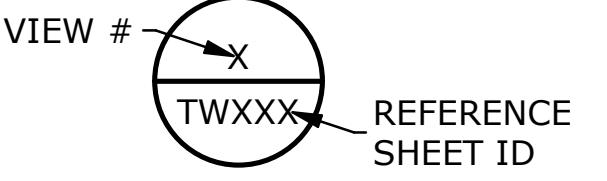


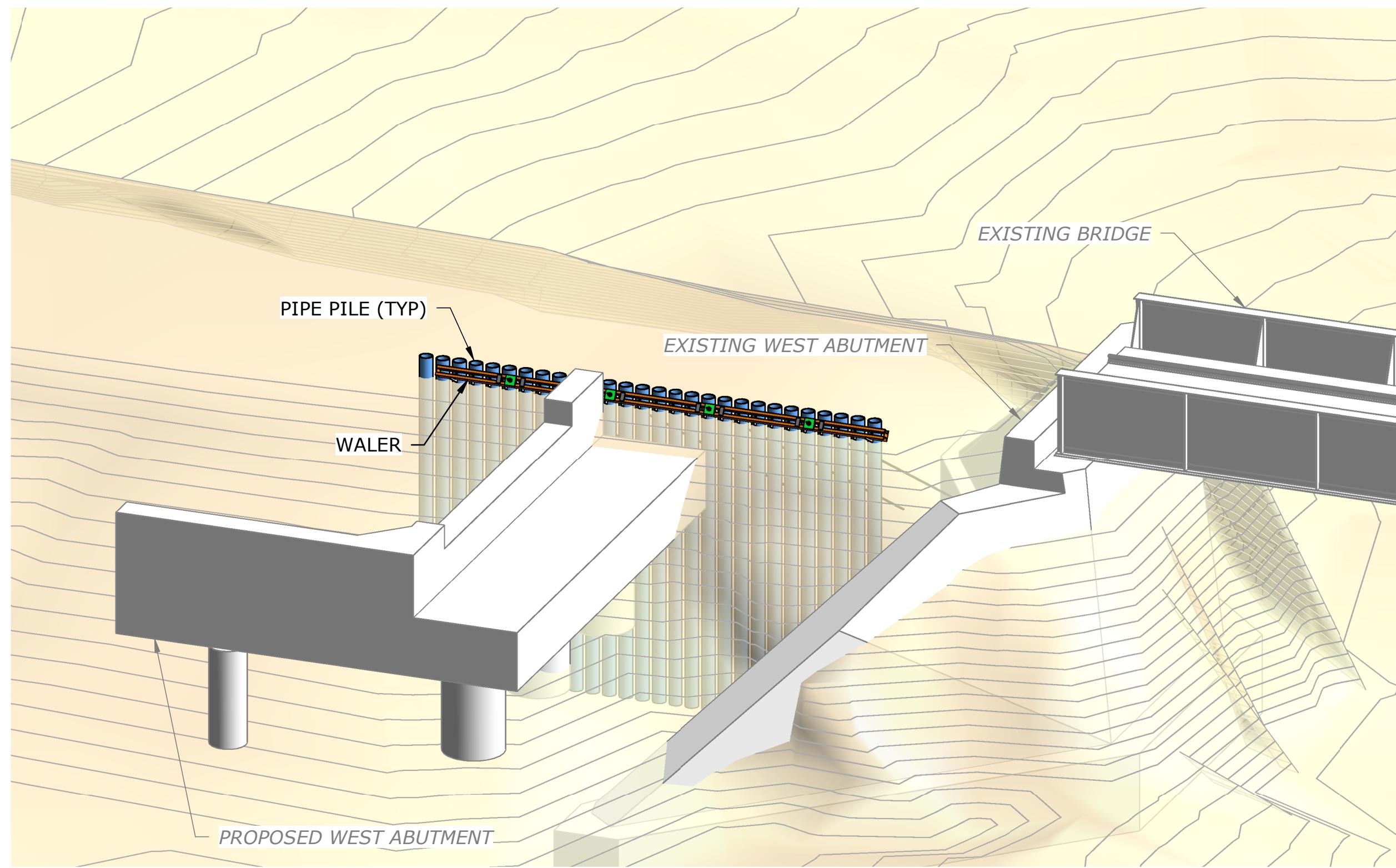
REFERENCE INDICATOR



SHEET INDEX

ID	TITLE
TW001	GENERAL NOTES & ISOMETRICS
TW002	PLANS
