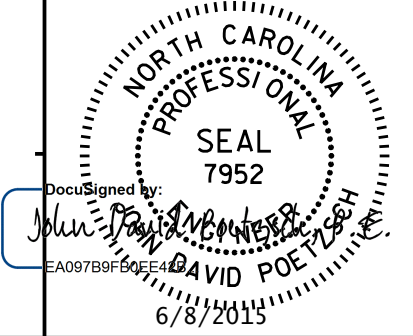
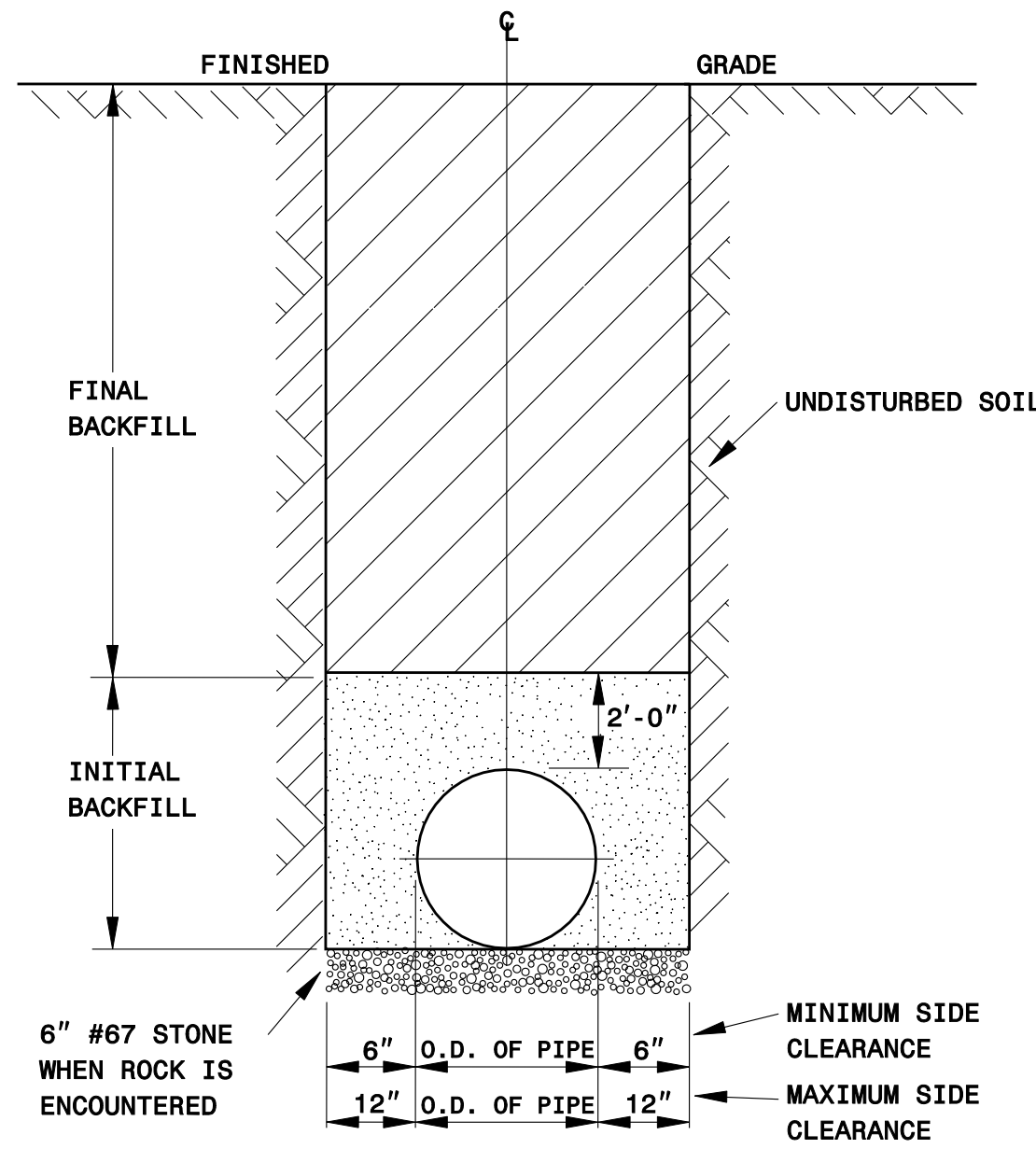


