

UNIVERSITY OFCREGON

CAMPUS CENTRAL TUNNEL WATER LINE REPAIR Eugene, Oregon

CAMPUS CENTRAL TUNNEL WATER LINE REPAIR -ISSUED FOR CONSTRUCTION

Project Team

Owner

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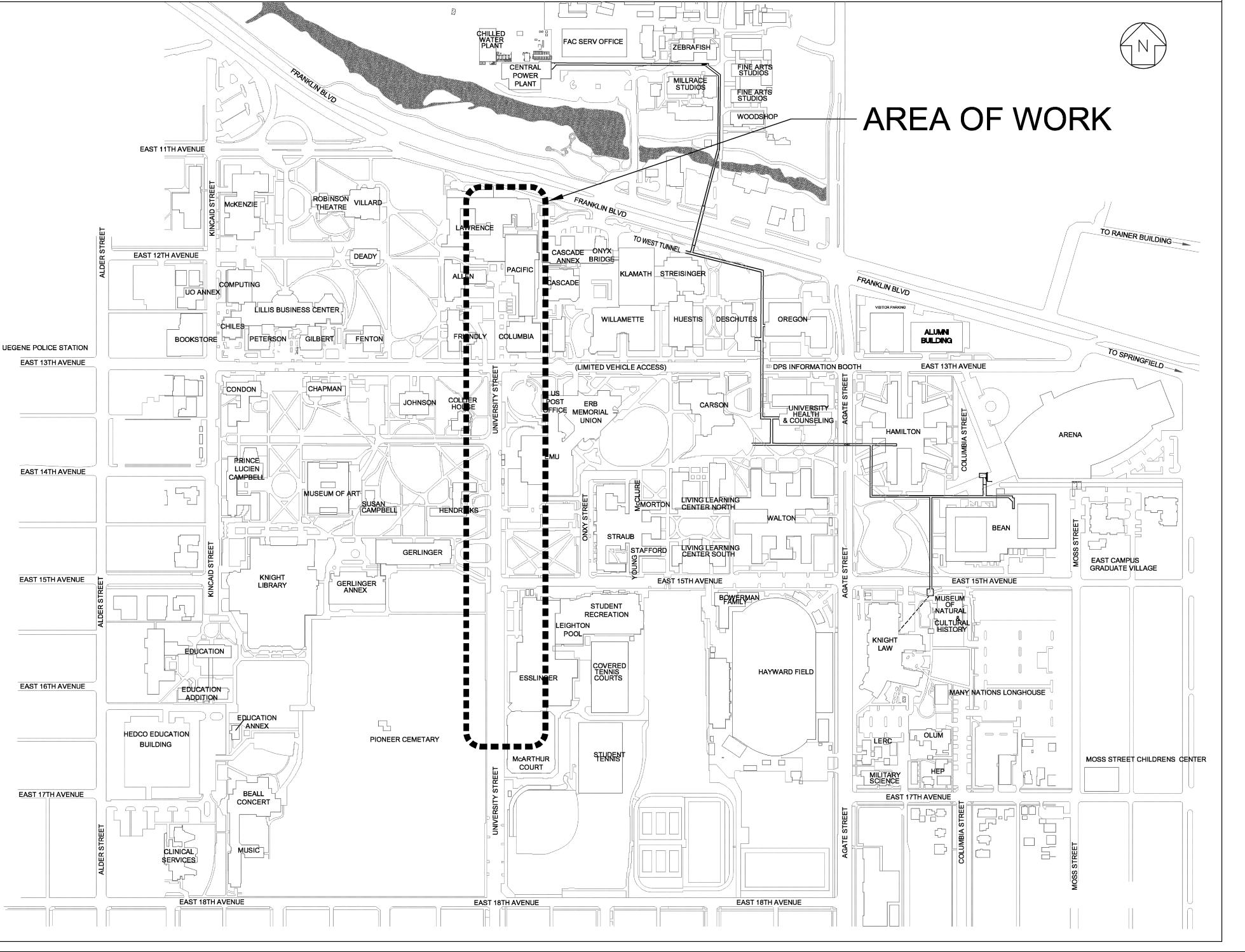
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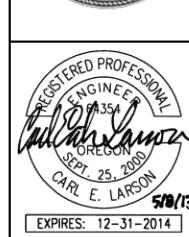
General Notes

- REQUIREMENTS THAT APPLY.
- VERIFY ALL DIMENSIONS AND CONDITIONS SHOWN ON DRAWINGS. NOTIFY PRIME CONSULTANT OF ANY DISCREPANCIES PRIOR TO START OF WORK.
- BIDDERS SHALL CAREFULLY EXAMINE THE SITE AND THE CONSTRUCTION DOCUMENTS OF THE WORK, ERRORS AND OMISSIONS IN THE PLANS OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE PRIME CONSULTANT PRIOR TO SUBMISSION OF BID SO THAT ADDENDA MAY BE ISSUED.
- 4. KEEP THE AREA OF WORK FREE OF GARBAGE AND DEBRIS ON A DAILY BASIS.
- 5. NO STORAGE OUTSIDE OF BUILDING OR TENANT SPACE SHALL BE ALLOWED WITHOUT AUTHORIZATION BY OWNER.
- 6. OWNER WILL NOT BE RESPONSIBLE FOR TOOLS OR MATERIAL GOODS STOLEN OR DAMAGED ON SITE.
- 7. UPON COMPLETION OF THE WORK, THOROUGHLY CLEAN THE CONSTRUCTION SITE.









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G0.00	CAMPUS CENTRAL WATER LINE REPAIR — COVER SHEET	M0.01	CAMPUS CENTRAL WATER LINE REPAIR — MECHANICAL LEGEND AND ABBREVIATIONS	
G0.01	CAMPUS CENTRAL WATER LINE REPAIR - DRAWING LIST	MR0.02	CAMPUS CENTRAL WATER LINE REPAIR - PIPING AND INSTRUMENTATION DIAGRAM CENTRAL WATER LINE REMOVALS	
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	CIVIL NOTES, LEGEND, ABBREVIATIONS AND DETAILS		CAMPUS CENTRAL WATER LINE REPAIR - PHASING PLAN NARRATIVE	
	NORTH ACCESS PLAN		CAMPUS CENTRAL WATER LINE REPAIR - TUNNEL SITE PLAN	
C2.1	SOUTH ACCESS PLAN		CAMPUS CENTRAL WATER LINE REPAIR — PARTIAL TUNNEL PLANS CENTRAL WATER LINE CAMPUS CENTRAL WATER LINE REPAIR — PARTIAL TUNNEL PLANS CENTRAL WATER LINE	
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	CAMPUS CENTRAL WATER LINE REPAIR — GENERAL STRUCTURAL NOTES, SPECIAL INSPECTIONS AND TESTING PROGRAM,		CAMPUS CENTRAL WATER LINE REPAIR — PARTIAL TUNNEL PLANS CENTRAL WATER LINE	
	DRAWING INDEX AND ABBREVIATIONS		CAMPUS CENTRAL WATER LINE REPAIR — PARTIAL TUNNEL PLANS CENTRAL WATER LINE	
S2.01	CAMPUS CENTRAL WATER LINE REPAIR — TUNNEL SITE PLAN	M1.07	CAMPUS CENTRAL WATER LINE REPAIR — PARTIAL TUNNEL PLANS CENTRAL WATER LINE	
S5.01	CAMPUS CENTRAL WATER LINE REPAIR — DETAILS	M2.01	CAMPUS CENTRAL WATER LINE REPAIR — TUNNEL SECTIONS	
		M3.01	CAMPUS CENTRAL WATER LINE REPAIR — DETAILS	
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- EXISTING MAPPING MAY NOT BE COMPLETE OR ACCURATE. EXISTING CONDITIONS HAVE NOT BEEN SURVEYED. CONTRACTOR TO VERIFY EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ENGINEER PRIOR TO BEGINNING CONSTRUCTION.
- ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THESE PLANS, THE PROJECT SPECIFICATIONS AND THE APPLICABLE REQUIREMENTS OF THE 2008 OREGON PLUMBING SPECIALTY CODE AND REQUIREMENTS OF THE CITY OF EUGENE.
- THE COMPLETED INSTALLATION SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES, ORDINANCES AND REGULATIONS. ALL PERMITS, LICENSES AND INSPECTIONS REQUIRED BY THE GOVERNING AUTHORITIES FOR THE EXECUTION AND COMPLETION OF WORK SHALL BE SECURED BY THE CONTRACTOR PRIOR TO COMMENCING
- 4. ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503) 232-1987). EXCAVATORS MUST NOTIFY ALL PERTINENT COMPANIES OR AGENCIES WITH UNDERGROUND UTILITIES IN THE PROJECT AREA AT LEAST 48 BUSINESS-DAY HOURS, BUT NOT MORE THAN 10 BUSINESS DAYS PRIOR TO COMMENCING AN EXCAVATION. SO UTILITIES MAY BE ACCURATELY LOCATED.
- 5. CONTACT ERIC GRAPE WITH CAMPUS FACILITIES TWO WEEKS PRIOR TO CONSTRUCTION FOR UTILITY LOCATES BY THE UNIVERSITY.
- 6. THE ENGINEER OR OWNER IS NOT RESPONSIBLE FOR THE SAFETY OF THE CONTRACTOR OR HIS CREW. ALL O.S.H.A. REGULATIONS SHALL BE STRICTLY ADHERED TO IN THE PERFORMANCE OF THE WORK.
- TEMPORARY AND PERMANENT EROSION CONTROL MEASURES SHALL BE IMPLEMENTED. THE CONTRACTOR SHALL ADHERE TO THE CITY OF EUGENE EROSION CONTROL PERMIT. FOR MINIMUM EROSION CONTROL MEASURES. THE ESC FACILITIES SHOWN IN THESE PLANS ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS, DURING THE CONSTRUCTION PERIOD, ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE THE SITE.
- 8. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL ROADWAYS. KEEPING THEM CLEAN AND FREE OF CONSTRUCTION MATERIALS AND DEBRIS, AND PROVIDING DUST CONTROL AS REQUIRED.
- 9. TRAFFIC CONTROL AND PEDESTRIAN SAFETY SHALL BE PROVIDED BY THE CONTRACTOR THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL PROVIDE A PLAN TO THE UNIVERSITY OF OREGON FOR REVIEW AND APPROVAL PRIOR TO COMMENCING CONSTRUCTION.
- 10. CONTRACTOR SHALL MAINTAIN ALL UTILITIES TO BUILDINGS AT ALL TIMES DURING CONSTRUCTION.
- 11. WORK ZONE, CONTRACTOR SHALL CREATE A SECURE WORK ZONE THAT PREVENTS PEDESTRIANS FROM ENTERING THE WORK ZONE AND AVOID POTENTIAL ACCIDENTS. THROUGH THE USE OF FENCING, BARRIERS AND SIGNAGE. CONTRACTOR SHALL SUBMIT A SECURE WORK ZONE PLAN TO THE UNIVERSITY OF OREGON FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

CONSTRUCTION NOTES

- 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION AND DISPOSAL OF EXISTING A.C., CURBS, SIDEWALKS AND OTHER SITE ELEMENTS.
- 2. EXCEPT FOR MATERIALS INDICATED TO BE STOCKPILED OR TO REMAIN ON UNIVERSITY'S PROPERTY, CLEARED MATERIALS SHALL BECOME CONTRACTOR'S PROPERTY, REMOVED FROM THE SITE, AND DISPOSED OF PROPERLY.
- 3. ITEMS INDICATED TO BE SALVAGED SHALL BE CAREFULLY REMOVED, DELIVERED AND STORED AT THE PROJECT SITE AS DIRECTED BY THE UNIVERSITY.
- 4. ALL LANDSCAPING, PAVEMENT, CURBS AND SIDEWALKS, BEYOND THE IDENTIFIED SITE AREA, DAMAGED DURING THE CONSTRUCTION SHALL BE REPLACED TO THEIR ORIGINAL CONDITION OR BETTER.
- 5. CONCRETE SIDEWALKS AND PAVEMENTS SHOWN FOR DEMOLITION SHALL BE REMOVED TO THE NEAREST EXISTING CONSTRUCTION JOINT.
- 6. SAWCUT STRAIGHT MATCHLINES TO CREATE A BUTT JOINT BETWEEN THE EXISTING AND NEW PAVEMENT.
- 7. CONTRACTOR SHALL ADJUST ALL EXISTING AND/OR NEW FLEXIBLE UTILITIES (WATER, GAS, TV, TELEPHONE, ELEC., ETC.) TO CLEAR ANY EXISTING OR NEW GRAVITY DRAIN UTILITIES (STORM DRAIN, SANITARY SEWER, ETC.) IF CONFLICT OCCURS.

EARTHWORK NOTES

1. SOIL MATERIALS

- A. SATISFACTORY SOILS, GRANULAR, AND FINE-GRAINED SITE FILLS ASTM D 2487 SOIL CLASSIFICATION GROUPS GW, GP, GM, SW, SP, AND SM, OR A COMBINATION OF THESE GROUP SYMBOLS; FREE OF ROCK OR GRAVEL LARGER THAN 3 INCHES IN ANY DIMENSION, PLASTIC CLAY, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER.
- B. BASE COURSE: USE ODOT 3/4-INCH 0-INCH BASE AGGREGATE.
- C. ENGINEERED FILL: USE ODOT 3/4-INCH 0-INCH OR 1-INCH 0-INCH BASE AGGREGATE. 2. PREPARATION
- A. PREVENT SURFACE WATER AND GROUND WATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES, AND FROM FLOODING PROJECT SITE AND SURROUNDING AREA. PROTECT SUBGRADES FROM SOFTENING, UNDERMINING, WASHOUT, AND DAMAGE BY RAIN OR WATER ACCUMULATION.

SUBGRADE INSPECTION

- A. PROOF-ROLL SUBGRADE BEFORE FILLING OR PLACING AGGREGATE WITH HEAVY PNEUMATIC-TIRED EQUIPMENT TO IDENTIFY SOFT POCKETS AND AREAS OF EXCESS YIELDING. DO NOT PROOF-ROLL WET OR SATURATED SUBGRADES.
- B. RECONSTRUCT SUBGRADES DAMAGED BY FREEZING TEMPERATURES. FROST, RAIN. ACCUMULATED WATER, OR CONSTRUCTION ACTIVITIES, AS DIRECTED BY ENGINEER, WITHOUT ADDITIONAL COMPENSATION.
- 4. SOIL FILL
- A. PLACE AND COMPACT FILL MATERIAL IN LAYERS TO REQUIRED ELEVATIONS AS FOLLOWS:
- 2. UNDER GRASS AND PLANTED AREAS USE SATISFACTORY SOIL MATERIAL
- 3. UNDER WALKS AND PAVEMENTS, USE SATISFACTORY SOIL MATERIAL.
- 4. UNDER STEPS, RAMPS, BUILDING SLABS, FOOTINGS, AND AROUND TUNNEL AND UTILITY STRUCTURES USE ENGINEERED FILL.

5. COMPACTION OF SOIL BACKFILLS AND FILLS

- A. PLACE FILL SOIL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HEAVY COMPACTION EQUIPMENT, AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS.
- B. COMPACT SOIL MATERIALS TO NOT LESS THAN THE FOLLOWING PERCENTAGES OF MAXIMUM DRY UNIT WEIGHT ACCORDING TO ASTM D 1557:
- 1. UNDER STRUCTURES, BUILDING SLABS, STEPS, AND PAVEMENTS, SCARIFY AND RECOMPACT TOP 12 INCHES OF EXISTING SUBGRADE AND EACH LAYER OF BACKFILL OR FILL SOIL MATERIAL AT 95 PERCENT.
- 2. UNDER WALKWAYS, SCARIFY AND RECOMPACT TOP 6 INCHES (150 MM) BELOW SUBGRADE AND COMPACT EACH LAYER OF BACKFILL OR FILL SOIL MATERIAL AT 92
- 3. UNDER LAWN OR UNPAVED AREAS, SCARIFY AND RECOMPACT TOP 6 INCHES (150 MM) BELOW SUBGRADE AND COMPACT EACH LAYER OF BACKFILL OR FILL SOIL MATERIAL AT 85 PERCENT.

6. BASE COURSES

- A. PLACE BASE COURSE ON SUBGRADES FREE OF MUD, FROST, SNOW, OR ICE.
- B. ON PREPARED SUBGRADE, PLACE BASE COURSE UNDER PAVEMENTS AND WALKS AS
- 1. SHAPE SUBBASE AND BASE COURSE TO REQUIRED CROWN ELEVATIONS AND CROSS-SLOPE GRADES. CROSS-SLOPE TO BE AT LEAST 1 AND NO MORE THAN 2
- 2. COMPACT BASE COURSE AT OPTIMUM MOISTURE CONTENT TO REQUIRED GRADES, LINES, CROSS SECTIONS, AND THICKNESS TO NOT LESS THAN 95 PERCENT OF MAXIMUM DRY UNIT WEIGHT ACCORDING TO ASTM D 1557.
- 7. FIELD QUALITY CONTROL
- A. GEOTECHNICAL ENGINEER SHALL BE CONTACTED BY CONTRACTOR TO GIVE ADDITIONAL EARTHWORK RECOMMENDATIONS PRIOR TO ANY EARTHWORK ACTIVITIES IN THE WET WEATHER SEASON

CEMENT-CONCRETE PAVEMENT NOTES

1. SUBMITTALS

- A. MATERIAL CERTIFICATES: SIGNED BY MANUFACTURERS CERTIFYING THAT EACH OF THE FOLLOWING MATERIALS COMPLIES WITH REQUIREMENTS:
- 1. CEMENTITIOUS MATERIALS AND AGGREGATES. 2. JOINT FILLERS.
- 3. SURFACE FINISHES.

2. QUALITY ASSURANCE

- A. INSTALLER QUALIFICATIONS: AN EXPERIENCED INSTALLER WHO HAS COMPLETED PAVEMENT WORK SIMILAR IN MATERIAL, DESIGN, AND EXTENT TO THAT INDICATED FOR THIS PROJECT AND WHOSE WORK HAS RESULTED IN CONSTRUCTION WITH A RECORD OF SUCCESSFUL IN-SERVICE PERFORMANCE.
- B. MANUFACTURER QUALIFICATIONS: MANUFACTURER OF READY-MIXED CONCRETE PRODUCTS COMPLYING WITH ASTM C 94 REQUIREMENTS FOR PRODUCTION FACILITIES
 - MANUFACTURER MUST BE CERTIFIED ACCORDING TO THE NATIONAL READY MIX CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM.

3. CONCRETE MATERIALS

- A. PORTLAND CEMENT: ASTM C 150, TYPE I.
- 1. FLY ASH: ASTM C 618, CLASS C.
- B. AGGREGATE: ASTM C 33, UNIFORMLY GRADED, FROM A SINGLE SOURCE, WITH COURSE AGGREGATE CLASS 4M. C. WATER: ASTM C 94.
- D. PAVEMENT-MARKING PAINT: ALKYD-RESIN TYPE; READY MIXED; COMPLYING WITH FS TT-P-115, TYPE I, OR AASHTO M 248, TYPE N.

4. CONCRETE MIXES

- A. PREPARE DESIGN MIXES, PROPORTIONED ACCORDING TO ACI 211.1 AND ACI 301, WITH THE FOLLOWING PROPERTIES:
- 1. COMPRESSIVE STRENGTH (28 DAYS): 4000 PSI.
- 2. MAXIMUM WATER-CEMENTITIOUS MATERIALS RATIO: 0.50. 3. SLUMP LIMIT: 4 INCHES.
- 4. AIR CONTENT: 6.0 PERCENT FOR 1-INCH MAXIMUM AGGREGATE.

5. CONCRETE MIXING

- A. READY-MIXED CONCRETE: COMPLY WITH REQUIREMENTS AND WITH ASTM C 94 AND ASTM C 1116.
- 1. WHEN AIR TEMPERATURE IS BETWEEN 85 DEG F AND 90 DEG F, REDUCE MIXING AND DELIVERY TIME FROM 1-1/2 HOURS TO 75 MINUTES; WHEN AIR TEMPERATURE IS ABOVE 90 DEG F, REDUCE MIXING AND DELIVERY TIME TO 60 MINUTES.

6. EXAMINATION

- A. EXAMINE EXPOSED SUBGRADES AND BASE SURFACES FOR COMPLIANCE WITH REQUIREMENTS FOR DIMENSIONAL, GRADING, AND ELEVATION TOLERANCES.
- B. PROOF-ROLL PREPARED BASE SURFACE BELOW CONCRETE PAVEMENTS WITH HEAVY PNEUMATIC-TIRED EQUIPMENT TO IDENTIFY SOFT POCKETS AND AREAS OF EXCESS YIELDING. BASE WITH SOFT SPOTS AND AREAS OF PUMPING OR RUTTING EXCEEDING DEPTH OF 1/2 INCH REQUIRE CORRECTION
- C. PROCEED WITH CONCRETE PAVEMENT OPERATIONS ONLY AFTER NONCONFORMING CONDITIONS HAVE BEEN CORRECTED AND SUBGRADE IS READY TO RECEIVE PAVEMENT.

7. JOINTS

- A. GENERAL: CONSTRUCT CONSTRUCTION CONTRACTION JOINTS AND TOOL EDGINGS TRUE TO LINE WITH FACES PERPENDICULAR TO SURFACE PLANE OF CONCRETE CONSTRUCT TRANSVERSE JOINTS AT RIGHT ANGLES TO CENTERLINE, UNLESS OTHERWISE INDICATED.
- 1. WHEN JOINING EXISTING PAVEMENT, PLACE TRANSVERSE JOINTS TO ALIGN WITH PREVIOUSLY PLACED JOINTS, UNLESS OTHERWISE INDICATED.
- B. CONTRACTION JOINTS: FORM WEAKENED-PLANE CONTRACTION JOINTS, SECTIONING CONCRETE INTO AREAS AS INDICATED. CONSTRUCT CONTRACTION JOINTS FOR A DEPTH EQUAL TO AT LEAST ONE-FOURTH OF THE CONCRETE THICKNESS, AS FOLLOWS:
- 1. LOCATE CONTRACTION JOINTS AT MAXIMUM INTERVALS OF 12 FEET. 2. USE GROOVED JOINTS TO PROVIDE A NEATER, CLEANER CONTRACTION JOINT UNLESS SAWED JOINTS ARE REQUESTED BY THE UNIVERSITY OF OREGON OR
- 3. GROOVED JOINTS: FORM CONTRACTION JOINTS AFTER INITIAL FLOATING BY GROOVING AND FINISHING EACH EDGE OF JOINT WITH GROOVER TOOL TO A 1/4 INCH RADIUS. REPEAT GROOVING OF CONTRACTION JOINTS AFTER APPLYING SURFACE FINISHES. ELIMINATE GROOVER MARKS ON CONCRETE SURFACES.

8. CONCRETE PLACEMENT

- A. COMPLY WITH REQUIREMENTS AND WITH RECOMMENDATIONS IN ACI 301 AND ACI 304R FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE.
- B. DO NOT ADD WATER TO CONCRETE DURING DELIVERY, AT PROJECT SITE, OR DURING PLACEMENT.
- C. DEPOSIT AND SPREAD CONCRETE IN A CONTINUOUS OPERATION BETWEEN TRANSVERSE JOINTS. DO NOT PUSH OR DRAG CONCRETE INTO PLACE OR USE VIBRATORS TO MOVE CONCRETE INTO PLACE.
- D. SCREED PAVEMENT SURFACES WITH A STRAIGHTEDGE AND STRIKE OFF. COMMENCE INITIAL FLOATING USING BULL FLOATS OR DARBIES TO FORM AN OPEN TEXTURED AND UNIFORM SURFACE PLANE BEFORE EXCESS MOISTURE OR BLEED WATER APPEARS ON THE SURFACE. DO NOT FURTHER DISTURB CONCRETE SURFACES BEFORE BEGINNING FINISHING OPERATIONS OR SPREADING DRY-SHAKE SURFACE
- E. WHEN ADJOINING CONCRETE PAVEMENT AREAS ARE PLACED IN SEPARATE POURS. DO NOT OPERATE EQUIPMENT ON CONCRETE UNTIL PAVEMENT HAS ATTAINED 85 PERCENT OF ITS 28-DAY COMPRESSIVE STRENGTH.