TW003	SECTIONS
TW004	GEOTECHNICAL MONITORING & WALER DETAILS

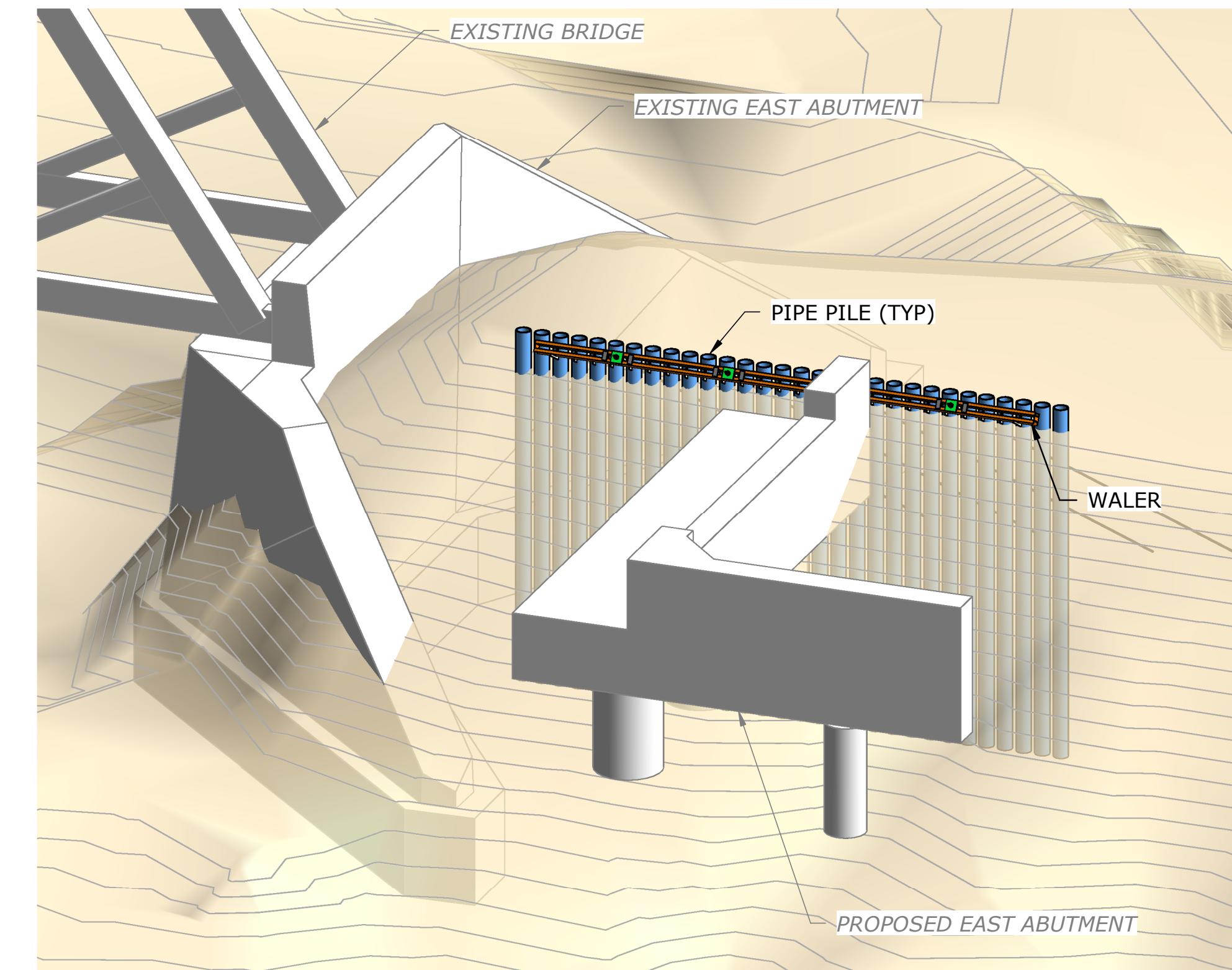
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WEST ABUTMENT ISOMETRIC

