



DEPARTMENT OF PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

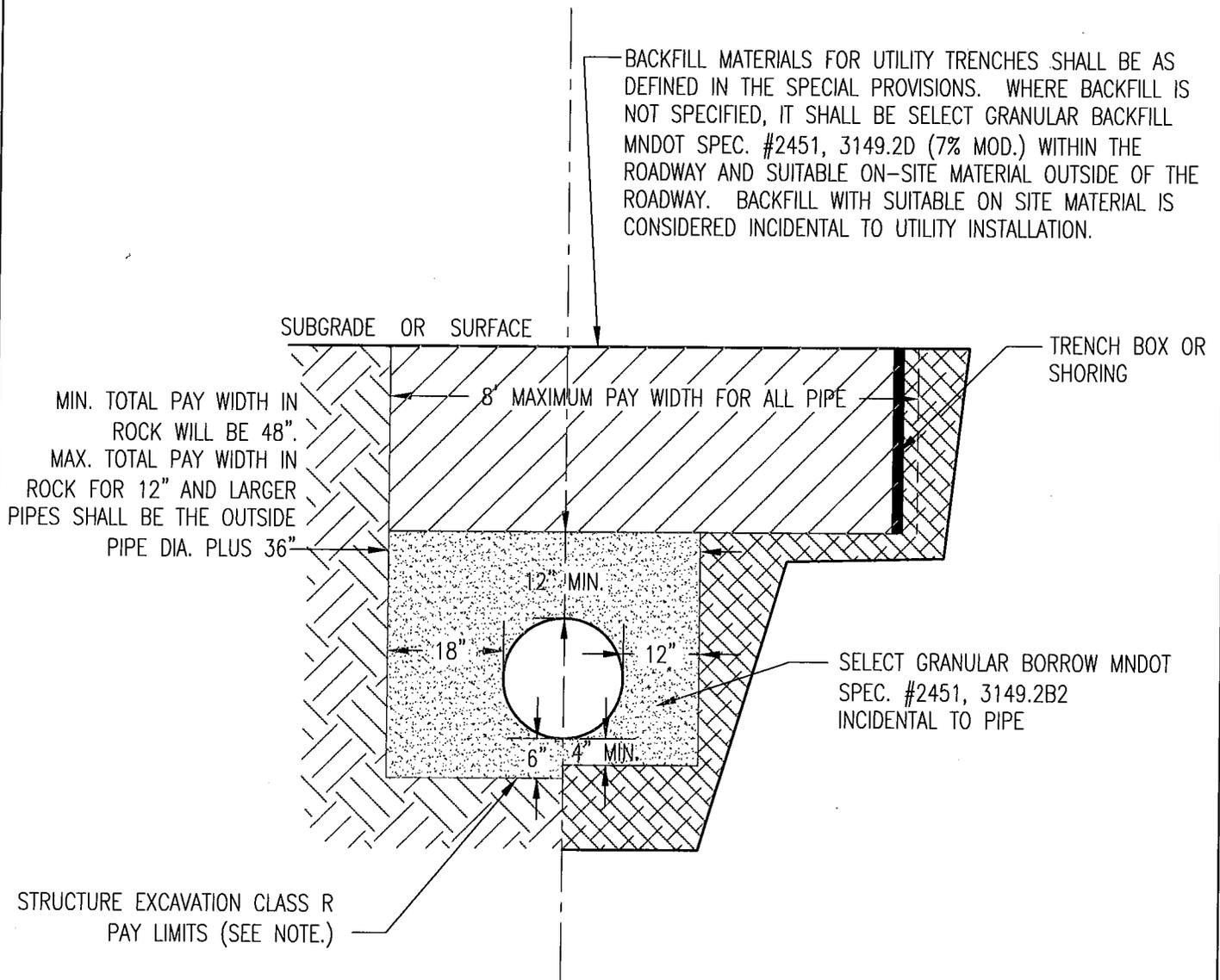
STANDARD DETAIL DRAWINGS

EXCAVATION DETAILS

- EX-1 DUCTILE IRON, PE WATERMAIN, PRESSURE SEWER, & FORCEMAIN
BEDDING
- EX-2 ALL STEEL & 6" & LARGER PE GAS MAIN BEDDING
- EX-3 PVC & CORRUGATED PE SEWER PIPE BEDDING
- EX-4 CONCRETE STORM SEWER BEDDING

ROCK SECTION

UNDISTURBED GROUND SECTION



NOTES:

