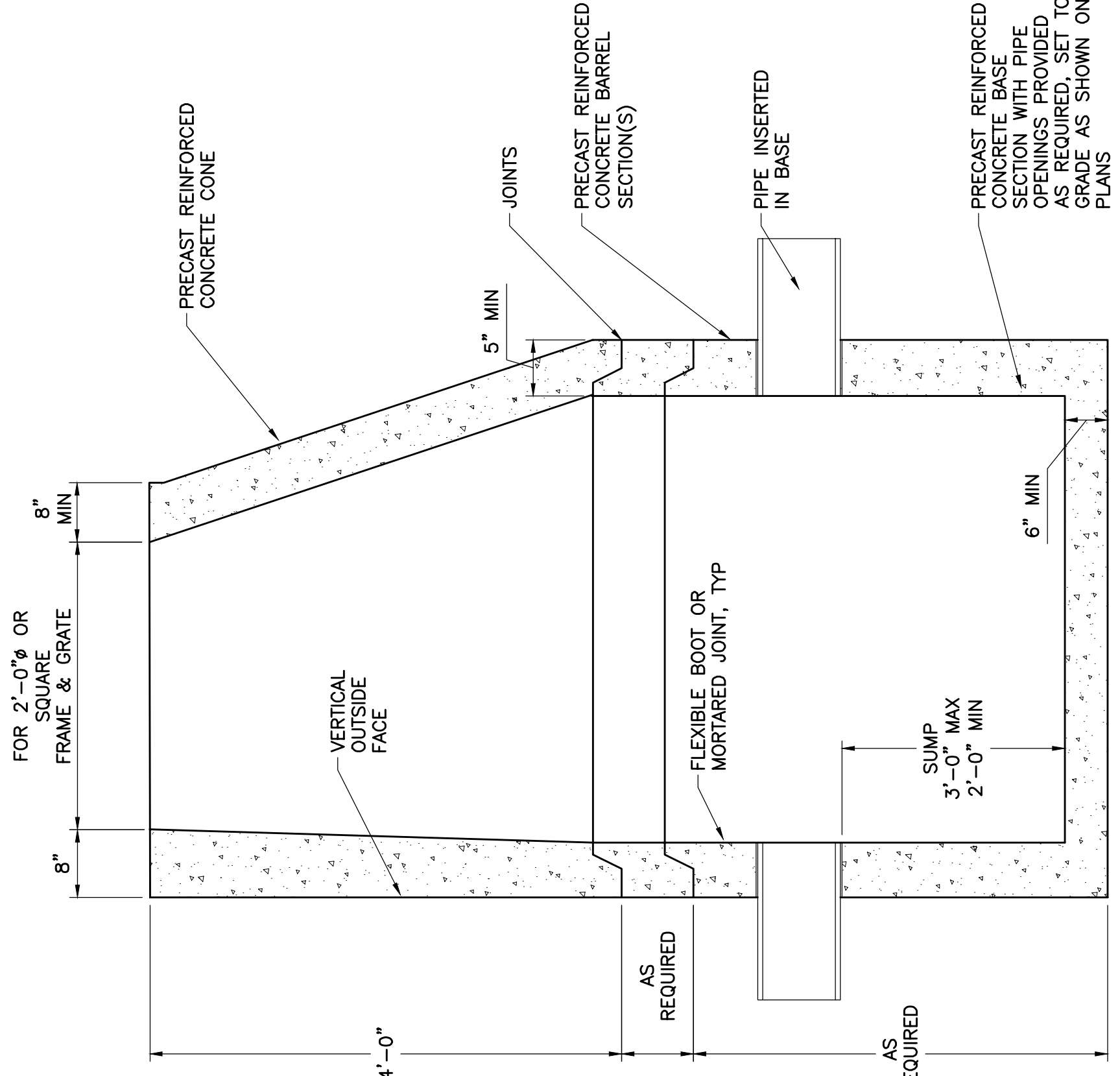


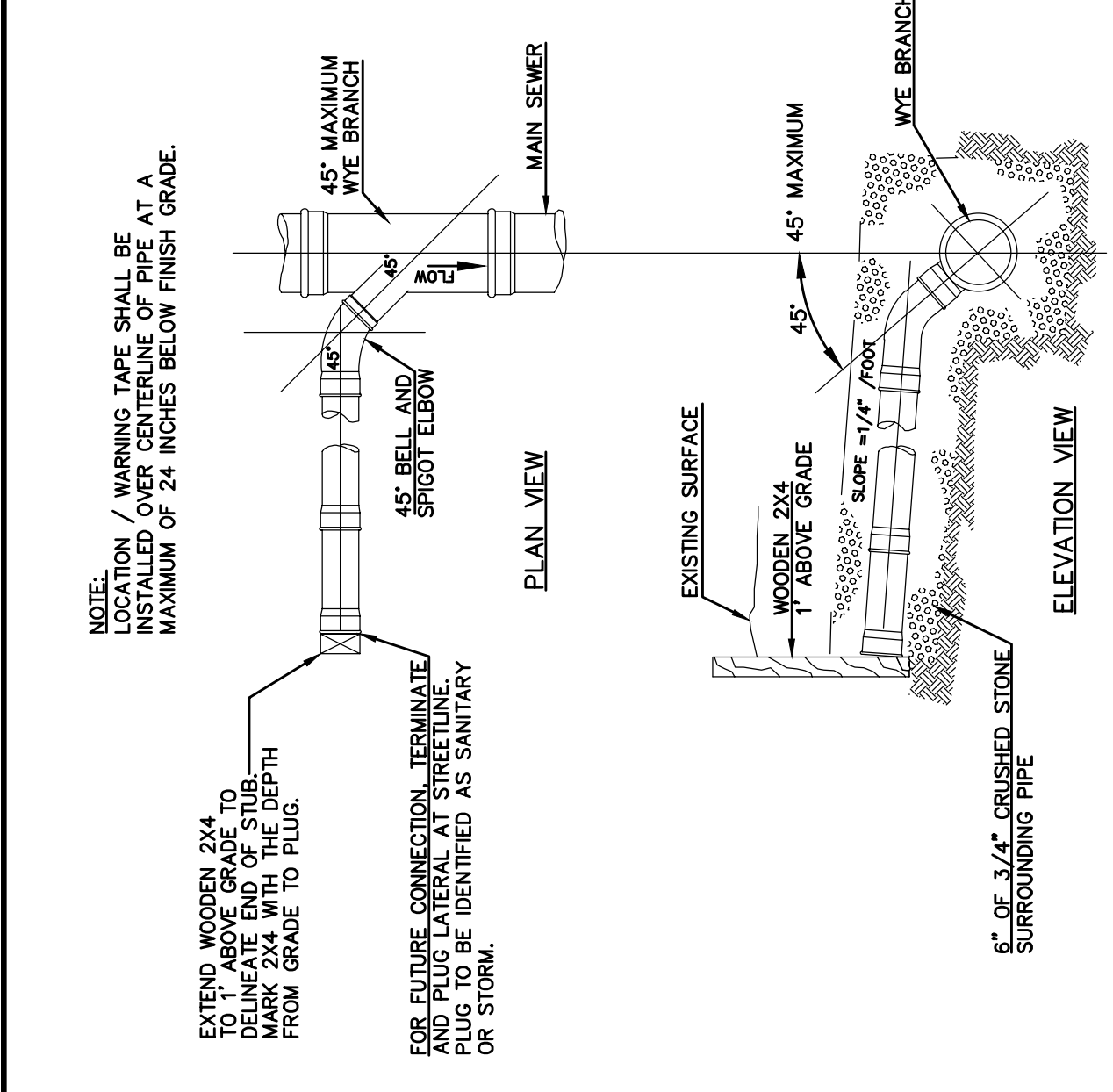
- NOTES:**
- MANHOLE CHANNELS, REQUIRING A CHANGE IN CURVE OR THE LONGEST POSSIBLE RADIUS, IF SIDE PIPES ENTER CHANNEL, SHAPE TO RECEIVE ADDED SIDE FLOW.
  - USE A FLAT SLAB TOP MANHOLE WHEN THE HEIGHT DIFFERENCE BETWEEN THE HIGHEST INVERT AND RIM IS LESS THAN 6'-0" AND WHEN MANHOLE DIAMETER IS GREATER THAN 4'-0".

