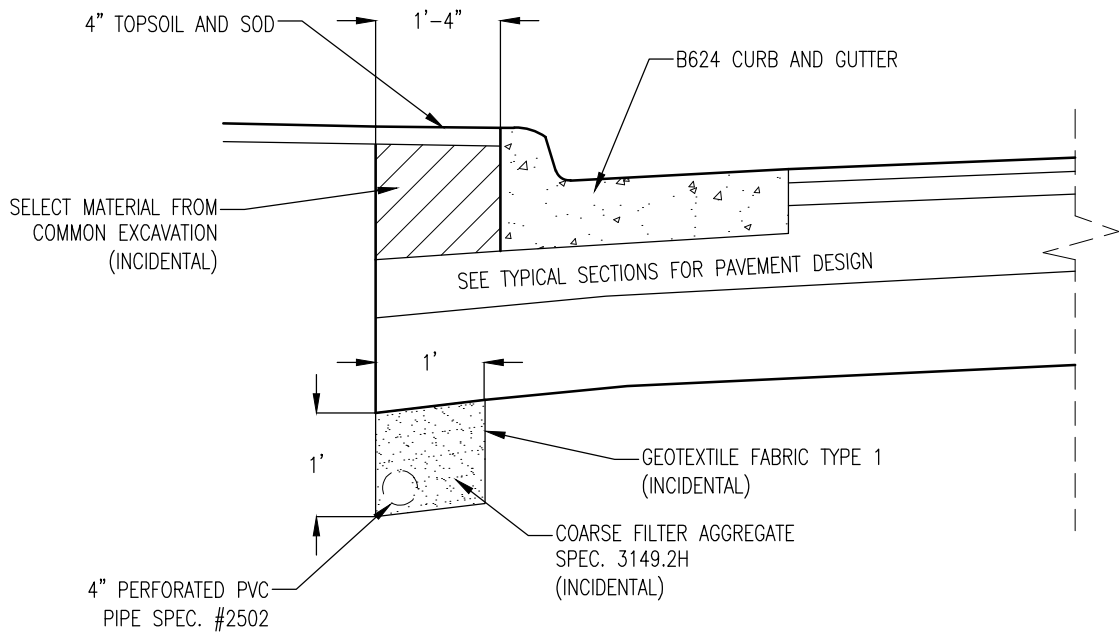


## STREET DETAILS

- STR-1 PERFORATED PIPE DETAIL
- STR-2 PERFORATED PIPE - SPECIAL
- STR-3 4" OR 6" CONCRETE WALK WITH CONCRETE CURB DESIGN V8 (MODIFIED)
- STR-4 BITUMINOUS CURB
- STR-5 DRIVEWAY & ALLEY ENTRANCES
- STR-6 CONCRETE RETAINING WALL, TYPE L
- STR-7 CONCRETE STEPS
- STR-8 STREET RESTORATION OVER TRENCH
- STR-9 BRICK PAVEMENT RESTORATION
- STR-10 LUG ANCHOR CONCRETE PAVEMENT
- STR-11 SILL CURB TYPE B624 (SPECIAL)
- STR-12 STREET TREE PLANTING ZONE SOIL TREATMENT - BOULEVARD
- STR-13 STREET TREE PLANTING ZONE SOIL TREATMENT - BEHIND SIDEWALK
- STR-14A PULL VAULT INSTALLATION A
- STR-14B PULL VAULT INSTALLATION B
- STR-14C PULL VAULT INSTALLATION C
- STR-14D PULL VAULT INSTALLATION D



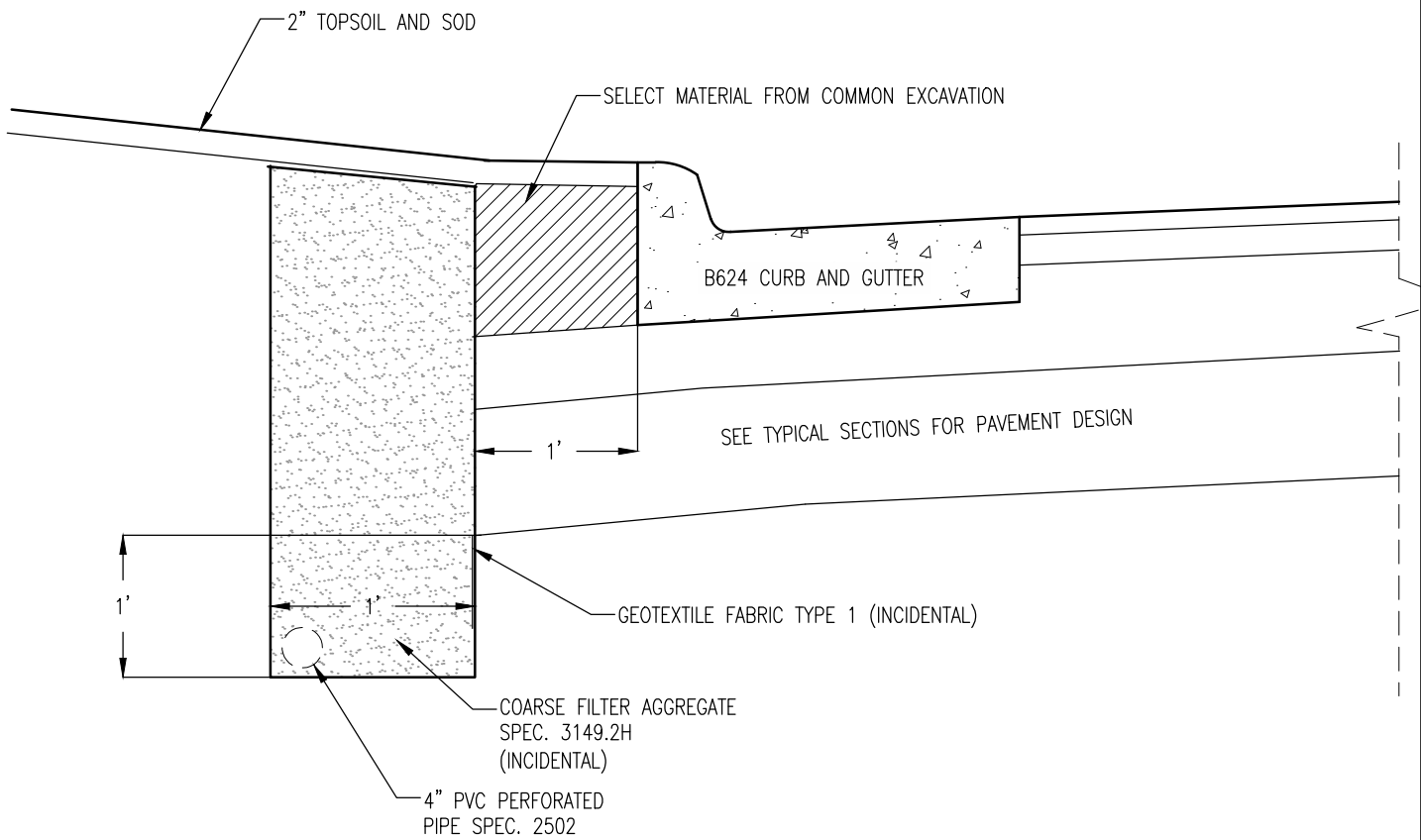
PERFORATED PIPE DETAIL

STR-1

REVISED/APPROVED 02/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



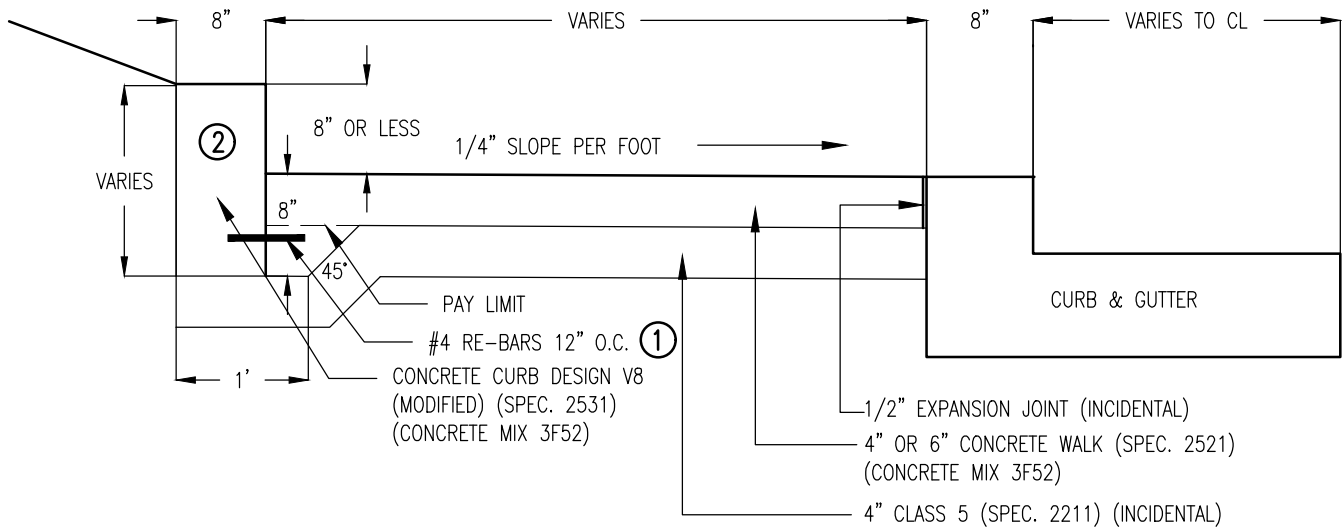
PERFORATED PIPE – SPECIAL

STR-2

REVISED/APPROVED 02/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



NOTES:

1. OPTIONAL REINFORCEMENT TIE BARS (INCIDENTAL) IF CURB IS POURED SEPARATELY FROM SIDEWALK
2. EXACT LOCATION AND ELEVATION OF CONCRETE CURB WILL BE DETERMINED IN THE FIELD BY THE ENGINEER