SCALE: NTS

NOTE: PERMANENT EMBANKMENT FILL IS NOT SHOWN FOR CLARITY



EAST ABUTMENT ISOMETRIC

SCALE: NTS

NOTE: PERMANENT EMBANKMENT FILL IS NOT SHOWN FOR CLARITY

GENERAL NOTES:

- KIEWIT ENGINEERING GROUP CANADA ULC (KEGC) IS THE ENGINEER OF RECORD AND IS HEREAFTER REFERENCED AS THE EOR. ALL ELEVATIONS IN METER.
- ALL DIMENSIONS AND UNITS ARE IN MILLIMETERS [ft-in] UNLESS NOTED OTHERWISE.
- ALL MANUFACTURED ITEMS SHALL BE INSTALLED PER MANUFACTURERS GUIDELINES AND SPECIFICATIONS, UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO COMMENCING WORK. ANY ERRORS, OMISSIONS, OR UNUSUAL CONDITIONS ARE TO BE REPORTED TO THE EOR IMMEDIATELY.
- EXISTING GEOTECHNICAL CONDITIONS:
 - GEOTECHNICAL DESIGN PARAMETERS AND CONDITIONS ARE BASED ON THE FOLLOWING REPORT, 'BRIDGE OVER ZANARDI RIVER, FACTUAL GEOTECHNICAL REPORT,' PREPARED BY STANTEC (2024).
 - THE EXISTING SUBGRADE IS EXPECTED TO CONSIST OF 6.7 to 9.0 m OF GRAVEL FILL WITH OCASSIONAL COBBLES, UNDERLAIN BY MEDIUM STRONG TO STRONG PHYLLITE/SCHIST BEDROCK.
 - THE DESIGN GROUNDWATER ELEVATION IS 2.3 m GEODETIC.
- TEMPORARY PILE SHORING WALLS ARE DESIGNED FOR USE BY KIEWIT (CONTRACTOR) ONLY THROUGH THE DURATION OF THE ZANARDI RAIL BRIDGE EXPANSION PROJECT.
- DESIGN SPECIFICATIONS AND CODES:
 - CANADIAN FOUNDATION ENGINEERING MANUAL (2023)
 - AREMA MANUAL FOR RAILWAY ENGINEERING (2015)
 - CN RAIL DESIGN CRITERIA FOR SHORING WALLS SUBMITTED BY THE CONSULTANT/CONTRACTOR (2011)
- DESIGN LOADS:
 - COOPER E90 SURCHARGE LOAD:
 - 108 kPa ON THE RAILROAD TIES

- MATERIALS & INSTALLATION:
 - PILES: ASTM A252 GRADE 3, OR GREATER
 - CHANNELS: CSA G40.21 350W or ASTM A572 GRADE 50
 - PLATES: CSA G40.21 350W or ASTM A572 GRADE 50
 - ANCHOR TENDONS: DYWIDAG T52N HOLLOW BARS, MINIMUM YIELD STRENGTH OF 730 kN [164.1 kip], OR APPROVED EQUIVALENT
 - ANCHOR CENTRALIZERS: SCHEDULE 20 OR 40 PVC AT MAXIMUM 2.0 m SPACING ALONG THE LENGTH OF THE TENDON, OR MAXIMUM 0.45 m AT EACH END OF THE TENDON, AND SECURED TO PREVENT SLIDING
 - GROUT: MICROSIL ANCHOR GROUT WITH MINIMUM 3-DAY COMPRESSIVE STRENGTH OF 28 MPa, AND MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 35 MPa
 - WELDS: CSA W59 AND W47.1 OR AWS D1.1 WITH E49XX ELECTRODE STRENGTH
 - PILES SHALL BE DRILLED WITH DOWNHOLE HAMMER, TO DESIGN TIP ELEVATIONS AS PER THE DRAWINGS.
 - PILES SHALL BE INSTALLED AT CENTRE-TO-CENTRE SPACING AS PER THE DRAWINGS.
 - PILES SHALL BE PLACED WITHIN +/-50 mm IN RELATION TO THE PILE WALL ALIGNMENT SHOWN IN THE DRAWINGS.
- CONTRACTOR SHALL ONLY USE DIMENSIONS INDICATED ON DRAWINGS. DO NOT SCALE DRAWINGS.
- CONTRACTOR SHALL CONTACT THE EOR FOR VERIFICATION PRIOR TO ANY SUBSTITUTIONS, DELETIONS, OR ADDITIONS.
- SUBMITTALS:
 - THE CONTRACTOR SHALL SUBMIT THE PROPOSED LOAD TESTING EQUIPMENT, INCLUDING CERTIFIED CALIBRATION RECORDS FOR EACH SET OF JACKING EQUIPMENT, AND TESTING CURVES FOR STRESS MEASUREMENT GAUGES WHICH SHOW THAT THE GAUGES HAVE BEEN CALIBRATED FOR THE JACK(S) FOR WHICH THEY ARE USED.