9. CONCRETE FINISHING

- A. GENERAL: WETTING OF CONCRETE SURFACES DURING SCREEDING, INITIAL FLOATING, OR FINISHING OPERATIONS IS PROHIBITED.
- B. FLOAT FINISH: BEGIN THE FINISH FLOATING OPERATION WHEN BLEED-WATER SHEEN HAS DISAPPEARED AND THE CONCRETE SURFACE HAS STIFFENED SUFFICIENTLY TO PERMIT OPERATIONS. FLOAT SURFACE WITH POWER-DRIVEN FLOATS, OR BY HAND FLOATING IF AREA IS SMALL OR INACCESSIBLE TO POWER UNITS. FINISH SURFACES TO TRUE PLANES. CUT DOWN HIGH SPOTS, AND FILL LOW SPOTS. REFLOAT
- 1.FINISH SHALL MATCH THE FINISH OF EXISTING CONCRETE WALK ADJACENT TO NEW CONCRETE WALK.

SURFACE IMMEDIATELY TO UNIFORM GRANULAR TEXTURE.

C. EDGING: TOOL EDGES OF PAVEMENT, GUTTERS, CURBS, AND JOINTS IN CONCRETE AFTER INITIAL FLOATING WITH AN EDGING TOOL TO A 1/4 INCH RADIUS. REPEAT TOOLING OF EDGES AFTER APPLYING SURFACE FINISHES. ELIMINATE TOOL MARKS ON CONCRETE SURFACES.

10. REPAIRS AND PROTECTION

- A. REMOVE AND REPLACE CONCRETE PAVEMENT THAT IS BROKEN, DAMAGED, DEFECTIVE. OR GENERALLY UNACCEPTABLE TO THE UNIVERSITY OF OREGON.
- B. PROTECT CONCRETE FROM DAMAGE. EXCLUDE TRAFFIC FROM PAVEMENT FOR AT LEAST 14 DAYS AFTER PLACEMENT. WHEN CONSTRUCTION TRAFFIC IS PERMITTED. MAINTAIN PAVEMENT AS CLEAN AS POSSIBLE BY REMOVING SURFACE STAINS AND SPILLAGE OF MATERIALS AS THEY OCCUR.
- C. MAINTAIN CONCRETE PAVEMENT FREE OF STAINS, DISCOLORATION, DIRT, AND OTHER FOREIGN MATERIAL. SWEEP CONCRETE PAVEMENT NOT MORE THAN TWO DAYS BEFORE DATE SCHEDULED FOR SUBSTANTIAL COMPLETION INSPECTIONS

LEGEND PROPOSED DESCRIPTION EXISTING BUILDING OUTLINE ////////// CONCRETE SIDEWALK Ψ Ψ Ψ LANDSCAPE AREA * * * ¥ • ¥ 4 STORM DRAIN _____ SD ____ **IRRIGATION** SANITARY SEWER POWER GAS MAIN ----- G ------CATCH BASIN LIGHT POLE MANHOLE OICV IRRIGATION VALVE BOX - - SAW CUT LINE

-SEE PLAN-----CONCRETE SIDEWALK 6" MIN. THICKNESS 4. 4. 4. 4. 4. 3" BASE COURSE

ABBREVIATIONS

SDMH

SSMH

S/W

CATCH BASIN

GAS LINE

IRRIGATION

LIGHT POLE

STORM DRAIN

SANITARY SEWER

STORM DRAIN MANHOLE

UNDERGROUND ELECTRIC

SANITARY SEWER MANHOLE

MANHOLE

SIDEWALK

WATER

CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS. CONSTRUCT EXPANSION JOINTS AT 200' MAX SPACING, AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY, UNLESS NOTED OTHERWISE. CONCRETE SIDEWALK

SCALE: NTS

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POTENTIAL UNDERGROUND FACILITY OWNERS

1-800-332-2344

Dig Safely. Call the Oregon One-Call Center Consulting Engineers 1201 Oak Street Suite 100 Eugene, Oregon 97401 Phone: (541) 684-4902 Fax: (541) 684-4909

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1. SAW CUT LOCATION AND LIMITS OF SURFACE RESTORATION SHOWN ARE ESTIMATED AND MAY VARY DEPENDING ON CONSTRUCTION METHODS. CONTRACTOR TO DETERMINE ACTUAL LIMITS REQUIRED FOR CONSTRUCTION. CONTRACTOR SHALL REPLACE ALL EXISTING CONDITION (TREES, PLANTINGS, WALKS, PAVERS) THAT ARE DAMAGED DURING CONSTRUCTION TO THE ORIGINAL CONDITION. WALKS SHALL BE REMOVED TO THE NEAREST CONTROL JOINT.

2. TUNNEL LOCATION IS APPROXIMATE AND BASED ON EXISTING CAMPUS UTILITY MAP. CONTRACTOR TO FIELD VERIFY TUNNEL LOCATION AND ADJUST ACCESS ACCORDING TO ACTUAL LOCATION.

3. CONTRACTOR TO COORDINATE WITH ERIC GRAPE AT THE UNIVERSITY OF OREGON FOR UTILITY LOCATES PRIOR TO CONSTRUCTION. 541-346-2378

KEY NOTES

- SAWCUT CONCRETE WALKWAY AND REPLACE CONCRETE WALKWAY PER DETAIL 1/C1.0. SEE NOTE 1.
- 2 RESTORE LAWN IN ALL DISTURBED AREAS NOT RECEIVING A HARD SURACE. LAWN TO MATCH EXISTING AND INCLUDE AT LEAST 12 INCHES OF ORGANIC TOPSOIL WITH AMENDMENTS. PROTECT SEEDED AREAS UNTIL PLANTING IS ESTABLISHED. SEE NOTE 1.
- 3 PROTECT EXISTING UTILITY. APPROXIMATE LOCATION. SEE NOTE 4.
- PROTECT EXISTING SIDEWALK. PROVIDE SHORING AS REQUIRED TO KEEP WORK LIMITS OUT OF PATH. SEE NOTE 1.
- 5 PROPOSED 2'X2' TUNNEL ACCESS FOR UTILITY PIPE INSTALLATION. FIELD ADJUST ACCESS SIZE AND LOCATION AS REQUIRED TO AVOID UTILITY CONFLICTS OR MITIGATE SURFACE RESTORATIONS.

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Mechanical and Electrical Enginee
Bellevue, WA

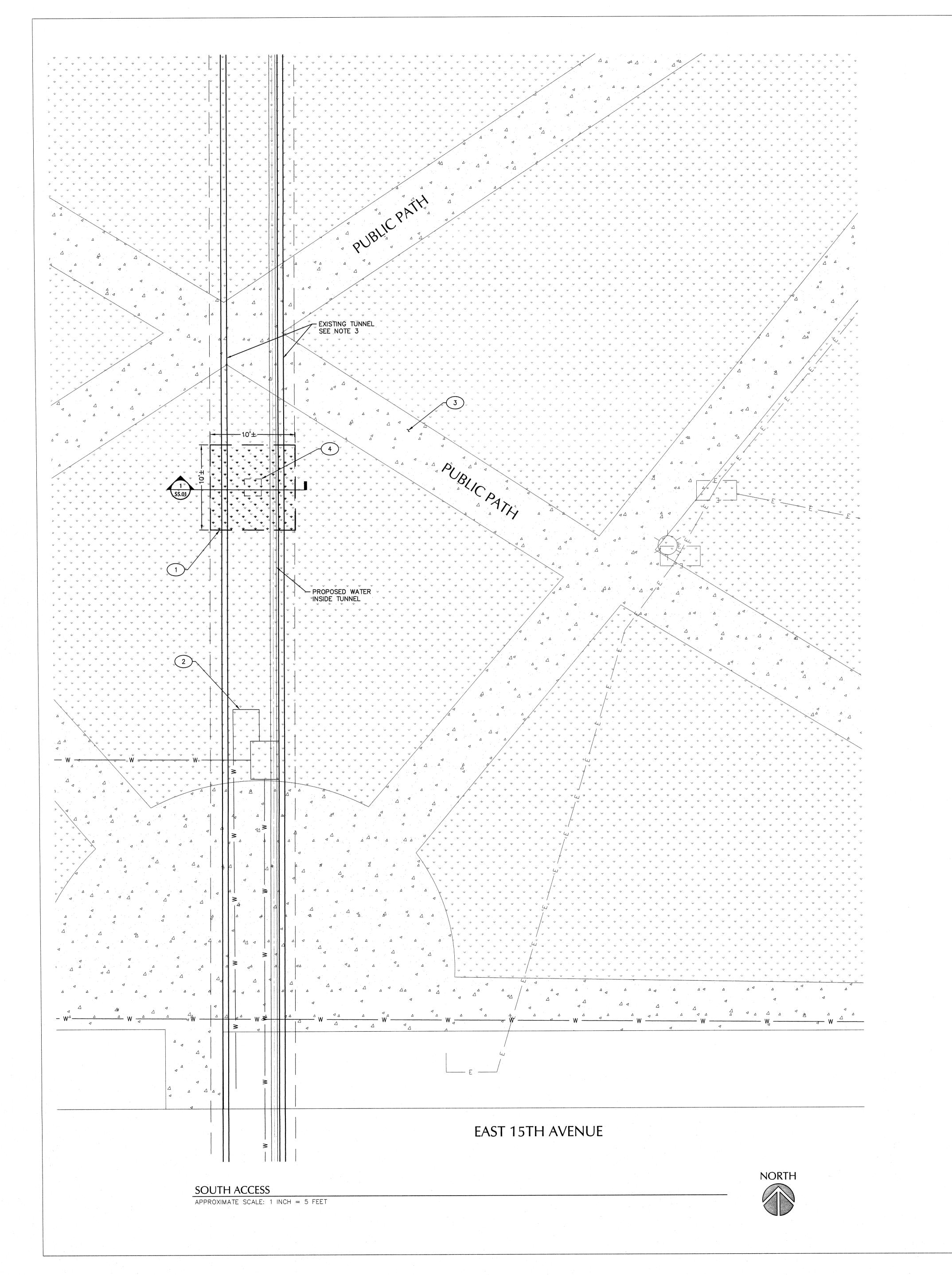


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SHEET NOTES

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- 2 PROTECT EXISTING UTILITY. APPROXIMATE LOCATION. SEE NOTE 4.
- PROTECT EXISTING PUBLIC PATH. PROVIDE SHORING AS REQUIRED TO KEEP WORK LIMITS OUT OF PATH. SEE NOTE 1.
- PROPOSED 2'X2' TUNNEL ACCESS FOR UTILITY PIPE INSTALLATION.
 FIELD ADJUST ACCESS SIZE AND LOCATION AS REQUIRED TO AVOID
 UTILITY CONFLICTS OR MITIGATE SURFACE RESTORATIONS. SEE NOTE 3.

REVISION

CAMPUS CENTRAL TUNNEL WATER LINE REPAIR

1217 UNIVERSITY OF OREGEON
FLIGENE, OR 97403-1217

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O8100.09
C2.1

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DRAWING INDEX

GENERAL STRUCTURAL NOTES, SPECIAL INSPECTIONS AND TESTING, DRAWING INDEX AND **ABBREVIATIONS**

TUNNEL SITE PLAN

S5.01 DETAILS

ABBREVIATIONS

ANCHOR BOLT AMERICAN CONCRETE LOW VELOCITY FASTENER INSTITUTE **ADDITIONAL** METAL BUILDING ARCHITECTURAL EXPOSED **MANUFACTURERS** STRUCTURAL STEEL ASSOCIATION AMERICAN INSTITUTE OF MECHANICAL STEEL CONSTRUCTION INCORPORATED ALTERNATE **MISCELLANEOUS ALUMINUM** MILES PER HOUR AMERICAN PLYWOOD ASSOCIATION MAGNETIC PARTICLE TESTING ARCHITECT AMERICAN SOCIETY OF CIVIL NOT IN CONTRACT **ENGINEERS** AMERICAN SOCIETY FOR TESTING AND MATERIALS AMERICAN WELDING SOCIETY NOT TO SCALE ON CENTER OUTSIDE DIAMETER OPPOSITE **BRACED FRAME OPEN WEB JOIST CENTER OF GRAVITY** POWDER ACTUATED CAST IN PLACE **FASTENER CONTROL JOINT** PART. PARTITION **COMPLETE JOINT** P/C PRECAST PENETRATION POUNDS PER CUBIC FOOT CENTERLINE PLATE PARTIAL PENETRATION **CONCRETE MASONRY UNIT** POUNDS PER SQUARE INCH COL. COLUMN POST-TENSIONED CONCRETE PRESSURE TREATED CONNECTION POLYVINYL CHLORIDE CONSTRUCTION R, RAD. RADIUS CONTINUOUS RESEARCH COUNCIL ON **BAR DIAMETER** STRUCTURAL CONNECTIONS **DEFORMED BAR ANCHOR** REFERENCE DIA., Ø REINFORCING DIAGONAL REQUIRED **DEAD LOAD** REQ'MTS. REQUIREMENTS SCHEDULE ELECTRICAL SLIP CRITICAL **ELEVATION EQUAL** SEISMIC LOAD RESISTING SYSTEM EXIST., EXISTING SLAB ON GRADE **EXPANSION** SPECIFICATION **EXTERIOR** SQUARE **FOUNDATION** STAINLESS STEEL STEEL STUD MANUFACTURERS **FLOOR** ASSOCIATION STANDARD STRUCT. STRUCTURAL SYMMETRICAL GALVANIZED THROUGH TONGUE AND GROOVE **HORIZONTAL** TRUSS JOIST **HOLLOW STRUCTURAL** TRANS. TRANSVERSE TS LIGHT GAUGE TUBE STEEL INTERNATIONAL BUILDING CODE INTERNATIONAL CONFERENCE **UNLESS NOTED OTHERWISE** OF BUILDING OFFICIALS ULTRASONIC TESTING INTERNATIONAL CODE COUNCIL VERT. VERTICAL **INSIDE DIAMETER VERIFY IN FIELD**

WITH

KIPS PER SQUARE FOOT

KIPS PER SQUARE INCH

LONG LEG HORIZONTAL LONG LEG VERTICAL

POUND

LOC.

LIVE LOAD

LOCATION

WIDE FLANGE

WITHOUT

WORK POINT

SPECIFICATION

WELDING PROCEDURE

WELDED WIRE FABRIC

GENERAL STRUCTURAL NOTES

STRUCTURAL DRAWINGS ARE A PORTION OF THE CONTRACT DOCUMENTS AND ARE INTENDED TO BE USED WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE REQUIREMENTS FROM THESE DRAWINGS INTO THEIR SHOP DRAWINGS AND WORK.

THESE GENERAL NOTES SUPPLEMENT THE PROJECT SPECIFICATIONS. REFER TO THE PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. NOTES AND DETAILS ON THE STRUCTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER THE GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE GIVEN, CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR WORK.

CODE REQUIREMENTS:
CONFORM TO THE 2010 OREGON STRUCTURAL SPECIALTY CODE (OSSC), BASED ON THE 2009 INTERNATIONAL BUILDING CODE (IBC).

TEMPORARY CONDITIONS:
THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL TEMPORARY BRACING AND/OR SUPPORT THAT MAY BE REQUIRED AS THE RESULT OF THE CONTRACTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES.

CONTRACTOR'S CONSTRUCTION AND/OR ERECTION SEQUENCES SHALL RECOGNIZE AND CONSIDER THE EFFECTS OF THERMAL MOVEMENTS OF STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD.

EXISTING CONDITIONS:
ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS SHALL BE FIELD VERIFIED. THE CONTRACTOR SHALL NOTIFY THE MECHANICAL ENGINEER OF ANY SIGNIFICANT DISCREPANCIES FROM CONDITIONS SHOWN ON THE

<u>DESIGN CRITERIA:</u>
THE FOLLOWING LOADS AND ALLOWABLES WERE USED FOR DESIGN:

	DESIGN CRITERIA		
GRAV	ITY SYSTEM CRITI	ERIA	
BELOW , SIDEWALKS AND LANDSCAPING	250 PSF L.L.		
GEO	TECHNICAL CRITE	RIA	
DESIGN BASED ON REPORT BY:	GRI INC., DATED FEBRUARY 19, 2010 AS SU DESIGN OF THE NEW MOSS STREE CONSTRUCTED IN	T TUNNEL AND VAULT,	
RETAINING WALLS - BRACED AT TOP	50 PCF (EQUIVALENT FLUID PRESSURE)		
RETAINING WALLS - SEISMIC	10H (SEISMIC LATERAL EARTH PRESSURE)		
ALLOWABLE SOIL PRESSURE:	2500 PSF WITH ⅓ INCREASE FOR SHORT TERM LOADING		
	SEISMIC CRITERIA		
OCCUPANCY CATEGORY			
SEISMIC DESIGN CATEGORY	D		
SITE CLASS	D		
IMPORTANCE FACTOR I _E = 1.0			
MCE SPECTRAL ACCELERATION	Ss = 0.98	S ₁ =0.35	
SITE COEFFICIENT	Fa = 1.01	F _V = 1.45	

SPECIAL INSPECTION WILL BE PROVIDED BY THE OWNER BASED ON THE REQUIREMENTS OF THE OSSC AS SUMMARIZED IN THE SPECIAL INSPECTION AND TESTING PROGRAM ON SHEET S0.01. CONTRACTOR SHALL PROVIDE SUFFICIENT NOTICE AND ACCESS FOR THE SPECIAL INSPECTOR TO PERFORM THESE INSPECTIONS.

SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT PRIOR TO FABRICATION AND CONSTRUCTION OF ALL STRUCTURAL ITEMS, INCLUDING THE FOLLOWING:

SUE	3MITTAL	S	
ITEM	SUBMITTAL (1,4)	DEFERRED SUBMITTAL (2,4)	COMMENTS
CONCRETE MIX DESIGNS	X		
CONCRETE REINFORCEMENT	Х		
CONCRETE ANCHORAGES	Х		
EMBEDDED STEEL ITEMS	Х		
MEP EQUIPMENT ANCHORAGE AND BRACING		Х	REF. NOTES

- SHOP DRAWINGS SHALL BE SUBMITTED TO FABRICATION AND CONSTRUCTION OF STRUCTURAL ITEMS. IF THE SHOP DRAWINGS DIFFER FROM OR ADD TO THE DESIGN OF THE STRUCTURAL DRAWINGS, THEY SHALL BEAR THE SEAL AND SIGNATURE OF A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF OREGON. ANY CHANGES TO THE STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT AND ARE SUBJECT TO REVIEW AND ACCEPTANCE OF THE STRUCTURAL ENGINEER.
- 2. DESIGN DRAWINGS, SHOP DRAWINGS, AND CALCULATIONS FOR THE DESIGN AND FABRICATION OF ITEMS THAT ARE DESIGNED BY OTHERS SHALL BEAR THE SEAL AND SIGNATURE OF A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF OREGON, AND SHALL BE SUBMITTED PRIOR TO FABRICATION. CALCULATIONS SHALL BE INCLUDED FOR ALL CONNECTIONS TO THE STRUCTURE, CONSIDERING LOCALIZED EFFECTS ON STRUCTURAL ELEMENTS INDUCED BY THE CONNECTION LOADS. DESIGN SHALL BE BASED ON THE REQUIREMENTS OF THE OSSC AND AS NOTED UNDER "DESIGN CRITERIA".
- THE CONTRACTOR SHALL COORDINATE SEISMIC RESTRAINTS OF MECHANICAL, PLUMBING, AND ELECTRICAL EQUIPMENT, MACHINERY, AND ASSOCIATED PIPING WITH THE STRUCTURE. CONNECTIONS TO STRUCTURE SHALL CONFORM TO ASCE 7-05 CHAPTER 13, BE DESIGNED BY AN ENGINEER REGISTERED IN THE STATE OF OREGON, AND SHALL BE SUBMITTED PRIOR TO FABRICATION.
- 4. FIELD ENGINEERED DETAILS DEVELOPED BY THE CONTRACTOR THAT DIFFER FROM OR ADD TO THE STRUCTURAL DRAWINGS SHALL BEAR THE SEAL AND SIGNATURE OF A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF OREGON AND SHALL BE SUBMITTED PRIOR TO CONSTRUCTION.

CONCRETE WORK SHALL CONFORM TO CHAPTER 19 OF THE OSSC. CONCRETE STRENGTHS SHALL BE VERIFIED BY STANDARD 28-DAY CYLINDER TESTS PER ASTM C39, AND SHALL BE AS FOLLOWS:

	CONCRETE STRENGTHS				
f'c (PSI)	ABSOLUTE WATER-CEMENT RATIO BY WEIGHT	USE			
	NON AIR-ENTRAINED				
4,000	.50	ALL USES			

MINIMUM CEMENT CONTENT PER CUBIC YARD SHALL BE AS FOLLOWS:

CEMENT CONTENT					
fc (PSI)	MINIMUM CEMENT PER CUBIC YARD				
4,000	550 LBS.				

FLYASH CONFORMING TO ASTM C618 (INCLUDING TABLE 2A) TYPE F OR TYPE C MAY BE USED TO REPLACE UP TO 20% OF THE CEMENT CONTENT, PROVIDED THAT THE MIX STRENGTH IS SUBSTANTIATED BY TEST DATA.

THE CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGNS ALONG WITH TEST DATA COMPLIANT WITH OSSC SECTION 1905 A MINIMUM OF TWO WEEKS PRIOR TO PLACING CONCRETE. NO WATER MAY BE ADDED TO CONCRETE IN THE FIELD UNLESS SPECIFICALLY APPROVED IN WRITING BY THE CONCRETE SUPPLIER IN CONJUNCTION WITH THE CONCRETE MIX DESIGN.

A WATER-REDUCING ADMIXTURE CONFORMING TO ASTM C494 USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS SHALL BE INCORPORATED IN CONCRETE DESIGN MIXES. A HIGH-RANGE WATER-REDUCING (HRWR) ADMIXTURE CONFORMING TO ASTM C494 TYPE F OR G MAY BE USED IN CONCRETE MIXES PROVIDING THAT THE SLUMP DOES NOT EXCEED 10".

WHERE NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE, THE EXISTING CONCRETE SURFACE SHALL BE CLEANED AND ROUGHENED TO A MINIMUM 1/4" AMPLITUDE. PROVIDE 3/4" CHAMFERS ON ALL EXPOSED CONCRETE EDGES, UNLESS NOTED OTHERWISE.

VERIFY ALL BLOCK OUTS WITH MECHANICAL, ELECTRICAL, AND PLUMBING REQUIREMENTS.