**TYPICAL 4-FT MANHOLE**  
SCALE: NTS



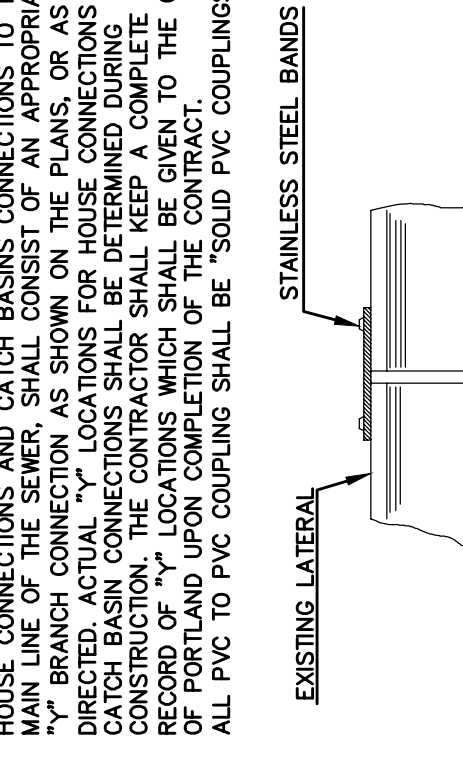
NOTE: USE FLAT SLAB TOP CATCH BASIN WHERE REQUIRED TO MATCH GRADE

**4-FT CATCH BASIN**  
SCALE: NTS

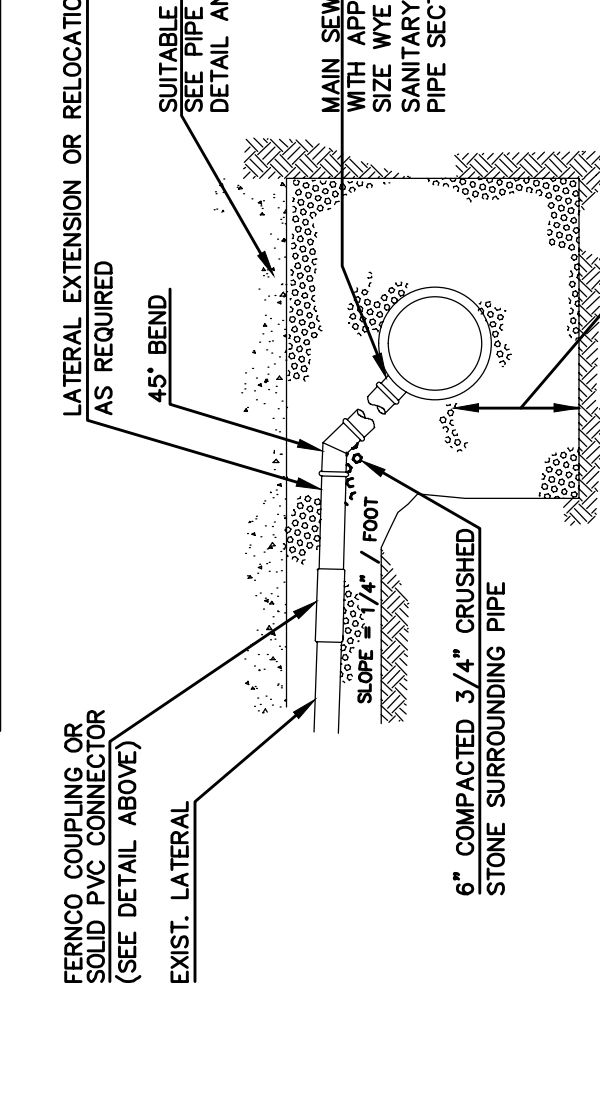


**TYPICAL HOUSE LATERAL TEE/WYE CONNECTION**  
SCALE: NTS

- NOTE:** LOCATIONS AND ELEVATIONS OF STEPS SHOWN ON THE PLANS SHALL BE SUBMITTED AS APPROPRIATE AND MAY BE ADJUSTED AS DIRECTED TO SUIT FIELD CONDITIONS.
- HOUSE CONNECTIONS AND CATCH BASIN CONNECTIONS TO THE "Y" BRANCH CONNECTION AS SHOWN ON THE PLANS, OR AS DIRECTED, ACTUAL "Y" LOCATIONS FOR HOUSE CONNECTIONS AND CATCH BASIN CONNECTIONS SHALL BE DETERMINED DURING CONSTRUCTION. THE LOCATION OF "Y" LOCATIONS SHALL BE RECORDED ON PORTLAND UPON COMPLETION OF THE CONTRACT. ALL PVC TO PVC COUPLING SHALL BE "SOLID PVC COUPLINGS".