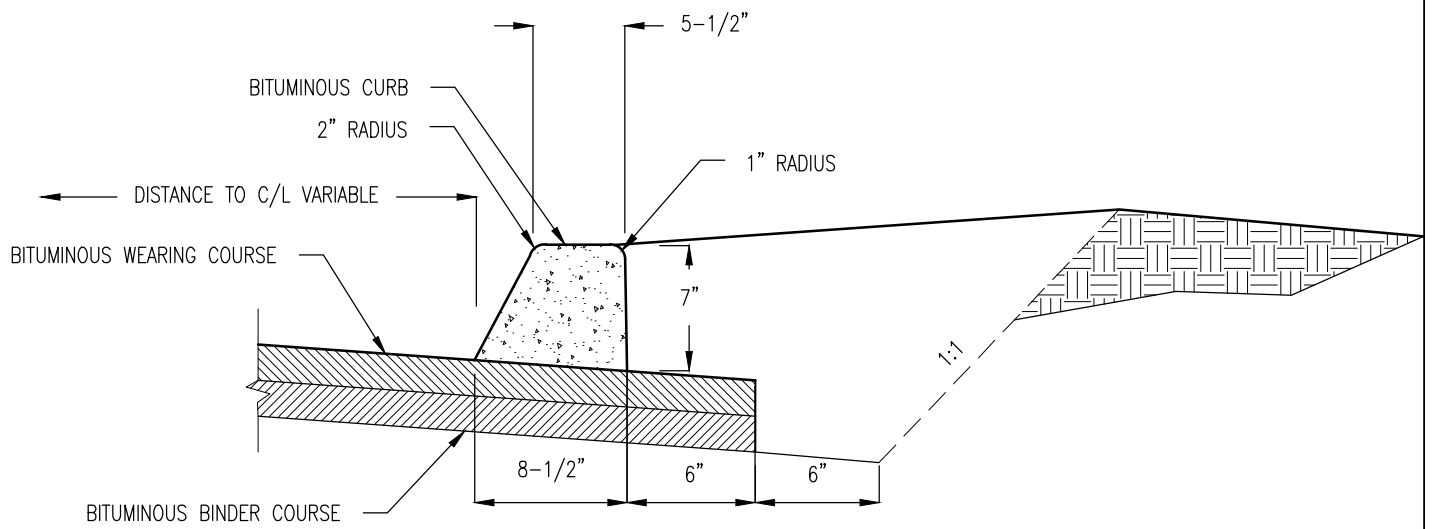
4" OR 6" CONCRETE WALK WITH CONCRETE CURB DESIGN V8 (MODIFIED)

STR-3

REVISED/APPROVED 01/20/2017

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



VOLUME OF CURB  
0.338 CU. FT. PER LIN. FT.

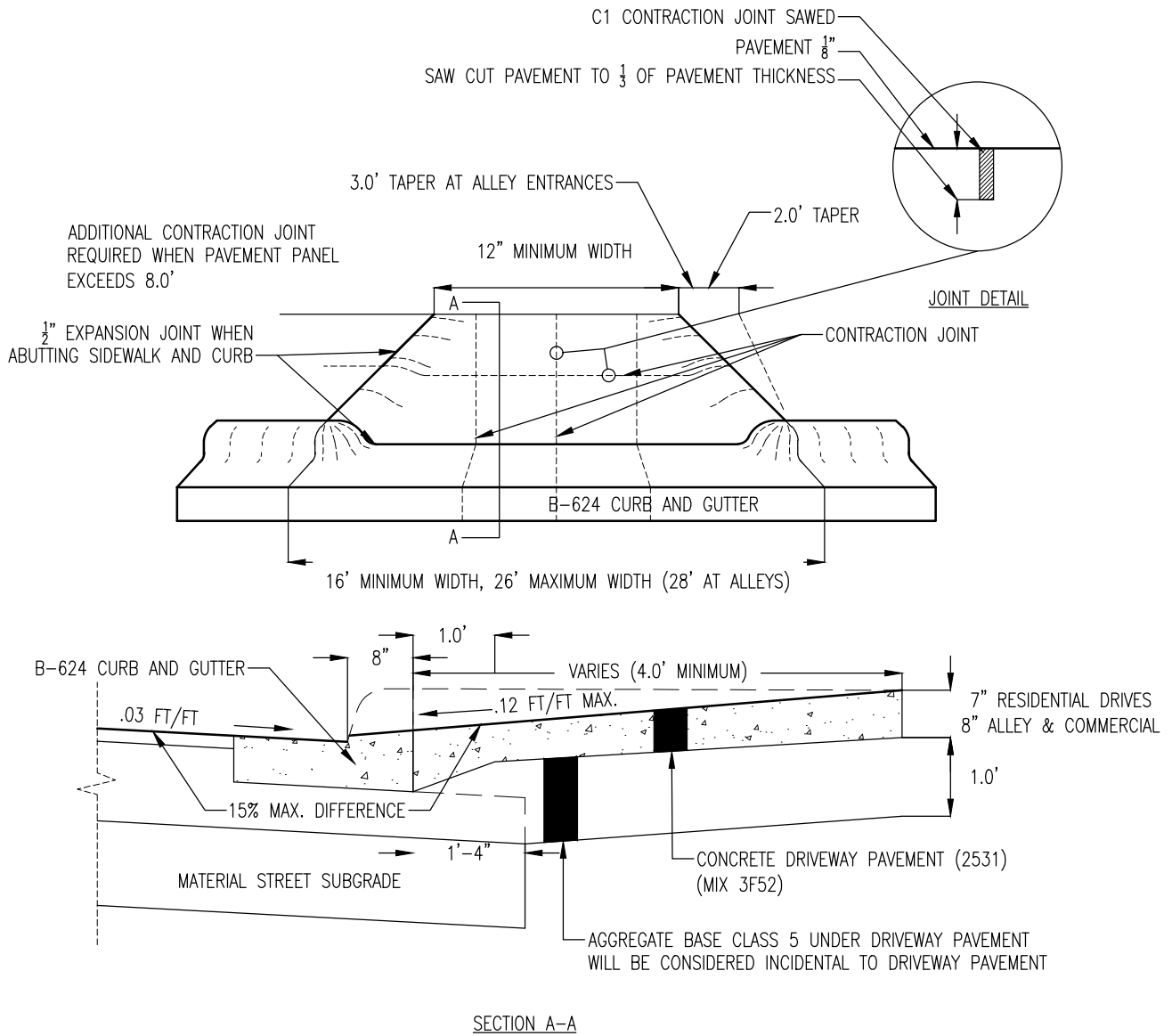
BITUMINOUS CURB

STR-4

REVISED/APPROVED 02/01/2013

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



NOTES:

1. WHERE THERE IS NO SIDEWALK OR THERE IS A GRASS BOULEVARD BETWEEN THE SIDEWALK AND THE BACK OF CURB THE CREST OF THE DRIVEWAY MUST BE AT LEAST 6" ABOVE GUTTER TO CONTAIN RUNOFF.
2. WHERE THERE IS SIDEWALK DIRECTLY BEHIND THE CURB, DRIVEWAY PROFILE SLOPE SHALL BE FLATTENED TO MEET ADA ACCESSIBLE ROUTE STANDARDS