SHORING AND RE-SHORING DESIGN IS THE CONTRACTOR'S RESPONSIBILITY AND SHALL CONFORM TO ACI 347-04 AND ACI 347.2R-05. SHORING AND SUPPORTING FORMWORK SHALL NOT BE REMOVED FROM HORIZONTAL MEMBERS BEFORE CONCRETE STRENGTH IS AT LEAST 70 PERCENT OF DESIGN STRENGTH, AS DETERMINED BY FIELD CURED CYLINDERS. IN ADDITION, SHORING SHALL NOT BE REMOVED SOONER THAN THE FOLLOWING:

SHORING AND RE-SHORING				
ELEMENT	MINIMUM REMOVAL TIME	COMMENTS		
JOIST, BEAM OR GIRDER SOFFITS LESS THAN 10'-0" CLEAR SPAN OVER 20'-0"	7 DAYS 21 DAYS	REMOVAL TIME MAY BE HALF OF THAT SHOWN WHERE FORMS WILL BE REMOVED WITHOUT DISTURBING SHORES. (3 DAYS MINIMUM)		
ONE WAY FLOOR SLABS LESS THAN 10'-0" CLEAR SPAN 10'-0" TO 20'-0"	4 DAYS 7 DAYS	REMOVAL TIME MAY BE HALF OF THAT SHOWN WHERE FORMS WILL BE REMOVED WITHOUT DISTURBING SHORES. (3 DAYS MINIMUM)		

REINFORCING STEEL:
REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, FOR DEFORMED BARS AND ASTM A185 FOR SMOOTH WELDED WIRE FABRIC (WWF), UNLESS OTHERWISE NOTED. REINFORCING STEEL TO BE WELDED SHALL CONFORM TO ASTM A706. REINFORCING STEEL SHALL BE SECURELY TIED IN PLACE WITH #16 ANNEALED IRON WIRE.

BARS IN SLABS SHALL BE SUPPORTED ON WELL-CURED CONCRETE BLOCKS OR APPROVED METAL CHAIRS, AS SPECIFIED BY THE CRSI MANUAL OF STANDARD PRACTICE, MSP-1. REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH THE "ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES," ACI 315. LAP ALL REINFORCING BARS PER THE TYPICAL LAP SPLICE LENGTH SCHEDULES, EXCEPT AS NOTED ON DRAWINGS. USE LAP LENGTH FOR SMALLER BAR WHEN SPLICING DIFFERENT BAR SIZES. MECHANICAL SPLICES NOTED ON THE PLANS SHALL BE DAYTON SUPERIOR BAR-LOCK (ICC ESR-2495) OR TAPERLOCK COUPLERS (ICC ESR-2481) OR APPROVED WITH A CURRENT ICC APPROVAL REPORT.

TYP. WALL AND SLAB LAP SPLICE LENGTH SCHEDULE (IN.)

(DOES NOT APPLY TO VERTICAL SHEAR WALL BOUNDARY REINFORCEMENT)

DAD OIZE	400	0 PSI
BAR SIZE	CASE 1	CASE 2
#3	16	16
#4	20	18
#5	28	24
#6	37	28
#7	60	40
#8	74	46
#9	90	57
#10	108	70
#11	127	83

- CASE 1 APPLIES TO BAR WITH CLEAR COVER < 1 1/2". CASE 2 APPLIES TO BAR WITH CLEAR COVER > 1 1/2".
- FOR CENTER-TO-CENTER SPACING LESS THAN 4db MULTIPLY LAP LENGTHS ABOVE BY 1.3.
- FOR TOP BARS, CAST ABOVE 12" OF CONCRETE, MULTIPLY LAP LENGTHS ABOVE BY 1.3.

REINFORCING STEEL SHALL HAVE PROTECTION AS FOLLOWS:

-	REINFORCING STEEL	CONCRETE COVER	
-	USE	COVER	
	SLAB BARS	1"	
	WALL BARS: INTERIOR FACES	3/4"	
	WALL BARS: EXPOSED TO EARTH OR WEATHER	1½" (#5 AND SMALLER)	
	WALL BANG. EXPOSED TO EARTH OR WEATHER	2" (#6 AND LARGER)	

CONCRETE ACCESSORIES

/ED POST INSTAL	T INSTALLED ANCHORS		
TYPE	ALTERNATE		
HILTI KWIK BOLT TZ (ICC ESR-1917)	SIMPSON STRONG-BOLT 2 (ICC ESR-3037)		
HILTI KWIK HUS-EZ (ICC ESR-3027)	SIMPSON TITEN HD (ICC ESR-2713)		
HILTI HIT-RE 500SD (ICC ESR-2322)	SIMPSON SET-XP (ICC ESR-2508)		
	TYPE HILTI KWIK BOLT TZ (ICC ESR-1917) HILTI KWIK HUS-EZ (ICC ESR-3027)		

ALL ANCHORS SHALL BE INSTALLED IN STRICT CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS DO NOT CUT REINFORCING IN NEW OR EXISTING CONCRETE DURING INSTALLATION. ANCHORS EXPOSED TO EARTH OR WEATHER SHALL BE PROTECTED FROM CORROSION BY HOT-DIP GALVANIZING OR USE OF STAINLESS

PERMANENTLY EXPOSED EMBEDDED PLATES AND ANGLES SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION, UNLESS OTHERWISE NOTED. NO LOADS OR WELDS SHALL BE PLACED ON EMBEDDED PLATES OR ANGLES FOR A MINIMUM OF 7 DAYS AFTER CASTING.

STRUT SYSTEMS:

 METAL FRAMING SYSTEMS SHALL BE MANUFACTURED BY: HILTI INSTALLATION SYSTEMS 35660 CLINTON ST **WAYNE, MI 48184** 5400 S 122ND EAST AVE.

800-521-7730 TULSA, OK 74146 2. CHANNELS

A. CHANNELS SHALL BE COLD-FORMED CARBON STEEL PLAIN: ASTM A1011, GRADE 33 OR A653 GRADE 33

MATERIAL THICKNESS: 12GA U.O.N. DIMENSIONS: APPROVED SUBSTITUTES: P1000: 15/8" X 15/8" HILTI HS 158-12 P5500: 15/8" X 27/16 HILTI HS 2716-12 P1001: 1%" X 31/4"

P5501: 1%" X 4%" FINISHES: PG OR GR B. CHANNELS SHALL HAVE A CONTINUOUS SLOT ALONG ONE SIDE WITH INTURNED LIPS. C. SECURE ATTACHMENT IS MADE TO THE FRAMING MEMBER WITH THE USE OF HARDENED, TOOTHED SLOTTED NUTS (CHANNEL NUTS) THAT ENGAGE THE INTURNED LIPS.

HILTI MS-41D

- 3. FITTINGS (UNISTRUT ONLY; HILTI NOT PRE-APPROVED, U.N.O. ON DRAWINGS.) A. FITTINGS SHALL BE PUNCHED FROM HOT ROLLED PLATE STEEL PLATE CONFORMING TO ASTM A635
 - a. HOLE SIZE: %6" DIAMETER b. HOLE SPACING: ¹³/₆" FROM ENDS AND 1½" ON CENTER c. WIDTH: 1%"
- 4. CHANNEL NUTS

d. THICKNESS: ½"

- A. CHANNEL NUTS SHALL BE FROM SAME MANUFACTURER AS CHANNELS. DO NOT MIX HILTI NUTS WITH UNISTRUT CHANNEL OR VICE VERSA.
- B. CHANNEL NUTS SHALL MEET THE REQUIREMENTS OF ASTM A1011 SS GR. 33. C. CHANNEL NUTS SHALL HAVE TWO TOOLED GROOVES IN THE TOP OF THE NUT TO ENGAGE THE INTURNED LIPS OF THE CHANNEL AND, AFTER BOLTING OPERATIONS ARE COMPLETED, WILL PREVENT ANY LONGITUDINAL MOVEMENT OF THE BOLT AND NUT.
- 5. BOLTS, SCREWS AND NUTS
- A. ALL BOLTS, SCREWS AND NUTS SHALL MEET OR EXCEED ASTM A307 AND SEA J429, GRADE 2 AND B. RECOMMENDED INSTALLATION TORQUES:

BOLT SIZE	³ / ₈ -16	<i>У</i> ₂-13
FOOT-LBS.	19 (15)	50 (30)
L		

SPECIAL INSPECTIONS AND TESTING PROGRAM

TABLE 1 - REQU	IRED S	IRUCTURA	IL SPE	JIAL II	NSPECTIONS
		INSPECTIO	N		
SYSTEM OR MATERIAL	IBC CODE REFERENCE	CODE OR STANDARD REFERENCE	FREQUENC	Y (NOTE 5)	REMARKS
		REFERENCE	CONTINUOUS	PERIODIC	
		FABRICATORS	-		
		CONCRETE			
REINFORCING STEEL AND (POST TENSIONED/PRETENSIONED) TENDON PLACEMENT	1704.4 1907.5 1913.4	ACI 318 1.3.2.C ACI 318 3.5 ACI 318 7.1 TO 7.7		×	TOLERANCE AND REINFORCING PLACEMEN PER ACI 7.5
WELDING REINFORCING STEEL	1704.3.1 1903.1	ACI 318 3.5.2 AWS D1.4, SECTION 7			REFER TO STEEL FOR WELDING REQUIREMENTS
1. VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706	TABLE 1704.4	AWS D1.4 ACI 318: SECTION 3.5.2		Х	
PLACEMENT OF CAST-IN-PLACE ANCHOR BOLTS	1704.4 1911.1 1912.1	ACI 318 1.3.2.C ACI 318 21.1.8	х		ALL BOLTS VISUALLY INSPECTED
VERIFYING USE OF REQUIRED MIX DESIGN(S)	1704.4 1904 1905.2-4 1913.2 1913.3	ACI 318 1.3.2.A ACI 318, CHAPTER 4 ACI 318 5.2-5.4		×	
CONCRETE PLACEMENT, NON-SHRINK GROUT	1704.4 1905.9-10	ACI 318 1.3.2.D ACI 318 5.9-5.10	Х		
CONCRETE/SHOTCRETE CURING	1704.4 1905.11-13 1913.9	ACI 318 1.3.2.D ACI 318 5.11-5.13		X	
VERIFICATION OF IN-SITU CONCRETE PRIOR TO REMOVAL OF FORMS AND SHORES FROM ELEVATED BEAMS AND SLABS	1704.4 1906.2	ACI 318 6.2		Х	
VERIFICATION OF FORMWORK	1704.4 1906.1	ACI 318 6.1.1		X	SPECIAL INSPECTIONS APPLY TO SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED
REINFORCING STEEL MECHANICAL COUPLERS, TERMINATORS AND FORMSAVERS		ICC EVALUATION REPORTS		×	
	POS	T INSTALLED CONCRETE A	NCHORS		
EXPANSION ANCHORS INSTALLATION IN HARDENED CONCRETE AND COMPLETED MASONRY	1703.4.2 1704.15	ICC EVALUATION REPORT	X	X (NOTE 6)	INSPECTION REQUIREMENTS PER ICC EVALUATION REPORT
EPOXY ANCHORS INSTALLATION IN HARDENED CONCRETE AND COMPLETED MASONRY	1912.1	ACI 318: 3.8.6. 21.1.8	Х		INSPECTION REQUIREMENTS PER ICC EVALUATION REPORT

TESTING

		TESTING				
SYSTEM OR MATERIAL	IBC CODE REFERENCE	REFERENCE STANDARD		ENCY	REMARKS	
		REFERENCE	CONTINUOUS	PERIODIC		
		CONCRETE				
DNCRETE STRENGTH	1903			IOR LESS 00 SF OF	FABRICATE SPECIMENS AT TIME FRESH CONCRETE IS PLACED	
NCRETE SLUMP	1704.4 1905.6	ASTM C143	SLAB OR WALL PLACED EACH DAY			
NCRETE AIR CONTENT		ASTM C231				
ONCRETE TEMPERATURE		ASTM C1064				

STATEMENT OF SPECIAL INSPECTION NOTES

- SPECIAL INSPECTIONS SHALL CONFORM TO SECTION 1704 OF THE 2010 OSSC. REFER TO TABLE 1 FOR SPECIAL INSPECTION AND TABLE 2 FOR TESTING
- SPECIAL INSPECTIONS AND ASSOCIATED TESTING SHALL BE PERFORMED BY AN APPROVED ACCREDITED INDEPENDENT AGENCY MEETING THE REQUIREMENTS OF ASTM E329 (MATERIALS), ASTM D3740 (SOILS), ASTM C1077 (CONCRETE), ASTM A880 (STEEL), AND ASTM E543 (NON-DESTRUCTIVE). THE INSPECTION AND TESTING AGENCY SHALL FURNISH TO THE STRUCTURAL ENGINEER A COPY OF THEIR SCOPE OF ACCREDITATION. SPECIAL INSPECTORS SHALL BE CERTIFIED BY THE BUILDING OFFICIAL. WELDING INSPECTORS SHALL BE QUALIFIED PER SECTION 6.1.4.1.1 OF AWS D1.1.
- THE SPECIAL INSPECTOR SHALL OBSERVE THE INDICATED WORK FOR COMPLIANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR FOR CORRECTION AND NOTED IN THE INSPECTION REPORTS.
- THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS FOR EACH INSPECTION TO THE BUILDING OFFICIAL, STRUCTURAL ENGINEER, CONTRACTOR, AND OWNER. THE SPECIAL INSPECTION AGENCY SHALL SUBMIT A FINAL REPORT STATING THAT THE WORK REQUIRING SPECIAL INSPECTION WAS INSPECTED AND IS IN CONFORMANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS AND THAT ALL DISCREPANCIES NOTED IN THE INSPECTION REPORTS HAVE BEEN CORRECTED.
- CONTINUOUS INSPECTION: THE FULL-TIME OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED.

PERIODIC INSPECTION: THE PART-TIME OR INTERMITTENT OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK HAS BEEN OR IS BEING PERFORMED AND AT THE COMPLETION OF THE WORK.

WHERE PERIODIC INSPECTION IS ALLOWED IN ACCORDANCE WITH AN EXPANSION ANCHOR'S ICC EVALUATION REPORT, INSPECTIONS SHALL BE AS

FOR ALL ANCHORS, PRIOR TO CONCEALMENT, VERIFY: ANCHOR TYPE, ANCHOR DIMENSIONS, ANCHOR SPACING AND EDGE DISTANCES.

 FOR EACH ANCHOR TYPE AND SIZE, INSPECTOR SHALL BE ONSITE TO CONTINUOUSLY INSPECT A MINIMUM OF THE FIRST 10 ANCHORS INSTALLED BY EACH INSTALLER FOR CONFORMANCE WITH ICC EVALUATION REPORT. PROVIDED ALL ANCHORS ARE INSTALLED CORRECTLY PER MANUFACTURER'S INSTRUCTIONS, PROVIDE PERIODIC INSPECTION ON A MINIMUM OF 10% OF THE NEXT 1000 ANCHORS BY EACH INSTALLED AND A MINIMUM OF 5% OF THE REMAINING ANCHORS BY EACH INSTALLER. INSPECTIONS SHALL OCCUR A MINIMUM OF ONCE PER WEEK AT A RANDOM TIME WHILE ANCHOR INSTALLATION IS ONGOING. ANY NON-COMPLIANCE ISSUES SHALL RESET THE INSPECTION REQUIREMENTS TO TEN (10) CONTINUOUS INSPECTIONS. NON-COMPLIANT ANCHORS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD FOR REVIEW AND SHALL BE BROUGHT INTO COMPLIANCE BY EITHER TESTING OR RE-INSTALLATION.

INSPECTION REPORTS SHALL IDENTIFY NAMES OF INSTALLERS.

SPECIAL INSPECTOR SHALL PROVIDE DOCUMENTATION AT THE END OF ANCHOR INSTALLATIONS STATING THAT THE MINIMUM NUMBER OF ANCHORS WERE INSPECTED.

SO

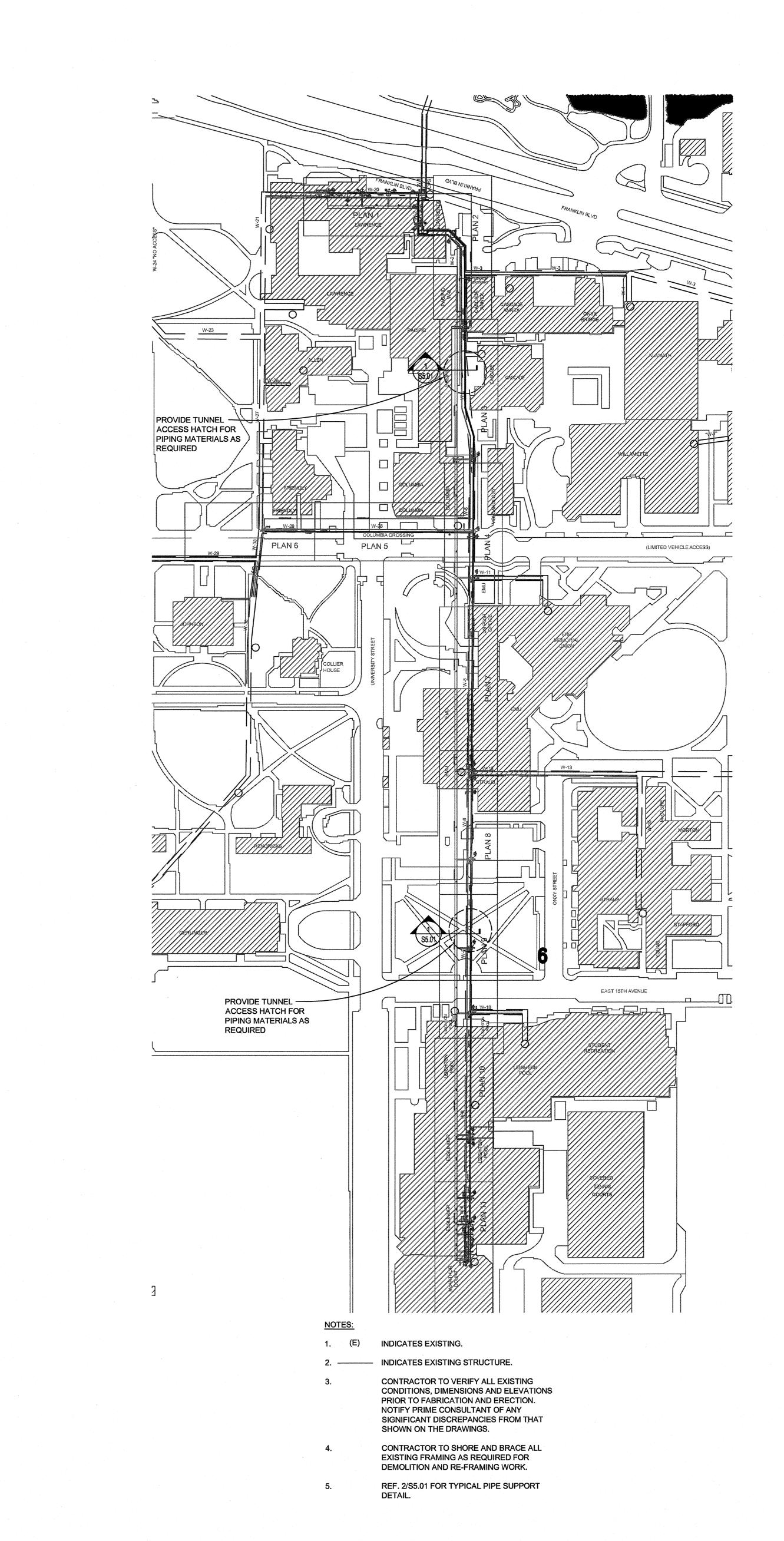
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05/08/13 SCALE AS SHOWN ENGR

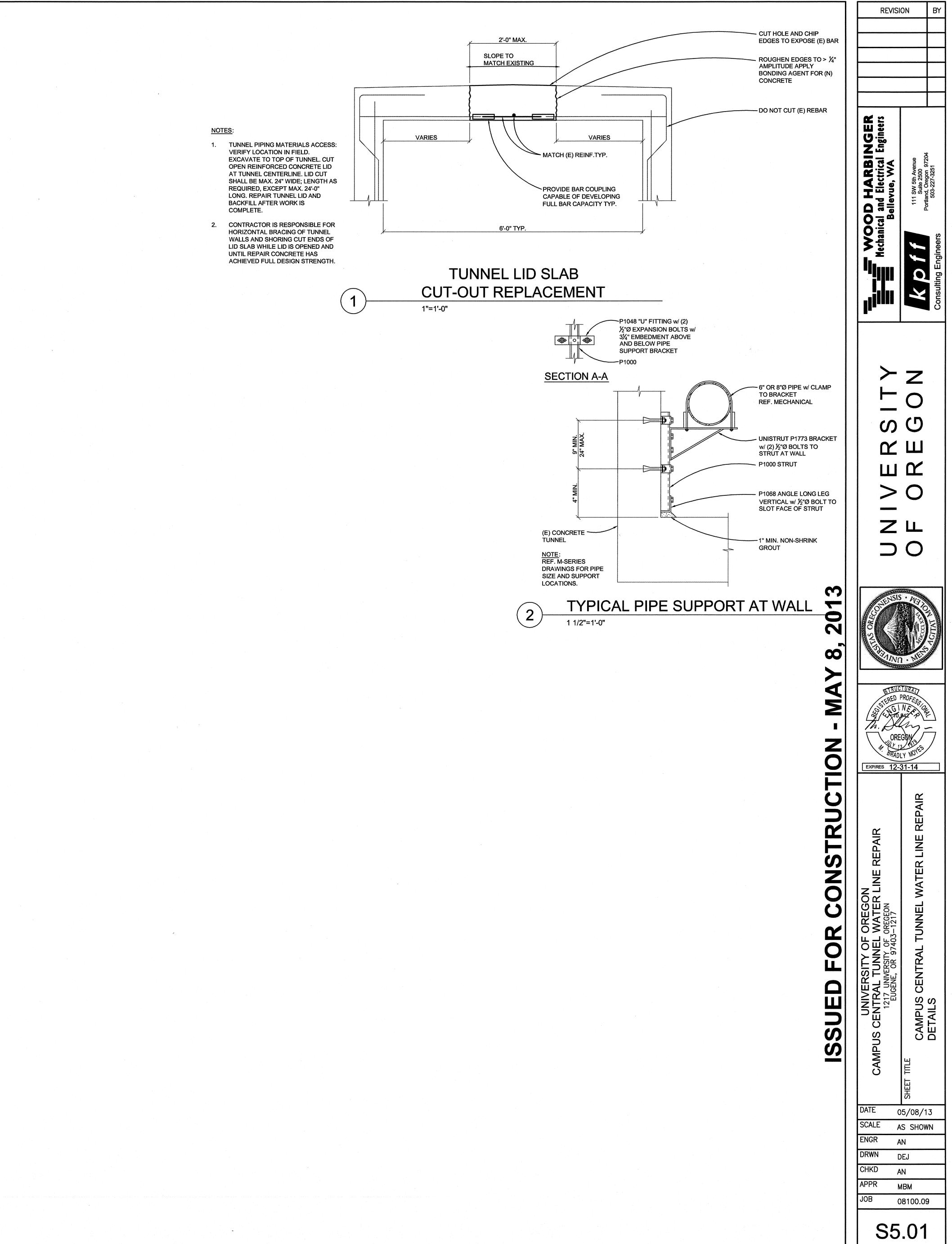
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S2.01

CAMPUS CENTRAL WATER LINE REPAIR - TUNNEL SITE PLAN

1"=100"