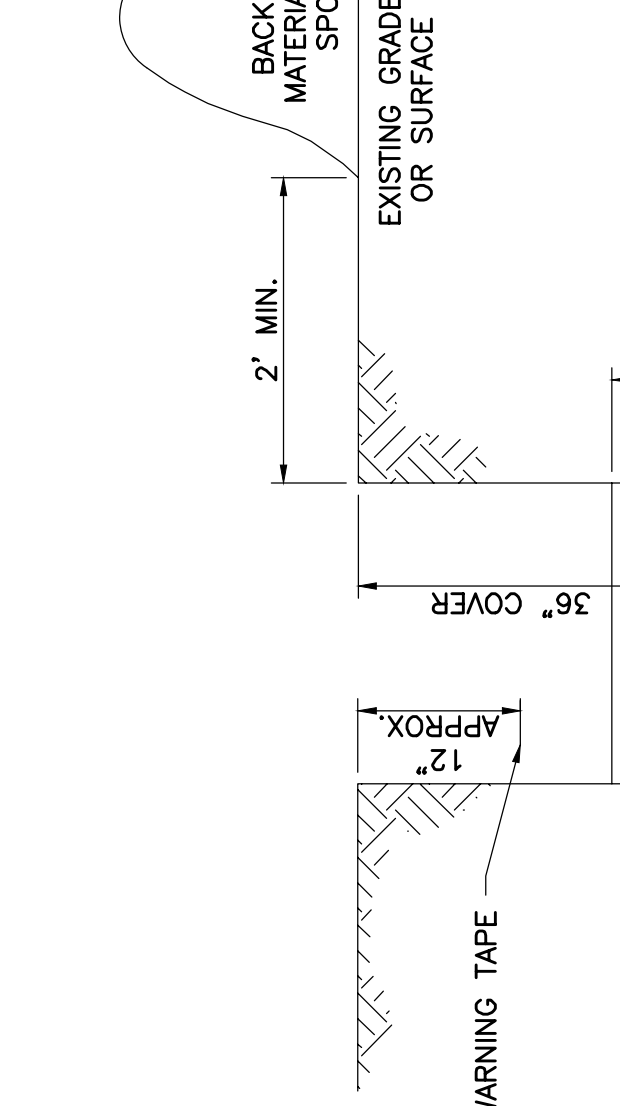


**TYPICAL EXISTING SEWER LATERAL CONNECTION**  
SCALE: NTS



**TYPICAL ELECTRICAL DUCT BANK DETAIL**  
(REFER TO NOTES BELOW FOR ADDITIONAL REQUIREMENTS)

**MASONRY PLUG**  
SCALE: NTS



**MASONRY PLUG**  
SCALE: NTS

NO.	SUBMISSIONS/REVISIONS	AP'D.	DATE
1	ISSUED FOR PORTLAND SITE PLAN REVIEW	JBM	11/17

DESIGNED BY:	MAG
CAD COORD:	MRL
CHECKED BY:	MAG
DATE:	11-15-17
APPROVED BY:	JBM
DATE:	11-15-17
PROJECT NO.:	136822A

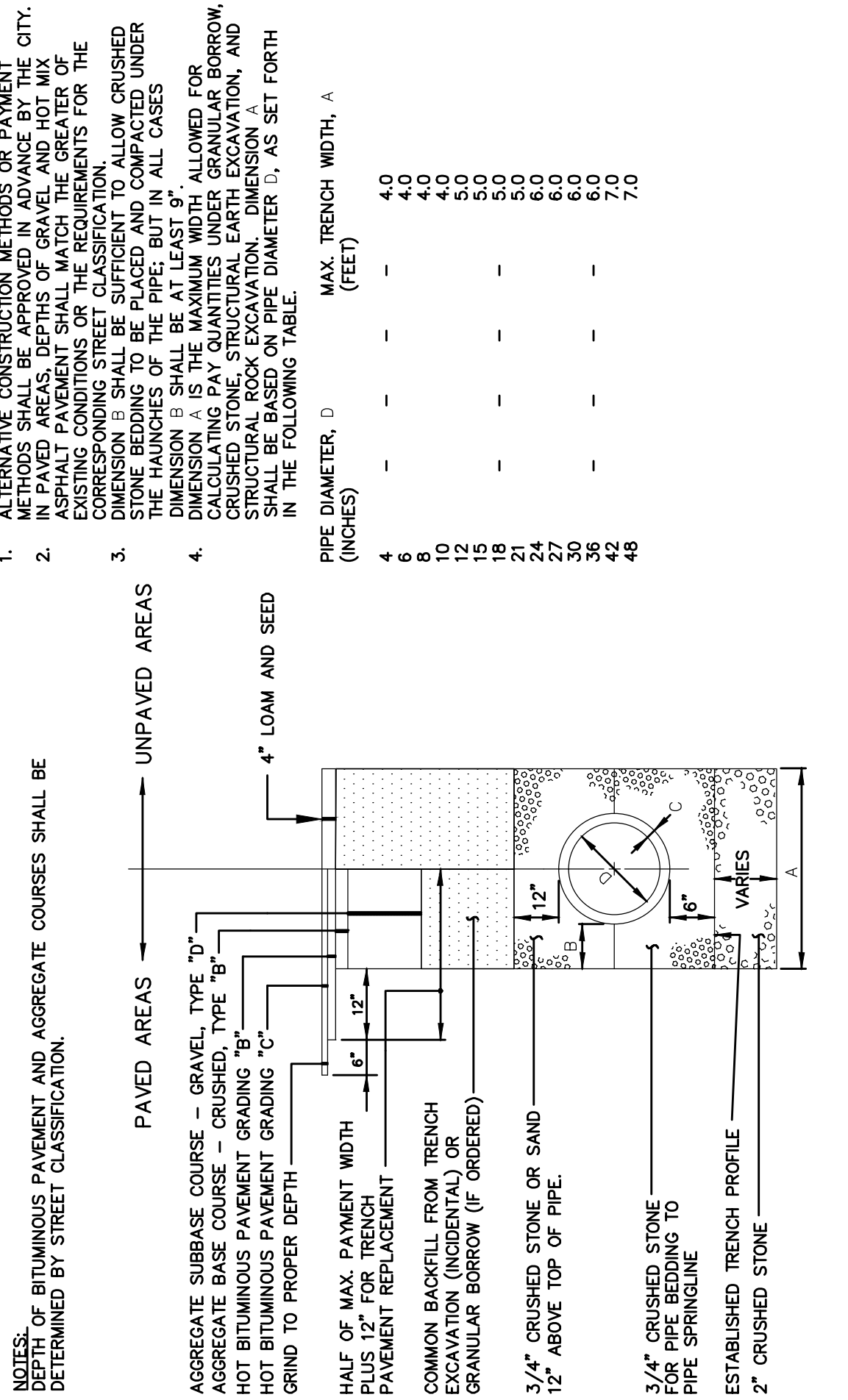


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DETAILS II

**PRELIMINARY  
FOR REVIEW ONLY**

**TYPICAL PIPE TRENCH INSTALLATION**  
SCALE: NTS



**NOTES:** (DUCT BANK DETAIL)

- DIMENSIONS TYPICAL FOR ALL DUCT BANKS, UNLESS OTHERWISE NOTED.
- THIS TYPICAL DUCT BANK SECTION HAS BEEN SHOWN AS AN EXAMPLE OF THE REQUIREMENTS FOR THE UNDERGROUND SYSTEM. THIS DETAIL DOES NOT SHOW THE SPACING, LOCATION, OR SIZE OF REINFORCING STEEL. REINFORCING STEEL SHALL BE SPECIFIED BY THE CONTRACTOR. THE SPECIFIC CONDUIT SIZES AND NUMBERS HAVE BEEN SHOWN BY EACH SPECIFIC DUCT BANK SECTION.