DRIVEWAY & ALLEY ENTRANCES

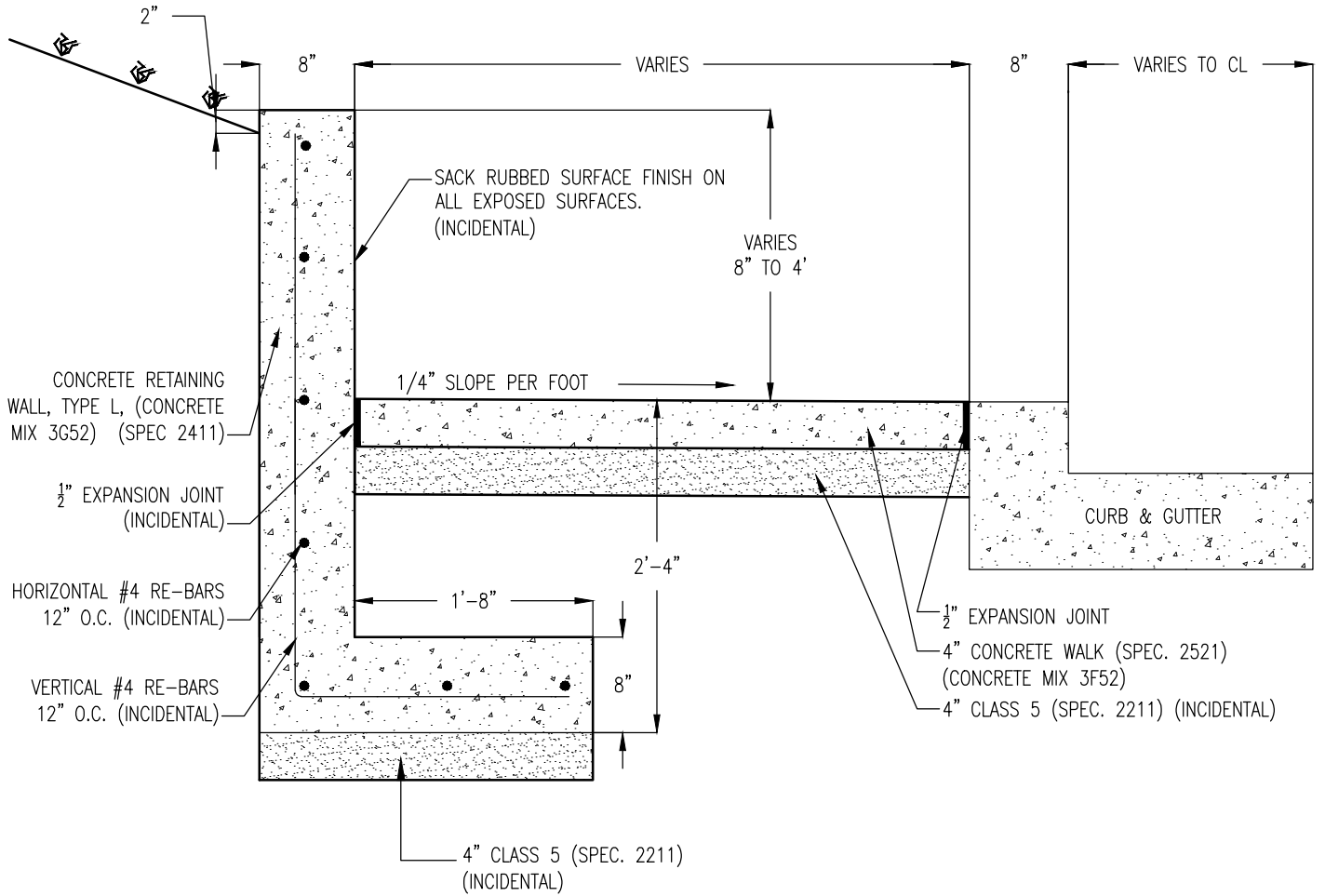
STR-5

REVISED/APPROVED 04/05/2019

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

EXACT LOCATION AND ELEVATION OF RETAINING WALL WILL  
BE DETERMINED IN THE FIELD BY THE ENGINEER



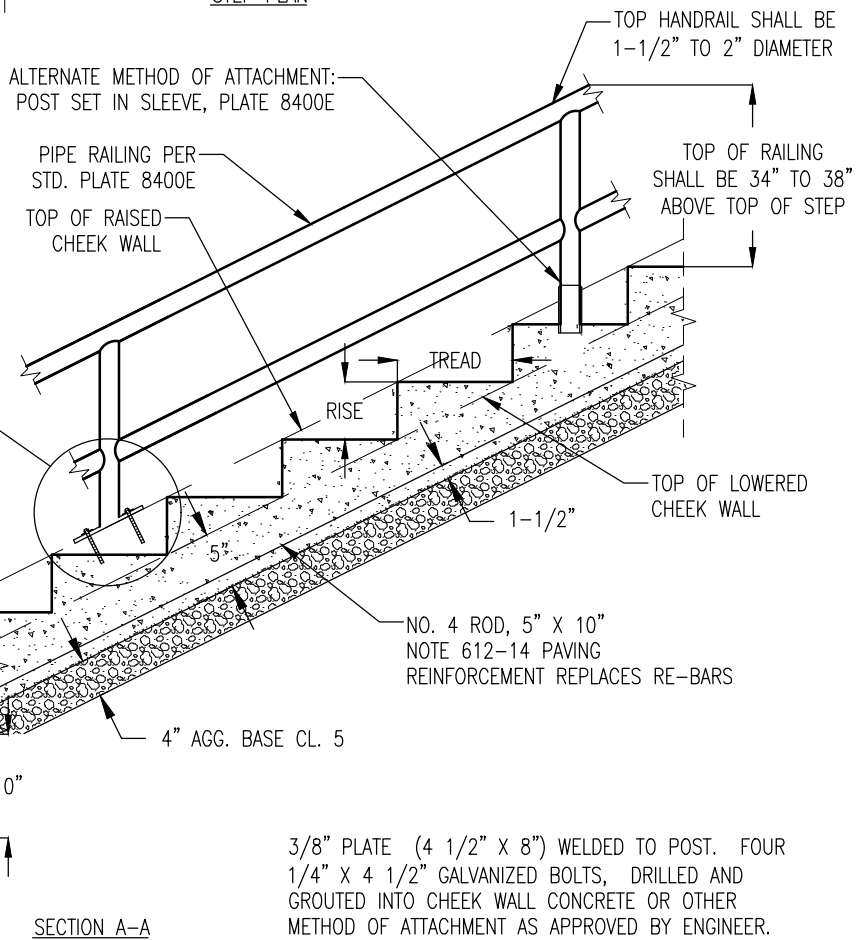
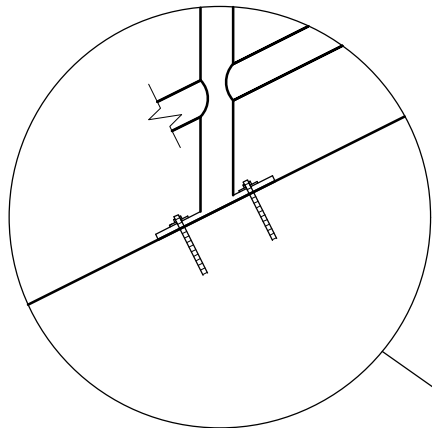
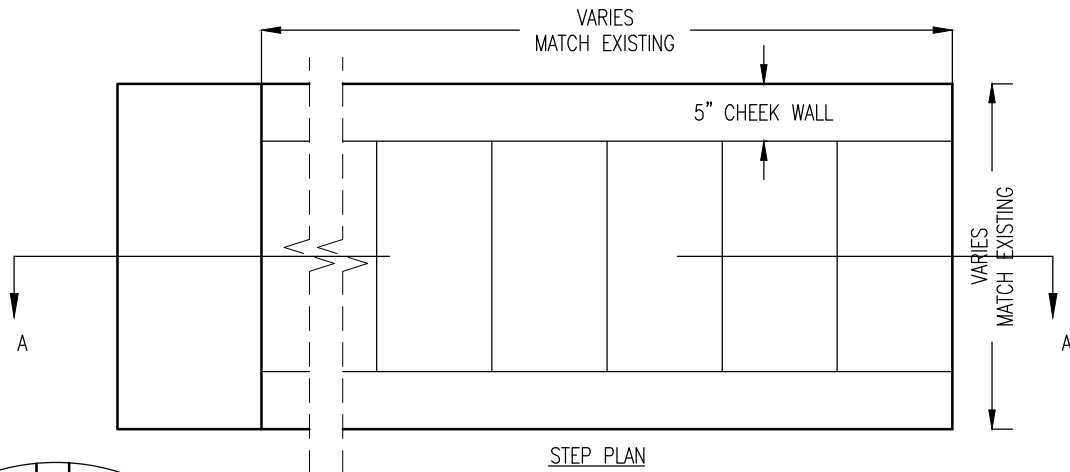
CONCRETE RETAINING WALL, TYPE L

STR-6

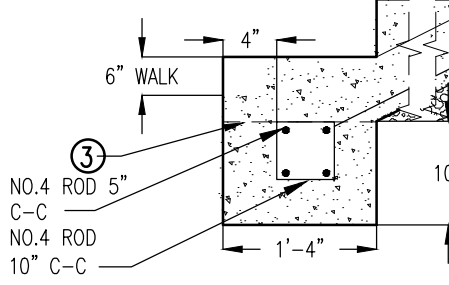
REVISED/APPROVED 01/20/2017

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



TREAD + RISER = 18" RISE WILL BE 4-1/2" MIN., 7" MAX. TREAD 1% SLOPE



SECTION A-A

3/8" PLATE (4 1/2" X 8") WELDED TO POST. FOUR 1/4" X 4 1/2" GALVANIZED BOLTS, DRILLED AND GROUTED INTO CHEEK WALL CONCRETE OR OTHER METHOD OF ATTACHMENT AS APPROVED BY ENGINEER.

NOTES:

1. 5" WIDE RAISED OR LOWERED CHEEK WALLS TO BE DETERMINED IN FIELD BY ENGINEER.
2. RAILINGS WILL BE REQUIRED WHERE MORE THAN THREE STEPS ARE NEEDED. RAILINGS TO BE PAINTED WITH BLACK PAINT PER CITY STANDARD SPEC. 2402
3. THE CONCRETE LUG ANCHOR MAY NOT BE NEEDED FOR 2 STEPS OR LESS.
4. INCLUDES: ALL EXCAVATION (EXCEPT ROCK EXC.), REMOVAL OF EXISTING STEPS, FORMING, CLASS 5, REINFORCING BAR, BACKFILL, AND CONCRETE (MIX 3G52),