CPS-WT-CW-001

500000

3/16" EMBEDDED TEXT —

ANNODIZED ALUM TAG

1"x3.9"x0.032" THICK

ROUNDED CORNERS —

SCALE: NONE

VALVE / DEVICE TAG DETAIL

ទំខ់ 1/2" EMBEDDED BAR CODE —

			LETTER .	TION IDENTIF	SUCCEEDING LETTER	12110
		MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
	Α	ANALYSIS		ALARM		
	В	BURNER/ COMBUSTION				
	С		CONTROL		CONTROL	
	D		DIFFERENTIAL			
TUNNEL)	Е	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
E	F	FLOW RATE	RATIO			
L	G			GLASS		
	Н	HAND				HIGH
		CURRENT		INDICATE		
	J	POWER	SCAN			
8" DIA NO. 6	K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE			
AD CHAIN AND NNECTOR	L	LEVEL		LIGHT		LOW
MINEOTOIX	М		MOMENTARY			MIDDLE
	0			ORIFICE		
	Р	PRESSURE		POINT (TEST) CONNECTION		
	Q	QUANTITY	INTEGRATE, TOTALIZE			
	R	RADIATION		RECORD		
	S	SPEED	SAFETY		SWITCH	
	Т	TEMPERATURE			TRANSMITTER	
	U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
	V	VIBRATION			VALVE/DAMPER	
	W	WEIGHT/FORCE			WELL	
	Χ	UNCLASSFIED				
	Y	EVENT, STATE OR PRESENCE			RELAY, COMPUTE, OR CONVERT	
	Z	POSITION			DRIVER, ACTUATOR	

XXX INSTRUMENT FURNISHED WITH EQUIPMENT

DDC INSTRUMENTATION AND CONTROL DEVICES

TWO POSTITION LEVEL TRANSMITTER SUMMARY ALARM MODULATING ALARM FAULT NITROUS OXIDE ALARM HORN OVER PRESSURE SWITCH PRESSURE ALARM (LOW) ANALOG INPUT MANUAL PUSH BUTTON SWITCH ANALOG OUTPUT FROM DDC SYSTEM (SHIELDED AS SPECIFIED OR INDICATED) PRESSURE INDICATOR ALARM SIGNAL TO DDC SYSTEM PRESSURE INDICATING CONTROLLER PULSE METER OR INITIATOR AUXILIARY DEVICE OR CONTACT CONTAMINATION ISOLATION VALVE PRESSURE SENSOR CARBON MONOXIDE SENSOR PRESSURE SWITCH (HIGH)

CARBON DIOXIDE SENSOR CONTROL RELAY CURRENT SENSOR

CURRENT SENSING RELAY CURRENT TRANSMITTER DESCRETE INPUT

DESCRETE OUTPUT

DIFFERENTIAL PRESSURE SWITCH DIFFERENTIAL PRESSURE SENSOR/TRANSMITTER

DIFFERENTIAL PRESSURE VALVE

DOOR SWITCH ENABLE/DISABLE

EMERGENCY SHUTDOWN SWITCH

FLOW CONTROL DAMPER

FLOW CONTROL VALVE

FLOW METER

FREEZE PROTECTION THERMOSTAT

FLOW SWITCH

FLOW SWITCH (LOW)

FLOW SWITCH (HIGH)

FLOW TRANSMITTER

FLOW TOTALIZER

GAS GENERATOR

HIGH HUMIDITY SWITCH

HUMIDITY SENSOR/TRANSMITTER

HUMIDITY TRANSMITTER

INDICATING LIGHT

QUANITY INDICATION

EQUIPMENT CONTROLLER OUTPUT CONTROL

MOTOR POWER USAGE TRANSDUCER

SETPOINT RESET

KILOWATTS

KILOWATT HOURS

LEAK/LEVEL DETECTOR

LEVEL INDICATION

LEVEL SWITCH

LEVEL SWITCH (HIGH)

LEVEL SWITCH (LOW)

LOCAL INSTRUMENT (XXX) PANEL MOUNTED INSTRUMENT (E) EXISTING INSTRUMENTATION (XXX) SHARED HMI DISPLAY

PRESSURE SWITCH (LOW)

PUMP LIGHT

PRESSURE TRANSMITTER

REFRIGERANT SWITCH

REVOLUTIONS PER MINUTE TRANSMITTER

SPEED

SMOKE DETECTOR

SWITCH (HAND)

LEVER HAND SWITCH

STATIC PRESSURE TRANSMITTER

START/STOP SIGNAL FROM DDC SYSTEM

ZONE TEMPERATURE SENSOR/TRANSMITTER

TEMPERATURE ALARM (LOW)

TEMPERATURE CONTROLLER

TEMPERATURE CONTROL VALVE

TOTAL DISSOLVED SOLIDS (THERMOMETER)

COMBINATION TEMPERATURE AND HUMIDITY SENSOR

TEMPERATURE INDICATOR

TONS COOLING

TEMPERATURE SENSOR/TRANSMITTER

TEMPERATURE SWITCH (HIGH)

TEMPERATURE SWITCH (LOW)

TEMPERATURE SENSOR/TRANSMITTER (PIPE OR DUCT)

CONTROLLER FAILURE ALARM

CONTROLLER OR MOTOR CURRENT

SPEED OR FREQUENCY (DDC INPUT)

POSITION INDICATING (LOW)

SPEED CONTROL SIGNAL (DDC OUTPUT)

CONTROLLER OR MOTOR STATUS POSITION (HIGH)

POSITION (LOW)

POSITION SWITCH (HIGH)

POSITION SWITCH (LOW)

POSITION TRANSMITTER

SAFETY DEVICE WITH HARD-WIRE SHUTDOWN

GENERAL NOTES

INSTRUMENT DIAGRAMS.

1. THE FOLLOWING NOTES APPLY TO ALL MECHANICAL DRAWINGS. ADDITIONAL GENERAL NOTES, WHICH SUPPLEMENT THE FOLLOWING

NOTES, MAY BE PROVIDED ON INDIVIDUAL DRAWINGS. 2. PIPING PLANS DO NOT SHOW ALL PIPING, PIPE SUPPORTS, OR PIPING COMPONENTS. PROVIDE PIPING, VALVES, SPECIALTY ITEMS,

INSTRUMENTATION, ETC. AS INDICATED ON THE PIPING &

3. PROVIDE PLUG OR BLIND FLANGE ON ALL VALVE OPEN ENDS.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF PHASING AND INSTALLATION OF ALL MECHANICAL WORK WITH THE WORK OF OTHER TRADES. THE CONTRACTOR SHALL BEAR THE TOTAL EXPENSE OF ADDITIONAL WORK THAT MAY BE CAUSED BY THE IMPROPER SEQUENCING OF CONSTRUCTION ACTIVITIES.

5. TEMPORARY PIPING: PROVIDE TEMPORARY PIPING AS REQUIRED TO LIMIT BUILDING WATER SERVICE INTERRUPTIONS TO 12 HOURS MAXIMUM ON EVENINGS OR WEEKENDS. PROVIDE DOMESTIC-WATER-RATED HOSE, PLASTIC PIPE, OR OTHER SUITABLE PIPING AS REQUIRED FOR TEMPORARY SERVICE.

6. REFER TO MECHANICAL DETAILS, DIAGRAMS, AND SPECIFICATIONS FOR REQUIRED SYSTEM FITTINGS, ACCESSORIES, CONTROL DEVICES, ETC. PREPARE SHOP DRAWINGS OF MECHANICAL SYSTEMS THAT ARE COORDINATED WITH THE APPROVED AND INSTALLED WORK OF ALL OTHER TRADES.

ARRANGE MECHANICAL SYSTEMS, EQUIPMENT, PIPING, AND ACCESSORIES SO THAT ACCESS CLEARANCES INDICATED BY THE DRAWINGS, REQUIRED BY APPLICABLE PORTIONS OF THE OREGON SPECIALTY CODE, NFPA 101, UFC, IMC, OSHA, AND AS RECOMMENDED BY MANUFACTURERS ARE PROVIDED.

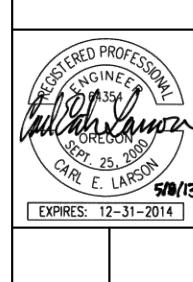
8. PROVIDE SUPPORTS AND SEISMIC RESTRAINTS FOR ALL PIPE AND EQUIPMENT AS SPECIFIED, AS REQUIRED, AND AS INDICATED. PROVIDE ALL REQUIRED SUPPLEMENTARY STRUCTURAL STEEL SUPPORTS, ATTACHMENTS, AND ANCHORAGES. PROVIDE ANCHOR BOLTS OF SIZE, TYPE, AND LENGTH AS REQUIRED.

9. ALL REQUIRED STRUCTURAL MEMBERS, BOLTS, AND WELDS SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) STEEL CONSTRUCTION MANUAL

10. WELD PIPE SUPPORTS TO PIPE AND STRUCTURAL MEMBERS IN ACCORDANCE WITH THE PIPE SUPPORT MANUFACTURER'S RECOMMENDATIONS

11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF PLUGGED DRAINS IN ALL PIPING LOW POINTS AND PLUGGED MANUAL VENTS AT ALL HIGH POINTS.

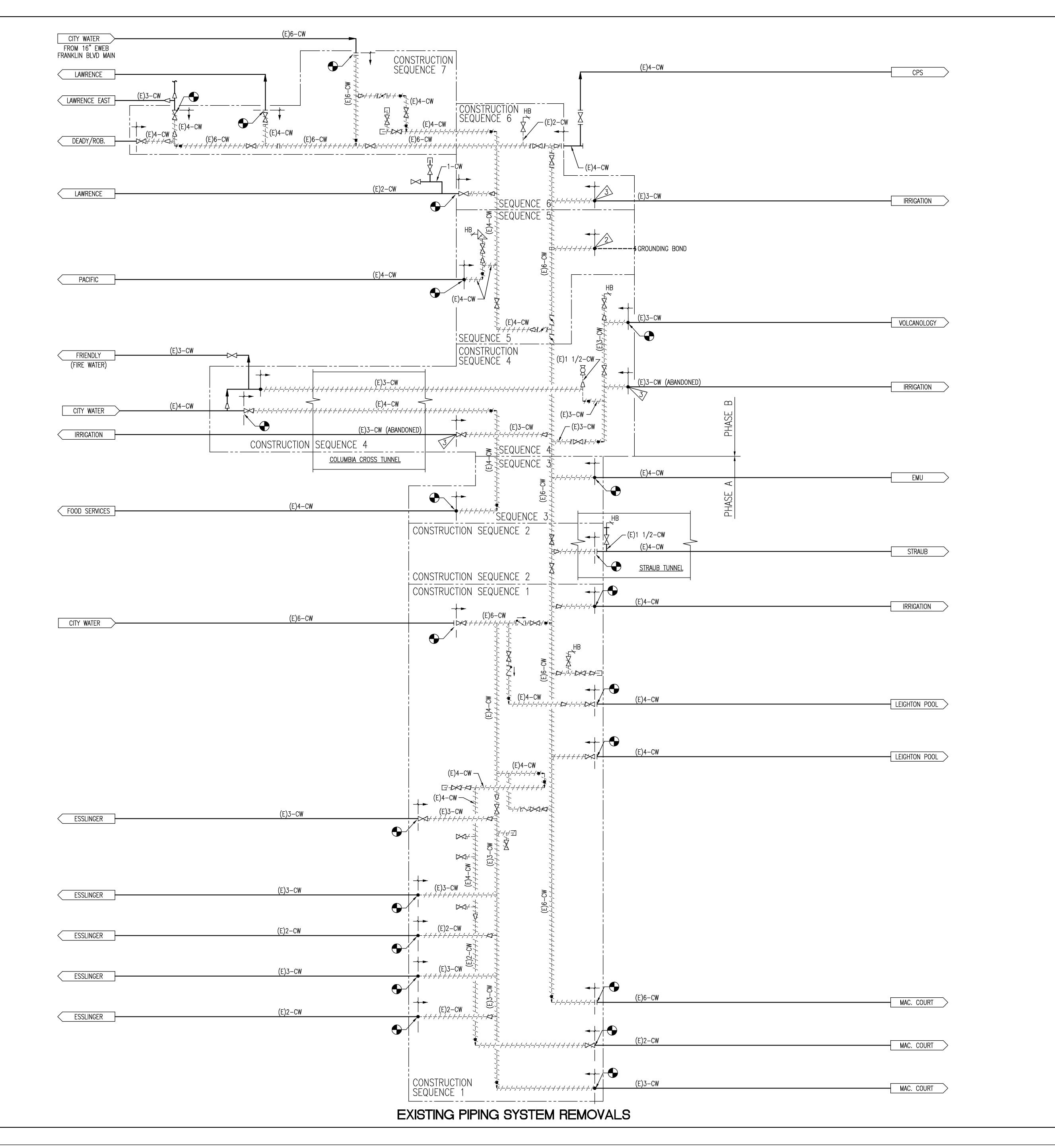
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LEGEND

GENERAL NOTES

- 1. SEE MO.01 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
- 2. REMOVE PIPING, VALVES, FITTINGS, AND APPURTENANCES INDICATED TO POC FOR NEW PIPING CONNECTIONS.
- 3. PROVIDE NEW PIPING BEFORE COMPLETING REMOVALS TO LIMIT BUILDING OUTAGES.
- 4. VERIFY EXISTING PIPING, BRANCHES, AND SIZES.

SHEET NOTES

1 REMOVE HOSE BIB AND CAP LINE 2 DISCONNECT AND ABANDON ELEC BOND 3 CAP ABANDONED PIPE AT TUNNEL WALL

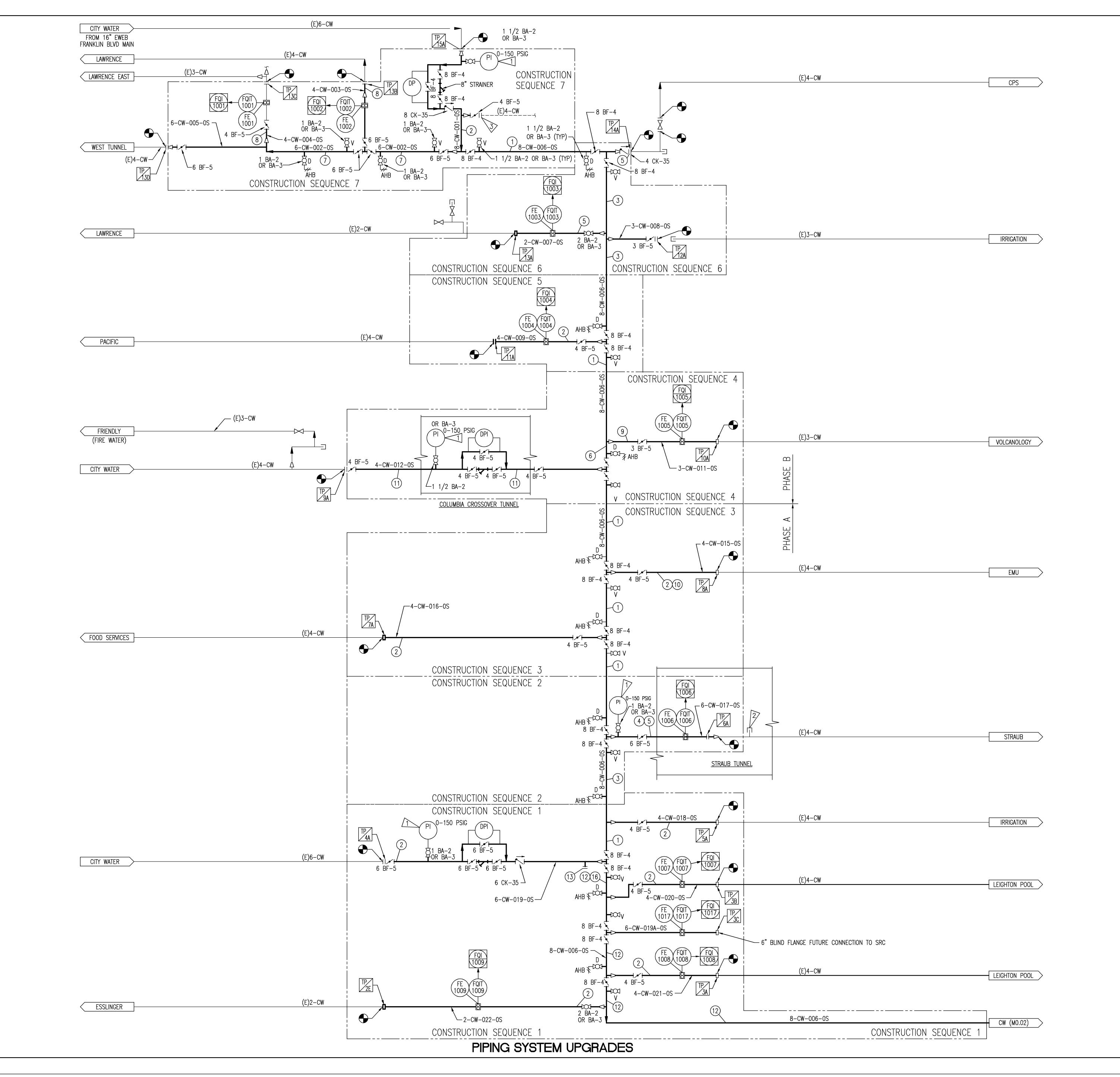
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MR0.02 SHEET



- 1. SEE MO.01 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES
- 2. COORDINATE CONTRACTOR STAGING AREAS WITH OWNER AUTHORIZED REPRESENTATIVE.

SHEET NOTES

- PROVIDE PRESSURE INDICATOR WITH RANGE INDICATED. PROVIDE INSTRUMENT VALVE BETWEEN PROCESS VALVE INDICATED AND
- 2 REMOVE HOSE BIBB AND CAP.
- 3 CONNECT EXISTING 4"CW AS REQUIRED FOR TEMPORARY SERVICE TO BLDGS DURING CONSTRUCTION. REMOVE AFTER COMPLETION OF NEW WORK.

CONSTRUCTION SEQUENCE NOTES

- (1) INSTALL NEW 8" PIPE ABOVE EXISTING 6" CW PIPING.
- (2) REMOVE EXISTING BUILDING TIE-IN, PROVIDE NEW BUILDING CONNECTION TO NEW 8" PIPE. (SEE DETAILS ON M3.01 AND M3.02
- (3) REMOVE EXISTING 6" CW HEADER AND PROVIDE NEW 8" PIPING.
- 4) REMOVE EXISTING 6" CW HEADER AND INSTALL NEW 8" PIPE AS
- (5) PROVIDE TEMPORARY TIE-IN DURING REMOVE AS REQUIRED, TO MAINTAIN WATER TO BUILDING.
- (6) REMOVE EXISTING 3" BRANCH CONNECTION TO VOLCANOLOGY ABOVE
- (7) INSTALL NEW 6" PIPE ABOVE EXISTING 6" CW PIPING.
- 8 REMOVE EXISTING BUILDING TIE-IN, PROVIDE NEW BUILDING
- (9) PROVIDE TEMPORARY TIE-IN CONNECTION TO EXISTING 6" CW WHEN 8" PIPE IS INSTALLED, DISCONNECT 6" CW TIE-IN AND
- (11) REMOVE EXISTING 3" CW HEADER (BELOW), 4" CW (COPPER) HEADER (ABOVE), AND PROVIDE NEW 4" CW PIPING WITH TIE-IN TO NEW 8" CW HEADER.
- INSTALL NEW 8" PIPE ABOVE OR ADJACENT TO THE EXISTING DRAWINGS M3.01 AND M3.02. INSTALL AS MUCH BRANCH PIPING AS POSSIBLE TO MAKE THE TRANSITION FROM OLD CONNECTION TO NEW AS SIMPLE AS POSSIBLE TO MINIMIZE
- (14) NOT USED ON THIS DRAWING.
- (15) NOT USED ON THIS DRAWING.
- (16) REMOVE 4" PIPING BETWEEN TP-4A AND TP-3B DURING SHUTDOWN AND PROVIDE NEW HEADER IN THIS AREA. TEMPORARY PIPING MAY BE REQUIRED TO ACCOMPLISH THIS TIE-IN. IF SO, PROVIDE TEE FOR EASY PERMANENT AND TEMPORARY PIPING TIE-IN TRANSITION.

- DEVICE.

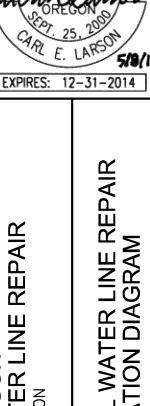
- REQUIRED TO FIT THROUGH CROSS SECTION AREA.
- EXISTING 6" CW PIPING.
- CONNECTION TO NEW 6" PIPE. (SEE DETAILS ON M3.01 DRAWINGS)
- RECONNECT TO NEW 8" PIPE.
- (10) REMOVE LOWER LADDER STEPS TO INSTALL NEW 8" PIPE.

- PROVIDE 6" BLIND FLANGE FOR TEMPORARY USE DURING CONSTRUCTION.

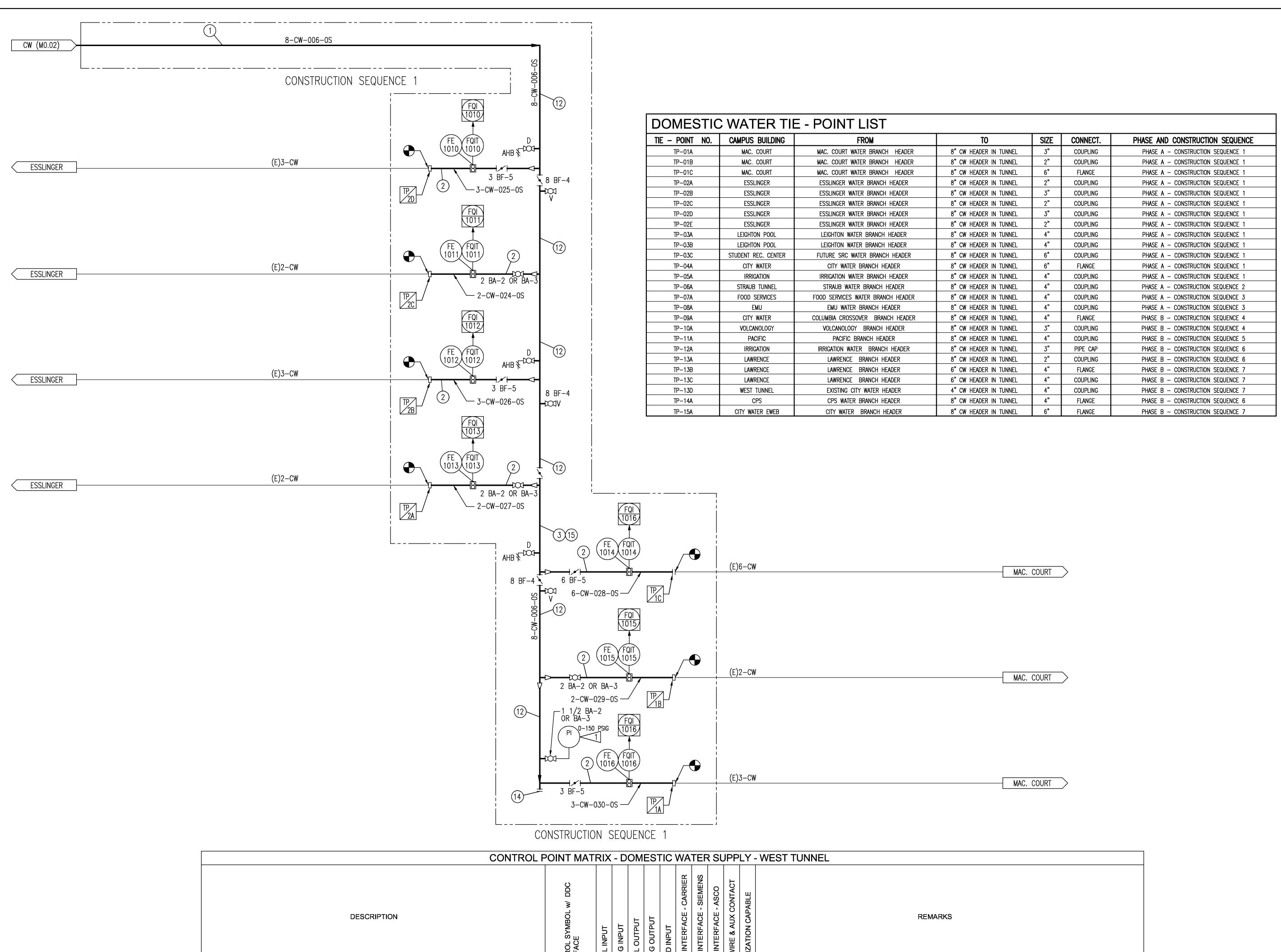
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CONSTRUCTION SEQUENCE 1										
CONTROL POINT MATRIX - DOMESTIC WATER SUPPLY - WEST TUNNEL										
DESCRIPTION	CONTROL SYMBOL w/ DDC INTERFACE	DIGITAL INPUT	ANALOG INPUT	ANALOG OUTPUT	PULSED INPUT	COMM INTERFACE - CARRIER	<u>ы</u>	RFACE -	HARDWIRE & AUX CONTACT TOTALIZATION CAPABLE	REMARKS
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1001 - LAWRENCE EAST	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1002 — LAWRENCE	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1003 — LAWRENCE	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1004 — PACIFIC	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1005 - VOLCANOLOGY	FE/FQIT/FQI			X					X	PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1006 — STRAUB	FE/FQIT/FQI			X					X	PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1007 — LEIGHTON POOL	FE/FQIT/FQI			X					X	PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1008 — LEIGHTON POOL	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1009 - ESSLINGER	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1010 — ESSLINGER	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1011 — ESSLINGER	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1012 — ESSLINGER	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1013 — ESSLINGER	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1014 — MAC. COURT	FE/FQIT/FQI			X						PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1015 — MAC. COURT	FE/FQIT/FQI			X					Х	PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1016 — MAC. COURT	FE/FQIT/FQI			X					Х	PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
FLOW, WATER, BUILDING WATER CONSUMPTION, POINT #1017 — STUDENT REC. CENTER	FE/FQIT/FQI			X					Х	PROVIDE DDC MONITORING. PROVIDE REMOTE REGISTER IN BUILDING MECHANICAL ROOM [1][2][3][4]
REMARKS										
[1] CONNECT METER OUTPUT TO NEAREST DDC PANEL.										
[2] CONNECT DDC PANEL TO REMOTE INDICATOR IN BUILDING MECHANICAL ROOM. COORDINATE EXACT LOCATION OF REMOTE INDICATOR WITH OWNERS REPRESENATATIVE PRIOR TO INSTALLATION AND ROUGH IN.										

