONSTRUCTION ENTRANCE**

**PHYSICAL DESCRIPTION** - A stabilized entrance to a construction site designed to minimize the amount of sediment tracked from the site on vehicles and equipment. Stabilization generally consists of aggregate over geogrid and geosynthetic material. Mud and sediment fall off of tires as they travel along the stabilized entrance, however, additional measures in the form of a washdown area should also be included on site. The stabilized entrance also distributes the axle load of vehicles over a larger area, thereby mitigating the rutting impact vehicles normally have on unpaved areas. See additional information in the "Construction Site Access Requirements" section of this manual.

**WHERE BMP IS TO BE INSTALLED** - At locations where it is safe for construction vehicles and equipment to access existing streets - preferably at location of future streets or drives.

**CONDITIONS FOR EFFECTIVE USE OF BMPs**

Drainage: Ditches or pipes, if needed, sized for 15 year, 20 minute storm; HGL 6" below surface of entrance

**WHEN BMP IS TO BE INSTALLED** - First order of work, along with washdown area, prior to vehicles or equipment accessing unpaved areas.

**INSTALLATION / CONSTRUCTION PROCEDURES**

- Grade and compact area of construction entrance.
- Install culvert under entrance if needed to maintain positive drainage.
- Place geosynthetic material next to compacted soil, lay geogrid on top of this, and cover with aggregate, forming diversion across entrance if needed to direct runoff away from roadway.
- See Washdown Station BMP for additional steps.

**O&M PROCEDURES:**

- Immediately remove any mud or debris tracked onto paved surfaces.
- Remove sediment and clods of dirt from construction entrance continuously.
- Replace rock if necessary to maintain clean surface.
- Repair settled areas.

**SITE CONDITIONS FOR REMOVAL** - Remove when vehicles and equipment will no longer access unpaved areas.

**TYPICAL DETAIL** - 806-46.01

**SEDIMENT BASIN - TEMPORARY**

**DURING CONSTRUCTION**, IF SITE RUNOFF FLOWS INTO A TEMPORARY SEDIMENT BASIN THAT WILL BE CONVERTED TO A PERMANENT BMP AREA, THEN AFTER THE TRIBUTARY AREA IS COMPLETELY STABLE THE SEDIMENT BASIN WILL NEED TO BE CLEANED OF ALL SILT, SEDIMENT, AND TRASH THAT HAS ACCUMULATED WITHIN IT. OVER EXCAVATE AS NECESSARY TO ALLOW FULL DEPTH OF THE BMP SECTION. BMP PLANTING, IF APPLICABLE, CAN BE INSTALLED ONLY AFTER THIS HAS BEEN DONE AND THE MSD INSPECTOR PROVIDES APPROVAL TO PLACE THE PLANTINGS.

**INFLTRATION BED:**

TO PREVENT CONSTRUCTION SEDIMENT FROM CLOGGING INFLTRATION BED, AT NO TIME MAY CONSTRUCTION SEDIMENT ENTER THESE FACILITIES. ADDITIONALLY, THESE FACILITIES SHALL NOT BE CONSTRUCTED UNTIL ALL SURROUNDING AREA THAT DRAINS TO THEM IS FULLY STABLE/ESTABLISHED.

**SHOP DRAWINGS FOR BMP:**

MSD SHOP DRAWINGS SUBMITTAL REQUIRED FOR BMP AND ITS COMPONENTS PRIOR TO CONSTRUCTION. MSD CONTACT: PLEASE CONTACT THE DISTRICT'S CONSTRUCTION MANAGEMENT DIVISION AT (314) 335-2072 FOR QUESTIONS.

NOTE: REMOVE SEDIMENT AT EL=613.50

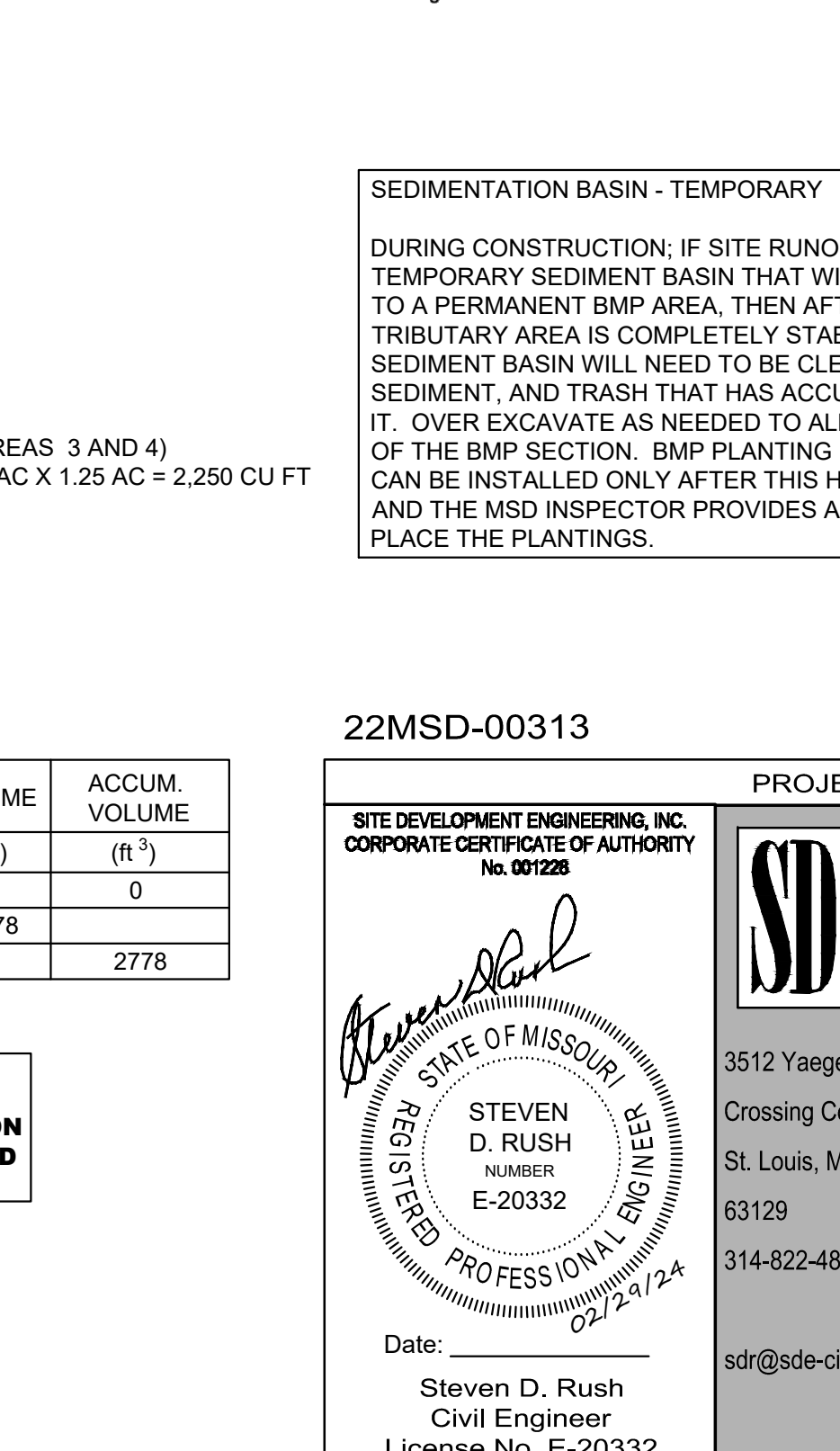
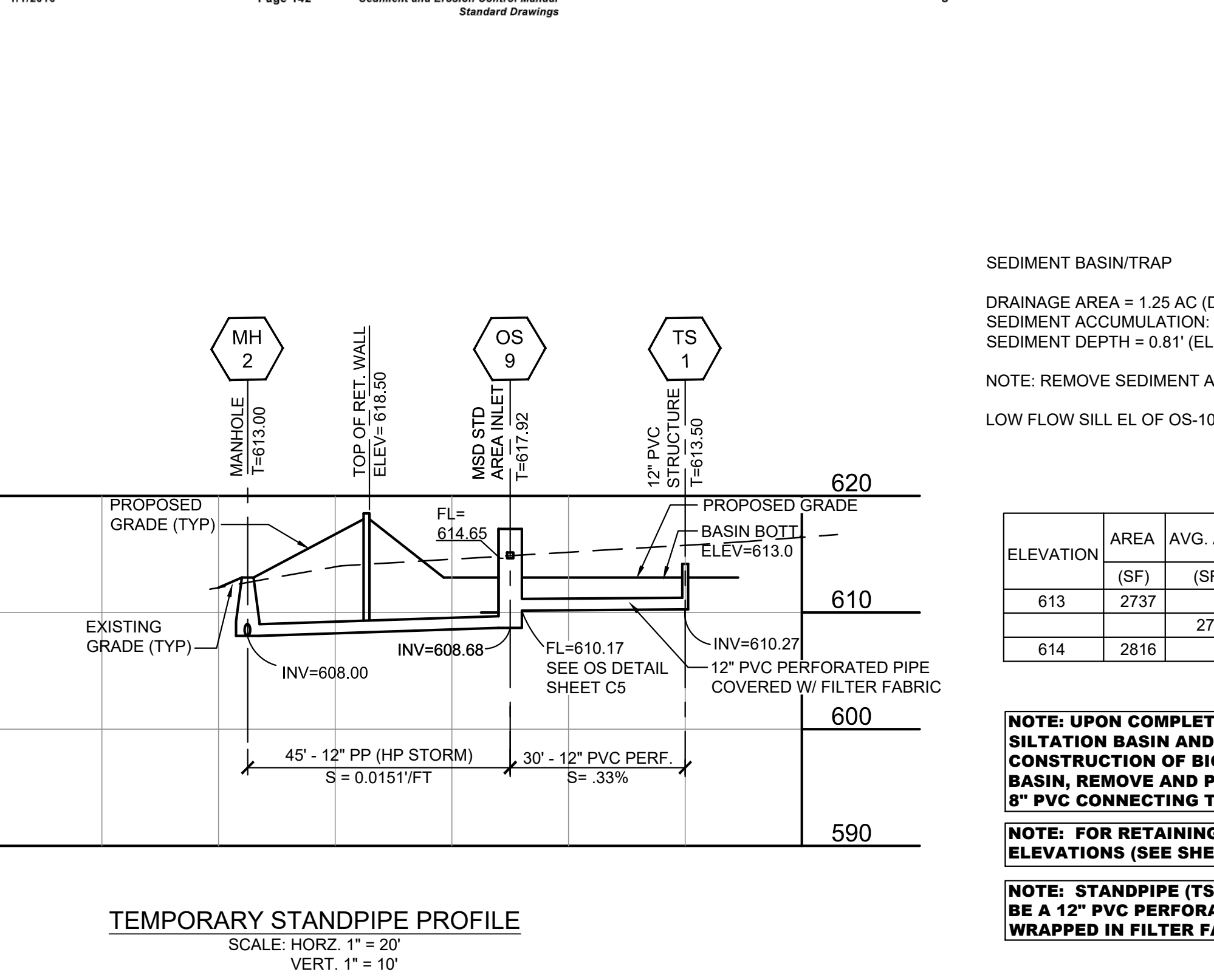
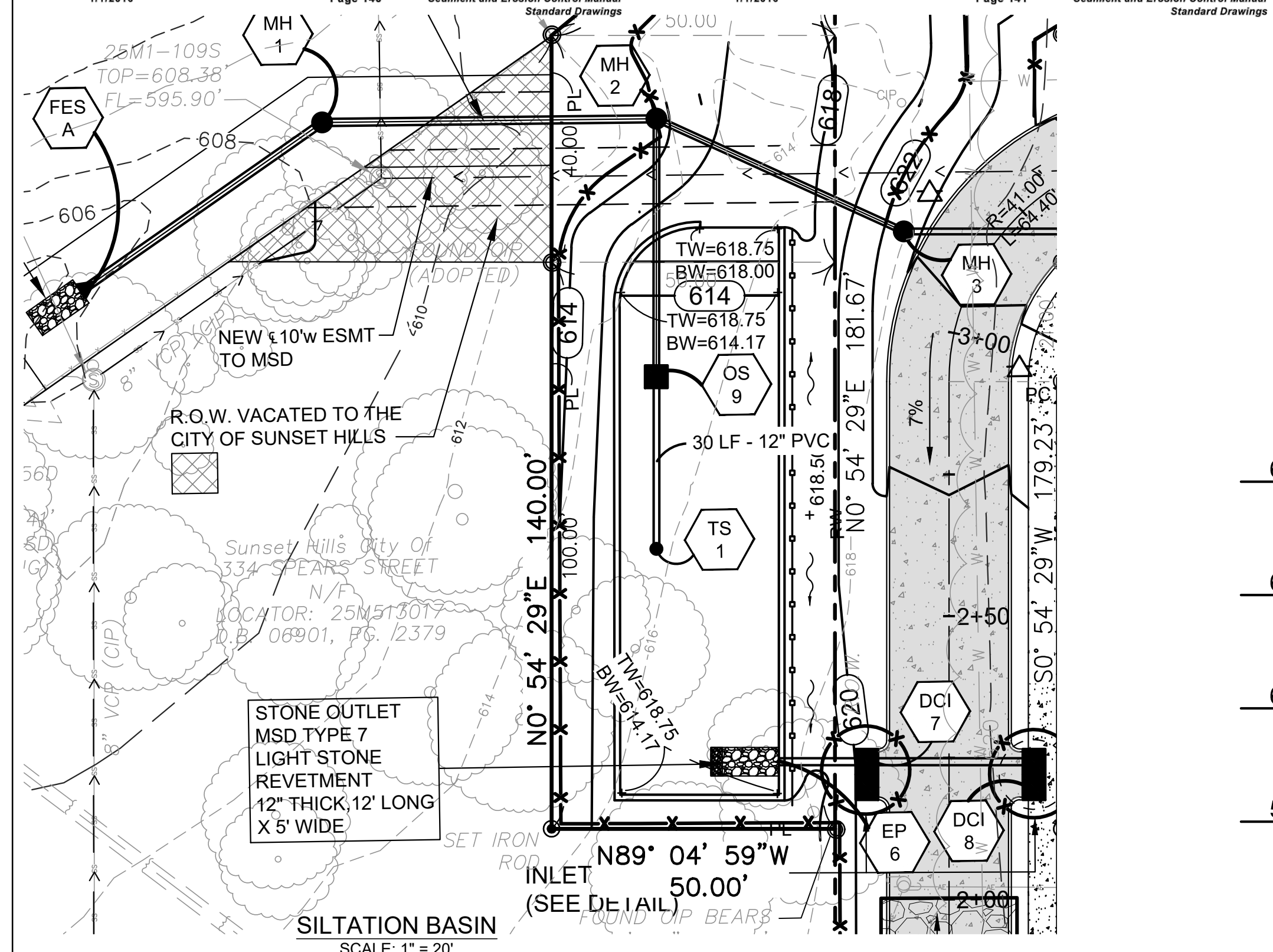
LOW FLOW SILL EL OF OS-10 = 616.30

NOTE: UPON COMPLETED USE OF SILTATION BASIN AND PRIOR TO CONSTRUCTION OF BIORETENTION BASIN, REMOVE AND PLUG TS AND 8" PVC CONNECTING TO OS-7.