CONCRETE STEPS

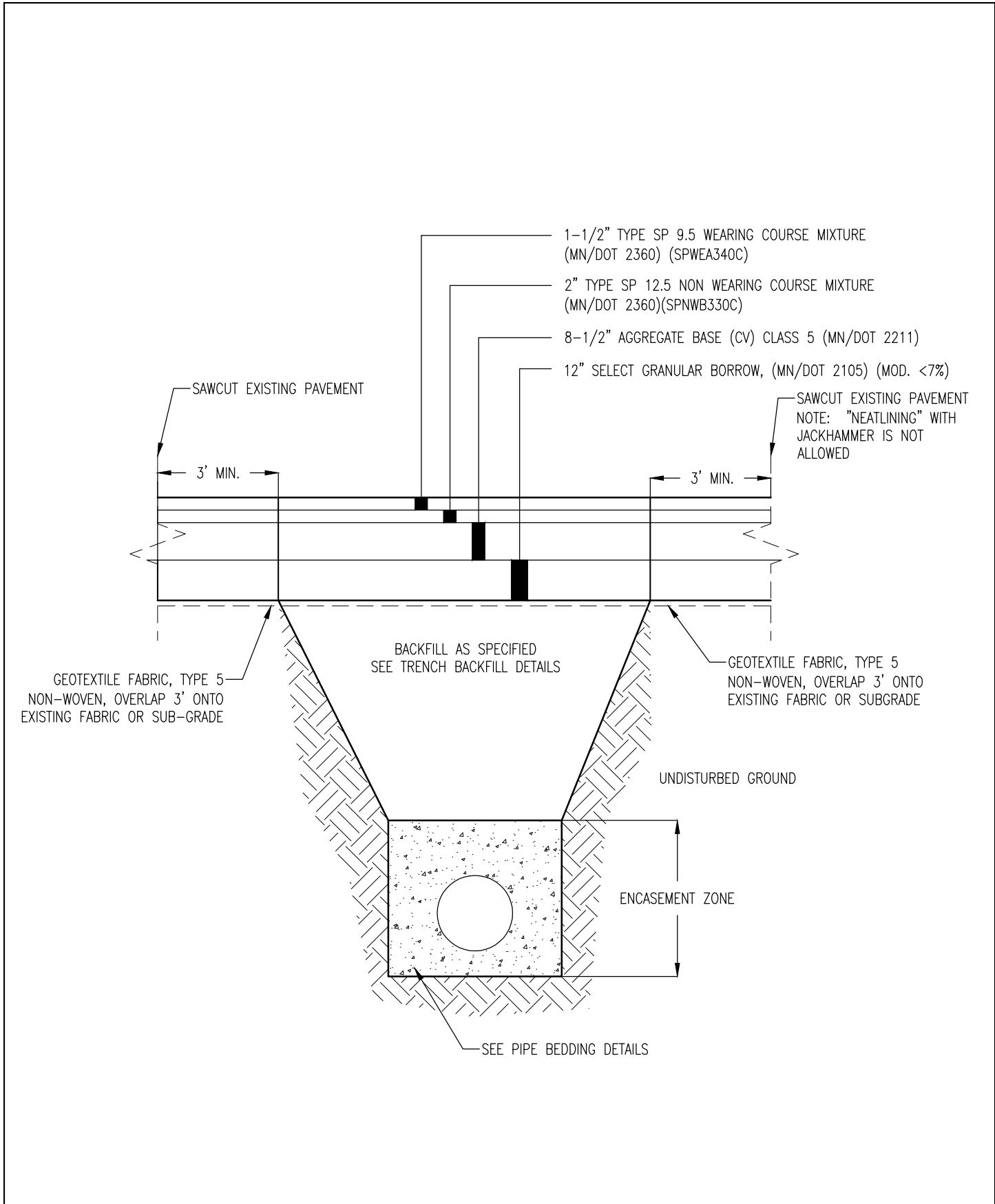
STR-7

REVISED/APPROVED 01/20/2017

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



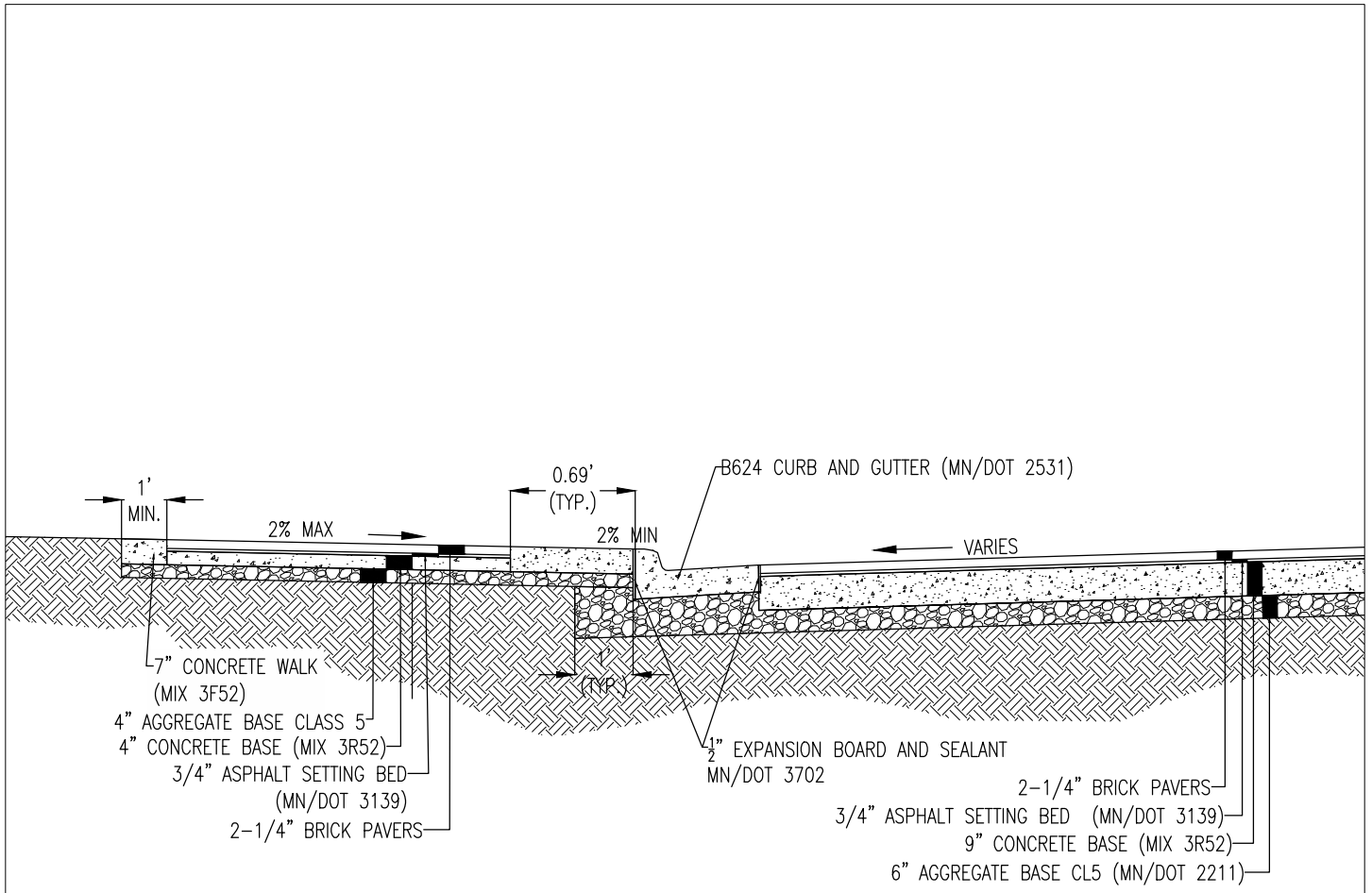


STREET RESTORATION OVER TRENCH STR-8

REVISED/APPROVED 04/05/2019

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

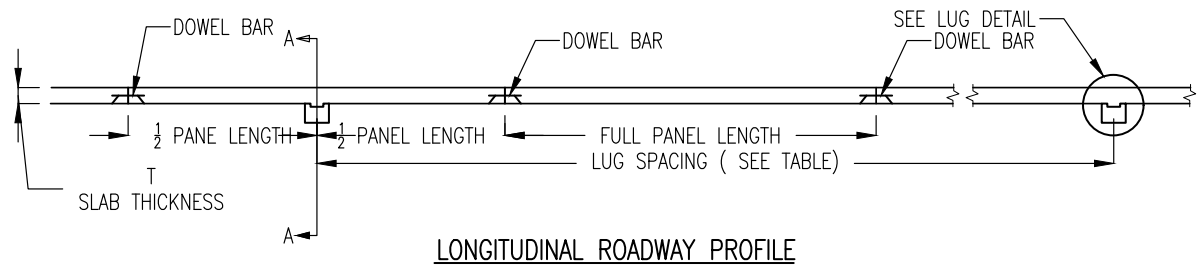
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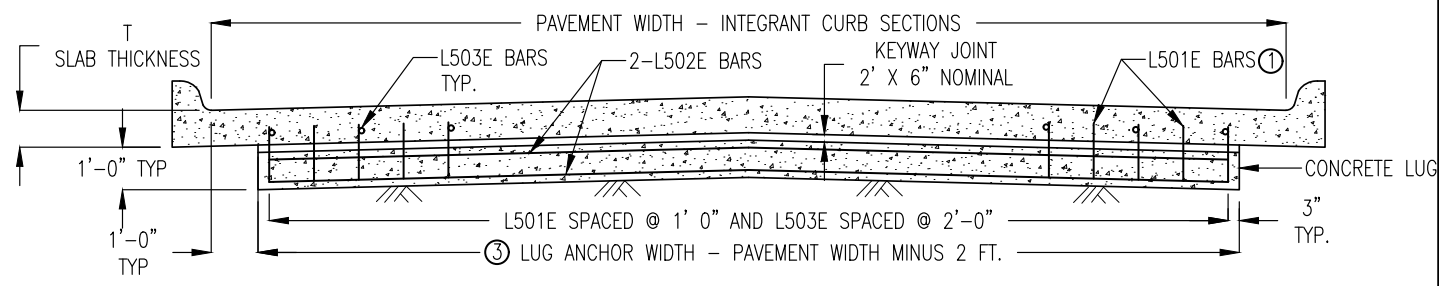
**NOTES:**

1. REFER TO 2540 BRICK PAVEMENT RESTORATION IN THE CITY OF DULUTH CONSTRUCTION STANDARDS
2. DRILL AND GROUT 1" DIA. DOWEL BARS (24" LENGTH) 16" O.C. INTO ADJACENT EXISTING CONCRETE BASE
3. ASPHALT SETTING BED MATERIALS SHALL MEET GRADATION "A" OF TABLE 3139-2 OF MN/DOT 3139
4. CONCRETE MIX 3F52 (SIDEWALK) OR MIX 3R52 (CONCRETE BASE) SHALL MEET THE PROVISIONS OF MN/DOT 2301 AND MN/DOT 2461
5. BRICK PAVERS (4" X 8" X 2-1/4") SHALL MEET ASTM C902-79A, EXCEPT AS MODIFIED IN THE CITY OF DULUTH CONSTRUCTION STANDARDS. BRICK COLOR AND TEXTURE SHALL MATCH EXISTING OR AS APPROVED BY ENGINEER.

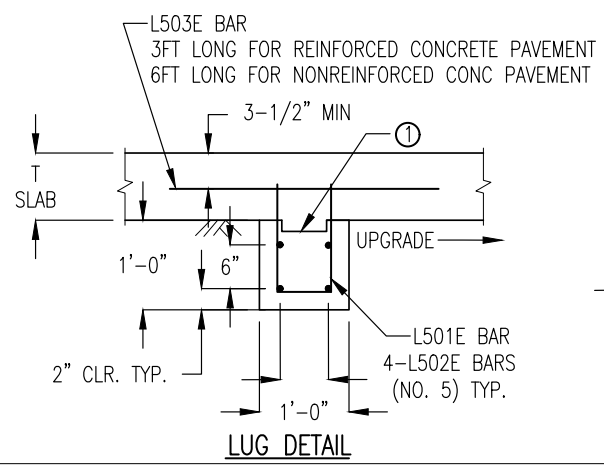
BRICK PAVEMENT RESTORATION		STR-9
REVISED/APPROVED 01/20/2017	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



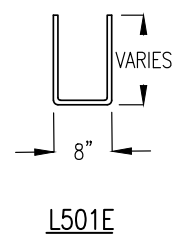
**LONGITUDINAL ROADWAY PROFILE**



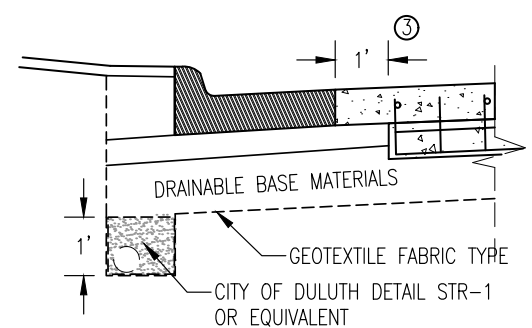
**SECTION A-A**



**LUG DETAIL**



**L501E**



**STANDARD CURB & GUTTER**

LUG ANCHOR SPACING TABLE		
ROADWAY GRADE	LUG ANCHOR SPACING	
	REINFORCED PAVEMENTS	UNREINFORCED PAVEMENTS*
OVER 3%	162 FT	153 FT
OVER 3-1/4%	135 FT	140 FT
OVER 3-1/2%	108 FT	111 FT
OVER 3-3/4%	81 FT	91 FT
OVER 4%	81 FT	78 FT
OVER 4-1/4%	54 FT	62 FT
OVER 4-1/2%	54 FT	45 FT

\* ADJUST TO FALL IN THE MIDDLE OF THE CONCRETE PANEL

SEE SPECIAL PROVISIONS FOR INSTALLATION AND MATERIAL DETAILS.

**GENERAL NOTES**

1. NO LUG DRAIN REQUIRED ON STREET SECTIONS CONSTRUCTED WITH A DRAINABLE BASE AND PERFORATED EDGE DRAIN SYSTEM.
2. FINAL GRADING OPERATIONS SHALL BE COMPLETED PRIOR TO EXCAVATING FOR LUG ANCHORS. ANY OVER TRENCHING SHALL BE FILLED WITH CONCRETE.
3. LUG ANCHORS SHALL BE CONSTRUCTED 2 DAYS PRIOR TO PAVEMENT CONSTRUCTION, WITH CONCRETE MIX 3C52 HE.
4. ALL REINFORCEMENT TO BE EPOXY COATED NO. 5 DEFORMED BARS AS PER MN/DOT SPEC. 3301, GRADE 60 AND TO HAVE A MINIMUM OF 2" COVER EXCEPT AS NOTED.