- 1. SEE MO.01 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
- 2. COORDINATE CONTRACTOR STAGING AREAS WITH OWNER AUTHORIZED REPRESENTATIVE.

SHEET NOTES

PROVIDE PRESSURE INDICATOR WITH RANGE INDICATED. PROVIDE INSTRUMENT VALVE BETWEEN PROCESS VALVE INDICATED AND DEVICE.

CONSTRUCTION SEQUENCE NOTE\$

- 1) INSTALL NEW 8" PIPE ABOVE EXISTING 6" CW PIPING.
- (2) REMOVE EXISTING BUILDING TIE-IN, PROVIDE NEW BUILDING
- (3) REMOVE EXISTING 6" CW HEADER AND PROVIDE NEW 8" PIPING.
- 4) NOT USED ON THIS DRAWING.
- 5) NOT USED ON THIS DRAWING.
- (7) NOT USED ON THIS DRAWING.
- 8 NOT USED ON THIS DRAWING.

- (11) NOT USED ON THIS DRAWING.
- 6" CW PIPE. PROVIDE TEE'S AND VALVING FOR NEW BRANCH PIPING OFF OF THE NEW 8" HEADER PER THE DETAILS ON DRAWINGS M3.01 AND M3.02. INSTALL AS MUCH BRANCH PIPING AS POSSIBLE TO MAKE THE TRANSITION FROM OLD CONNECTION TO NEW AS SIMPLE AS POSSIBLE TO MINIMIZE DOWNTIME.
- (13) NOT USED ON THIS DRAWING.
- AS A POINT FOR TEMPORARY PIPING CONNECTION.
- (15) DURING REMOVAL OF PIPING FROM STAIRCASE SOUTH TO 6" BRANCH USE THE NEW 8" HEADER TO PROVIDE A TEMPORARY TEE TO CONNECT WATER TO THE THREE BRANCHES TO MCARTHUR COURT.

- CONNECTION TO NEW 8" PIPE. (SEE DETAILS ON M3.01 AND M3.02

- (6) NOT USED ON THIS DRAWING.
- (9) NOT USED ON THIS DRAWING.
- (10) NOT USED ON THIS DRAWING.
- 12 INSTALL NEW 8" PIPE ABOVE OR ADJACENT TO THE EXISTING
- (14) DURING REMOVAL OF ADJACENT PIPE, USE THIS LOCATION
- (16) NOT USED ON THIS DRAWING.

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PIPING SYSTEM UPGRADES

[3] AT CONTRACTOR'S OPTION, WHERE TOTAL WIRE LENGTH IS LESS THAN 300 FEET, DIRECT CONNECTION FROM METER TO REMOTE INDICATOR FURNISHED WITH METER IS ACCEPTABLE.

[4] REMOTE INDICATOR READOUT SHALL BE IN GALLONS.

PHASING PLAN

INTRODUCTION

THIS PROJECT REPLACES A 6" DOMESTIC WATER MAIN IN THE CENTRAL TUNNEL FROM LAWRENCE HALL TO MACARTHUR COURT, AND INCLUDES CONNECTIONS TO TWO MAIN EUGENE WATER & ELECTRIC BOARD (EWEB) STREET MAINS AND BUILDING AND IRRIGATION SUPPLIES. THE PURPOSE OF THIS PHASING PLAN IS TO PROVIDE A RECOMMENDED PLAN TO REPLACE THE DOMESTIC WATER LINE IN THIS AREA.

THIS PROJECT REPLACES A 6-INCH, TWO 4-INCH, AND 3-INCH MAINS PLUS A SEPARATE 4-INCH CONNECTION TO LEIGHTON POOL, WITH A SINGLE 8-INCH MAIN EXTENDING FROM LAWRENCE TO MCARTHUR COURT. WE PROPOSE REPLACING BRANCH CONNECTIONS TO POINTS-OF-CONNECTION AFTER AN EXISTING ISOLATION VALVE (IF ANY). IF THE BRANCH DOES NOT HAVE A TUNNEL ISOLATION VALVE, ONE WILL BE ADDED. A 4-INCH LINE IN THE COLUMBIA CROSS TUNNEL FROM EWEB SUPPLY AT FRIENDLY TO FOOD SERVICES WILL ALSO BE REPLACED AND THE NEW BRANCH TO FOOD SERVICES WILL BE ROUTED TO THE NEW 8-INCH MAIN.

ADDITIONAL SHUTOFF VALVES ARE INSTALLED ON THE 8-INCH MAIN AT MOST OF THE BUILDING BRANCH CONNECTIONS TO ALLOW ISOLATING ONE SECTION OF THE MAIN FOR REPAIR WITHOUT SHUTTING OFF THE ENTIRE LINE.

PRESSURE GAGES ARE ADDED AT THE TWO EWEB SUPPLY CONNECTIONS AT THE FRANKLIN BLVD MAIN NEAR LAWRENCE AND NEAR THE LEIGHTON POOL.

MAINTAINING THE SUPPLY OF DOMESTIC WATER TO THE BUILDINGS ON CAMPUS IS A PRIORITY IN THIS WATER LINE REPLACEMENT PROJECT. CAREFUL PHASING AND CONTRACTOR COOPERATION CAN MINIMIZE THE DISRUPTION TO THE OCCUPANTS WHILE THIS IMPROVEMENT IS INSTALLED.

MULTIPLE SUGGESTED STRATEGIES WERE CONSIDERED FOR THE PHASING PLAN. THESE STRATEGIES ARE AS FOLLOWS:

- 1. SPLIT THE CONSTRUCTION INTO TWO PHASES, EACH PHASE REPLACING HALF OF THE WATER LINE AT ONE TIME CONSEQUENTLY LEAVING HALF OF THE BUILDINGS WATER SUPPLY SHUT DOWN FOR A PERIOD OF TIME TO REMOVE ALL PIPING AND INSTALL NEW LARGER PIPING IN THE SAME PLACE. BUILDING TIE-INS WILL ALSO BE REMOVEED AND RE-PIPED IN THE AREA OF WORK DURING EACH PHASE. THIS OPTION WOULD REQUIRE A LONGER OUTAGE THAN IS AVAILABLE
- 2. REPLACE ALL BUILDING TIE-INS FIRST TO THE EXISTING SUPPLY HEADER. ONCE ALL TIE-INS ARE INSTALLED, REMOVE OLD HEADER IN SECTIONS AND PROVIDETHE NEW HEADER IN THE SAME LOCATION, RECONNECTING TO EXISTING HEADER AS NECESSARY. SINCE THERE ARE SOMETIMES HUNDREDS OF FEET OF PIPING IN BETWEEN SOME BUILDING TIE-INS, IT WOULD TAKE TOO MUCH TIME TO REPLACE THE HEADER AND WOULD REQUIRE A LONGER OUTAGE THAN IS AVAILABLE.
- 3. REPLACE BOTH SUPPLY HEADER AND TIE-INS STARTING AT EITHER END OF THE TUNNEL AND PROVIDE TEMPORARY PIPING TO SUPPLY BUILDING CONNECTIONS AS NECESSARY. THIS OPTION WOULD WORK, BUT WOULD REQUIRE MULTIPLE SHUTDOWNS FOR THE SAME AREAS. SINCE ISOLATION VALVES ON THE MAIN LINE ARE LIMITED, LARGE SECTIONS OF PIPING WOULD HAVE TO BE DRAINED AND PATCHED MULTIPLE TIMES.

THE SUGGESTED DESIGN IS A COMBINATION OF THE CONSIDERED STRATEGIES WITH THE INTENT ON USING PHASING AND CONSTRUCTION SEQUENCES TO LIMIT THE BUILDING DOWNTIMES TO 8 HOURS AT NIGHT AND WEEKEND WORK FOR LONGER SHUTDOWNS. THIS STRATEGY WILL ALLOW SUBSTANTIAL INSTALLATION TO PROCEED BEFORE EXISTING WATER PIPING IS REMOVED, REDUCING OUTAGES. BRANCH CONNECTIONS TO BUILDINGS CAN BE MADE AFTER MOST OF THE NEW PIPING IS IN PLACE.

GENERAL STRATEGY: PHASES, SEQUENCES, AND STEPS

PHASING — THE WEST TUNNEL SECTION FOR THIS WILL BE SPLIT UP INTO TWO PHASES, PHASE A AND PHASE B. THE PURPOSEZ w OF SPLITTING THIS SYSTEM UP IS TO SPREAD THE WORK OUT OVER TWO DIFFERENT CONSTRUCTION PERIODS PROVIDING FLEXIBILITY WITH TIMING AND BUDGET. TWO MAJOR HEADERS FROM EWEB FEED THE EXISTING WATER MAIN AND THE PHASES ARE SPLIT UP SUCH THAT EACH PHASE IS FED BY AT LEAST ONE OF THE MAINS AT ONE TIME TO SUPPLY WATER TO THE BUILDINGS NOT AFFECTED BY THAT PHASE. EITHER PHASE CAN BE PERFORMED FIRST.

CONSTRUCTION SEQUENCES - WITHIN EACH OF THE PHASES, THE WORK WILL BE SPLIT UP INTO SEQUENCES OF WORK. THE PURPOSE OF THIS DIVISION IS TO PROVIDE CONNECTIONS FROM THE MAIN LINE TO LIMIT THE NUMBER OF BUILDINGS AFFECTED AT ANY ONE TIME, MINIMIZING THE NUMBER OF SHUTDOWNS TO EACH BUILDING. WITHIN EACH CONSTRUCTION SEQUENCE IS A SPECIFIC STEP TO BE PERFORMED DURING THE SEQUENCE. THESE STEPS ARE DEFINED IN MORE DETAIL ON THE DRAWINGS LISTED BELOW IN THE PARAGRAPH LABELED "DRAWINGS." A GENERAL SUMMATION OF THE SEQUENCE'S STEPS ARE AS FOLLOWS:

- 1. INSTALL NEW 8-INCH PIPING HEADER ON WALL ABOVE THE EXISTING 6-INCH CW PIPING IN ALL AREAS WHERE OBSTRUCTIONS ALLOW PIPE TO BE RUN. IF PIPING IS OBSTRUCTED, PROVIDE A TEMPORARY CAP AND CONTINUE TO EXTEND PIPING ON OTHER SIDE OF OBSTRUCTION. PROVIDE ISOLATION VALVES WHERE INDICATED ON NEW DRAWINGS. WHEN NEW HEADER IS EXTENDED PAST A CONNECTION POINT. PROVIDE A TEE FOR NEW TIE-IN. WHERE EXISTING TIE-IN IS IN THE WAY OF NEW TEE, PROVIDE TEMPORARY CAP OR VALVE ON EITHER END OF PIPE, FOR EASE OF TIE-IN ONCE THE OBSTRUCTION IS REMOVEED. AS MAIN HEADER PIPING AND BUILDING CONNECTIONS ARE REPLACED, THE SYSTEM WILL CONTINUE TO EXPAND DOWN THE TUNNEL REPLACING SECTIONS OF PIPING AND BRANCH CONNECTIONS ONE AT A TIME. THIS WILL MINIMIZE THE DOWNTIME TO THE BUILDINGS AND THE ENTIRE SYSTEM.
- 2. WHEN NEW 8-INCH HEADER PIPING IN THE SEQUENCE IS INSTALLED, PROVIDE TEMPORARY SHUTDOWN TO THE BUILDING SUPPLY TIE-IN. REMOVE BUILDING CONNECTIONS FROM EXISTING 6 INCH HEADER TO BUILDING CONNECTION POINT WHERE PIPING EXITS THE TUNNEL. PROVIDE CONNECTION FROM BUILDING TIE-IN TO NEW 8-INCH HEADER. PROVIDE A TEMPORARY CAP ON THE EXISTING 6-INCH HEADER UNTIL ALL BUILDING TIE-INS HAVE BEEN REPLACED.
- 3. FOR AREAS WHERE PIPING NEEDS TO BE TAKEN OUT PRIOR TO INSTALLATION OF NEW HEADER, PROVIDE A LONGER SHUTDOWN AND PROVIDE TEMPORARY PIPING AS REQUIRED TO MAINTAIN BUILDING SUPPLY DURING NON-SHUTDOWN PERIODS.
- 4. AFTER THE REPLACEMENT OF ALL BUILDING TIE-INS AND SUPPLY WATER CONNECTIONS OF THE EXISTING 6-INCH HEADER HAVE BEEN COMPLETED, REMOVE THE EXISTING 6-INCH HEADER SECTIONS ALONG WITH ANY LEFTOVER BRANCH PIPING.

A DESCRIPTION IN MORE DETAIL OF EACH PHASE AND CONSTRUCTION SEQUENCES IS AS FOLLOWS:

PHASE A - SOUTH TUNNEL - MCARTHUR COURT TO COLOMBIA CROSSOVER

HEADER IN THIS SEQUENCE.

CONSTRUCTION SEQUENCE NUMBER: 1. IN THE AREA INDICATED AS CONSTRUCTION SEQUENCE 1 ON DRAWING MO.02 AND MO.03, THERE ARE 11 BUILDING BRANCH CONNECTIONS THAT WILL NEED TO BE REPLACED IN ONE DOWNTIME PERIOD ALONG WITH ONE CITY WATER CONNECTION HEADER. THE REASON FOR THIS IS THAT THERE ARE NOT ENOUGH ISOLATION VALVES ON THE EXISTING 6-INCH HEADER TO SHUT DOWN THESE AREAS IN SECTIONS. THIS ONE LARGE SHUTDOWN WILL ALLOW FOR ONLY NEEDING TO DRAIN THE MAIN HEADER AT THIS END ONCE TO ACCOMPLISH THE CHANGEOVER. INSTALL NEW 8-INCH HEADER PIPING ON WALL ABOVE OR ADJACENT TO THE EXISTING 6—INCH CW PIPING IN ALL AREAS WHERE CLEARANCES AND LACK OF OBSTRUCTION ALLOW PIPE TO BE RUN. WHERE NEW BRANCH CONNECTIONS WILL BE, PROVIDE A TEE FOR BRANCH PIPING CONNECTIONS. THIS CAN BE ACCOMPLISHED FOR TIE-IN POINTS TP-2A, TP-2B, TP-2C, TP-2D, TP-2E, TP-3A AND TP-3D. IF PIPING IS OBSTRUCTED BY THE EXISTING BRANCH OR OTHER ITEM, PROVIDE A VALVE AND A BLIND FLANGE FOR THE MAIN 8-INCH PIPING ON EITHER SIDE OF THE OBSTRUCTION AND CONTINUE TO EXTEND PIPING TO THE END OF THE TUNNEL. PROVIDE ISOLATION VALVES WHERE INDICATED ON NEW DRAWINGS MO.02 AND MO.03. WHERE EXISTING BRANCH PIPING IS IN THE WAY OF NEW TEE PROVIDE TEMPORARY CAP AND VALVE ON EITHER END OF PIPE, FOR EASE OF TIE-IN AT A LATER POINT. NONE OF THE INSTALLED PIPING AT THIS POINT WILL CONTAIN WATER AND THE ENDS SHALL BE COVERED TO PREVENT WATER AND DEBRIS FROM CONTAMINATING THE PIPE. THE AMOUNT OF REMOVAL AND INSTALLATION REQUIRED TO DISCONNECT AND RECONNECT BRANCH TIE-INS TO BUILDING SHOULD BE MINIMIZED AS TO ACCOMPLISH ALL HEADER CONNECTIONS AT ONE TIME. IT IS ANTICIPATED THAT THREE OF THE BUILDING TIE-INS (TP-1A, TP-1B AND TP-1C) AT THE SOUTH END OF THE TUNNEL WILL NEED TO BE CONNECTED TO THE NEW HEADER AT THE LOCATION DEFINED ON THE DRAWINGS WHICH WILL NOT BE PERMANENTLY CONNECTED, BUT WILL REQUIRE A TEMPORARY CONNECTION TO FEED THAT HEADER (SEE DRAWING MO.02 FOR CONNECTION LOCATION.) THE 6" CW PIPING ON THE STAIRCASE AND THE PIPING LEADING TO MCARTHUR COURT TO THE 6-INCH TIE IN POINT TP-1C WILL NEED TO BE REMOVEED PRIOR TO THE INSTALLATION OF THE NEW HEADER IN THAT AREA AND THE BRANCH CONNECTION WILL NEED TO BE PERFORMED AFTER THE HEADER HAS BEEN REPLACED. ONCE ALL SECTIONS OF NEW HEADER AND BRANCH PIPING ARE INSTALLED. THE EXISTING 6-INCH SUPPLY WATER LINE CAN BE ISOLATED AT THE CLOSEST MAIN ISOLATION VALVE (AT INTERSECTION FOR STRAUB TUNNEL) AND DRAINED. ONCE THE CITY WATER LINE IS ISOLATED, THE HEADER IN THE TUNNEL SHALL BE REMOVEED AND REPLACED WITH A PREFABRICATED HEADER SHOWN ON DETAIL 12 ON DRAWING M3.02 THAT WILL REPLACE THE EXISTING AND SUPPLY THE NEW 8-INCH HEADER. REMOVE THE EXISTING 4-INCH PIPING CONNECTION TO MAIN HEADER SERVING TP-3B AND PROVIDE NEW HEADER IN ITS CURRENT LOCATION. THIS WORK MAY NOT BE ABLE TO BE FINISHED IN THE WEEKEND DOWN PERIOD, SO IT MAY REQUIRE A TEMPORARY CONNECTION IN WHICH CASE A TEE WILL NEED TO BE PROVIDED FOR EASE OF TRANSITION ONCE HEADER PIPING IS INSTALLED. AT THIS TIME, THE EXISTING BUILDING TIE-INS CAN BE REMOVEED AND CONNECTED TO THE NEW 8-INCH HEADER. BRANCH PIPING TIE-IN POINT TP-5A WILL NEED TO BE CONNECTED ONCE NEW HEADER WORK IS COMPLETED. HOWEVER IT IS AN IRRIGATION PIPE AND MAY BE DOWN FOR A LONGER PERIOD OF TIME. ONCE ALL WORK IN THIS SEQUENCE IS COMPLETED, MOVE ON TO SEQUENCE 2. DO NOT CONNECT THE NEW HEADER TO THE EXISTING 6-INCH

PHASE A - - SOUTH TUNNEL - MCARTHUR COURT TO COLOMBIA CROSSOVER (CONTINUED)

- 2. CONSTRUCTION SEQUENCE 2 CONSISTS OF REMOVEING A STRETCH OF PIPING THAT IS SLOPED ALONG THE TUNNEL WHICH OBSTRUCTS THE ROUTING OF ANY NEW PIPING. ALL CONNECTIONS ASSOCIATED WITH CONSTRUCTION SEQUENCE 1 SHALL BE SELF-CONTAINED BY THE NEW SUPPLY HEADER. THE NORTH AND SOUTH ENDS OF PIPING MAIN WILL NOT BE CONNECTED AND ARE SUPPLIED BY HEADERS ON EITHER END OF THE TUNNEL. THE SECTION OF PIPING IN THIS AREA CAN BE ISOLATED AND REMOVEED WITHOUT ANY DOWNTIME SINCE IT DOES NOT SERVE ANY BRANCH PIPING. AFTER EXISTING 6-INCH HEADER PIPING IS REMOVEED. INSTALL NEW 8-INCH HEADER PIPING IN ITS PLACE. PROVIDE TEMPORARY SHUTDOWN TO THE BUILDING SUPPLY TIE-IN POINT TP-6A. REPLACE PIPING AND ISOLATION VALVES IN THIS AREA AND ROUTE NEW 8-INCH HEADER THROUGH THE TUNNEL CROSSING. ONCE PIPING AND BRANCHES ARE IN PLACE, REMOVE TEMPORARY PIPING TO TP-6A AND CONNECT TO THE NEW HEADER.
- 3. CONSTRUCTION SEQUENCE 3 CONSISTS OF ROUTING THE NEW 8-INCH HEADER IN MAIN AREAS ABOVE EXISTING 6-INCH MAIN. PROVIDE TIE-INS TO BUILDINGS STARTING WITH FOOD SERVICES (TP-7A) WORKING NORTH TO THE EMU (TP-8A). PROVIDE SHUTDOWNS AS REQUIRED TO CHANGE OVER BUILDING TIE-INS FROM THE OLD TO THE NEW HEADER. REMOVE ANY MISCELLANEOUS HEADER AND BRANCH PIPING AS REQUIRED. AS SECTIONS OF HEADER ARE ADDED AND AS BUILDINGS ARE TIED INTO THE SYSTEM, PROVIDE PRESSURE TESTING AND FLUSHING AS REQUIRED BY THE SPECIFICATIONS.