NOTE: FOR RETAINING WALL ELEVATIONS (SEE SHEET C3)

NOTE: STANDPIPE (TS) SHALL BE A 12" PVC PERFORATED PIPE WRAPPED IN FILTER FABRIC.

ELEVATION	AREA (SF)	AVG. AREA (SF)	VOLUME (ft <sup>3</sup> )	ACCUM. VOLUME (ft <sup>3</sup> )
613	2737	2778	2778	0
614	2816	2778	2778	2778



22MSD-00313 HT#8369 MSD BASE MAP NO. 25M

PROJECT SITE ADDRESS / LOCATION: SUNSET HILLS

**SDE** SITE DEVELOPMENT ENGINEERING, INC. PLANNING • CONSULTING • CIVIL ENGINEERING

**Manors at Lynstone Park**

DATE: 10/10/23 JOB NO.: 222-205 DRAWN BY: DWD  
 CHECKED BY: SDR SCALE: As Shown

SWPPP-2

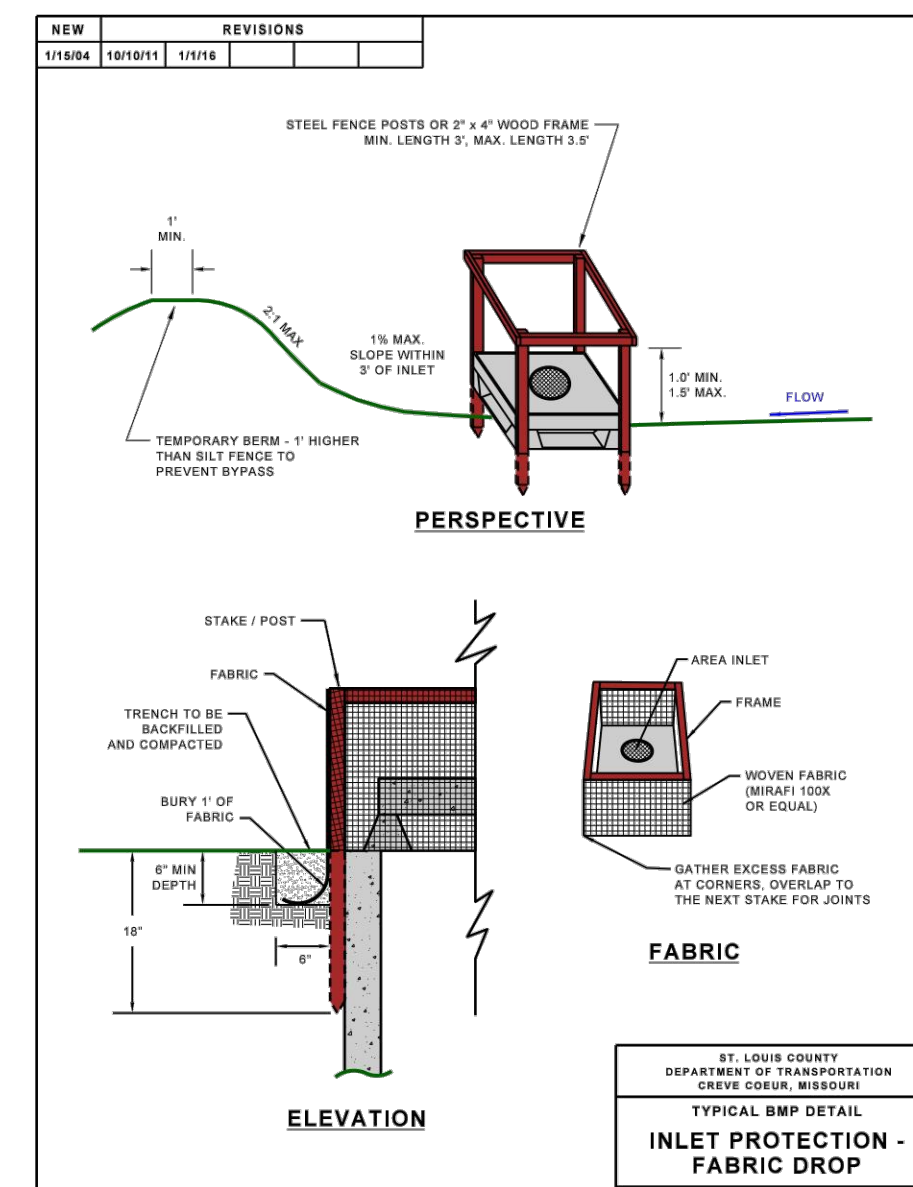
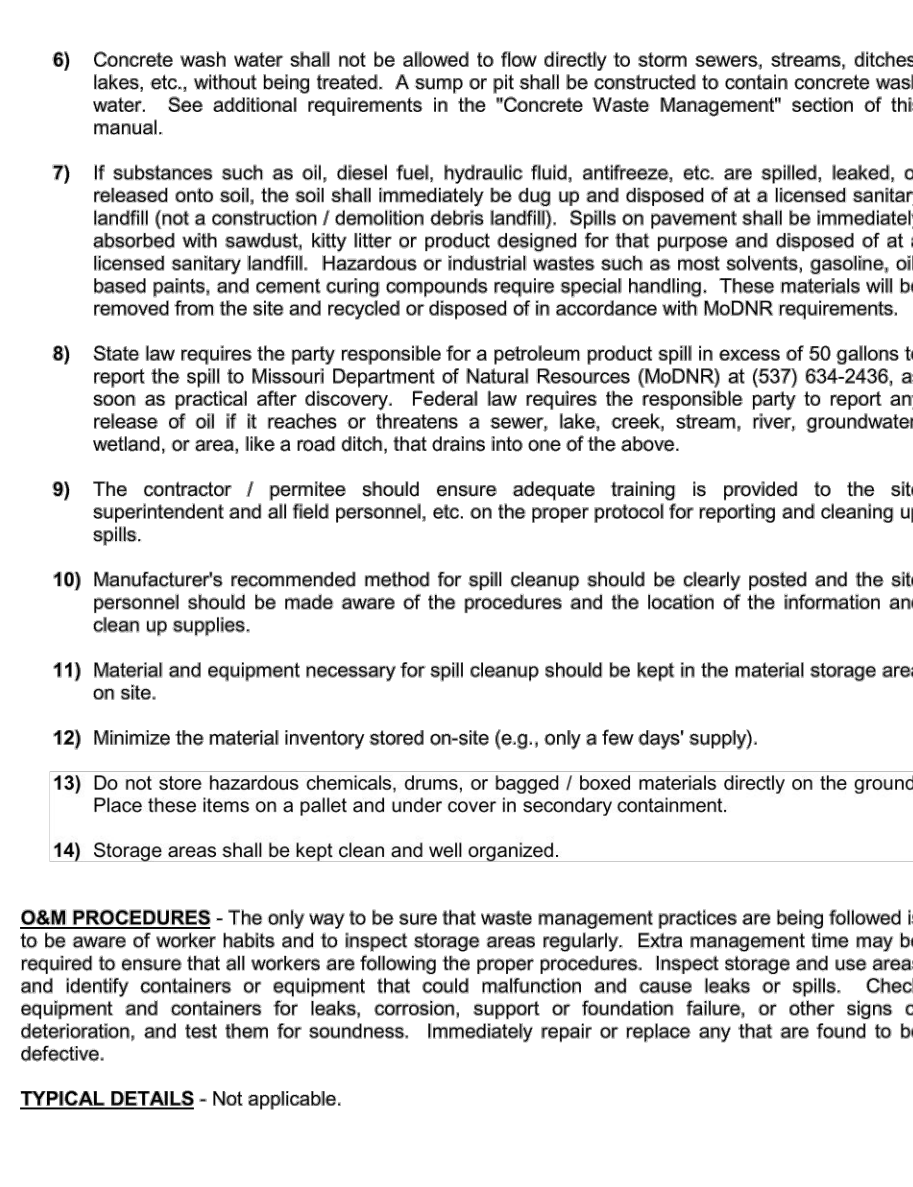
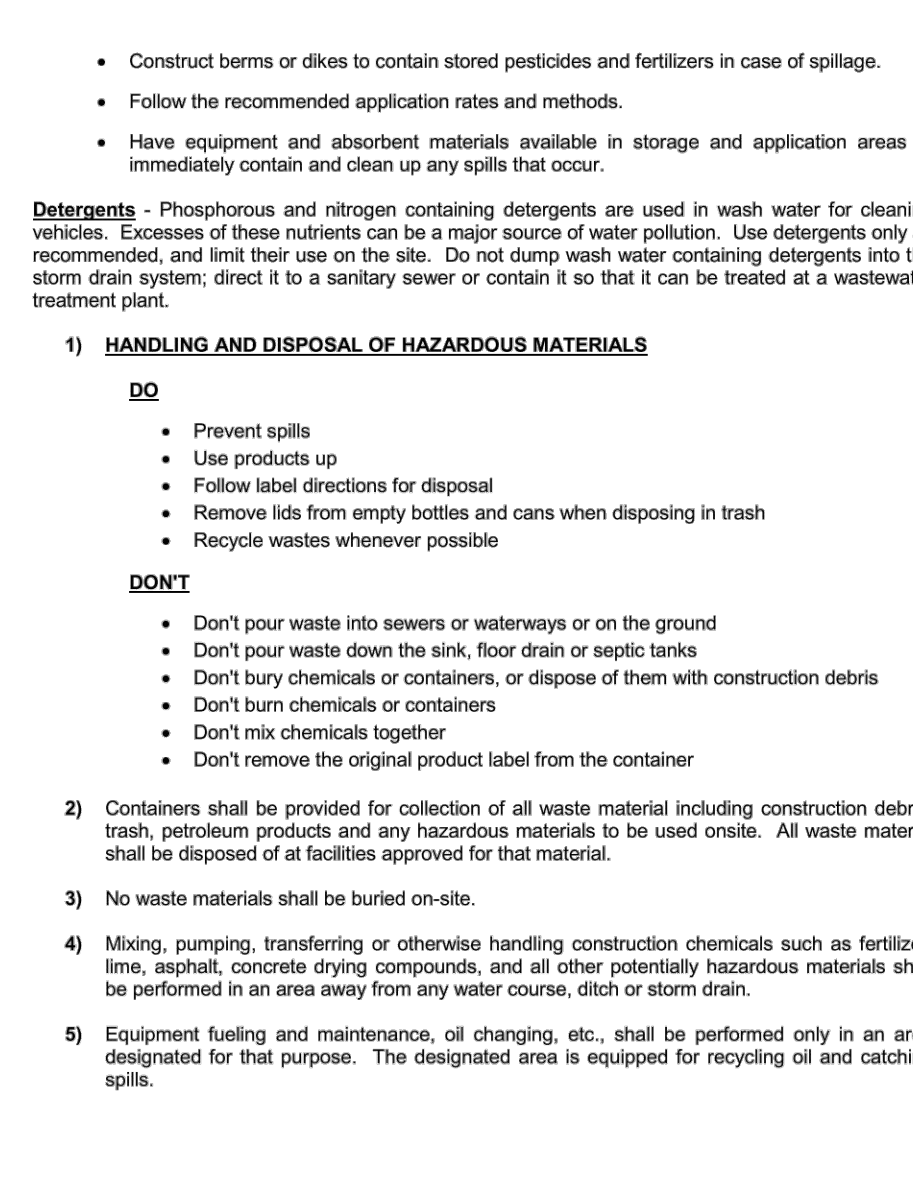
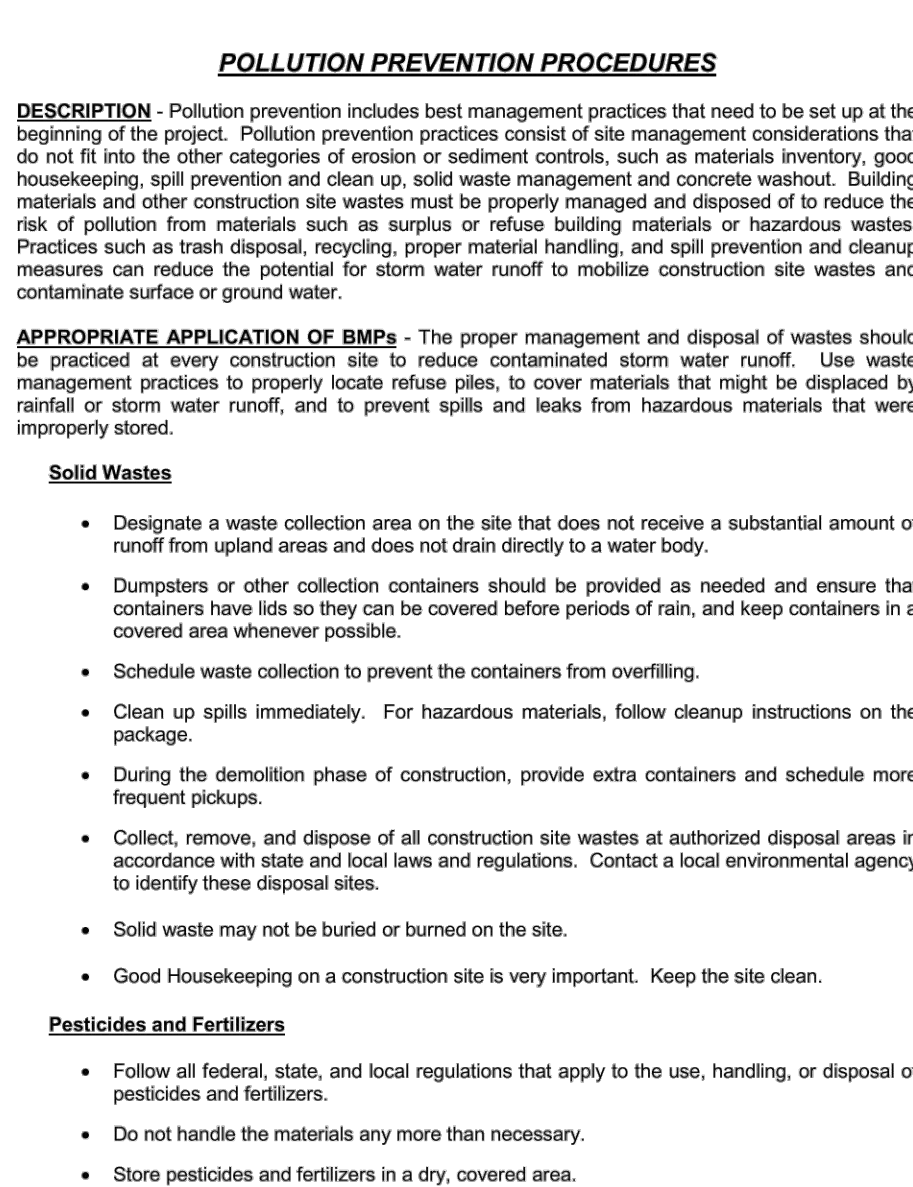