**NOTES**

- ① KEYWAY JOINT APPROXIMATELY 5-1/2" X 1-1/2", USE NOMINAL 2" X 6" PLANK TO FORM KEYWAY.
- ② CONTRACTOR MAY BEND OR USE THREADED CONNECTOR ON L501E BARS AND / OR MODIFY KEYWAY TO FACILITATE FINE GRADING UPON APPROVAL BY THE ENGINEER.
- ③ LUG ANCHOR WIDTH SHALL BE DETERMINED FROM FACE OF CURB MEASURE FOR INTEGRANT CURB DESIGNS, OR EDGE OF PAVEMENT FOR NON-INTEGRANT CURB AND GUTTER DESIGNS.

**LUG ANCHOR - CONCRETE PAVEMENT**

**STR-10**

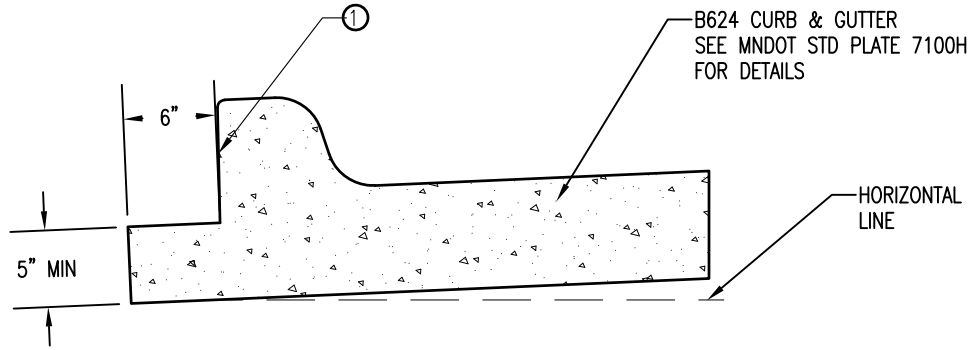
REVISED/APPROVED 04/05/2019

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

## SILL CURB DETAIL

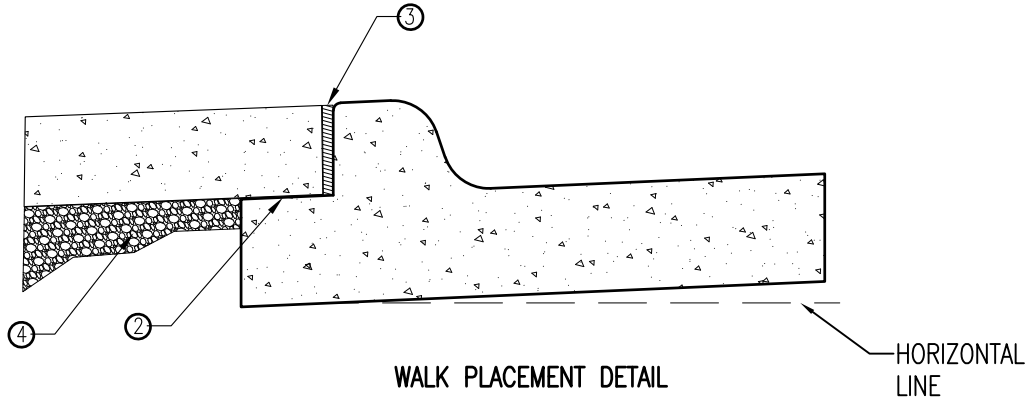
FOR 6 OR 8 INCH CONCRETE WALKS



SILL SHALL BE INTEGRAL TO THE CURB & GUTTER

NOTES

- ① DIMENSION TO BE THE SAME AS SIDEWALK. (MIN 6")
- ② PLACE BOND BREAKER BETWEEN WALK AND TOP OF SILL
- ③ ½" PREFORMED JOINT FILL MNDOT SPEC. 3702
- ④ COMPACTED AGGREGATE BASE CLASS 5 MNDOT SPEC 2211
- ⑤ INCIDENTAL TO SIDEWALK CONSTRUCTION.



WALK PLACEMENT DETAIL

DESIGN TYPE	CONCRETE	
	CU YDS. PER LINEAL FOOT	LINEAL FT. PER CU YD
B624 - 6" WALK	0.0793	12.61
B624 - 8" WALK	0.0756	13.28

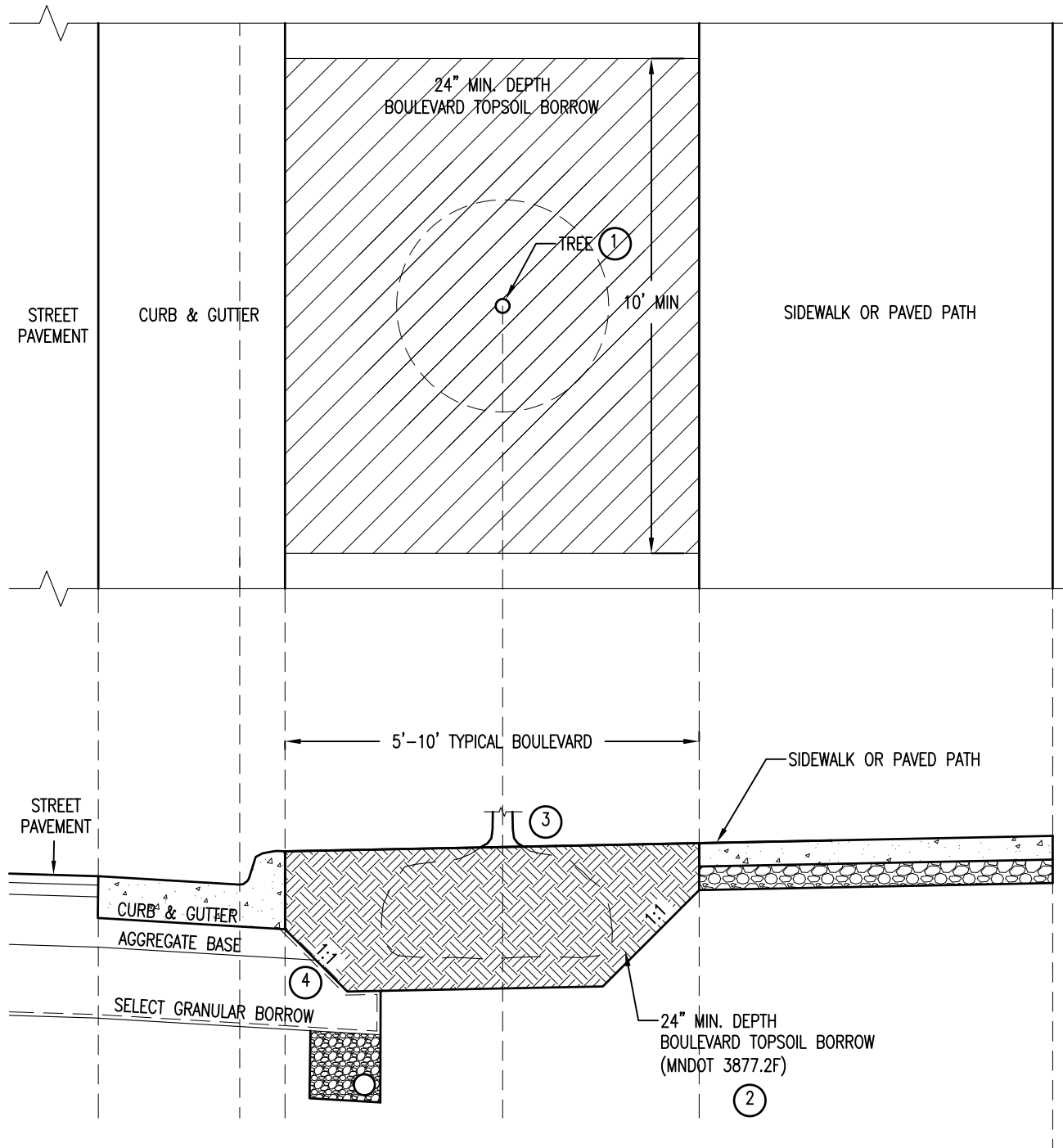
SILL CURB TYPE B624 (SPECIAL)

STR-11

REVISED/APPROVED 04/05/2019

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



NOTES:

- ① TREE SPECIES AND LOCATIONS SHALL BE IN ACCORDANCE WITH SECTION 2571 OF THE CONSTRUCTION STANDARDS.
- ② SUBMIT BOULEVARD TOPSOIL BORROW DESIGN MIX AT LEAST 3 WEEKS PRIOR TO USE.
- ③ DEPTH OF TREE PLANTING PER MN/DOT 2571 AND (ICAMMLP)
- ④ EXTEND GEOTEXTILE SEPARATION FABRIC BETWEEN PLANTING ZONE AND STREET SUBBASE/BASE.

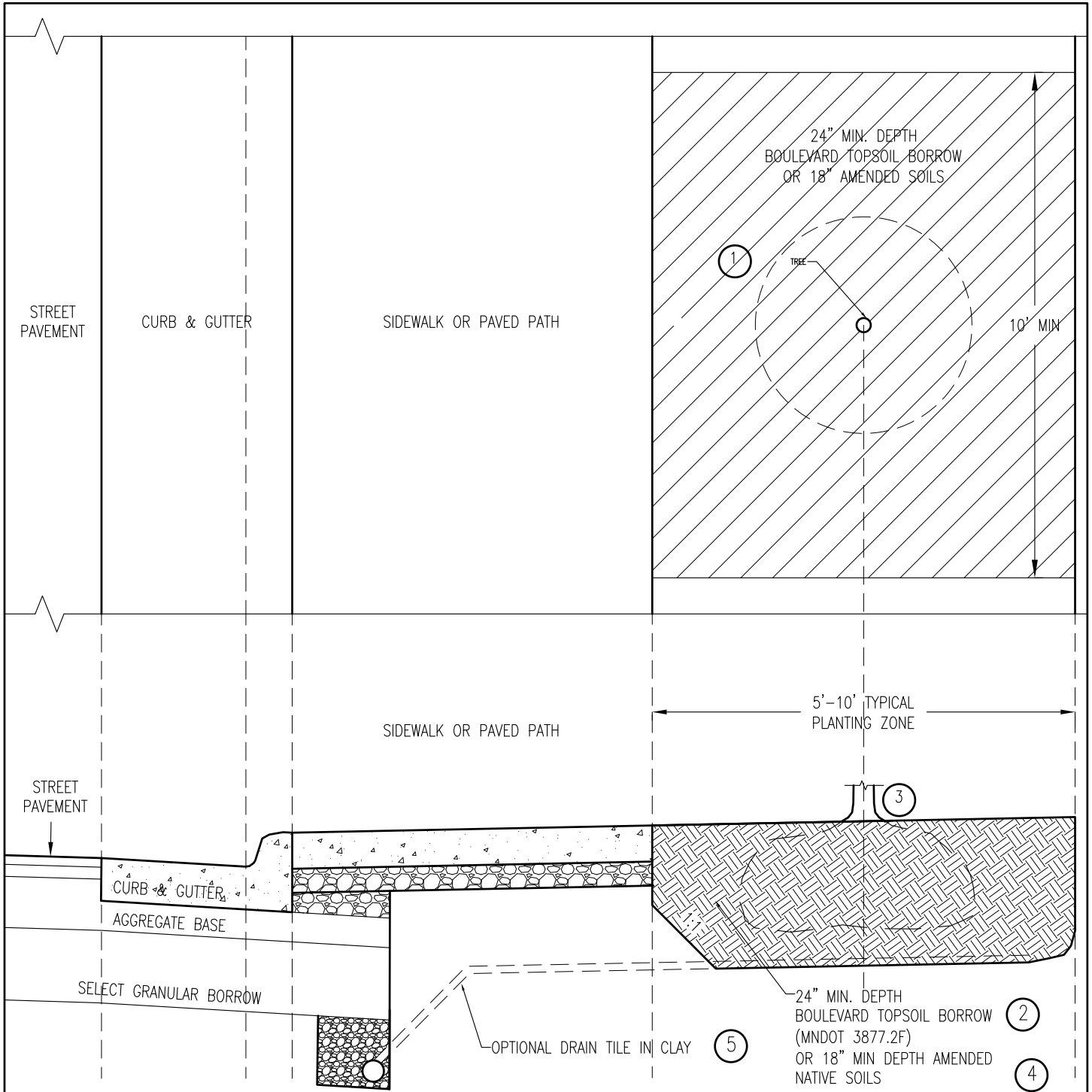
STREET TREE PLANTING ZONE SOIL TREATMENT – BLVD