PHASE B - NORTH TUNNEL - LAWRENCE TO COLOMBIA CROSSOVER

IF PHASE A IS COMPLETED FIRST, START WITH CONSTRUCTION SEQUENCE 4 NEXT. IF PHASE B IS STARTED FIRST, START WITH CONSTRUCTION SEQUENCE 7 AND WORK BACKWARDS FROM 7 TO 1. SOME TIE-INS AND TEMPORARY PIPING SEQUENCES MAY

- 4. SEQUENCE 4 CONSISTS OF REMOVING PIPING CONNECTIONS TO COLUMBIA CROSSOVER TUNNEL FROM THE EXISTING MAIN, PROVIDING A NEW TIE-IN POINT FOR VOLCANOLOGY HALL ON THE NEW 8-INCH HEADER AND PROVIDING A NEW CONNECTION FROM THE 4-INCH CITY WATER SUPPLY HEADER LOCATED ACROSS THE COLUMBIA CROSSOVER TUNNEL. PROVIDE TEMPORARY PIPING FOR VOLCANOLOGY TIE-IN POINT (TP-10A) ON NEW 8" HEADER WHILE 3-INCH BRANCH PIPING IS BEING REMOVEED TO MAKE ROOM FOR NEW 8-INCH HEADER. ROUTE NEW 8-INCH HEADER THROUGH ENTIRE SECTION OF TUNNEL. ISOLATION VALVES FOR THIS AREA ARE LOCATED ON THE MAIN LINE NEAR THE TAKEOFF FOR PACIFIC HALL TIE-IN POINT TP-11A. REMOVE ALL WATER PIPING IN THE COLUMBIA CROSSOVER TUNNEL AS INDICATED ON THE REMOVAL DRAWING. THE CITY WATER CONNECTION TO THE 8-INCH SUPPLY HEADER DOES NOT REQUIRE A SHUTDOWN SINCE THE SUPPLY HEADER DOES NOT REQUIRE SUPPLY FROM THIS PIPE TO MAINTAIN SERVICE TO BUILDINGS CONNECTED TO IT. ROUTE NEW CITY WATER CONNECTION FROM FRIENDLY THROUGH COLUMBIA CROSSOVER TUNNEL TO NEW 8-INCH MAIN AS OTHER WORK IS BEING ACCOMPLISHED. RECONNECT VOLCANOLOGY TO 8-INCH MAIN ONCE THE MAIN HAS BEEN EXTENDED DOWN TO THE EDGE OF SEQUENCE 4. FOR THE MULTIPLE ABANDON EXISTING BURIED IRRIGATION PIPING CONNECTIONS. PROVIDE PERMANENT CAP WHERE PIPING EXITS THE TUNNEL
- 5. SEQUENCE 5 CONSISTS OF EXTENDING THE 8-INCH SUPPLY HEADER FROM THE CONNECTION POINT IN CONSTRUCTION SEQUENCE 4 TO THE BRANCH TIE-IN POINT TP11A FOR PACIFIC HALL. THE EXISTING INSTALLATION SUPPLIES THIS BRANCH FROM A SECONDARY 4-INCH HEADER THAT PARALLELS THE EXISTING 6-INCH HEADER. BOTH 4-INCH AND 6-INCH PIPING WILL BE REMOVEED IN THIS PHASE, BUT THE 8-INCH HEADER CAN BE EXTENDED TO PACIFIC ABOVE THE EXISTING 6-INCH HEADER AND A BRANCH TIE-IN POINT CAN BE INSTALLED BEFORE EITHER HEADER IS REMOVEED. WHERE OBSTRUCTIONS PREVENT THE 8-INCH HEADER FROM BEING EXTENDED SUCH AS WHERE THE 4-INCH PARALLEL HEADER TAKES OF THE MAIN 6-INCH HEADER, PROVIDE A VALVE AND A BLIND FLANGE FOR USE IN CONNECTING THE SYSTEM ONCE THE HEADER CAN BE REMOVEED DURING THE SHUTDOWN. AFTER THE 8-INCH HEADER IS IN PLACE, THE BUILDING CAN BE SHUT DOWN AND THE EXISTING CONNECTION CAN BE ISOLATED AND REMOVEED AND THE NEW TIE-IN CAN BE MADE AND THE 8-INCH HEADER PIPING CAN BE CONNECTED. REMOVE ANY MISCELLANEOUS HEADER AND BRANCH PIPING. PROVIDE A CAP ON THE END OF THE REMOVEED 4-INCH PARALLEL HEADER TO MAINTAIN WATER SUPPLY TO THE 2-INCH BRANCH CONNECTION TO LAWRENCE
- 6. SEQUENCE 6 CONSISTS OF REMOVING ALL PIPING IN THE AREA INDICATED WITHIN THE DASHED LINE ON DRAWING MO.02 AND REPLACING WITH THE NEW 8-INCH HEADER AND PROVIDING CONNECTIONS TO THE BRANCH TIE-INS. THIS WILL REQUIRE ONLY ONE BRANCH (TP-13A) TO RECEIVE A TEMPORARY CONNECTION FROM A TEE ON THE EXISTING MAIN SUPPLY HEADER LABELED AS FLAG NOTE THREE IN THE AREA OF CONSTRUCTION SEQUENCE 7. EXISTING 6-INCH VALVING SEPARATES CONSTRUCTION SEQUENCE 6 FROM 7 AND SHALL BE USED TO ISOLATE THE TWO. WATER IS NOT REQUIRED TO BE PROVIDED TO THE 4-INCH CPS CONNECTION (TP-14A) DURING THIS TIME AS IT IS USED FOR SPRAY DOWN PURPOSES IN THE TUNNEL. THE 3-INCH IRRIGATION PIPING IS BEING PERMANENTLY CAPPED AND ABANDONED WHERE THE PIPE EXITS THE TUNNEL REMOVE EXISTING 6-INCH HEADER IN THIS AREA PRIOR TO ROUTING THE NEW 8-INCH SINCE THE 6-INCH PIPING IS OBSTRUCTING THE PATH FOR THE NEW 8-INCH HEADER. PROVIDE LAWRENCE HALL BUILDING TIE-IN (TP-13A) TO THE NEW 8-INCH HEADER. PROVIDE CAPPED PIPING CONNECTION FOR FUTURE IRRIGATION USE. RECONNECT CPS SUPPLY BRANCH TP-14A WHEN NEW 8-INCH HEADER AND BRANCH PIPING IS INSTALLED. REMOVE ANY MISCELLANEOUS HEADER AND BRANCH
- 7. SEQUENCE 7 CONSISTS OF REPLACING THE EXISTING CITY WATER SUPPLY HEADER. THE MAIN SUPPLY PIPING AND THE BRANCH CONNECTIONS. ROUTE NEW 8-INCH HEADER IN MAIN AREAS ABOVE EXISTING 6-INCH MAIN. REPLACE MAIN 8-INCH CITY WATER TIE-IN TO NEW HEADER, KEEPING EXISTING 6-INCH HEADER IN SERVICE AS WELL AS SUPPLYING WATER TO NEW 8-INCH HEADER. REMOVE NECESSARY BRANCH PIPING TO CONNECT NEW HEADER SECTIONS. PROVIDE TEMPORARY PIPING TO SUPPLY LAWRENCE HALL TIE-IN POINT 13B AND 13C AND TO THE WEST TUNNEL 13D BY CONNECTING TO THE EXISTING 6-INCH SUPPLY HEADER. ONCE THE TEMPORARY PIPING IS IN PLACE, THE EXISTING CITY WATER SUPPLY HEADER CAN BE REMOVEED AND REPLACED. ONCE THIS HEADER IS REPLACED, CONNECT IT TO THE 8-INCH HEADER EFFECTIVELY CONNECTING THE WHOLE SYSTEM. ROUTE NEW 6-INCH SUPPLY HEADER WEST OF THE NEW CITY WATER TIE-IN TOWARDS TP-13B, TP-13-C AND TP-13D. REPLACE EXISTING BRANCHES IN PLACE DURING SHUTDOWN. REMOVE ALL MISCELLANEOUS WATER PIPING IN THE AREA.
- CONSTRUCTION SEQUENCES AND COMPONENTS HAVE BEEN IDENTIFIED IN THE PHASES ABOVE AND ON THE DRAWINGS, HOWEVER, EXTRA TEES, VALVING AND TEMPORARY PIPING MAY BE REQUIRED FOR EASE OF INSTALLATION OR TO MINIMIZE BUILDING DOWNTIME. PROVIDE THESE COMPONENTS AS REQUIRED TO ACCOMPLISH THE REPLACEMENT OF HEADER AND BRANCH PIPING WITH-IN THE DOWNTIME CONSTRAINTS. FOR BUILDING SHUTDOWNS, WHERE EXISTING ISOLATION VALVES IN THE TUNNELS TO BUILDINGS ARE NOT AVAILABLE, ISOLATE AT NEAREST VALVE INSIDE THE BUILDING. WHERE ISOLATION FOR THE SEQUENCES ABOVE IS NOT IDENTIFIED, FIND THE NEAREST VALVE TO ISOLATE THE SYSTEM. IT IS UNCLEAR IF EXISTING ISOLATION VALVES ARE OPERABLE AND WILL HOLD WATER. IF VALVES FAIL, PROVIDE A METHOD FOR USING A TEMPORARY ISOLATION MEASURE.

DRAWINGS

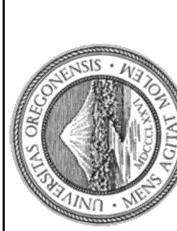
DRAWINGS IN THIS SUBMITTAL INCLUDE PIPING DIAGRAMS AND TUNNEL BACKGROUND PLANS. MRO.02 SHOWS THE EXTENT OF THE PROPOSED PIPING REMOVALS. MO.02 AND MO.03 SHOW THE PROPOSED UPGRADES INCLUDING PROPOSED PHASING AND CONSTRUCTION SEQUENCES. DRAWING MO.03 ALSO SHOWS A SCHEDULE OF TIE-IN POINTS FROM THE TUNNEL TO THE BUILDINGS, INCLUDING SIZE. PHASE AND CONSTRUCTION SEQUENCE. DRAWING M1.01 THROUGH M1.07 SHOW THE TUNNEL PLAN VIEW DRAWINGS INDICATING LOCATION OF TIE-INS, CONSTRUCTION SEQUENCES AND GENERAL ROUTING OF PIPE.

1. SEE MO.01 FOR SYMBOLS. ABBREVIATIONS. AND GENERAL NOTES

LEGEND

REVISION

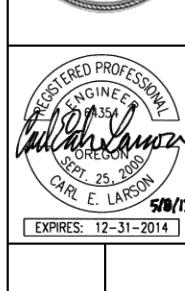
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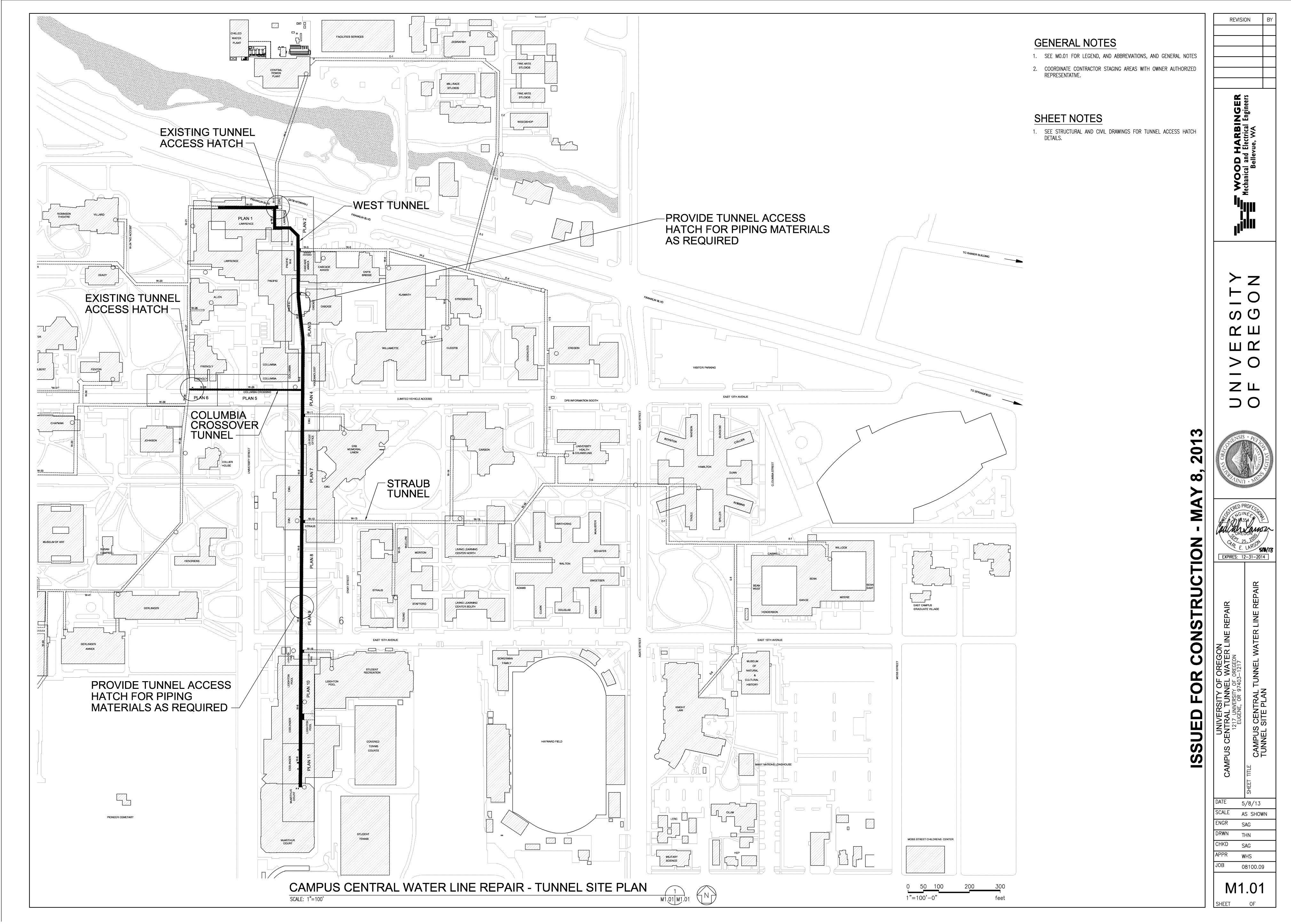
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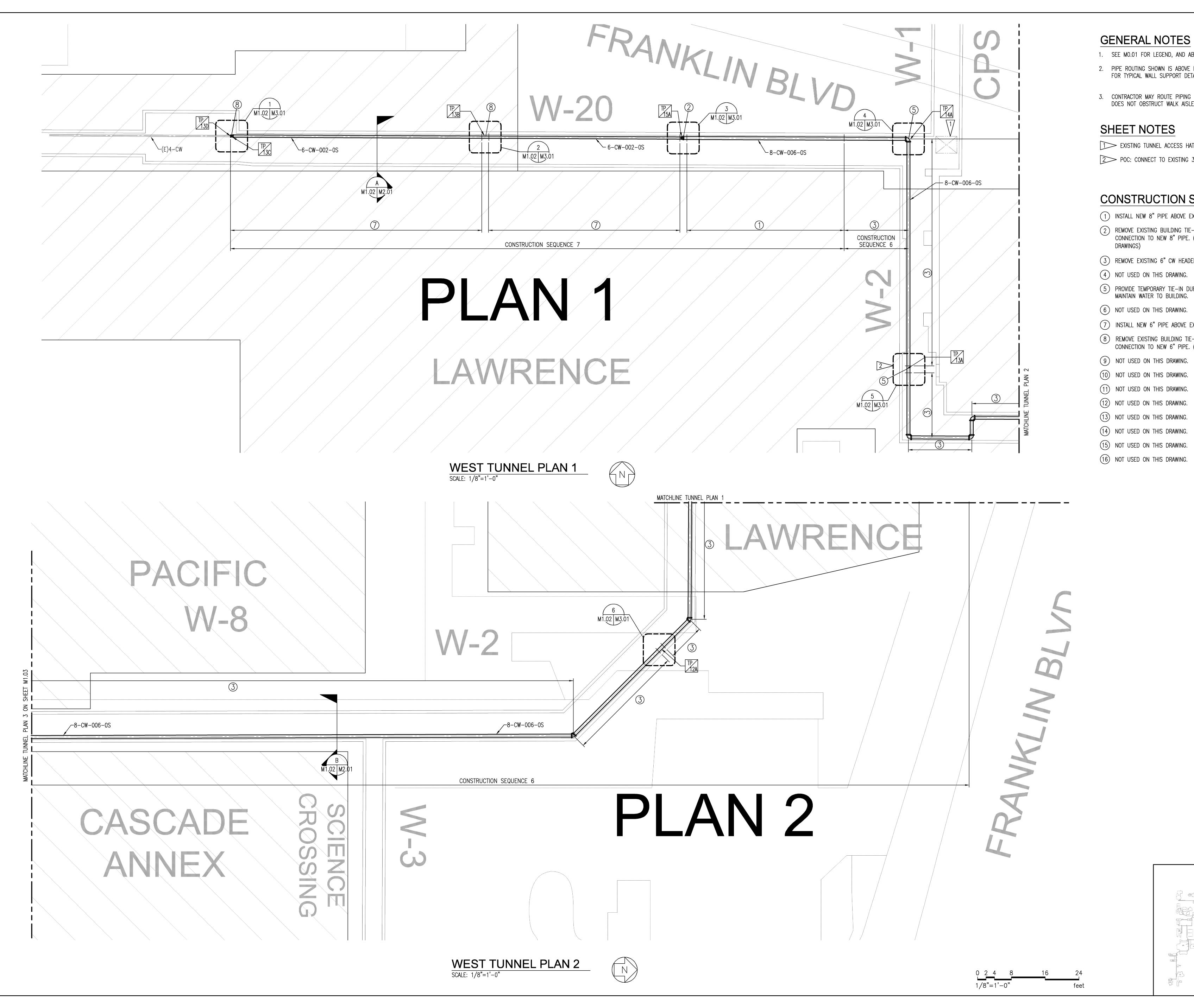




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1. SEE MO.01 FOR LEGEND, AND ABBREVIATIONS, AND GENERAL NOTES

2. PIPE ROUTING SHOWN IS ABOVE FLOOR AT WALL. SEE 18 M3.02

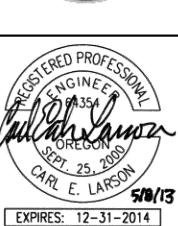
CONTRACTOR MAY ROUTE PIPING ELSEWHERE IN TUNNEL PROVIDED IT DOES NOT OBSTRUCT WALK AISLE OR ACCESS TO OTHER EQUIPMENT.

1 EXISTING TUNNEL ACCESS HATCH FROM DRIVEWAY ABOVE POC: CONNECT TO EXISTING 3-CW ABOVE 8-CW

CONSTRUCTION SEQUENCE NOTES

(1) INSTALL NEW 8" PIPE ABOVE EXISTING 6" CW PIPING.

- 2 REMOVE EXISTING BUILDING TIE-IN, PROVIDE NEW BUILDING CONNECTION TO NEW 8" PIPE. (SEE DETAILS ON M3.01 AND M3.02
- (3) REMOVE EXISTING 6" CW HEADER AND PROVIDE NEW 8" PIPING.
- 5 PROVIDE TEMPORARY TIE-IN DURING REMOVAL AS REQUIRED, TO MAINTAIN WATER TO BUILDING.
- (7) INSTALL NEW 6" PIPE ABOVE EXISTING 6" CW PIPING.
- 8 REMOVE EXISTING BUILDING TIE-IN, PROVIDE NEW BUILDING CONNECTION TO NEW 6" PIPE. (SEE DETAILS ON M3.01 DRAWINGS)



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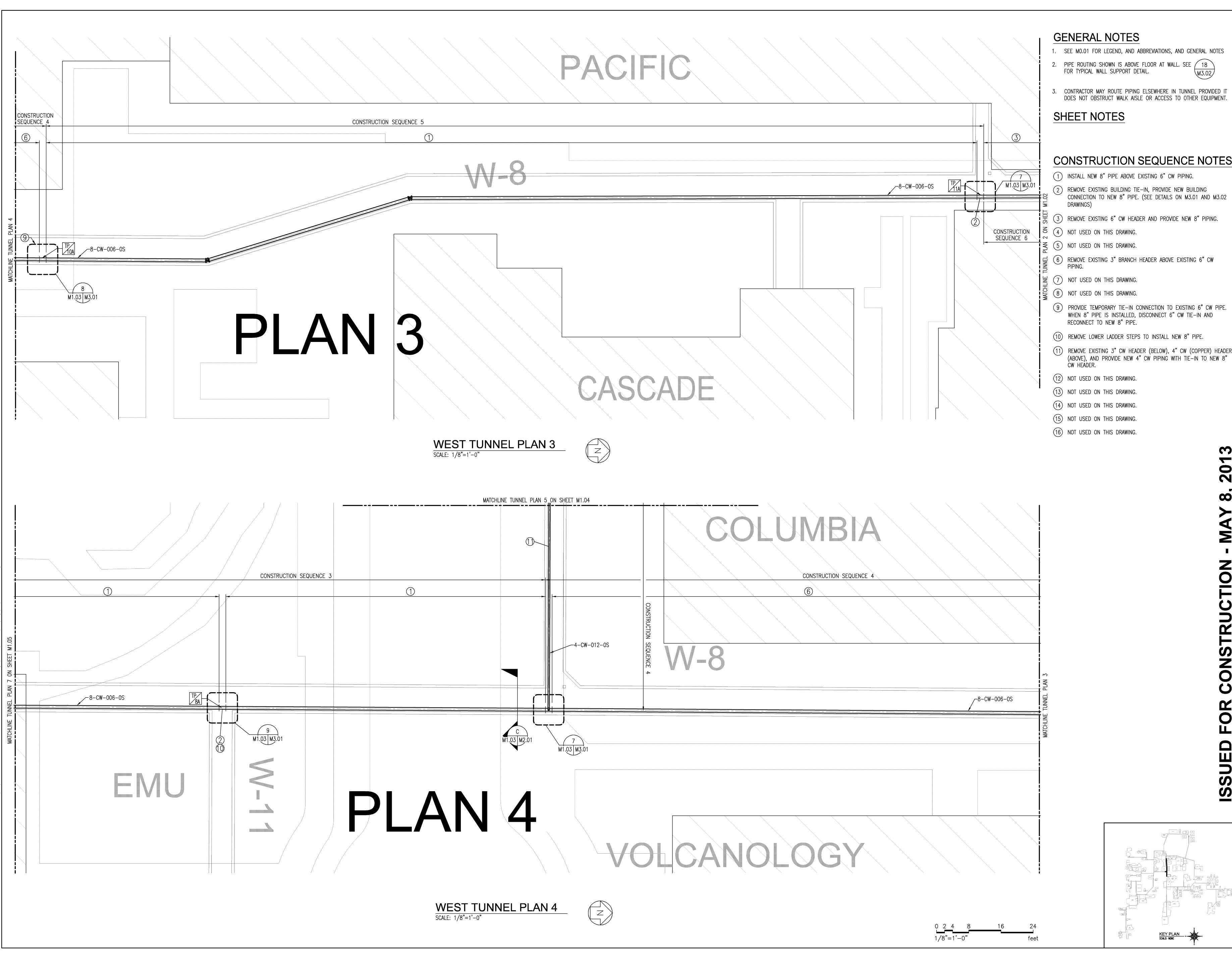
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M1.02



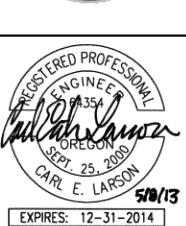
2. PIPE ROUTING SHOWN IS ABOVE FLOOR AT WALL. SEE
FOR TYPICAL WALL SUPPORT DETAIL.

M3.02

CONTRACTOR MAY ROUTE PIPING ELSEWHERE IN TUNNEL PROVIDED IT DOES NOT OBSTRUCT WALK AISLE OR ACCESS TO OTHER EQUIPMENT.