- CONSTRUCTION SEQUENCE:
 - PLACE EMBANKMENT FILL TO DESIGN GRADE AS PER THE OWNER ENGINEER'S DRAWINGS, OR LOWER TO INSTALL THE CN BRIDGE ABUTMENT PILES AND SHORING PILES.
 - PRIOR TO INSTALLING PILES, CONTRACTOR SHALL IDENTIFY ALL UNDERGROUND UTILITIES AND BRING TO THE ATTENTION OF THE EOR.
 - INSTALL SHORING PILES.
 - EXCAVATE TO 0.6 m BELOW UNDERSIDE OF WALER.
 - INSTALL THE ANCHORS AND WALER.
 - COMPLETE REQUIRED PROOF AND PERFORMANCE TESTING ON THE ANCHORS.
 - EXCAVATE TO DESIGN ABUTMENT SUBGRADE ELEVATION, WITH 1.5H : 1.0V SLOPES AS SHOWN IN DW TW003, OR AS APPROVED BY THE EOR.
 - PLACE BRIDGE ABUTMENT PHASE I CONCRETE.
 - BACKFILL TO TOP OF PHASE I CONCRETE AS SPECIFIED BY THE OWNER'S ENGINEER.
 - REMOVE WALER, DE-STRESS AND CUT ANCHORS AT THE PILE WALL.
 - PLACE BRIDGE ABUTMENT PHASE II CONCRETE.
 - BACKFILL PILE WITH PEA GRAVEL
 - BACKFILL ABUTMENT TO DESIGN GRADE.
- ANCHOR DESIGN LOAD:
 - DESIGN LOAD (DL): 357 kN [80 kip]
 - LOCK OFF LOAD: 1.1 X DL = 393 kN [88 kip]
 - PROOF LOAD: 1.33 X DL = 475 kN [107 kip]
 - PERFORMANCE LOAD: 2.0 X DL = 714 kN [160 kip]

ANCHOR TESTING:

- ONE OF THE PRODUCTION ANCHORS SHALL BE PERFORMANCE TESTED IN ACCORDANCE WITH THE POST-TENSIONING INSTITUTE'S (PTI) RECOMMENDATIONS.
 - THE REMAINING PRODUCTION ANCHORS SHALL BE PROOF TESTED IN ACCORDANCE WITH THE PTI'S RECOMMENDATIONS.
 - IN THE CIRCUMSTANCE THAT ANY ANCHORS DO NOT MEET THE PTI REQUIREMENTS THE EOR SHOULD BE NOTIFIED PRIOR TO WORK PROCEEDING.
16. KIEWIT TEMPORARY STRUCTURES AND CONSTRUCTION DEVICES (TSCD) POLICY:
- THIS DESIGN IS A MODERATE RISK ITEM AND THE FOLLOWING INSPECTIONS ARE REQUIRED:
 - HOLD POINT 1 - SITE MEETING PRIOR TO COMMENCEMENT OF WORK.
 - HOLD POINT 2 - VERIFICATION OF THE OFFSET FROM THE CN TRACKS TO THE PROPOSED PILE WALL.
 - HOLD POINT 3 - PERIODIC REVIEW OF PILE INSTALLATION
 - HOLD POINT 4 - PERIODIC REVIEW OF ANCHOR AND WALER INSTALLATION
 - HOLD POINT 5 - REVIEW OF ANCHOR PROOF AND PERFORMANCE TESTING
 - HOLD POINT 6 - REVIEW OF THE EXPOSED SOIL CONDITIONS AT THE ABUTMENT EXCAVATION
 - HOLD POINT 7 - REVIEW OF THE COMPLETED PILE WALL
 - ALL INSPECTIONS SHALL ADHERE TO THE INSPECTION REQUIREMENTS OF THE PROJECT RISK MANAGEMENT PLAN.
 - APPROVED EXPERIENCED DISTRICT PERSONNEL INSPECTORS SHALL BE AS IDENTIFIED IN THE PROJECT RISK MANAGEMENT PLAN.
 - THE INSPECTION DOCUMENTATION SHALL BE SIGNED AND EMAILED TO THE TSCD MANAGER, EOR AND TSCD COORDINATOR.

Kiewit

B	07-11-25	ISSUED FOR REVIEW	J.H.W.	S.T/K.F	K.F.
A	05-09-25	ISSUED FOR REVIEW	J.H.W.	S.T/K.F	K.F.

MARK	DATE	DESCRIPTION	DRWN	DESG	QCDC
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PROJECT: **ZANARDI RAIL BRIDGE EXPANSION**
LOCATION: PRINCE RUPERT, BC