STR-12

REVISED/APPROVED 04/05/2019

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

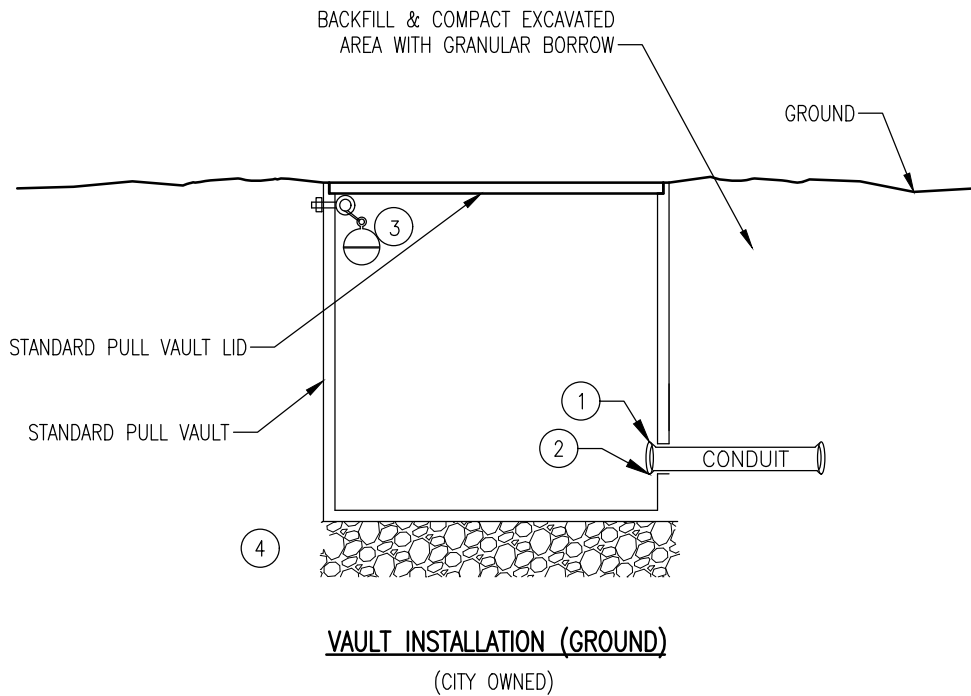
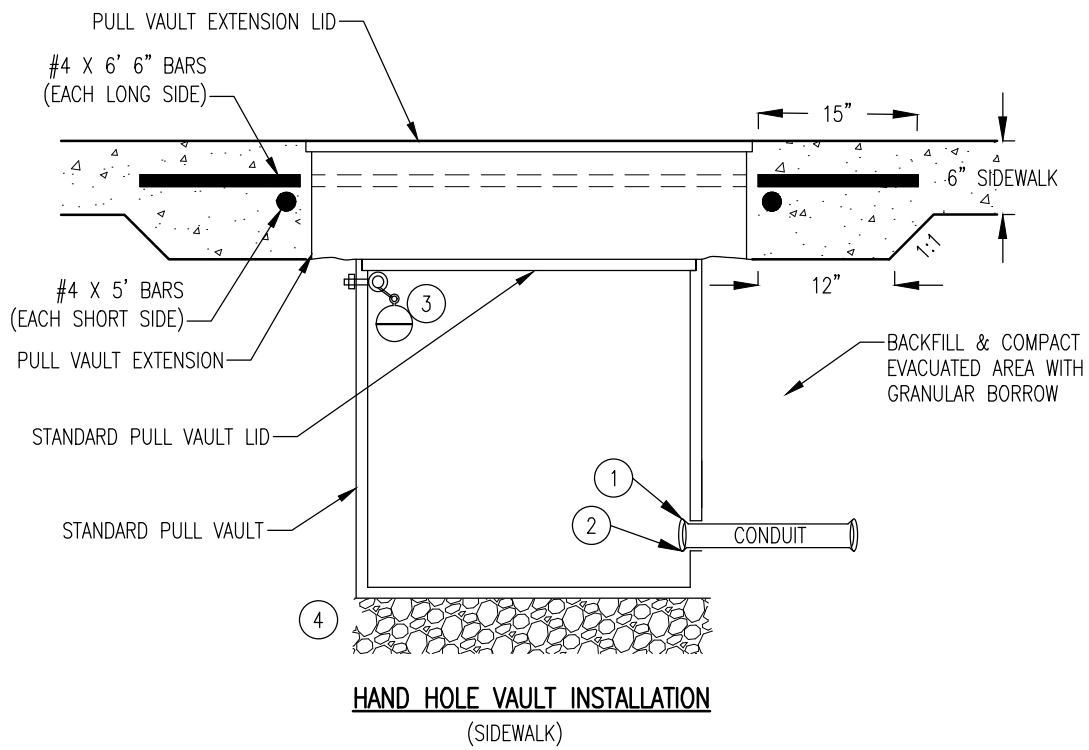
NO SCALE



NOTES:

- ① TREE SPECIES AND LOCATIONS SHALL BE IN ACCORDANCE WITH SECTION 2571 OF THE CONSTRUCTION STANDARDS.
- ② SUBMIT BOULEVARD TOPSOIL BORROW DESIGN MIX AT LEAST 3 WEEKS PRIOR TO USE.
- ③ DEPT OF TREE PLANTING PER MN/DOT 2571 AND (ICAMMLP)
- ④ SUBMIT SOIL AMENDMENT DESIGN MIX AT LEAST 4 WEEKS PRIOR TO USE.
- ⑤ CONNECT OPTIONAL PLANTING ZONE DRAIN TILE TO STREET PIPE UNDERDRAIN OR NEARBY DRAINAGE STRUCTURE AS DIRECTED BY ENGINEER.

STREET TREE PLANTING ZONE SOIL TREATMENT—BEHIND SIDEWALK		STR-13
REVISED/APPROVED 04/05/2019	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