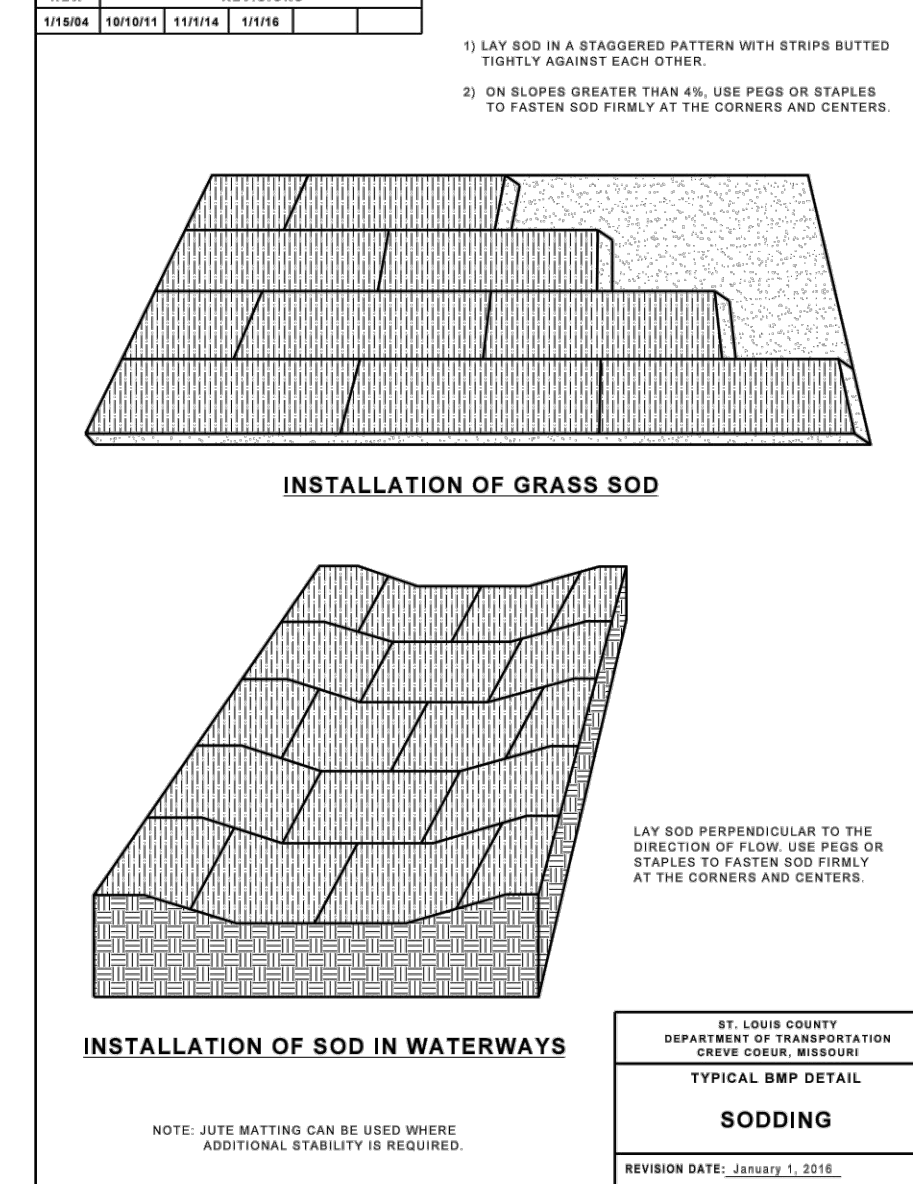
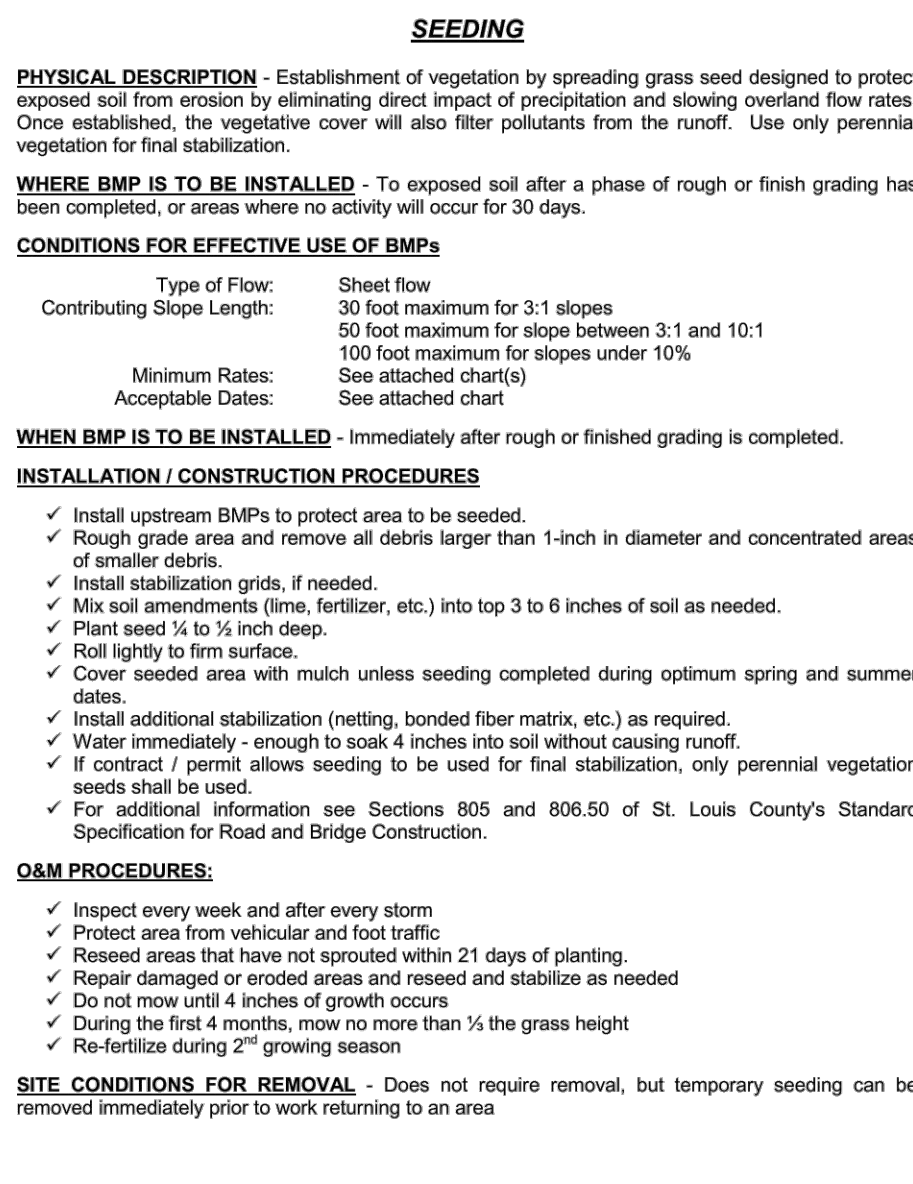
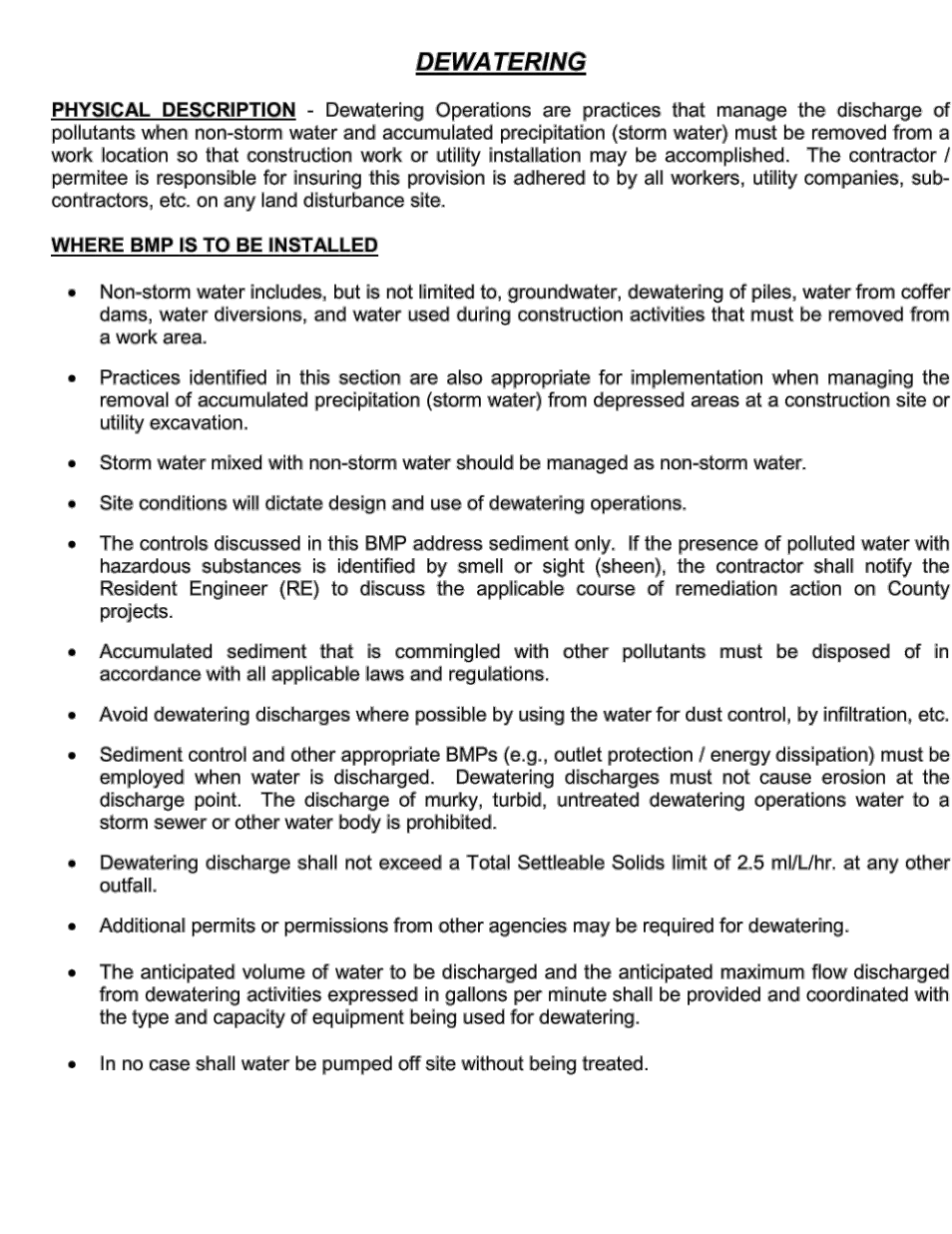
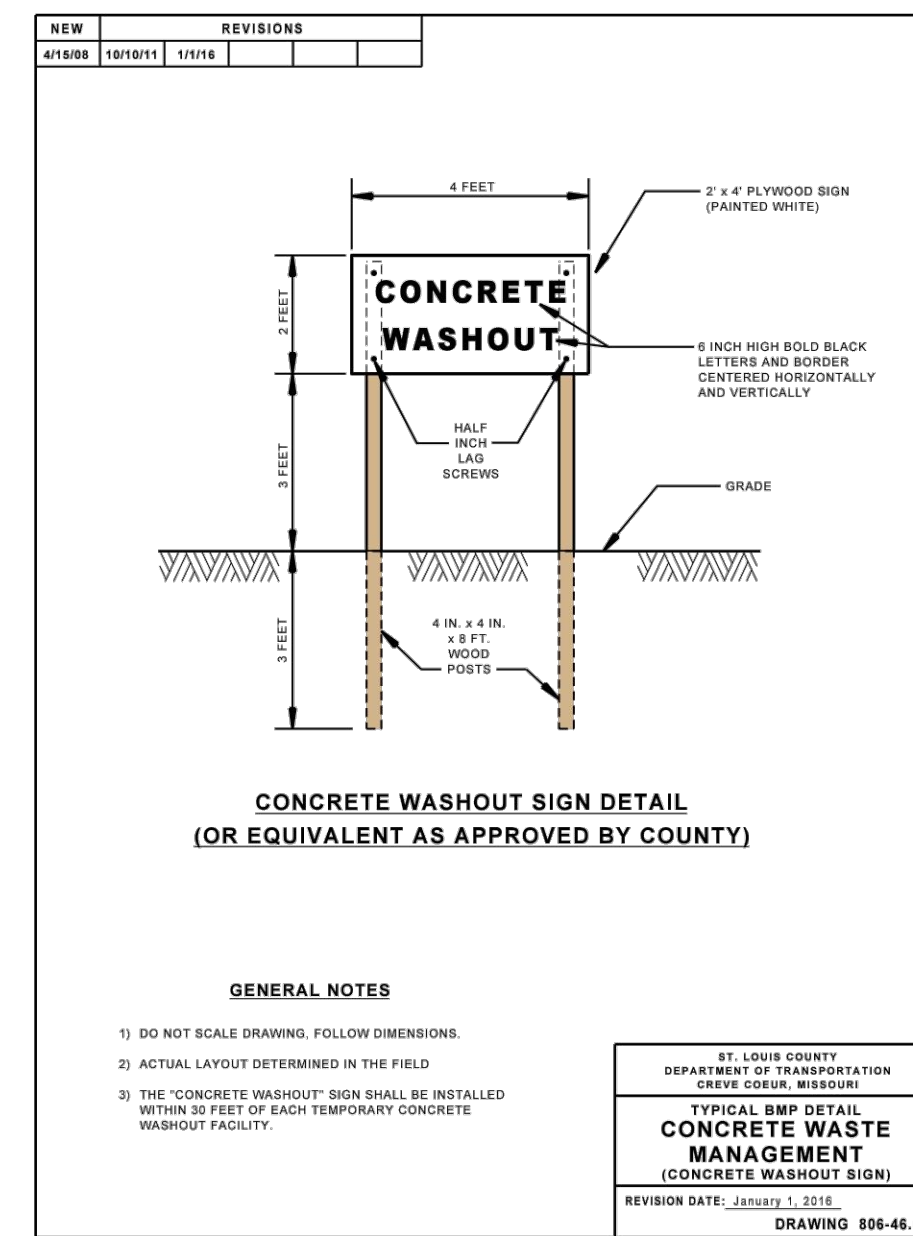
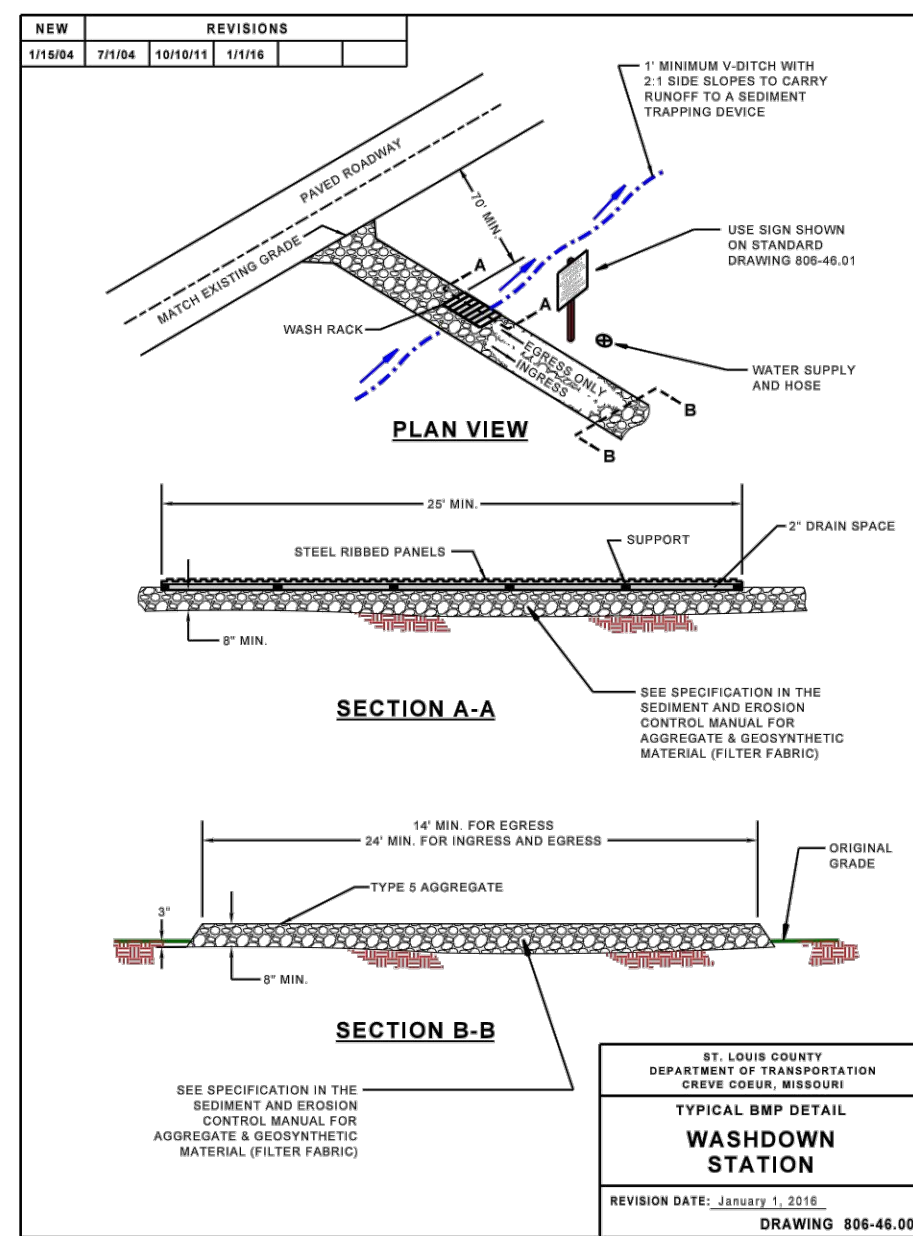
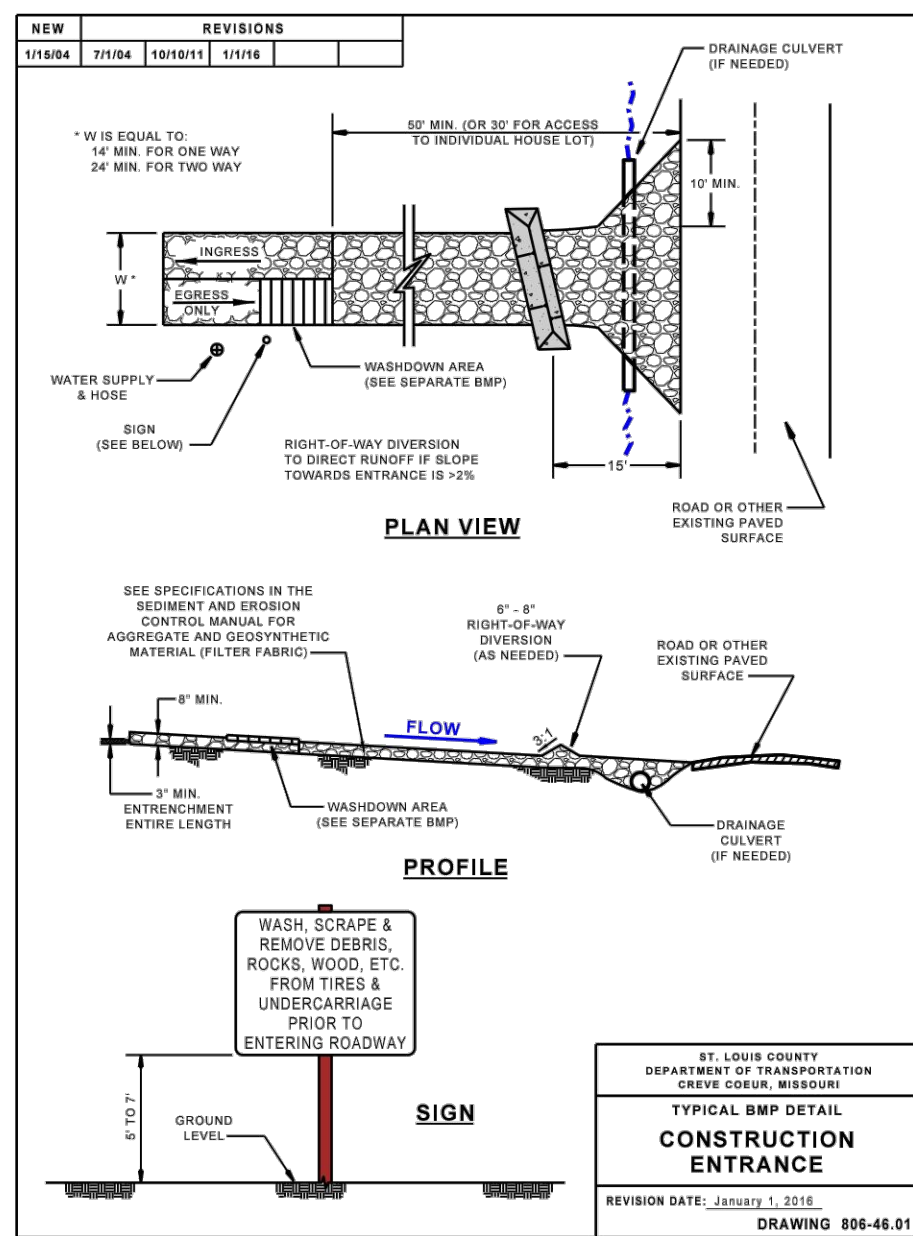
REV.: 01/03/24 MSD REVIEW 01/03/24 MSD SUBMITTAL 01/11/24 SLC SWPPP 02/01/24 Agency Review