PROJECT TASK:
EAST AND WEST ABUTMENT TEMPORARY SHORING

SHEET TITLE:
GENERAL NOTES & ISOMETRICS

TSCD RISK:
MODERATE

JOB-TASK NO:
25-096-521.01.01

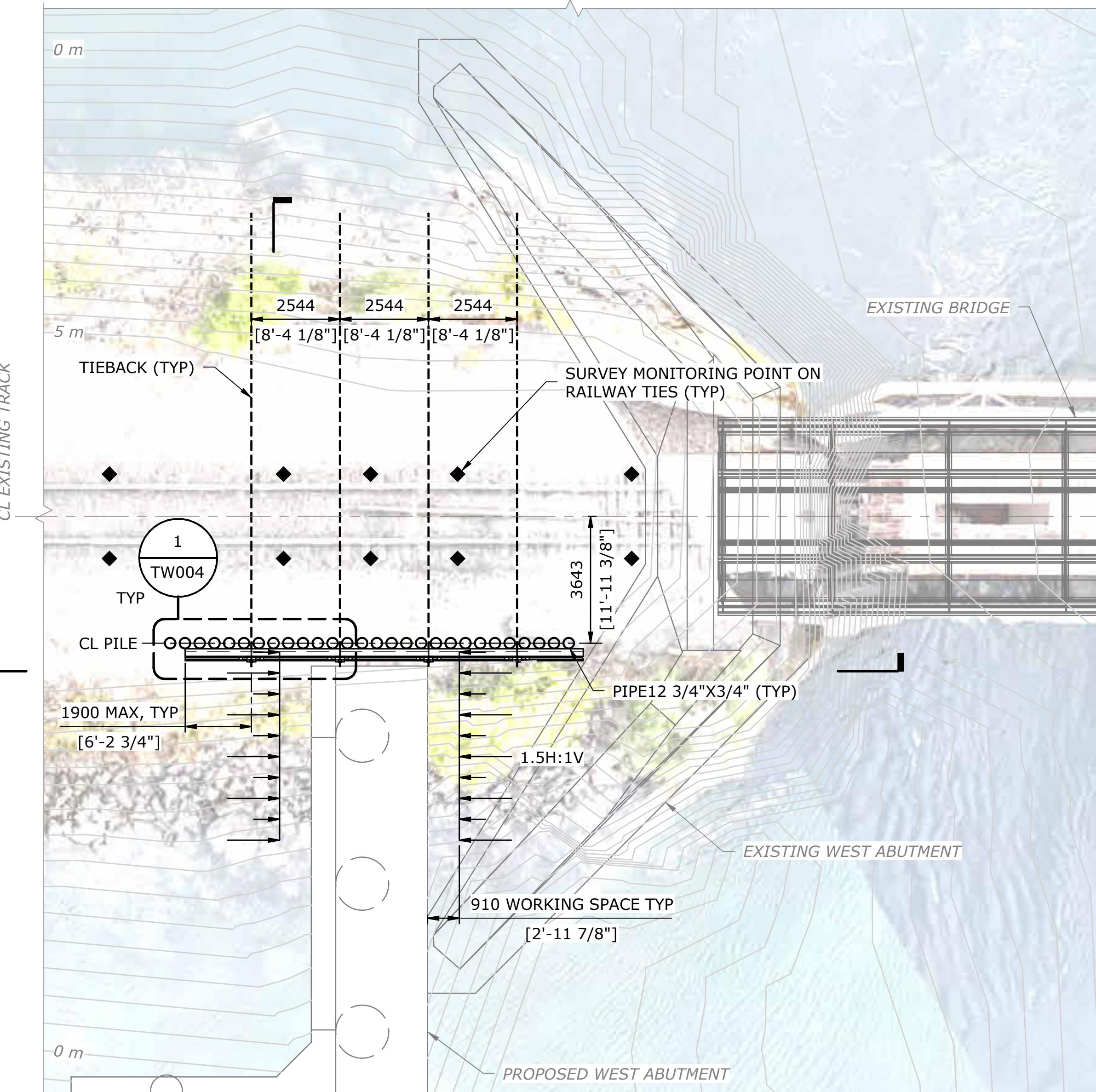
SHEET ID:
TW001

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TOTAL SHEETS ISSUED: 4
DRAWING SCALES SHOWN ARE BASED ON A 22"x34" SHEET
ABOVE ELEVATIONS PER US NATIONAL CAD STANDARD
R:\d360223\521.01.01.rvt