CONSTRUCTION SEQUENCE NOTES

- 2 REMOVE EXISTING BUILDING TIE-IN, PROVIDE NEW BUILDING CONNECTION TO NEW 8" PIPE. (SEE DETAILS ON M3.01 AND M3.02
- 岩 (3) REMOVE EXISTING 6" CW HEADER AND PROVIDE NEW 8" PIPING.
- WHEN 8" PIPE IS INSTALLED, DISCONNECT 6" CW TIE-IN AND
- REMOVE EXISTING 3" CW HEADER (BELOW), 4" CW (COPPER) HEADER (ABOVE), AND PROVIDE NEW 4" CW PIPING WITH TIE-IN TO NEW 8"

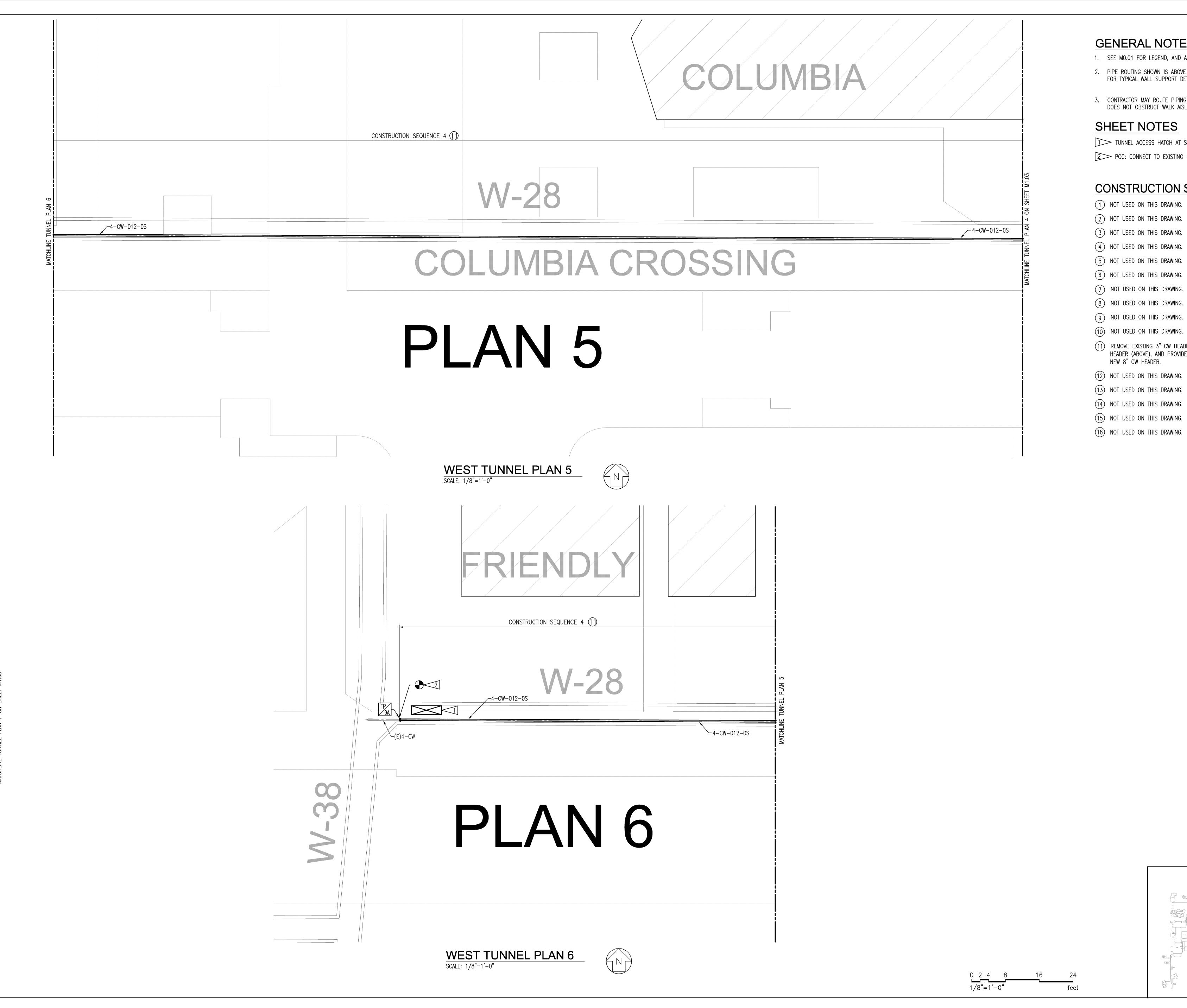


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M1.03



- 1. SEE MO.01 FOR LEGEND, AND ABBREVIATIONS, AND GENERAL NOTES
- 2. PIPE ROUTING SHOWN IS ABOVE FLOOR AT WALL. SEE 18
 FOR TYPICAL WALL SUPPORT DETAIL.

 M3.02
- 3. CONTRACTOR MAY ROUTE PIPING ELSEWHERE IN TUNNEL PROVIDED IT DOES NOT OBSTRUCT WALK AISLE OR ACCESS TO OTHER EQUIPMENT.

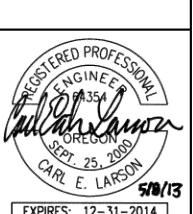
1 TUNNEL ACCESS HATCH AT SURFACE.

2 POC: CONNECT TO EXISTING 4-CW. PROVIDE BUTTERFLY VALVE.

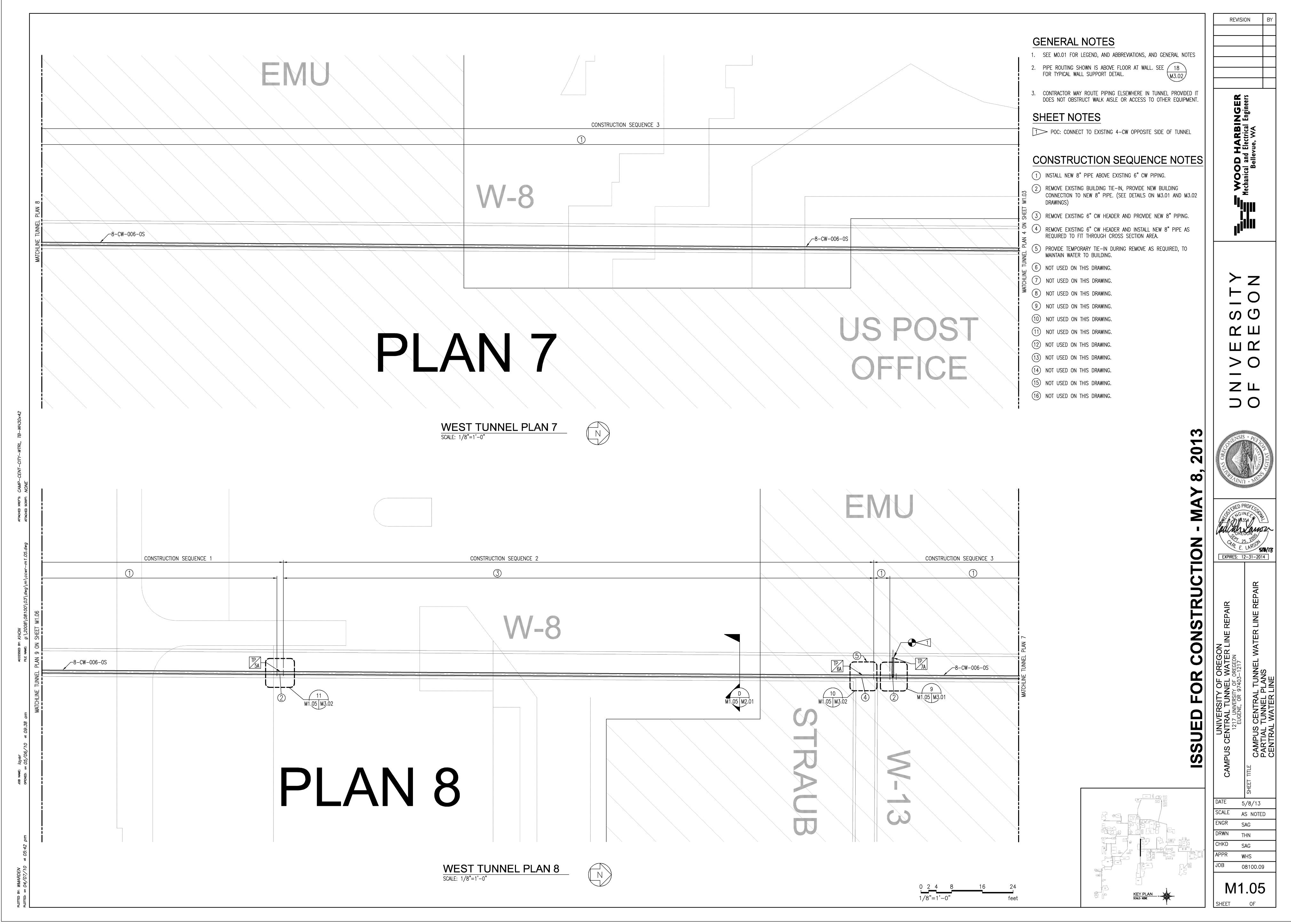
CONSTRUCTION SEQUENCE NOTES

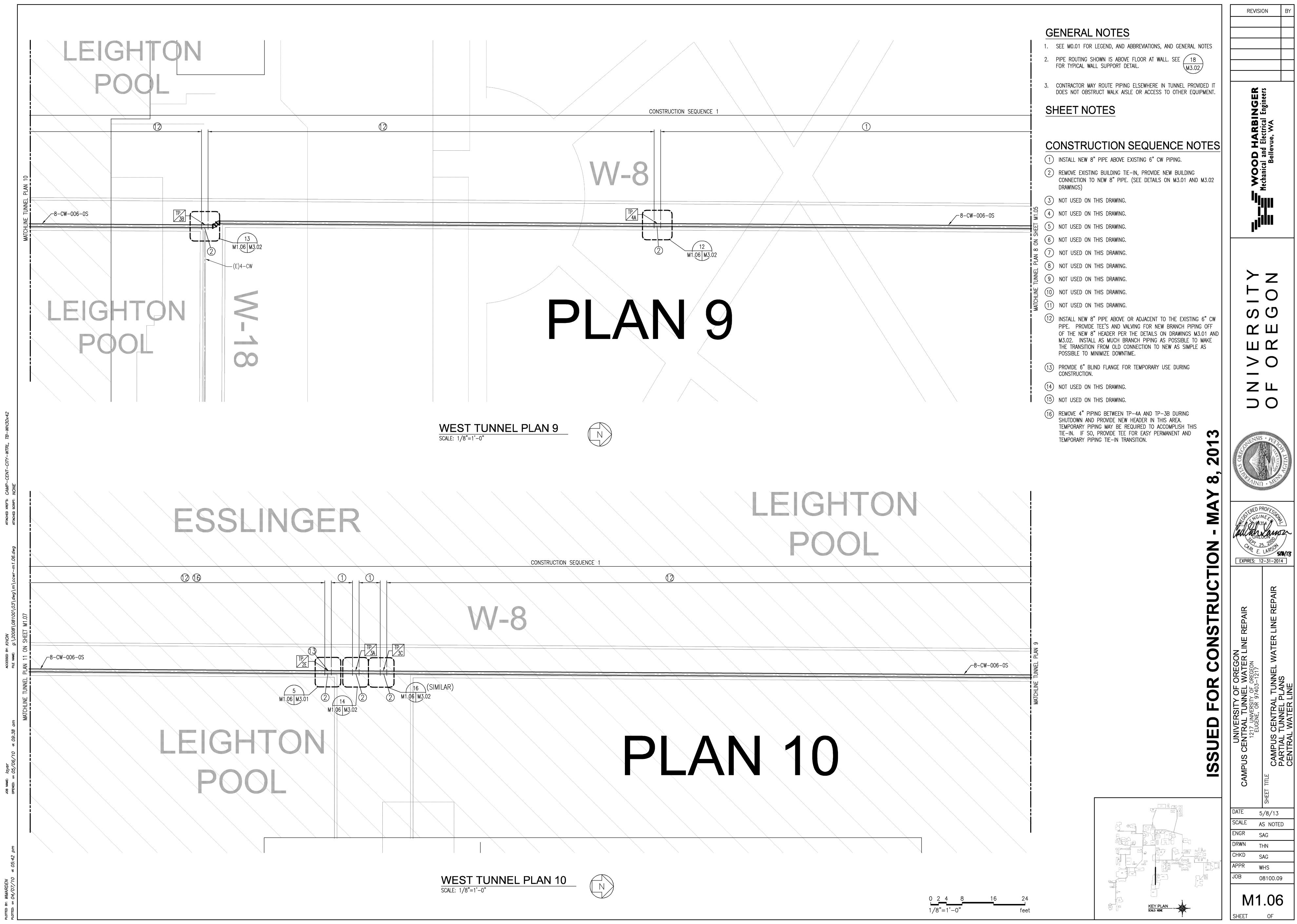
- (3) NOT USED ON THIS DRAWING.
- 5 NOT USED ON THIS DRAWING.
- (6) NOT USED ON THIS DRAWING.

- (10) NOT USED ON THIS DRAWING.
- (11) REMOVE EXISTING 3" CW HEADER (BELOW), 4" CW (COPPER)
 HEADER (ABOVE), AND PROVIDE NEW 4" CW PIPING WITH TIE-IN TO
 NEW 8" CW HEADER.



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WEST TUNNEL PLAN 11
SCALE: 1/8"=1'-0"



GENERAL NOTES

- 1. SEE MO.01 FOR LEGEND, AND ABBREVIATIONS, AND GENERAL NOTES
- 2. PIPE ROUTING SHOWN IS ABOVE FLOOR AT WALL. SEE 18
 FOR TYPICAL WALL SUPPORT DETAIL.

 M3.02
- CONTRACTOR MAY ROUTE PIPING ELSEWHERE IN TUNNEL PROVIDED IT DOES NOT OBSTRUCT WALK AISLE OR ACCESS TO OTHER EQUIPMENT.

SHEET NOTES

POC: CONNECT TO EXISTING 3-CW OPPOSITE SIDE OF TUNNEL POC: CONNECT TO EXISTING 2-CW OPPOSITE SIDE OF TUNNEL

CONSTRUCTION SEQUENCE NOTES

- 1) NOT USED ON THIS DRAWING.
- DEMO EXISTING BUILDING TIE-IN, PROVIDE NEW BUILDING CONNECTION TO NEW 8" PIPE. (SEE DETAILS ON M3.01 AND M3.02 DRAWINGS)
- 3 DEMO EXISTING 6" CW HEADER AND PROVIDE NEW 8" PIPING.
- 4 NOT USED ON THIS DRAWING.
- 5 NOT USED ON THIS DRAWING.
- (6) NOT USED ON THIS DRAWING.
- 7) NOT USED ON THIS DRAWING.
- (8) NOT USED ON THIS DRAWING.
- (9) NOT USED ON THIS DRAWING. (10) NOT USED ON THIS DRAWING.
- (11) NOT USED ON THIS DRAWING.
- (12) INSTALL NEW 8" PIPE ABOVE OR ADJACENT TO THE EXISTING 6" CW
- 13) NOT USED ON THIS DRAWING.
- DURING DEMOLITION OF ADJACENT PIPE, USE THIS LOCATION AS A POINT FOR TEMPORARY PIPING CONNECTION.

AS SIMPLE AS POSSIBLE TO MINIMIZE DOWNTIME.

- DURING DEMOLITION OF PIPING FROM STAIRCASE SOUTH TO 6" BRANCH USE THE NEW 8" HEADER TO PROVIDE A TEMPORARY TEE TO CONNECT WATER TO THE THREE BRANCHES TO MCARTHUR COURT.
- (16) NOT USED ON THIS DRAWING.

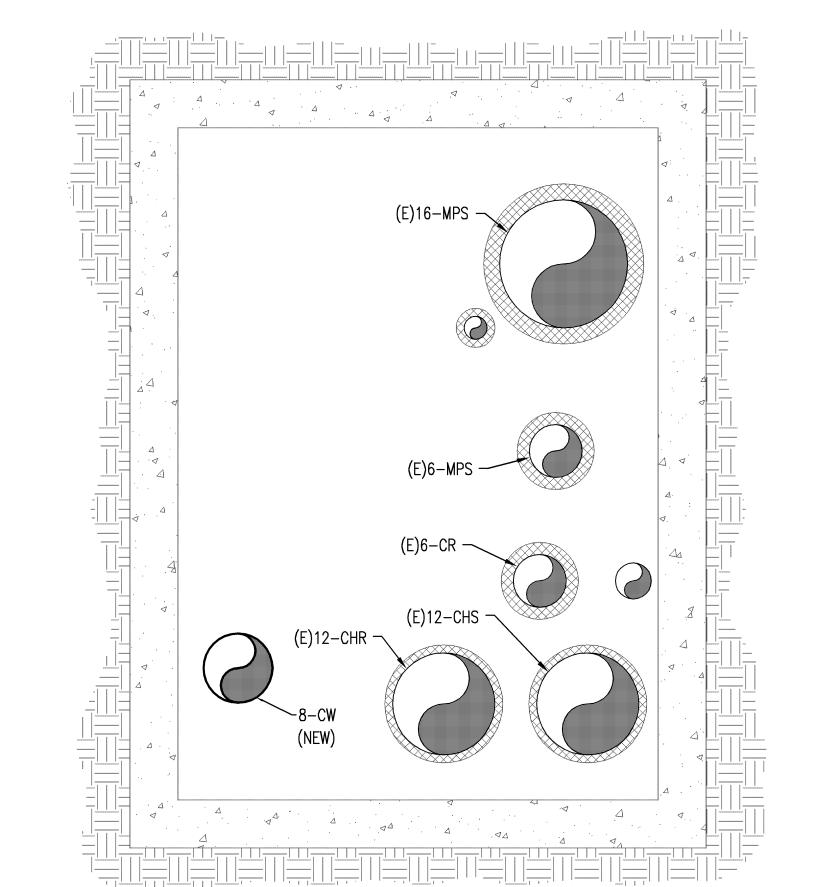


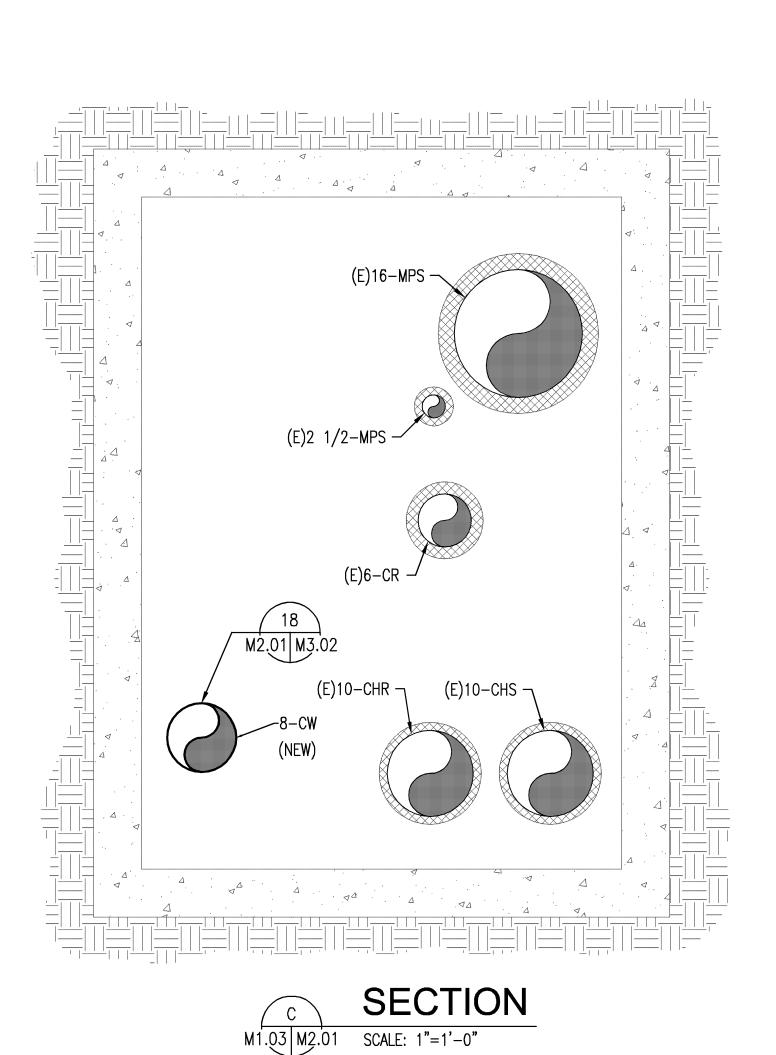
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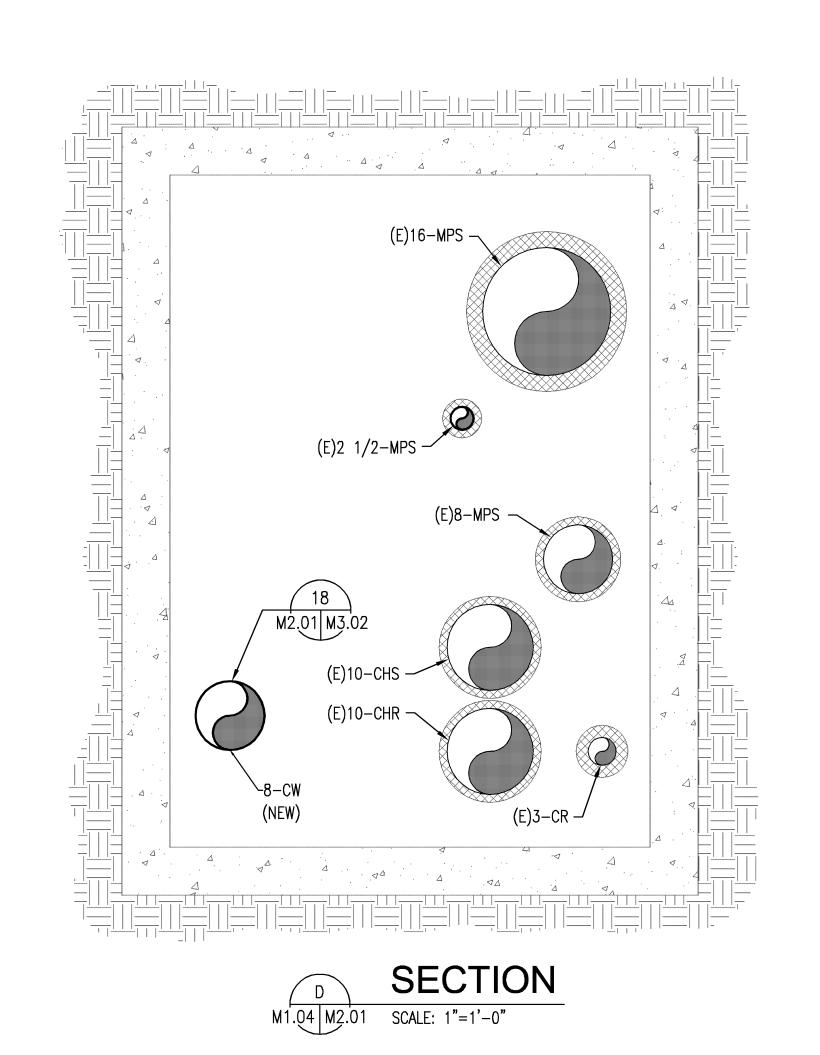




