

EAST-WEST UTILITY TUNNEL REMOVAL OPERATIONAL APPROACH

PRE-REMEDIATION ACTIVITIES:

- A. ABANDONED UTILITIES ARE SHOWN IN THE AREA AND WILL BE MANAGED AS FOLLOWS:
 - i. ABANDONED CATCH BASIN NEAR DAMAGED TUNNEL SECTIONS WILL BE DEMOLISHED AND REMOVED.
 - ii. ABANDONED LIFT STATION NEAR JB 7 WILL BE DEMOLISHED FLUSH WITH THE BASE OF EXCAVATION TO FACILITATE REMOVAL OF TUNNEL SECTIONS #1-9. A SECOND EXCAVATION EFFORT WILL BE MADE TO REMOVE THE REMAINDER OF THE LIFT STATION BEFORE BACKFILLING FOR NEW DIRECT BURIED UTILITIES.
 - iii. ABANDONED 8" STORM SEWER ALONG SOUTH SIDE OF TUNNEL SERVED AS A TUNNEL UNDERDRAIN. THIS UNDERDRAIN WILL BE EXCAVATED ALONG TUNNEL SECTIONS #4-9 AND #50-63 TO DETERMINE ITS CONTAMINATION POTENTIAL.
 - i. UNDERDRAIN WILL BE EXCAVATED IN ENTIRETY IF CONTAMINATED.
 - ii. UNDERDRAIN WILL BE ABANDONED-IN-PLACE IF NO CONTAMINATION IS IDENTIFIED.
 - iv. EXISTING UTILITIES ARE SHOWN IN THE AREA AND WILL BE MANAGED AS FOLLOWS:
 - i. EXISTING 8" STORM SEWER ALONG NORTH SIDE OF TUNNEL SERVED AS A TUNNEL UNDERDRAIN. THIS UNDERDRAIN WILL BE EXCAVATED FROM THE LIFT STATION TO TUNNEL SECTION #82 TO DETERMINE ITS CONTAMINATION POTENTIAL.
 - i. UNDERDRAIN WILL BE EXCAVATED IN ENTIRETY IF CONTAMINATED.
 - ii. UNDERDRAIN WILL BE ABANDONED-IN-PLACE IF NO CONTAMINATION IS IDENTIFIED.
 - ii. LIFT STATION NEAR JB 9 WILL BE DEMOLISHED FLUSH WITH THE BASE OF EXCAVATION AND BACKFILLED TO GRADE USING APPROVED BACKFILL MATERIAL AND COVERED WITH A STEEL PLATE.
 - iii. IDENTIFICATION OF RADIOLOGICAL CONTAMINATION ON OR NEAR THE LIFT STATION MAY REQUIRE REMOVAL OR DECONTAMINATION OF THIS STRUCTURE.
 - iv. CATCH BASIN NEAR JB 9A WAS TEMPORARILY PLACED DURING DIRECT BURIED UTILITY CHASE BACKFILLING. IT WILL BE REMOVED AND REPLACED DURING FINAL RESTORATION.
 - v. NEW DIRECT BURIED UTILITIES ALONG NORTH FACE OF EXCAVATION ARE DEEPER THAN THE EXCAVATION AND SHOULD NOT BE ENCOUNTERED.
 - vi. EXISTING MANHOLE NEAR JB 7 WILL BE REMOVED AND EVALUATED FOR REUSE.
 - i. IF REUSABLE, MANHOLE WILL BE USED DURING RESTORATION ACTIVITIES.
 - ii. IF NOT REUSABLE, MANHOLE WILL BE EVALUATED TO DETERMINE ITS FINAL DISPOSITION.
 - vii. EXISTING 8" STORM SEWER CONNECTED TO REMOVED MANHOLE WILL BE CUT AND CAPPED AT LIMITS OF EXCAVATION FOR FUTURE RESTORATION.
- B. UTILITIES WITHIN THE EAST-WEST TUNNEL SYSTEM WILL BE ABANDONED-IN-PLACE PRIOR TO INITIATING TUNNEL REMOVAL. ALL FRIABLE ASBESTOS PIPE INSULATION WILL BE ABATED BY A LICENSED ASBESTOS ABATEMENT CONTRACTOR.
- C. WHERE APPLICABLE, ASPHALT WILL BE SAW CUT AT THE LIMITS OF EXCAVATION.
- D. ALL ASPHALT NORTH OF BLDG 2A WILL BE REMOVED IN PREPARATION OF FUTURE RESTORATION ACTIVITIES.
- E. OPERATIONS WILL DEMARCATe EXCLUSION ZONE WITH HIGH VISIBILITY FENCING.
- F. CRZ, EXCLUSION ZONE, AND AIR MONITORS WILL BE PLACED AS DIRECTED BY SRSL.