- IT SHALL BE REQUIRED THAT A MINIMUM OF 1'-0" CLEARANCE BE PROVIDED AT ALL TIMES BETWEEN ALL POWER CONDUITS AND ALL SIGNAL AND/OR CONTROL CONDUITS IN ORDER TO AVOID ANY ELECTRICAL NOISE INTERFERENCE WITH THE CABLES OR WIRES WITHIN THESE SIGNAL AND CONTROL CONDUITS.
- EXCAVATION, TRENCHING AND BACKFILLING SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 2 OF THIS CONTRACT.
- CONCRETE ENCASEMENT SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 3 OF THIS CONTRACT.
- REINFORCING STEEL SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 3 OF THIS CONTRACT.
- REFER TO THE CONTRACT DRAWINGS FOR SPECIFIC DETAILS FOR CONCRETE ENCASEMENT AND REINFORCING OF ELECTRICAL DUCT BANKS.
- INSTALL MARKER TAPE THE ENTIRE LENGTH OF EACH DUCT BANK.
- TYPICAL SPACING BETWEEN CONDUITS SHALL BE 3 INCHES UNLESS OTHERWISE NOTED.
- A CONTINUOUS #4/0 BARE COPPER GROUND CONDUCTOR SHALL BE PROVIDED AND ROUTED BENEATH ALL DUCT BANKS (AND ELECTRICAL MANHOLES IF APPLICABLE) IN ORDER TO ELECTRICALLY BOND ALL BUILDING SERVICES AND EQUIPMENT TO THE SAME POTENTIAL.

**TYPICAL ELECTRICAL DUCT BANK DETAIL**  
(REFER TO NOTES BELOW FOR ADDITIONAL REQUIREMENTS)

**MASONRY PLUG**  
SCALE: NTS