1. TRENCH STABILIZATION MATERIAL MAY BE USED IN AREAS AS DETERMINED BY THE ENGINEER.
2. A MIN. OF 1 CU. YD. OF STRUCTURE EXCAVATION, CLASS R, WILL BE PAID FOR EVERY 10' OF PIPE WHERE ROCK REMOVAL IS REQUIRED.
3. EXCESS EXCAVATION MATERIAL SHALL BE DISPOSED OF OFF PROJECT R.O.W. (INCIDENTAL)
4. WHERE UTILITIES ARE INSTALLED IN ROCK TRENCHES OUTSIDE OF THE ROADWAY, THE CONTRACTOR SHALL PROVIDE COMMON BORROW MATERIAL TO SUPPLEMENT SUITABLE ON SITE BACKFILL MATERIALS AS NECESSARY. COMMON BORROW MATERIAL IS INCIDENTAL TO STRUCTURE EXCAVATION, CLASS R. REFER TO SPECIFICATIONS FOR RESTRICTIONS ON COMMON BORROW MATERIALS.

DUCTILE IRON, PE WATERMAIN, PRESSURE SEWER, & FORCEMAIN BEDDING

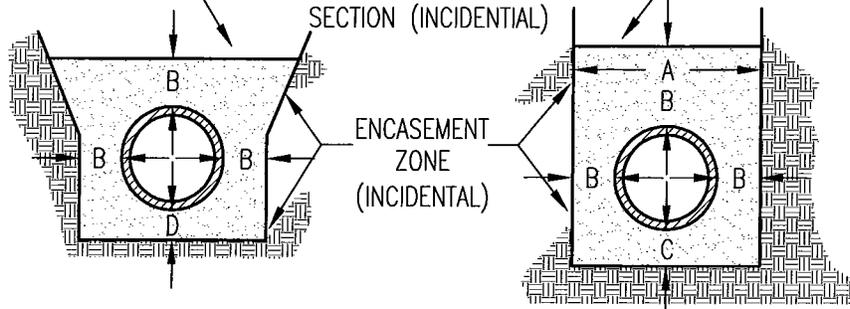
EX-1

REVISED/APPROVED 2/01/2013

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

NO SCALE

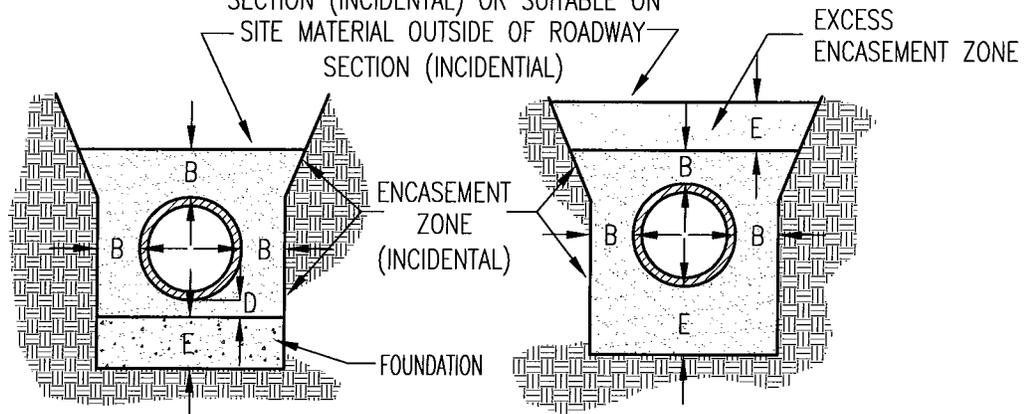
SELECT GRANULAR BACKFILL MNDOT SPEC.
#2451, 3149.2D (7% MOD) IN ROADWAY
SECTION (INCIDENTAL) OR SUITABLE ON
SITE MATERIAL OUTSIDE OF ROADWAY
SECTION (INCIDENTIAL)



NORMAL TRENCH

ROCK TRENCH

SELECT GRANULAR BACKFILL MNDOT SPEC.
#2451, 3149.2D (7% MOD) IN ROADWAY
SECTION (INCIDENTIAL) OR SUITABLE ON
SITE MATERIAL OUTSIDE OF ROADWAY
SECTION (INCIDENTIAL)