3512 Yaeger Crossing Court St. Louis, Missouri 63129 314-822-4800

STEVEN D. RUSH LICENSED PROFESSIONAL ENGINEER No. E-20332

DATE: Steven D. Rush Civil Engineer License No. E-20332

SHEET: **C9**



22MSD-00313 HT#8369 MSD BASE MAP NO. 25M

PROJECT SITE ADDRESS / LOCATION: SUNSET HILLS

**SDE ENGINEERING, INC.**  
PLANNING • CONSULTING • CIVIL ENGINEERING

**Manors at Lynstone Park**

DATE: 10/023 JOB NO.: 222-205 DRAWN BY: DWD  
CHECKED BY: SDR SCALE: As Shown

SWPPP-3

REV.: 01/03/24 MSD REVIEW 02/20/24 MSD REVIEW 01/11/24 SLC SWPPP 02/01/24 Agency Review

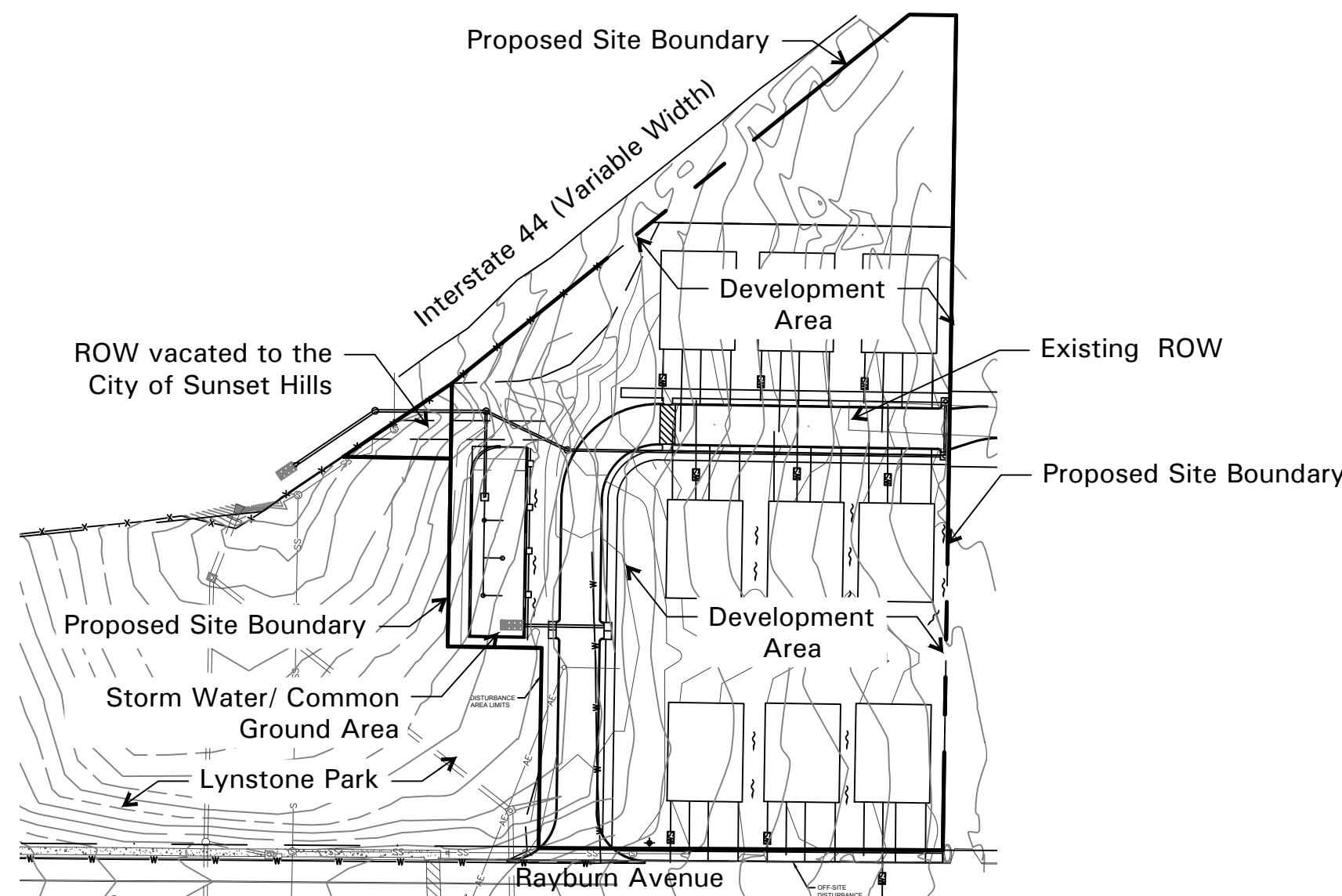
3512 Yaeger Crossing Court St. Louis, Missouri 63129 314-822-4800

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E-20332

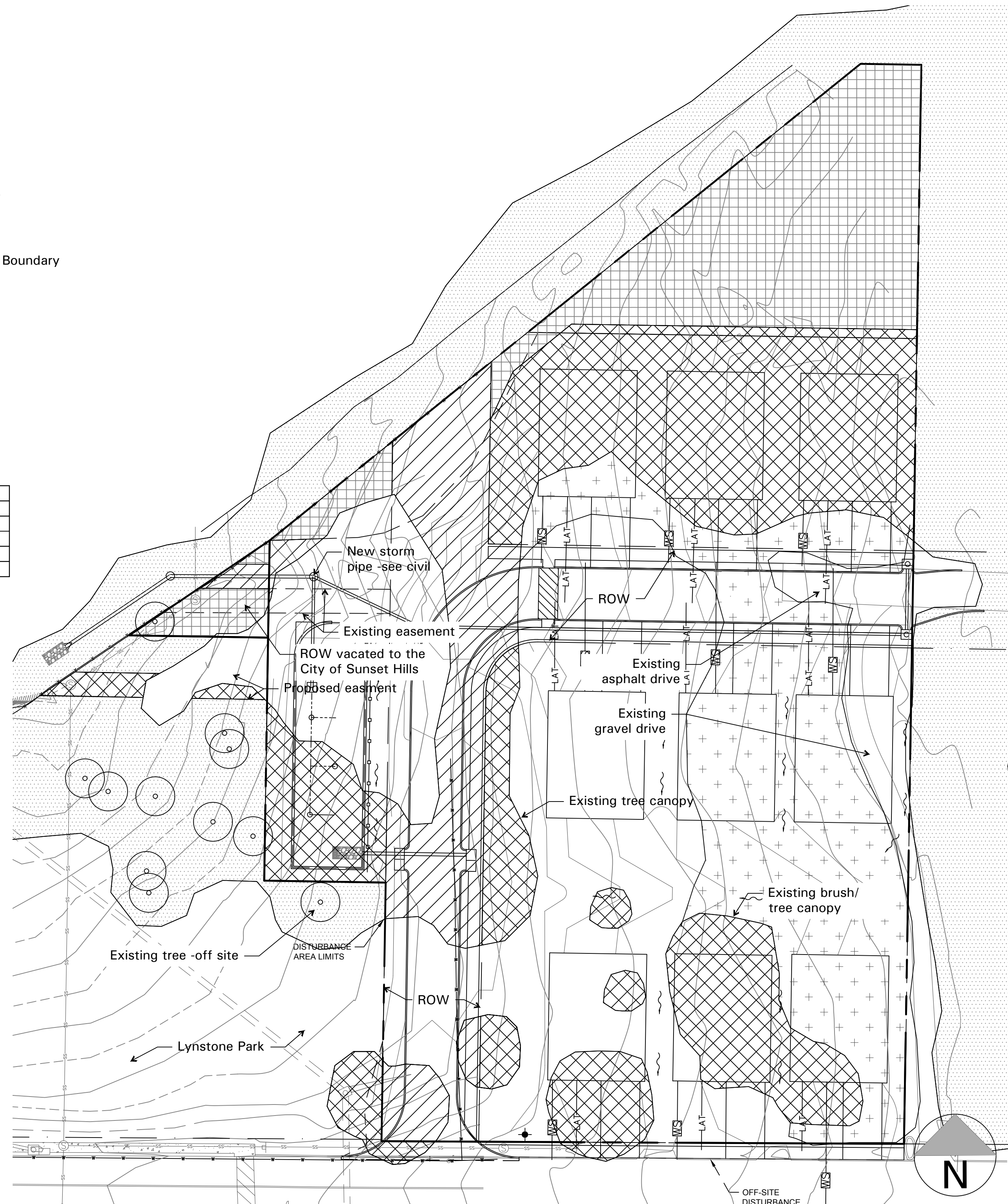
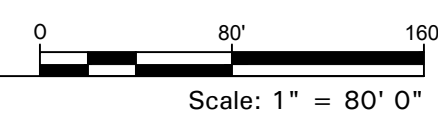
Steven D. Rush  
Civil Engineer  
License No. E-20332

SHEET: C10



Proposed Site Areas			
Site Area	89,874 sq. ft.		2.06 acres
Deduct ROW vacated to the City of Sunset Hills	-1,140 sq. ft.		-0.03 acres
<b>Total Site Area</b>	<b>88,734 sq. ft.</b>		<b>2.04 acres</b>
Deduct proposed City ROW	19,277 sq. ft.		0.44 acres
Adjusted Site Development Area	69,457 sq. ft.		1.59 acres

1 Area Site Diagram



1 Tree Canopy Area

Proposed Site Areas			
Site Area	89,874 sq. ft.		2.06 acres
Deduct ROW vacated to the City of Sunset Hills	-1,140 sq. ft.		-0.03 acres
<b>Total Site Area</b>	<b>88,734 sq. ft.</b>		<b>2.04 acres</b>
Deduct proposed City ROW	19,277 sq. ft.		0.44 acres
Adjusted Site Development Area	69,457 sq. ft.		1.59 acres

Tree Canopy Coverage			
Total Existing Tree Canopy	43,900 sq. ft.		1.01 acres
Deduct Tree Canopy at proposed ROW	-7,750 sq. ft.		-0.18 acres
Total Existing Tree excluding ROW Canopy	36,150 sq. ft.		0.83 acres

Adjusted Tree Canopy			
Total Existing Tree excluding ROW Canopy	36,150 sq. ft.		0.83 acres (100%)
Less Tree Canopy to remain	-11,935 sq. ft.		-0.27 acres (33.6%)
<b>Tree Canopy to be mitigated</b>	<b>24,215 sq. ft.</b>		<b>0.56 acres (66.4%)</b>

New Tree Plantings (see sheet L1.0)				New Tree Canopy (sq. ft.)	
Qty.	Common/ Botanical Name	Size	Canopy Area	Area	Total
4	Red Maple/ <i>Acer rubrum</i>	2.5" Cal.	100	250	1,000
14	Honey Locust/ <i>Gleditsia triacanthos f. inermis</i> 'Skycole'	2.5" Cal.	100	250	3,500
3	Redbud/ <i>Cercis canadensis</i>	1.5" Cal.	50	125	375
<b>Sq. Ft. total new tree canopy</b>				<b>4,875</b>	

**Existing Trees and Canopy Narrative:**

Site is adjacent to Lynstone Park along Rayburn Avenue. Appearance of existing landscape is that of a residential area with little to no maintenance over the past 10-15 years.

Majority of the site wooded with a variety of trees including fruit, maples, elm and oak trees. Center portion of wooded is overgrown with bush honeysuckle and herbaceous weeds.

Individual trees found on site are a part of an dilapidated landscape.

**Tree canopy documented using the following:**

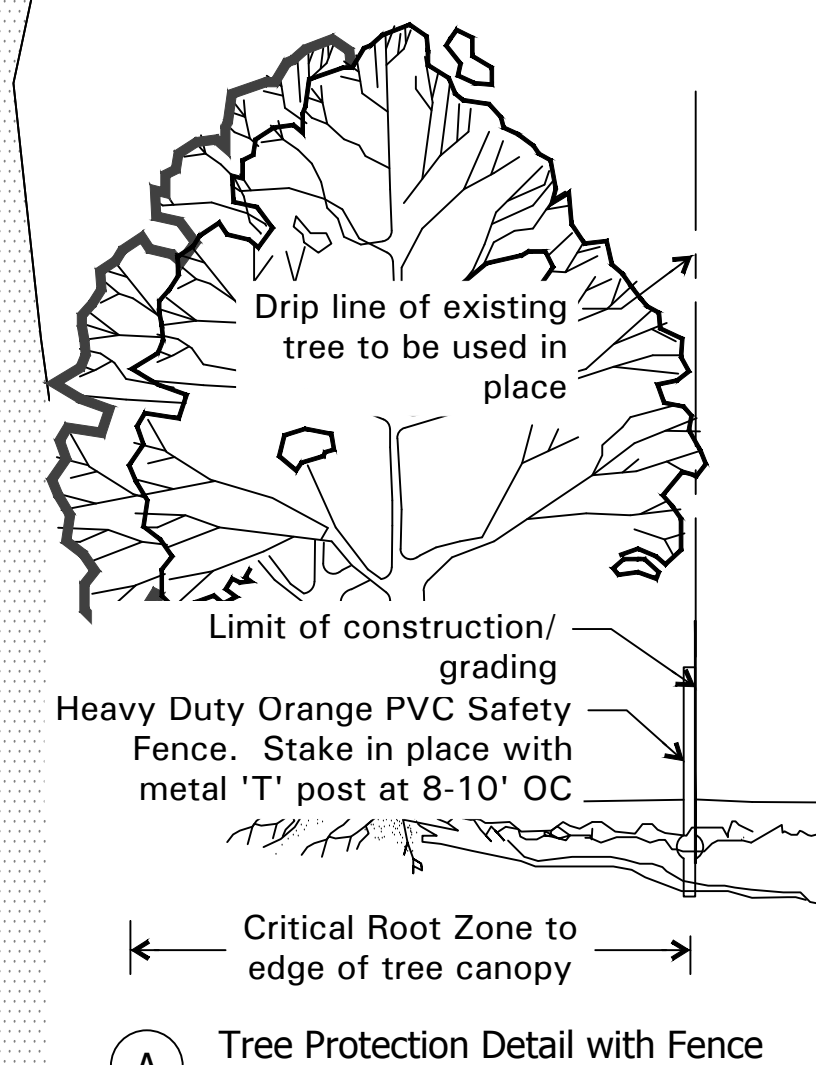
- Goggle Earth images dated 1996 through 2019,
- Survey of existing conditions provided by Site Development Engineering, Inc.
- Field observation on September 18, 2023 by Dermody & Associates, LLC.

**Legend:**

Symbol	Description
[Grid Pattern]	Tree Canopy to remain
[Cross-hatch Pattern]	Tree Canopy to be removed
[Diagonal Lines]	Tree Canopy to be removed at proposed City ROW
[Stippled Pattern]	Tree Canopy adjoining site
[+ Symbol]	Herbaceous vegetation
[Circle with Center]	Existing off site tree

**Overall Sheet Set:**

- TPP1.0 -Canopy Area Plan Diagram/ Plan
- TPP1.1 -Tree Protection/ Mitigation and Planting Plan
- L1.0 -Planting Plan



A Tree Protection Detail with Fence

**APPLICATION SPECIFIC NOTES:**

- 1) A "Pre meeting" shall be held on site by the general contractor will include operators, construction supervisors, owner representative and architect. Meeting shall be held to discuss tree protection methods and limits.
- 2) Clearing limits shall be staked by general contractor prior to on site meeting, see Civil plan for limit of grading
- 3) No clearing or grading shall begin where root pruning and tree preservation measures have not been completed.
- 4) The sequence of tree treatment and preservation measures shall be:
  - a) Stake limit of grading
  - b) Install tree protection fence
- 5) General contractor shall be responsible to insure that no equipment and materials are stored with areas of protected trees. General contractor shall be responsible to repair and/ or replace trees damaged due to his/ her negligence. Owner and his/ her representatives shall judge the assessment of tree replacement or repair.



Uisce beatha  
ph# 314.205.8871  
Missouri Certificate of Authority  
#200902208

**Surveyor/ Civil Engineer:**

Site Development Engineering, Inc.  
3512 Yaeger Crossing Ct.  
St. Louis, MO 63129

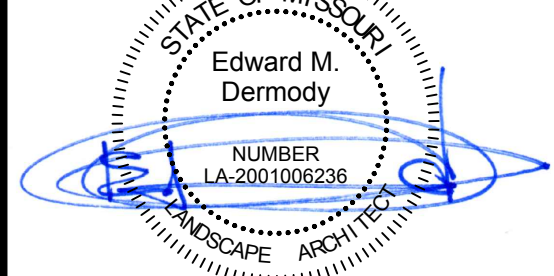
Tree Preservation and Tree Mitigation Plan For:  
Manors at Lynstone Park,  
Sunset Hills, MO

Drawing prepared for:  
Manors at Lynstone Park, LLC  
10025 Office Center Ave., Suite 114  
St. Louis, Missouri 63128

**Revisions:**

No.	Description	Date:
1	City Comments	11/7/23
2	City Comments	11/20/23
3	City Comments	2/6/24
4	City Comments	2/15/24

2/15/24



Edward M. Dermody  
Landscape Architect  
LA-2001006236

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Issue Date: October 17, 2023

Drawn by: EMD

Checked By: EMD

Sheet Title

Tree Canopy Area Diagram/ Plan

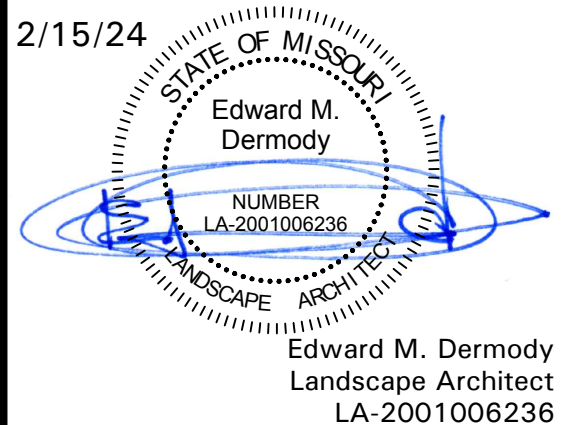
Project Number: 499.001

Sheet Number:

TPP 1.0

Revisions:

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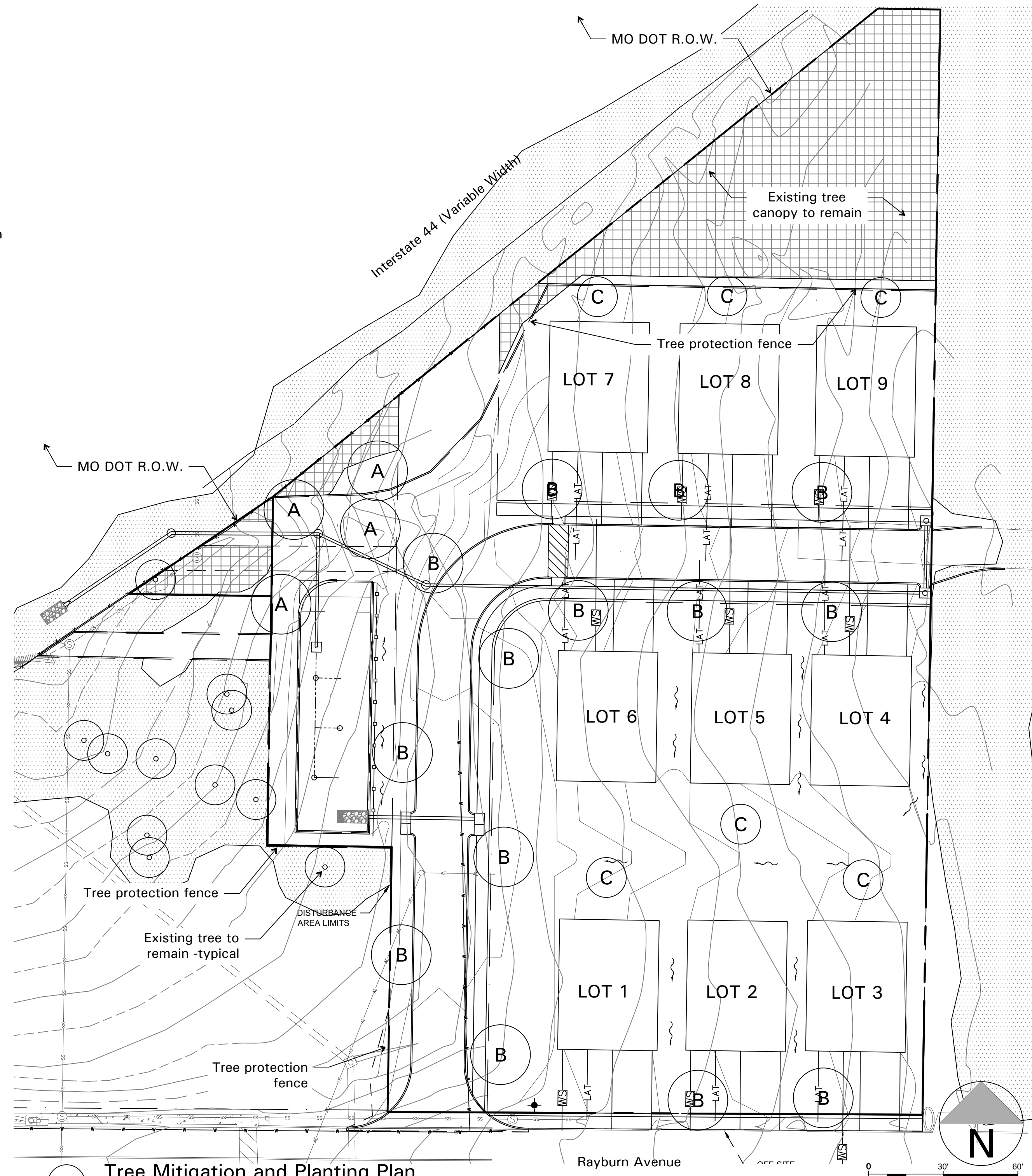
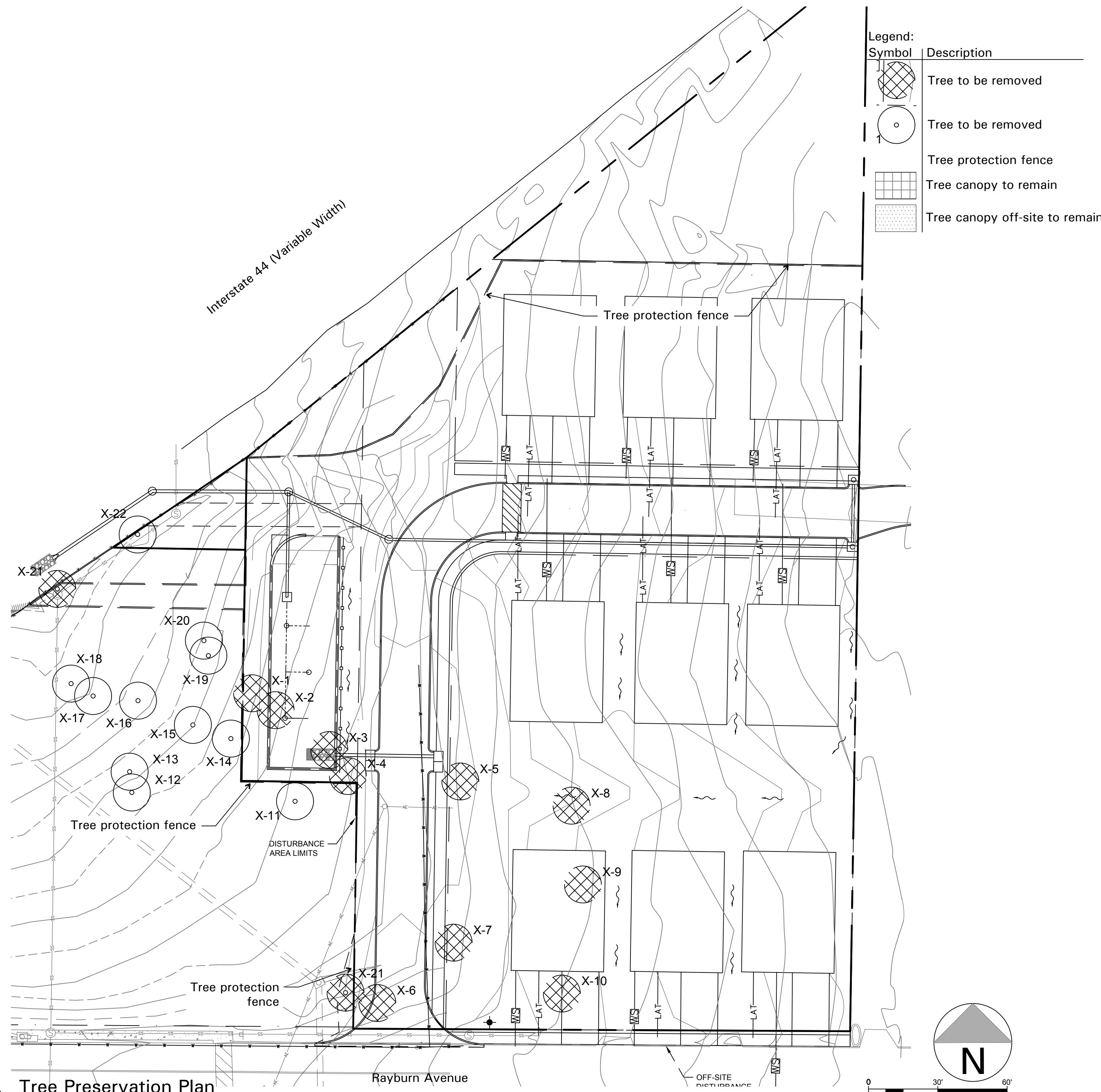


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Sheet Title

**Tree Protection/  
Mitigation and  
Planting Plan**

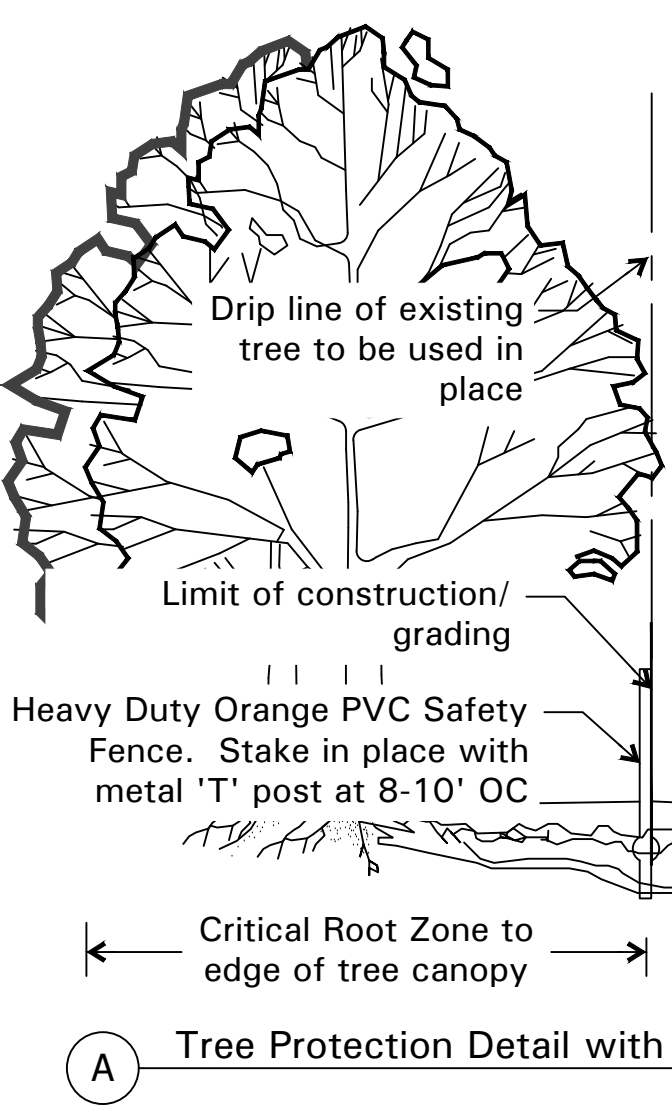
Project Number: 499.001  
Sheet Number:  
TPP 1.1