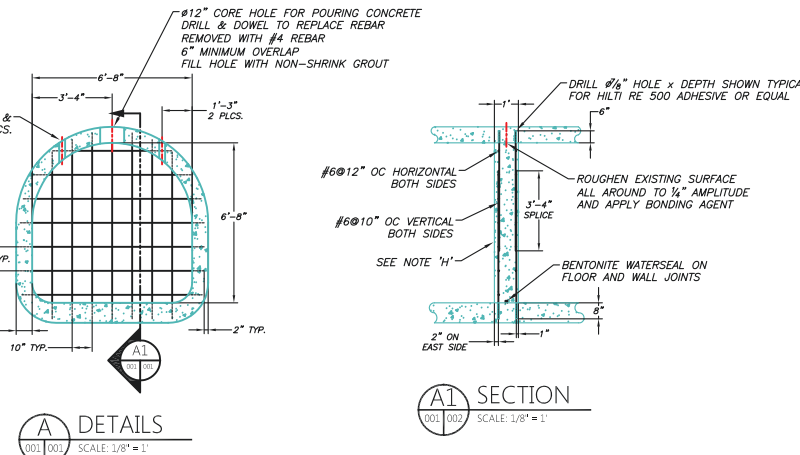
REMEDIATION ACTIVITIES:

- A. WATER FOR DUST SUPPRESSION TO BE SUPPLIED FROM WATER TRUCK, POLYETHYLENE TANK, OR NEAREST FIRE HYDRANT.
- B. TRUCK ACCESS TO BE DETERMINED BY OPERATIONS.
- C. CABRERA WILL COORDINATE WITH PRAXAIR TO REROUTE VEHICLE TRAFFIC AS NEEDED.
- D. EXCAVATION.
 - i. EXCAVATION IS NOT TO EXTEND BEYOND LIMITS SHOWN WITHOUT APPROVAL FROM SITE MANAGER, PROJECT ENGINEER, AND USAGE.
 - ii. DEPTH OF EXCAVATION IN SUPPORT OF UTILITY TUNNEL REMOVAL IS EXPECTED TO BE APPROXIMATELY 12'-0".
 - i. BENCHING AT 1.75'-1" WILL BE UTILIZED.
- E. EXCAVATION SEQUENCE.
 - i. REMOVAL OF THE EAST-WEST UTILITY TUNNEL WILL PROCEED IN TWO (2) STAGES.
 - ii. STAGE 1 WILL BEGIN AT JB 7 AND PROCEED WEST UNTIL TUNNEL SECTION #9 IS REMOVED.
 - a. TEMPORARY BULKHEAD AT JB 7 WILL BE INSTALLED AFTER REMOVAL OF TUNNEL SECTION #2.
 - b. TEMPORARY BULKHEAD WILL CONSIST OF WELDED STEEL PLATES BOLTED TO JB 7 AND SEALED TO MINIMIZE WATER INFILTRATION.
 - c. EACH LIFT SHALL ACHIEVE AT LEAST 95% COMPACTION.
 - iii. STAGE 2 WILL BEGIN NEAR JB 9 AND PROCEED EAST UNTIL ALL REMAINING TUNNEL SECTIONS HAVE BEEN REMOVED.
 - a. TUNNEL SECTION #89 WILL BE COMPLETELY EXPOSED BUT NOT REMOVED TO FACILITATE PLACEMENT OF THE PERMANENT CAST-IN-PLACE CONCRETE BULKHEAD.
 - b. PERMANENT CONCRETE BULKHEAD WILL BE INSTALLED AS SOON AS POSSIBLE TO MINIMIZE WATER INFILTRATION TO THE ACTIVE UTILITY TUNNEL SYSTEM.
 - iv. TUNNEL REMOVAL WILL BEGIN WITH TUNNEL SECTION #88.
 - i. IDENTIFICATION OF RADIOLOGICAL CONTAMINATION ON OR NEAR TUNNEL SECTION #89 AND/OR JB 9 MAY REQUIRE REMOVAL OR DECONTAMINATION OF THESE STRUCTURES.
 - F. EXCAVATION AND TUNNEL REMOVAL PROCEDURE.
 - i. SOIL, SOIL-LIKE MATERIAL, AND DEBRIS WILL BE EXCAVATED FROM THE TOP AND SIDES OF EACH TUNNEL SECTION.
 - ii. A TEMPORARY ASBESTOS ZONE WILL BE ESTABLISHED TO SEPARATE/REMOVE EACH TUNNEL SECTION.
 - iii. EACH TUNNEL SECTION WILL BE STAGED IN AN ASBESTOS/RADIOLOGICAL ZONE IN PREPARATION FOR FINAL DISPOSAL.
 - iv. LOOSE ACM MASTIC WHICH FALLS OFF TUNNEL SECTIONS INTO THE EXCAVATION WILL BE COLLECTED AND PLACED IN ASBESTOS BAGS FOR DISPOSAL.
 - v. CONTRACTED THIRD PARTY AIR MONITOR WILL OVERSEE TUNNEL REMOVAL. COLLECTED OF LOOSE ACM MASTIC WITHIN THE EXCAVATION, AND TUNNEL STAGING AREA.
 - vi. EXCAVATION WILL BE GUIDED USING RADIOLOGICAL FIELD MEASUREMENTS AND ON-SITE LABORATORY RESULTS.
 - g. EXCAVATED MATERIAL OUTSIDE EXISTING CLASS I FSSU'S WILL BE SENT FOR OFF-SITE DISPOSAL OR BENEFICIAL REUSE PROCESSING USING RADIOLOGICAL FIELD MEASUREMENTS.
 - h. EXCAVATED MATERIAL WITHIN EXISTING CLASS I FSSU'S WILL BE TRANSPORTED TO THE ON-SITE CLEAN BACKFILL STOCKPILE FOR BENEFICIAL REUSE AS OUTLINED IN THE TECHNICAL MEMO FOR MANAGEMENT OF FSS CLASS I SOILS (SUBMITTAL 1084).
 - i. BELOW GRADE STRUCTURES WILL BE REMOVED IF IMPACTED BY CONTAMINATED MATERIAL.
 - j. DUST SUPPRESSION WATER AND GROUND WATER WILL BE COLLECTED VIA SUMP AND TREATED IN ACCORDANCE WITH THE SEWER DISCHARGE PERMIT AND LINDE FUSRAP SITE WATER MANAGEMENT PLAN (REV. 2) BEFORE DISCHARGE TO THE SANITARY SEWER.

ABANDONED-IN-PLACE PIPING REMOVAL WILL INCLUDE BUT NOT BE LIMITED TO:

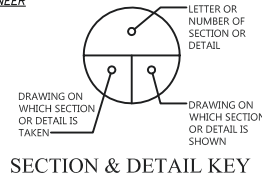
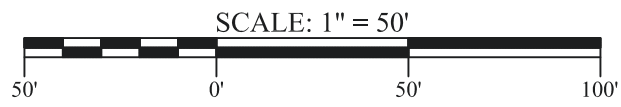
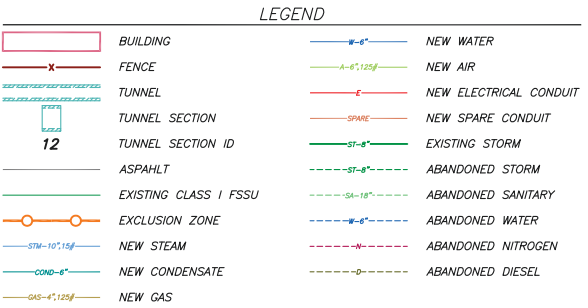
- WATER - 6" GALVANIZED PIPE
- LOW PRESSURE NATURAL GAS (8 PSI) - 4" STEEL PIPE
- HIGH PRESSURE NATURAL GAS (120 PSI) - 4" STEEL PIPE
- FIBER OPTIC CABLE - 1" FLEXIBLE INNERDUCT
- LOW PRESSURE STEAM (15 PSI) - 14" STEEL PIPE
- HIGH PRESSURE STEAM (150 PSI) - 4" STEEL PIPE
- LOW PRESSURE CONDENSATE - 2" STEEL PIPE
- HIGH PRESSURE CONDENSATE - 6" STEEL PIPE
- COMPRESSED AIR (125 PSI) - 14" STEEL PIPE
- NITROGEN (2000 PSI) - 1" STAINLESS STEEL PIPE
- FIRE ALARM - (2) PLASTIC CONDUIT
- TELEPHONE - (1) PLASTIC CONDUIT
- ELECTRICAL - (3) RIGID CONDUITS WITH ELECTRICAL CABLES