1. SEE MO.01 FOR LEGEND, AND ABBREVIATIONS, AND GENERAL NOTES







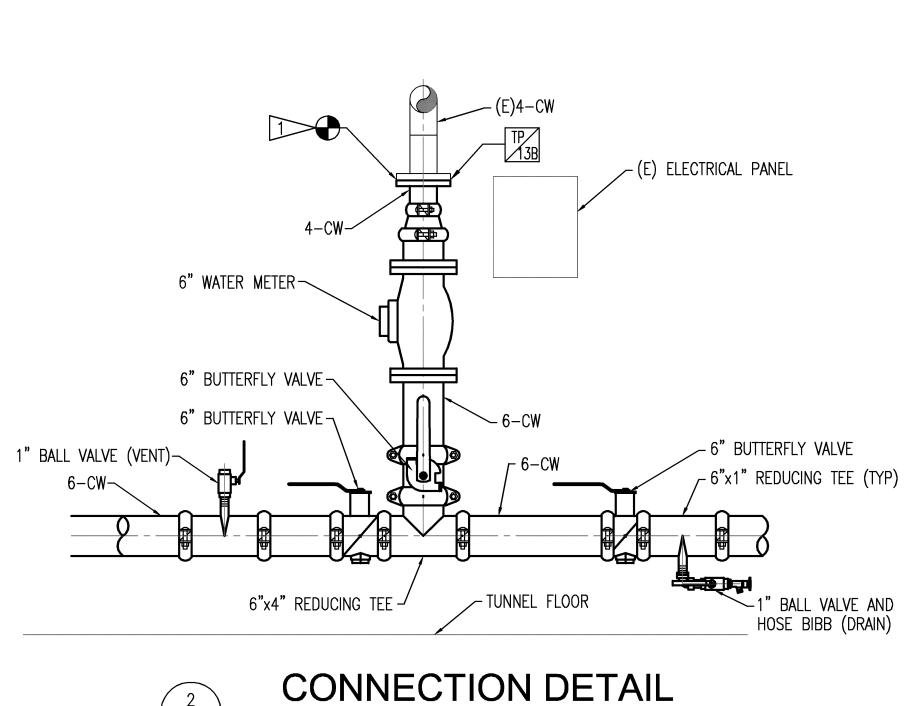
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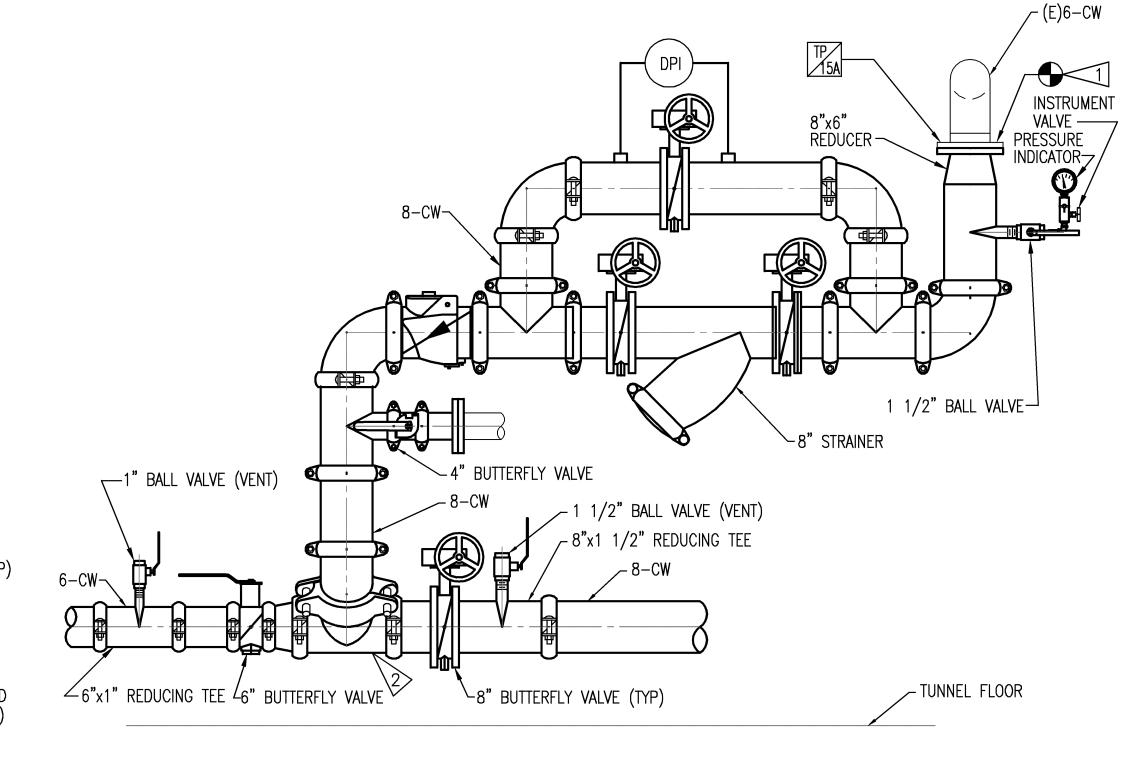
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M2.01



SCALE: 3/4"=1'-0"

M1.02 M3.01



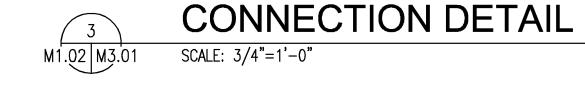
GENERAL NOTES

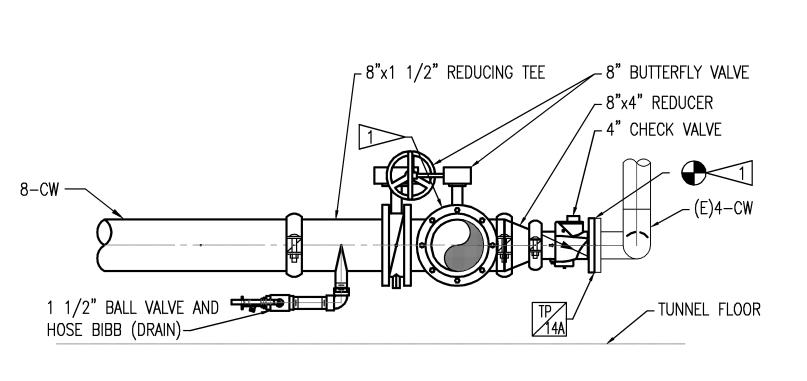
- SEE MO.01 FOR LEGEND, AND ABBREVIATIONS, AND GENERAL NOTES
- ALL VALVES AND TEE FITTINGS SHALL HAVE RIGID COUPLINGS

SHEET NOTES

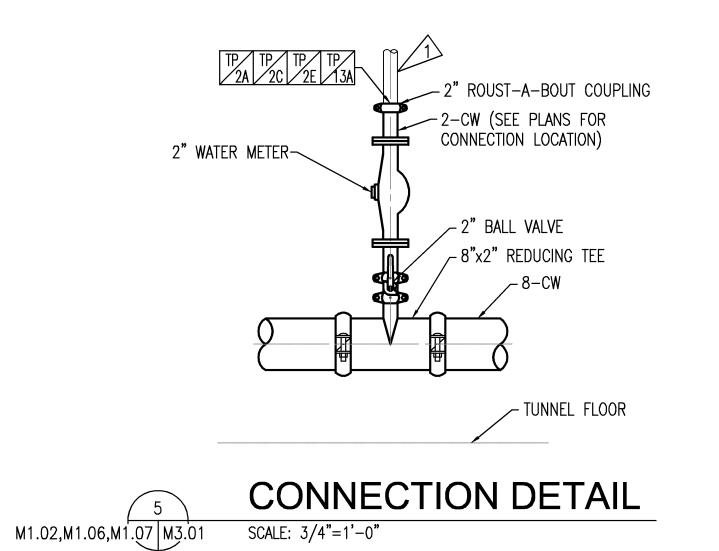
VERIFY LOCATION OF EXISTING PIPING POC AND PROVIDE PIPING PER MO.02 AND MO.03 TO SATISFY ACTUAL FIELD CONDITIONS

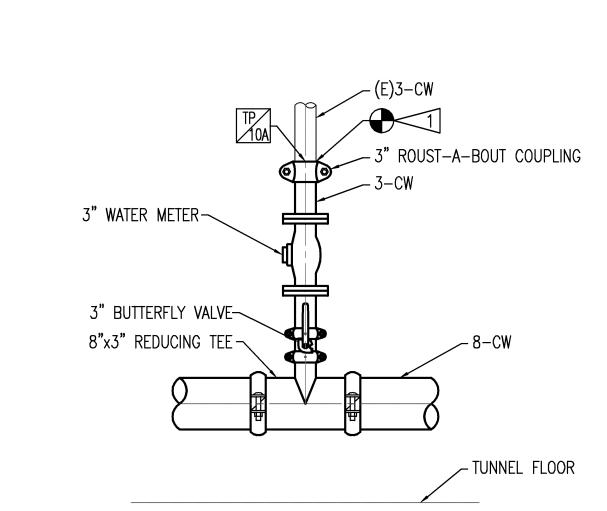
2 ROLL TEE AND ADD ELBOW TO MISS OBSTRUCTIONS ON WALL

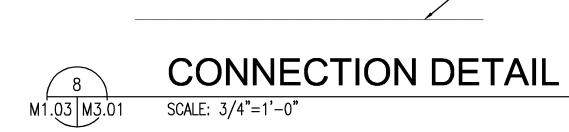


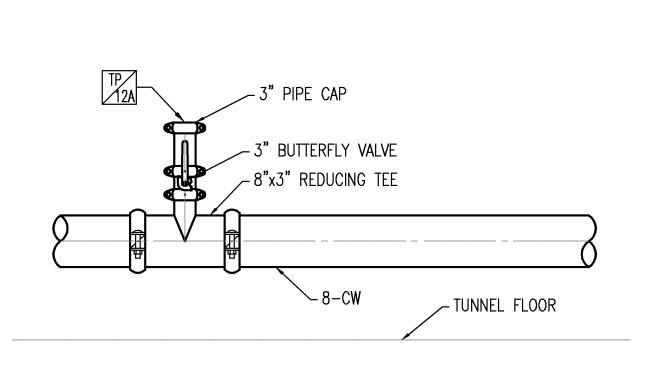


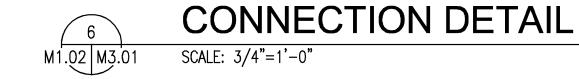


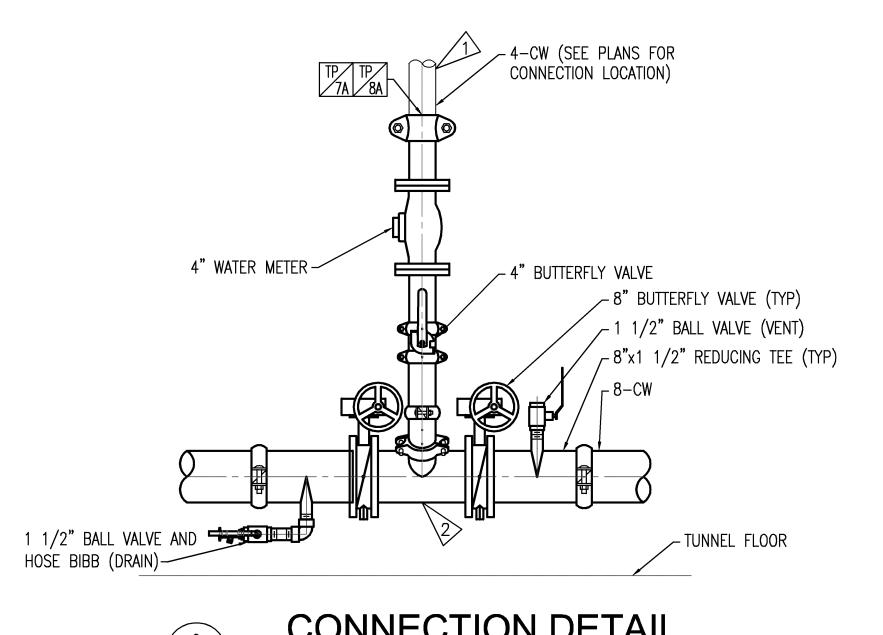












CONNECTION DETAIL SCALE: 3/4"=1'-0" M1.03,M1.05 M3.01

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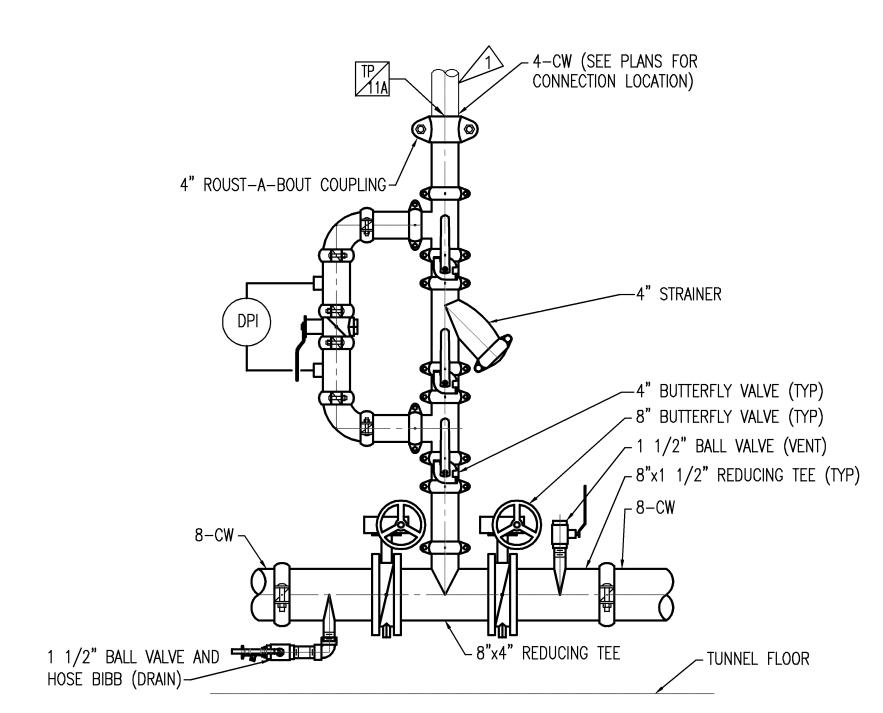
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M3.01 SHEET OF



CONNECTION DETAIL M1.03 M3.01 SCALE: 3/4"=1'-0"



1. SEE MO.01 FOR LEGEND, AND ABBREVIATIONS, AND GENERAL NOTES

2. ALL VALVES AND TEE FITTINGS SHALL HAVE RIGID COUPLINGS

SHEET NOTES

1 1/2" BALL VALVE

- TUNNEL FLOOR

-1 1/2" BALL VALVE (VENT)

VERIFY LOCATION OF EXISTING PIPING POC AND PROVIDE PIPING PER MO.02 AND MO.03 TO SATISFY ACTUAL FIELD CONDITIONS

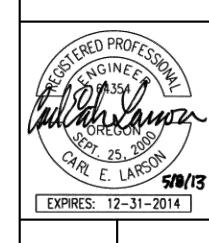
2>> ROLL TEE AND ADD ELBOW TO MISS OBSTRUCTIONS ON WALL

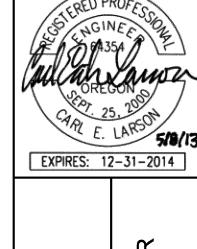


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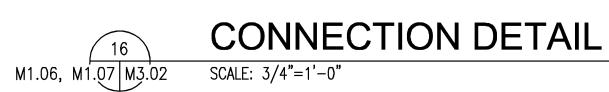
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M3.02 SHEET OF

(E)4-CW-

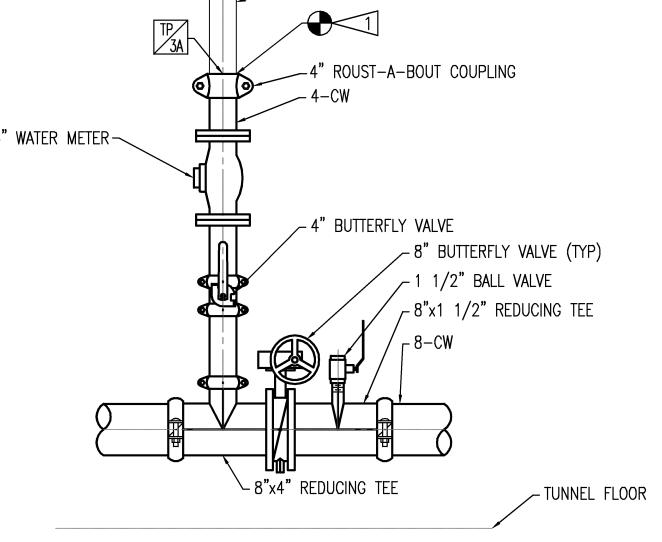


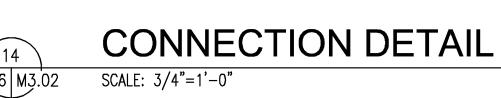
_4" WATER METER

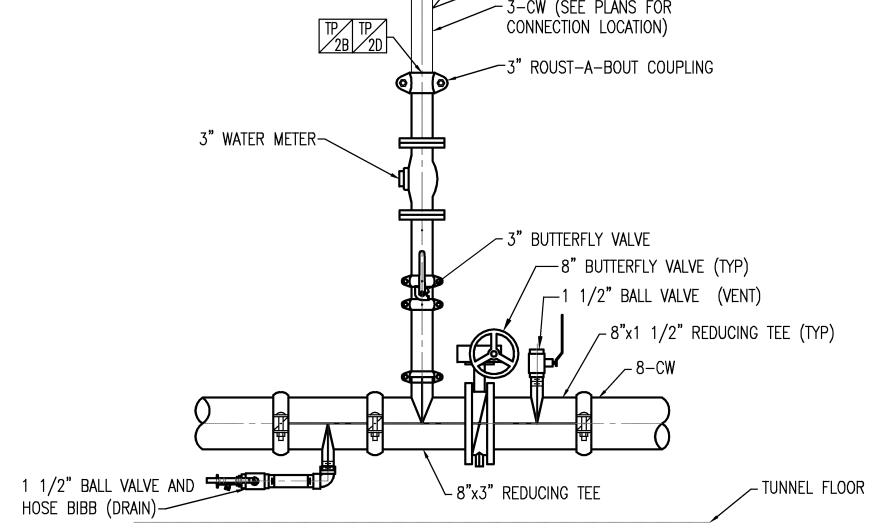
M1.06 M3.02

_ 4" BUTTERFLY VALVE

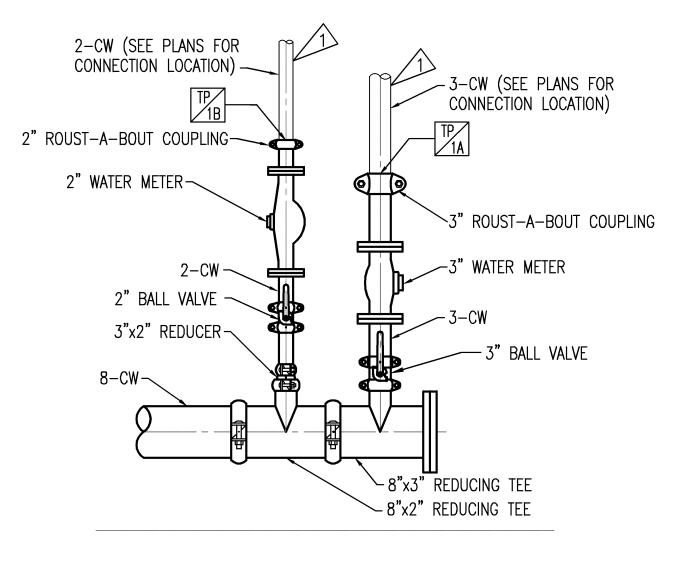
SCALE: 3/4"=1'-0"

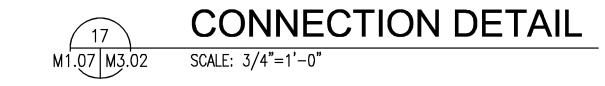


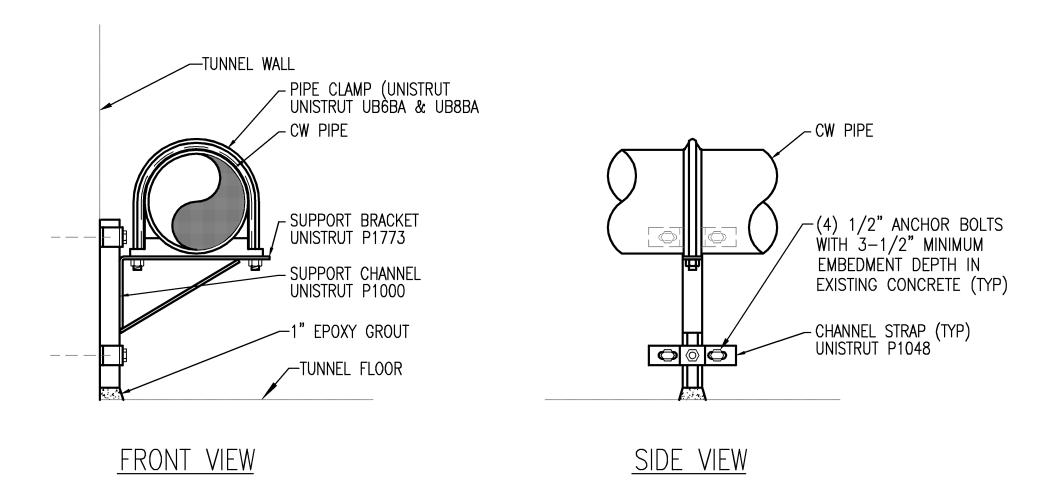




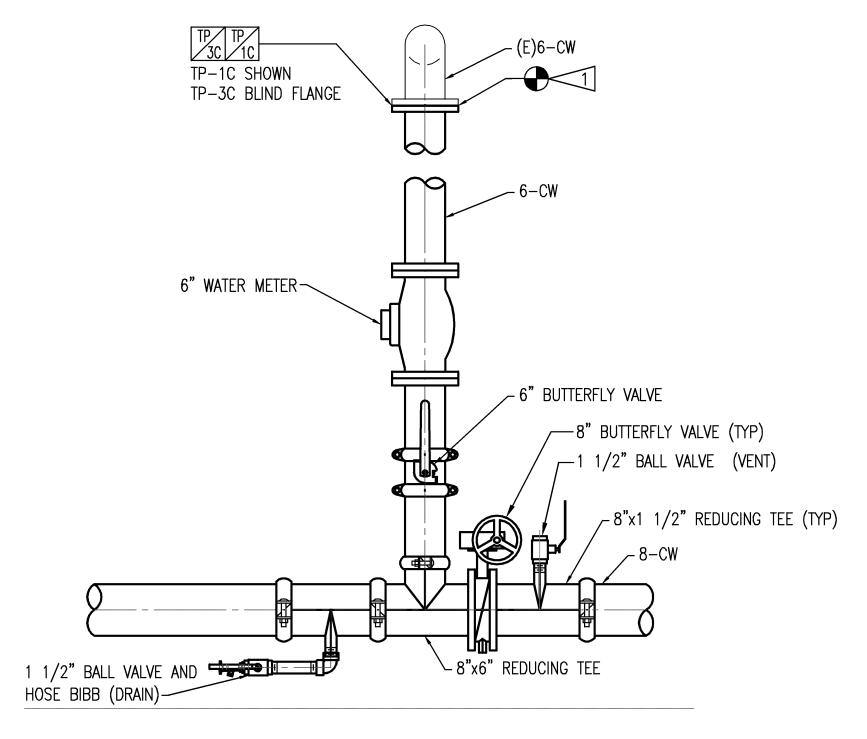
CONNECTION DETAIL M1.07 M3.02 SCALE: 3/4"=1'-0"







TYPICAL WALL SUPPORT DETAIL 18 M2.01 M3.02 SCALE: 1 1/2"=1'-0"



CONNECTION DETAIL

─ 8"x1 1/2" REDUCING TEE

-8"x4" REDUCING TEE