SCALE: NONE



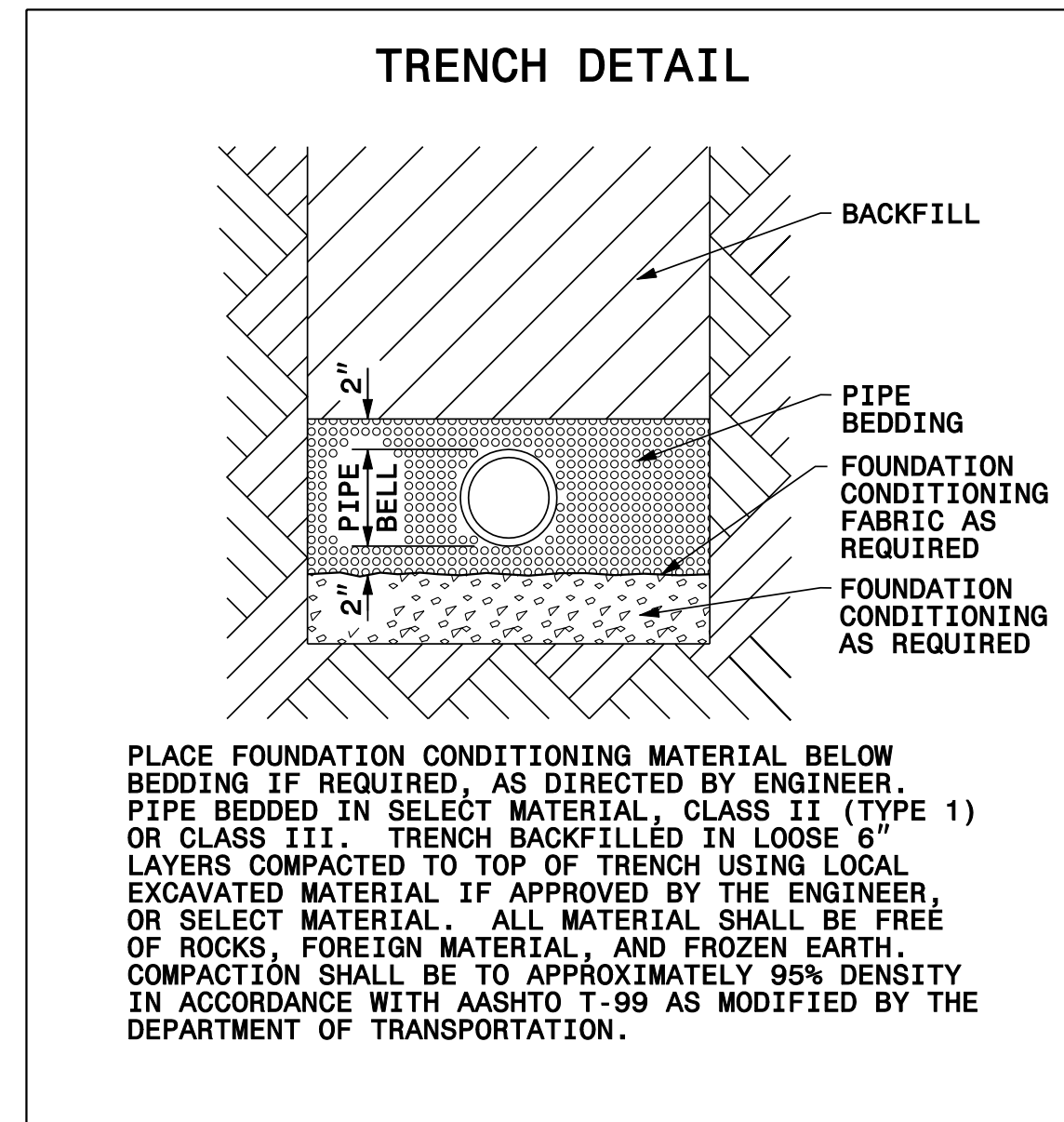
UTILITY CONSTRUCTION



TRENCH & BACKFILL DETAIL

NOTES:

- TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
- NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
- ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
- BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.
- ACHIEVE 80% COMPACTION IN NON-TRAFFIC AREAS, AND 95% COMPACTION IN TRAFFIC AREAS.
- IF IN EASEMENT 4" TOPSOIL, AND 12" CLEAN SELECT FILL IS REQUIRED.
- NO BOULDERS 8" IN DIAMETER OR GREATER ALLOWED IN FINAL BACKFILL.



MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

PROPOSED RCP STORM DRAIN CROSSING OVER SANITARY SEWER OR WATER

SADDLE TO BE 1" COMPRESSIBLE JOINT MATERIAL

CLEARANCE BETWEEN PIPE = 1 1/2" MIN. / 18" MAX.

FORMED CONCRETE PIER

#57 STONE DUMPED LOOSE AND SHOVEL SLICED IN

6" FOUNDATION CONDITIONING MATERIAL

FIRM UNDISTURBED SUBGRADE BELOW PIER

12" 12" CL VAR. SIZES SAN. SEWER OR WATER 12" CL 12"

12" 12" CL 12" 12" CL

SECTION "B-B"

SECTION "A-A"

IRON RETAINING GLAND M.J. RESTRAINT

NOMINAL PIPE SIZE	WEDGES QUANTITY	BOLTS QUANTITY	PRESS RATING
6"	3	6	350
8"	4	6	350
12"	8	8	350

8" SIZE SHOWN 6" & 12" SIMILAR

IRON RETAINING GLAND M.J. RESTRAINT

LR (MIN. LENGTH OF RESTRAINT EACH DIRECTION OF THRUST IN LINEAR FEET)
Based on 200 psig pressure, Safety Factor of 2.0:1, BARE DI PIPE AND ML Soil, 3.5' cover
Chart does not apply to pipes wrapped in polyethylene wrap

PIPE SIZE	VALVES DEAD ENDS TEES	90° ELBOWS	45° ELBOW & CROSSES	22-1/2" ELBOWS	REDUCER
6"	55'	31'	13'	7'	8"x2" 67"
8"	72'	40'	17'	8'	8"x6" 30"
12"	102'	57'	24'	12'	12"x8" 54"
16"	195'	101'	42'	20'	16"x8" 157"

RESTRAINED JOINT DETAIL FOR TYPICAL TEE INTERSECTION
4 WAY INTERSECTION SIMILARLY RESTRAINED

NOTES:

- THRUST RESTRAINT SHALL BE INSTALLED ON DUCTILE IRON WATER DISTRIBUTION LINES 6" THRU 16" DIAMETER IN THE MANNER SHOWN.
- IRON RETAINING GLAND M.J. RESTRAINT SHALL NOT BE USED ON PVC PIPE.
- PIPE GREATER THAN 16 INCH DIAMETER SHALL REQUIRE RESTRAINED JOINT PIPE FOR THE PROPER LENGTH.
- COMPACT FITTINGS ARE ACCEPTABLE FOR USE WITH IRON RETAINING GLAND M.J. RESTRAINT AND OTHER FORMS OF DI RESTRAINT.
- THE MINIMUM LENGTH OF RESTRAINT INDICATED SHALL REQUIRE ALL JOINTS WITHIN THE LR DISTANCE TO BE RESTRAINED.
- RESTRAINT SYSTEM SHALL BE INSPECTED AND APPROVED PWC PRIOR TO BACKFILLING.
- RESTRAINT SYSTEMS MAY VARY BASED UPON THE ENGINEERS' DESIGN AS SHOWN ON THE PLAN AND PROFILE SHEETS.
- GRIPPER RING AND FIELD LOK GASKETS ARE AN ACCEPTABLE METHOD OF RESTRAINT ON DUCTILE IRON PIPE ONLY.

ALTERNATE RESTRAINT DETAIL (DUCTILE IRON PIPE ONLY) N.T.S.

DATE: 6/19/2015
DRAWN: 033380 uc.pdf-544007