

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	-----
CULVERT - (LINE)	-----
EXISTING RIGHT OF WAY	-----
PROPERTY LINE	-----
FENCE - CHAINLINK	-----
FENCE - UNIDENTIFIED	-----
FENCE - BARB WIRE	-----
SIDEWALK - BITUMINOUS	-----
RAILROADS	-----
PAINTED STREET SYMBOLS	-----
CROSSWALK LINES	-----
ALLEYS - NO CURBS, CONCRETE	-----
RECREATIONAL PATHS	-----
TREE - UNIDENTIFIED (LINE)	-----
HEDGE	-----

CITY OF DULUTH

DEPARTMENT OF PUBLIC WORKS AND UTILITIES ENGINEERING DIVISION

CONSTRUCTION PLANS FOR: VARIOUS 2012 FLOOD REPAIRS INCLUDING RETAINING WALL REPLACEMENT, RIPRAP, EROSION CONTROL AND DEBRIS REMOVAL AT BRIDGE L5930

LOCATED ON: AT TISCHER CREEK ADJACENT TO ANNA STREET

LEGAL DESCRIPTION: LOCATED IN THE SOUTHEAST QUARTER OF SECTION 11, T50N, R14W, CITY OF DULUTH, MINNESOTA. FROM A POINT THAT IS APPROXIMATELY 1420 FEET WEST AND 1730 FEET NORTH OF THE SOUTHEAST CORNER OF SECTION 11, T50N, R14W TO A POINT THAT IS APPROXIMATELY 1290 FEET WEST AND 1640 FEET NORTH OF THE SOUTHEAST CORNER OF SECTION 11, T50N, R14W

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 CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT ENGINEERING DIVISION 2016 EDITION STANDARD CONSTRUCTION SPECIFICATIONS SHALL APPLY.

ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MN MUTCD, INCLUDING THE FIELD MANUAL DATED "LATEST EDITION". (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 C/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

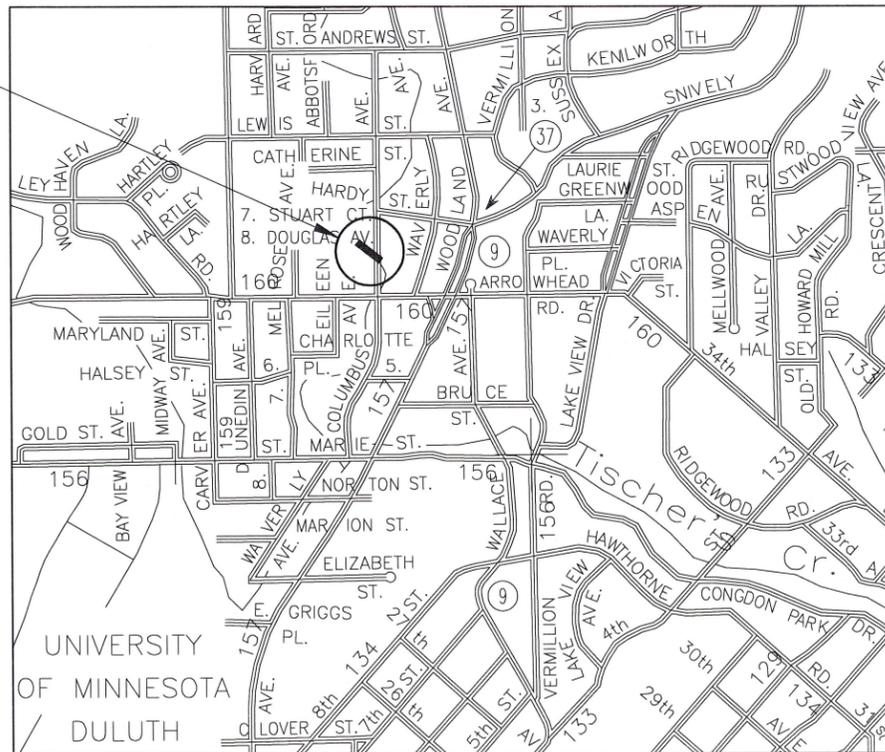
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SHEET No.	DESCRIPTION
1	TITLE SHEET
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3	GENERAL PLAN & SCOPE
4	INLET ELEVATION & RIPRAP DETAILS
5	RETAINING WALL ELEVATION & DETAILS
6	FENCE & WALL CONNECTION DETAILS
7-8	STORMWATER POLLUTION PROTECTION PLAN
9	TRAFFIC CONTROL
10	AS-BUILT BRIDGE DATA

UTILITY SYMBOLS

PROPERTY CORNER	⊠
CONTROL POINT	⊠
WATER METER	⊠
WELL	⊠
PEDESTAL (TELEPHONE CABLE TERMINAL)	⊠
PEDESTAL (TELEVISION 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	⊠
SIGN - UNIDENTIFIED (SYMBOL)	⊠
MONUMENT	⊠

BR. NO. L5930

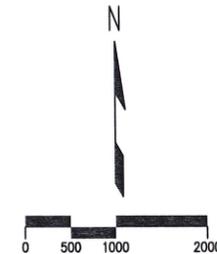


INDEX MAP

SCALE: 0 500'

MANHOLE & CATCH BASIN INDEX

ICB #	INPLACE CATCH BASIN	IMGH #	INPLACE WATER/GAS MANHOLE	PCB #	PROPOSED CATCH BASIN	PWGMH #	PROPOSED WATER/GAS MANHOLE
IMH #	INPLACE DRAINAGE MANHOLE	IMHST #	INPLACE STEAM MANHOLE	PMH #	PROPOSED DRAINAGE MANHOLE	PMHST #	PROPOSED STEAM MANHOLE
ISMH #	INPLACE SANITARY MANHOLE	IGM #	INPLACE GAS ONLY MANHOLE	PSMH #	PROPOSED SANITARY MANHOLE	PGMH #	PROPOSED GAS ONLY MANHOLE
TMH #	INPLACE TELEPHONE MANHOLE	IPMH #	INPLACE POWER MANHOLE	PTMH #	PROPOSED TELEPHONE MANHOLE	PPMH #	PROPOSED POWER MANHOLE



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



PROJECT LOCATION:
ST. LOUIS COUNTY
CITY OF DULUTH
SEC. 11, T50N R14W



PERFORMANCE DRIVEN DESIGN.
LHBcorp.com
PROJ. NO. 120451
21 W. Superior St., Ste. 500 | Duluth, MN 55802 | 218.727.8446

LHB PROJECT. No. 120451.07

CITY OF DULUTH PROJECT No. 1238

DESIGN DESIGNATION

ADT (CURRENT YEAR) 2016	20
ADT (FUTURE YEAR) 2036	25
HCA DT (CURRENT)	--
HCA DT (FUTURE)	--
STRUCTURE DESIGN	N/A
SOIL FACTOR	N/A
DESIGN SPEED	N/A
BASED ON STOPPING SIGHT DISTANCE	
HEIGHT OF EYE =	3.5 FT.
HEIGHT OF OBJECT =	2.0 FT.

I HEREBY CERTIFY THAT THIS PLAN 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.

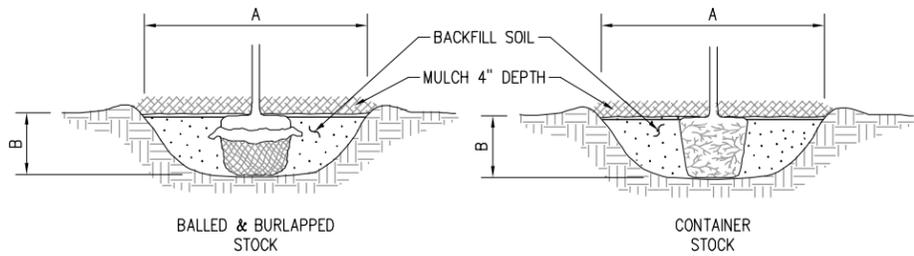
LISA M. KARLGAARD

PROJECT ENGINEER (TYPED OR PRINTED NAME)
Lisa M. Karlgaard 05/11/16 47556
PROJECT ENGINEER DATE LIC. No.

CITY APPROVALS:
APPROVED *[Signature]* CHIEF ENGINEER OF TRANSPORTATION 5/16/16 DATE

APPROVED *[Signature]* CHIEF ENGINEER OF UTILITIES 5/16/16 DATE

APPROVED *[Signature]* CITY ENGINEER 5/16/16 DATE



- | | |
|---|---|
| <ol style="list-style-type: none"> SCARIFY SIDES AND BOTTOM OF HOLE. PROCEED WITH CORRECTIVE PRUNING AS DIRECTED BY LANDSCAPE ARCHITECT. SET PLANT ON UNDISTURBED NATIVE SOIL, OR THOROUGHLY COMPACTED BACKFILL SOIL AT THE SAME DEPTH AS IT WAS GROWN IN THE NURSERY. PLANT SHALL BE PLACED IN PLANTING HOLE WITH BURLAP AND WIRE BASKET, IF USED, INTACT. ONCE IN PLACE, THE PLANT SHALL BE BACKFILLED TO WITHIN 12" OF THE TOP OF THE ROOTBALL. THE BURLAP SHALL BE FOLDED OR CUT BACK. PLUMB AND BACKFILL WITH BACKFILL SOIL PER MNDOT SPEC 3877.2B. BACKFILL VOIDS AND CONSTRUCT 3" DEPTH WATERING BASIN. WATER THOROUGHLY WITHIN 2 HOURS. PLACE MULCH WITHIN 48 HOURS OF THE SECOND WATERING. BIODEGRADABLE TWINE MAY BE LEFT ON AS SUPPORT BETWEEN THE ROOT BALL AND ROOT COLLAR UNTIL THE END OF THE PLANT MAINTENANCE PERIOD AT WHICH TIME IT MUST BE CUT AND TOTALLY REMOVED FROM THE ROOT COLLAR. USE OF NONBIODEGRADABLE TWINE SHALL NOT BE PERMITTED. | <ol style="list-style-type: none"> SCARIFY SIDES AND BOTTOM OF HOLE. PROCEED WITH CORRECTIVE PRUNING AS DIRECTED BY LANDSCAPE ARCHITECT. REMOVE CONTAINER AND SCORE OUTSIDE OF SOIL MASS TO REDIRECT CIRCLING FIBROUS ROOTS AS NECESSARY. SET PLANT ON UNDISTURBED NATIVE SOIL, OR THOROUGHLY COMPACTED BACKFILL SOIL AT THE SAME DEPTH AS IT WAS GROWN IN THE NURSERY. BACKFILL VOIDS AND CONSTRUCT 3" DEPTH WATERING BASIN. WATER THOROUGHLY WITHIN 2 HOURS. PLACE MULCH WITHIN 48 HOURS OF THE SECOND WATERING. |
|---|---|

NOTES:

- THE PLANTING DETAILS REPRESENT ADEQUATELY DRAINED SOIL CONDITIONS. THE CONTRACTOR SHOULD EXERCISE DISCRETION IN SETTING PLANTS 1"-3" HIGHER IN POORLY DRAINED SOILS.
- ON 2:1 SLOPES OR GREATER, DO NOT CONSTRUCT THE UPHILL HALF OF THE WATERING BASIN.
- ON WET, POORLY DRAINED SOILS, DO NOT CONSTRUCT WATERING BASIN.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE DRAINAGE IN HEAVY POORLY DRAINED OR IMPERVIOUS SOILS.
- MULCH PER MNDOT SPEC 3882.

SHRUB & TREE PLANTING DETAILS

PLANTING HOLE DIMENSIONS			
PLANT TYPE	PLANT SIZE (UP TO AND INCLUDING)	MIN. HOLE WIDTH (INCHES)	
		A	B
EVERGREEN TREES	3' B.B.	42	11
	4' B.B.	51	13
	5' B.B.	60	13
	6' B.B.	66	15
	7' B.B.	72	16
	8' B.B.	81	18
	9' B.B.	90	20
SHADE & FLOWERING TREES	10' B.B.	102	21
	1" B.B.	54	14
	1 1/4" B.B.	60	14
	1 1/2" B.B.	66	15
	1 3/4" B.B.	72	16
	2" B.B.	84	19
	2" B.B.	72	16
EVERGREEN SHRUBS (UPRIGHT)	2 1/2" B.B.	84	19
	3" B.B.	96	20
	3 1/2" B.B.	114	23
	4" B.B.	126	25
	2' B.B.	36	9
	3' B.B.	48	12
	4' B.B.	63	14
EVERGREEN SHRUBS (SPREADING)	18" SPREAD B.B.	30	8
	2' SPREAD B.B.	36	9
	2 1/2' SPREAD B.B.	42	11
	3' SPREAD B.B.	48	12
DECIDUOUS SHRUBS	18" B.B.	30	8
	2' B.B.	33	9
	3' B.B.	42	11
	4' B.B.	48	12
	5' B.B.	54	14
	6' B.B.	60	14
	18" B.B.	27	7
	2' B.B.	30	8
	3' B.B.	36	9
	4' B.B.	42	11
CONTAINER GROWN PLANTS	5' B.B.	48	12
	6' B.B.	54	14
	#1 CONT.	23	7
	#2 CONT.	26	9
	#3 CONT.	30	10
	#5 CONT.	36	13
#7 CONT.	42	13	
#15 CONT.	51	18	
#20 CONT.	60	21	

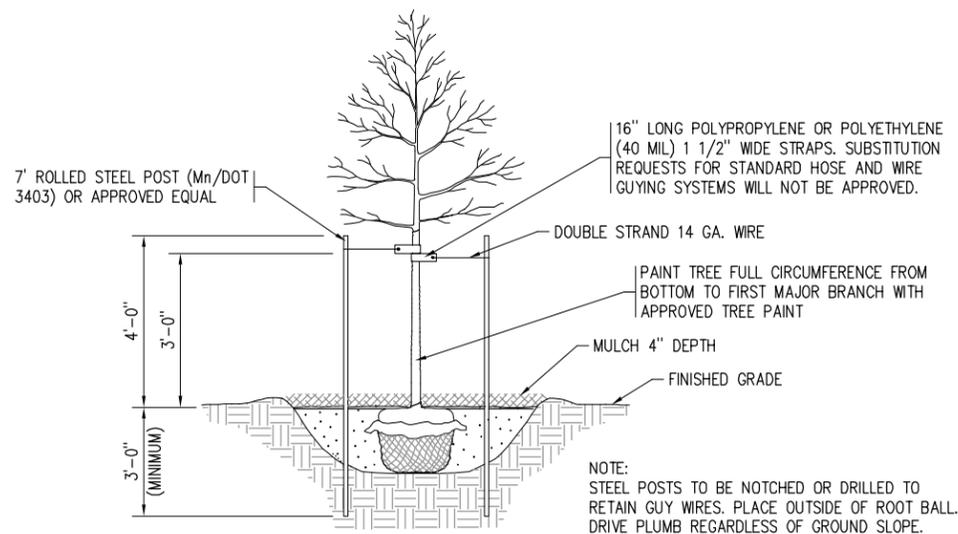
STATEMENT OF ESTIMATED QUANTITIES					
LINE	SPEC. NO.	ITEM	UNIT	CITY PROJ. NO. 1238	
				L5930	
				FEMA	FLOOD BOND
1	2021.501	MOBILIZATION	LUMP SUM	1	1
2	2104.501	REMOVE CONCRETE RETAINING WALL	LIN FT	72 (P)	72 (P)
3	2104.607	REMOVE DEBRIS	CU YD	9 (P)	9 (P)
4	2105.601	TEMPORARY STREAM DIVERSION SYSTEM	LUMP SUM	1	1
5	2105.601	DEWATERING	LUMP SUM	1	1
6	2452.618	STEEL SHEET PILING (PERMANENT)	SQ FT	1920	1920
7	2511.501	RANDOM RIPRAP CLASS III	CU YD	76	76
8	2557.501	WIRE FENCE DESIGN SPECIAL	LIN FT	72 (P)	72 (P)
9	2557.603	REMOVE AND REINSTALL WIRE FENCE	LIN FT	50	50
10	2563.601	TRAFFIC CONTROL	LUMP SUM	1	1
③ 11	2571.502	DECIDUOUS TREE	TREE	6	6
④ 12	2573.502	SILT FENCE, TYPE HI	LIN FT	50	50
13	2573.502	SILT FENCE, TYPE TB	LIN FT	100	100
① 14	2575.505	SODDING TYPE LAWN	SQ YD	200	200
④ 15	2575.523	EROSION CONTROL BLANKETS CATEGORY 3	SQ YD	120	120
② 16	2575.555	TURF ESTABLISHMENT	LUMP SUM	1	1

KEY NOTES:

- PLACE SOD ON ALL DISTURBED AREAS SOUTH OF ANNA STREET.
- TO BE USED ON BRIDGE SLOPES NORTH OF ANNA STREET. TURF ESTABLISHMENT SHALL INCLUDE:
 - 4 INCHES TOPSOIL
 - SEED MIXTURE 36-311 AT THE RATE OF 70 POUNDS PER ACRE
 - FERTILIZER TYPE 3 AT THE RATE OF 70 POUNDS PER ACRE
- ALL EXCAVATION, SOIL PREPARATION, BACKFILL SOIL, MULCH, STAKING, AND OTHER DETAIL REQUIREMENTS SHALL BE INCLUDED IN THE UNIT PRICE FOR "DECIDUOUS TREE" - SPEC. 2571.
- TO BE USED AS DIRECTED BY THE ENGINEER. SPECIFIC LOCATIONS HAVE NOT BEEN DETAILED IN THIS PLAN.

NOTES:

- WITHIN THE PLAN, WHEREVER THE WORD INCIDENTAL IS USED IT SHALL MEAN NO DIRECT PAYMENT WILL BE MADE FOR THAT ITEM
- (P) INDICATES PLAN QUANTITY.



STANDARD TREE STAKING & WRAPPING DETAIL

STANDARD PLATES	
THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT.	
PLATE NUMBER	DESCRIPTION
8000J	CHANNELIZERS

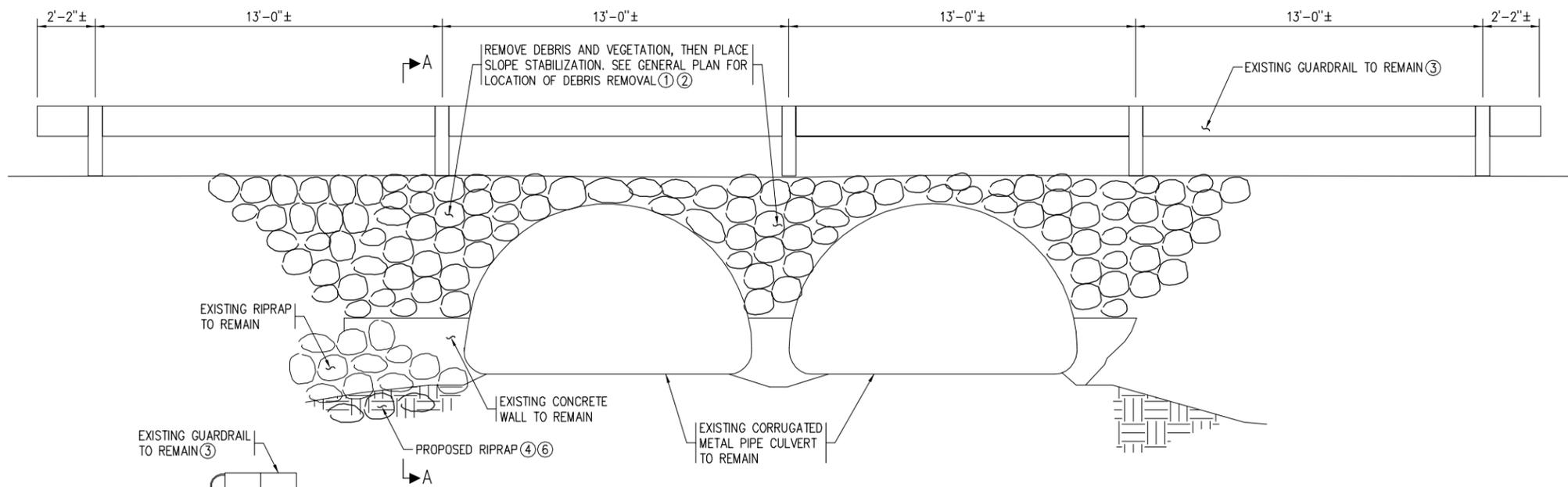
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
 NAME: Lisa M. Karlgaard LIC. NO. 47556 DATE 05/11/16

TITLE: **STATEMENT OF ESTIMATED QUANTITIES & PLANTING DETAILS**

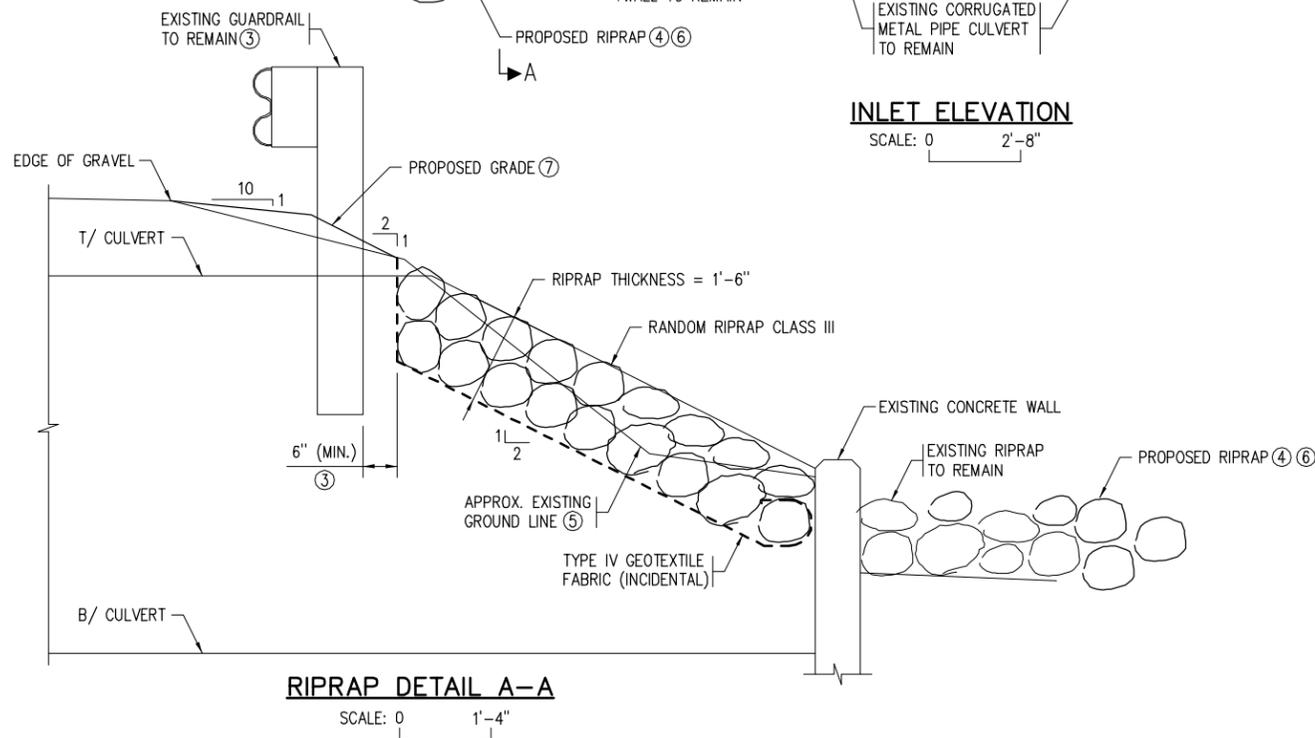
DES: LMK DR: GAV APPROVED:
 CHK: JDL CHK: LMK

Bridge No. **L5930**

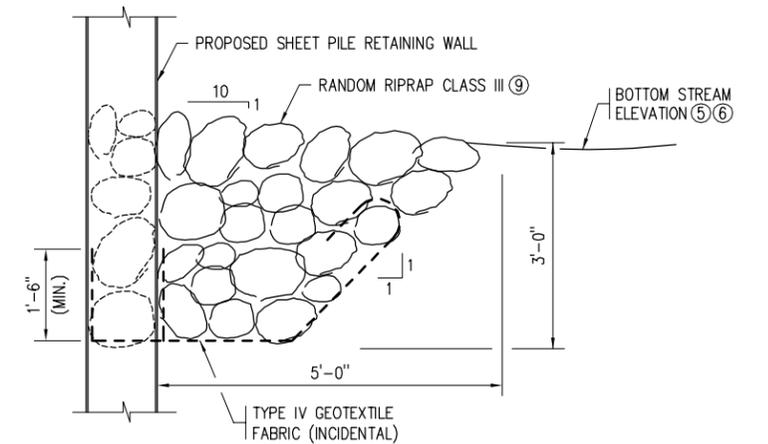
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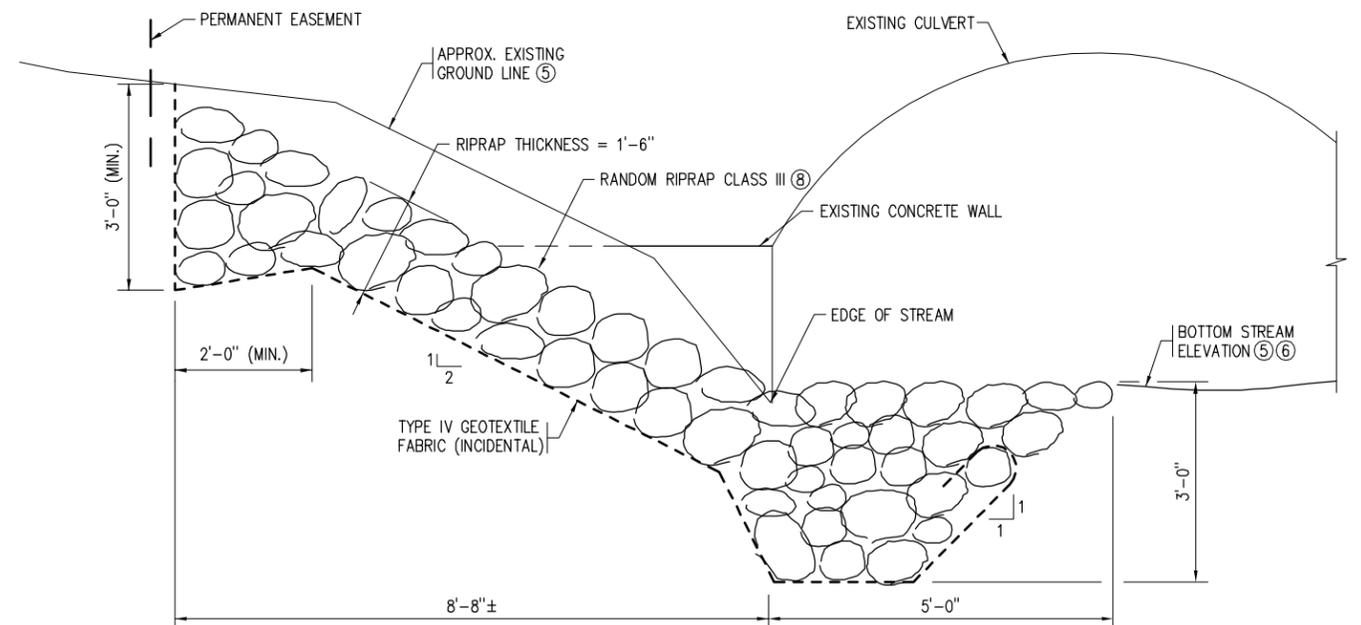
INLET ELEVATION
SCALE: 0 2'-8"



RIPRAP DETAIL A-A
SCALE: 0 1'-4"



RIPRAP DETAIL C-C
SCALE: 0 1'-4"



RIPRAP DETAIL B-B
SCALE: 0 1'-4"

KEY NOTES:

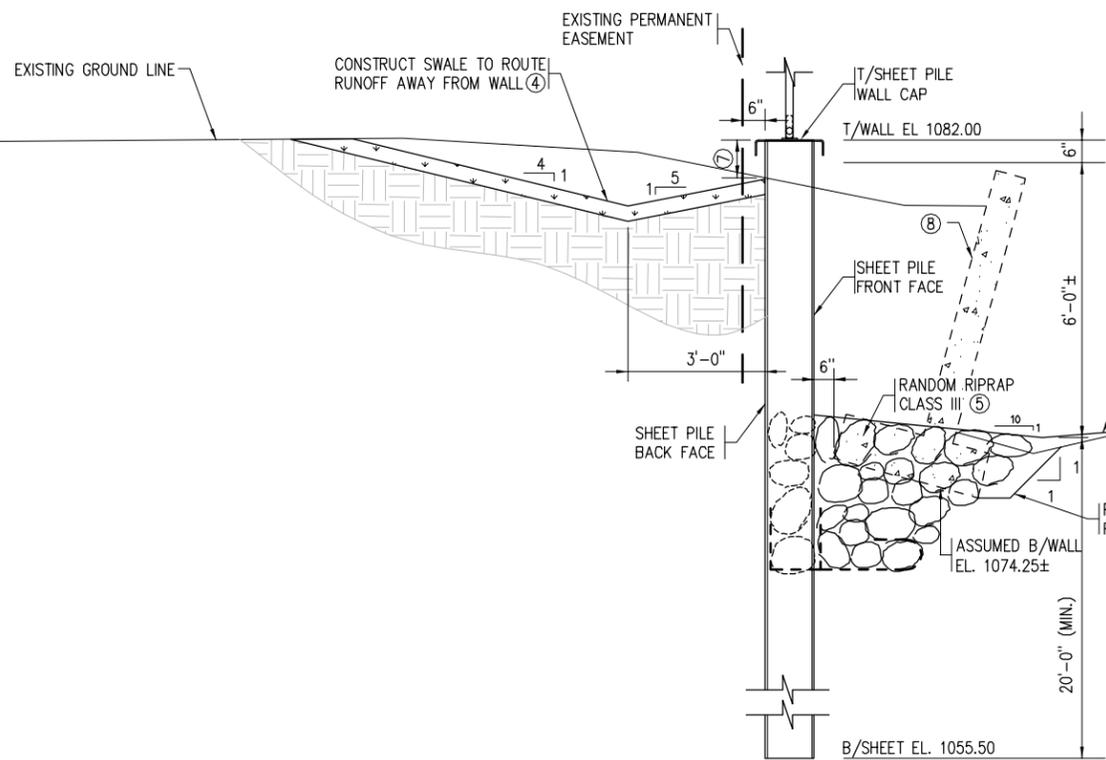
- ① CLEAR DEBRIS AND VEGETATION FROM SLOPES IN LOCATIONS OF PROPOSED RIPRAP. DEBRIS IN STREAM (OBSTRUCTING FLOW OF STREAM THROUGH STRUCTURE) IS TO BE REMOVED AS DIRECTED BY THE ENGINEER IN THE FIELD. SEE SHT B03 FOR APPROXIMATE LOCATIONS AND ADDITIONAL DETAIL. PAID FOR UNDER ITEM "REMOVE DEBRIS."
- ② FURNISH AND INSTALL 20 CU. YD. "RANDOM RIPRAP CLASS III" (RIPRAP THICKNESS = 1'-6") AND 60 SQ. YD. GEOTEXTILE FILTER TYPE IV (INCIDENTAL) PER DETAIL A-A (THIS SHEET) AND AS DIRECTED BY THE ENGINEER IN THE FIELD.
- ③ CONTRACTOR TO PROTECT EXISTING GUARDRAIL. ANY DAMAGE TO GUARDRAIL TO BE REPAIRED AT NO EXPENSE TO THE CITY. CONTRACTOR TO USE CAUTION WHEN EXCAVATING NEAR GUARDRAIL POSTS TO AVOID UNDERMINING ESTABLISHED EMBEDMENT.
- ④ FURNISH AND INSTALL 5 CU. YD. "RANDOM RIPRAP CLASS III" ALONG EAST BANK OF BRIDGE INLET TO SUPPLEMENT EXISTING RIPRAP AND PROVIDE ADDITIONAL BANK PROTECTION AS DIRECTED BY ENGINEER IN THE FIELD. SEE SHT B03 FOR APPROXIMATE LOCATION.
- ⑤ ALL REQUIRED EXCAVATION FOR PLACEMENT OF PROPOSED RIPRAP TO BE INCIDENTAL TO ITEM "RANDOM RIPRAP CLASS III." EXCAVATION IN STREAM SHALL BE PERFORMED IN THE DRY WHILE STREAM DIVERSION IS IN PLACE.
- ⑥ REFER TO SPECIAL PROVISIONS FOR RESTRICTIONS AND SPECIAL REQUIREMENTS FOR WORK PERFORMED IN THE STREAM BED.
- ⑦ ALL LOCATIONS BETWEEN PROPOSED RIPRAP AND EDGE OF GRAVEL ROADWAY AS WELL AS AREAS DISTURBED DURING DEBRIS REMOVAL AND PLACEMENT OF RIPRAP TO RECEIVE TOPSOIL, SEED AND EROSION CONTROL BLANKET CATEGORY 3. TO BE PAID FOR UNDER ITEM "TURF ESTABLISHMENT." SEE SHT. B02 FOR DETAILS.
- ⑧ FURNISH AND INSTALL 15 CU. YD. "RANDOM RIPRAP CLASS III" (RIPRAP THICKNESS = 1'-6") AND 35 SQ. YD. GEOTEXTILE FILTER TYPE IV (INCIDENTAL) PER DETAIL B-B (THIS SHEET) AND AS DIRECTED BY THE ENGINEER IN THE FIELD.
- ⑨ FURNISH AND INSTALL 35 CU. YD. "RANDOM RIPRAP CLASS III" (RIPRAP THICKNESS = 1'-6") AND 65 SQ. YD. GEOTEXTILE FILTER TYPE IV (INCIDENTAL) PER DETAIL C-C (THIS SHEET) AND AS DIRECTED BY THE ENGINEER IN THE FIELD.

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: *Lisa M. Karlgaard* LIC. NO. 47556 DATE 05/11/16
LISA M. KARLGAARD

TITLE:
INLET ELEVATION & RIPRAP DETAILS

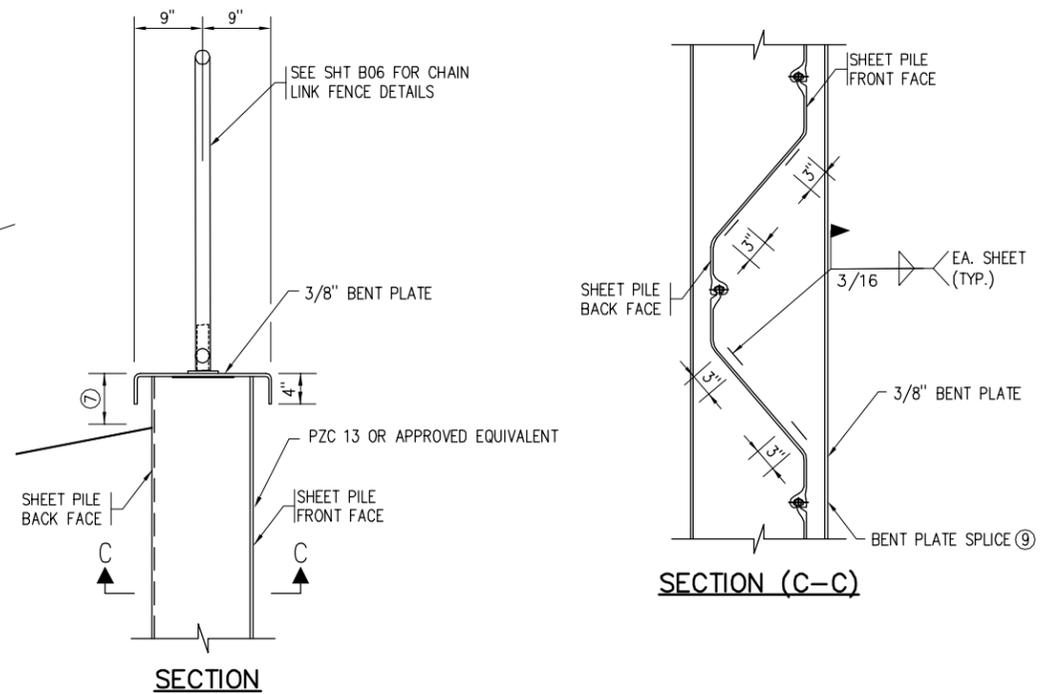
DES: LMK	DR: LMK	APPROVED:
CHK: JDL	CHK: JDL	
Sheet No. B04 of 10 Sheets		

Bridge No.
L5930



RETAINING WALL SECTION A-A

SCALE: 0 2'-0"

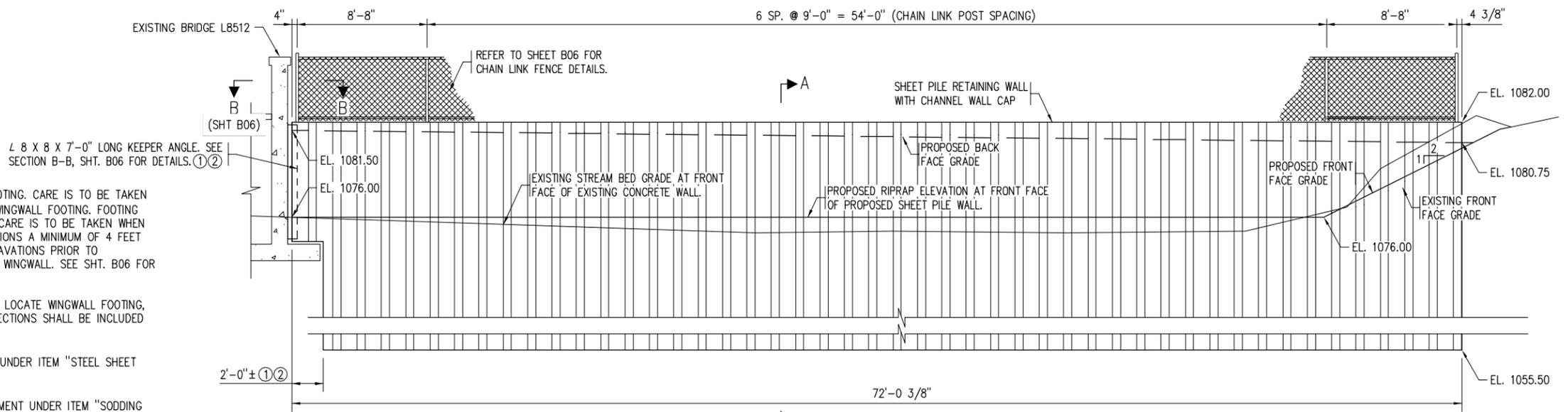


WALL CAP DETAILS (3)

SCALE: 0 1'-0"

KEY NOTES:

- ① SHEET PILE NEAR BRIDGE L8512 TO CANTILEVER OVER EXISTING BRIDGE WINGWALL FOOTING. CARE IS TO BE TAKEN DURING REMOVALS TO PREVENT DAMAGE AND/OR UNDERMINING OF EXISTING BRIDGE WINGWALL FOOTING. FOOTING SIZE AND DEPTH IS ASSUMED. NO ORIGINAL PLAN OR AS-BUILT DATA IS AVAILABLE. CARE IS TO BE TAKEN WHEN DRIVING SHEET PILE NEAR EXISTING FOOTING. CONTRACTOR TO HALT DRIVING OPERATIONS A MINIMUM OF 4 FEET SHORT OF THE BRIDGE WINGWALL AND COMPLETE CONCRETE WALL REMOVAL AND EXCAVATIONS PRIOR TO COMPLETING THE REMAINING SHEET PILE DRIVING AND CONNECTION TO THE CONCRETE WINGWALL. SEE SHT. B06 FOR CONNECTION DETAILS.
- ② ALL EXCAVATION REQUIRED TO EXPOSE THE CONCRETE WINGWALL VERTICAL FACE AND LOCATE WINGWALL FOOTING. ATTACH THE KEEPER ANGLE, AND BACKFILL BEHIND THE CANTILEVERED SHEET PILE SECTIONS SHALL BE INCLUDED FOR PAYMENT UNDER ITEM "STEEL SHEET PILING (PERMANENT)."
- ③ FURNISHING AND INSTALLING OF STEEL WALL CAP SHALL BE INCLUDED FOR PAYMENT UNDER ITEM "STEEL SHEET PILING (PERMANENT)." STEEL SHALL BE PER MNDOT SPEC 3306 OR 3309.
- ④ PLACE 4" TOPSOIL AND SOD OVER ALL DISTURBED AREAS. TO BE INCLUDED FOR PAYMENT UNDER ITEM "SODDING TYPE LAWN."
- ⑤ SEE SHT B04 FOR RIPRAP PLACEMENT DETAIL AND SHT B03 FOR RIPRAP LOCATIONS.
- ⑥ STREAMBED MATERIAL EXCAVATED FOR WALL REMOVAL SHALL BE SALVAGED ON SITE AND REPLACED DURING BACKFILL OF THE STREAM/SHEET PILE WALL.
- ⑦ VARIES, SEE RETAINING WALL ELEVATION (THIS SHEET) FOR PROPOSED BACK FACE GRADE.
- ⑧ EXISTING CONCRETE RETAINING WALL AND FOOTING TO BE REMOVED PRIOR TO PLACEMENT OF SHEET PILE WALL.
- ⑨ PROVIDE CAP COMPONENTS AT A 15'-0" MINIMUM LENGTH. COMPONENTS TO BE CONTINUOUSLY WELDED IN FIELD.



RETAINING WALL ELEVATION

SCALE: 0 4'-0"

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: *Lisa M. Karlgaard* LIC. NO. 47556 DATE 05/11/16
 LISA M. KARLGAARD

TITLE: **RETAINING WALL ELEVATION & DETAILS**

DES: CJM	DR: LMK	APPROVED:
CHK: KDM	CHK: JDL	
Sheet No. B05 of 10 Sheets		

Bridge No. L5930

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 1/4 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 REGULATORY 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.
- 2) ALL PERMANENT STORMWATER TREATMENT SYSTEMS ARE OPERATIONAL AND ALL SEDIMENT IS REMOVED FROM TEMPORARY AND PERMANENT SEDIMENTATION BASINS AND CONVEYANCE SYSTEMS.
- 3) ALL TEMPORARY SYNTHETIC AND STRUCTURAL EROSION PREVENTION AND SEDIMENT CONTROL BMPs MUST BE REMOVED. BMPs DESIGNED TO DECOMPOSE MAY BE LEFT IN PLACE.
- 4) ANY DISTURBED LAND USED FOR AGRICULTURAL PURPOSES MUST BE RETURNED TO ITS PRECONSTRUCTION CONDITION.

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
- 2) MINNESOTA DEPARTMENT OF NATURAL RESOURCES
- 3) ARMY CORPS. OF ENGINEERS

2. GENERAL NATURE OF CONSTRUCTION ACTIVITY DESCRIPTION

A. THE PROJECT INVOLVES REMOVAL OF EXISTING CONCRETE RETAINING WALL AND THE CONSTRUCTION OF A SHEET PILE WALL AT TISCHER CREEK

1. REMOVE APPROX. 72 L.F. EXISTING CONCRETE RETAINING WALL.
2. CONSTRUCT 72 L.F. OF STEEL SHEET PILE WALL.

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

- A. PRE-CONSTRUCTION CONDITIONS: 0.00 ACRES
- B. POST-CONSTRUCTION CONDITIONS: 0.00 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 SHEET B08
- 2) PERMANENT BMPs: SEE SHEET B08
- B. SITE MAPS
- 1) EXISTING GRADES: SEE PLAN AND PROFILE SHEETS
- 2) FINAL GRADES: SEE PLAN AND PROFILE SHEETS
- 3) DRAINAGE PATTERNS: N/A
- 4) IMPERVIOUS SURFACING AND SOIL TYPES: N/A
- 5) LOCATION OF AREAS NOT TO BE DISTURBED: SEE PLAN SHEET B03 FOR CONSTRUCTION LIMITS

C. STANDARD DETAILS FOR BMPs: SEE SHEET B08

D. TABULATION OF ESTIMATED PRELIMINARY QUANTITIES FOR BMPs: SEE SHEET B02

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 BRIDGE 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 (AGGREGATE 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 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" 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: Lisa M. Karlgaard LIC. NO. 47556 DATE 05/11/16

LISA M. KARLGAARD

TITLE:

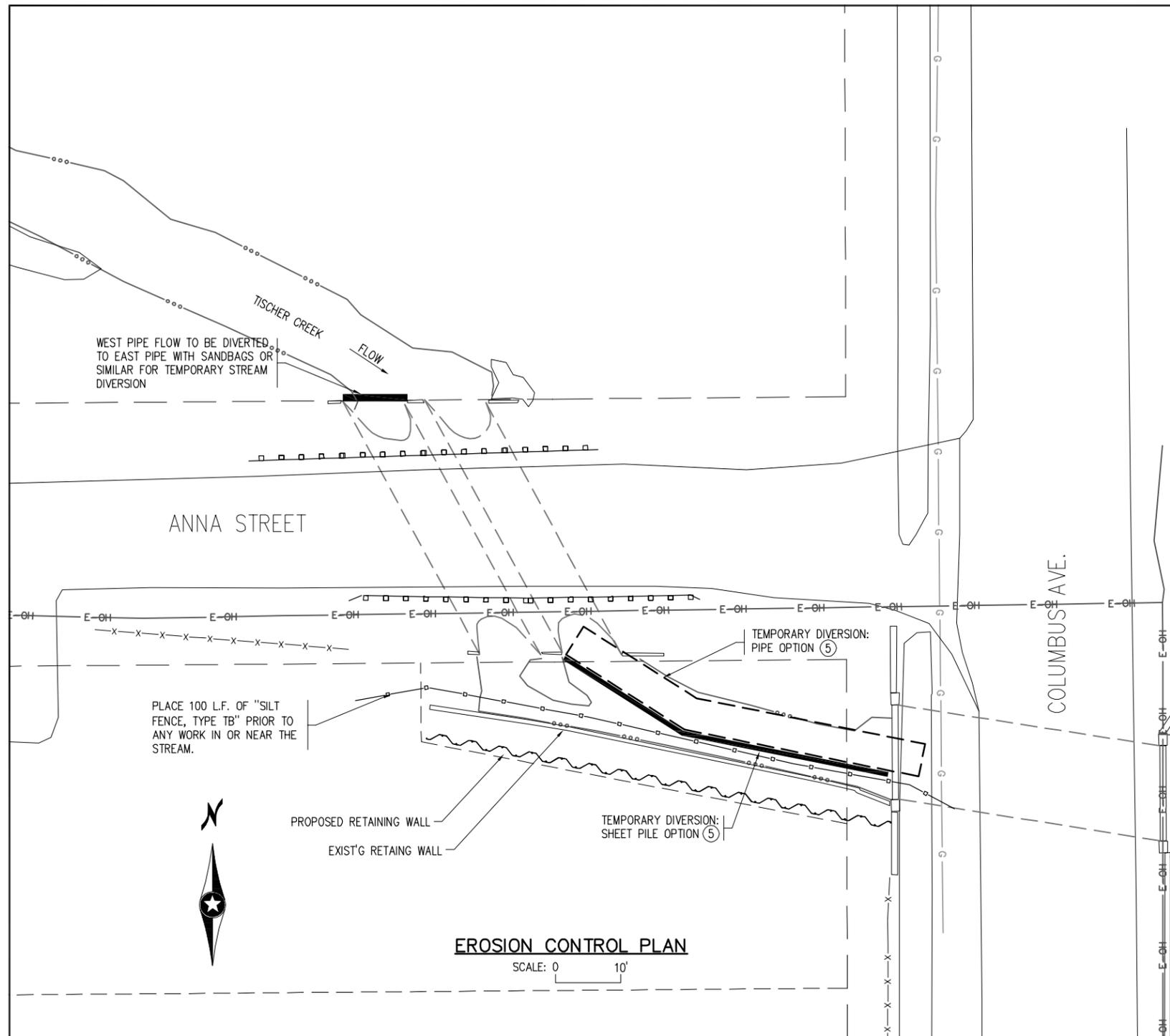
STORM WATER POLLUTION PREVENTION PLAN

DES: GAV DR: GAV APPROVED:

CHK: LMK CHK: LMK

Sheet No. B07 of 10 Sheets

Bridge No. L5930

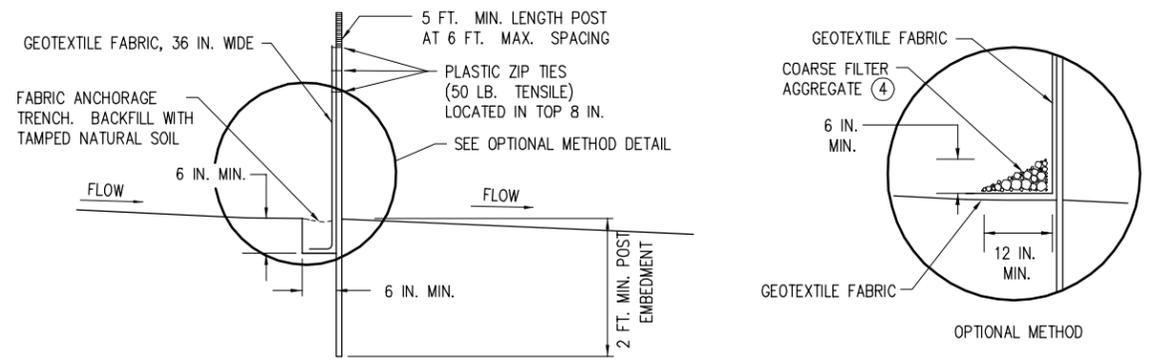


EROSION CONTROL PLAN

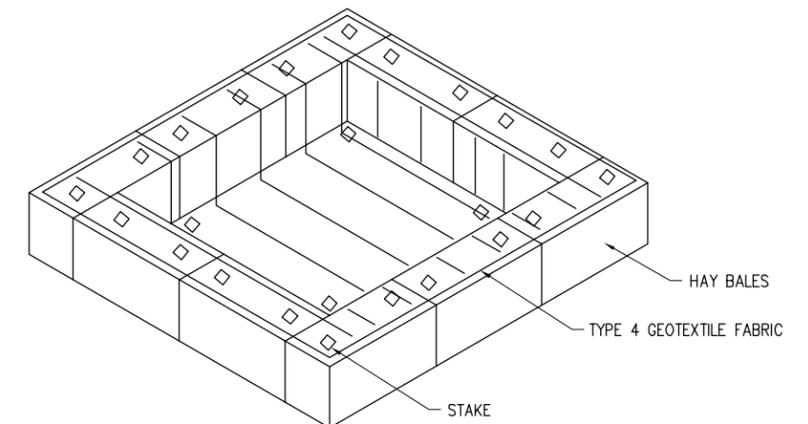
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KEY NOTES:

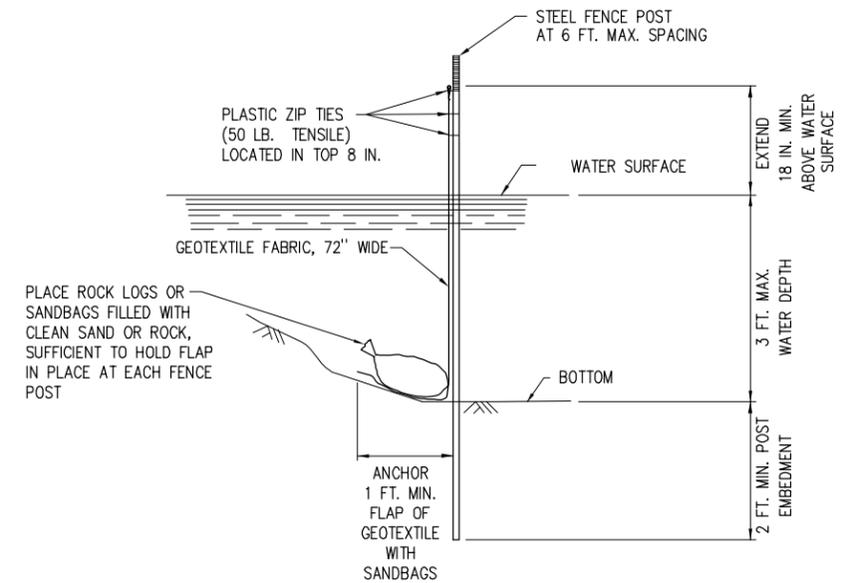
- ① TEMPORARY DEWATERING BASIN TO BE CONSTRUCTED AS SHOWN. OTHER DESIGNS MAY BE UTILIZED WITH ENGINEER'S APPROVAL. TO BE INCLUDED INCIDENTAL TO ITEM "DEWATERING."
- ② ANY DEWATERING OF WORK AREA SHALL BE DISCHARGED TO TEMPORARY DEWATERING BASIN.
- ③ BASIN IS SIZED FOR A PUMP WITH A 3" DISCHARGE HOSE. LARGER PUMPS WILL REQUIRE A LARGER BASIN. HAY BALES ARE TO MEET THE REQUIREMENTS OF BALE CHECK, SPEC. 2573 & 3882. THE REMOVAL OF SEDIMENT FROM THE BASIN IS CONSIDERED TO BE INCIDENTAL AND NO DIRECT PAYMENT WILL BE MADE. TYPE 4 GEOTEXTILE FABRIC (SPEC. 3733) IS TO BE DRAPED OVER THE BALES AND INTO THE BASIN. THE FABRIC SHALL BE STAKED TO THE GROUND AT THE FOUR INSIDE CORNERS OF THE BASIN. STAKES TO ANCHOR THE BALES SHALL BE PLACED AFTER THE FABRIC HAS BEEN PLACED, SO AS TO ANCHOR BOTH THE BALES AND THE FABRIC. THE USE OF FLOCCULANTS MAY BE REQUIRED TO ACCELERATE THE SETTLEMENT OF THE SEDIMENT. DIMENSIONS OF THE SEDIMENT BASIN ARE APPROXIMATELY 12'X12' BUT MAY NEED TO BE ENLARGED IN ORDER TO EFFECTIVELY FILTER THE SEDIMENT AND NO DIRECT PAYMENT WILL BE MADE.
- ④ COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.
- ⑤ CONTRACTOR IS RESPONSIBLE FOR DESIGN AND MAINTENANCE OF A STREAM DIVERSION AND DEWATERING AS NECESSARY TO COMPLETE ALL WALL REMOVAL AND RIPRAP PLACEMENT IN THE DRY. STREAM SHALL BE DIVERTED TO EASTERN PIPE OF BRIDGE L5930. STREAM DIVERSION SHALL BE MADE WITH PIPES AND SANDBAGS (OR OTHER NON-EARTH, NON-ERODIBLE STRUCTURE). DIVERSION PIPE SHALL BE SIZED FOR A MINIMUM Q2 STORM EVENT AND SHALL BE 5 FT. IN DIAMETER (MIN). ALTERNATELY, THE DIVERSION MAY BE CONSTRUCTED OF TEMPORARY SHEET PILE. DIVERSION CHANNEL FOR TEMPORARY SHEET PILE DIVERSION SHALL CARRY AN EQUIVALENT FLOW TO THE PIPE DIVERSION. PAYMENT FOR DIVERSION SHALL BE INCLUDED FOR PAYMENT UNDER ITEM "TEMPORARY STREAM DIVERSION SYSTEM." DEWATERING REQUIRED FOR REMOVAL AND PLACEMENT OPERATIONS OF WALLS AND RIPRAP SHALL BE INCLUDED FOR PAYMENT UNDER ITEM "DEWATERING." SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.



SILT FENCE TYPE HI (HAND INSTALLED)



TEMPORARY DEWATERING BASIN ① ② ③



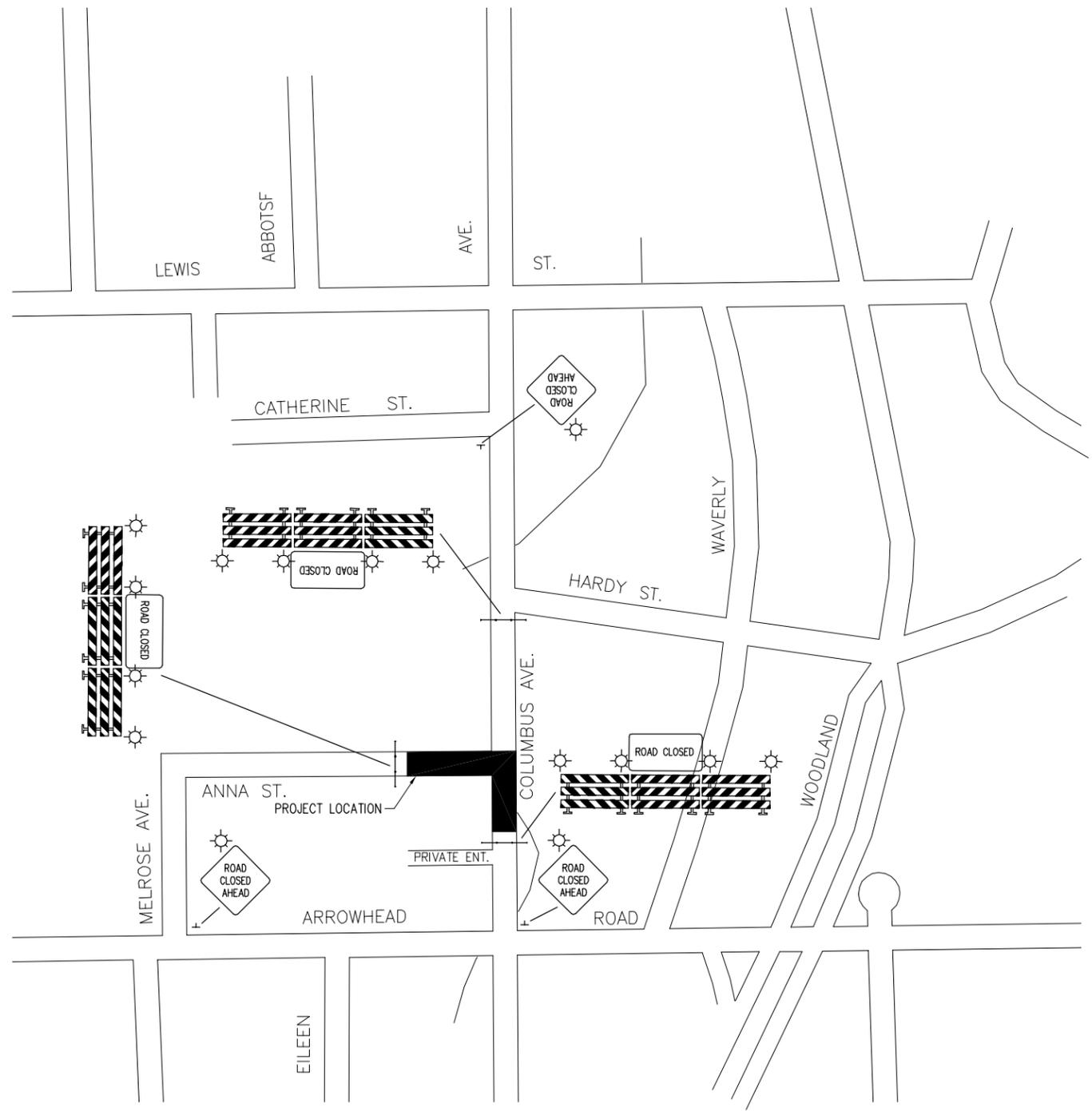
SILT FENCE TYPE TB

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 NAME: *Lisa M. Karlgaard* LIC. NO. 47556 DATE: 05/11/16

TITLE:
STORM WATER POLLUTION PREVENTION PLAN

DES: GAV DR: GAV APPROVED:
 CHK: LMK CHK: LMK
Sheet No. B08 of 10 Sheets

Bridge No. L5930



TRAFFIC CONTROL PLAN

- 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 (CURRENT VERSIONS), 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 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 MAY 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 INDICATED CONSTRUCTION SIGNING AND ROAD CLOSURE SIGNAGE 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 "CURRENT". 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 AT STREET INTERSECTIONS, AS SHOWN, IN ADVANCE OF THE CONSTRUCTION AND AT THE NEAREST INTERSECTION AND SHALL HAVE A TYPE "A" LOW INTENSITY FLASHING AMBER WARNING LIGHT MOUNTED ON THEM.

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.	NOTES
R11-2	ROAD CLOSED	48" x 30" BLK. ON WHITE	3	
W20-3	ROAD CLOSED AHEAD	48" x 48" BLK. ON ORANGE	3	⑨
TYPE III BARRICADE		8' ORANGE & WHITE	6	
TYPE III BARRICADE		8' ORANGE & WHITE	3	
TYPE A FLASHERS		YELLOW	15	⑦

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

LEGEND	
	DENOTES TYPE III BARRICADE
	DENOTES SIGN

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 NAME: Lisa M. Karlgaard LIC. NO. 47556 DATE 05/11/16

TITLE: **TRAFFIC CONTROL**

DES: GAV DR: GAV APPROVED:
 CHK: LMK CHK: LMK
Sheet No. B09 of 10 Sheets

Bridge No. **L5930**