WET TRENCH

UNSTABLE TRENCH

1. DIMENSIONS:
 - A. MAXIMUM PAY WIDTH - O.D. PIPE +24"
 - B. MINIMUM - 6"
 - C. 6" BELOW PIPE
 - D. 4" BELOW PIPE
 - E. DETERMINED BY THE ENGINEER
2. ENCASEMENT MATERIAL TO BE MNDOT SPEC. #2451, 3149.2K SAND COVER
3. FOUNDATION MATERIAL SHALL BE GRADED AS FOLLOWS:

SIEVE SIZE	FOUNDATION
2"	100
1"	85-100
3/4"	30-60
3/8"	0-10

ALL STEEL & 6" AND LARGER PE GAS MAIN BEDDING DETAIL

EX-2

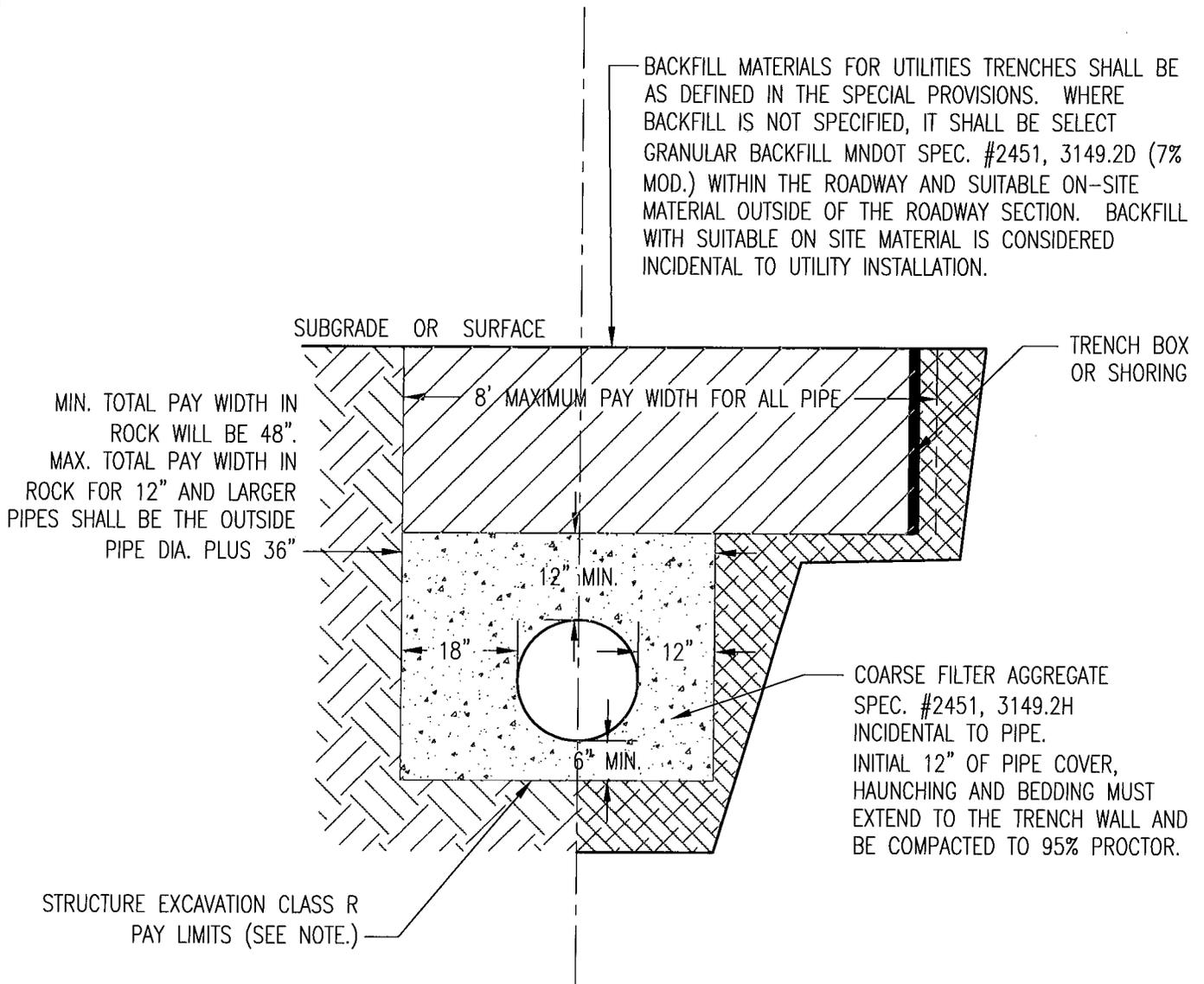
REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
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ROCK SECTION