- NOTES
- 1. HORIZONTAL DATUM LISTED AS NEW YORK STATE PLANE COORDINATES NAD 27 WEST ZONE (3103)
- 2. ALL UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE IN LOCATION AND ELEVATION AND BASED ON BEST AVAILABLE INFORMATION
- 3. ALL ELECTRICAL CONDUITS ENCASED IN CONCRETE EXCEPT WHERE NOTED



GENERAL CONCRETE NOTES

- A. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 318-02, BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
- B. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS.
- C. REINFORCEMENT MINIMUM COVER, UNLESS NOTED, SHALL BE:
 - 1 1/2" - FOR #5 BARS AND SMALLER
 - 2" - FOR #6 BARS AND LARGER
 - 3" - FOR ALL BARS WHERE CONCRETE IS DEPOSITED AGAINST GROUND
- D. REINFORCING STEEL: ASTM A615, GRADE 60 DEFORMED BARS
- E. CONCRETE SEALER: 'SONNEBORN KURE-N-SEAL' OR EQUAL
- F. GROUT SHALL BE A NON-SHRINK TYPE MANUFACTURED AND PLACED IN ACCORDANCE WITH ASTM REQUIREMENTS AND SPECIFICATIONS.
- G. CONCRETE ADHESIVE: 'HILTI RE 500' INJECTION ADHESIVE ANCHOR OR EQUAL
- H. CONCRETE WATERPROOFING SHALL BE APPLIED ON BACKFILL SIDE OF TUNNEL AND EXTERIOR WALL OF BULKHEAD IN THREE (3) PARTS.
 - 1. PRIME JOINTS WITH 'TREMCO VULKEM 171' PRIMER OR EQUAL
 - 2. CAULK JOINTS WITH 'TREMCO VULKEM 116' SEALANT OR EQUAL
 - 3. APPLY 'TREMCO TREMPROOF 250 GC' MEMBRANE OR EQUAL TO SURFACE AND JOINTS OF BULKHEAD
- I. FORMWORK SHALL BE IN ACCORDANCE WITH ACI-347, 'GUIDE TO FORMWORK FOR CONCRETE'.
- J. DRILL 3/4" OBSERVATION HOLES IN FORMWORK TO ENSURE CONCRETE COVERAGE.



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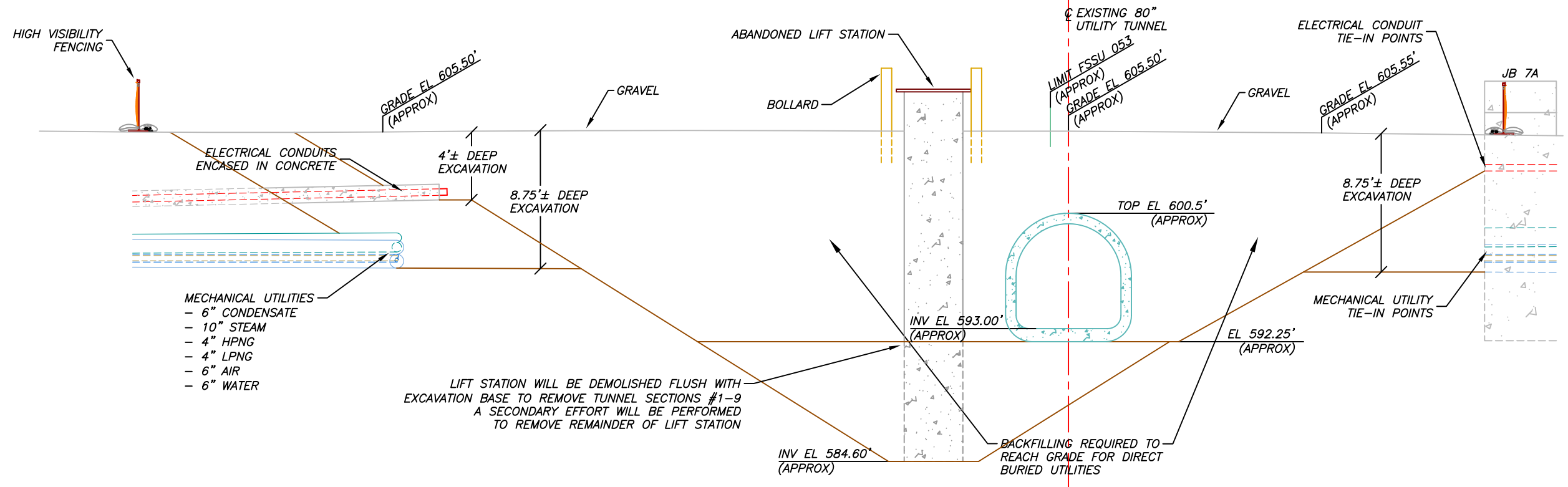
LINDE FUSRAP SITE
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EAST-WEST UTILITY TUNNEL EXCAVATION
OPERATIONAL APPROACH

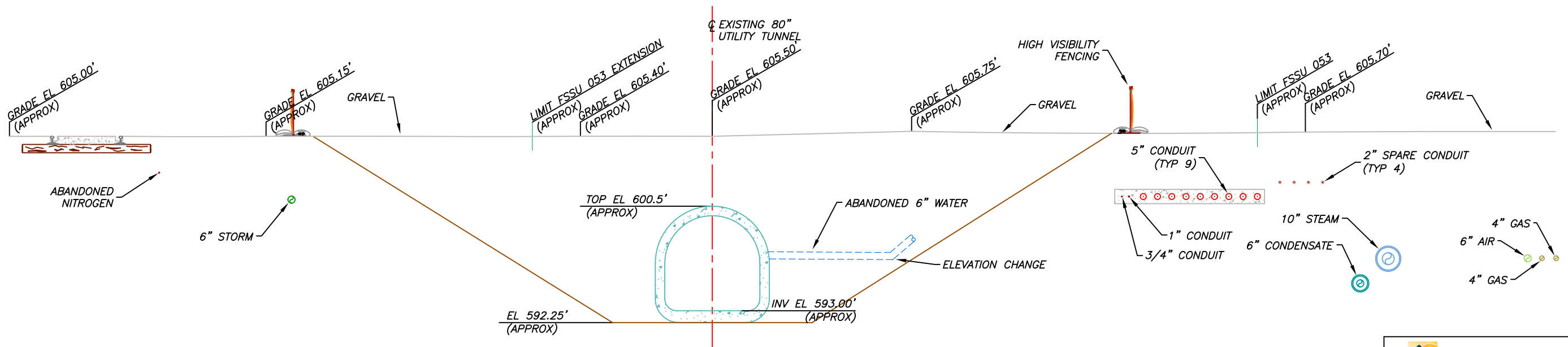
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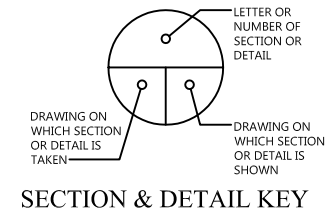
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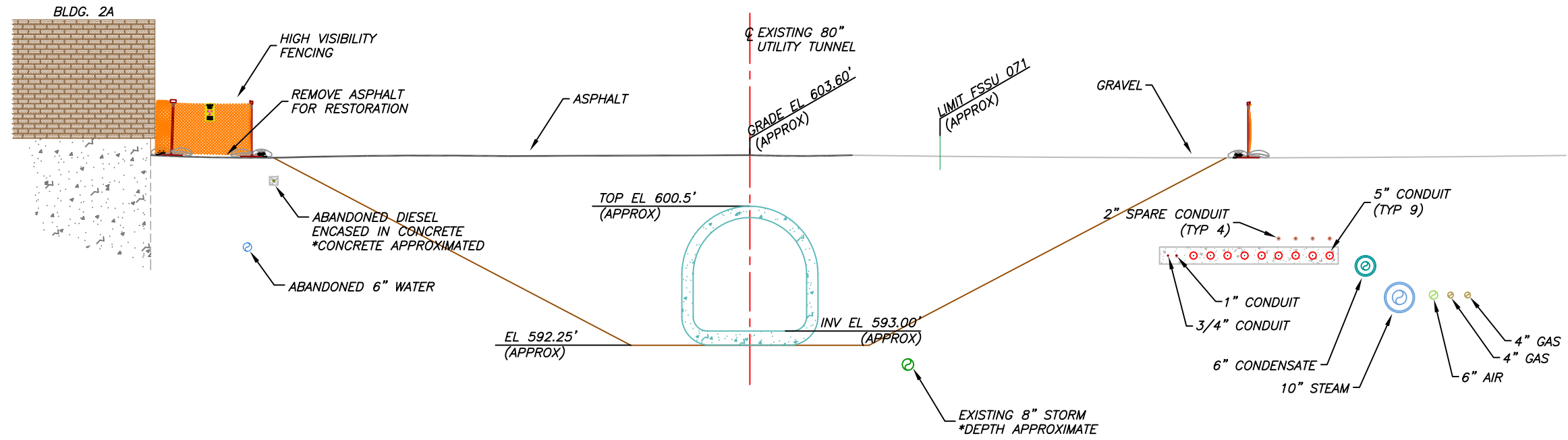
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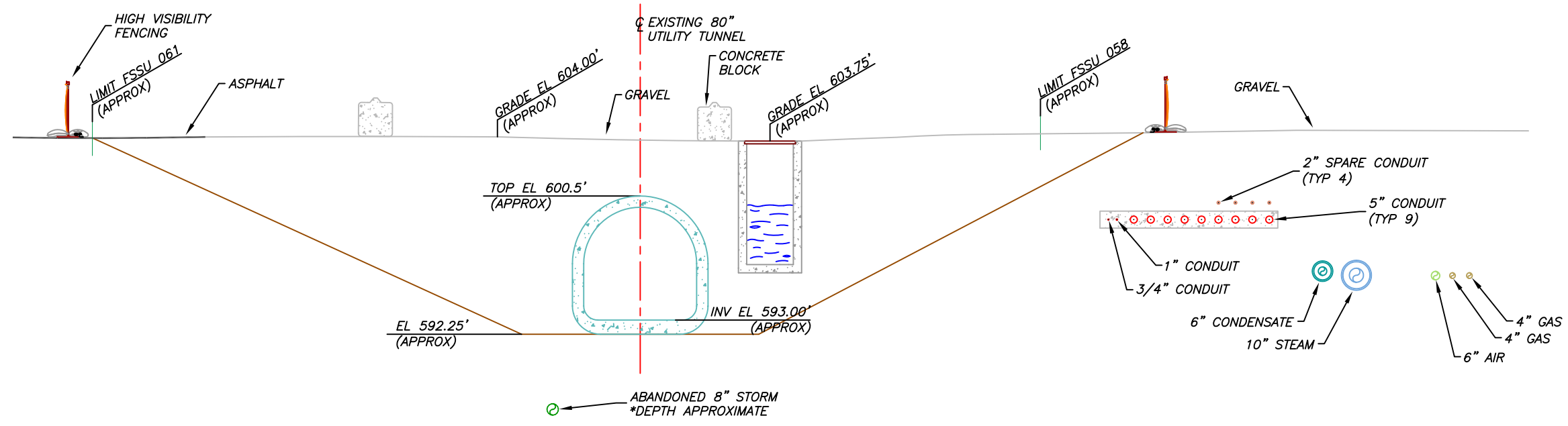
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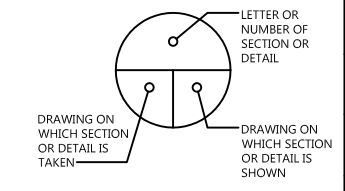
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LINDE FUSRAP SITE TONAWANDA, NY W912P4-07-D-0002, 0002			
EAST-WEST UTILITY TUNNEL EXCAVATION OPERATIONAL APPROACH - DETAILS			
SHEET NO.	AREA/SUBTASK	DRAWING NO.	DATE
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D SECTION
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SHEET 3 OF 3	AREA D2/M	E/W - 003	5/4/2012