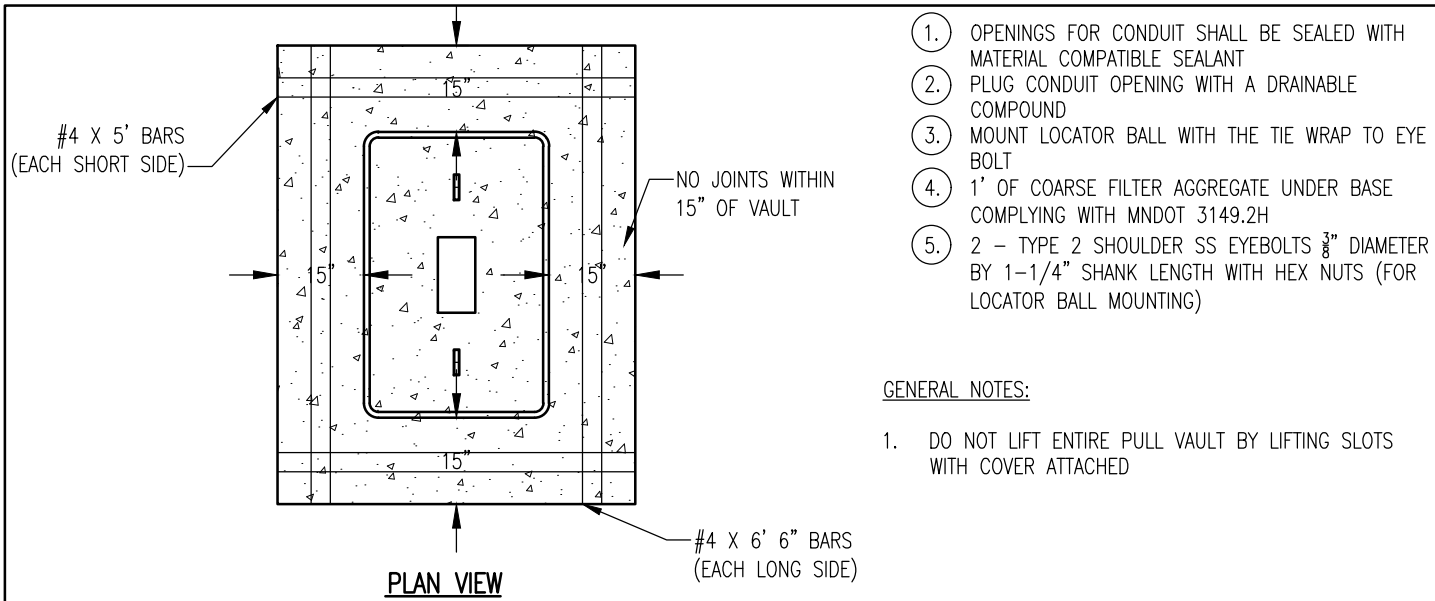
PULL VAULT INSTALLATION A

STR-14A

REVISED/APPROVED 04/05/2019

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

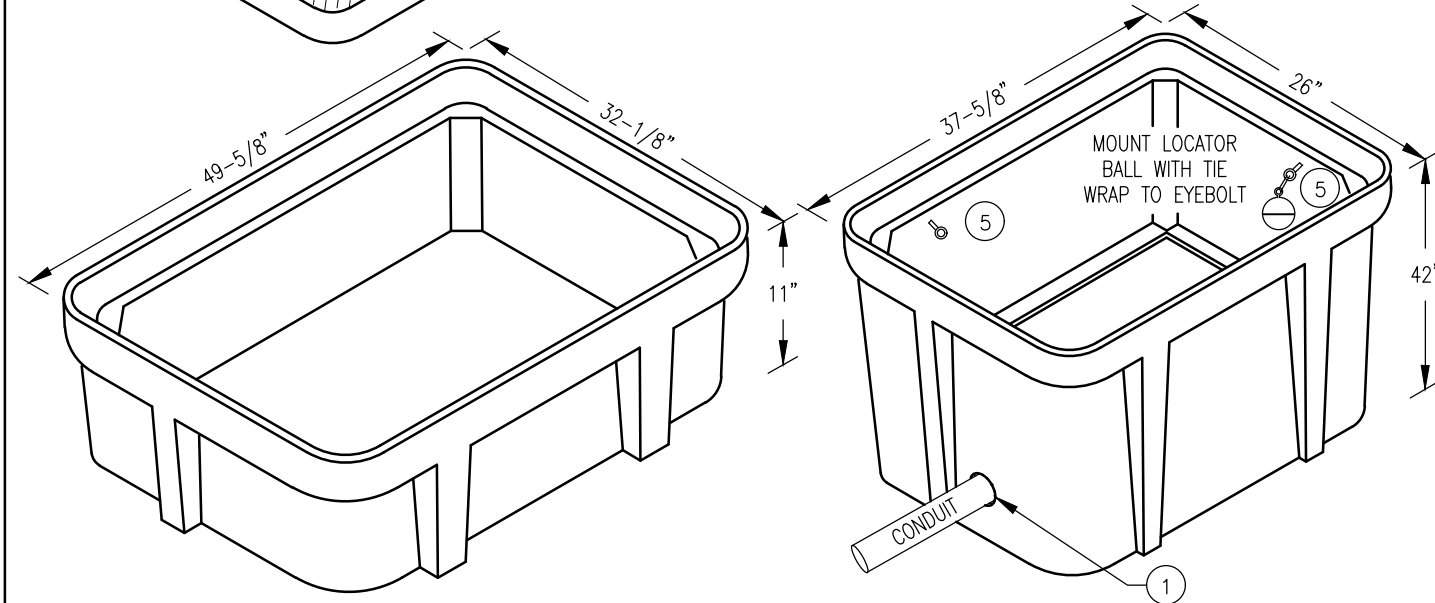
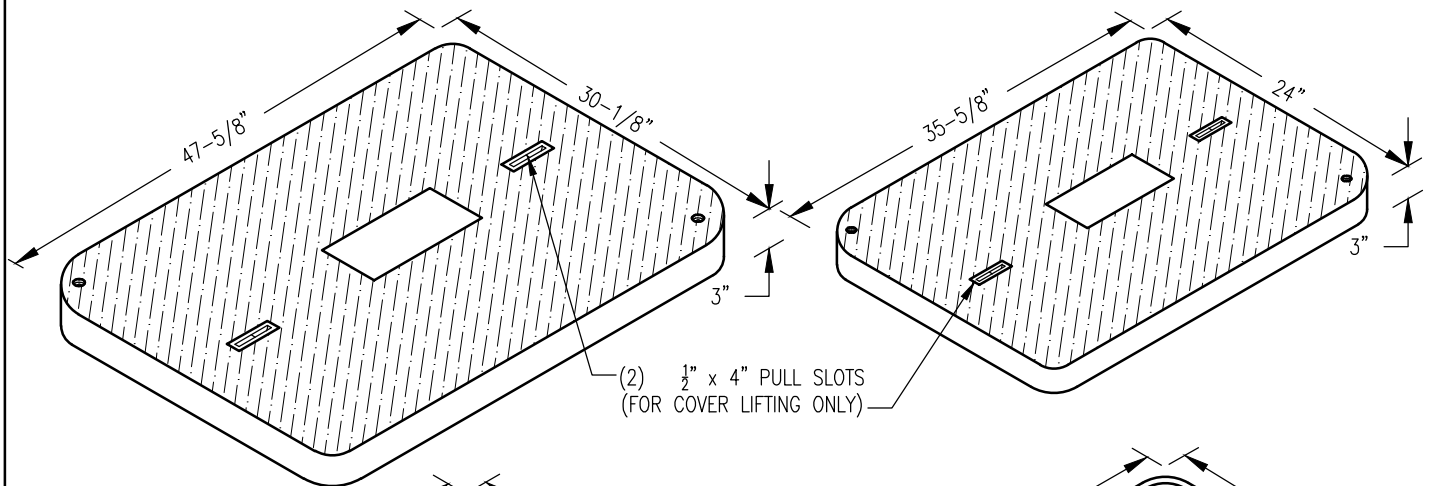
NO SCALE



- ① OPENINGS FOR CONDUIT SHALL BE SEALED WITH MATERIAL COMPATIBLE SEALANT
- ② PLUG CONDUIT OPENING WITH A DRAINABLE COMPOUND
- ③ MOUNT LOCATOR BALL WITH THE TIE WRAP TO EYE BOLT
- ④ 1' OF COARSE FILTER AGGREGATE UNDER BASE COMPLYING WITH MNDOT 3149.2H
- ⑤ 2 - TYPE 2 SHOULDER SS EYEBOLTS  $\frac{3}{8}$ " DIAMETER BY 1-1/4" SHANK LENGTH WITH HEX NUTS (FOR LOCATOR BALL MOUNTING)

GENERAL NOTES:

1. DO NOT LIFT ENTIRE PULL VAULT BY LIFTING SLOTS WITH COVER ATTACHED

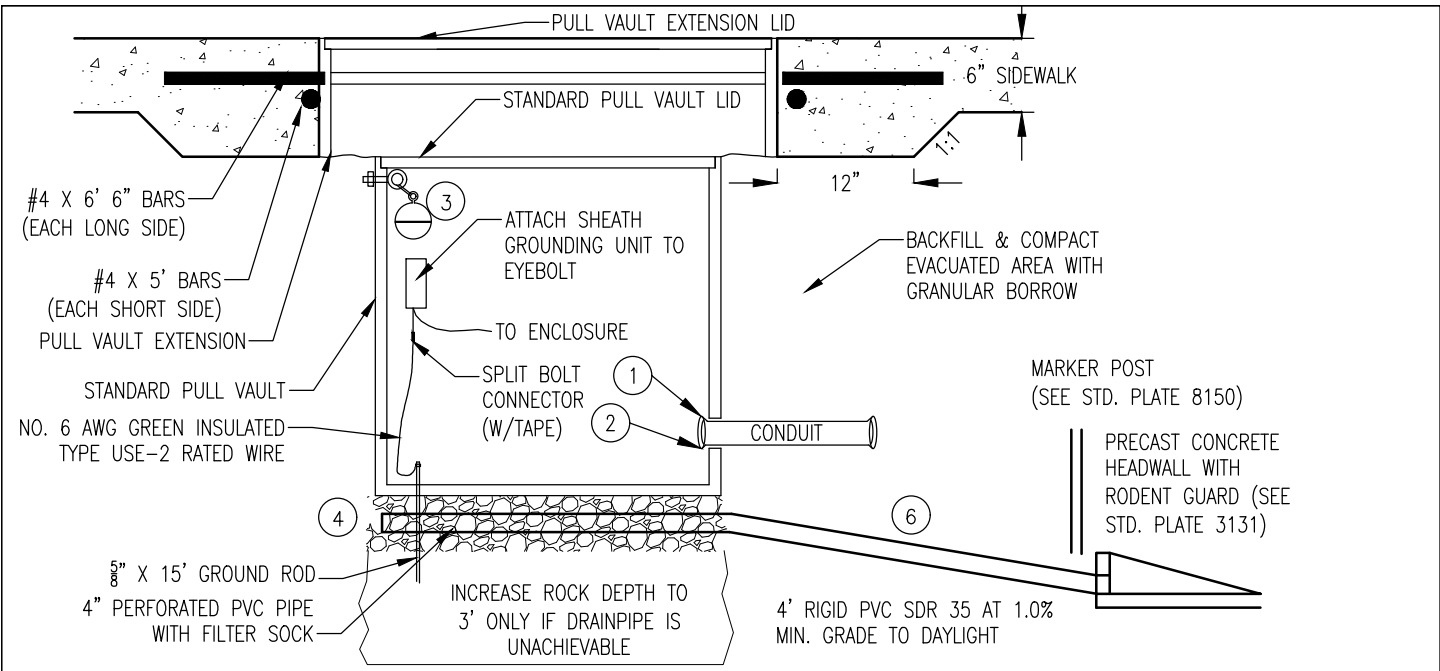


**PULL VAULT EXTENSION AND LID**  
(ONLY REQUIRED FOR SIDEWALK INSTALLATIONS)

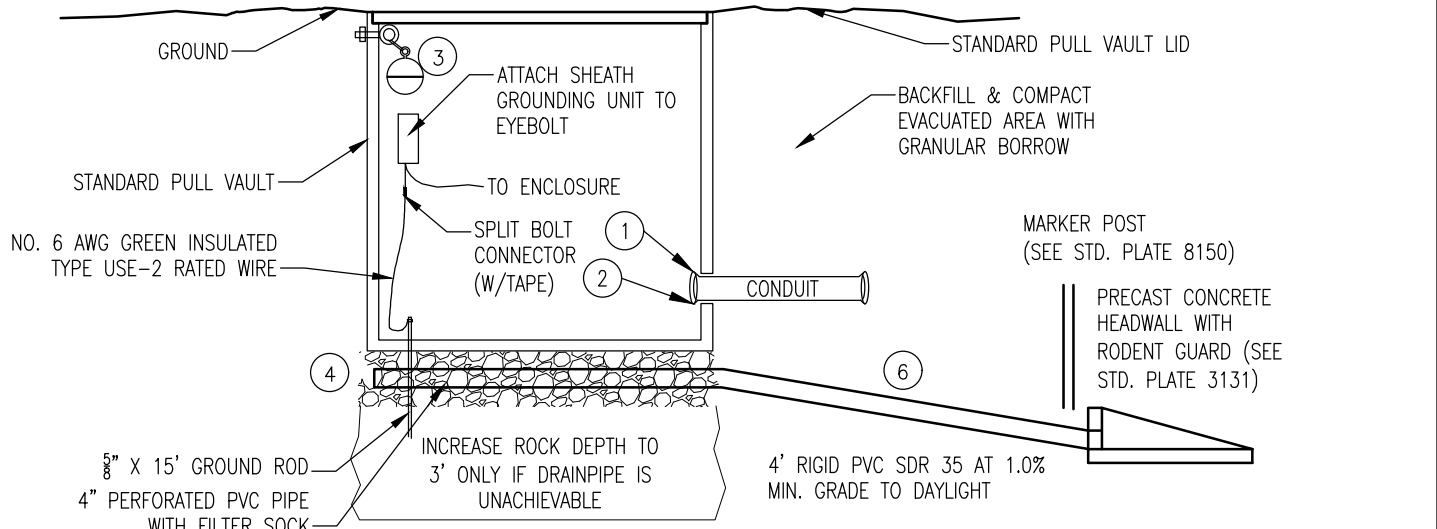
**STANDARD PULL VAULT AND LID**  
(CITY OWNED)