UNDISTURBED GROUND SECTION



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PVC AND CORRUGATED POLYETHYLENE SEWER PIPE BEDDING DETAIL

EX-3

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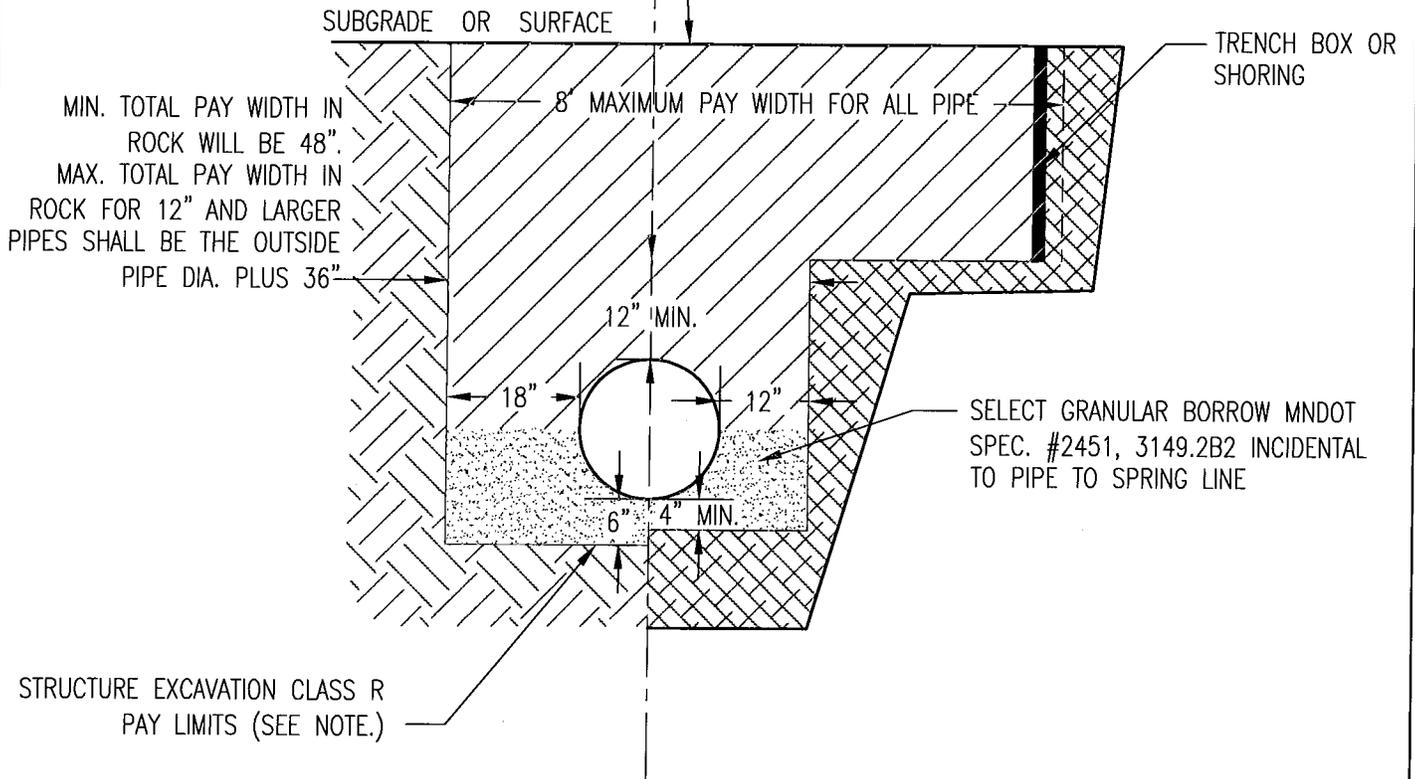
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ROCK SECTION

UNDISTURBED GROUND SECTION

BACKFILL MATERIALS FOR UTILITY TRENCHES SHALL BE AS DEFINED IN THE SPECIAL PROVISIONS. WHERE BACKFILL IS NOT SPECIFIED, IT SHALL BE SELECT GRANULAR BACKFILL MNDOT SPEC. #2451, 3149.2D (7% MOD.) WITHIN THE ROADWAY AND SUITABLE ON-SITE MATERIAL OUTSIDE OF THE ROADWAY. BACKFILL WITH SUITABLE ON SITE MATERIAL IS CONSIDERED INCIDENTAL TO UTILITY INSTALLATION.



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CONCRETE STORM SEWER BEDDING

EX-4

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