RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT

18681 Lake Drive East
Chanhassen, MN 55317
952-607-6512
www.rpbcwd.org

Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2016-017 – modification

Considered at Board of Managers Meeting: July 10, 2024

Received complete: June 26, 2024

Applicant: Metropolitan Council – Southwest Light Rail Transit (SWLRT) Project

Representative: WBS, Earth Evans

Project: SWLRT - Construction of approximately 1.5 miles of SWLRT project corridor including light rail construction, road reconstruction, and construction of the Southwest Light Rail Transit Station area and bridge was approved in early 2017. Stormwater management facilities including one wet pond, seven infiltration basins, 19 ditches with check dams, pervious pavement, and planter boxes were constructed to provide volume control, water quality, and rate control for runoff prior to discharging offsite. Metropolitan Council has requested approval of a modification to the plans for the project involving conversion of the pervious pavement to combination of granite rock and impervious surface at three Traction Power Substation (TPSS) locations.

Location: Three TPSS locations in Eden Prairie with a footprint of 0.9% of the SWLRT project area in RPBCWD.

Reviewer: Scott Sobiech, PE; Barr Engineering Co.

Proposed Board Action

Manager _____ moved and Manager _____ seconded adoption of the following resolutions based on the permit report that follows and the presentation of the matter at the July 10, 2024 meeting of the managers:

Resolved that the application for reinstatement of permit 2016-017 and a modification to approval of permit 2016-017 is approved, subject to the conditions and stipulations set forth in the Recommendations section of the attached report;

Resolved that on determination by the RPBCWD administrator that the conditions of approval of the permit have been affirmatively resolved, the RPBCWD president or administrator is authorized and directed to sign and deliver permit 2016-017 to the applicant on behalf of RPBCWD.

Upon vote, the resolutions were adopted, _____ [VOTE TALLY].

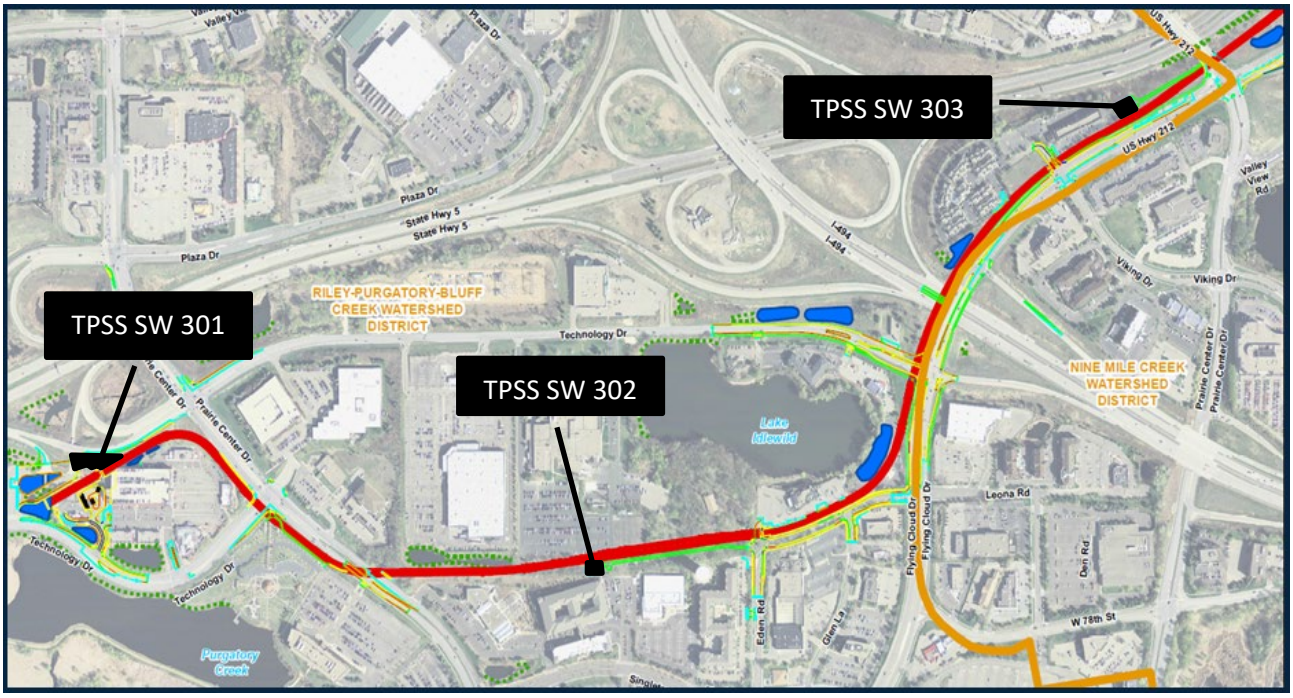
Applicable Rule Conformance Summary for Modification Request

Rule	Issue		Conforms to RBPCWD Rules?	Comments
J	Stormwater Management	Rate	Yes	
		Volume	Yes	

Rule	Issue		Conforms to RBPCWD Rules?	Comments
		Water Quality	Yes	
		Low Floor Elev.	Yes	
		Maintenance	Yes	
		Chloride Management	N/A	Requirement not in place during original approval.
		Wetland Protection	N/A	Requirement not in place during original approval.
L	**Permit Fee Deposit**		N/A	
M	**Financial Assurance**		N/A	

Background

Because of the lack of availability of pervious bituminous and supplier prices, Metropolitan Council modified the SWLRT plans by replacing most of the pervious pavement at the Traction Power Substation Site pads (TPSS) SW-301, SW-302 and SW-303 with pervious 1.5-inch granite aggregate and converting a portion of these areas to impervious surface parking pads. The proposed modification work at the TPSS locations represent 0.21 acres (0.5%) of the overall 42 acres of disturbance in the RPBCWD. The TPSS locations are considered redevelopment.



Most of the work is complete at the TPSS locations except for the proposed 1.5-inch granite aggregate and impervious pads (see adjacent photo of current site condition at TPSS 302 showing the approved course filter aggregate). Of the 17,769 square feet (SF) associated with the TPSS locations, 8,322 SF was approved impervious surface under permit 2016-017, 840 SF will be new additional bituminous, and the remaining portion of the TPSS locations will be covered with 1.5-inch granite aggregate above the approved course filter aggregate and fine filter aggregate with elevated draintile to promote abstraction. While overall site and project is provided for context, the analysis below is limited to the stormwater management rule criteria impacted by the proposed modification (rate, volume, and water quality). The applicant has completed design and is proposing a modification to permit 2016-017 to document the continued compliance.

The board's January 2017 conditional approval included delegation of limited authority to the administrator to approve requests for permit modifications, but because the five-year approval term for permit 2016-017 expired in December 2021, the applicant is requesting both approval of the modification and reinstatement of the permit.

The project site information is summarized in the following table.

Project site information (within RPBCWD's jurisdiction)

Site Information	Permit 2016-017	Modification	Total
Total Site Area (acres)	54	54	54
Existing Site Impervious Area (acres)	16.1	16.1	16.1
Post Construction Site Impervious (acres)	20.9	20.92	20.92
Increase in Site Impervious Area (acres)	4.8	0.02	4.82
Percent Increase in Impervious Surface	29.8	0.1	29.9
Disturbed Site Impervious Area (acres)	16.1	0.02	16.1
Percent Disturbance of Existing Impervious Surface	100	0	100
Total Disturbed Area (acres)	42	0.21	42

Exhibits:

1. Permit application dated June 11, 2024
2. Stormwater Memo dated May 24, 2024 (revised April 17, 2024)

3. Pavement Drawing Measurements received June 11, 2024
4. Pavement Cross Section sheet dated February 20, 2019 (revised June 25, 2024)
5. Drawings showing the proposed modifications dated June 25, 2024
6. Three 2014 Soil Borings by Braun Intertec
7. Specifications for walking ballast (1.5-inch granite aggregate)
8. Existing and Proposed HydroCAD Models for site TSPP 303 received June 26, 2024
9. Response to review comment received June 26, 2024
10. Construction photos of TPSS location 301, 302, and 303

Rule Specific Permit Conditions

Rule J: Stormwater Management

Because the overall project involves alteration of more 42 acres of surface area within RPBCWD's jurisdiction, conformance with RPBCWD's Stormwater Management Rule (Rule J) is required. The TPSS location areas of the project are considered redevelopment. The proposed modification work at the TPSS locations represent 0.21 acres (0.5%) of the overall 42 acres of disturbance in the RPBCWD. Because the overall project also increased the impervious area by more than 50 percent at three TPSS locations, the criteria of Section 3 will apply to the entire TPSS locations (Rule J, Subsection 2.3).

Rate Control

In order to meet the rate control criteria listed in Subsection 3.1.a, the 2-, 10-, and 100-year post development peak runoff rates must be equal to or less than the existing discharge rates at all locations where stormwater leaves the site.

The Applicant used a HydroCAD hydrologic model to simulate runoff rates for pre- and post-development conditions for the 2-, 10-, and 100-year frequency storm events using a nested rainfall distribution, and a 100-year frequency, 10-day snowmelt event. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site areas containing the three TPSS locations are summarized in the table below. The proposed project conforms to RPBCWD Rule J, Subsection 3.1.a.

Rate Control Summary:

Modeled Discharge Location	2-Year Discharge (cfs)		10-Year Discharge (cfs)		100-Year Discharge (cfs)		10-Day Snowmelt (cfs)	
	Ex	Prop	Ex	Prop	Ex	Prop	Ex	Prop
Tech Drive Box	3.7	0.0	6.2	0.0	11.2	3.1	1.7	1.6
Eden Curve Pond	48.2	20.3	81.3	59.8	146.5	88.1	30.0	23.5
303 (TPSS- Valley View)	0.2	<0.1	0.5	0.2	0.9	0.5	<0.1	<0.1

Volume Abstraction

TPSS Redevelopment Sites

Subsections 3.1.b and 2.3 of Rule J require the abstraction onsite of 1.1 inches of runoff from all impervious surfaces at the TPSS redevelopment locations. The Applicant proposes to install 1.5-inch granite aggregate over course filter aggregate and fine filter aggregate with elevated draintile to cover most of the TPSS sites to mitigate the need to provide additional rate control, volume abstraction, and water quality treatment. The following table summarizes land cover types associated with the TPSS locations.

TPSS	Total Area (SF)	Building Impervious Area (SF)	New Parking Pad Impervious Area (SF)	Impervious Area (SF)	Required Abstraction Volume (CF)	Provided Abstraction Volume (CF)
SW301	8860	3536	280	3816	350	851
SW302	3956	2428	280	2708	248	380
SW303	4953	2358	280	2638	242	475
Total	17,769	8322	840	9162	840	1,706

Because the fine filter aggregate below the draintile will provide abstraction for 1.1 inches of runoff from the constructed buildings and the impervious surface added to the project with this requested modification. The engineer concurs with the applicant's design infiltration rateand that the fine filter aggregate below the drwiantile will draw down within 48 hours (Rule J, subsection 3.1b.3)

The table below summarizes the volume abstraction for the TPSS redevelopment sites. The proposed project is in conformance with Rule J, Subsection 3.1.b.

Volume Abstraction Summary – TPSS Redevelopment Sites:

Required Abstraction Depth (inches)	Required Abstraction Volume (cubic feet)	Provided Abstraction Depth (inches)	Provided Abstraction Volume (cubic feet)
1.1	840	2.2	1,706

Water Quality Management

Subsection 3.1.c of Rule J requires the Applicant to provide volume abstraction in accordance with 3.1b or least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS) from site runoff, and no net increase in TSS or TP loading leaving the site from existing conditions. Because the 1.5-inch granite aggregate, course filter aggregate, and fine filter aggregate section with elevated draintile proposed by the applicant provides volume

abstraction meeting the standard in 3.1b and the engineer concurs with the modeling, under paragraph 3.1c.i, the engineer finds that the proposed project provides the required stormwater-quality protection.

Maintenance

Subsection 3.7 of Rule J requires the submission of maintenance plan. All stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity to assure that they continue to function as designed. The applicant executed a maintenance agreement with RPBCWD on May 7, 2018 as required by the original approval. The engineer recommends, that as a condition of approval, the applicant provide an updated draft maintenance agreement or amendment to the existing agreement to account for the change at the TPSS locations for RPBCWD's review and approval. Once approved by RPBCWD, the applicant must execute the revised maintenance agreement.

Applicable General Requirements:

1. The RPBCWD Administrator and Engineer shall be notified at least three days prior to commencement of the modification work.
2. Construction of the modification must be consistent with the plans, specifications, and models that were submitted by the applicant that were the basis of permit modification approval. The date(s) of the approved plans, specifications, and modeling are listed on the permit. The grant of the permit modification does not in any way relieve the permittee, its engineer, or other professional consultants of responsibility for the permitted work.
3. The grant of the permit does not relieve the permittee of any responsibility to obtain approval of any other regulatory body with authority.
4. The issuance of this permit does not convey any rights to either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.
5. In all cases where the doing by the permittee of anything authorized by this permit involves the taking, using or damaging of any property, rights or interests of any other person or persons, or of any publicly owned lands or improvements or interests, the permittee, before proceeding therewith, must acquire all necessary property rights and interest.
6. RPBCWD's determination to issue this permit was made in reliance on the information provided by the applicant. Any substantive change in the work affecting the nature and extent of applicability of RPBCWD regulatory requirements or substantive changes in the methods or means of compliance with RPBCWD regulatory requirements must be the subject of an application for a permit modification to the RPBCWD.
7. If the conditions herein are met and the permit is issued by RPBCWD, the applicant, by accepting the permit, grants access to the site of the work at all reasonable times during and after construction to authorized representatives of the RPBCWD for inspection of the work.

Findings

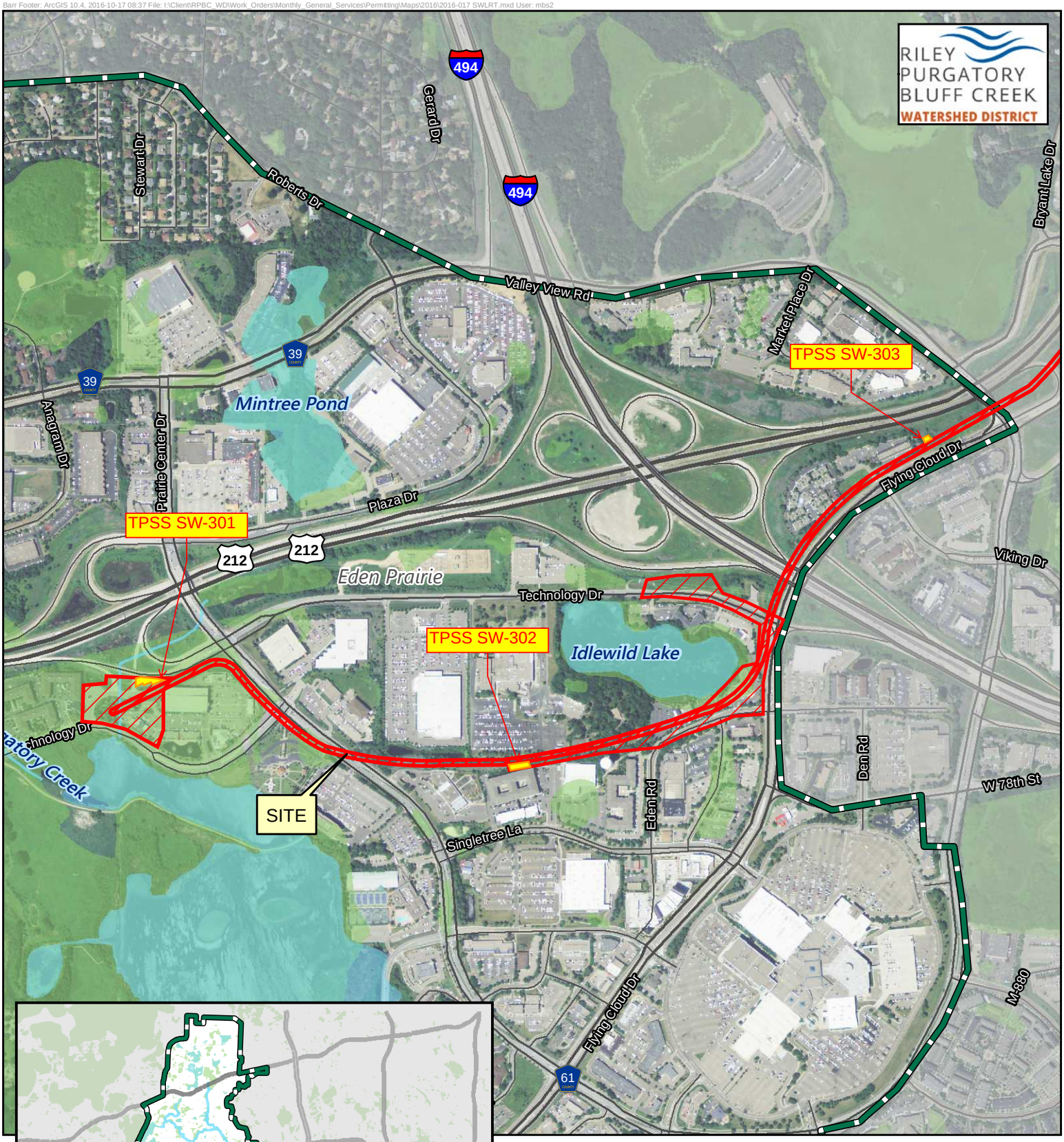
1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. The proposed project modification will conform to Rule J.

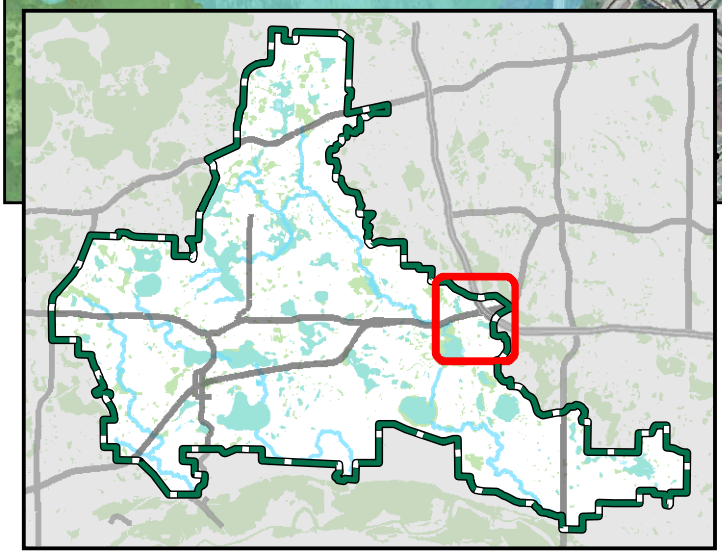
Recommendation:

Approval of the permit modification and reinstatement of permit 2016-017 for one year, as modified.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. Continued compliance with General Requirements.
2. Per Rule J Subsection 4.5, upon completion of the site work, the permittee must submit as-built drawings demonstrating that at the time of final stabilization the stormwater management facilities conforms to design specifications and functions as intended and approved by the District. As-built/record drawings must be signed by a professional engineer licensed in Minnesota and include, but not limited to:
    a) the surveyed bottom elevations, water levels, and general topography of all facilities;
    b) the size, type, and surveyed invert elevations of all stormwater facility inlets and outlets;
    c) the surveyed elevations of all emergency overflows including stormwater facility, street, and other;
    d) other important features to show that the project was constructed as approved by the Managers and protects the public health, welfare, and safety.
3. Providing the following additional close-out materials:
    a) Documentation that disturbed pervious areas remaining pervious have been decompacted per Rule C.3.2c criteria
4. To close out the permit, the applicant must provide an updated draft maintenance agreement and Exhibit A to account for the change at the TPSS locations for RPBCWD's review and approval. Once approved by RPBCWD, the applicant must execute the revised maintenance agreement.





N

Feet

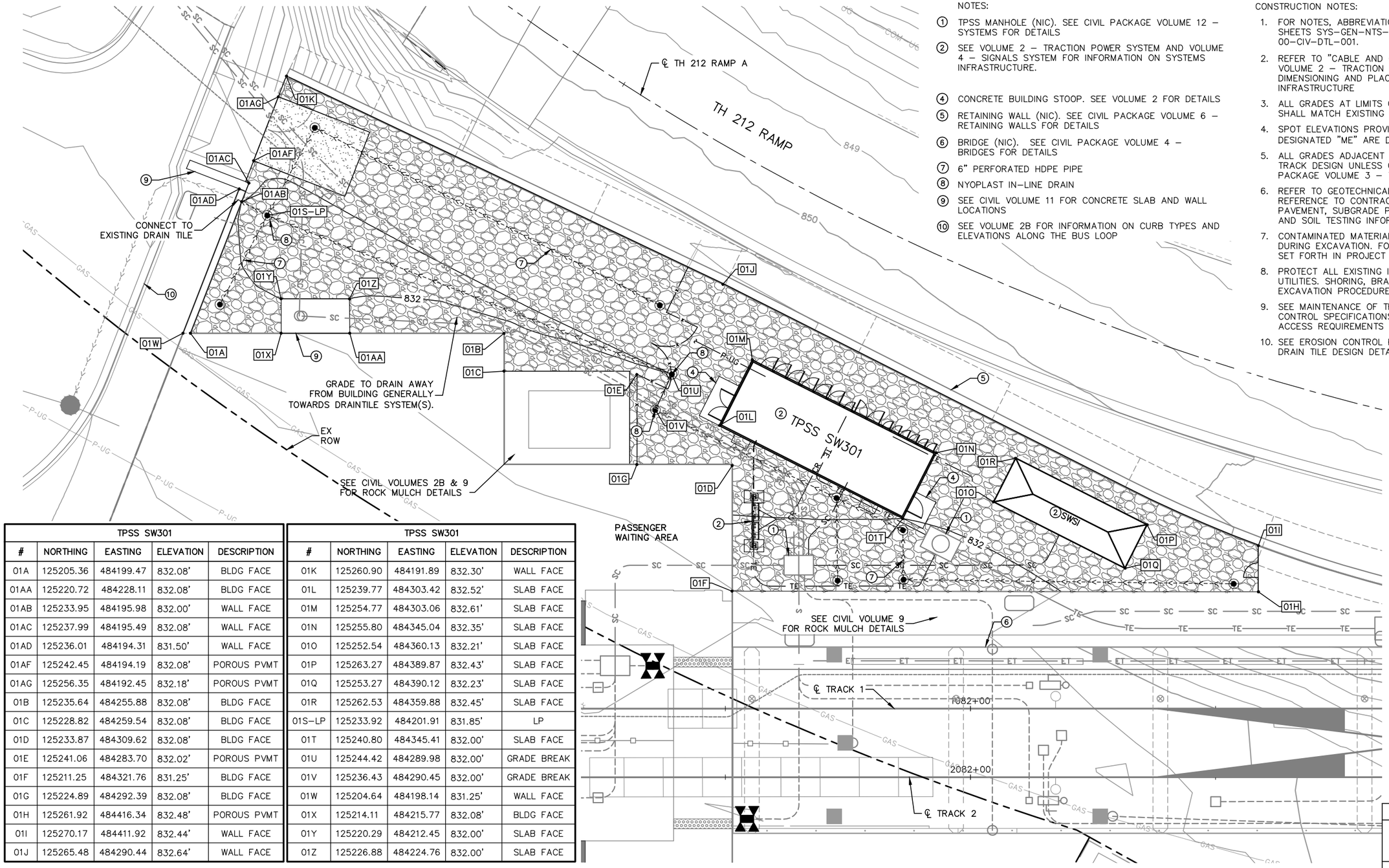
0 1,000

Permit Location Map

SWLRT

Permit 2016-017

Riley Purgatory Bluff Creek Watershed District



NOTES:

1. TPSS MANHOLE (NIC). SEE CIVIL PACKAGE VOLUME 12 – SYSTEMS FOR DETAILS
2. SEE VOLUME 2 – TRACTION POWER SYSTEM AND VOLUME 4 – SIGNALS SYSTEM FOR INFORMATION ON SYSTEMS INFRASTRUCTURE.
4. CONCRETE BUILDING STOOP. SEE VOLUME 2 FOR DETAILS
5. RETAINING WALL (NIC). SEE CIVIL PACKAGE VOLUME 6 – RETAINING WALLS FOR DETAILS
6. BRIDGE (NIC). SEE CIVIL PACKAGE VOLUME 4 – BRIDGES FOR DETAILS
7. 6" PERFORATED HDPE PIPE
8. NYOPLAST IN-LINE DRAIN
9. SEE CIVIL VOLUME 11 FOR CONCRETE SLAB AND WALL LOCATIONS
10. SEE VOLUME 2B FOR INFORMATION ON CURB TYPES AND ELEVATIONS ALONG THE BUS LOOP

CONSTRUCTION NOTES:

1. FOR NOTES, ABBREVIATIONS, AND SYMBOLS SEE SHEETS SYS-GEN-NTS-001, SYS-GEN-NTS-002, 00-CIV-DTL-001.
2. REFER TO "CABLE AND CONDUIT SCHEDULE" IN VOLUME 2 – TRACTION POWER SYSTEM FOR DIMENSIONING AND PLACEMENT OF SYSTEMS INFRASTRUCTURE
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9. SEE MAINTENANCE OF TRAFFIC AND TRAFFIC CONTROL SPECIFICATIONS FOR TRAIL AND SIDEWALK ACCESS REQUIREMENTS
10. SEE EROSION CONTROL PLANS IN THIS VOLUME FOR DRAIN TILE DESIGN DETAILS

TPSS SW301				
#	NORTHING	EASTING	ELEVATION	DESCRIPTION
01A	125205.36	484199.47	832.08'	BLDG FACE
01AA	125220.72	484228.11	832.08'	BLDG FACE
01AB	125233.95	484195.98	832.00'	WALL FACE
01AC	125237.99	484195.49	832.08'	WALL FACE
01AD	125236.01	484194.31	831.50'	WALL FACE
01AF	125242.45	484194.19	832.08'	POROUS PVMT
01AG	125256.35	484192.45	832.18'	POROUS PVMT
01B	125235.64	484255.88	832.08'	BLDG FACE
01C	125228.82	484259.54	832.08'	BLDG FACE
01D	125233.87	484309.62	832.08'	BLDG FACE
01E	125241.06	484283.70	832.02'	POROUS PVMT
01F	125211.25	484321.76	831.25'	BLDG FACE
01G	125224.89	484292.39	832.08'	BLDG FACE
01H	125261.92	484416.34	832.48'	POROUS PVMT
01I	125270.17	484411.92	832.44'	WALL FACE
01J	125265.48	484290.44	832.64'	WALL FACE

TPSS SW301				
#	NORTHING	EASTING	ELEVATION	DESCRIPTION
01K	125260.90	484191.89	832.30'	WALL FACE
01L	125239.77	484303.42	832.52'	SLAB FACE
01M	125254.77	484303.06	832.61'	SLAB FACE
01N	125255.80	484345.04	832.35'	SLAB FACE
01O	125252.54	484360.13	832.21'	SLAB FACE
01P	125263.27	484389.87	832.43'	SLAB FACE
01Q	125253.27	484390.12	832.23'	SLAB FACE
01R	125262.53	484359.88	832.45'	SLAB FACE
01S-LP	125233.92	484201.91	831.85'	LP
01T	125240.80	484345.41	832.00'	SLAB FACE
01U	125244.42	484289.98	832.00'	GRADE BREAK
01V	125236.43	484290.45	832.00'	GRADE BREAK
01W	125204.64	484198.14	831.25'	WALL FACE
01X	125214.11	484215.77	832.08'	BLDG FACE
01Y	125220.29	484212.45	832.00'	SLAB FACE
01Z	125226.88	484224.76	832.00'	SLAB FACE

LEGEND

PAVEMENT TYPE A	
WALKING BALLAST	

SOUTHWEST Green Line LRT Extension

SOUTHWEST LIGHT RAIL

SEGMENT W1
TPSS SITE SW301

REV: 0

DATE : 06/25/2024

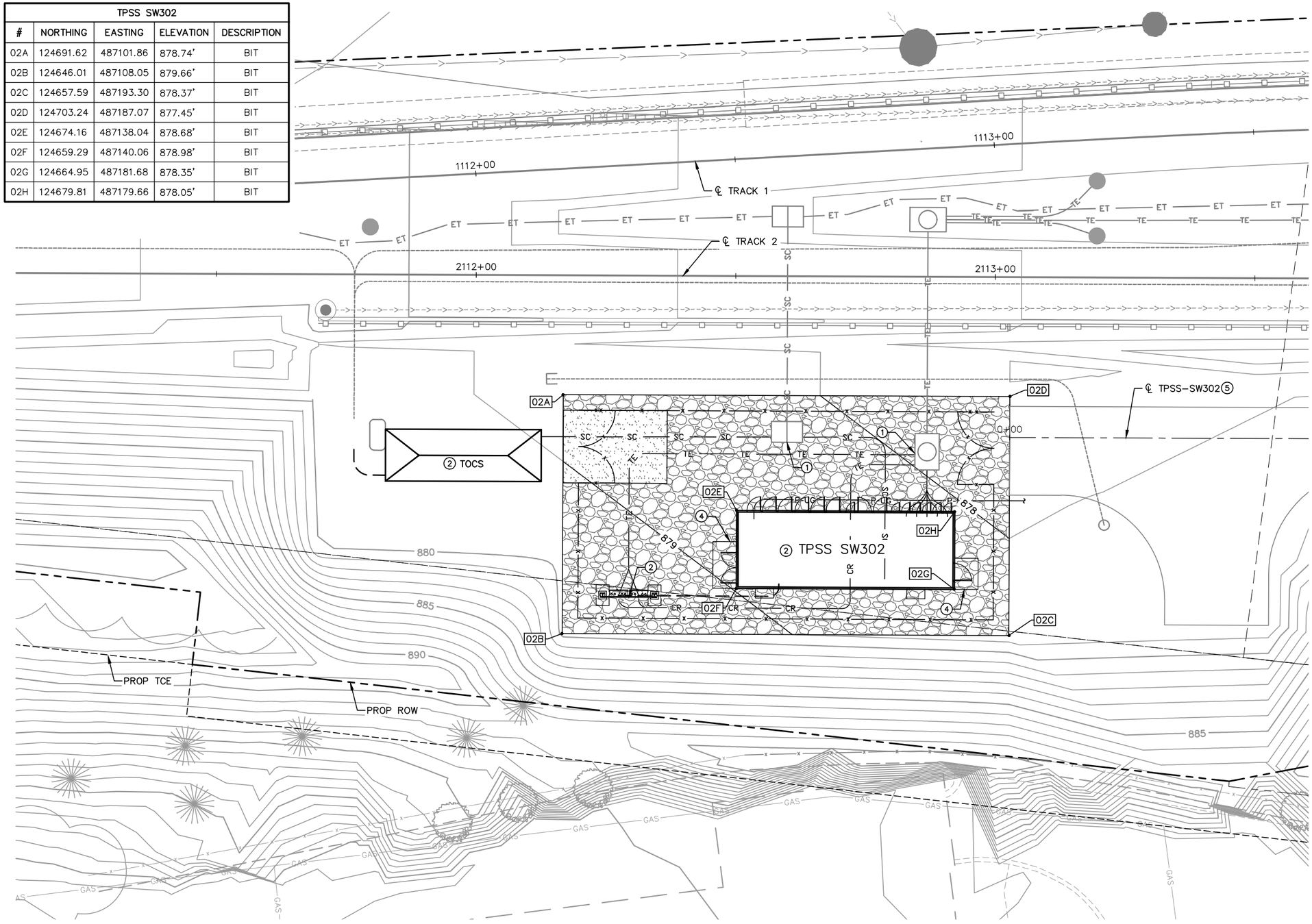
NORTH
0 5 10 20
HORIZONTAL SCALE IN FEET

METROPOLITAN COUNCIL

AECOM

SRF Consulting Group, Inc.

TPSS SW302				
#	NORTHING	EASTING	ELEVATION	DESCRIPTION
02A	124691.62	487101.86	878.74'	BIT
02B	124646.01	487108.05	879.66'	BIT
02C	124657.59	487193.30	878.37'	BIT
02D	124703.24	487187.07	877.45'	BIT
02E	124674.16	487138.04	878.68'	BIT
02F	124659.29	487140.06	878.98'	BIT
02G	124664.95	487181.68	878.35'	BIT
02H	124679.81	487179.66	878.05'	BIT



LEGEND

PAVEMENT TYPE A	
WALKING BALLAST	

CONSTRUCTION NOTES:

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NOTES:

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② SEE VOLUME 2 – TRACTION POWER SYSTEM AND VOLUME 4 – SIGNALS SYSTEM FOR INFORMATION ON SYSTEMS INFRASTRUCTURE.

④ CONCRETE BUILDING STOOP. SEE VOLUME 2 FOR DETAILS

⑤ TPSS ACCESS ROAD (NIC). SEE CIVIL PACKAGE VOLUME 2B – CIVIL FOR DETAILS

SOUTHWEST
Green Line LRT Extension

SOUTHWEST LIGHT RAIL

SEGMENT W1
TPSS SITE SW302

REV: 0

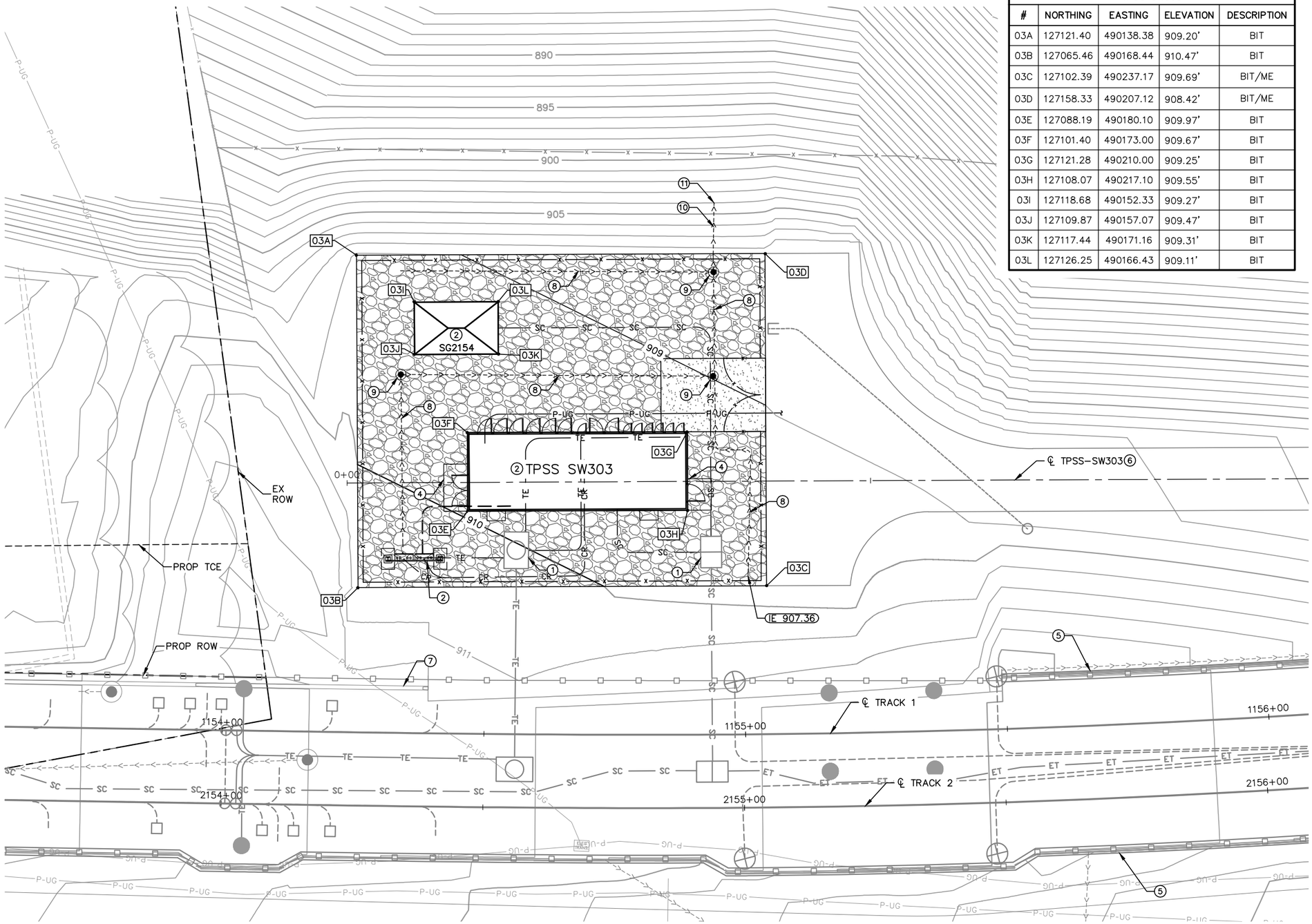
DATE : 06/25/2024

NORTH
0 5 10 20
HORIZONTAL SCALE IN FEET

METROPOLITAN COUNCIL

AECOM

SRF Consulting Group, Inc.



TPSS SW303				
#	NORTHING	EASTING	ELEVATION	DESCRIPTION
03A	127121.40	490138.38	909.20'	BIT
03B	127065.46	490168.44	910.47'	BIT
03C	127102.39	490237.17	909.69'	BIT/ME
03D	127158.33	490207.12	908.42'	BIT/ME
03E	127088.19	490180.10	909.97'	BIT
03F	127101.40	490173.00	909.67'	BIT
03G	127121.28	490210.00	909.25'	BIT
03H	127108.07	490217.10	909.55'	BIT
03I	127118.68	490152.33	909.27'	BIT
03J	127109.87	490157.07	909.47'	BIT
03K	127117.44	490171.16	909.31'	BIT
03L	127126.25	490166.43	909.11'	BIT

LEGEND	
PAVEMENT TYPE A	
WALKING BALLAST	

CONSTRUCTION NOTES:

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④ CONCRETE BUILDING STOOP. SEE VOLUME 2 FOR DETAILS

⑤ RETAINING WALL (NIC). SEE CIVIL PACKAGE VOLUME 6 – RETAINING WALLS FOR DETAILS

⑥ TPSS ACCESS ROAD (NIC). SEE CIVIL PACKAGE VOLUME 2B – CIVIL FOR DETAILS

⑦ BALLAST CURB (NIC). SEE CIVIL PACKAGE VOLUME 3 – TRACKWORK FOR DETAILS

⑧ 6" PERFORATED HDPE PIPE

⑨ NYOPLAST IN-LINE DRAIN

⑩ 6" HDPE PIPE

⑪ PRECAST CONCRETE HEADWALL PER MNDOT STANDARD PLATE 3131C

SOUTHWEST
Green Line LRT Extension

SOUTHWEST LIGHT RAIL

SEGMENT W1
TPSS SITE SW303

REV: 0

DATE : 06/25/2024

NORTH
0 5 10 20
HORIZONTAL SCALE IN FEET

METROPOLITAN COUNCIL

AECOM

SRF Consulting Group, Inc.

MNDOT STANDARD PLATES

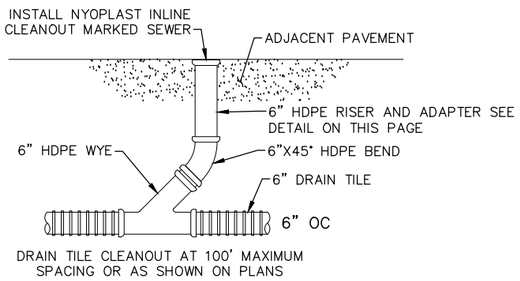
3131C	PRECAST CONCRETE HEADWALL FOR SUBSURFACE DRAINS
4006L	MANHOLE OR CATCH BASIN PRECAST
4101D	RING CASTING FOR MANHOLE OR CATCH BASIN

GENERAL NOTES

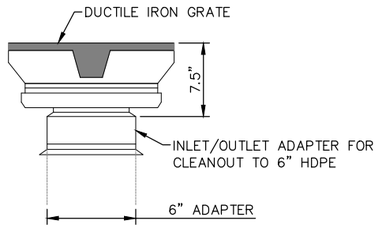
1. SIDEWALK, TRAIL, AND CURB DISTURBED OUTSIDE THE LIMITS OF CONSTRUCTION SHALL BE REPLACED TO MATCH THE EXISTING CONDITION. AREAS OF DISTURBANCE OUTSIDE THE LIMITS OF CONSTRUCTION SHALL BE AT THE CONTRACTOR'S EXPENSE.
2. CONTACT UTILITY COMPANIES FOR LOCATIONS OF ALL PUBLIC AND PRIVATE UTILITIES WITHIN THE WORK AREA PRIOR TO BEGINNING CONSTRUCTION. CONTACT GOPHER STATE ONE CALL AT 651-454-0002 IN THE METRO AREA, OR 1-800-252-1166 TOLL FREE FOR EXACT LOCATIONS OF EXISTING UTILITIES AT LEAST 48 WORKING HOURS BEFORE BEGINNING ANY CONSTRUCTION IN ACCORDANCE WITH MINNESOTA STATUE 216D.
3. CONTAMINATED SOILS ARE PRESENT THROUGHOUT THE PROJECT. REFER TO THE CONTRACT DOCUMENTS FOR ADDITIONAL INFORMATION REGARDING THE LIMITS AND MEASURES NEEDED IN HANDLING AND DISPOSING OF CONTAMINATED SOILS DURING CONSTRUCTION.
4. FOR HORIZONTAL AND VERTICAL CONTROL POINTS SEE CIVIL PACKAGE VOLUME 1 – EXISTING CONDITIONS AND REMOVALS

CONSTRUCTION NOTES

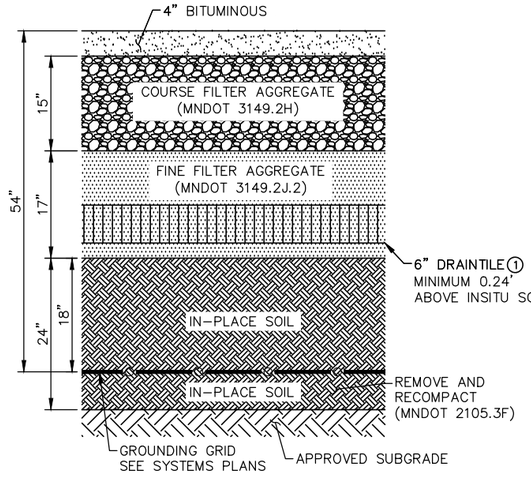
1. SUITABLE GRADING MATERIAL ON THE PROJECT SHALL CONSIST OF SOILS ENCOUNTERED WITH THE EXCEPTION OF TOPSOIL, DEBRIS, ORGANIC MATERIAL, MUCK, AND OTHER UNSTABLE MATERIAL.
2. OTHER GRADING MATERIAL ON THIS PROJECT SHALL CONSIST OF ALL SOILS ENCOUNTERED ON THIS PROJECT EXCEPT DEBRIS.
3. SELECT GRANULAR MATERIAL SHALL MEET THE REQUIREMENTS OF MNDOT SPECIFICATION 3149.2B2.
4. SUITABLE GRADING MATERIAL FROM ALL PORTIONS OF THE PROJECT SHALL BE USED IN FILL AREAS, AS REQUIRED, THROUGHOUT THE PROJECT.
5. NO DISPOSAL SITE IS PROVIDED. ALL EXCESS MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR FOR DISPOSAL. THE CONTRACTOR SHALL DISPOSE OF MATERIAL UNSUITABLE FOR USE IN THE CONSTRUCTION IN ACCORDANCE WITH PROVISIONS OF MNDOT SPECIFICATION 2104.3D3
6. COMPACTION OF THE GRADING OF THE PROJECT SHALL BE BY THE "SPECIFIED DENSITY METHOD". SEE MNDOT SPECIFICATION 2105.3F1.
7. COMPACTION OF THE AGGREGATE BASE FOR ALL AREA TO RECEIVE BITUMINOUS SURFACING SHALL BE BY THE "SPECIFIED DENSITY METHOD".
8. EXCAVATION FOR THE POROUS PAVEMENT WILL REQUIRE EXCAVATING AND BACKFILLING AROUND ITEMS SUCH AS MANHOLES, RETAINING WALLS, DUCTBANKS AND SIGNAL HOUSE FOUNDATIONS. BRACE AND SUPPORT IN-PLACE ITEMS AS NEEDED.
9. SUPPORT ALL IN-PLACE UTILITIES AND OTHER INFRASTRUCTURE DURING EXCAVATION AND CONSTRUCTION OF PROPOSED WORK. COSTS SHALL BE INCIDENTAL TO CONTRACT.
10. CONTRACTOR MUST RESTORE OR REPAIR DAMAGED UTILITIES TO CONDITION EQUAL TO OR BETTER THAN PRE-CONSTRUCTION CONDITION AND AS REQUIRED BY OWNER.
11. SHORING, SHEETING, BRACING, TRENCH BOXING, AND OTHER EXCAVATION MEASURES USED IN THE COURSE OF WORK TO INSTALL THE PROPOSED INFRASTRUCTURE OR USED TO SUPPORT, PROTECT, OR MAINTAIN SURFACE AND SUBSURFACE STRUCTURES AND UTILITIES SHALL BE DESIGNED, FURNISHED, INSTALLED, AND REMOVED AT THE CONTRACTOR'S EXPENSE. COSTS SHALL BE INCIDENTAL TO THE CONTRACT.
12. STRIP AND REUSE AS SLOPE DRESSING ALL TOPSOIL AND EXISTING SLOPE DRESSING WHERE PRESENT IN AREA TO BE DISTURBED BY CONSTRUCTION. ALL SLOPE DRESSING SHALL MEET THE REQUIREMENTS OF "SELECT TOPSOIL BORROW: (MNDOT SPECIFICATION 3877). TESTING OF SOILS USED SHALL BE REQUIRED.
13. PLACE A MINIMUM OF 4" SELECT TOPSOIL BORROW OR SLOPE DRESSING ON ALL AREAS DISTURBED BY CONSTRUCTION AND SCHEDULED FOR PERMANENT TURF ESTABLISHMENT.
14. PROVIDE AND MAINTAIN TEMPORARY DRAINAGE THROUGHOUT CONSTRUCTION UNTIL THE PERMANENT DRAINAGE SYSTEM AND STRUCTURES ARE IN PLACE AND OPERATIONAL. INSTALL TEMPORARY DITCHES, PIPING, PUMPS, OR OTHER MEANS AS NECESSARY IN ORDER TO INSURE PROPER DRAINAGE AT ALL TIMES. TEMPORARY DRAINAGE SHALL BE DESIGNED, FURNISHED, INSTALLED, AND REMOVED AT THE CONTRACTOR'S EXPENSE. COSTS SHALL BE INCIDENTAL TO THE CONTRACT.



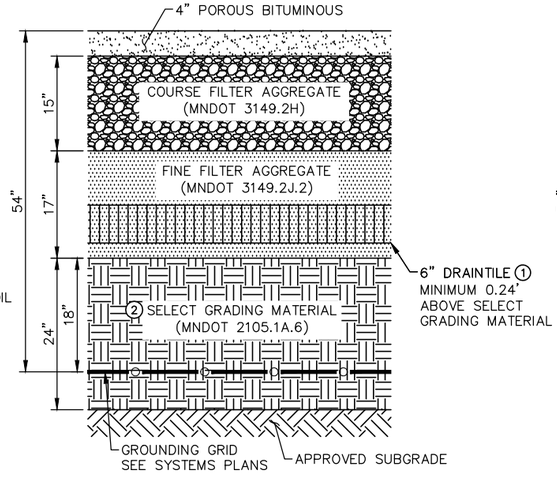
4 DRAIN TILE CLEANOUT
NOT TO SCALE



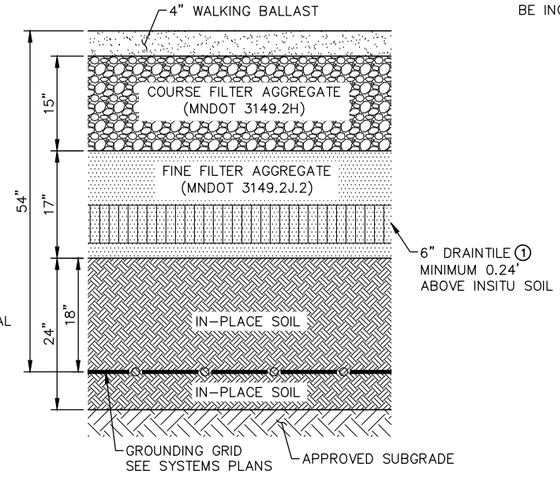
5 NYOPLAST 8" INLINE DRAIN
NOT TO SCALE



1 PAVEMENT TYPE A TYPICAL SECTION
NOT TO SCALE



2 POROUS PAVEMENT TYPE B③ TYPICAL SECTION
NOT TO SCALE



3 WALKING BALLAST ④ TYPICAL SECTION
NOT TO SCALE

NOTES:

① SEE EROSION CONTROL PLANS FOR DRAIN TILE DETAILS

② EXCLUDES SELECT GRANULAR MATERIAL PER MNDOT SPECIFICATION 3149.2B.2

③ TYPE B POROUS PAVEMENT SITES INCLUDE TPSS SW310, SW311, SW312, SW313, SW315, AND SW316

④ WALKING BALLAST SITES INCLUDE TPSS SW301, SW302, AND SW303

SOUTHWEST Green Line LRT Extension

SOUTHWEST LIGHT RAIL
CIVIL NOTES AND DETAILS

REV: 0

DATE : 06/25/2024

METROPOLITAN COUNCIL

AECOM

SRF Consulting Group, Inc.

SECTION 34 11 16
BALLAST

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes, but is not limited to, the following:
   1. Furnishing, quality testing, and production testing crushed rock for use as ballast for ballasted track for ballasted track construction.

B. Related Sections include the following:
   1. Section 34 11 06, Special Trackwork – Ballasted Track Construction
   2. Section 34 72 02, Ballasted Track Construction

1.02 RELATED DOCUMENTS

A. Drawings, General Provisions, of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.

B. See Section 01 20 00, Price and Payment Procedures for Measurement and payment requirements for Work under this Section.

1.03 REFERENCES

A. American Railway Engineering and Maintenance of Way Association (AREMA):
   1. Manual of Railway Engineering

B. ASTM International (ASTM):
   1. ASTM C29: Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate
   2. ASTM C88: Standard Test Method for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
   3. ASTM C117: Standard Test Method for Materials Finer Than 75-Micrometer (No. 200) Sieve in Mineral Aggregates by Washing
   4. ASTM C127: Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
   5. ASTM C136: Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
   6. ASTM C142: Standard Test Method for Clay Lumps and Friable Particles in Aggregates
   7. ASTM C702: Standard Practice for Reducing Samples of Aggregate to Testing Size
   8. ASTM C535: Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
   9. ASTM D75: Standard Test Method for Sampling Aggregates
   10. ASTM D4791: Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate

1.04 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Submit the following for review to the CAR:
   1. The name and qualifications of the ballast supplier.
   2. The name and qualifications of the testing service.
   3. Ballast testing and inspection results:
      a. Submit certificates of compliance certify the ballast material meets the requirements of this Section.

b. Submit certified reports of ballast qualification testing not less than 30 days before delivery to the job site.
c. Submit certified reports of ballast production testing on a weekly basis during production of the ballast.

4. Ballast handling plan.

1.05 QUALITY CONTROL

A. Employ a testing laboratory, approved by COUNCIL, certified to perform testing as specified herein.

B. Testing Laboratory Services:
1. The supplier's laboratory may be utilized for ballast production testing, but not initial product acceptance tests. Engage the services of an independent testing agency approved by COUNCIL to perform product acceptance tests. All source/plant testing will be the responsibility of the CONTRACTOR and requires approval from COUNCIL. COUNCIL will be responsible for point of placement testing.

C. Testing and Inspection:
1. Prior to initial shipment, submit test results to the CAR. If ballast source is changed, test ballast from replacement source prior to delivery.
2. Perform the following tests as specified, by an independent laboratory:
a. Method of sampling:
1) In accordance with ASTM D75, and ASTM C702
b. Sieve analysis:
1) In accordance with ASTM C136
c. Material finer than No. 200 Sieve:
1) In accordance with ASTM C117
2) Acceptance criteria as specified by the AREMA Manual for Railway Engineering, Chapter 1, Part 2, Table 1-2-1
d. Deleterious substances:
1) In accordance with ASTM C142
2) Acceptance criteria as specified by the AREMA Manual for Railway Engineering, Chapter 1, Part 2, Table 1-2-1
e. Resistance to degradation from abrasion:
1) In accordance with ASTM C535
2) Acceptance criteria as specified by the AREMA Manual for Railway Engineering, Chapter 1, Part 2, Table 1-2-1
f. Unit weight:
1) In accordance with ASTM C29
2) Acceptance criteria as specified by the AREMA Manual for Railway Engineering, Chapter 1, Part 2, Table 1-2-1
g. Soundness of aggregate:
1) In accordance with ASTM C88
2) Acceptance criteria as specified by the AREMA Manual for Railway Engineering, Chapter 1, Part 2, Table 1-2-1
h. Percentage of flat and elongated particles:
1) In accordance with ASTM D4791
2) Acceptance criteria as specified by the AREMA Manual for Railway Engineering, Chapter 1, Part 2, Table 1-2-1
i. Bulk specific gravity and percentage of absorption:
1) In accordance with ASTM C127
2) Acceptance criteria as specified by the AREMA Manual for Railway Engineering, Chapter 1, Part 2, Table 1-2-1
3. Ballast will be neither delivered to the site nor spread on grade prior to qualification test results being reviewed by the CAR.
4. Upon review of certified test reports the CAR will notify the CONTRACTOR of the material’s acceptance or disapproval.

5. Initial review of materials by the CAR will not prevent the removal and replacement of materials discovered to not meet this Section during construction and routine quality assurance operations by CAR.
6. Maintain and keep an up to date summary listing of ballast deliveries, the production testing required, samples taken, production tests performed and results, and the approximate location where the ballast that is represented by each group of production test results has been placed.
7. If any testing sample fails to meet the testing requirements, conduct a second test on another sample. In the event the second sample also fails to meet the requirements, halt delivery of the ballast and take immediate corrective action to meet the requirements of this Section. Promptly segregate materials which do not comply with this specification that have already been delivered to the project site from the accepted materials and removed from the premises. Replace materials not meeting the requirements of this specification at no additional cost to the COUNCIL.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Ballast:
   1. Provide prepared ballast that is of crushed rock containing no carbonates or slag, and which has hard, strong, angular, durable particles, free deleterious substances.
      a. Material will be crushed granite, traprock, quartzite, or gneiss. For uniformity, the same specified material will be used for the entire Contract limits.
   2. Ballast Gradation:
      a. Mainline ballast gradation will conform to AREMA Manual of Railway Engineering Chapter 1, Part 2, Table 1-2-2, Size No. 4A.
      b. Walking ballast gradation will conform to AREMA Manual of Railway Engineering Chapter 1, Part 2, Table 1-2-2, Size No. 5.

PART 3 - EXECUTION

3.01 PRODUCTION AND HANDLING

A. Manage the blending, stockpiling and other production and handling operations to minimize segregation, degradation, breakage, excessive fall, or contamination of the finished product. Limit the movement of wheeled or tracked vehicles over stockpiled materials.

B. Wash and re-screen processed ballast as necessary to correct fine particle contamination prior to stockpiling or immediately prior to loading.

3.02 QUALITY CONTROL INSPECTION

A. If material loaded or being loaded does not conform to the requirements of this Section, stop further loading until the faults has been corrected. Promptly remove defective material and replace at no additional cost to the COUNCIL.

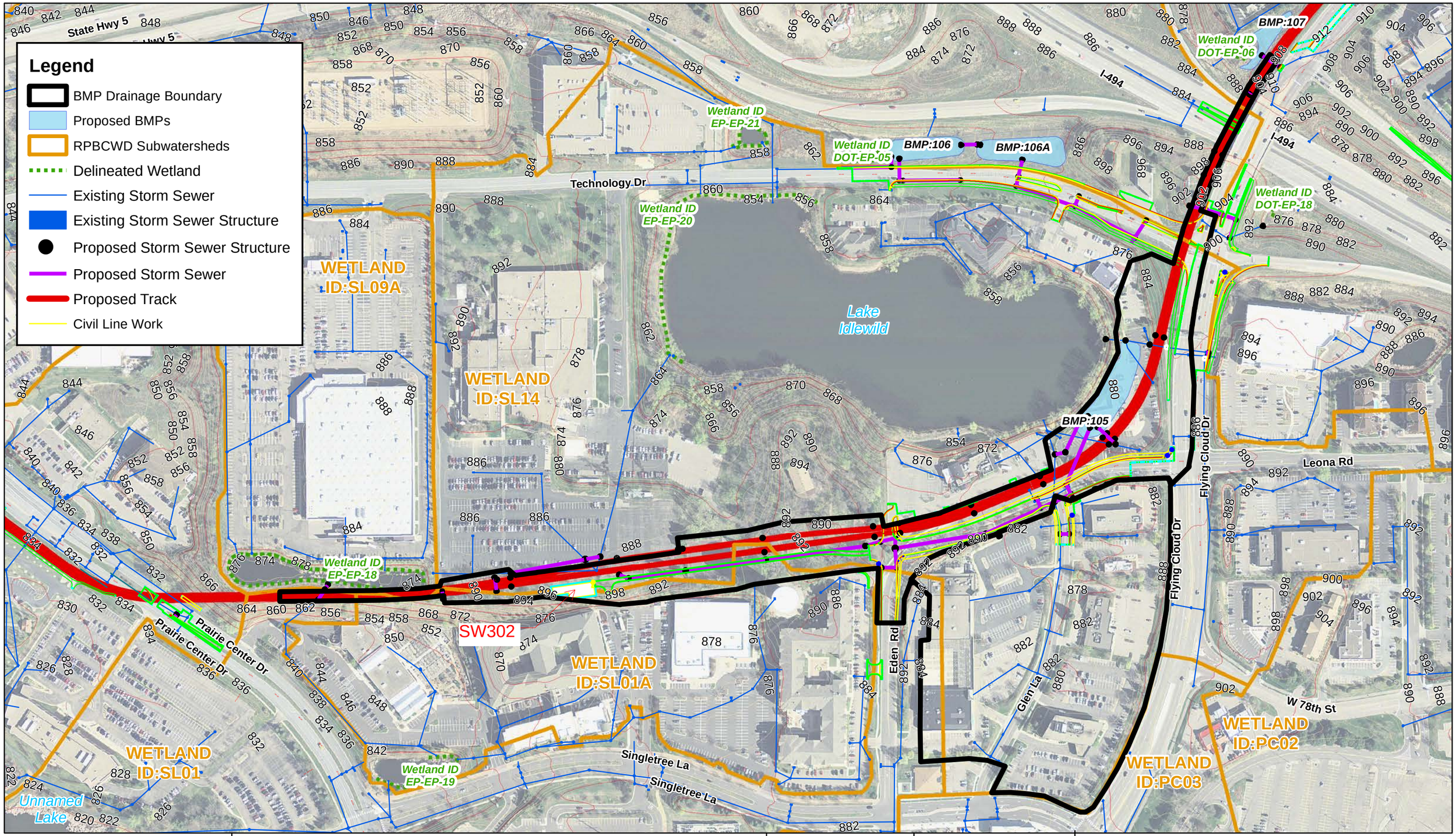
B. Source Quality Control
   1. From each 2000 tons of ballast, subject a test sample of no less than 150 pounds to all tests as specified in Article 1.05 of this Section.

C. Provide certification to CAR that the ballast delivered to the job site is typical of ballast which passed acceptance and production tests as specified in Article 1.05.

3.03 INSTALLATION

A. Install as specified in Sections 34 11 06, Special Trackwork – Ballasted Track Construction, and 34 72 02, Ballasted Track Construction.

END OF SECTION 34 11 16



SOUTHWEST
Green Line LRT Extention

EXHIBIT D3: SWLRT BMP 105

(EDEN CURVE)
TRIBUTARY AREA

DATE: 02/11/2016

N

0 75 150 300

METROPOLITAN COUNCIL

AECOM

WSB & Associates, Inc.

SW301

BMP:104

BMP:100

BMP:100

Wetland ID EP-EP-22

Wetland ID EP-EP-24

BMP:101

BMP:102

Wetland ID EP-EP-16

Technology Dr

Wetland ID DIG-EP-EP-04

Legend

- BMP Drainage Boundary
- Proposed BMPs
- Delineated Wetland
- Existing Storm Sewer
- Existing Storm Sewer Structure
- Proposed Storm Sewer Structure
- Proposed Storm Sewer
- Proposed Track
- Civil Line Work

SOUTHWEST
Green Line LRT Extention

EXHIBIT D1: SWLRT BMP 100, 101, 102

(SOUTHWEST STATION)
TRIBUTARY AREAS

DATE: 02/11/2016

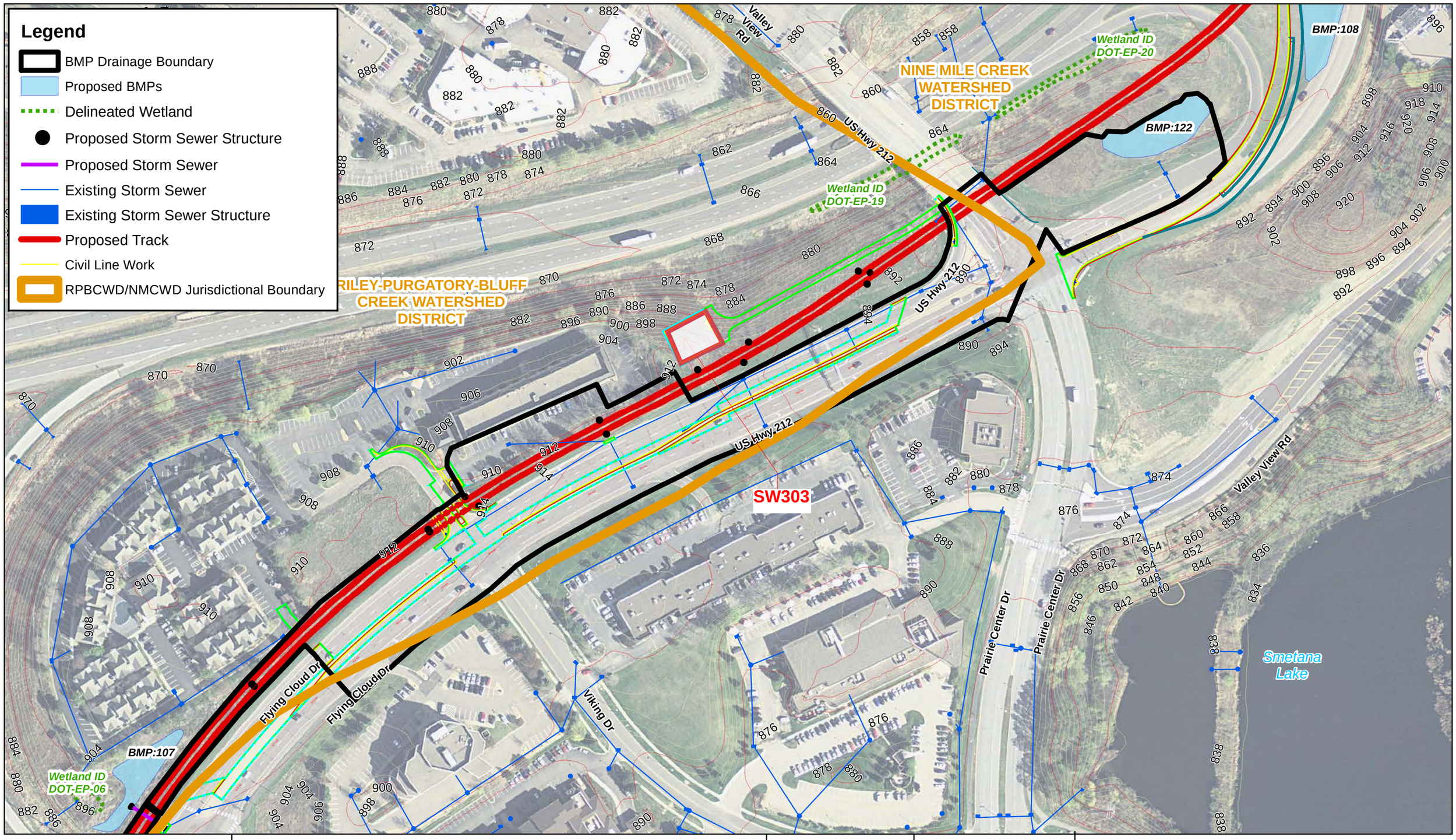
N

0 20 40 80

METROPOLITAN COUNCIL

AECOM

WSB



SOUTHWEST
Green Line LRT Extention

EXHIBIT D6: SWLRT BMP 122

(Local Work (LW) 26)
TRIBUTARY AREA

DATE: 02/11/2016

N
0 40 80 160

METROPOLITAN COUNCIL

AECOM

WSB & Associates, Inc.