<b>PULL VAULT INSTALLATION B</b>		<b>STR-14B</b>
REVISED/APPROVED 04/05/2019	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

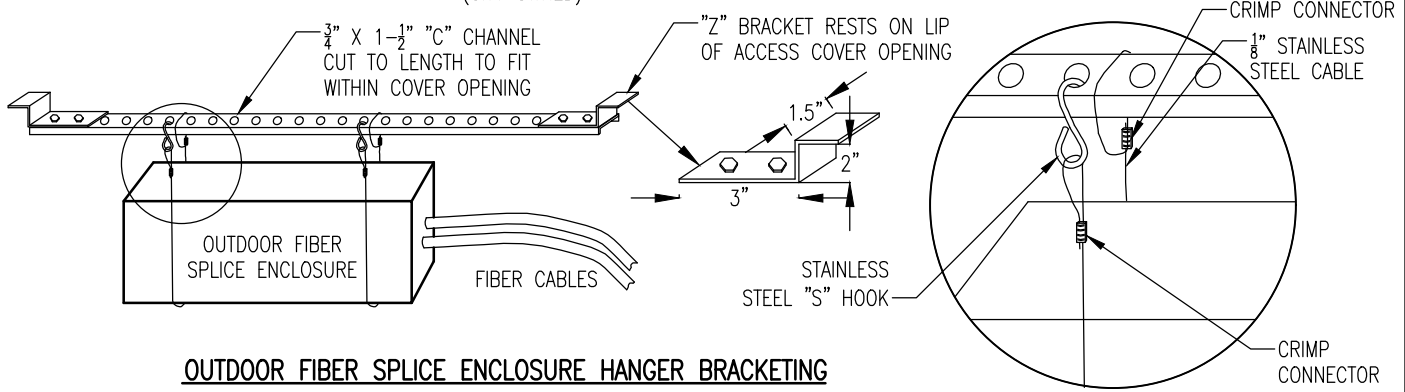




**PULL/SPLICE VAULT INSTALLATION**  
(SIDEWALK)

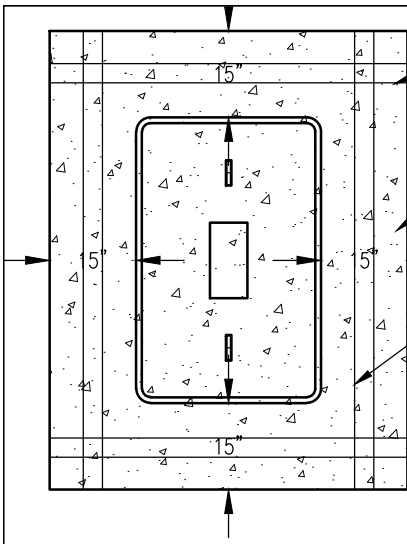


**VAULT INSTALLATION (GROUND)**  
(CITY OWNED)



**OUTDOOR FIBER SPLICE ENCLOSURE HANGER BRACKETING**

<b>PULL VAULT INSTALLATION C</b>		<b>STR-14C</b>
REVISED/APPROVED 04/05/2019	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

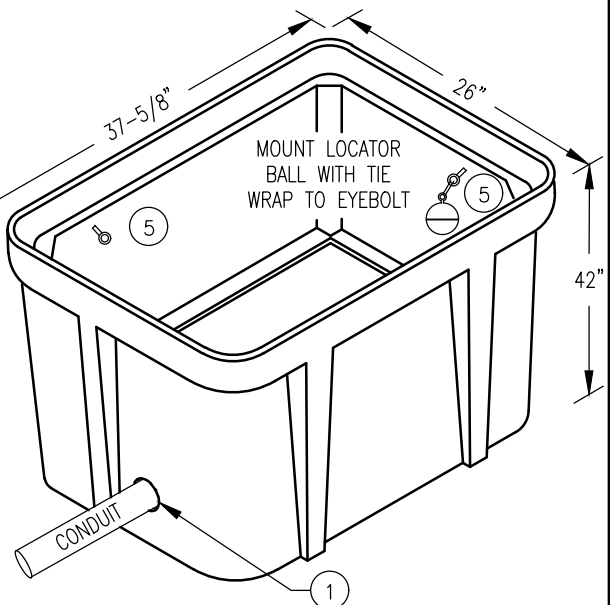
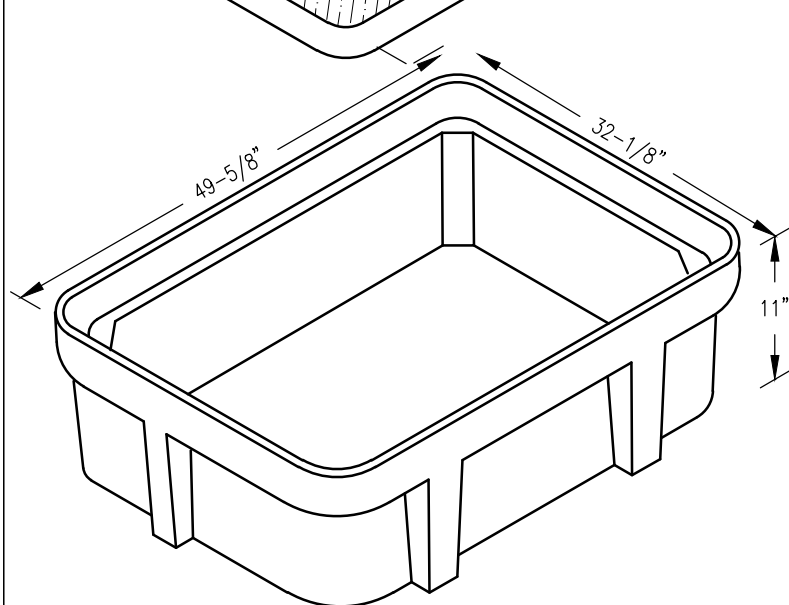
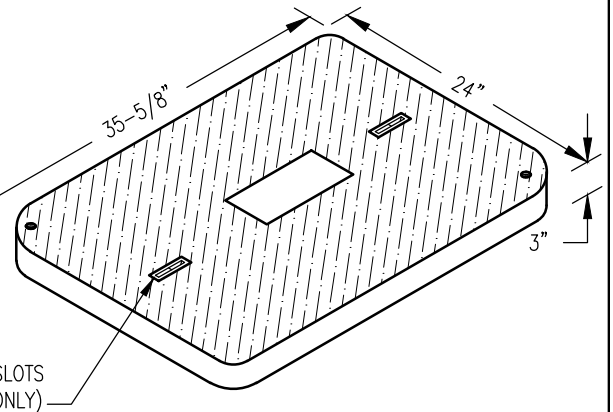
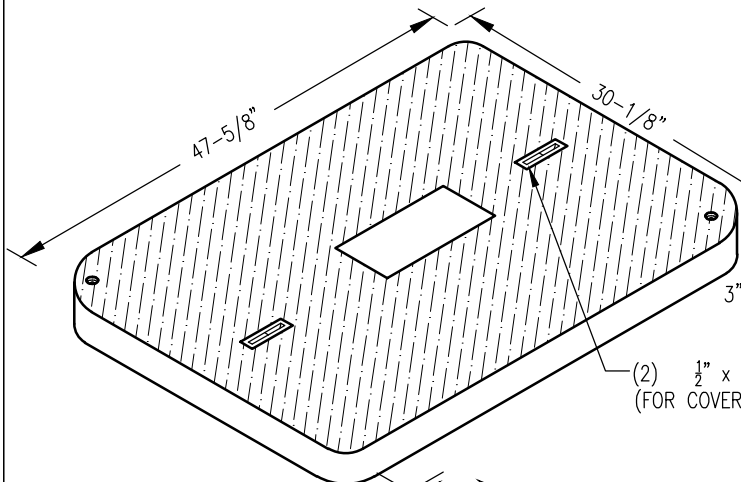


**PLAN VIEW**

**GENERAL NOTES:**

1. DO NOT LIFT ENTIRE PULL VAULT BY LIFTING SLOTS WITH COVER ATTACHED
2. GROUND CONNECTIONS SHALL BE COATED WITH OXIDATION PROHIBITING COMPOUND.
3. CABLE SHALL ENTER BELOW THE SUPPORT BRACKETS WITH A MINIMUM OF 70' OF SLACK FOR EACH CABLE OUTSIDE OF THE ENCLOSURE. CABLE SHALL BE COILED AROUND INSIDE OF SUPPORT BRACKETS. CABLES SHALL BE CUT TO THE SAME LENGTH AT THE ENCLOSURE.

- ①. OPENINGS FOR CONDUIT SHALL BE SEALED WITH MATERIAL COMPATIBLE SEALANT
- ②. PLUG CONDUIT OPENING WITH A DRAINABLE COMPOUND
- ③. MOUNT LOCATOR BALL WITH THE TIE WRAP TO EYE BOLT
- ④. 1' OF COARSE FILTER AGGREGATE UNDER BASE COMPLYING WITH MNDOT 3149.2H
- ⑤. 2 - TYPE 2 SHOULDER SS EYEBOLTS  $\frac{3}{8}$ " DIAMETER BY 1-1/4" SHANK LENGTH WITH HEX NUTS (FOR LOCATOR BALL MOUNTING)
- ⑥. DRAIN PIPE MAY BE PLACED IN SIDEWALL OF PULL VAULT TO ACHIEVE DRAINAGE IN AREAS WHERE MINIMUM PIPE OUTFALL IS AVAILABLE.



**PULL VAULT EXTENSION AND LID**  
(ONLY REQUIRED FOR SIDEWALK INSTALLATIONS)

**STANDARD PULL VAULT AND LID**  
(CITY OWNED)

**PULL VAULT INSTALLATION D**

**STR-14D**

REVISED/APPROVED 04/05/2019

CITY OF DULUTH STANDARD DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE