

PLAN SYMBOLS

QUARTER SECTION LINE	----
SECTION LINE	----
SIXTEENTH SECTION LINE	----
STATE BOUNDARY	----
TOWNSHIP LINE	----
CONTOUR - INDEX	----
CONTOUR - INTERMEDIATE	----
ROAD - TRAIL	----
ROAD - GRAVEL (UNIMPROVED)	----
ROADWAY	----
ROAD - SHOULDER GRAVEL	----
PARKING - GRAVEL (UNIMPROVED)	----
PARKING	----
ROAD - CENTERLINE	----
ENTRANCE	----
CURB	----
GUARDRAIL	----
EXISTING STEAM	----
EXISTING GAS MAIN	----
EXISTING SANITARY SEWER	----
EXISTING STORM DRAIN	----
EXISTING WATER MAIN	----
EXISTING ELEC-UG	----
EXISTING TEL-UG	----
EXISTING TV-UG	----
PROPOSED STEAM	----
PROPOSED GAS MAIN	----
PROPOSED SANITARY SEWER	----
PROPOSED STORM DRAIN	----
PROPOSED WATER MAIN	----
PROPOSED ELEC-UG	----
PROPOSED TEL-UG	----
PROPOSED TV-UG	----
PROPOSED SUB-DRAIN	----
CLAVERT - (LINE)	----
PROPERTY LINE	----
TEMPORARY EASEMENT	----
FENCE - CHAINLINK	----
FENCE - UNIDENTIFIED	----
FENCE - BARS WIRE	----
SIDEWALK - BITUMINOUS	----
RAILROADS	----
PAINTED STREET SYMBOLS	----
CROSSWALK LINES	----
ALLEYS - NO CURBS, CONCRETE	----
RECREATIONAL PATHS	----
TREE - UNIDENTIFIED (LINE)	----
HEDGE	----

UTILITY SYMBOLS

PROPERTY CORNER	○
CONTROL POINT	△
WATER METER	⊕
WELL	⊙
PEDESTAL (TELEPHONE CABLE TERMINAL)	⊕
PEDESTAL (TELEPHONE CABLE TERMINAL)	⊕
PARKING METER - SINGLE	⊕
PARKING METER - DOUBLE	⊕
FIRE HYDRANT	⊕
GAS SHUT OFF VALVE	⊕
GAS VALVE	⊕
WATER SHUT OFF VALVE	⊕
WATER VALVE	⊕
EXISTING CATCH BASIN	⊕
EXISTING ELECTRIC MANHOLE	⊕
EXISTING GAS MANHOLE	⊕
EXISTING SANITARY MANHOLE	⊕
EXISTING STEAM MANHOLE	⊕
EXISTING STORM MANHOLE	⊕
EXISTING TELEPHONE MANHOLE	⊕
EXISTING TELEPHONE VAULT	⊕
EXISTING TELEVISION MANHOLE	⊕
EXISTING WATER MANHOLE	⊕
EXISTING WATER & GAS MANHOLE	⊕
PROPOSED CATCH BASIN	⊕
PROPOSED ELECTRIC MANHOLE	⊕
PROPOSED GAS MANHOLE	⊕
PROPOSED SANITARY MANHOLE	⊕
PROPOSED STEAM MANHOLE	⊕
PROPOSED STORM MANHOLE	⊕
PROPOSED TELEPHONE MANHOLE	⊕
PROPOSED TELEPHONE VAULT	⊕
PROPOSED TELEVISION MANHOLE	⊕
PROPOSED WATER MANHOLE	⊕
PROPOSED WATER & GAS MANHOLE	⊕
ANODE	⊕
ELECTRICAL BOX	⊕
ELECTRICAL VAULT	⊕
ELECTRICAL HAND HOLE (PULL BOX)	⊕
ELECTRICAL METER	⊕
ELECTRICAL PANEL	⊕
ELECTRICAL TRANSFORMER BOX	⊕
EXISTING LIGHT POLE	⊕
PROPOSED LIGHT POLE	⊕
LITE ON POWER POLE	⊕
POLE - ELECTRICAL W/TRANSFORMER	⊕
LUMIN	⊕
LUMIN2	⊕
POWER POLE	⊕
SIGNAL VAULT	⊕
TRAFFIC SIGNAL	⊕
TRAFFIC SIGNAL POLE	⊕
ANCHOR	⊕
BUSH	⊕
SWAMP - (SYMBOL)	⊕
TREE - UNIDENTIFIED (SYMBOL)	⊕
TREE - EVERGREEN	⊕
SOIL BORING	⊕
SGN - UNIDENTIFIED (SYMBOL)	⊕
MONUMENT	⊕

# MINNESOTA DEPARTMENT OF TRANSPORTATION

# CITY OF DULUTH

## DEPARTMENT OF PUBLIC WORKS AND UTILITIES

## ENGINEERING DIVISION

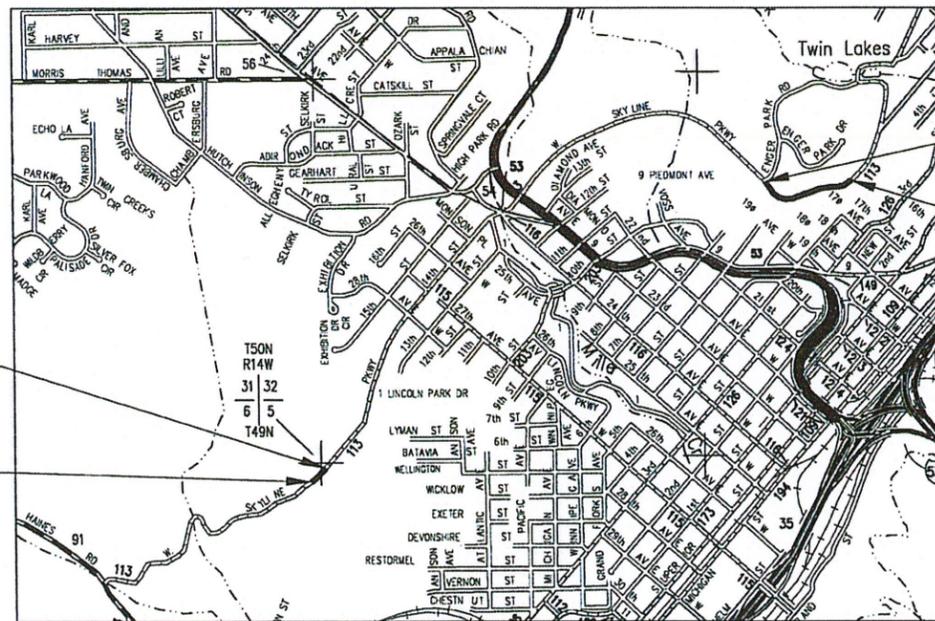
CONSTRUCTION PLANS FOR: WEST SKYLINE PARKWAY RETAINING WALL RESTORATION - STONE MASONRY RETAINING WALL AND MONUMENT RESTORATION AT THE ONEOTA OVERLOOK AND SECTION 3 TURNOUT SITES.

GEOGRAPHIC LOCATION: LOCATED ALONG WEST SKYLINE PARKWAY (M.S.A.S. 113) APPROX. 0.70 MILES EAST OF C.S.A.H. 91 (ONEOTA OVERLOOK) AND APPROX. 0.80 MILES EAST OF T.H. 53 (SECTION 3 TURNOUT).

LEGAL DESCRIPTION: ONEOTA OVERLOOK: FROM A POINT THAT IS 131' WEST AND 259' SOUTH OF THE NORTHEAST CORNER OF SEC. 6, T49N, R14W. TO A POINT THAT IS 61' EAST AND 72' SOUTH OF THE NORTHWEST CORNER OF SEC. 5, T49N, R14W.

SECTION 3 TURNOUT: FROM A POINT THAT IS 948' EAST AND 1502' SOUTH OF THE NORTHWEST CORNER OF SEC. 33, T50N, R14W. TO A POINT THAT IS 2125' EAST AND 1485' SOUTH OF THE NORTHWEST CORNER OF SEC. 33, T50N, R14W.

ONEOTA OVERLOOK				SECTION 3 TURNOUT					
GROSS LENGTH	269.78	FEET	0.051	MILE	GROSS LENGTH	1056.12	FEET	0.200	MILE
BRIDGES-LENGTH	N/A	FEET	N/A	MILE	BRIDGES-LENGTH	N/A	FEET	N/A	MILE
EXCEPTIONS-LENGTH	---	FEET	---	MILE	EXCEPTIONS-LENGTH	---	FEET	---	MILE
NET LENGTH	269.78	FEET	0.051	MILE	NET LENGTH	1056.12	FEET	0.200	MILE



END ONEOTA OVERLOOK WORK  
STA. 54+12.60

BEG. ONEOTA OVERLOOK WORK  
BEG. S.P. 118-060-012  
STA. 51+42.82

BEG. SECTION 3 TURNOUT WORK  
STA. 101+82.89

END SECTION 3 TURNOUT WORK  
END S.P. 118-060-012  
STA. 112+39.01

**WARNING**  
LOCATION OF UNDERGROUND UTILITIES  
TO BE VERIFIED BY CONTRACTOR.  
CALL BEFORE DIGGING.  
GOPHER STATE ONE CALL  
1-800-252-1166  
REQUIRED BY LAW

**MANHOLE & CATCH BASIN INDEX**

INPLACE CATCH BASIN	INPLACE WATER/GAS MANHOLE	PROPOSED CATCH BASIN	PROPOSED WATER/GAS MANHOLE
INPLACE DRAINAGE MANHOLE	INPLACE STEAM MANHOLE	PROPOSED DRAINAGE MANHOLE	PROPOSED STEAM MANHOLE
INPLACE SANITARY MANHOLE	INPLACE GAS ONLY MANHOLE	PROPOSED SANITARY MANHOLE	PROPOSED GAS ONLY MANHOLE
INPLACE TELEPHONE MANHOLE	INPLACE POWER MANHOLE	PROPOSED TELEPHONE MANHOLE	PROPOSED POWER MANHOLE



PROJECT LOCATION:  
CITY OF DULUTH  
ST. LOUIS COUNTY  
ONEOTA OVERLOOK: SEC. 5 & 6, T49N, R14W  
SECTION 3 TURNOUT: SEC. 33, T50N, R14W



LHB PROJECT. No. 160126

City of Duluth Proj. No. 1494

S.P. No. 118-060-012

Minn. Proj. No. **TA 6917 (223)**

**GOVERNING SPECIFICATIONS**  
THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.  
(AVAILABLE AT: <http://www.dot.state.mn.us/pre-letting/spec/>)

THE 2017 EDITION OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS SHALL APPLY.

ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MN MUTCD, INCLUDING THE FIELD MANUAL DATED "LATEST ADDITION".  
(AVAILABLE AT: <http://www.dot.state.mn.us/trafficeng/>)

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

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5	EROSION CONTROL NOTES
6	EROSION CONTROL DETAILS
7	ONEOTA OVERLOOK - EROSION CONTROL PLAN
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10	ONEOTA OVERLOOK - GENERAL PLAN & WORK SCOPE
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16-17	SECTION 3 TURNOUT - TRAFFIC CONTROL
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THIS PLAN CONTAINS 33 SHEETS

**DESIGN DESIGNATION**

	ONEOTA OVERLOOK	SECTION 3 T.O.
PROJECT	2017	2017
ADT (CURRENT YEAR) 2017	723	1782
ADT (FUTURE YEAR) 2037	868	2139
HCADT (CURRENT)	---	---
HCADT (FUTURE)	N/A	N/A
STRUCTURE DESIGN	130	130
SOIL FACTOR	N/A	N/A
DESIGN SPEED	N/A	N/A
CLASSIFICATION	COLLECTOR	COLLECTOR

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

PROJECT ENGINEER: *Joseph D. Litman*  
 JOSEPH D. LITMAN 04/03/17 21833  
 PROJECT ENGINEER (TYPED OR PRINTED NAME) DATE LIC. No.  
 CITY APPROVALS:  
 APPROVED: *[Signature]* 4/3/17 DATE  
 APPROVED: *[Signature]* 4/3/17 DATE  
 APPROVED: *[Signature]* 4/3/17 DATE  
 STATE AND FEDERAL AID APPROVALS:  
 DISTRICT STATE AID ENGINEER: REVIEWED FOR COMPLIANCE WITH STATE AND FEDERAL-AID RULES/POLICY DATE  
 STATE AID ENGINEER: APPROVED FOR STATE AND FEDERAL AID FUNDING DATE 5-25-17

SHEET 01 OF 33 SHEETS

**STATEMENT OF ESTIMATED QUANTITIES**

BID ITEM	SPEC. NO.	ITEM	UNIT	ONEOTA OVERLOOK	SECTION 3 TURNOUT	TOTAL QUANTITY	FINAL QUANTITY
1	2021.501	MOBILIZATION	LUMP SUM	0.25	0.75	1	
① 2	2101.511	CLEARING AND GRUBBING	LUMP SUM	0.4	0.6	1	
3	2104.505	REMOVE BITUMINOUS PAVEMENT	SQ YD	300	1580	1880	
4	2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	210	900	1110	
5	2105.501	COMMON EXCAVATION	CU YD	150	420	570	
6	2105.522	SELECT GRANULAR BORROW MOD 7% (CV)	CU YD	200	580	780	
7	2105.604	GEOTEXTILE FABRIC TYPE V	SQ YD	280	780	1060	
8	2118.607	AGGREGATE SURFACING (CV) CLASS 1	CU YD		30	30	
9	2211.503	AGGREGATE BASE (CV) CLASS 5	CU YD	70	280	350	
② ③ 10	2360.501	TYPE SP 9.5 WEARING COURSE MIXTURE (3,C)	TON	29	150	179	
② ③ 11	2360.502	TYPE SP 12.5 NON WEARING COURSE MIXTURE (3,C)	TON	48	250	298	
12	2401.521	STRUCTURE EXCAVATION CLASS E	CU YD	180	1110	1290	
13	2433.516	ANCHORAGES TYPE 1	EACH	16		16	
14	2451.515	COARSE AGGREGATE BEDDING (CV)	CU YD	10	90	100	
15	2501.515	12" RC PIPE APRON	EACH	2		2	
16	2502.601	DRAINAGE SYSTEM	LUMP SUM		1	1	
17	2503.541	12" RC PIPE SEWER DESIGN 3006	LIN FT	10		10	

**STATEMENT OF ESTIMATED QUANTITIES (CONTINUED)**

BID ITEM	SPEC. NO.	ITEM	UNIT	ONEOTA OVERLOOK	SECTION 3 TURNOUT	TOTAL QUANTITY	FINAL QUANTITY
18	2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN H	LIN FT	9		9	
19	2506.602	CASTING ASSEMBLY SPECIAL	EACH	2		2	
20	2511.501	RANDOM RIPRAP CLASS III	CU YD	9	15	24	
21	2511.511	GRANULAR FILTER MOD	CU YD		190	190	
22	2511.515	GEOTEXTILE FILTER TYPE VII	SQ YD		20	20	
23	2511.602	FURNISH AND SET BOULDER	EACH		30	30	
24	2511.602	RESET BOULDER	EACH		110	110	
25	2540.601	MONUMENT RESTORATION	LUMP SUM		1	1	
26	2541.618	RECONSTRUCT STONE HISTORIC STRUCTURE (DRY-STACK)	SQ FT		3270	3270	
27	2541.618	RECONSTRUCT STONE HISTORIC STRUCTURE (MORTARED)	SQ FT	460		460	
28	2541.618	REPAIR CONCRETE CAP TYPE 1	SQ FT	35		35	
29	2541.618	REPAIR CONCRETE CAP TYPE 2	SQ FT		3000	3000	
30	2541.618	REPOINT HISTORIC STRUCTURE	SQ FT	2470		2470	
31	2541.618	RESTORE HISTORIC WALL (RE-CHINK)	SQ FT		80	80	
32	2563.601	TRAFFIC CONTROL	LUMP SUM	0.75	0.25	1	
⑨ 33	2573.502	SILT FENCE, TYPE HI (TYPE 1)	LIN FT	170	590	760	
⑩ 34	2573.502	SILT FENCE, TYPE HI (TYPE 2)	LIN FT	250	140	390	
35	2573.530	STORM DRAIN INLET PROTECTION	EACH		2	2	
36	2574.525	COMMON TOPSOIL BORROW	CU YD	60	90	150	
④ 37	2575.523	EROSION CONTROL BLANKETS CATEGORY 3N	SQ YD	820	1050	1870	
⑤ 38	2575.555	TURF ESTABLISHMENT	LUMP SUM	0.4	0.6	1	
⑥ 39	2582.502	4" DOUBLE SOLID LINE PAINT	LIN FT		830	830	
⑦ 40	2582.502	4" SOLID LINE PAINT	LIN FT		830	830	

**STANDARD PLATES**

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT

PLATE NO.	DESCRIPTION
3000L	REINFORCED CONCRETE PIPE
3006G	GASKET JOINT FOR REINFORCED CONCRETE PIPE
3100G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3131C	PRECAST CONCRETE HEADWALL FOR SUBSURFACE DRAINS
3133D	RIPRAP AT REINFORCED CONCRETE PIPE OUTLETS
4006L	MANHOLE OR CATCH BASIN PRECAST - DESIGNS G & H
4101D	RING CASTING FOR MANHOLE OR CATCH BASIN
4140D	SPECIAL GRATE CASTINGS FOR CATCH BASIN (CONVEX & CONCAVE) CASTING NO. 720 & 721
8000J	CHANNELIZERS

**CITY OF DULUTH STANDARD PLATES**

THE FOLLOWING STANDARD PLATES, APPROVED BY THE CITY OF DULUTH, SHALL APPLY ON THIS PROJECT

PLATE NO.	DESCRIPTION
STRM-5A	CONCRETE ENCASED CASTING COLLAR FOR STORM MH

**CASTING ASSEMBLY INFORMATION ⑧**

TYPE OF STRUCTURE	CATCH BASIN - STORM (PCB-1 & PCB-2)		
CASTING DESCRIPTION	FRAME	GRATE	CURB BOX
CITY STD. PLATE NUMBER	NA	NA	NA
HEIGHT IN FEET	0.58	0.22	NA
NUMBER REQUIRED	2	2	NA
STANDARD PLATE NUMBER	4101D	4140D	NA
MNDOT CASTING NUMBER	700-7	721	NA
STRUCTURE TYPE		DESIGN H	

**WARNING**

LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL BEFORE DIGGING. GOPHER STATE ONE CALL 1-800-252-1166 REQUIRED BY LAW

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

**KEY NOTES**

- ① APPROX. TOTAL AREA = 0.25 ACRES (EST. 0.10 ACRES AT ONEOTA OVERLOOK & 0.15 ACRES AT SECTION 3 TURNOUT).
- ② BASIS OF PAYMENT IS 115 LBS. PER SQ. YD. INCH.
- ③ TACK COAT SHALL BE CONSIDERED INCIDENTAL TO THE BITUMINOUS COURSES.
- ④ PLACE ON ALL DISTURBED SLOPES. SEE PLAN SHEETS FOR LOCATIONS.
- ⑤ ALL AREAS DISTURBED BY CONSTRUCTION OUTSIDE THE SHOULDER P.I.'S (APPROX. 0.25 ACRES; EST. 0.10 ACRES AT ONEOTA OVERLOOK AND 0.15 ACRES AT SECTION 3 TURNOUT) SHALL HAVE TURF ESTABLISHMENT PERFORMED AS FOLLOWS UNLESS OTHERWISE NOTED:  
SEED MIXTURE 36-311 AT THE RATE OF 33.5 POUNDS/ACRE  
COMMERCIAL FERTILIZER, TYPE 2 AT THE RATE OF 500 POUNDS/ACRE.
- ⑥ DOUBLE SOLID LINE TO BE YELLOW PAINT COLOR.
- ⑦ SINGLE SOLID LINE TO BE WHITE PAINT COLOR.
- ⑧ TO BE INCLUDED IN PRICE BID FOR ITEM "CASTING ASSEMBLY SPECIAL".
- ⑨ SILT FENCE, TYPE HI (TYPE 1) INCLUDES ESTIMATED QUANTITY FOR SILT FENCE EMBEDDED IN SOIL. SEE SHT. 06 FOR DETAILS.
- ⑩ SILT FENCE, TYPE HI (TYPE 2) INCLUDES ESTIMATED QUANTITY FOR SILT FENCE EMBEDDED IN BEDROCK/ LEDGE ROCK SURFACE. SEE SHT. 06 FOR DETAILS.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
NAME: Joseph D. Litman LIC. NO. 21833 DATE 04/03/2017  
JOSEPH D. LITMAN

City of Duluth Proj. No. 1494

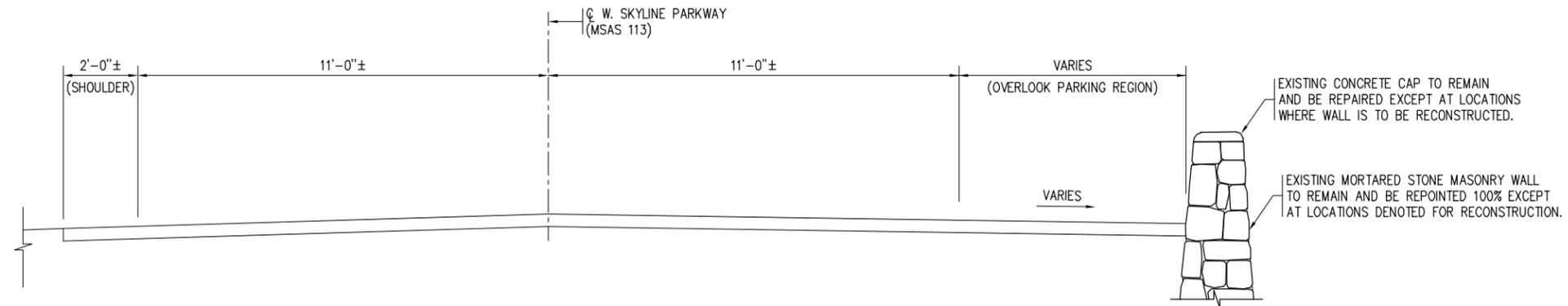
State Proj. No. 118-060-012

STATEMENT OF ESTIMATED QUANTITIES

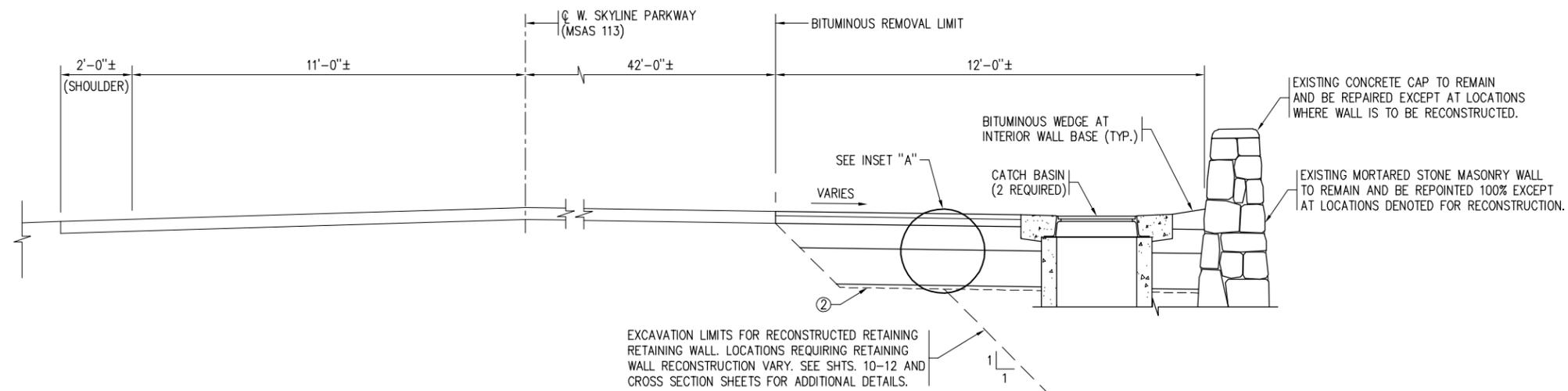
Sheet No. 02 of 33 Sheets

**KEY NOTES:**

- ① TACK COAT SHALL BE CONSIDERED INCIDENTAL TO BITUMINOUS COURSES.
- ② ROADWAY SUBCUT EXCAVATION TO BE INCLUDED IN PRICE BID FOR ITEM "COMMON EXCAVATION" UNLESS OTHERWISE NOTED.



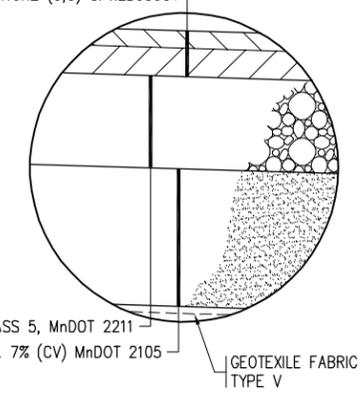
**TYPICAL SECTION (ONEOTA OVERLOOK)**  
(STA. 51+43.00 TO 51+78.00 & STA. 53+78.00 TO 54+13.00)



**TYPICAL SECTION (ONEOTA OVERLOOK)**  
(STA. 51+78.00 TO 53+78.00)

1 1/2" TYPE SP 9.5 WEARING COURSE MIXTURE (3,C) SPWEA340C  
PLACE TACK COAT BETWEEN BITUMINOUS COURSES MnDOT 2357 (1)  
2 1/2" TYPE SP 12.5 WEARING COURSE MIXTURE (3,C) SPWEB330C

8 1/2" AGGREGATE BASE (CV) CLASS 5, MnDOT 2211  
12" SELECT GRANULAR BORROW MOD. 7% (CV) MnDOT 2105  
GEOTEXILE FABRIC TYPE V



**INSET A**

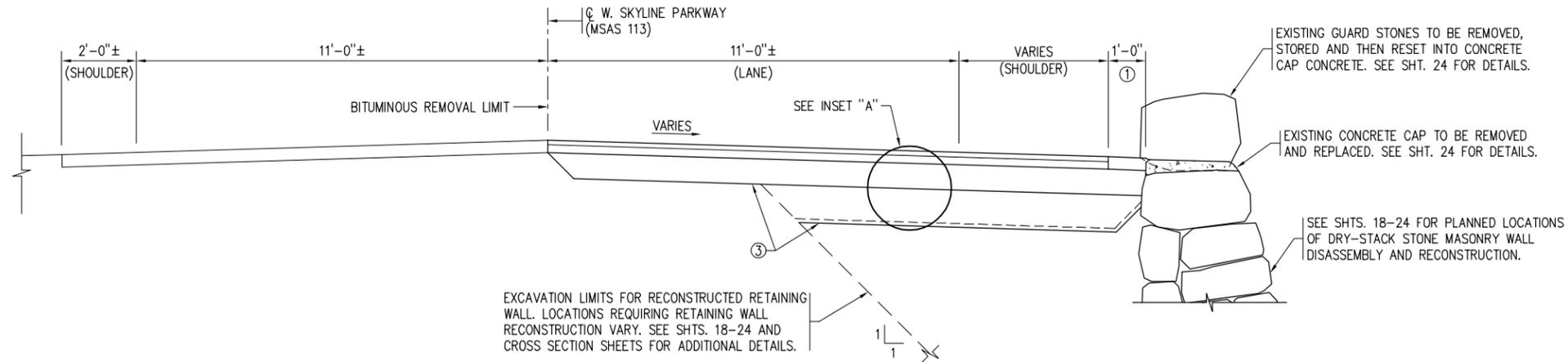
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NAME: *Joseph D. Litman* LIC. NO. 21833 DATE 04/03/2017  
JOSEPH D. LITMAN

City of Duluth Proj. No. 1494  
State Proj. No. 118-060-012

ONEOTA OVERLOOK - CONSTRUCTION DETAILS  
Sheet No. 03 of 33 Sheets

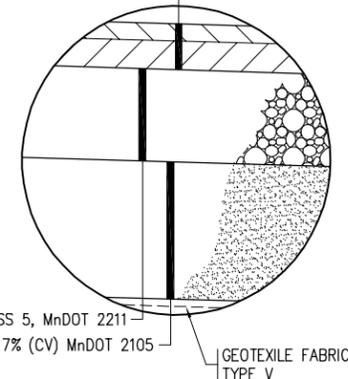
**KEY NOTES:**

- ① 4" AGGREGATE SURFACING (CV) CLASS 1 MnDOT 2118
- ② TACK COAT SHALL BE CONSIDERED INCIDENTAL TO BITUMINOUS COURSES.
- ③ ROADWAY SUBCUT EXCAVATION TO BE INCLUDED IN PRICE BID FOR ITEM "COMMON EXCAVATION" UNLESS OTHERWISE NOTED.

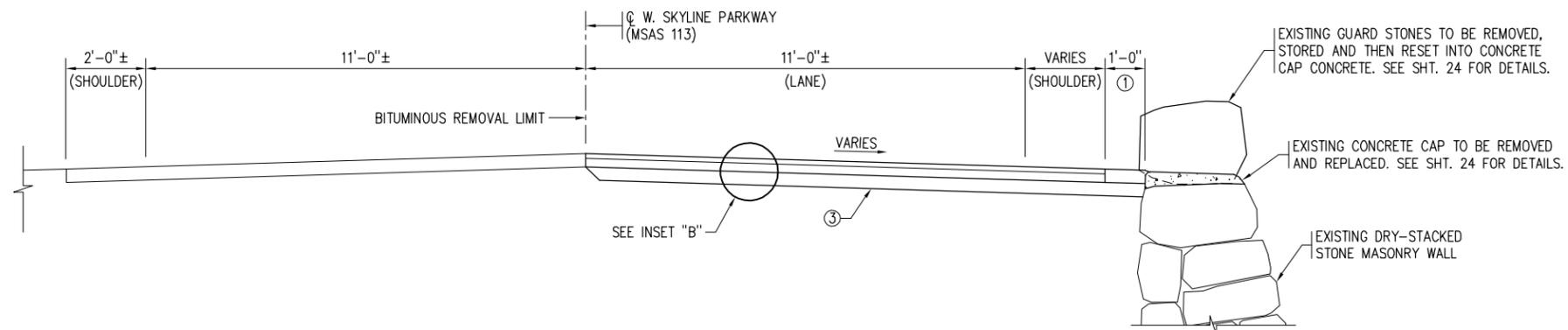


**TYPICAL SECTION – WALL RECONSTRUCTION REGIONS (SECTION 3 TURNOUT)**

1 1/2" TYPE SP 9.5 WEARING COURSE MIXTURE (3,C) SPWEA340C  
 PLACE TACK COAT BETWEEN BITUMINOUS COURSES MnDOT 2357 ②  
 2 1/2" TYPE SP 12.5 WEARING COURSE MIXTURE (3,C) SPWEB330C

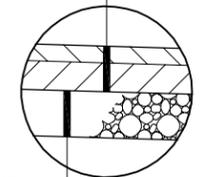


**INSET "A"**

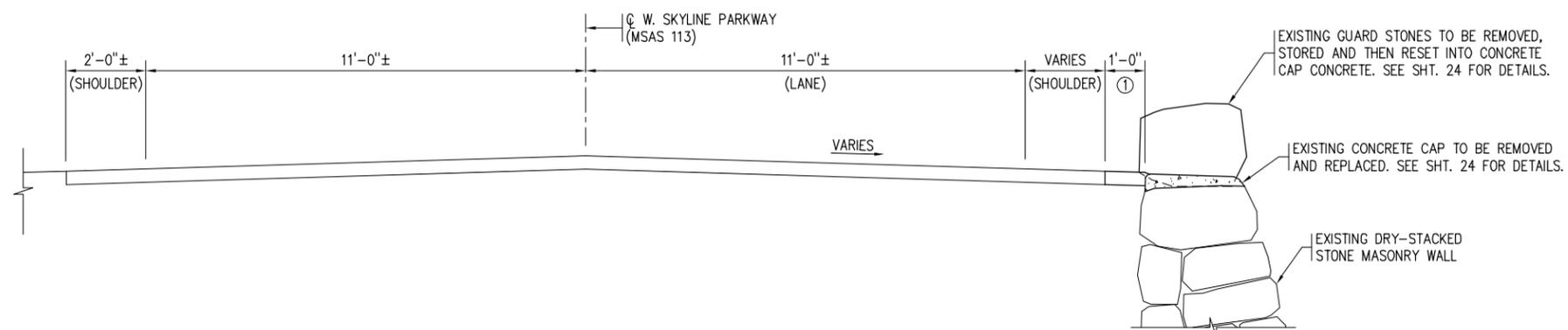


**TYPICAL SECTION – NON WALL RECONSTRUCTION REGIONS WITH ROADWAY REPLACEMENT (SECTION 3 TURNOUT)**

1 1/2" TYPE SP 9.5 WEARING COURSE MIXTURE (3,C) SPWEA340C  
 PLACE TACK COAT BETWEEN BITUMINOUS COURSES MnDOT 2357 ②  
 2 1/2" TYPE SP 12.5 WEARING COURSE MIXTURE (3,C) SPWEB330C



**INSET "B"**



**TYPICAL SECTION – NON WALL RECONSTRUCTION REGIONS WITH NO ROADWAY REPLACEMENT (SECTION 3 TURNOUT)**

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 NAME: *Joseph D. Litman* LIC. NO. 21833 DATE 04/03/2017  
 JOSEPH D. LITMAN

City of Duluth Proj. No. 1494  
 State Proj. No. 118-060-012

SECTION 3 TURNOUT – CONSTRUCTION DETAILS  
 Sheet No. 04 of 33 Sheets

1. GENERAL REQUIREMENTS FOR CONSTRUCTION ACTIVITY

- A. EROSION PREVENTION: THE CONTRACTOR MUST PLAN FOR AND IMPLEMENT CONSTRUCTION PRACTICES THAT MINIMIZE EROSION SO THAT INSPECTION AND MAINTENANCE REQUIREMENTS OF THE GENERAL STORMWATER PERMIT ARE MET. COMMON EROSION PREVENTION PRACTICES INCLUDE:
- 1) MARKING AND DELINEATING AREAS OF THE SITE NOT TO BE DISTURBED (WITH FLAGS, STAKES, SIGNS, SILT FENCE, ETC.).
  - 2) STABILIZING ALL EXPOSED SOIL AREAS AS SOON AS POSSIBLE, BUT IN NO CASE LATER THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.
  - 3) STABILIZE THE LAST 200 LINEAL FEET OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH OR SWALE WITHIN 24 HOURS AFTER CONNECTING TO RECEIVING SURFACE WATER OR STORM SEWER INLET.
  - 4) PROVIDE TEMPORARY OR PERMANENT ENERGY DISSIPATION TO PIPE OUTLETS WITHIN 24 HOURS OF CONNECTING TO A SURFACE WATER.
- B. SEDIMENT CONTROL: THE CONTRACTOR MUST PLAN FOR AND IMPLEMENT CONSTRUCTION PRACTICES THAT MINIMIZE SEDIMENT FROM ENTERING SURFACE WATERS, INCLUDING BUT NOT LIMITED TO: CURB AND GUTTER SYSTEMS AND STORM SEWER INLETS. COMMON SEDIMENT CONTROL PRACTICES INCLUDE:
- 1) DO NOT ALLOW ANY UNBROKEN SLOPE LENGTH GREATER THAN 75 FEET FOR 3:1 (H:V) SLOPES OR STEEPER IN ORDER TO MAINTAIN SHEET FLOW AND MINIMIZE RILLS AND GULLIES.
  - 2) ALL SEDIMENT CONTROL BMPs MUST BE ESTABLISHED ON ALL DOWN GRADIENT PERIMETERS BEFORE ANY UPGRADIENT LAND DISTURBING ACTIVITIES CAN BEGIN AND SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION IS ESTABLISHED.
  - 3) THE TIMING FOR SEDIMENT CONTROL BMPs MAY BE ADJUSTED TO ACCOMMODATE SHORT-TERM CONSTRUCTION ACTIVITIES, SUCH AS CLEARING AND GRUBBING OR PASSAGE OF VEHICLES, AND MUST BE COMPLETED AS QUICKLY AS POSSIBLE. SEDIMENT CONTROL BMPs MUST BE INSTALLED IMMEDIATELY AFTER SHORT-TERM CONSTRUCTION IS COMPLETE, OR BEFORE THE NEXT PRECIPITATION EVENT IF THE ACTIVITY IS NOT COMPLETE.
  - 4) PROTECT ALL STORM DRAIN INLETS WITH APPROPRIATE BMPs DURING CONSTRUCTION UNTIL ALL SOURCES WITH POTENTIAL FOR DISCHARGING TO THE INLET HAVE BEEN STABILIZED. INLET PROTECTION MAY ONLY BE REMOVED EARLIER IF SPECIFIC SAFETY CONCERNS (STREET FLOODING/FREEZING) HAVE BEEN BROUGHT FORTH IN WRITING BY JURISDICTIONAL AUTHORITY.
  - 5) TEMPORARY STOCKPILES MUST HAVE SILT FENCE OR OTHER EFFECTIVE SEDIMENT CONTROLS, AND CANNOT BE PLACED IN ANY SURFACE WATERS, INCLUDING STORMWATER CONVEYANCES SUCH AS CURB AND GUTTER SYSTEMS OR DITCHES.
  - 6) ALL VEHICLE TRACKING OF SEDIMENT FROM THE CONSTRUCTION SITE, OR ONTO STREETS WITHIN THE SITE, MUST BE MINIMIZED BY BMPs SUCH AS STONE PADS, CONCRETE OR STEEL WASH RACKS, OR EQUIVALENT SYSTEMS. STREET SWEEPING MUST BE PERFORMED IF BMPs ARE NOT ADEQUATE TO PREVENT SEDIMENT FROM BEING TRACKED ONTO THE STREETS / ROADWAYS.
- C. DEWATERING AND BASIN DRAINING: THE CONTRACTOR MUST ENSURE THAT ALL WATER FROM DEWATERING OR BASIN DRAINING ACTIVITIES ARE DISCHARGED IN A MANNER THAT DOES NOT CAUSE NUISANCE CONDITIONS, EROSION IN RECEIVING CHANNELS OR DOWNSLOPE PROPERTIES, OR INUNDATION IN WETLANDS CAUSING SIGNIFICANT ADVERSE IMPACTS TO THE WETLANDS. ANY TURBID OR SEDIMENT LADEN DISCHARGE WATER MUST BE ADEQUATELY TREATED BY DISCHARGING TO A TEMPORARY OR PERMANENT SEDIMENTATION BASIN ON THE PROJECT SITE WHENEVER POSSIBLE, OR TREATED WITH APPROPRIATE BMPs IF THE WATER CANNOT BE DISCHARGED TO A SEDIMENT BASIN. THE CONTRACTOR MUST VISUALLY CHECK THE TREATED STORMWATER PRIOR TO DISCHARGING TO RECEIVING WATERS TO ENSURE ADEQUATE TREATMENT IS BEING MET.
- D. INSPECTIONS AND MAINTENANCE: THE CONTRACTOR MUST ROUTINELY INSPECT THE ENTIRE CONSTRUCTION SITE AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS DURING CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES OVER 24 HOURS. INSPECTION OF AREAS WITH PERMANENT COVER MAY BE REDUCED TO ONCE PER MONTH. THE CONTRACTOR SHALL RECORD IN WRITING ALL INSPECTION AND MAINTENANCE ACTIVITY ON FORMS WITH INFORMATION REQUIRED BY PART IV.E.2 OF THE GENERAL STORMWATER PERMIT. ALL NONFUNCTIONAL BMPs MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WITH FUNCTIONAL BMPs WITHIN 24 HOURS AFTER DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS. COMMON ROUTINE MAINTENANCE ACTIVITIES INCLUDE:
- 1) ALL SILT FENCE MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WHEN THEY BECOME NONFUNCTIONAL OR THE SEDIMENT REACHES 1/3 OF THE FENCE HEIGHT WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS.
  - 2) DRAIN ALL TEMPORARY AND PERMANENT SEDIMENTATION BASINS AND REMOVE SEDIMENT WHEN THE DEPTH OF SEDIMENT COLLECTED IN THE BASIN REACHES 1/2 THE STORAGE VOLUME WITHIN 72 HOURS OF DISCOVERY OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS.
  - 3) REMOVE ALL DEPOSITED SEDIMENT FROM SURFACE WATERS AND STORMWATER CONVEYANCE SYSTEMS (DITCHES, CURB AND GUTTERS, CATCH BASINS, ETC.) AND RESTABILIZE THE AREAS WHERE SEDIMENT REMOVAL RESULTS IN EXPOSED SOIL WITHIN 7 DAYS OF DISCOVERY OR AFTER OBTAINING PERMISSION FROM JURISDICTIONAL AUTHORITIES.
  - 4) REMOVE ANY TRACKED SEDIMENT FROM ALL PAVED SURFACES WITHIN 24 HOURS AFTER DISCOVERY OR SOONER AS REQUIRED FOR PERMIT COMPLIANCE.
  - 5) REMOVE ANY SEDIMENT THAT ESCAPES THE CONSTRUCTION SITE IN A MANNER AND AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS AND SAFETY HAZARDS.
  - 6) OPERATE, MAINTAIN, AND INSPECT ANY TEMPORARY OR PERMANENT WATER QUALITY MANAGEMENT BMPs TO ENSURE ADEQUATE TREATMENT IS BEING MET.
- E. POLLUTION PREVENTION MANAGEMENT MEASURES: THE CONTRACTOR MUST MANAGE AND IMPLEMENT POLLUTION PREVENTION MEASURES TO PREVENT AIR, LAND, AND WATER CONTAMINATION AND MEET REGULARY COMPLIANCE. COMMON POLLUTION PREVENTION MANAGEMENT MEASURES INCLUDE:
- 1) COLLECT SOLID WASTE (SEDIMENT, CONSTRUCTION AND DEMOLITION DEBRIS, ASPHALT/CONCRETE MILLINGS, FLOATING DEBRIS, PAPER, PLASTIC, FABRIC, ETC) AND DISPOSE IN COMPLIANCE WITH MPCA REQUIREMENTS.
  - 2) STORE HAZARDOUS MATERIALS (FUEL, PAINT, ETC.) AND PROVIDE SECONDARY CONTAINMENT TO PREVENT SPILLS, LEAKS, AND OTHER DISCHARGE. RESTRICT ACCESS TO STORAGE AREAS AND DISPOSE OF HAZARDOUS WASTE IN COMPLIANCE WITH MPCA REQUIREMENTS.
  - 3) LIMIT EXTERNAL WASHING OF TRUCKS AND CONSTRUCTION VEHICLES TO A DEFINED AREA OF SITE. CONTAIN RUNOFF AND PROPERLY DISPOSE OF WASTE. NO ENGINE DEGREASING IS ALLOWED ON SITE.
  - 4) ALL LIQUID AND SOLID WASTE GENERATED BY CONCRETE WASHOUT OPERATIONS MUST BE CONTAINED IN A LEAK-PROOF CONTAINMENT FACILITY OR IMPERMEABLE LINER ONSITE. NO LIQUID OR SOLID WASTE MUST CONTACT THE GROUND AND NO RUNOFF IS ALLOWED FROM THE CONCRETE WASHOUT OPERATIONS OR AREA. ALL WASTE MUST BE PROPERLY DISPOSED IN COMPLIANCE WITH MPCA REGULATIONS. A SIGN MUST BE INSTALLED NEAR EACH WASHOUT FACILITY TO INFORM CONCRETE EQUIPMENT OPERATORS TO UTILIZE THE PROPER FACILITIES.
- F. FINAL STABILIZATION: THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING FINAL STABILIZATION FOR THE SITE AS DESCRIBED IN PART IV.G OF THE GENERAL STORMWATER PERMIT. SPECIFIC CONDITIONS REQUIRED FOR FINAL STABILIZATION INCLUDE:

- 1) ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED AND ALL SOILS ARE STABILIZED BY A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70% OVER THE ENTIRE PERVIOUS SURFACE AREA, OR OTHER EQUIVALENT MEANS NECESSARY TO PREVENT SOIL FAILURE UNDER EROSION CONDITIONS. ALL TEMPORARY SYNTHETIC AND STRUCTURAL EROSION PREVENTION AND SEDIMENT CONTROL BMPs MUST BE LEFT IN-PLACE UNTIL RESTORATION GOAL IS MET – 70% DENSITY.
- 2) ALL PERMANENT STORMWATER TREATMENT SYSTEMS ARE OPERATIONAL AND ALL SEDIMENT IS REMOVED FROM TEMPORARY AND PERMANENT SEDIMENTATION BASINS AND CONVEYANCE SYSTEMS.
- 3) BMPs DESIGNED TO DECOMPOSE MAY BE LEFT IN PLACE.

2. EROSION CONTROL RESPONSIBILITIES

A. THE CONTRACTOR IS RESPONSIBLE FOR OVERSEEING THE EROSION CONTROL IMPLEMENTATION AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPs BEFORE AND DURING CONSTRUCTION. THE FOLLOWING PERSON IS DESIGNATED TO PERFORM THESE DUTIES ON BEHALF OF THE CONTRACTOR AND IS TRAINED AND CERTIFIED TO INSPECT AND INSTALL BMPs AND/OR MANAGE SITES COVERED UNDER THE GENERAL STORMWATER PERMIT:

B. THE OWNER IS RESPONSIBLE FOR THE LONG-TERM OPERATION AND MAINTENANCE OF PERMANENT STORMWATER MANAGEMENT SYSTEM. THE FOLLOWING PERSON IS DESIGNATED TO PERFORM THESE DUTIES:

CITY OF DULUTH

C. THE GENERAL CONTRACTOR IS IN CHARGE OF ALL EROSION CONTROL IMPLEMENTATION ON THE SITE AND WILL BE ACCOUNTABLE FOR ALL OTHER CONTRACTORS WORKING ON SITE AND THEIR COMPLIANCE WITH GENERAL STORMWATER PERMIT AND SWPPP REQUIREMENTS.

3. REGULATORY AGENCIES AND PERMITS

A. THE CONTRACTOR SHALL COMPLY WITH REQUIREMENTS OF ALL REGULATORY AGENCIES AND PERMITS HAVING JURISDICTION DURING CONSTRUCTION ACTIVITIES. IN ADDITION TO THE MPCA AND GENERAL STORMWATER PERMIT, THE FOLLOWING REGULATORS AND PERMITS ARE KNOWN TO HAVE SITE JURISDICTION:

- 1) CITY OF DULUTH – EROSION CONTROL PERMIT
- 2) DEPARTMENT OF NATURAL RESOURCES

4. GENERAL NATURE OF CONSTRUCTION ACTIVITY DESCRIPTION

A. THE PROJECT INVOLVES THE RE-CONSTRUCTION OF STONE RETAINING WALLS

**TOTAL DISTURBED AREA = 0.62 ACRES (BOTH SITES COMBINED)**

1. CLEARING & GRUBBING OF EXISTING VEGETATION.
2. RE-CONSTRUCT STONE RETAINING WALLS.
3. RESTORE SLOPES.
4. PARTIAL REPLACEMENT OF EXISTING DRIVING SURFACE.

5. IMPERVIOUS SURFACE AREAS (TO NEAREST 1/4 ACRE)

- A. PRE-CONSTRUCTION CONDITIONS: 0.25 ACRES
- B. POST-CONSTRUCTION CONDITIONS: 0.25 ACRES
- C. NET DIFFERENCE: 0.00 ACRES

6. POTENTIAL FOR SEDIMENT AND POLLUTANTS DISCHARGES FROM THE SITE

- A. SEDIMENT FROM OVERLAND (SHEET) FLOW FROM THE SITE WILL BE CONTAINED BY A PERIMETER CONTROL OF SILT FENCE AND SEDIMENT TRAPS AT POINTS OF DISCHARGE.
- B. SEDIMENT AND TURBIDITY FROM DEWATERING ACTIVITIES WILL BE TREATED BY MEANS OF A PORTABLE SEDIMENT CONTAINMENT SYSTEM OR OTHER ENGINEER APPROVED METHOD. THE CONTRACTOR IS RESPONSIBLE TO MEET THE STORMWATER DISCHARGE REQUIREMENTS OF THE COUNTY, AND OTHER AGENCIES WITH REGULATING AUTHORITY. AT A MINIMUM, STORMWATER QUALITY FROM DEWATERING ACTIVITIES AND OTHER DISCHARGES FROM THE SITE MUST MEET THE TURBIDITY AND SEDIMENT LEVELS OF THE RECEIVING SURFACE WATERS.
- C. LIQUID AND SOLID WASTE FROM CONCRETE OPERATIONS WILL BE TREATED BY DESIGNATED CONCRETE WASHOUT STATIONS.
- D. MAJOR DRAINAGE WAY RUNS THROUGH PROJECT LIMITS. CONTRACTOR SHALL BE PREPARED FOR LARGE RUNOFF VOLUMES & FLOWS FROM RAIN EVENTS.

7. DRAWING REFERENCES

A. LOCATION AND TYPE OF EROSION PREVENTION AND SEDIMENT CONTROL BMPs

- 1) TEMPORARY BMPs: SEE SHEETS 06, 07, 14 & 15
- 2) PERMANENT BMPs: SEE SHEETS 07, 14 & 15

B. SITE MAPS

- 1) EXISTING GRADES: SEE PLAN SHEETS
- 2) FINAL GRADES: SEE PLAN SHEETS
- 3) DRAINAGE PATTERNS: SEE SHEETS 07, 14 & 15
- 4) IMPERVIOUS SURFACING AND SOIL TYPES: SEE PLAN AND PROFILE SHEETS
- 5) LOCATION OF AREAS NOT TO BE DISTURBED: SEE PLAN AND PROFILE SHEETS

C. STANDARD DETAILS FOR BMPs: SEE SHEET 06

D. TABULATION OF ESTIMATED PRELIMINARY QUANTITIES FOR BMPs: SEE SHEET 02

8. TIMING/SCHEDULE OF BMP INSTALLATION FOR EROSION PREVENTION AND SEDIMENT CONTROL

A. PRIOR TO LAND DISTURBANCE ACTIVITIES:

- 1) INSTALL SILT FENCE AT SITE PERIMETERS AND AROUND AREAS NOT TO BE DISTURBED.

B. DURING CONSTRUCTION ACTIVITIES:

- 1) INSTALL SILT FENCE AROUND STOCKPILES.
- 2) INSTALL AND MAINTAIN PORTABLE SEDIMENT CONTAINMENT SYSTEMS FOR TREATING GROUNDWATER FROM DEWATERING OPERATIONS.

- 3) INSTALL INLET PROTECTION AT NEW CULVERT INLETS AND DITCH FLOW CONTROL DEVICES.
  - 4) CONSTRUCT RIPRAP AT CULVERT OUTLETS AND ELSEWHERE AS SHOWN ON THE PLANS.
  - 5) INSTALL EROSION CONTROL BLANKETS, SOD, AND SEED/MULCH IN AREAS SHOWN ON THE PLANS WHEN LAND DISTURBING ACTIVITIES ARE COMPLETE.
  - 6) INSPECT AND MAINTAIN ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPs, INCLUDING REMOVING SEDIMENT DEPOSITS AND SWEEPING STREETS.
  - 7) ALL DEMOLITION AND REMOVAL OPERATIONS SHALL BE PERFORMED IN A MANNER WHICH CONTAINS ALL DEBRIS FROM ENTERING THE STREAM. IF REMOVAL OPERATIONS RESULT IN DEBRIS ENTERING THE STREAM REMOVAL OPERATIONS SHALL BE SUSPENDED AND METHODS CORRECTED PRIOR TO RESUMING. ANY DEBRIS WHICH DOES ENTER THE STREAM SHALL BE REMOVED.
- C. UPON COMPLETION OF LAND DISTURBANCE ACTIVITIES:
- 1) ESTABLISH PERMANENT COVER IN ALL AREAS OF THE SITE AND MAINTAIN UNTIL FINAL STABILIZATION.
  - 2) UPON FINAL STABILIZATION, REMOVE ALL TEMPORARY BMPs (STABILIZED CONSTRUCTION EXITS, INLET PROTECTION, SILT FENCE, CONCRETE WASHOUT STATIONS, PORTABLE SEDIMENT CONTAINMENT SYSTEMS) AND REMOVE ANY SEDIMENT THAT HAS ACCUMULATED IN TEMPORARY BMPs, CONVEYANCE SYSTEMS, SEDIMENT BASINS, AND PERMANENT STORMWATER MANAGEMENT SYSTEMS.

9. PROCEDURES FOR ESTABLISHING ADDITIONAL BMPs FOR SITE CONDITIONS DURING CONSTRUCTION

A. IF ANY DOWN GRADIENT TREATMENT SYSTEM IS OVERLOADED, ADDITIONAL UPGRADIENT SEDIMENT CONTROL OR REDUNDANT BMPs MUST BE INSTALLED BY THE CONTRACTOR TO ELIMINATE THE OVERLOADING CONDITION. CONTRACTOR SHALL BE PROACTIVE REGARDING EROSION & SEDIMENT CONTROL MEASURES.

10. METHODS OF FINAL STABILIZATION

A. FINAL STABILIZATION WILL BE ACCOMPLISHED BY IMPERVIOUS SURFACING (BITUMINOUS STREETS, CONCRETE SIDEWALKS, CURB AND GUTTER, ASPHALT ROOFTOPS, ETC.) AND VEGETATIVE GROUND COVERS (SODDING AND SEEDING/MULCHING). SPECIFIC CONSTRUCTION METHODS ARE DESCRIBED IN THE PLANS AND SPECIFICATIONS.

11. PERMANENT STORMWATER MANAGEMENT SYSTEMS (NOT REQUIRED)

A. THE PROJECT DOES NOT EXCEED THE THRESHOLD OF 1 ACRE OF NEW IMPERVIOUS THEREFORE NO PERMANENT STORMWATER MANAGEMENT SYSTEM IS REQUIRED.

12. STANDARDS SPECIFICATIONS FOR CONSTRUCTION

A. UNLESS OTHERWISE NOTED IN CONTRACT DOCUMENTS, ALL MATERIAL AND CONSTRUCTION REQUIREMENTS FOR TEMPORARY SEDIMENT CONTROL AND EROSION PREVENTION SHALL BE IN ACCORDANCE WITH THE MINNESOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, 2016 EDITION AND AS MODIFIED BY THE PROJECT SPECIAL PROVISIONS.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

NAME: Joseph D. Litman LIC. NO. 21833 DATE 04/03/2017

JOSEPH D. LITMAN

City of Duluth Proj. No. 1494

State Proj. No. 118-060-012

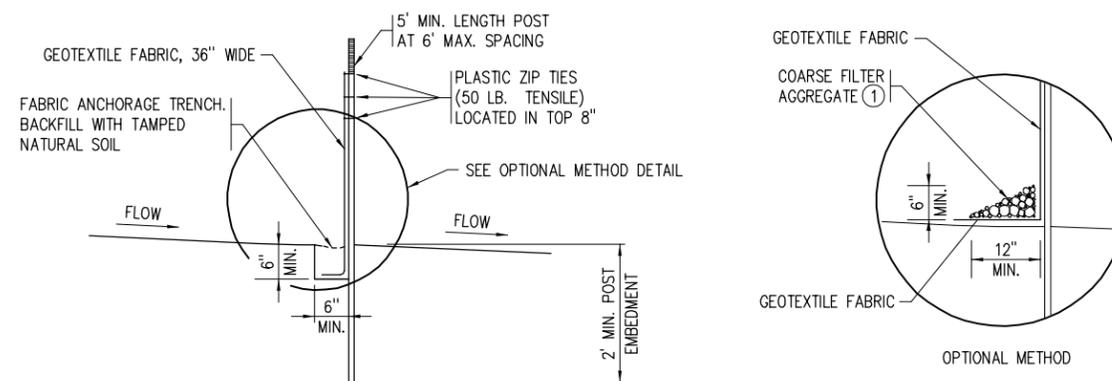
EROSION CONTROL NOTES

Sheet No. 05 of 33 Sheets

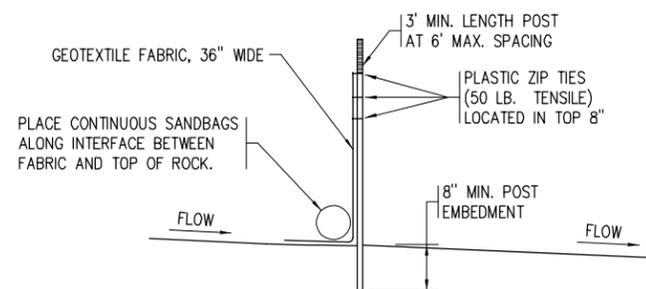
**KEY NOTES:**

SEE SPECS. 2573, 3137, 3149 & 3886.

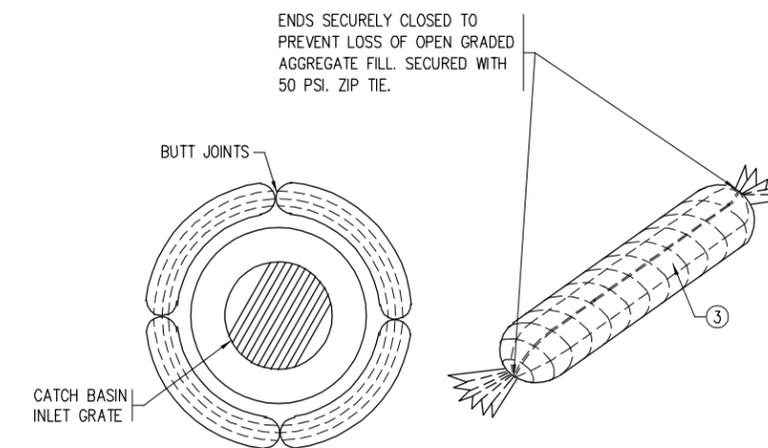
- ① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.
- ② TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 1 ACRE.
- ③ GEOTEXTILE SOCK BETWEEN 4-10 FEET LONG AND 4-6 INCH DIAMETER. SEAM TO BE JOINED BY TWO ROWS OF STITCHING WITH A PLASTIC MESH BACKING OR PROVIDE A HEAT BONDED SEAM (OR APPROVED EQUIVALENT). FILL ROCK LOG WITH OPEN GRADED AGGREGATE CONSISTING OF SOUND DURABLE PARTICLES OF COARSE AGGREGATE CONFORMING TO SPEC. 3137 TABLE 3137-1; CA-3 GRADATION.
- ④ TO BE INCLUDED IN PRICE BID FOR ITEM "SILT FENCE, TYPE HI (TYPE 1)".
- ⑤ TO BE INCLUDED IN PRICE BID FOR ITEM "SILT FENCE, TYPE HI (TYPE 2)".
- ⑥ TO BE INCLUDED IN PRICE BID FOR ITEM "STORM DRAIN INLET PROTECTION".



**SILT FENCE, TYPE HI (TYPE 1) ② ④**  
(HAND INSTALLED ON SOIL SURFACE)



**SILT FENCE, TYPE HI (TYPE 2) ② ⑤**  
(HAND INSTALLED ON BEDROCK/ LEDGE ROCK SURFACE)



**ROCK LOG/COMPOST LOG ⑥**

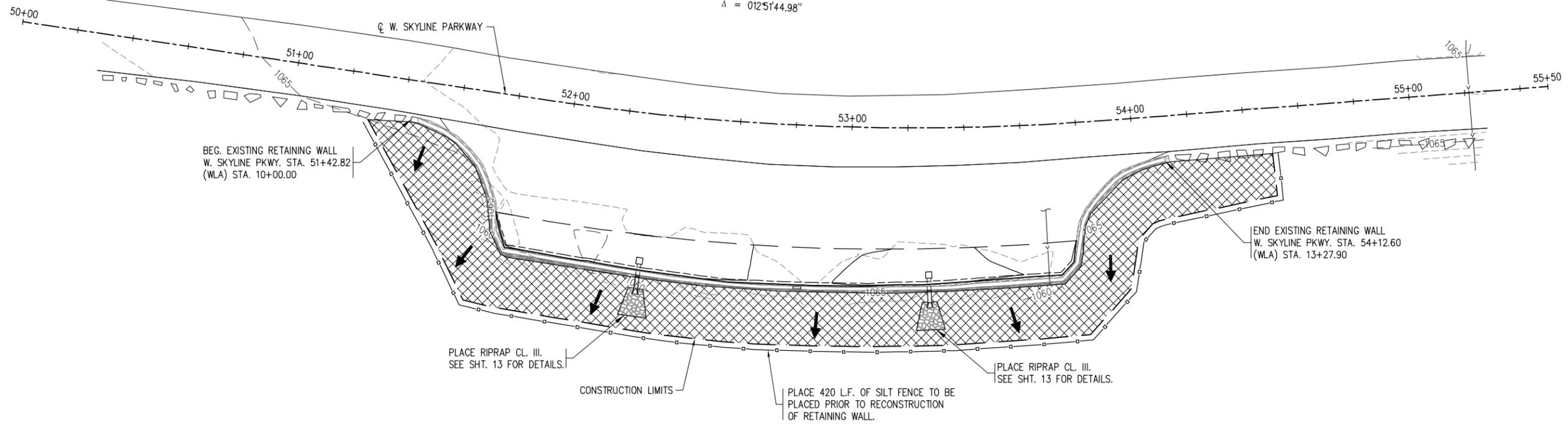
DEVICES MUST BE ADJUSTED ACCORDINGLY AS TO NOT CAUSE FLOODING ON ROADWAY THAT WOULD IMPEDE TRAFFIC FLOW.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
NAME: *Joseph D. Litman* LIC. NO. 21833 DATE 04/03/2017  
JOSEPH D. LITMAN

City of Duluth Proj. No. 1494  
State Proj. No. 118-060-012

EROSION CONTROL DETAILS  
Sheet No. 06 of 33 Sheets

R = 875.00'  
 L = 196.43'  
 T = 98.63'  
 $\Delta = 0125144.98''$



EROSION CONTROL PLAN — ONEOTA OVERLOOK  
 SCALE: 0 20'



DENOTES EROSION CONTROL BLANKET CATEGORY 3N PLACED AFTER STONE MASONRY WALL REPAIR AND RECONSTRUCTION AND AS DIRECTED BY THE ENGINEER IN THE FIELD. ①

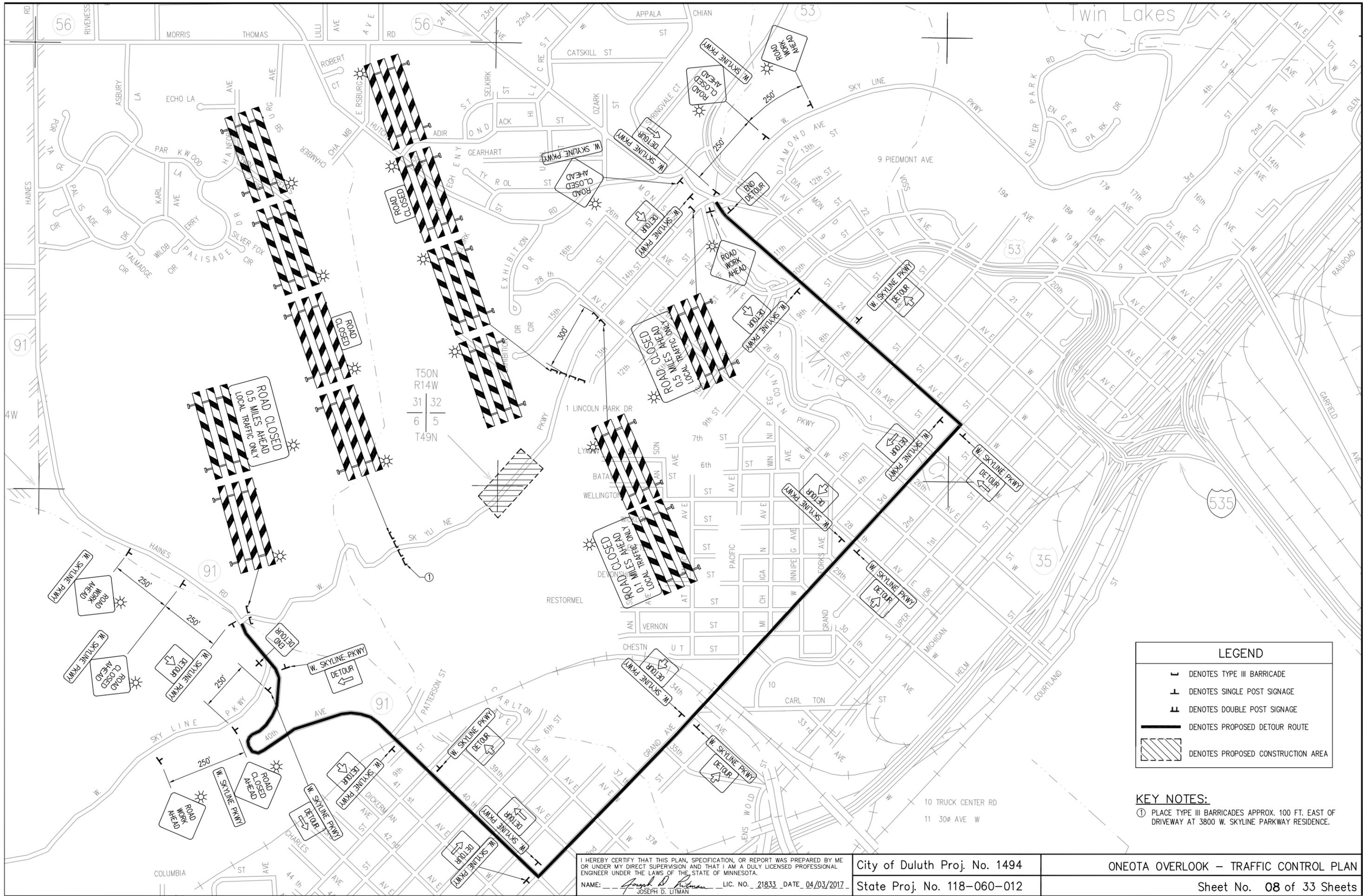
KEY NOTES:

- ① PLACE EROSION CONTROL BLANKET ON ALL SLOPES DISTURBED BY CONSTRUCTION AND AS SHOWN IN THIS EROSION CONTROL PLAN AND AS DIRECTED BY THE ENGINEER IN FIELD. TO BE INCLUDED FOR PAYMENT UNDER ITEM "EROSION CONTROL BLANKETS CATEGORY 3N".
- ALL EROSION CONTROL MEASURES SHALL BE IN PLACE FOR ALL PHASES OF CONSTRUCTION.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
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ONEOTA OVERLOOK — EROSION CONTROL PLAN  
 Sheet No. 07 of 33 Sheets



LEGEND	
	DENOTES TYPE III BARRICADE
	DENOTES SINGLE POST SIGNAGE
	DENOTES DOUBLE POST SIGNAGE
	DENOTES PROPOSED DETOUR ROUTE
	DENOTES PROPOSED CONSTRUCTION AREA

**KEY NOTES:**  
 ① PLACE TYPE III BARRICADES APPROX. 100 FT. EAST OF DRIVEWAY AT 3800 W. SKYLINE PARKWAY RESIDENCE.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 NAME: *Joseph D. Litman* LIC. NO. 21833 DATE 04/03/2017  
 JOSEPH D. LITMAN

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ONEOTA OVERLOOK – TRAFFIC CONTROL PLAN  
 Sheet No. 08 of 33 Sheets

**TRAFFIC CONTROL NOTES**

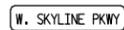
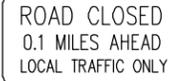
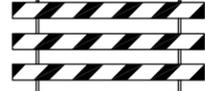
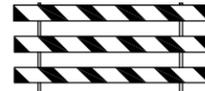
- ① ALL SIGNING INDICATED ON THIS TRAFFIC CONTROL PLAN, EXCEPT THOSE SIGNS WHICH ARE INPLACE, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. ALL APPROPRIATE SIGNING, INCLUDING INPLACE SIGNS, SHALL BE MAINTAINED BY THE CONTRACTOR DURING THE LIFE OF THE CONTRACT. EXISTING STOP SIGNS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT.
- ② ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO, AND BE PLACED IN ACCORDANCE WITH, THE "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MMUTCD) INCLUDING PART VI AND THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS DATED "LATEST EDITION". THE MINNESOTA STANDARD SIGNS MANUALS PARTS I, II, AND III AND THE APPROPRIATE MATERIAL SPECIFICATIONS.
- ③ THE CONTRACTOR SHALL RECEIVE COMPENSATION FOR ALL WORK DESCRIBED HEREIN AND ELSEWHERE IN THESE PLANS (ONEOTA OVERLOOK AND SECTION 3 TURNOUT TRAFFIC CONTROL) ON THE BASIS OF A LUMP SUM PAYMENT FOR ITEM TRAFFIC CONTROL (2563.601).
- ④ THE CONTRACTOR SHALL PLACE ADEQUATE PLASTIC DRUMS, WARNING SIGNS, AND BARRICADES WITHIN THE CONSTRUCTION ZONE TO PROTECT VEHICULAR TRAFFIC AND PEDESTRIAN TRAFFIC FROM CONSTRUCTION OPERATIONS. ADDITIONAL SIGNING MAY INCLUDE, BUT IS NOT LIMITED TO BUMP, DIP, LOOSE GRAVEL, ETC. THE NUMBER AND PLACEMENT OF TRAFFIC CONTROL DEVICES SHALL BE DETERMINED BY THE SEQUENCE OF THE CONTRACTORS OPERATIONS. TRAFFIC CONTROL DEVICES SHALL BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
- ⑤ ALL TRAFFIC CONTROL DEVICES SHALL BE REMOVED OR COVERED AS SOON AS THEY ARE NO LONGER REQUIRED OR APPROPRIATE.
- ⑥ THE INITIAL CONSTRUCTION SIGNING SHALL BE ERECTED PRIOR TO CONSTRUCTION OPERATIONS.
- ⑦ TYPE A (LOW INTENSITY) FLASHERS SHALL BE FURNISHED, INSTALLED, AND MAINTAINED ON TYPE III BARRICADES AND ADVANCED WARNING SIGNS WHEN USED AT NIGHT, OR TO IDENTIFY HAZARDS, AND AS DETAILED IN THIS TRAFFIC CONTROL PLAN. ADDITIONAL FLASHERS SHALL BE FURNISHED, INSTALLED, AND MAINTAINED ON SIGNS, BARRICADES, AND CHANNELIZERS AS NEEDED OR AS DIRECTED BY THE ENGINEER FOR TRAFFIC CONTROL THROUGH WORK ZONES WITHIN THE PROJECT LIMITS.
- ⑧ FLAGGING SHALL BE REQUIRED WHEN WORK IS AT THE EDGE OF THE DRIVING LANE TO PROTECT TRAFFIC FROM EXCAVATION AND PAVING OPERATIONS. FLAGGING SHALL BE IN ACCORDANCE WITH THE PERTINENT LAYOUTS SHOWN IN PART VI OF THE MMUTCD, INCLUDING THE FIELD MANUAL DATED "LATEST EDITION". ALL SUCH WORK RELATED TO FLAGGING, INCLUDING FLAG PERSONS, SHALL BE CONSTRUED TO BE INCLUDED IN THE LUMP SUM PAYMENT FOR TRAFFIC CONTROL (2563.601).
- ⑨ "ROAD CLOSED AHEAD" SIGNS SHALL BE MOUNTED APPROXIMATELY 250 FT IN ADVANCE OF THE CONSTRUCTION AND THE NEAREST INTERSECTION AND SHALL HAVE A TYPE "A" LOW INTENSITY FLASHING AMBER WARNING LIGHT MOUNTED ON THEM.
- ⑩ "ROAD CLOSED" SIGNS MAY BE USED WHERE THE ROADWAY IS CLOSED TO ALL TRAFFIC EXCEPT CONTRACTOR'S EQUIPMENT OR OFFICIALLY AUTHORIZED VEHICLES.
- ⑪ WHEN A "ROAD CLOSED TO THRU TRAFFIC" SIGN IS USED, THE "STOP" OR "YIELD" SIGN AT THAT INTERSECTION SHALL BE LEFT IN PLACE OR MOVED TO A SUITABLE LOCATION WHERE THE DRIVER CAN STILL SEE THE SIGN.
- ⑫ "ROAD CLOSED TO THRU TRAFFIC" AND "ROAD CLOSED TO LOCAL TRAFFIC" SIGNS SHALL BE LOCATED AT A POINT IN THE STREET AS TO PERMIT LOCAL TRAFFIC USE BUT EFFECTIVELY DISCOURAGE THRU TRAFFIC USE.

**KEY NOTES:**

- ① POSTS, WEIGHTS AND HARDWARE REQUIRED FOR SIGN PLACEMENT ARE INCIDENTAL ITEMS.
- ② ALL SIGN PANEL DIMENSIONS ARE IN INCHES.

**TRAFFIC – BILL OF MATERIALS ①**

THE FOLLOWING ITEMS ARE INCLUDED AND PAID FOR UNDER SPEC. 2563.601 TRAFFIC CONTROL

SIGN NO.	DEVICE	SIZE ②	NO. REQ'D ONEOTA OVERLOOK	NOTES
G20-X4		72"x18" BLK. ON ORANGE	22	
M4-8a		24"x18" BLK. ON ORANGE	2	
M4-9MT		30"x24" BLK. ON ORANGE	10	
M4-9ML		30"x24" BLK. ON ORANGE	4	
M4-9MR		30"x24" BLK. ON ORANGE	3	
R11-2		48"x30" BLK. ON WHITE	2	
R11-3a		60"x30" BLK. ON WHITE	1	
R11-3a		60"x30" BLK. ON WHITE	2	
W20-1		36"x36" BLK. ON ORANGE	4	
W20-3		36"x36" BLK. ON ORANGE	4	
TYPE III BARRICADE		8' ORANGE & WHITE	6	
TYPE III BARRICADE		8' ORANGE & WHITE	7	
TYPE A FLASHERS		YELLOW	21	

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 NAME: Joseph D. Litman LIC. NO. 21833 DATE 04/03/2017  
 JOSEPH D. LITMAN

City of Duluth Proj. No. 1494

State Proj. No. 118-060-012

ONEOTA OVERLOOK – TRAFFIC CONTROL NOTES

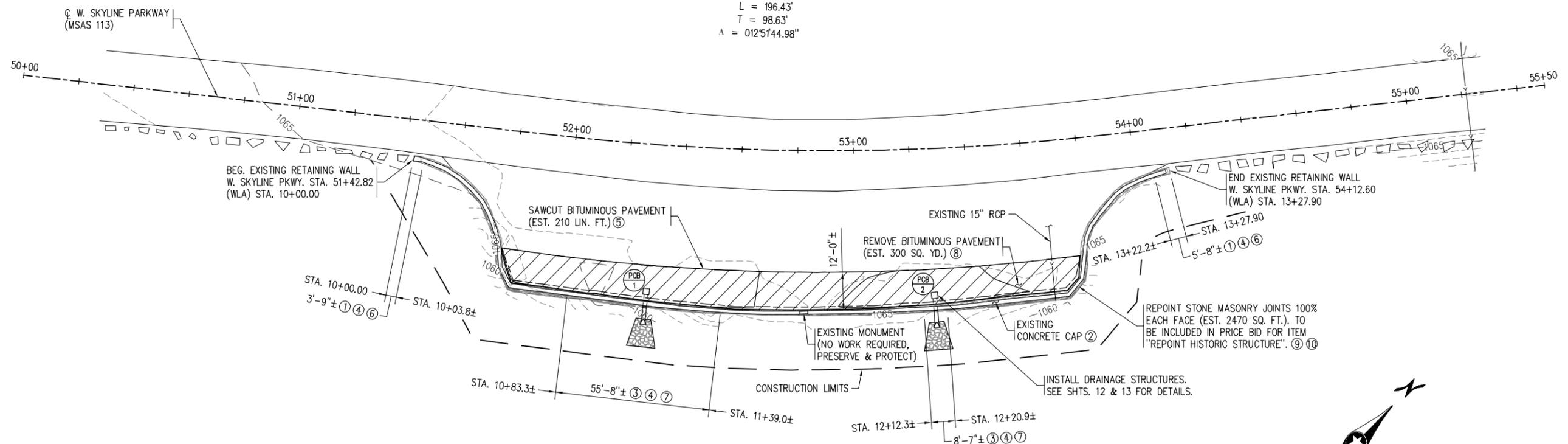
Sheet No. 09 of 33 Sheets

**KEY NOTES:**

- ① DISASSEMBLE AND RECONSTRUCT MORTARED STONE WALL (EST. 10 SQ. FT. AT SOUTHWEST WALL END & 15 SQ. FT. AT NORTHEAST WALL END). EXISTING STONES SHALL BE SALVAGED AND REUSED. CONTRACTOR SHALL DOCUMENT/MARK EXISTING STONE LOCATIONS AND ORIENTATION PRIOR TO DISASSEMBLY TO ALLOW FOR ORIGINAL STONES TO BE PLACED IN THEIR ORIGINAL POSITIONS/ORIENTATION. SEE SPECIAL PROVISIONS FOR FURTHER DETAIL. TO BE INCLUDED IN PRICE BID FOR ITEM "RECONSTRUCT STONE HISTORIC STRUCTURE (MORTARED)".
- ② REPAIR CONCRETE CAP AT SPOT DETERIORATED REGIONS AS DIRECTED BY ENGINEER IN FIELD (EST. 35 SQ. FT.). SEE SHT. 12 FOR CONCRETE CAP REPAIR DETAIL (TYPE 1). TO BE INCLUDED IN PRICE BID FOR ITEM "REPAIR CONCRETE CAP TYPE 1".
- ③ DISASSEMBLE AND RECONSTRUCT MORTARED STONE WALL (EST. TOTAL 435 SQ. FT. FOR BOTH LOCATIONS). EXISTING STONES SHALL BE SALVAGED AND REUSED. CONTRACTOR SHALL DOCUMENT/MARK EXISTING STONE LOCATIONS AND ORIENTATION PRIOR TO DISASSEMBLY TO ALLOW FOR ORIGINAL STONES TO BE PLACED IN THEIR ORIGINAL POSITIONS/ORIENTATION. SEE SPECIAL PROVISIONS FOR FURTHER DETAIL. TO BE INCLUDED IN PRICE BID FOR ITEM "RECONSTRUCT STONE HISTORIC STRUCTURE (MORTARED)".
- ④ MISSING AND FRACTURED STONES TO BE REPLACED WITH NEW STONES OF THE SAME ROCK TYPE, COLOR, TEXTURE AND SIZES. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS. FURNISHING OF STONE WHERE NECESSARY TO BE INCIDENTAL TO ITEM "RECONSTRUCT STONE HISTORIC STRUCTURE (MORTARED)".
- ⑤ TO BE INCLUDED IN PRICE BID FOR ITEM "SAWING BITUMINOUS PAVEMENT (FULL DEPTH)".
- ⑥ REMOVE AND REPLACE EXISTING CONCRETE CAP (EST. 8 SQ. FT. AT SOUTHWEST WALL END & 10 SQ. FT. AT NORTHEAST WALL END). TO BE INCLUDED IN PRICE BID FOR ITEM "RECONSTRUCT STONE HISTORIC STRUCTURE (MORTARED)".
- ⑦ REMOVE AND REPLACE EXISTING CONCRETE CAP (EST. 90 SQ. FT.). TO BE INCLUDED IN PRICE BID FOR ITEM "RECONSTRUCT STONE HISTORIC STRUCTURE (MORTARED)".
- ⑧ TO BE INCLUDED IN PRICE BID FOR ITEM "REMOVE BITUMINOUS PAVEMENT".
- ⑨ MISSING AND FRACTURED STONES TO BE REPLACED WITH NEW STONES OF THE SAME ROCK TYPE, COLOR, TEXTURE AND SIZES. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS. FURNISHING OF STONE WHERE NECESSARY TO BE INCIDENTAL TO ITEM "REPOINT HISTORIC STRUCTURE".
- ⑩ REPOINTING WORK AT WALL RECONSTRUCTION REGIONS WILL NOT BE MEASURED SEPARATELY AND SHALL BE INCLUDED UNDER ITEM "RECONSTRUCT STONE HISTORIC STRUCTURE (MORTARED)".

 DENOTES BITUMINOUS REMOVAL LIMITS

R = 875.00'  
 L = 196.43'  
 T = 98.63'  
 $\Delta = 0125144.98''$



**EXISTING SITE PLAN & GENERAL WORK SCOPE**

SCALE: 0 20'

EXISTING RIGHT OF WAY EXCEEDS PROJECT LIMITS

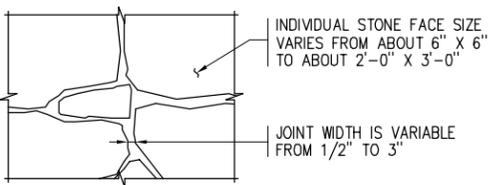
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 NAME: Joseph D. Litman LIC. NO. 21833 DATE 04/03/2017  
 JOSEPH D. LITMAN

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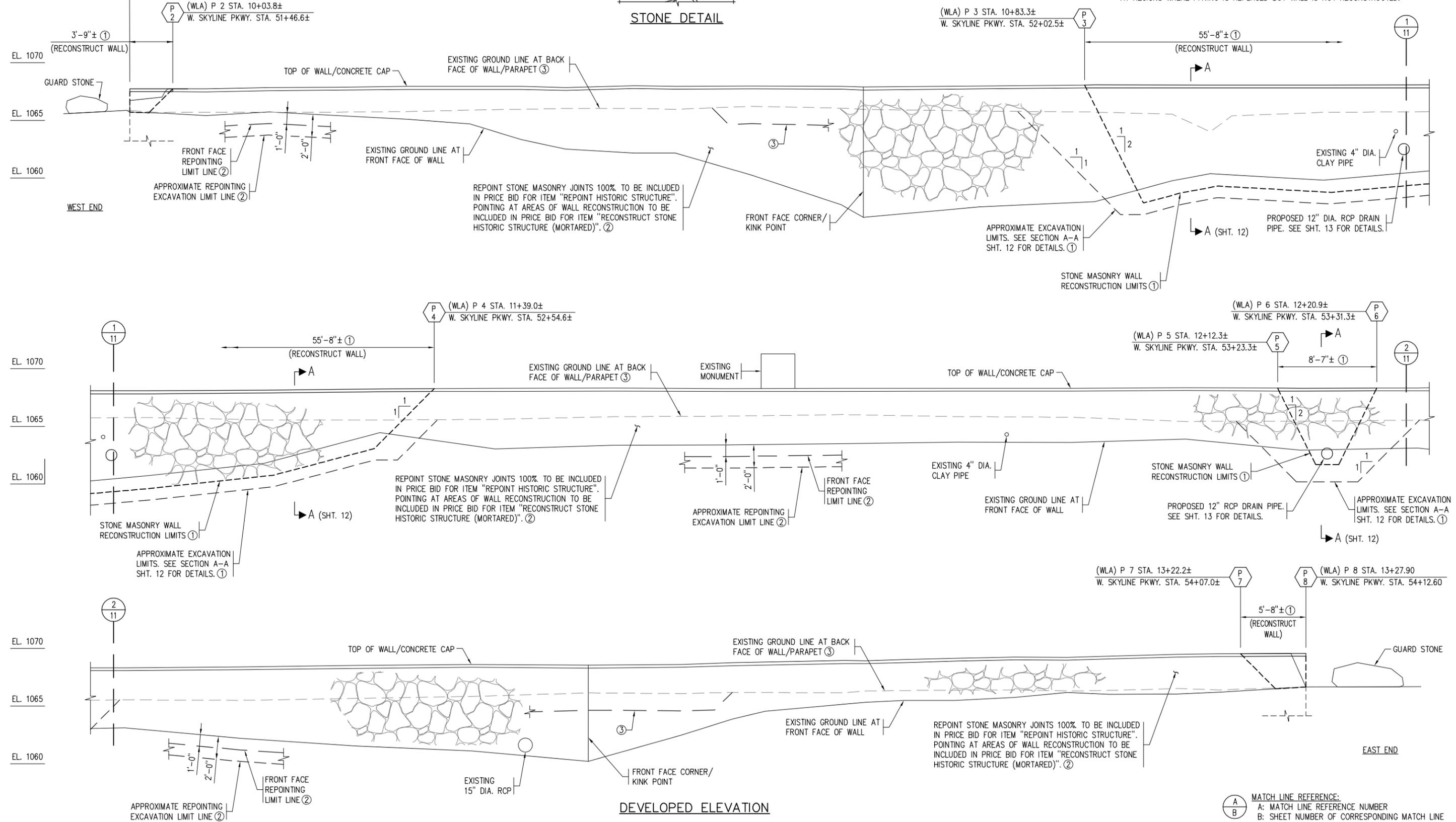
State Proj. No. 118-060-012

ONEOTA OVERLOOK – GENERAL PLAN & WORK SCOPE

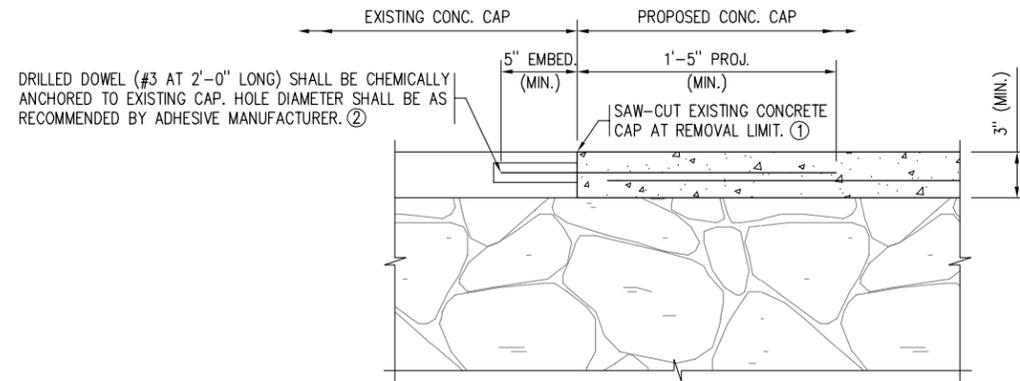
Sheet No. 10 of 33 Sheets



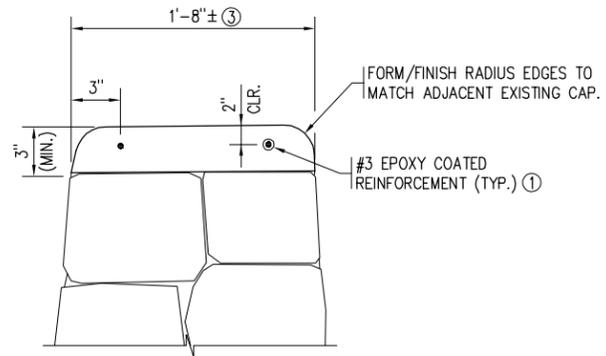
- KEY NOTES:**
- ① STONE MASONRY WALL RECONSTRUCTION LIMITS SHOWN ARE APPROXIMATE. LIMITS DURING CONSTRUCTION SHALL BE FINAL SET AND DIRECTED BY THE ENGINEER IN THE FIELD.
  - ② SEE SHT. 12, REPOINT STONE MASONRY JOINTS DETAIL, FOR FURTHER INFORMATION.
  - ③ BACK FACE REPOINTING LIMIT LINE TO BE AT TOP OF BITUMINOUS PAVING WHERE PAVING REMAINS IN PLACE AND SHALL BE TO 1'-6" BELOW PROPOSED TOP OF PAVING ELEVATION AT REGIONS WHERE PAVING IS REPLACED BUT WALL IS NOT RECONSTRUCTED.



**MATCH LINE REFERENCE:**  
 A: MATCH LINE REFERENCE NUMBER  
 B: SHEET NUMBER OF CORRESPONDING MATCH LINE

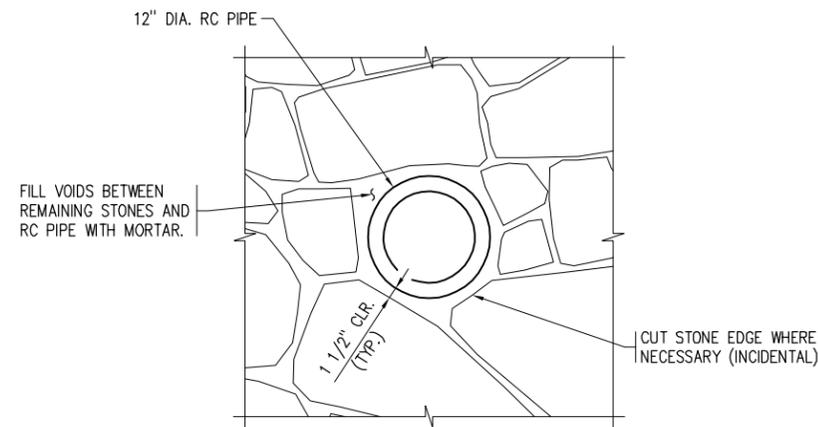


ELEVATION



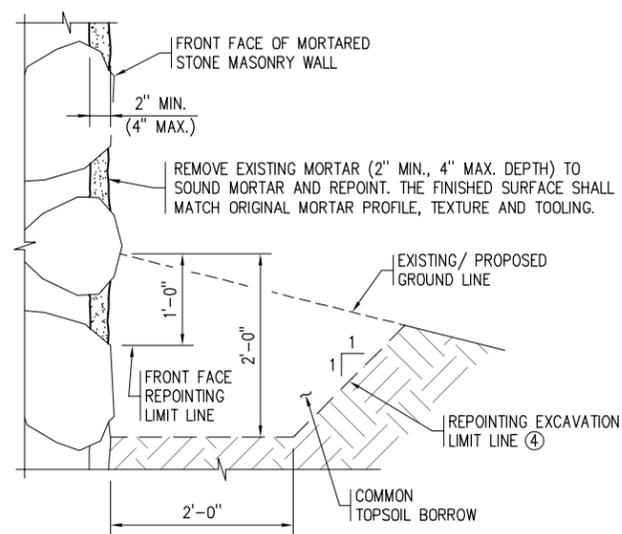
SECTION

CONCRETE CAP REPAIR DETAIL (TYPE 1)



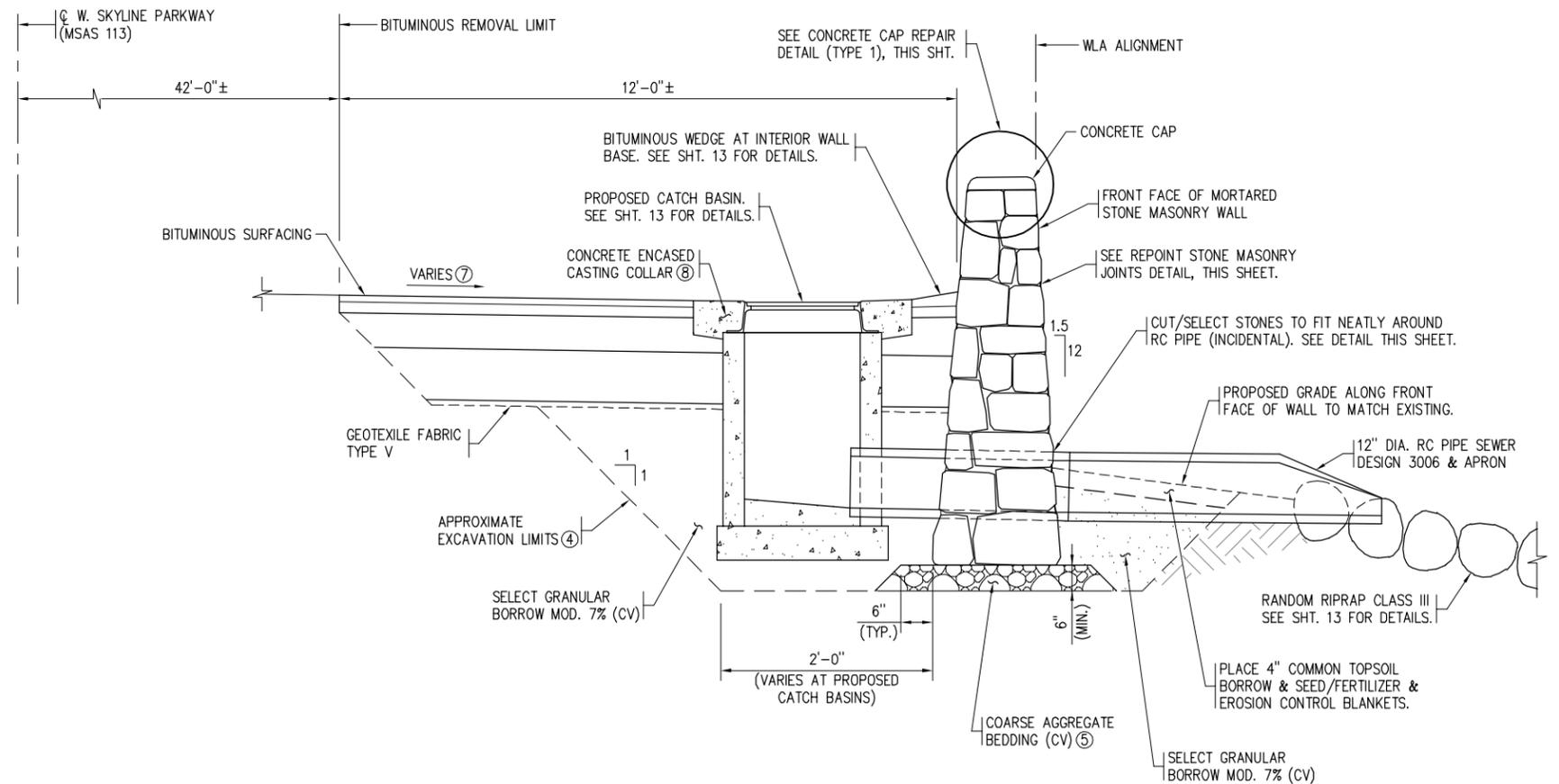
RC PIPE WALL PENETRATION DETAIL

ALL WORK ASSOCIATED WITH RC PIPE PENETRATION IS INCIDENTAL TO ITEM "RECONSTRUCT STONE HISTORIC STRUCTURE (MORTARED)".



REPOINT STONE MASONRY JOINTS DETAIL

ALL WORK INCLUDED IN PRICE BID FOR ITEM "REPOINT HISTORIC STRUCTURE" UNLESS OTHERWISE NOTED.



SECTION A-A (ONEOTA OVERLOOK)  
(TYPICAL AT WALL RECONSTRUCTION AREAS)

KEY NOTES:

- ① TO BE INCLUDED IN PRICE BID FOR ITEM "REPAIR CONCRETE CAP TYPE 1".
- ② TO BE INCLUDED IN PRICE BID FOR ITEM "ANCHORAGES TYPE 1".
- ③ PROPOSED CONCRETE CAP SHALL MATCH EXISTING CONCRETE CAP COLOR, TEXTURE AND FINISH. SEE SPECIAL PROVISIONS FOR ADDITIONAL DETAILS.
- ④ LINE REPRESENTS THE MINIMUM EXCAVATION LIMITS FOR ITEM "STRUCTURE EXCAVATION CLASS E" AND EMBANKMENT. ACTUAL EXCAVATION LIMITS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON EXISTING SOIL CHARACTERISTICS AND OSHA SAFETY REQUIREMENTS. EXCAVATION, BACKFILL FOR EXCAVATION AND ANY SURFACE RESTORATION BEYOND THE PAY LIMIT LINE IS INCIDENTAL.
- ⑤ PROVIDE COMPACTED AGGREGATE BEDDING AS SHOWN WHERE STONE MASONRY WALL REMOVAL IS EXCAVATED DEEPER THAN EXISTING STONE WALL/FOUNDATION. IF NATURAL BEDROCK SURFACE IS EXPOSED, RECONSTRUCT STONE WALL DIRECTLY ON BEDROCK SURFACE.
- ⑥ PROVIDE 1'-5" (MIN.) LAP FOR SPLICED BARS WITHIN REPAIRED CAP REGION.
- ⑦ SEE SHT. 13 FOR DETAILS.
- ⑧ SEE CITY OF DULUTH STANDARD PLATE STRM-5A FOR DETAILS. TO BE INCLUDED IN PRICE BID FOR ITEM "CASTING ASSEMBLY SPECIAL".

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NAME: *Joseph D. Litman* LIC. NO. 21833 DATE 04/03/2017

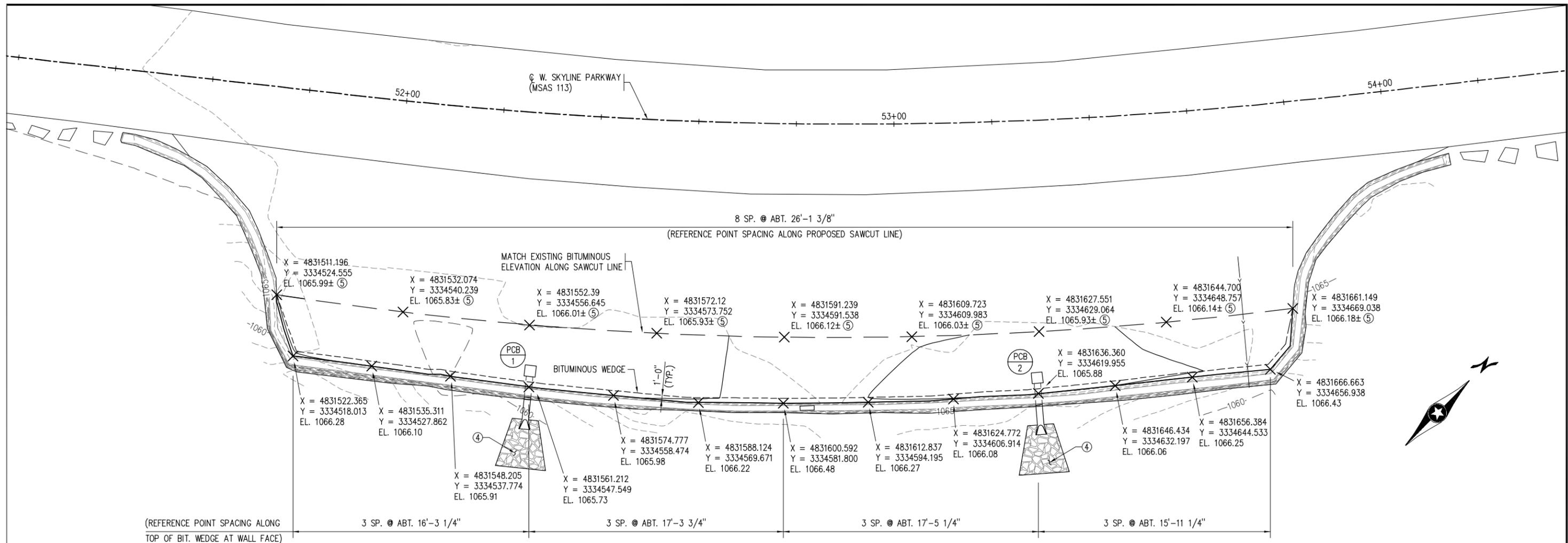
JOSEPH D. LITMAN

City of Duluth Proj. No. 1494

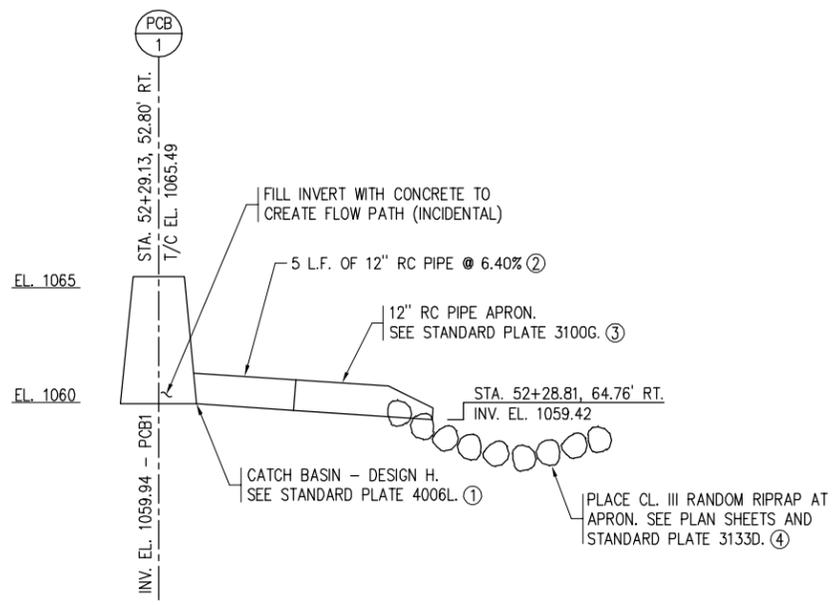
State Proj. No. 118-060-012

ONEOTA OVERLOOK - WALL DETAILS

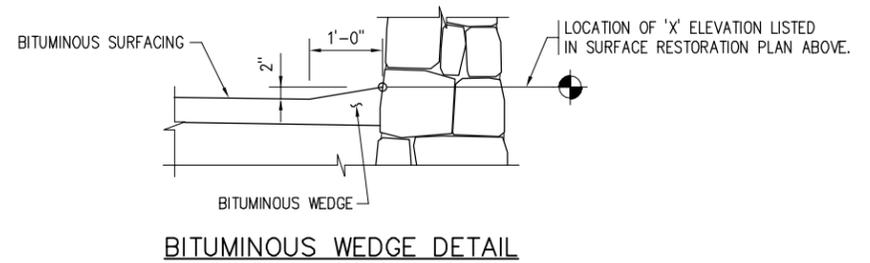
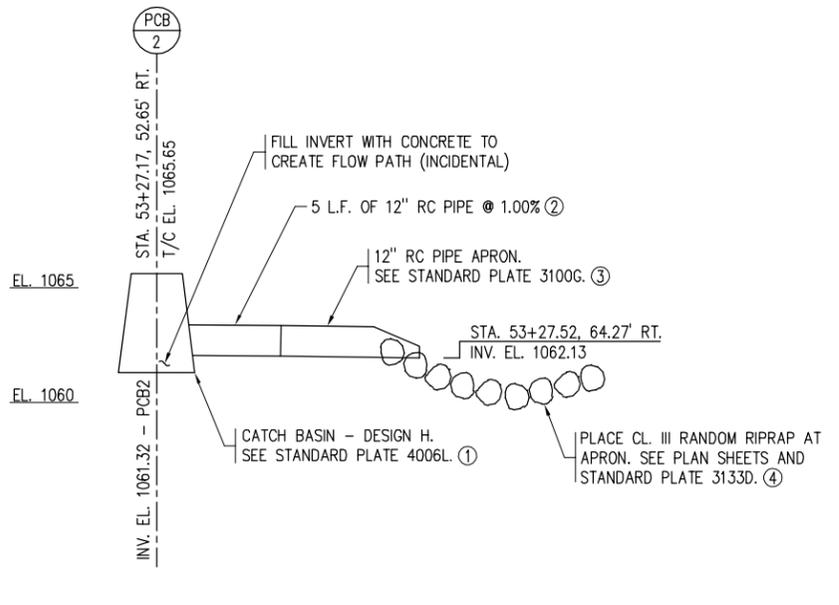
Sheet No. 12 of 33 Sheets



**SURFACE RESTORATION PLAN**  
SCALE: 0 10'

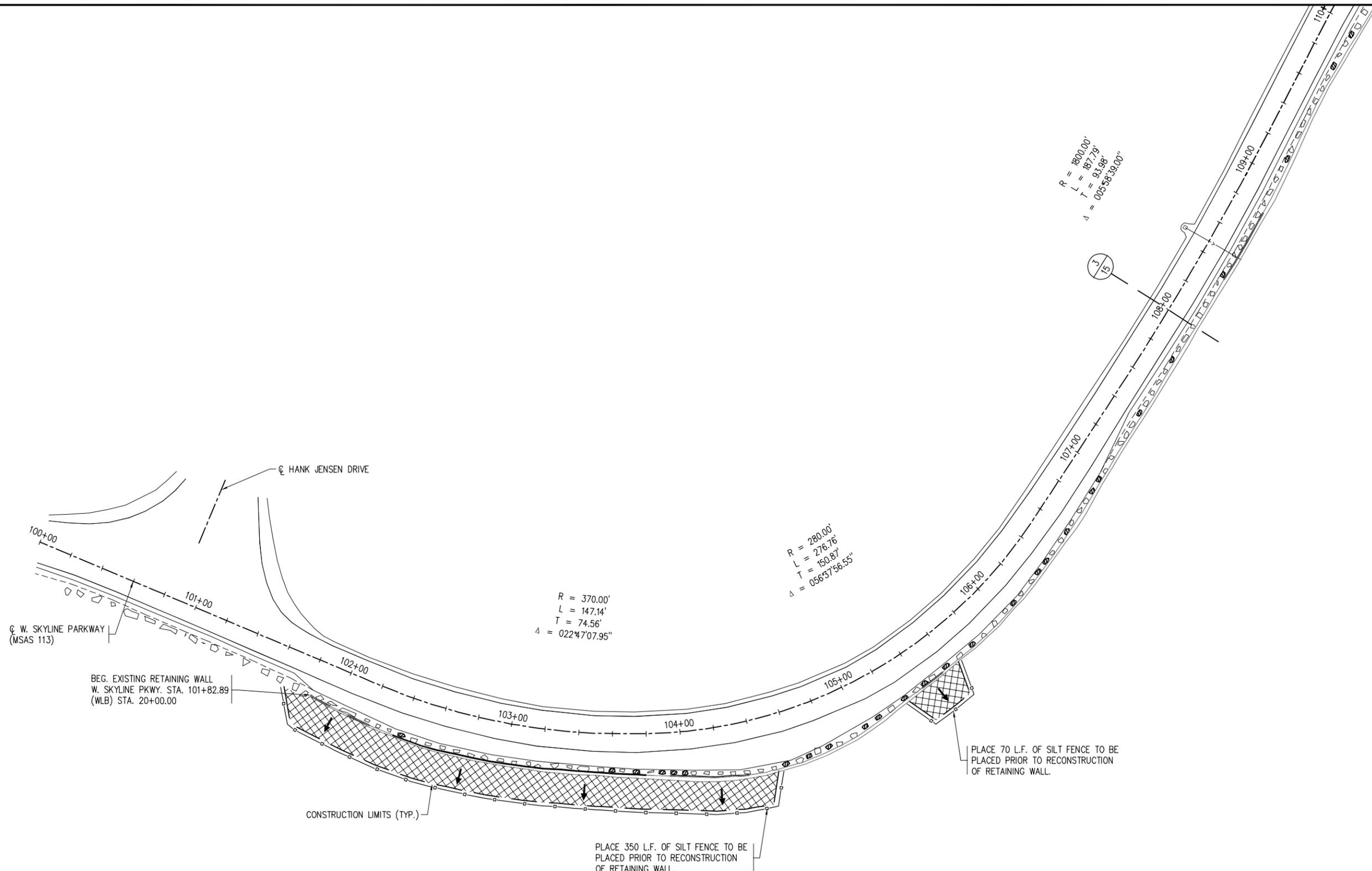


**STORM SEWER PROFILES**



**BITUMINOUS WEDGE DETAIL**

- KEY NOTES:**
- ① TO BE INCLUDED IN PRICE BID FOR ITEM "CONSTRUCT DRAINAGE STRUCTURE DESIGN H".
  - ② TO BE INCLUDED IN PRICE BID FOR ITEM "12" RC PIPE SEWER DESIGN 3006".
  - ③ TO BE INCLUDED IN PRICE BID FOR ITEM "12" RC PIPE APRON".
  - ④ RIPRAP SHALL BE OF THE SAME ROCK TYPE, TEXTURE AND COLOR AS EXISTING STONE MASONRY RETAINING WALL. TO BE INCLUDED IN PRICE BID FOR ITEM "RANDOM RIPRAP CLASS III".
  - ⑤ MATCH ELEVATION TO EXISTING SAWCUT BITUMINOUS SURFACE.



EROSION CONTROL PLAN – SECTION 3 TURNOUT  
 SCALE: 0 30'



DENOTES EROSION CONTROL BLANKET CATEGORY 3N PLACED AFTER RECONSTRUCTION OF THE STONE MASONRY WALL AND AS DIRECTED BY THE ENGINEER IN THE FIELD. ①

**KEY NOTES:**  
 ① PLACE EROSION CONTROL BLANKET ON ALL SLOPES DISTURBED BY CONSTRUCTION AND AS SHOWN IN THIS EROSION CONTROL PLAN AND AS DIRECTED BY THE ENGINEER IN FIELD. TO BE INCLUDED IN PRICE BID FOR ITEM "EROSION CONTROL BLANKETS CATEGORY 3N."

– ALL EROSION CONTROL MEASURES SHALL BE IN PLACE FOR ALL PHASES OF CONSTRUCTION.

**MATCH LINE REFERENCE:**  
 A: MATCH LINE REFERENCE NUMBER  
 B: SHEET NUMBER OF CORRESPONDING MATCH LINE

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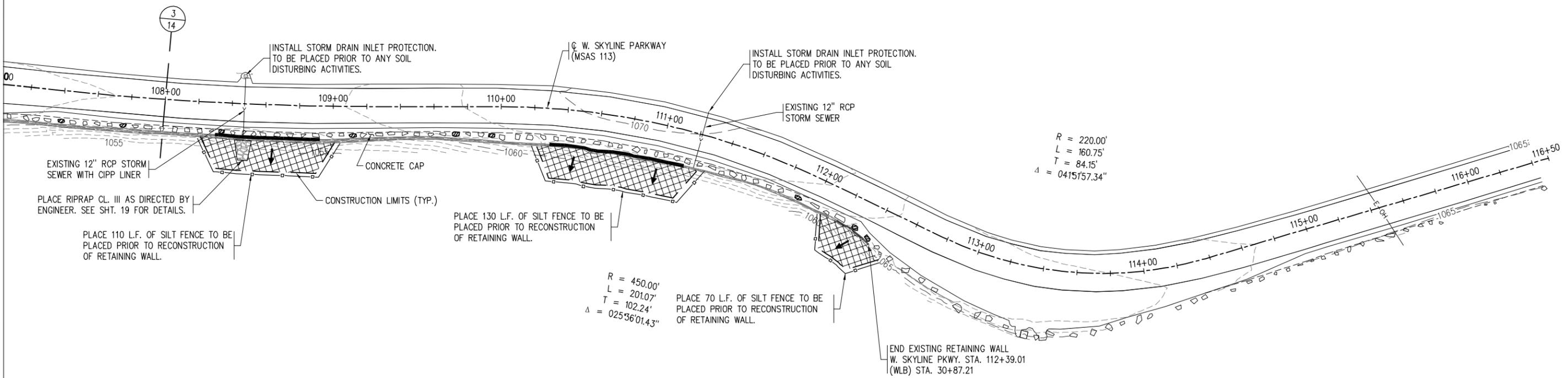
City of Duluth Proj. No. 1494  
 State Proj. No. 118-060-012

SECTION 3 TURNOUT – EROSION CONTROL PLAN  
 Sheet No. 14 of 33 Sheets

R = 1800.00'  
 L = 187.79'  
 T = 93.98'  
 $\Delta = 005^{\circ}58'39.00''$

R = 220.00'  
 L = 160.75'  
 T = 84.15'  
 $\Delta = 0415^{\circ}57.34''$

R = 450.00'  
 L = 201.07'  
 T = 102.24'  
 $\Delta = 025^{\circ}36'01.43''$



EROSION CONTROL PLAN — SECTION 3 TURNOUT

SCALE: 0 30'



DENOTES EROSION CONTROL BLANKET CATEGORY 3N PLACED AFTER RECONSTRUCTION OF THE STONE MASONRY WALL AND AS DIRECTED BY THE ENGINEER IN THE FIELD. ①

KEY NOTES:

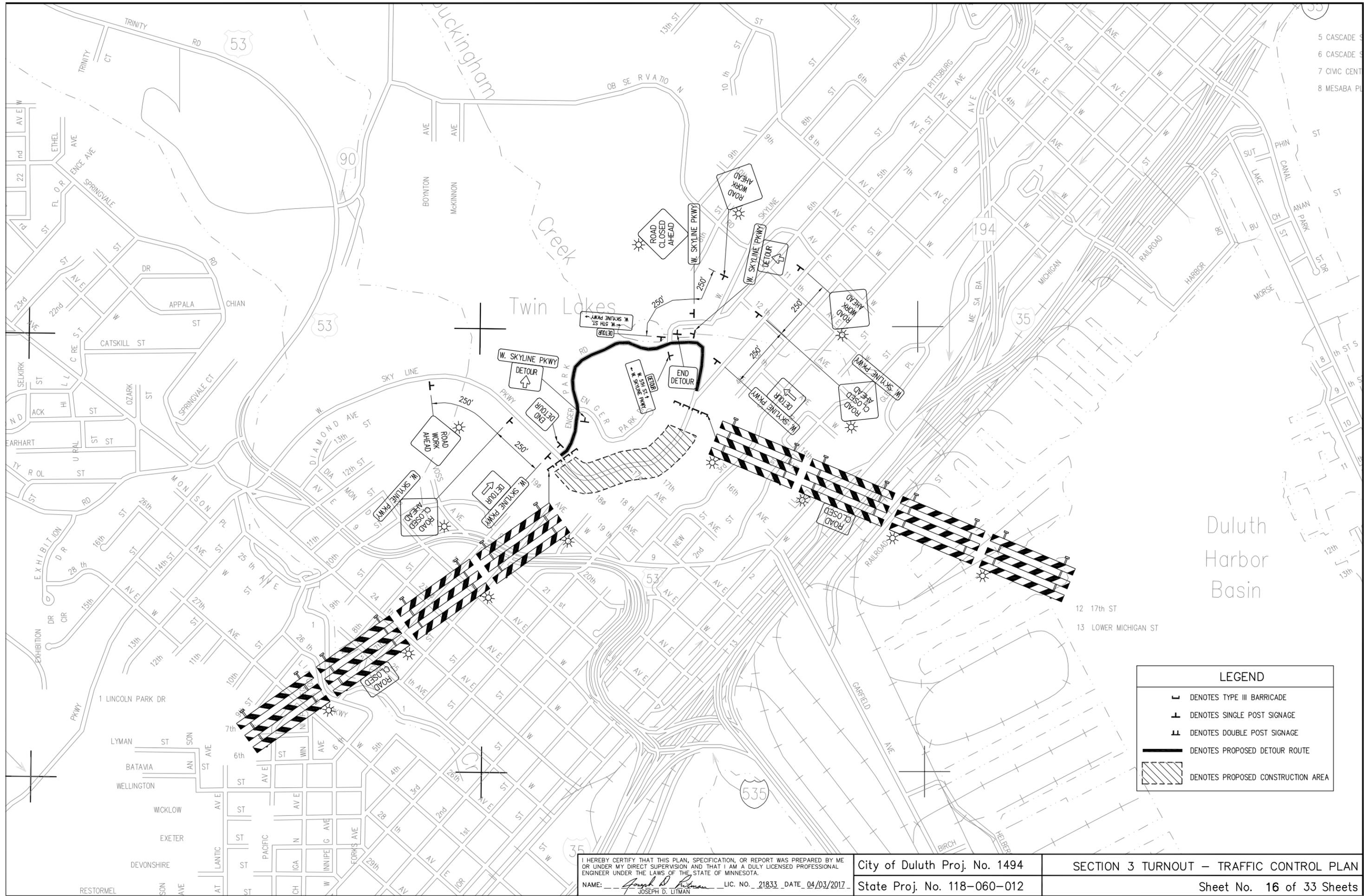
- ① PLACE EROSION CONTROL BLANKET ON ALL SLOPES DISTURBED BY CONSTRUCTION AND AS SHOWN IN THIS EROSION CONTROL PLAN AND AS DIRECTED BY THE ENGINEER IN FIELD. TO BE INCLUDED IN PRICE BID FOR ITEM "EROSION CONTROL BLANKETS CATEGORY 3N".
- ALL EROSION CONTROL MEASURES SHALL BE IN PLACE FOR ALL PHASES OF CONSTRUCTION.

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SECTION 3 TURNOUT — EROSION CONTROL PLAN  
 Sheet No. 15 of 33 Sheets



5 CASCADE S  
 6 CASCADE S  
 7 CIVIC CENT  
 8 MESABA PL

LEGEND	
	DENOTES TYPE III BARRICADE
	DENOTES SINGLE POST SIGNAGE
	DENOTES DOUBLE POST SIGNAGE
	DENOTES PROPOSED DETOUR ROUTE
	DENOTES PROPOSED CONSTRUCTION AREA

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SECTION 3 TURNOUT – TRAFFIC CONTROL PLAN  
 Sheet No. 16 of 33 Sheets

**TRAFFIC CONTROL NOTES**

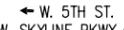
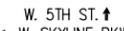
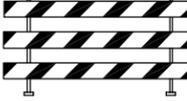
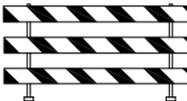
- ① ALL SIGNING INDICATED ON THIS TRAFFIC CONTROL PLAN, EXCEPT THOSE SIGNS WHICH ARE INPLACE, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. ALL APPROPRIATE SIGNING, INCLUDING INPLACE SIGNS, SHALL BE MAINTAINED BY THE CONTRACTOR DURING THE LIFE OF THE CONTRACT. EXISTING STOP SIGNS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT.
- ② ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO, AND BE PLACED IN ACCORDANCE WITH, THE "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MMUTCD) INCLUDING PART VI AND THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS DATED "LATEST EDITION". THE MINNESOTA STANDARD SIGNS MANUALS PARTS I, II, AND III AND THE APPROPRIATE MATERIAL SPECIFICATIONS.
- ③ THE CONTRACTOR SHALL RECEIVE COMPENSATION FOR ALL WORK DESCRIBED HEREIN AND ELSEWHERE IN THESE PLANS (ONEOTA OVERLOOK AND SECTION 3 TURNOUT TRAFFIC CONTROL) ON THE BASIS OF A LUMP SUM PAYMENT FOR ITEM TRAFFIC CONTROL (2563.601).
- ④ THE CONTRACTOR SHALL PLACE ADEQUATE PLASTIC DRUMS, WARNING SIGNS, AND BARRICADES WITHIN THE CONSTRUCTION ZONE TO PROTECT VEHICULAR TRAFFIC AND PEDESTRIAN TRAFFIC FROM CONSTRUCTION OPERATIONS. ADDITIONAL SIGNING MAY INCLUDE, BUT IS NOT LIMITED TO BUMP, DIP, LOOSE GRAVEL, ETC. THE NUMBER AND PLACEMENT OF TRAFFIC CONTROL DEVICES SHALL BE DETERMINED BY THE SEQUENCE OF THE CONTRACTORS OPERATIONS. TRAFFIC CONTROL DEVICES SHALL BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
- ⑤ ALL TRAFFIC CONTROL DEVICES SHALL BE REMOVED OR COVERED AS SOON AS THEY ARE NO LONGER REQUIRED OR APPROPRIATE.
- ⑥ THE INITIAL CONSTRUCTION SIGNING SHALL BE ERECTED PRIOR TO CONSTRUCTION OPERATIONS.
- ⑦ TYPE A (LOW INTENSITY) FLASHERS SHALL BE FURNISHED, INSTALLED, AND MAINTAINED ON TYPE III BARRICADES AND ADVANCED WARNING SIGNS WHEN USED AT NIGHT, OR TO IDENTIFY HAZARDS, AND AS DETAILED IN THIS TRAFFIC CONTROL PLAN. ADDITIONAL FLASHERS SHALL BE FURNISHED, INSTALLED, AND MAINTAINED ON SIGNS, BARRICADES, AND CHANNELIZERS AS NEEDED OR AS DIRECTED BY THE ENGINEER FOR TRAFFIC CONTROL THROUGH WORK ZONES WITHIN THE PROJECT LIMITS.
- ⑧ FLAGGING SHALL BE REQUIRED WHEN WORK IS AT THE EDGE OF THE DRIVING LANE TO PROTECT TRAFFIC FROM EXCAVATION AND PAVING OPERATIONS. FLAGGING SHALL BE IN ACCORDANCE WITH THE PERTINENT LAYOUTS SHOWN IN PART VI OF THE MMUTCD, INCLUDING THE FIELD MANUAL DATED "LATEST EDITION". ALL SUCH WORK RELATED TO FLAGGING, INCLUDING FLAG PERSONS, SHALL BE CONSTRUED TO BE INCLUDED IN THE LUMP SUM PAYMENT FOR TRAFFIC CONTROL (2563.601).
- ⑨ "ROAD CLOSED AHEAD" SIGNS SHALL BE MOUNTED APPROXIMATELY 250 FT IN ADVANCE OF THE CONSTRUCTION AND THE NEAREST INTERSECTION AND SHALL HAVE A TYPE "A" LOW INTENSITY FLASHING AMBER WARNING LIGHT MOUNTED ON THEM.
- ⑩ "ROAD CLOSED" SIGNS MAY BE USED WHERE THE ROADWAY IS CLOSED TO ALL TRAFFIC EXCEPT CONTRACTOR'S EQUIPMENT OR OFFICIALLY AUTHORIZED VEHICLES.
- ⑪ WHEN A "ROAD CLOSED TO THRU TRAFFIC" SIGN IS USED, THE "STOP" OR "YIELD" SIGN AT THAT INTERSECTION SHALL BE LEFT IN PLACE OR MOVED TO A SUITABLE LOCATION WHERE THE DRIVER CAN STILL SEE THE SIGN.
- ⑫ "ROAD CLOSED TO THRU TRAFFIC" AND "ROAD CLOSED TO LOCAL TRAFFIC" SIGNS SHALL BE LOCATED AT A POINT IN THE STREET AS TO PERMIT LOCAL TRAFFIC USE BUT EFFECTIVELY DISCOURAGE THRU TRAFFIC USE.

**KEY NOTES:**

- ① POSTS, WEIGHTS AND HARDWARE REQUIRED FOR SIGN PLACEMENT ARE INCIDENTAL ITEMS.
- ② ALL SIGN PANEL DIMENSIONS ARE IN INCHES.

**TRAFFIC – BILL OF MATERIALS ①**

THE FOLLOWING ITEMS ARE INCLUDED AND PAID FOR UNDER SPEC. 2563.601 TRAFFIC CONTROL

SIGN NO.	DEVICE	SIZE ②	NO. REQ'D SECTION 3 TURNOUT	NOTES
G20-X4		72"x18" BLK. ON ORANGE	7	
M4-8		24"x12" BLK. ON ORANGE	2	
M4-8a		24"x18" BLK. ON ORANGE	2	
M4-9MT		30"x24" BLK. ON ORANGE	2	
M4-9ML		30"x24" BLK. ON ORANGE	1	
M4-9MR		30"x24" BLK. ON ORANGE	1	
R11-2		48"x30" BLK. ON WHITE	2	
W16-8aP		VAR"x15" BLK. ON YELLOW	1	
W16-8bP		VAR"x15" BLK. ON YELLOW	1	
W20-1		36"x36" BLK. ON ORANGE	3	
W20-3		36"x36" BLK. ON ORANGE	3	
TYPE III BARRICADE		8' ORANGE & WHITE	4	
TYPE III BARRICADE		8' ORANGE & WHITE	4	
TYPE A FLASHERS		YELLOW	14	

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State Proj. No. 118-060-012

SECTION 3 TURNOUT – TRAFFIC CONTROL NOTES

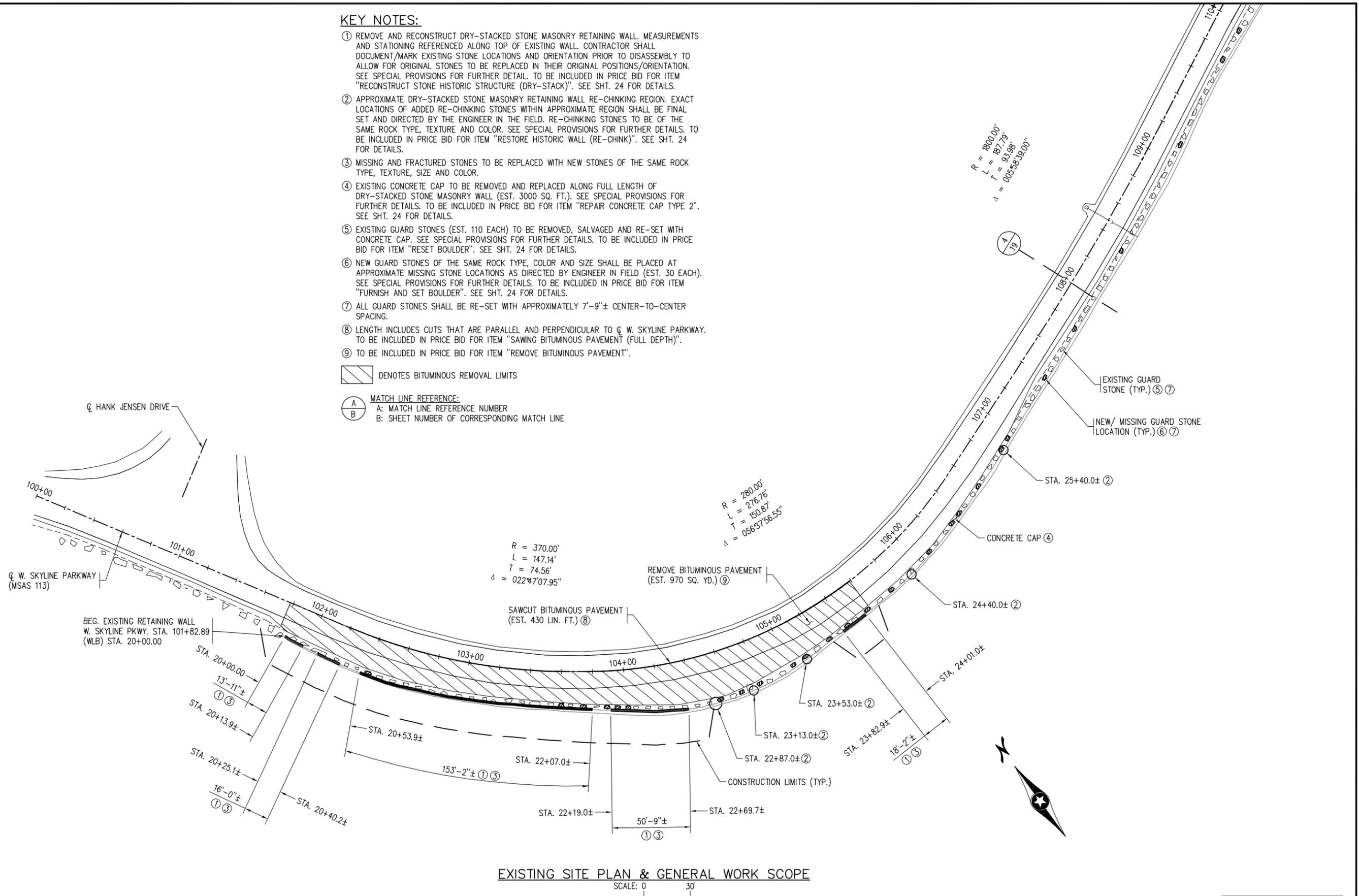
Sheet No. 17 of 33 Sheets

**KEY NOTES:**

- ① REMOVE AND RECONSTRUCT DRY-STACKED STONE MASONRY RETAINING WALL. MEASUREMENTS AND STATIONING REFERENCED ALONG TOP OF EXISTING WALL. CONTRACTOR SHALL DOCUMENT/MARK EXISTING STONE LOCATIONS AND ORIENTATION PRIOR TO DISASSEMBLY TO ALLOW FOR ORIGINAL STONES TO BE REPLACED IN THEIR ORIGINAL POSITIONS/ORIENTATION. SEE SPECIAL PROVISIONS FOR FURTHER DETAIL. TO BE INCLUDED IN PRICE BID FOR ITEM "RECONSTRUCT STONE HISTORIC STRUCTURE (DRY-STACK)". SEE SHT. 24 FOR DETAILS.
- ② APPROXIMATE DRY-STACKED STONE MASONRY RETAINING WALL RE-CHINKING REGION. EXACT LOCATIONS OF ADDED RE-CHINKING STONES WITHIN APPROXIMATE REGION SHALL BE FINAL SET AND DIRECTED BY THE ENGINEER IN THE FIELD. RE-CHINKING STONES TO BE OF THE SAME ROCK TYPE, TEXTURE AND COLOR. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS. TO BE INCLUDED IN PRICE BID FOR ITEM "RESTORE HISTORIC WALL (RE-CHINK)". SEE SHT. 24 FOR DETAILS.
- ③ MISSING AND FRACTURED STONES TO BE REPLACED WITH NEW STONES OF THE SAME ROCK TYPE, TEXTURE, SIZE AND COLOR.
- ④ EXISTING CONCRETE CAP TO BE REMOVED AND REPLACED ALONG FULL LENGTH OF DRY-STACKED STONE MASONRY WALL (EST. 3000 SQ. FT.). SEE SPECIAL PROVISIONS FOR FURTHER DETAILS. TO BE INCLUDED IN PRICE BID FOR ITEM "REPAIR CONCRETE CAP TYPE 2". SEE SHT. 24 FOR DETAILS.
- ⑤ EXISTING GUARD STONES (EST. 110 EACH) TO BE REMOVED, SALVAGED AND RE-SET WITH CONCRETE CAP. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS. TO BE INCLUDED IN PRICE BID FOR ITEM "RESET BOULDER". SEE SHT. 24 FOR DETAILS.
- ⑥ NEW GUARD STONES OF THE SAME ROCK TYPE, COLOR AND SIZE SHALL BE PLACED AT APPROXIMATE MISSING STONE LOCATIONS AS DIRECTED BY ENGINEER IN FIELD (EST. 30 EACH). SEE SPECIAL PROVISIONS FOR FURTHER DETAILS. TO BE INCLUDED IN PRICE BID FOR ITEM "FURNISH AND SET BOULDER". SEE SHT. 24 FOR DETAILS.
- ⑦ ALL GUARD STONES SHALL BE RE-SET WITH APPROXIMATELY 7'-9"± CENTER-TO-CENTER SPACING.
- ⑧ LENGTH INCLUDES CUTS THAT ARE PARALLEL AND PERPENDICULAR TO C. W. SKYLINE PARKWAY. TO BE INCLUDED IN PRICE BID FOR ITEM "SAWING BITUMINOUS PAVEMENT (FULL DEPTH)".
- ⑨ TO BE INCLUDED IN PRICE BID FOR ITEM "REMOVE BITUMINOUS PAVEMENT".

 DENOTES BITUMINOUS REMOVAL LIMITS

 MATCH LINE REFERENCE:  
 A: MATCH LINE REFERENCE NUMBER  
 B: SHEET NUMBER OF CORRESPONDING MATCH LINE



**EXISTING SITE PLAN & GENERAL WORK SCOPE**

SCALE: 0 30'

EXISTING RIGHT OF WAY EXCEEDS PROJECT LIMITS

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 NAME: *Joseph D. Litman* LIC. NO. 21833 DATE 04/03/2017  
 JOSEPH D. LITMAN

City of Duluth Proj. No. 1494  
 State Proj. No. 118-060-012

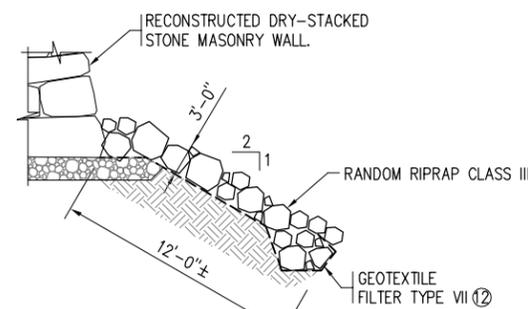
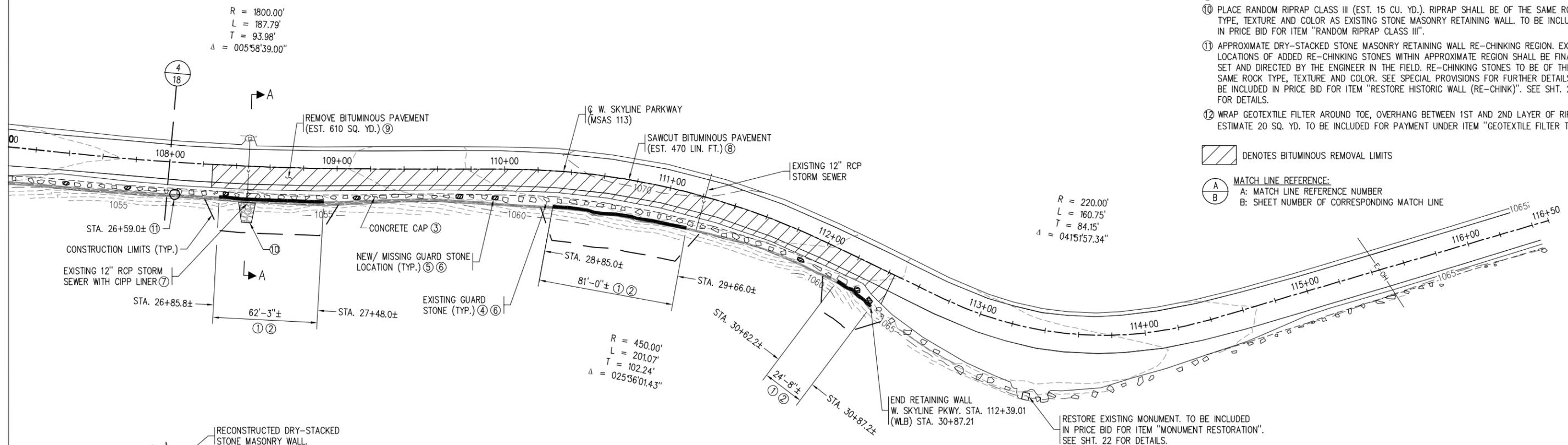
SECTION 3 TURNOUT - GENERAL PLAN & WORK SCOPE  
 Sheet No. 18 of 33 Sheets

**KEY NOTES:**

- ① REMOVE AND RECONSTRUCT DRY-STACKED STONE MASONRY RETAINING WALL. MEASUREMENTS AND STATIONING REFERENCED ALONG TOP OF EXISTING WALL. CONTRACTOR SHALL DOCUMENT/ MARK EXISTING STONE LOCATIONS AND ORIENTATION PRIOR TO DISASSEMBLY TO ALLOW FOR ORIGINAL STONES TO BE REPLACED IN THEIR ORIGINAL POSITIONS/ORIENTATION. SEE SPECIAL PROVISIONS FOR FURTHER DETAIL. TO BE INCLUDED IN PRICE BID FOR ITEM "RECONSTRUCT STONE HISTORIC STRUCTURE (DRY-STACK)". SEE SHT. 24 FOR DETAILS.
- ② MISSING AND FRACTURED STONES TO BE REPLACED WITH NEW STONES OF THE SAME ROCK TYPE, TEXTURE, SIZE AND COLOR.
- ③ EXISTING CONCRETE CAP TO BE REMOVED AND REPLACED ALONG FULL LENGTH OF DRY-STACKED STONE MASONRY WALL. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS. TO BE INCLUDED IN PRICE BID FOR ITEM "REPAIR CONCRETE CAP TYPE 2". SEE SHT. 24 FOR DETAILS.
- ④ EXISTING GUARD STONES TO BE REMOVED, SALVAGED AND RE-SET WITH CONCRETE CAP. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS. TO BE INCLUDED IN PRICE BID FOR ITEM "RESET BOULDER". SEE SHT. 24 FOR DETAILS.
- ⑤ NEW GUARD STONES OF THE SAME ROCK TYPE, COLOR AND SIZE SHALL BE PLACED AT APPROXIMATE MISSING STONE LOCATIONS AS DIRECTED BY ENGINEER IN FIELD. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS. TO BE INCLUDED IN PRICE BID FOR ITEM "FURNISH AND SET BOULDER". SEE SHT. 24 FOR DETAILS.
- ⑥ ALL GUARD STONES SHALL BE RE-SET WITH APPROXIMATELY 7'-9"± CENTER-TO-CENTER SPACING.
- ⑦ EXISTING STORM SEWER TO REMAIN IN-PLACE UPON COMPLETION OF WALL RECONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY SUPPORT, SHORING OF EXISTING PIPE DURING EXCAVATION OF WALL, AND UNTIL RECONSTRUCTION/ BACKFILL IS COMPLETED. ALL COSTS ASSOCIATED WITH TEMPORARY SUPPORT/ SHORING OF EXISTING STORM SEWER SHALL BE INCIDENTAL TO ITEM "RECONSTRUCT STONE HISTORIC STRUCTURE (DRY-STACK)".
- ⑧ LENGTH INCLUDES CUTS THAT ARE PARALLEL AND PERPENDICULAR TO C SKYLINE PARKWAY. TO BE INCLUDED IN PRICE BID FOR ITEM "SAWING BITUMINOUS PAVEMENT (FULL DEPTH)".
- ⑨ TO BE INCLUDED IN PRICE BID FOR ITEM "REMOVE BITUMINOUS PAVEMENT".
- ⑩ PLACE RANDOM RIPRAP CLASS III (EST. 15 CU. YD.). RIPRAP SHALL BE OF THE SAME ROCK TYPE, TEXTURE AND COLOR AS EXISTING STONE MASONRY RETAINING WALL. TO BE INCLUDED IN PRICE BID FOR ITEM "RANDOM RIPRAP CLASS III".
- ⑪ APPROXIMATE DRY-STACKED STONE MASONRY RETAINING WALL RE-CHINKING REGION. EXACT LOCATIONS OF ADDED RE-CHINKING STONES WITHIN APPROXIMATE REGION SHALL BE FINAL SET AND DIRECTED BY THE ENGINEER IN THE FIELD. RE-CHINKING STONES TO BE OF THE SAME ROCK TYPE, TEXTURE AND COLOR. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS. TO BE INCLUDED IN PRICE BID FOR ITEM "RESTORE HISTORIC WALL (RE-CHINK)". SEE SHT. 24 FOR DETAILS.
- ⑫ WRAP GEOTEXTILE FILTER AROUND TOE, OVERHANG BETWEEN 1ST AND 2ND LAYER OF RIPRAP. ESTIMATE 20 SQ. YD. TO BE INCLUDED FOR PAYMENT UNDER ITEM "GEOTEXTILE FILTER TYPE VII".

 DENOTES BITUMINOUS REMOVAL LIMITS

**MATCH LINE REFERENCE:**  
 A: MATCH LINE REFERENCE NUMBER  
 B: SHEET NUMBER OF CORRESPONDING MATCH LINE



SECTION A-A

EXISTING SITE PLAN & GENERAL WORK SCOPE

SCALE: 0 30'



EXISTING RIGHT OF WAY EXCEEDS PROJECT LIMITS

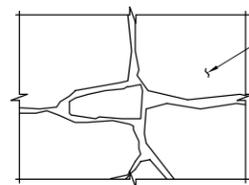
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SECTION 3 TURNOUT - GENERAL PLAN & WORK SCOPE

Sheet No. 19 of 33 Sheets

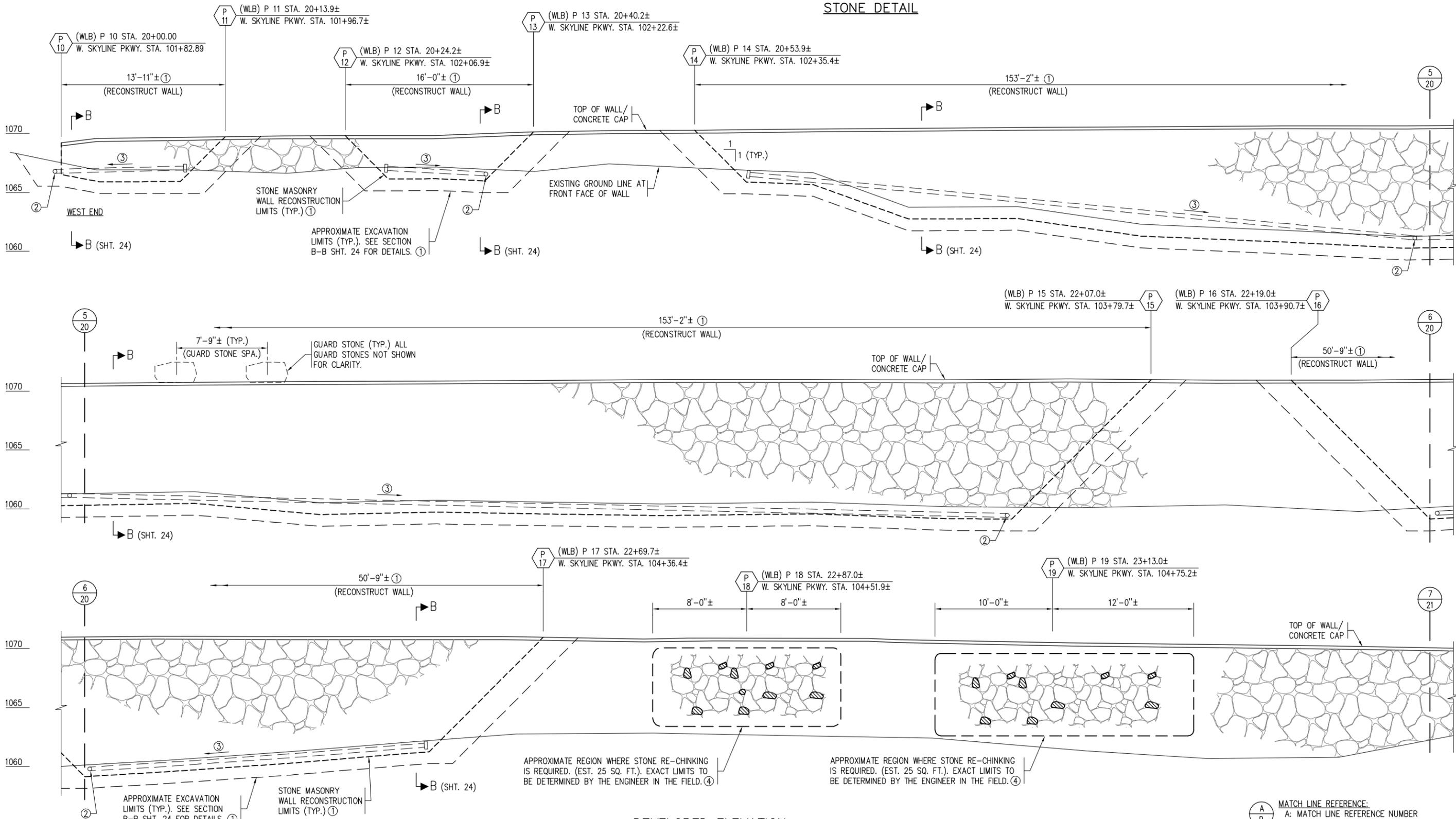


INDIVIDUAL STONE FACE SIZE Varies FROM ABOUT 6" X 6" TO ABOUT 2'-0" X 3'-0"

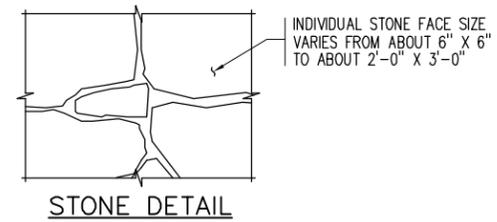
STONE DETAIL

**KEY NOTES:**

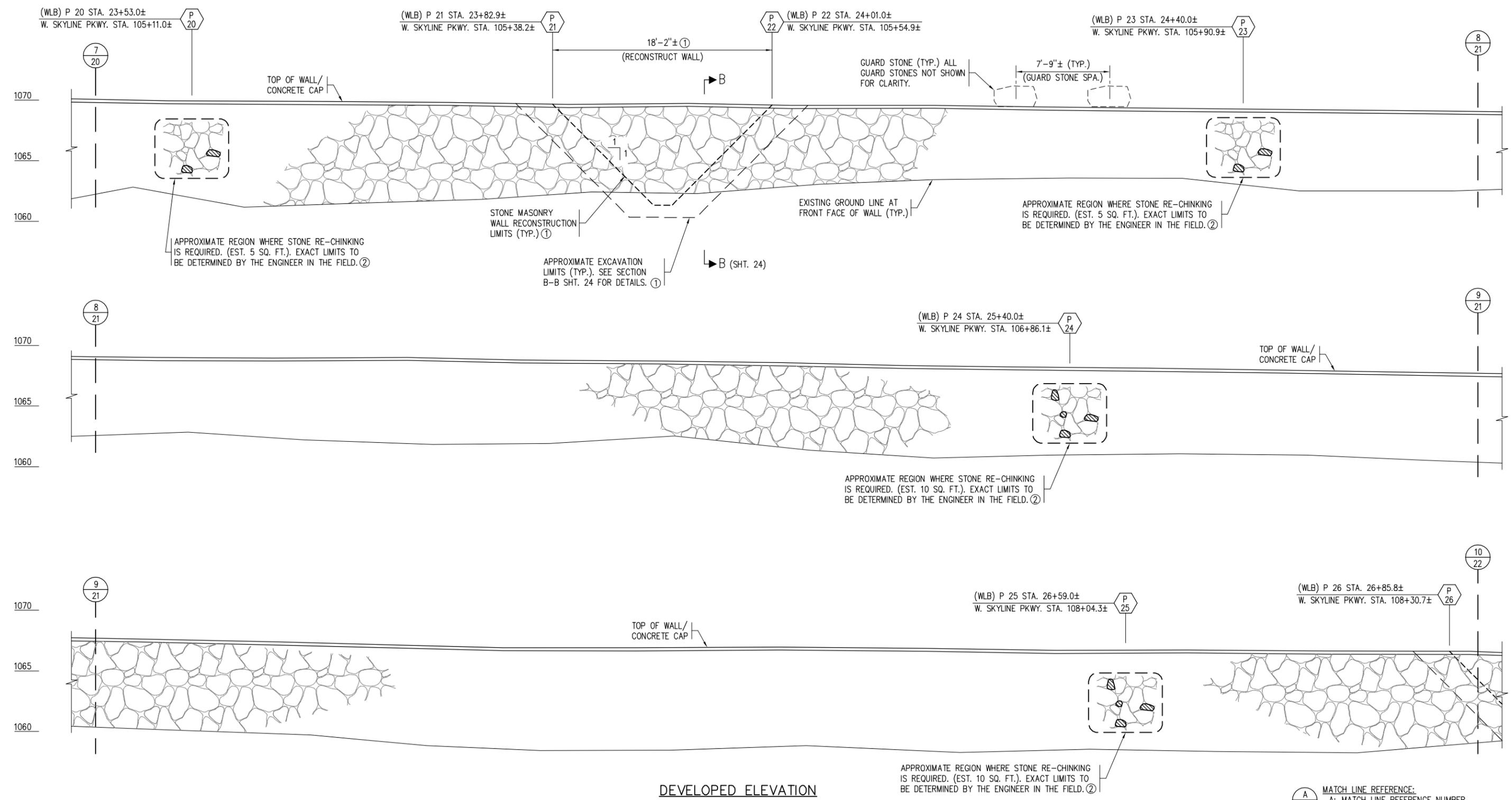
- ① STONE MASONRY WALL RECONSTRUCTION LIMITS SHOWN ARE APPROXIMATE. LIMITS DURING CONSTRUCTION SHALL BE FINAL SET AND DIRECTED BY THE ENGINEER IN THE FIELD.
- ② DRAINAGE SYSTEM TO BE DAYLIGHTED INTO FRONT FACE SLOPE. SEE SHT. 24 FOR DRAINAGE SYSTEM DETAILS.
- ③ 1/8" PER FT. MINIMUM SLOPE.
- ④ SEE SHT. 24 FOR STONE RE-CHINKING DETAILS.



MATCH LINE REFERENCE:  
 A: MATCH LINE REFERENCE NUMBER  
 B: SHEET NUMBER OF CORRESPONDING MATCH LINE



**KEY NOTES:**  
 ① STONE MASONRY WALL RECONSTRUCTION LIMITS SHOWN ARE APPROXIMATE. LIMITS DURING CONSTRUCTION SHALL BE FINAL SET AND DIRECTED BY THE ENGINEER IN THE FIELD.  
 ② SEE SHT. 24 FOR STONE RE-CHINKING DETAILS.



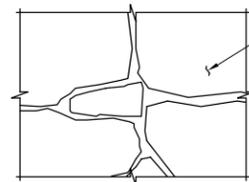
**DEVELOPED ELEVATION**

**MATCH LINE REFERENCE:**  
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DEVELOPED ELEVATION - SECTION 3 TURNOUT  
 Sheet No. 21 of 33 Sheets

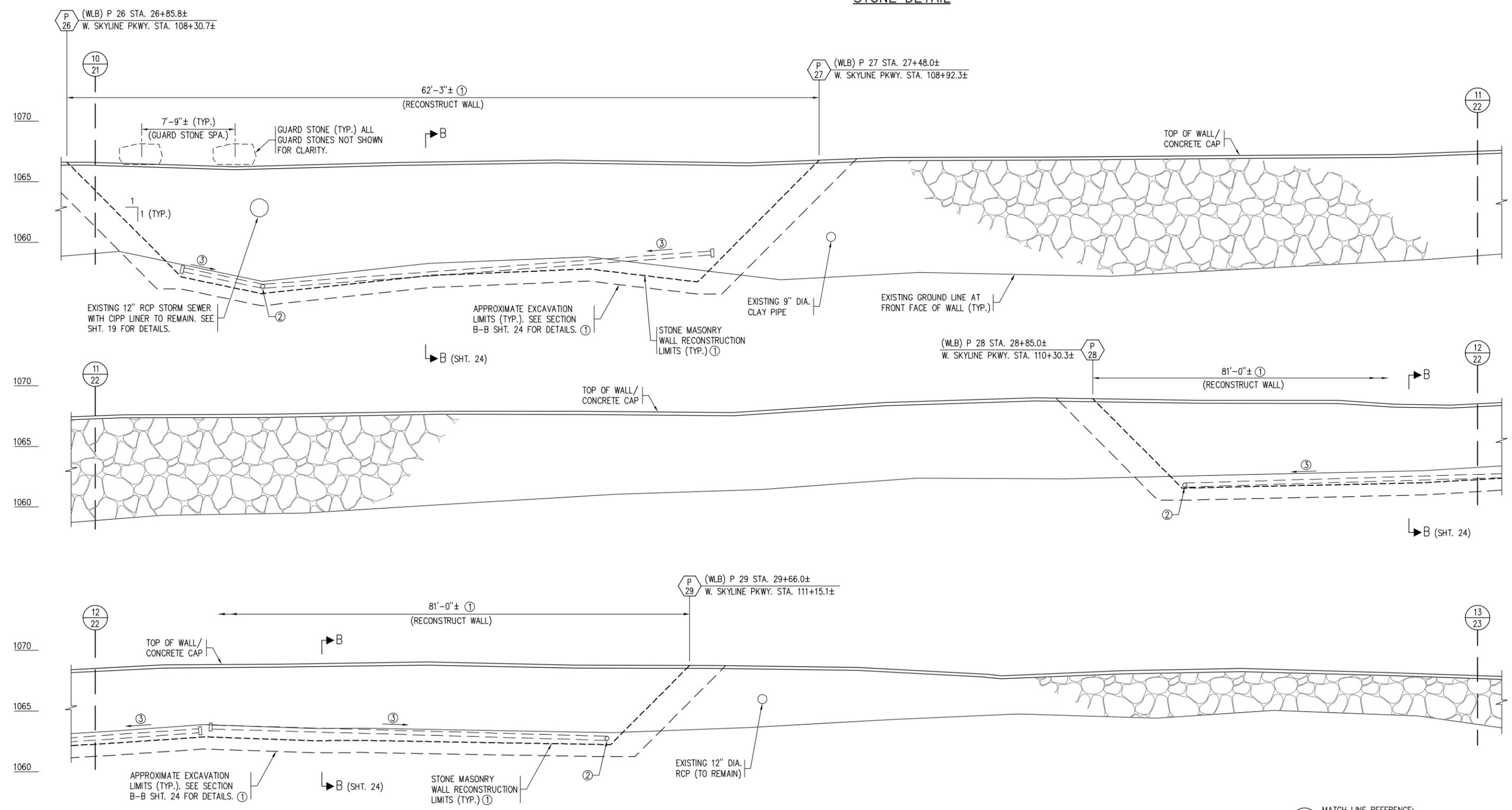


INDIVIDUAL STONE FACE SIZE VARIES FROM ABOUT 6" X 6" TO ABOUT 2'-0" X 3'-0"

STONE DETAIL

**KEY NOTES:**

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- ② DRAINAGE SYSTEM TO BE DAYLIGHTED INTO FRONT FACE SLOPE. SEE SHT. 24 FOR DRAINAGE SYSTEM DETAILS.
- ③ 1/8" PER FT. MINIMUM SLOPE.



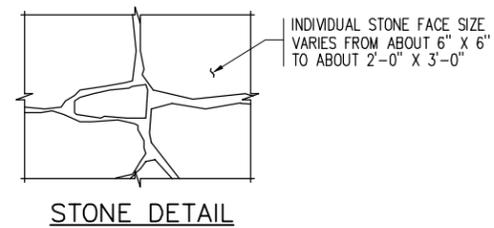
**DEVELOPED ELEVATION**

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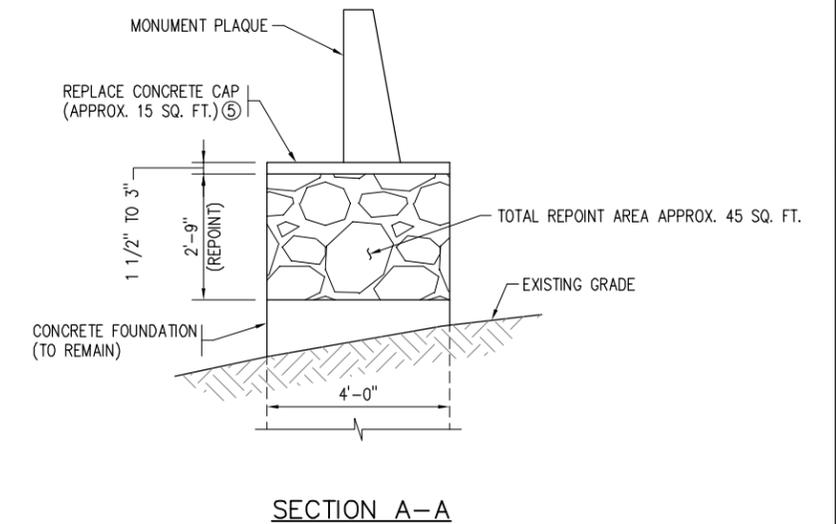
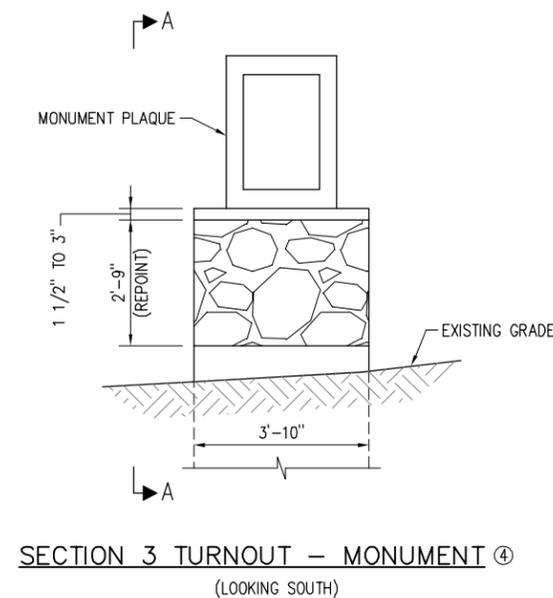
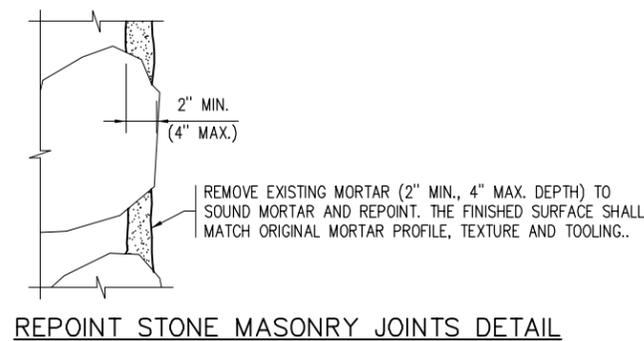
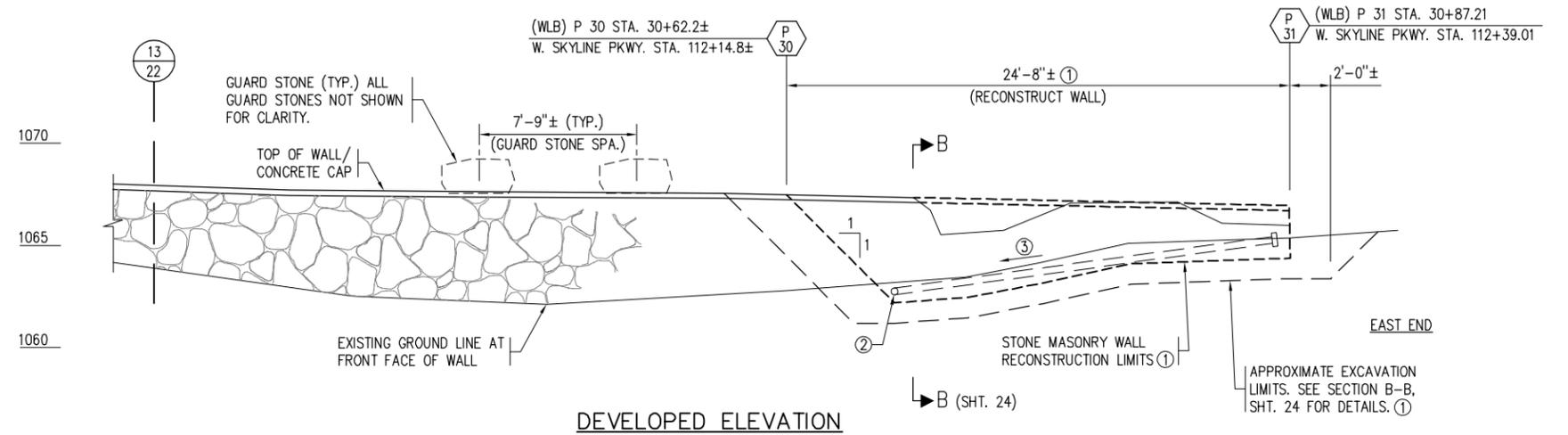
City of Duluth Proj. No. 1494  
 State Proj. No. 118-060-012

DEVELOPED ELEVATION - SECTION 3 TURNOUT  
 Sheet No. 22 of 33 Sheets



**KEY NOTES:**

- ① STONE MASONRY WALL RECONSTRUCTION LIMITS SHOWN ARE APPROXIMATE. LIMITS DURING CONSTRUCTION SHALL BE FINAL SET AND AS DIRECTED BY THE ENGINEER IN THE FIELD.
- ② DRAINAGE SYSTEM TO BE DAYLIGHTED INTO FRONT FACE SLOPE. SEE SHT. 24 FOR DRAINAGE SYSTEM DETAILS.
- ③ 1/8" PER FT. MINIMUM SLOPE.
- ④ PAYMENT FOR EXISTING MONUMENT RESTORATION WORK TO BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "MONUMENT RESTORATION", INCLUDES BUT IS NOT LIMITED TO MORTAR REPOINTING, EXISTING CONCRETE CAP REMOVAL AND NEW CONCRETE CAP FORMING AND PLACEMENT. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS.
- ⑤ REPLACED CONCRETE CAP SHALL MATCH EXISTING CONCRETE CAP COLOR, TEXTURE AND FINISH. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS.

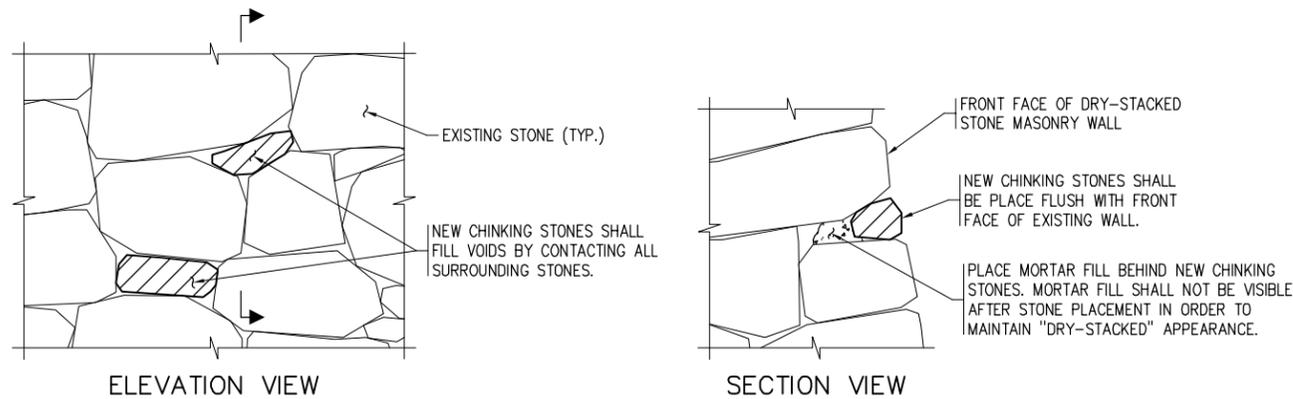


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DEVELOPED ELEVATION - SECTION 3 TURNOUT  
 Sheet No. 23 of 33 Sheets



**STONE RE-CHINKING DETAIL**

- NEW CHINKING STONES SHALL BE OF THE SAME ROCK TYPE, TEXTURE AND COLOR AS EXISTING STONE MASONRY WALL.
- MORTAR FILL AND FURNISHING AND PLACEMENT OF STONE TO BE INCLUDED UNDER ITEM "RESTORE HISTORIC WALL (RE-CHINK)".
- SEE SPECIAL PROVISIONS FOR FURTHER DETAILS.

**STONE WALL DESIGN DATA:**

2006 FHWA ROCKERY DESIGN AND CONSTRUCTION GUIDELINES

FRICTION ANGLE,  $\phi = 32^\circ$

COHESION,  $c = 0$

BULK UNIT WEIGHT,  $\gamma_R = 150$  PCF

ALLOWABLE BEARING PRESSURE = 3 000 PSF

**KEY NOTES:**

- PROVIDE COMPACTED AGGREGATE BEDDING AS SHOWN WHERE STONE MASONRY WALL REMOVAL IS EXCAVATED DEEPER THAN EXISTING STONE WALL/FOUNDATION. IF NATURAL BEDROCK SURFACE IS EXPOSED, RECONSTRUCT STONE WALL DIRECTLY ON BEDROCK SURFACE.
- LINE REPRESENTS THE MINIMUM EXCAVATION LIMITS AND PAY LIMIT LINE FOR ITEM "STRUCTURE EXCAVATION CLASS E" AND EMBANKMENT. ACTUAL EXCAVATION LIMITS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON EXISTING SOIL CHARACTERISTICS AND OSHA SAFETY REQUIREMENTS. EXCAVATION, BACKFILL FOR EXCAVATION AND ANY SURFACE RESTORATION BEYOND THE PAY LIMIT LINE IS INCIDENTAL.
- CONCRETE CAP SHALL MATCH EXISTING CONCRETE CAP COLOR, TEXTURE AND FINISH. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS.
- PAYMENT TO BE INCLUDED IN PRICE BID FOR ITEM "REPAIR CONCRETE CAP TYPE 2", INCLUDES BUT IS NOT LIMITED TO EXISTING CAP REMOVAL, CONCRETE MIX, FORMING, STRIPPING, PLACEMENT AND FINISHING OF PROPOSED CONCRETE CAP.
- TO BE INCLUDED IN PRICE BID FOR ITEM "DRAINAGE SYSTEM".
- STONES COMPRISING STACKED STONE WALL TO BE OBTAINED FROM STONES SALVAGED FROM EXISTING STONE WALL. MISSING AND FRACTURED STONES ARE TO BE REPLACED WITH NEW STONES OF THE SAME ROCK TYPE, TEXTURE, SIZE AND COLOR. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS.
- PROVIDE GRANULAR FILTER AT GRADATION SPECIFIED IN THE SPECIAL PROVISIONS. TO BE INCLUDED IN PRICE BID FOR ITEM "GRANULAR FILTER MOD".
- STONE WALL DESIGN BASE WIDTH (B) SHALL BE DETERMINED BY EQUATION  $B = 1.05 \cdot [2.5 \text{ FT.} + (3/12) \cdot (\text{WALL HEIGHT})]$ .
- VARIES. FRONT FACE WALL BATTER TO MATCH EXISTING/ADJOINING WALL SEGMENT AT EACH LOCATION.
- AGGREGATE SURFACING (CV) CLASS 1.
- EXISTING BITUMINOUS REMOVAL TO BE INCLUDED IN ITEM "REMOVE BITUMINOUS PAVEMENT".

**DRY-STACKED WALL CONSTRUCTION NOTES:**

- PLACE EACH ROCK INDIVIDUALLY BY EQUIPMENT SUITABLE FOR LIFTING, MANIPULATING AND PLACING ROCKS. ENSURE THAT EACH ROCK IS FIRMLY SET AND SUPPORTED BY UNDERLYING MATERIALS AND ADJACENT ROCKS. REPOSITION OR REPLACE LOOSE ROCKS.
- BACKFILL FRONT FACE AND BACK FACE CONSECUTIVELY UNTIL REACHING FRONT FACE GRADE.
- DO NOT CONSTRUCT STONE WALL EXCEEDING THE HEIGHTS SHOWN ON THE PLAN WITHOUT APPROVAL BY ENGINEER IN FIELD.
- PLACE BASE, FACING AND CAP ROCKS SO THAT THEIR HEIGHT DIMENSION IS NOT GREATER THAN THEIR WIDTH, THE LONGEST DIMENSION OF THE BASE, FACING AND CAP ROCKS IS PERPENDICULAR TO FACE OF ROCK.

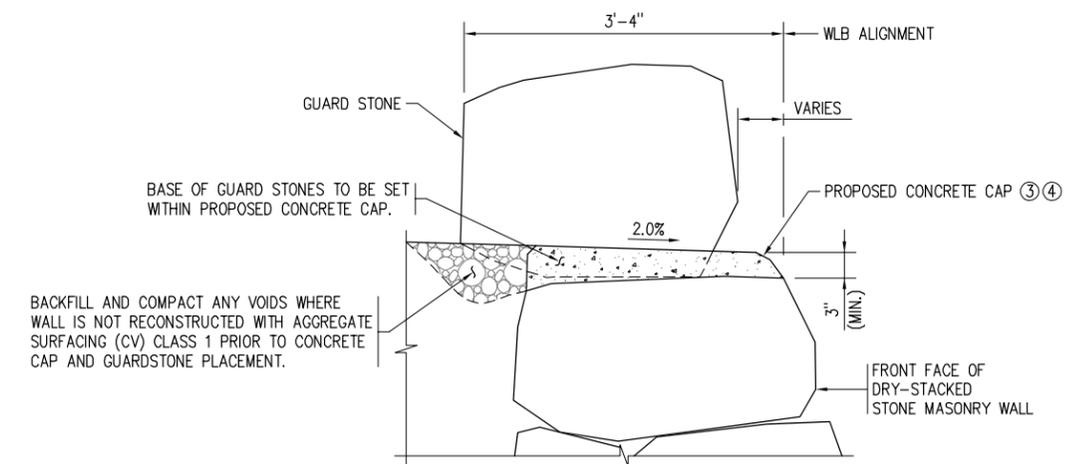
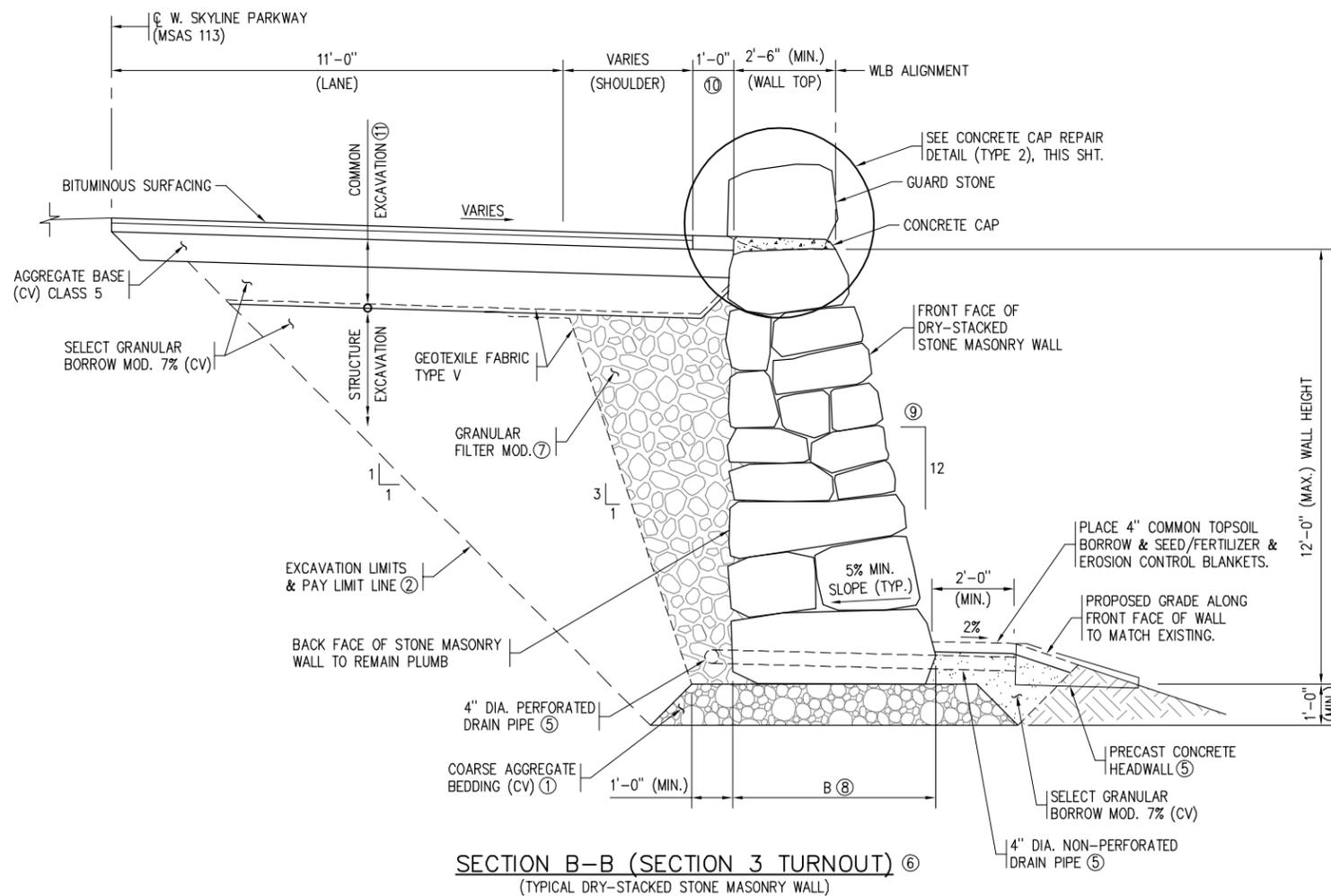
**DRAINAGE SYSTEM NOTES:**

PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "DRAINAGE SYSTEM". INCLUDES BUT IS NOT LIMITED TO 4" DIAMETER PERFORATED AND NON-PERFORATED PIPE, GEOTEXTILE FABRIC, ELBOWS, TEES, END CAPS, COUPLINGS, SLEEVES AND PRECAST CONCRETE HEADWALLS.

ALL PIPE TO COMPLY WITH SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE PER SPEC. 3733, TYPE 1. ATTACH TO PIPE PER SPEC. 2502.

USE PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131C FOR DETAILS.



**CONCRETE CAP REPAIR DETAIL (TYPE 2)**

- EXISTING CONCRETE CAP SHALL BE REMOVED FOR ENTIRE LENGTH OF WALL (WLB).
- EXISTING STONES ARE TO BE SALVAGED AND RE-SET. MISSING STONES SHALL BE REPLACED WITH NEW STONES OF THE SAME ROCK TYPE AND COLOR.
- GUARD STONES TO BE PLACED AT SPACING SHOWN ON ELEVATION SHEETS AND DETAIL ABOVE PRIOR TO POURING CONCRETE CAP.

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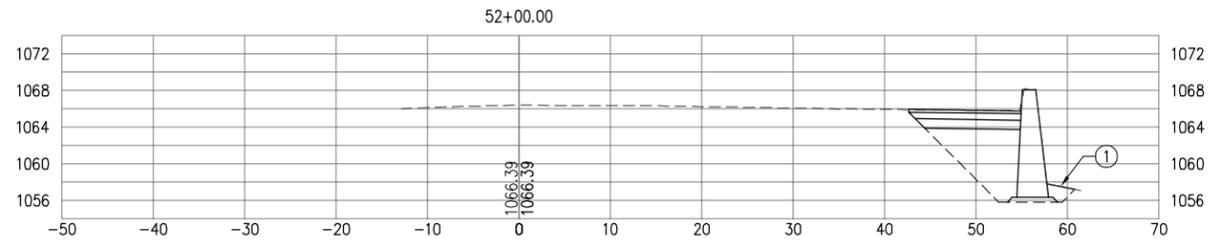
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SECTION 3 TURNOUT - WALL DETAILS

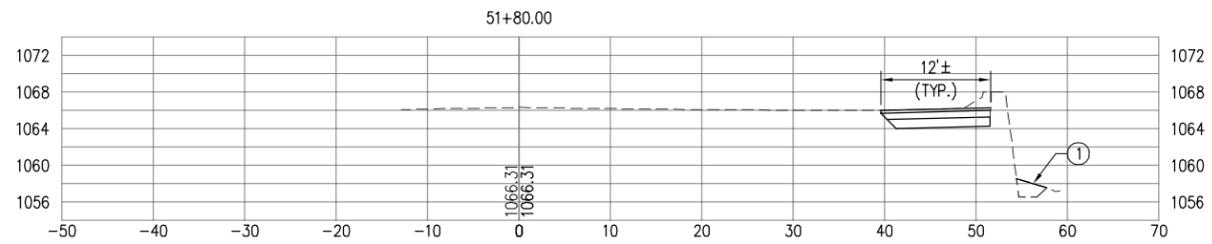
Sheet No. 24 of 33 Sheets

EXISTING RIGHT OF WAY  
EXCEEDS PROJECT LIMITS

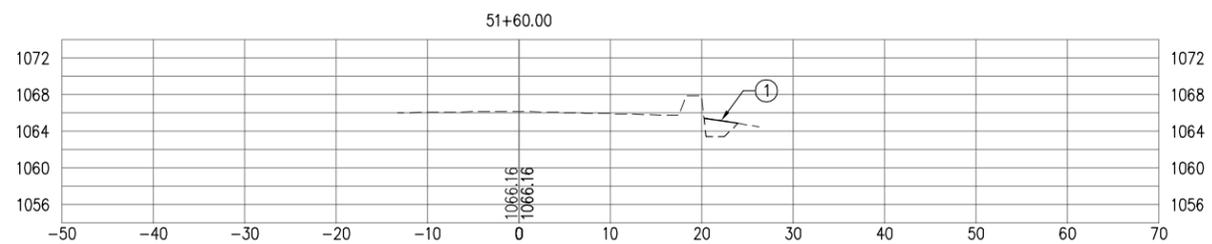
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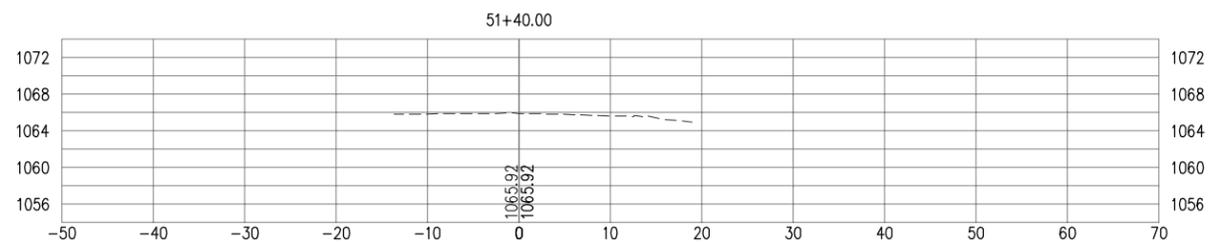
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7	3	10
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0	2	2
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NOTES:  
① SLOPE TO MATCH EXISTING GRADE.

WARNING  
LOCATION OF UNDERGROUND UTILITIES  
TO BE VERIFIED BY CONTRACTOR.  
CALL BEFORE DIGGING.  
GOPHER STATE ONE CALL  
811 OR 1-800-252-1166  
REQUIRED BY LAW

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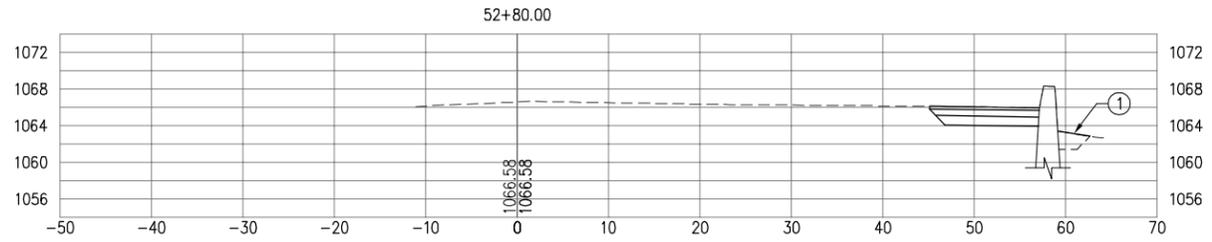
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ONEOTA OVERLOOK - CROSS SECTIONS

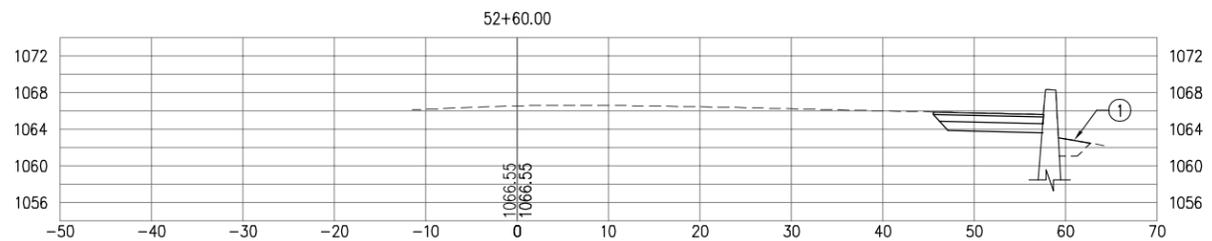
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EXISTING RIGHT OF WAY  
EXCEEDS PROJECT LIMITS

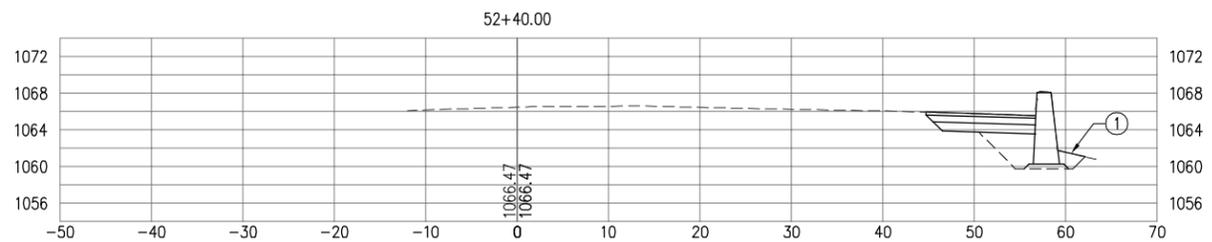
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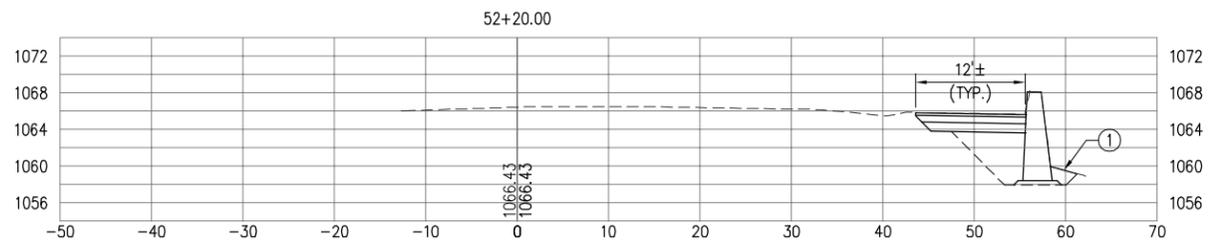
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14	16	20
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14	35	30
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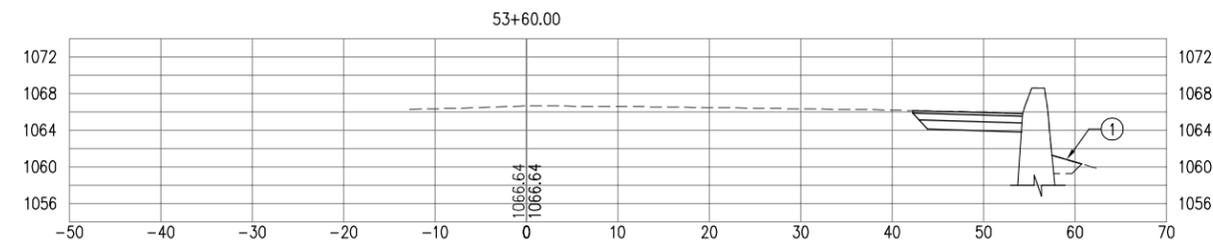
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ONEOTA OVERLOOK - CROSS SECTIONS

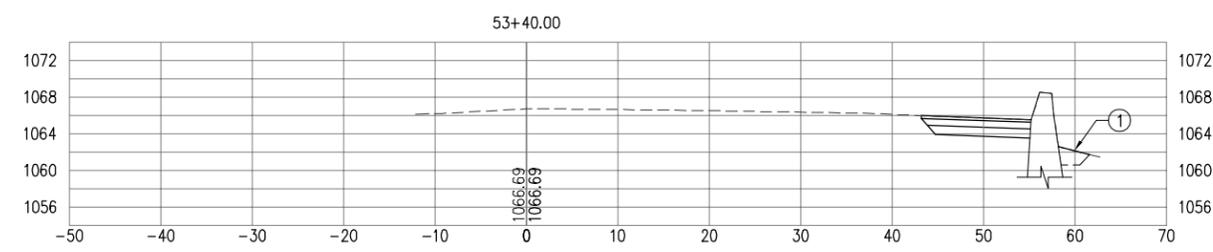
Sheet No. 26 of 33 Sheets

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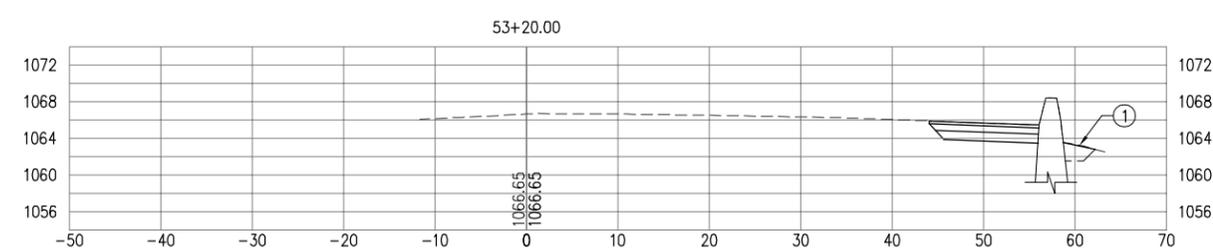
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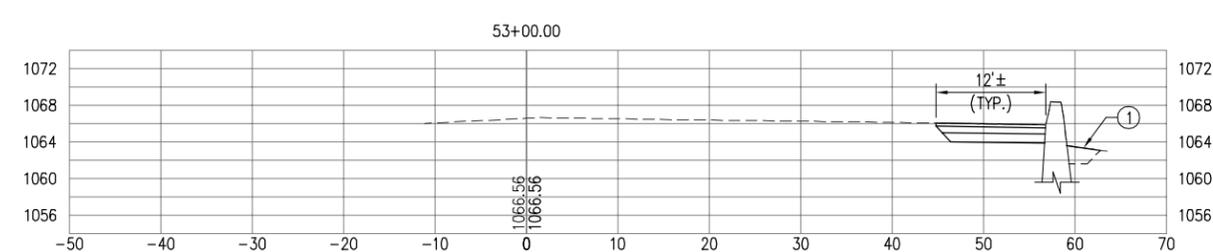
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NOTES:  
① SLOPE TO MATCH EXISTING GRADE.

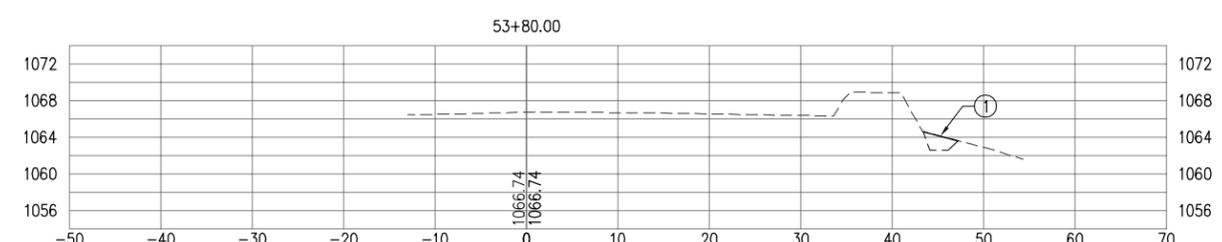
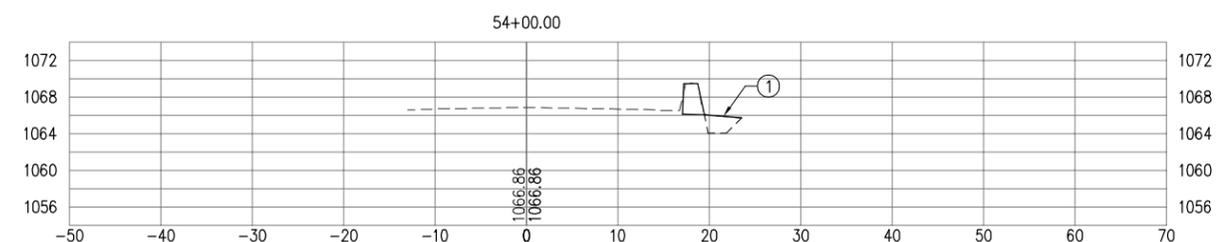
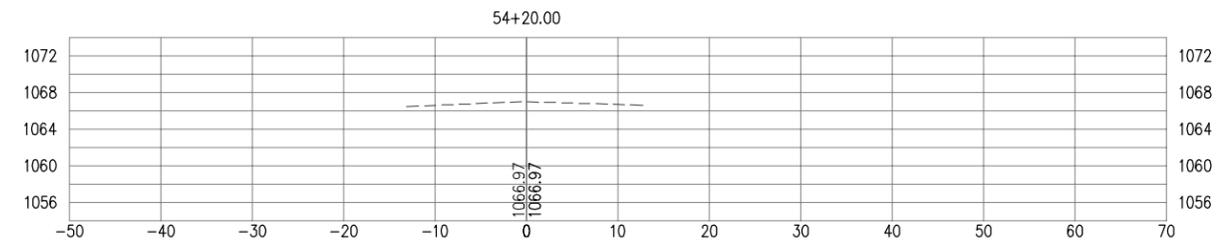
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ONEOTA OVERLOOK - CROSS SECTIONS  
Sheet No. 27 of 33 Sheets

EXISTING RIGHT OF WAY  
EXCEEDS PROJECT LIMITS



	EXC. COMMON	STRUCT.	EMB.
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0	4	7
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NOTES:  
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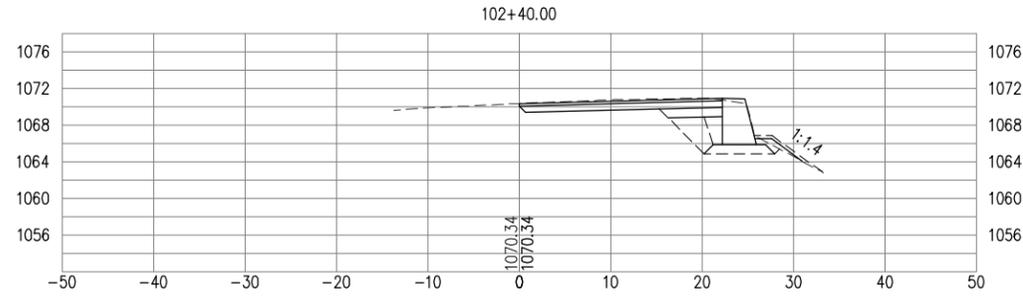
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME  
OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL  
ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
NAME: Joseph D. Litman LIC. NO. 21833 DATE 04/03/2017  
JOSEPH D. LITMAN

City of Duluth Proj. No. 1494  
State Proj. No. 118-060-012

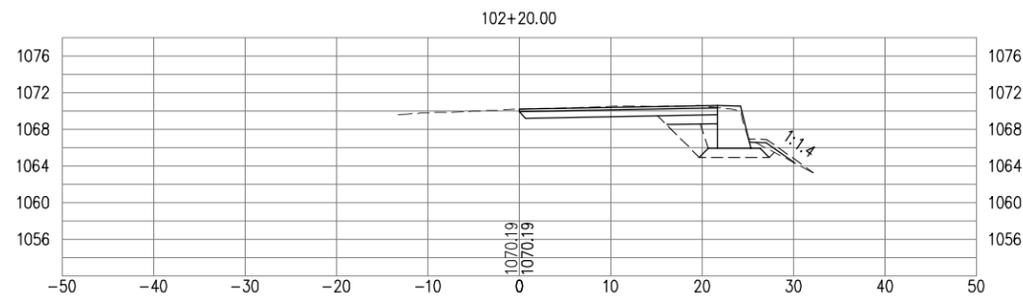
ONEOTA OVERLOOK - CROSS SECTIONS  
Sheet No. 28 of 33 Sheets

EXISTING RIGHT OF WAY  
EXCEEDS PROJECT LIMITS

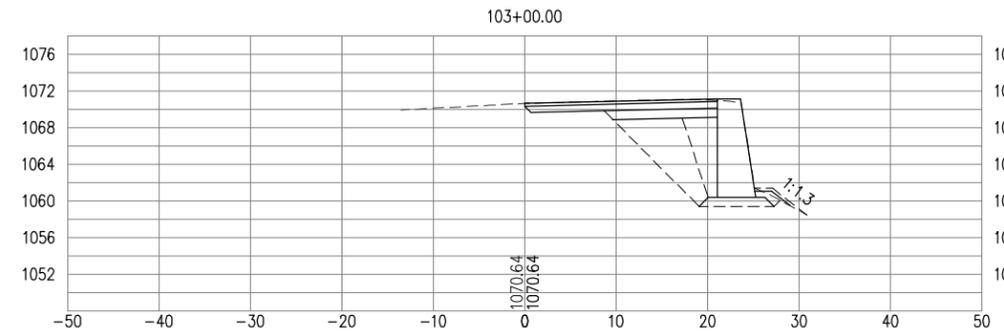
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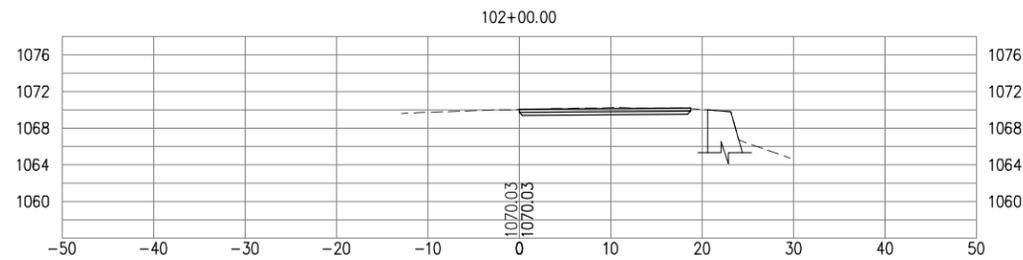
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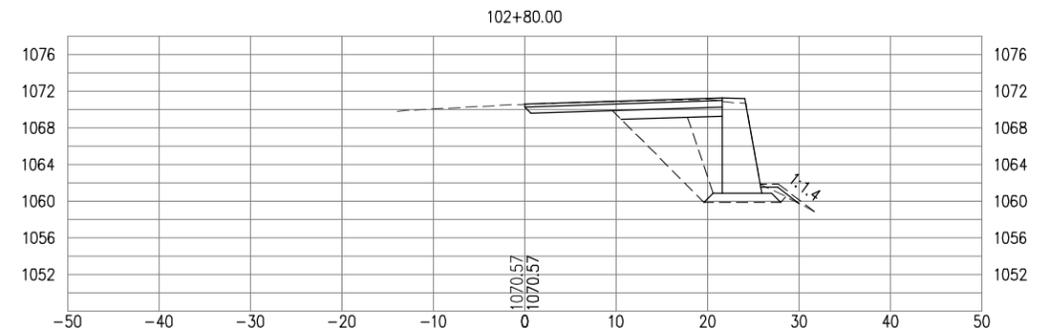
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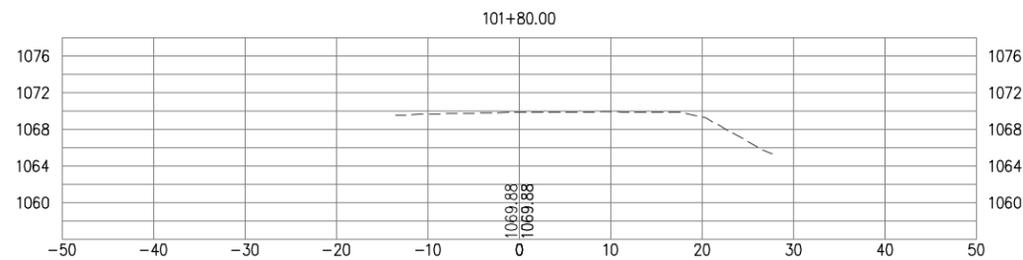
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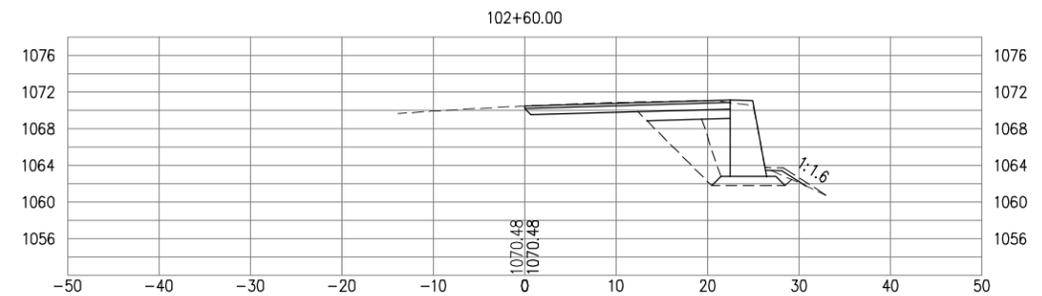
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9 12 8



19 65 47



WARNING  
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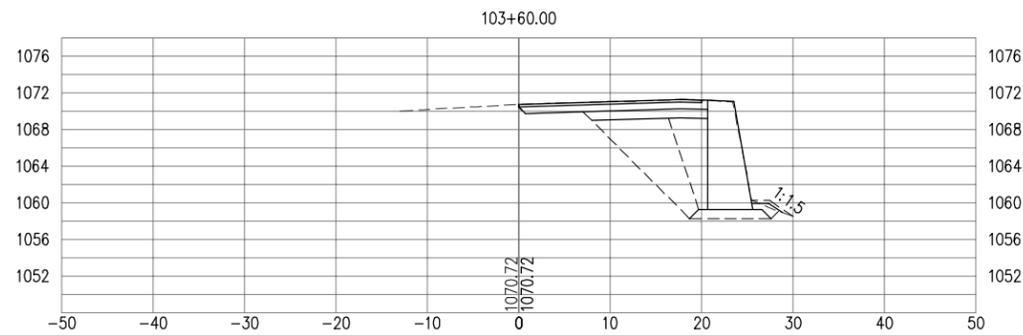
City of Duluth Proj. No. 1494

State Proj. No. 118-060-012

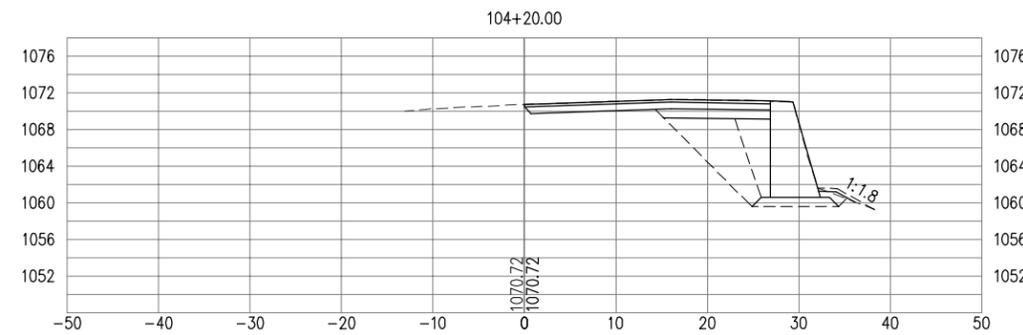
SECTION 3 TURNOUT - CROSS SECTIONS

Sheet No. 29 of 33 Sheets

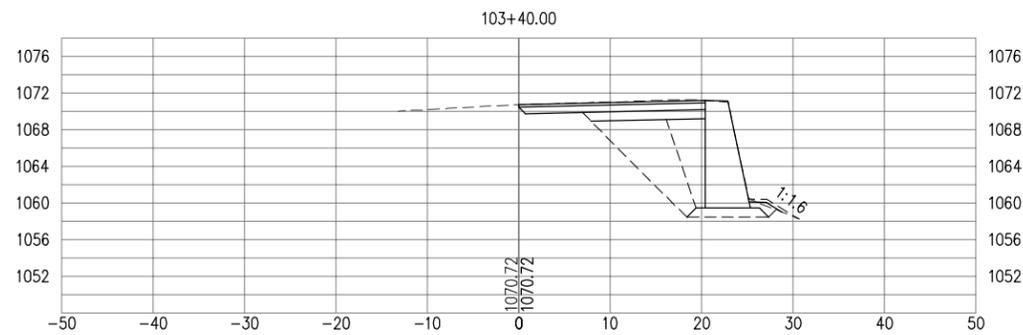
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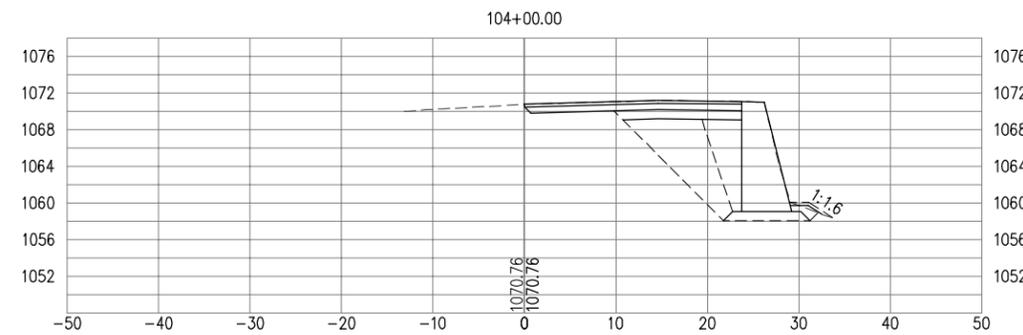
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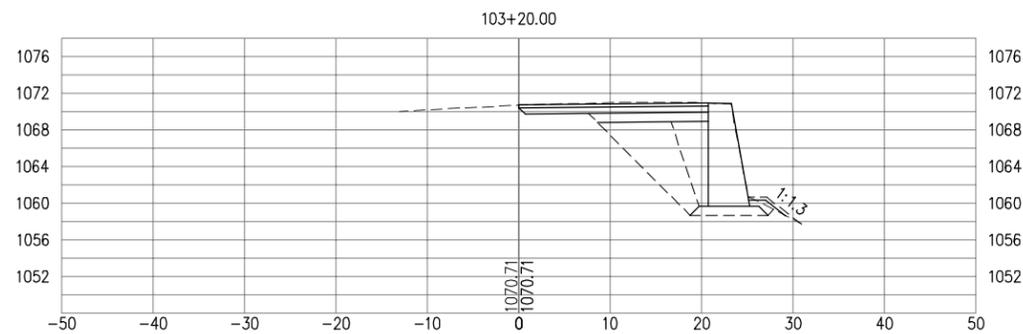
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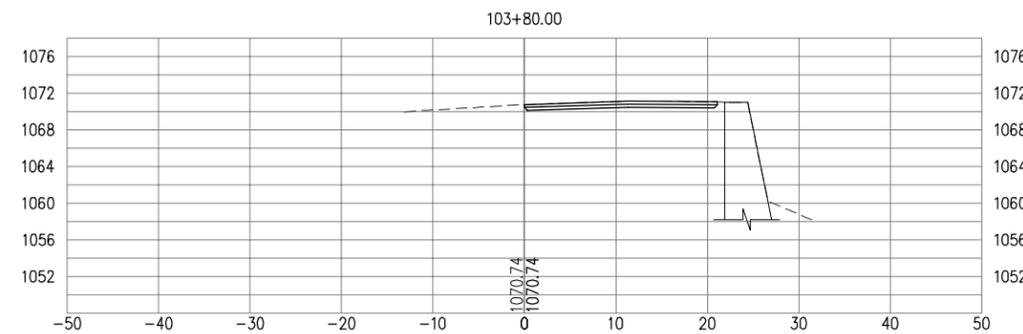
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20 92 67



10 26 18



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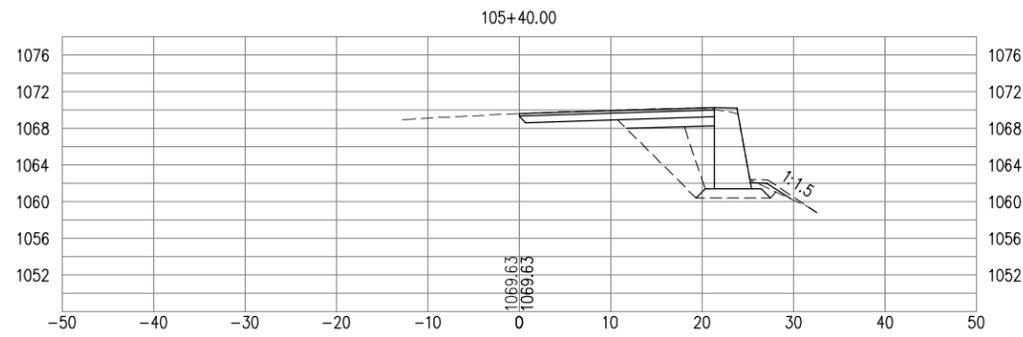
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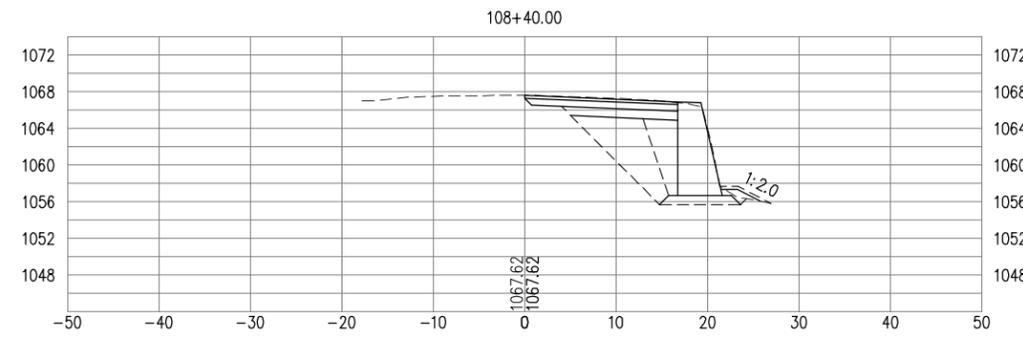
SECTION 3 TURNOUT - CROSS SECTIONS

Sheet No. 30 of 33 Sheets

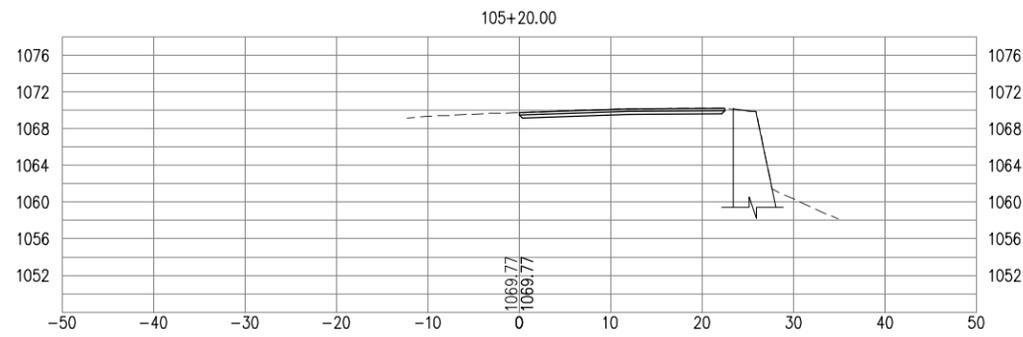
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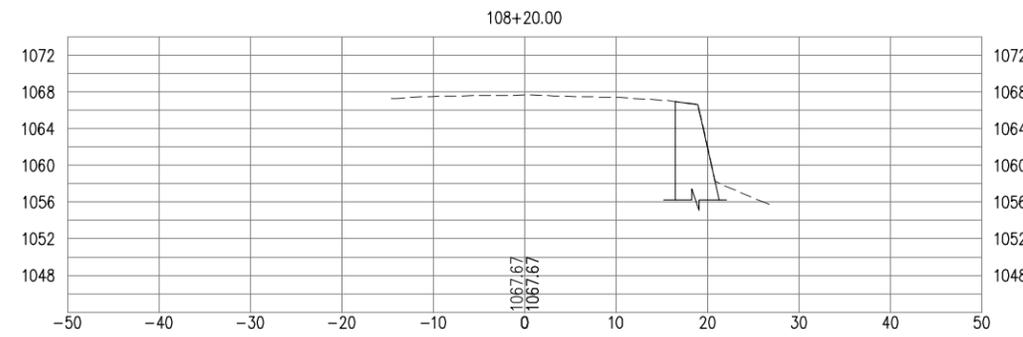
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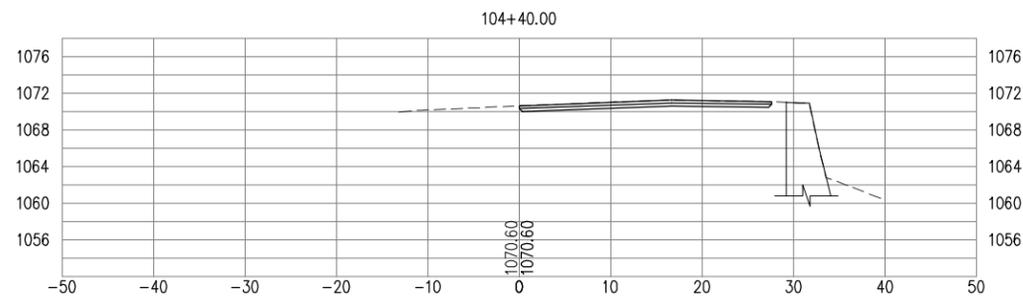
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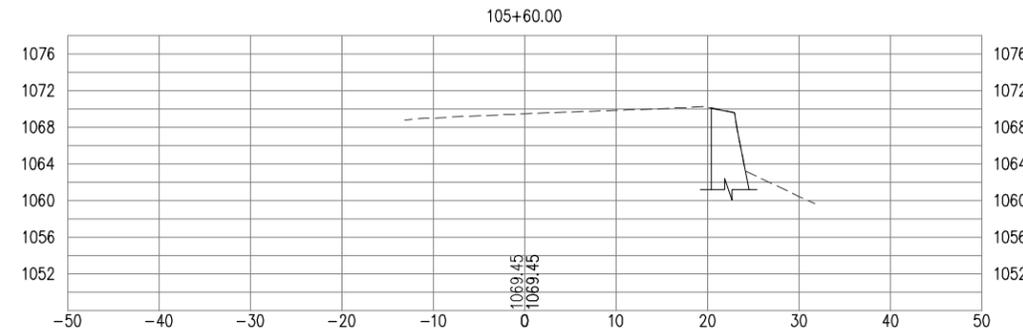
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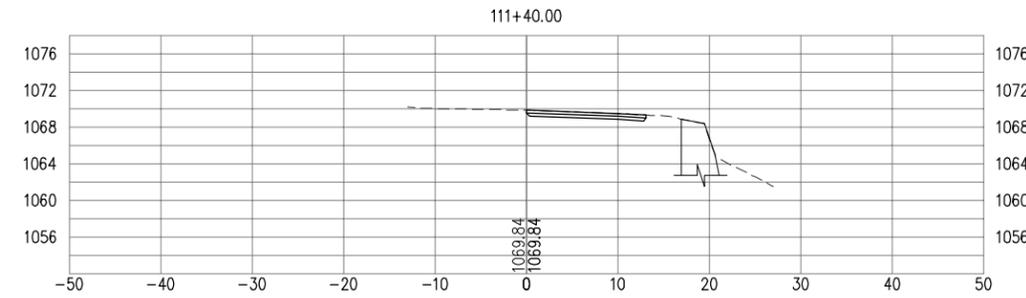
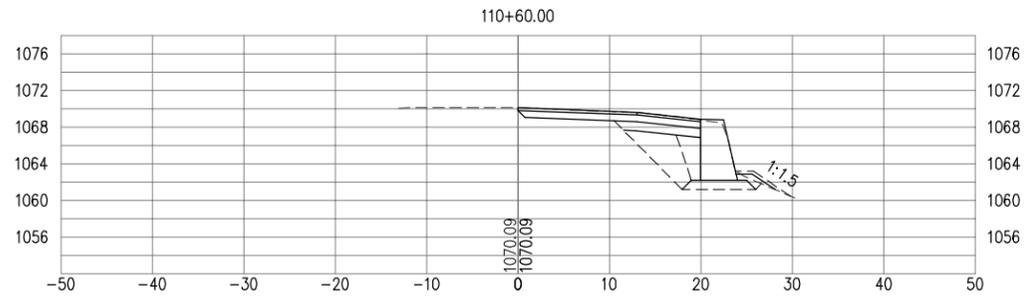
State Proj. No. 118-060-012

SECTION 3 TURNOUT - CROSS SECTIONS

Sheet No. 31 of 33 Sheets

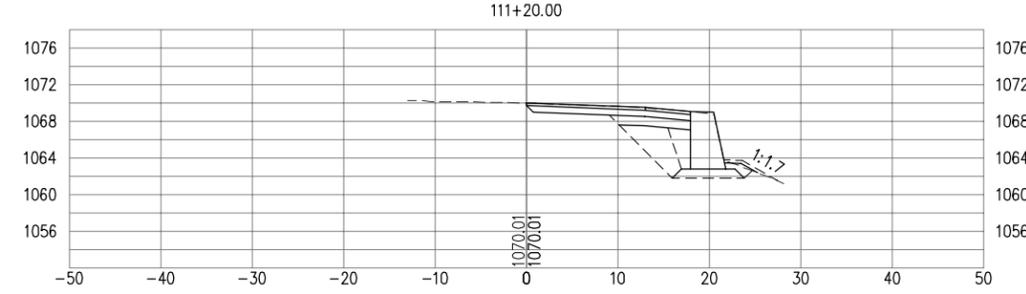
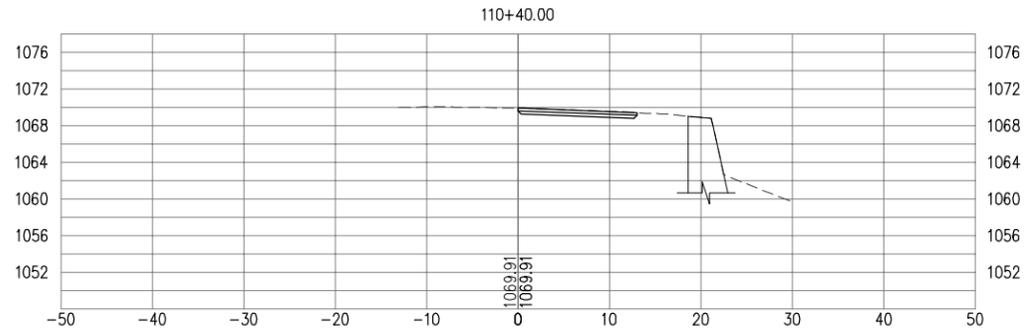
EXISTING RIGHT OF WAY  
EXCEEDS PROJECT LIMITS

EXC. EMB.  
COMMON STRUCT. 17 44 30



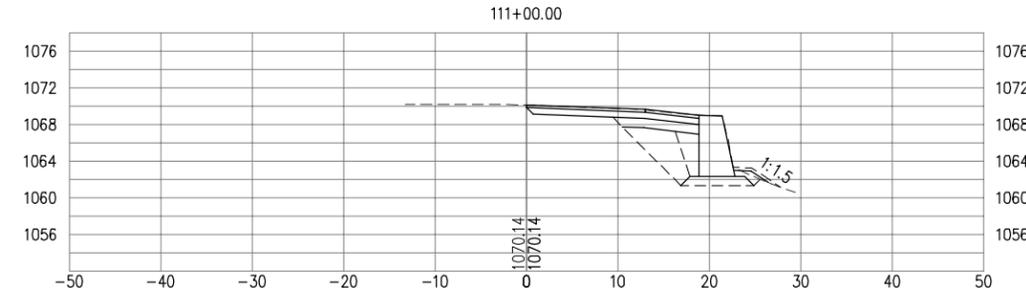
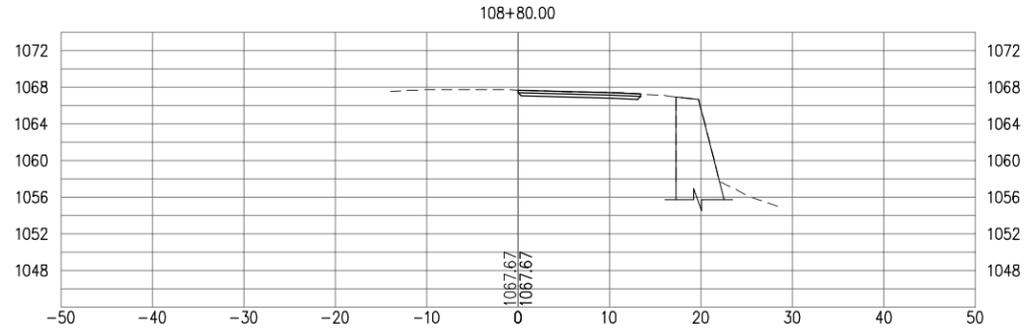
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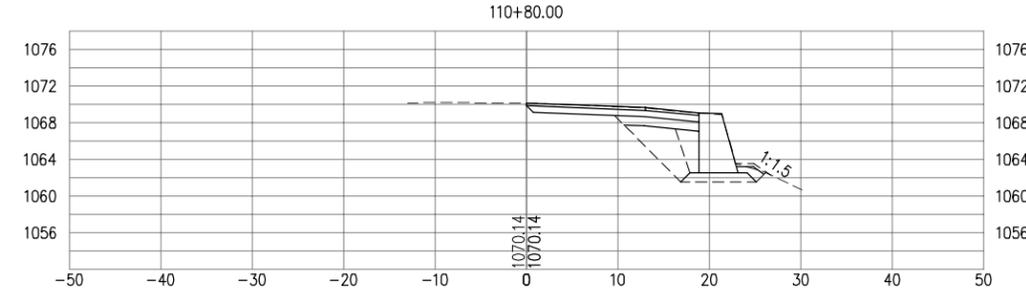
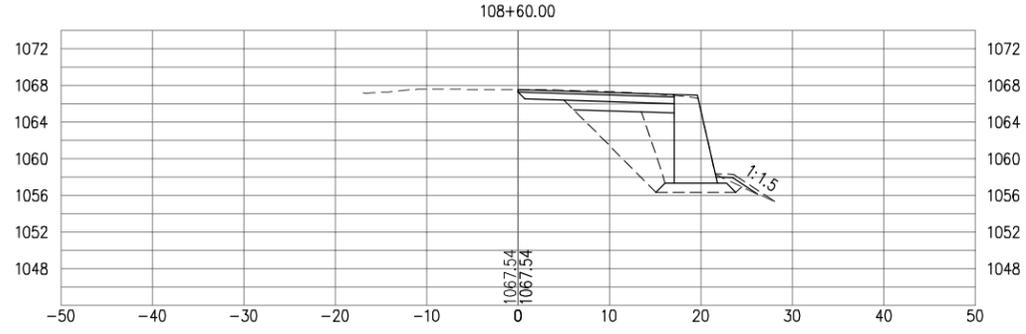
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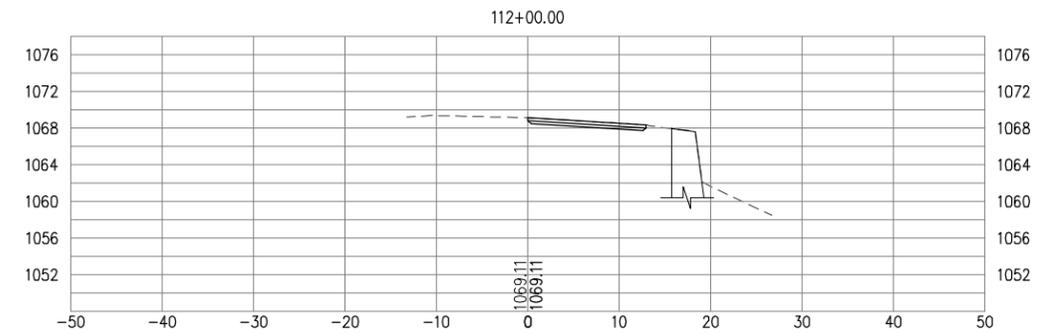
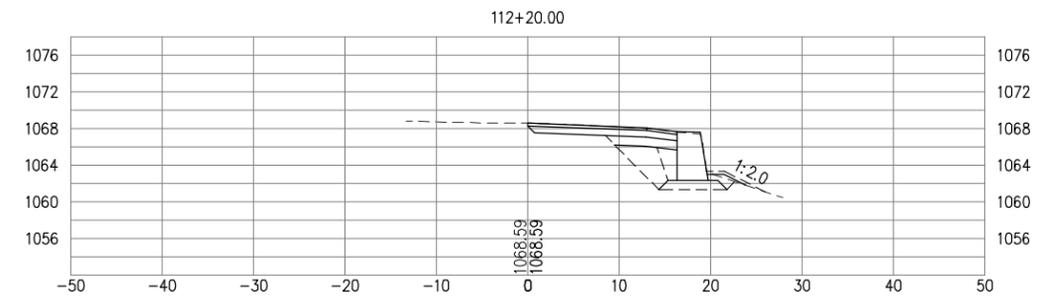
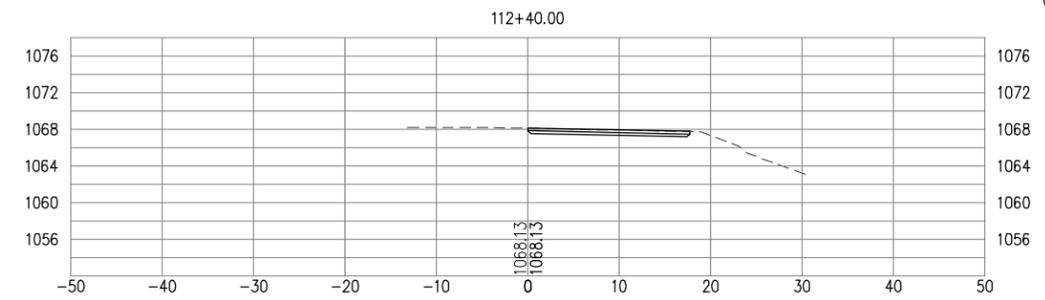
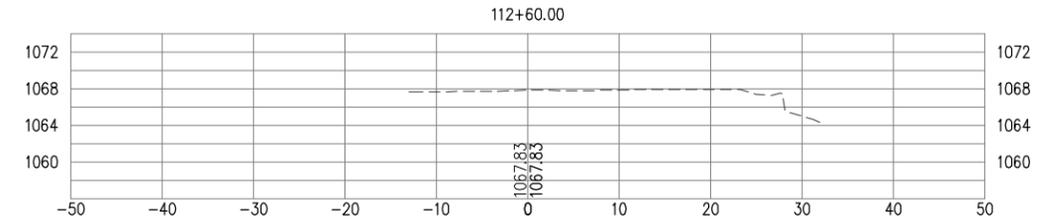
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SECTION 3 TURNOUT - CROSS SECTIONS  
Sheet No. 32 of 33 Sheets

EXISTING RIGHT OF WAY  
EXCEEDS PROJECT LIMITS



	EXC. COMMON	STRUCT.	EMB.
	1	0	0

11 16 12

6 8 6

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SECTION 3 TURNOUT - CROSS SECTIONS

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