1 Tree Preservation Plan

2 Tree Mitigation and Planting Plan

Existing Tree Schedule						Existing Tree Values)						
Key	Common Name	DBH	Condition	Comment	Status	1" Cal. tree	Radius (inches)	Area (inches)	Factor by class			Value (\$)
						Species	Condition	Location				
X-1	Oak	20"	Good	to be removed		100.00	10	31.85	1.0	0.9	0.8	2,292.99
X-2	Oak	20"	Good	to be removed		100.00	10	31.85	1.0	0.9	0.8	2,292.99
X-3	Catalpa	10"	Good	to be removed		100.00	5	7.96	0.7	0.8	0.8	356.89
X-4	Oak	24"	Good	to be removed	Landmark Tree	100.00	12	45.86	1.0	0.8	0.8	2,935.03
X-5	Hackberry	30"	Good	to be removed	Landmark Tree in ROW	100.00	15	71.66	1.0	0.9	0.8	5,159.24
X-6	Oak	30"	Good	to be removed		100.00	15	71.66	1.0	0.8	0.1	573.25
X-7	Walnut	8"	Poor	to be removed		100.00	4	5.10	1.0	0.2	0.8	81.53
X-8	Mimosa	6"	Fair	to be removed		100.00	3	2.87	0.5	0.5	0.7	50.16
X-9	Redbud -multi-stem	6x3"	Poor	to be removed		100.00	9	25.80	0.9	0.2	0.8	371.46
X-10	Maple -Silver	24"	Poor	to be removed		100.00	12	45.86	0.8	0.2	0.2	146.75
Total Existing Tree Value												\$14,260.10
Existing Off-Site Tree Schedule						Existing Off-Site Tree Values)						
Key	Common Name	DBH	Condition	Comment	Status	1" Cal. tree	Radius (inches)	Area (inches)	Factor by class			Value (\$)
						Species	Condition	Location				
X-11	Oak	24"	Good	to remain	Landmark Tree	100.00	12	45.86	1.0	0.8	0.8	2,935.03
X-12	Persimmon	10"	Good	to remain		100.00	5	7.96	0.8	0.8	0.8	407.64
X-13	Persimmon	8"	Good	to remain		100.00	4	5.10	0.8	0.8	0.8	260.89
X-14	Oak	18"	Good	to remain	Landmark Tree	100.00	9	25.80	1.0	0.8	0.8	1,650.96
X-15	Oak	24"	Good	to remain	Landmark Tree	100.00	12	45.86	1.0	0.8	0.8	2,935.03
X-16	Oak	18"	Fair	to remain	Landmark Tree	100.00	9	25.80	1.0	0.8	0.8	1,650.96
X-17	Persimmon	12"	Good	to remain		100.00	6	11.46	0.8	0.8	0.8	587.01
X-18	Oak	20"	Good	to remain	Landmark Tree	100.00	10	31.85	1.0	0.8	0.8	2,038.22
X-19	Oak	20"	Fair	to remain	Landmark Tree	100.00	10	31.85	1.0	0.8	0.8	2,038.22
X-20	Oak	30"	Fair	to remain	Landmark Tree	100.00	12	45.86	1.0	0.8	0.5	1,719.75
X-21	Cottonwood	20"	Good	to be removed	conflict with existing utilities	100.00	10	31.85	0.5	0.8	0.1	127.39
X-22	Cottonwood	22"	Good	to remain	conflict with existing utilities	100.00	11	38.54	0.5	0.8	0.1	154.14
X-23	Maple -Silver	24"	Fair	to be removed		100.00	12	45.86	0.8	0.2	0.2	146.75
Total Existing Off-Site Tree Value												\$16,651.97

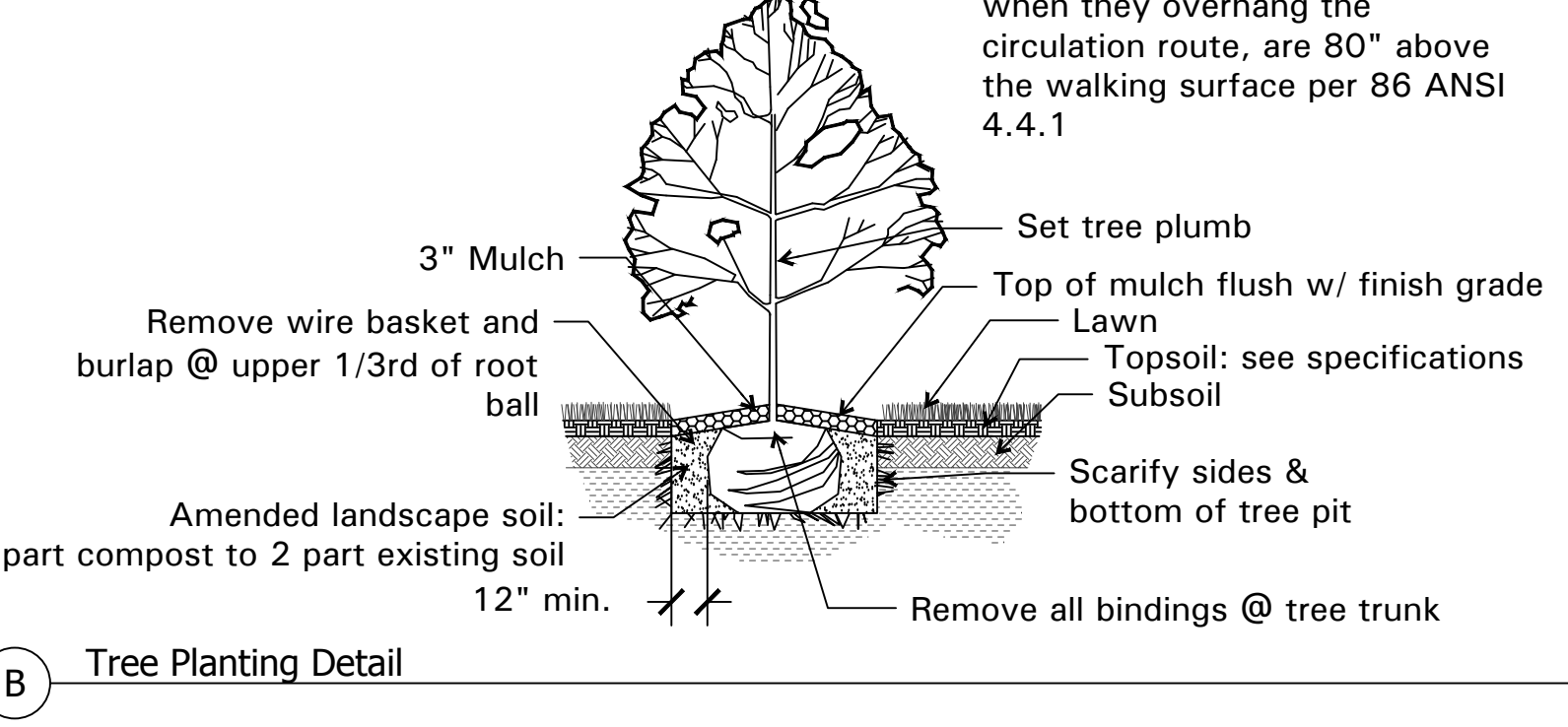


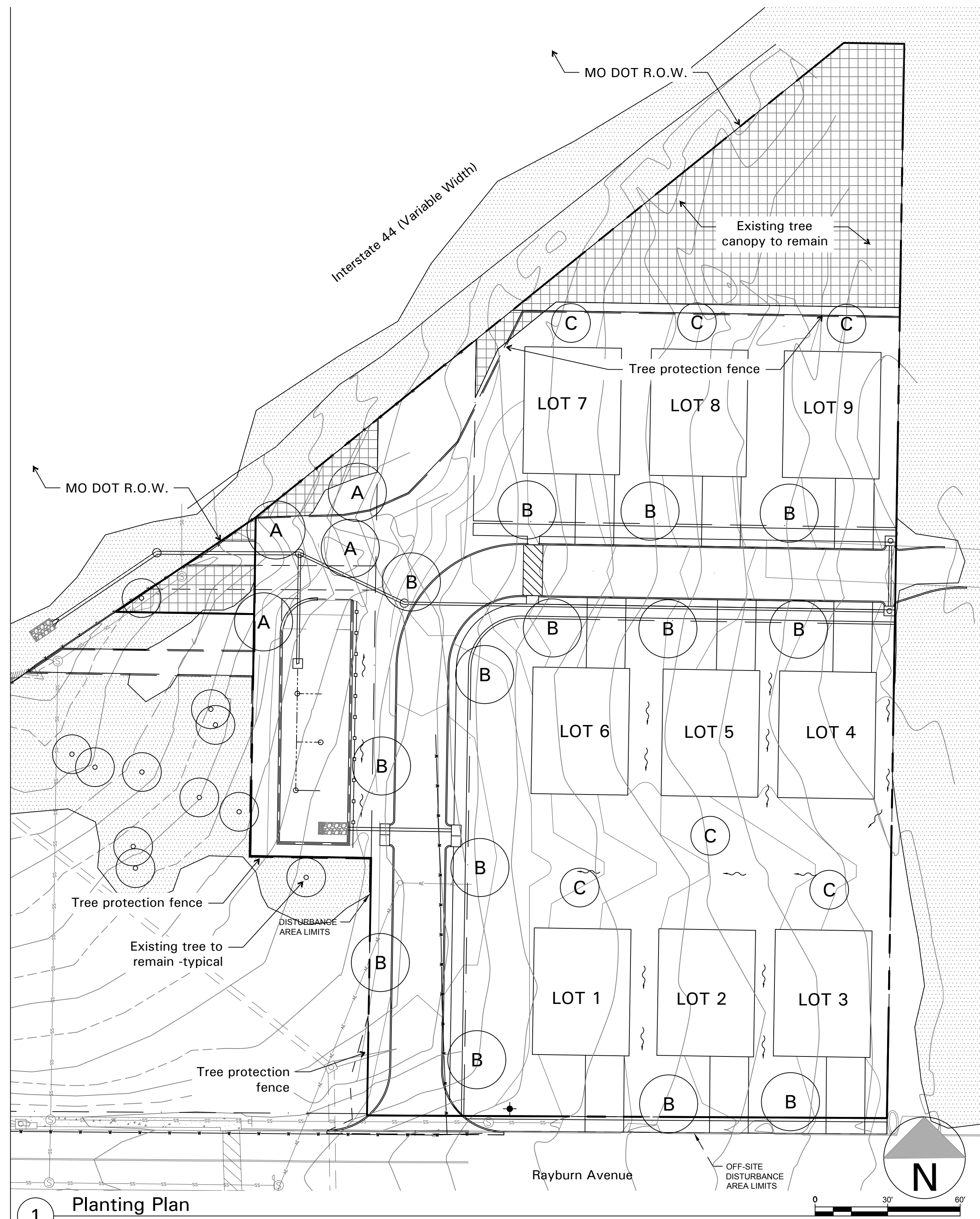
**APPLICATION SPECIFIC NOTES:**

- 1) A "Pre meeting" shall be held on site by the general contractor will include operators, construction supervisors, owner representative and architect. Meeting shall be held to discuss tree protection methods and limits.
- 2) Clearing limits shall be staked by general contractor prior to on site meeting, see Civil plan for limit of grading
- 3) No clearing or grading shall begin where root pruning and tree preservation measures have not been completed.
- 4) The sequence of tree treatment and preservation measures shall be:
  - a) Stake limit of grading
  - b) Install tree protection fence
- 5) General contractor shall be responsible to insure that no equipment and materials are stored with areas of protected trees. General contractor shall be responsible to repair and/or replace trees damaged due to his/ her negligence. Owner and his/ her representatives shall judge the assessment of tree replacement or repair.

Landscape Planting Schedule		
Key	Qty	Description
A	4	Trees at Common Ground Tree
B	14	Street tree
C	3	Flowering Tree
		6,280 Canopy area to remain

SEE SHEET L1.0 FOR PLANT TYPES AND BMP PLANTINGS



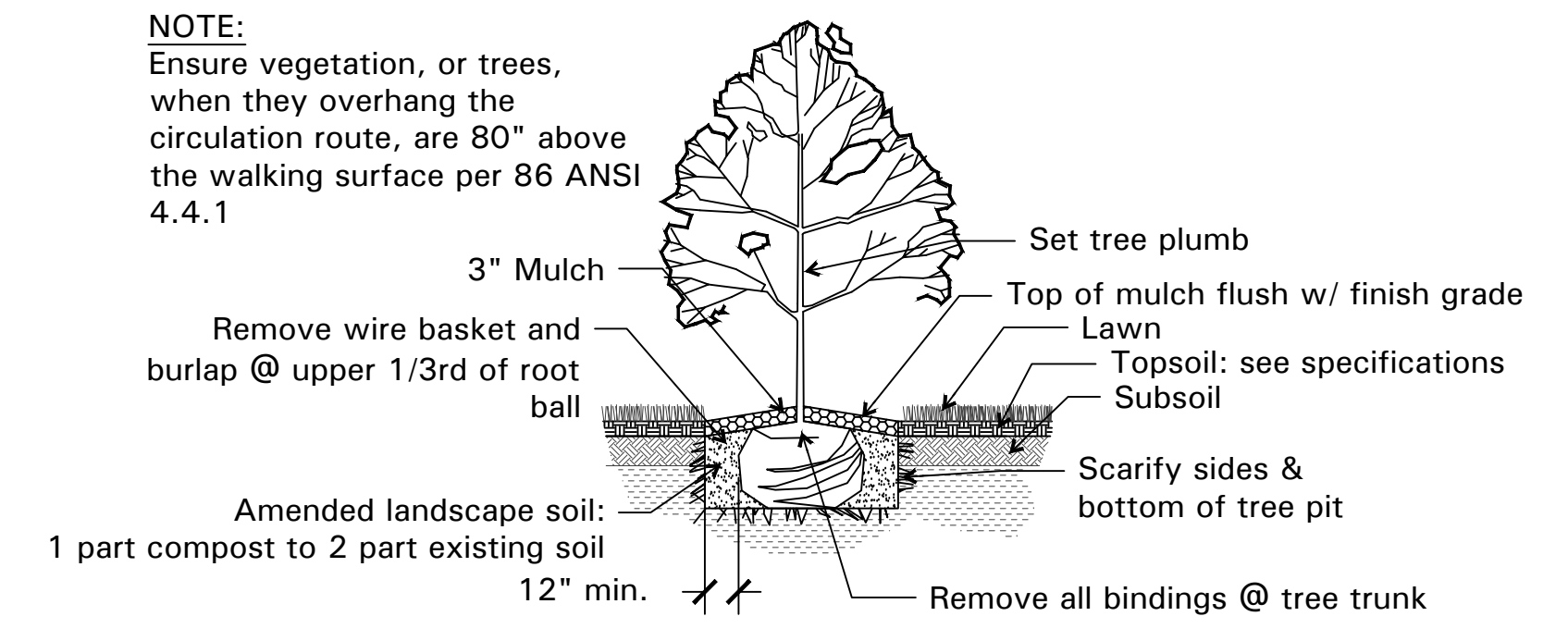


1 Planting Plan

Landscape Planting Schedule				
Key	Qty	Common Name	Botanical Name	Size
A	4	Red Maple	Acer rubrum	2.5" Cal.
B	14	Honey Locust	Gleditsia triacanthos f. inermis 'Skycote'	2.5" Cal.
C	3	Redbud	Ceris canadensis	1.5" Cal.

- GENERAL PLAN NOTES:**
- All plant species are Missouri Native cultivars and or drought tolerant.
  - See Civil sheets for lawn and erosion control.
  - Contractor is responsible for installing all plant material shown on plan.
  - Provide plants, of quantity, size, genus, species and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock".
  - Contractor to review and field verify existing and proposed conditions prior to construction.
  - Contractor is responsible to field locate all utilities prior to installation. Field adjust plants as required to avoid utilities.
  - Contractor to provide one-year full replacement guarantee on all plant materials shown on this plan.
  - Plan(s) do not constitute contractor means and methods. Job site safety and project coordination is responsibility of contractor(s).

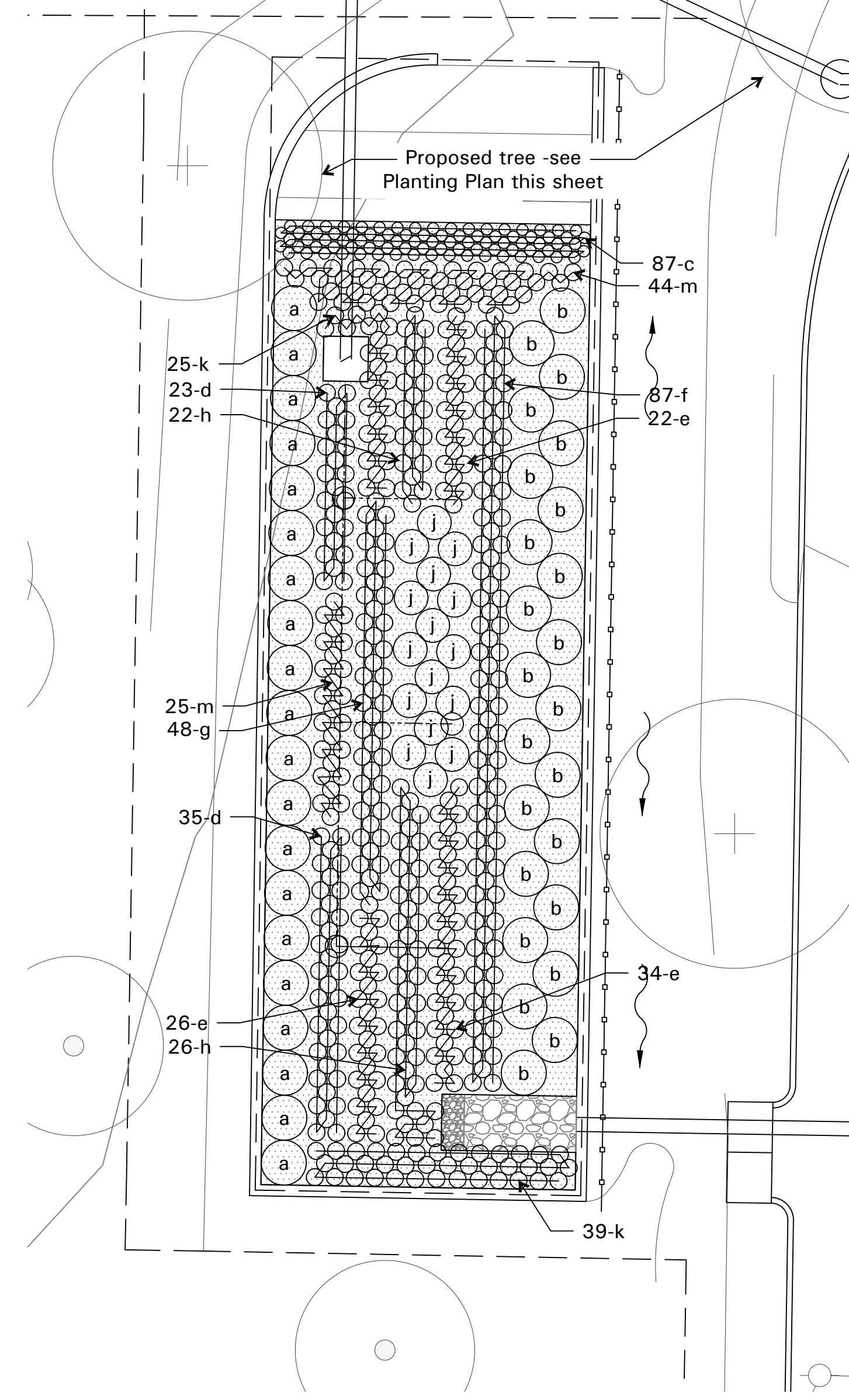
**NOTE:**  
Ensure vegetation, or trees, when they overhang the circulation route, are 80" above the walking surface per 86 ANSI 4.4.1



A Tree Planting Detail

Planting, Water and Mulch Requirements						
Water Availability	Required Planting Period	Minimum Container Size	Water Requirement First 3 Weeks	Water Requirement After 3 Weeks	Shredded leaf compost mulch depth for forbs and grasses	Shredded hardwood Bark Mulch for shrubs
Manual watering by hand	Late Feb. - Early June Sept. - October	see planting schedule this sheet	1" (60 min) every 4 days	1" (60 min) every 7 days until plants established	1.5" for plugs 2.5" for quarts	3" Depth

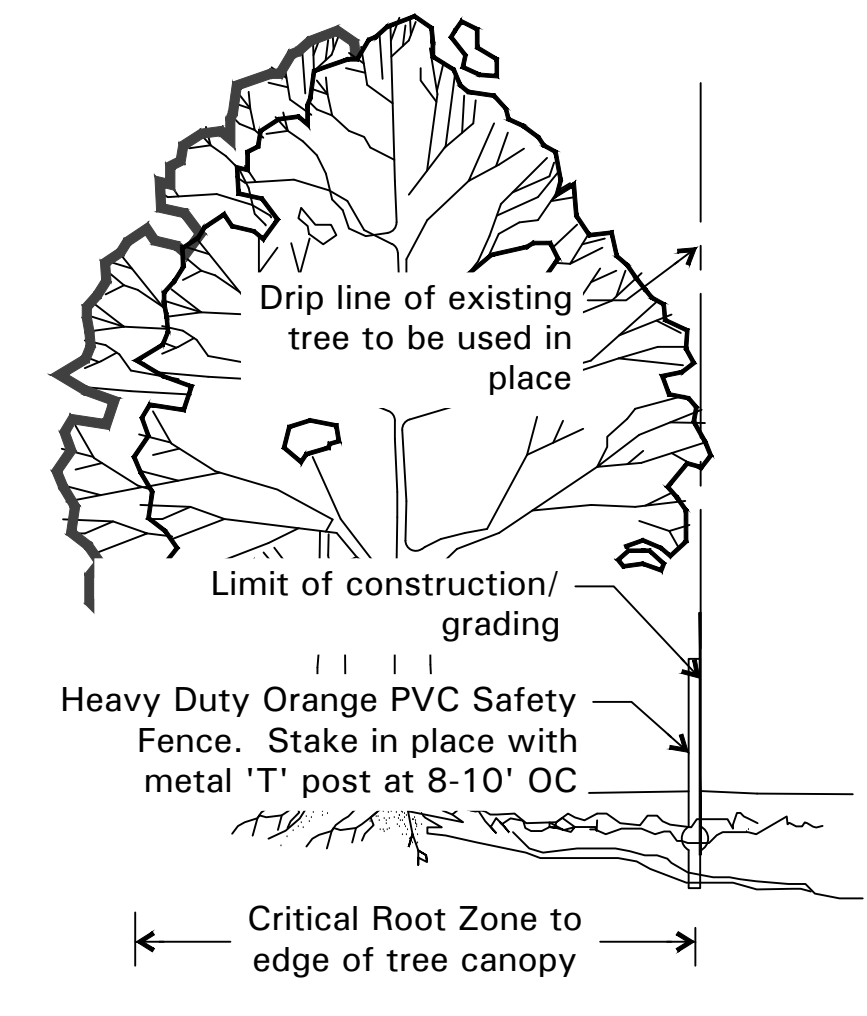
BMP Planting Schedule						
Type	Key	Qty	Botanical Name	Common Name	Size	Spacing
SHRUBS	a	20	Callicarpa americana	American Beautyberry	3 Gal.	30" OC
	b	24	Hydrangea arborescens	Hydrangea	3 Gal.	48" OC
GRASS/SEDGES	c	87	Carex albicans	Oak Sedge	1 Qt.	12" OC
	d	58	Schizachyrium scoparium	Little Bluestem	1 Gal.	18" OC
	e	82	Sporobolus heterolepis	Prairie Drop Seed	1 Gal.	18" OC
FORBS	f	87	Aster oblongifolius	Aromatic Aster	1 Gal.	18" OC
	g	48	Asclepias tuberosa	Butterfly Milkweed	1 Gal.	18" OC
	h	48	Echinacea purpurea 'Kim's Knee High'	Purple Coneflower	1 Gal.	18" OC
	j	16	Hibiscus lasiocarpus 'Koooper King'	Rose Mallow	1 Gal.	30" OC
	k	64	Iris fulva	Copper Iris	1 Gal.	18" OC
	m	69	Rudbeckia fulgida 'Goldstrum'	Orange Coneflower	1 Gal.	18" OC
2,340			+/- Sq. Ft. MSD approved mulch			



2 BMP Planting Plan

**Bio - Retention Planting Notes:**

- All plantings shall adhere to "Ecotype Rule." Plants of Missouri and/or Southern Illinois ecotype are required.
- Plant selections and design is based on providing a formal aesthetic.
- Refer to 'Planting, Water and Mulch Requirements for Stormwater BMP for Irrigation requirements.
- All landscape installation and maintenance work shall adhere to 'Landscape Guide for Stormwater Best Management Practice Design' published by MSD, St. Louis, MO Revision 2, May 2012.
- Bio-Retention plantings to be watered by hand as needed.
- See Civil Sheets for soils, under drain, seeding, sod and erosion control. THIS DETAIL FOR BMP PLANTING ONLY.
- Contractor to provide one-year full replacement guarantee on all plant materials shown on this plan.



B Tree Protection Detail with Fence

**APPLICATION SPECIFIC NOTES:**

- A "Pre meeting" shall be held on site by the general contractor will include operators, construction supervisors, owner representative and architect. Meeting shall be held to discuss tree protection methods and limits.
- Clearing limits shall be staked by general contractor prior to on site meeting, see Civil plan for limit of grading
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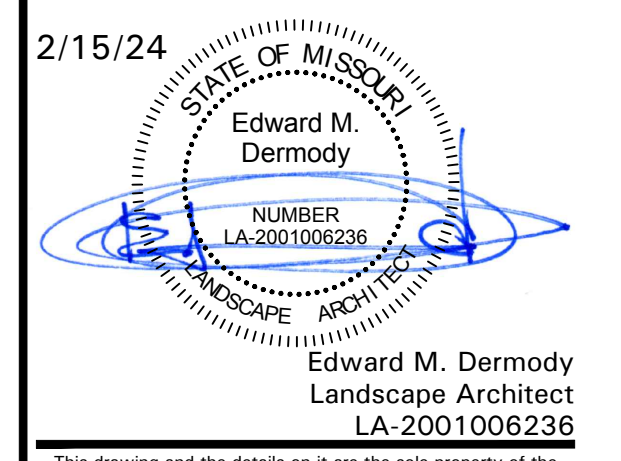
ph# 314.205.8871  
Missouri Certificate of Authority #200902208

Surveyor/ Civil Engineer:  
Site Development  
Engineering, Inc.  
3512 Yaeger Crossing Ct.  
St. Louis, MO 63129

Tree Preservation and Tree Mitigation Plan For:  
Manors at Lynstone Park,  
Sunset Hills, MO

Drawing prepared for:  
Manors at Lynstone Park, LLC  
10025 Office Center Ave., Suite 114  
St. Louis, Missouri 63128

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Sheet Title  
**Planting Plan**

Project Number: 499.001

Sheet Number:  
**L1.0**