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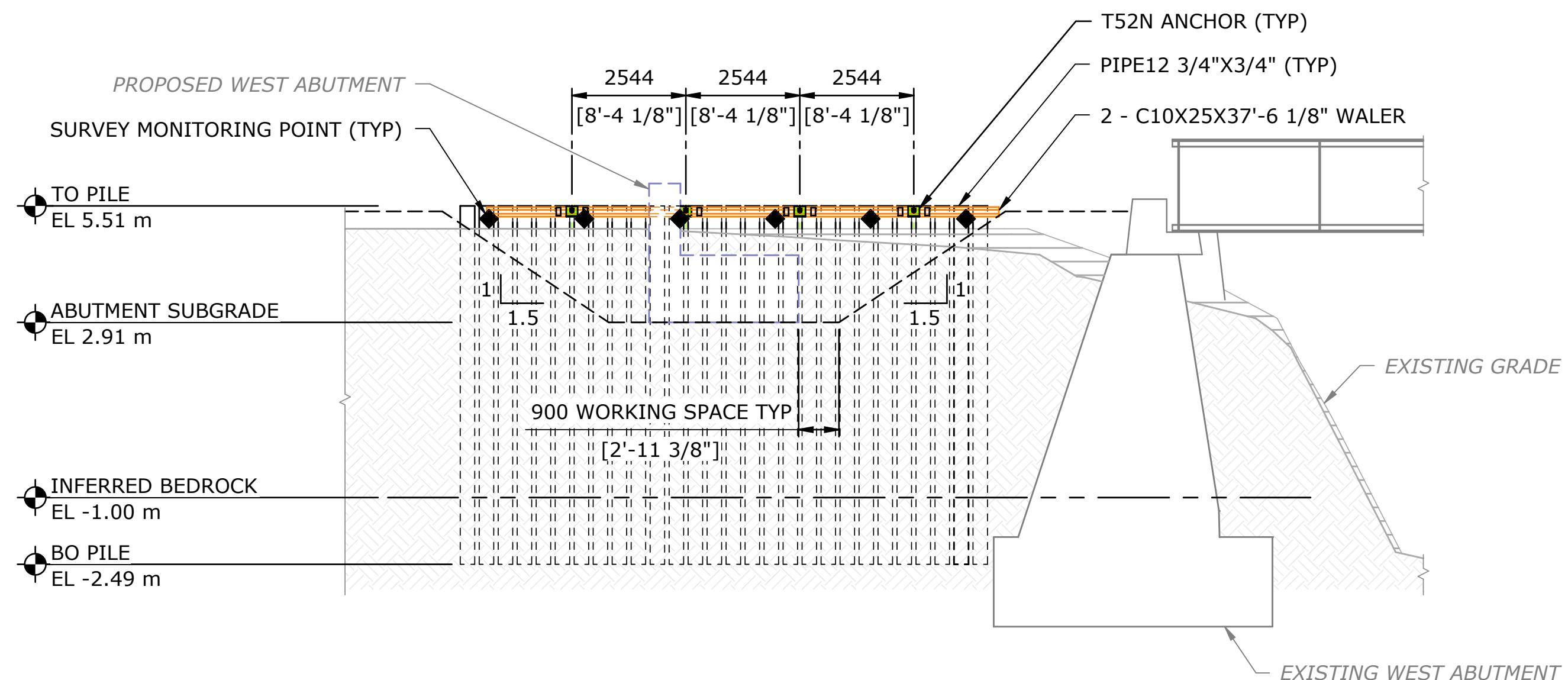
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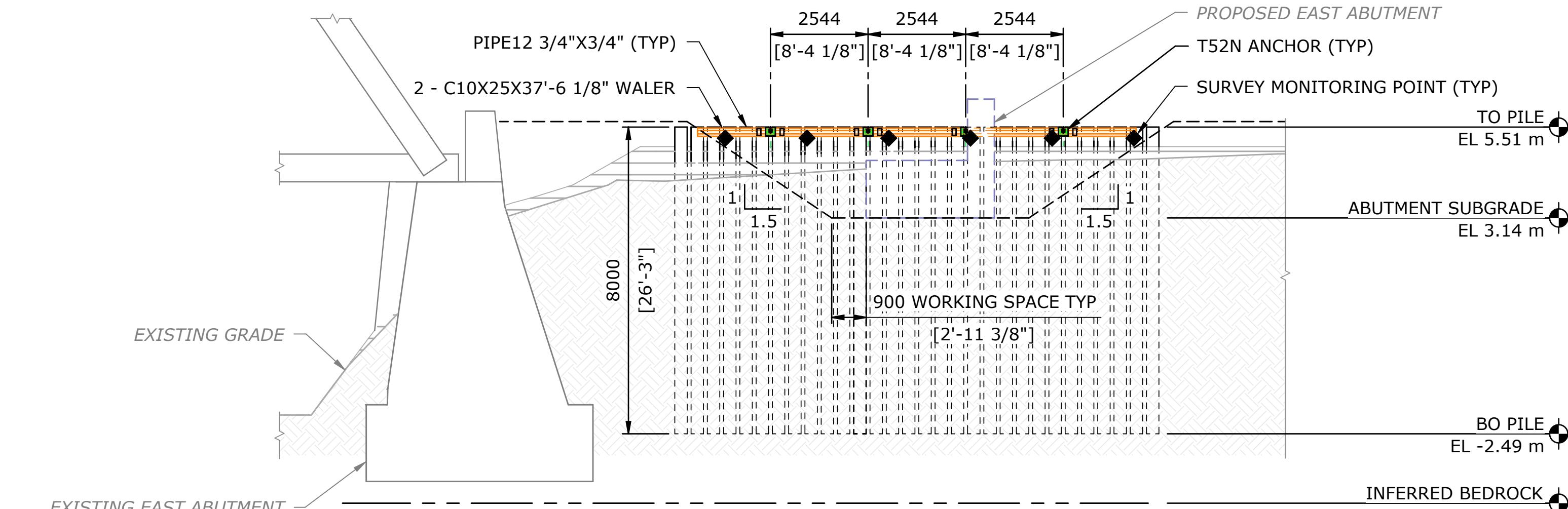
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WEST ABUTMENT SECTION

SCALE: 1 : 100

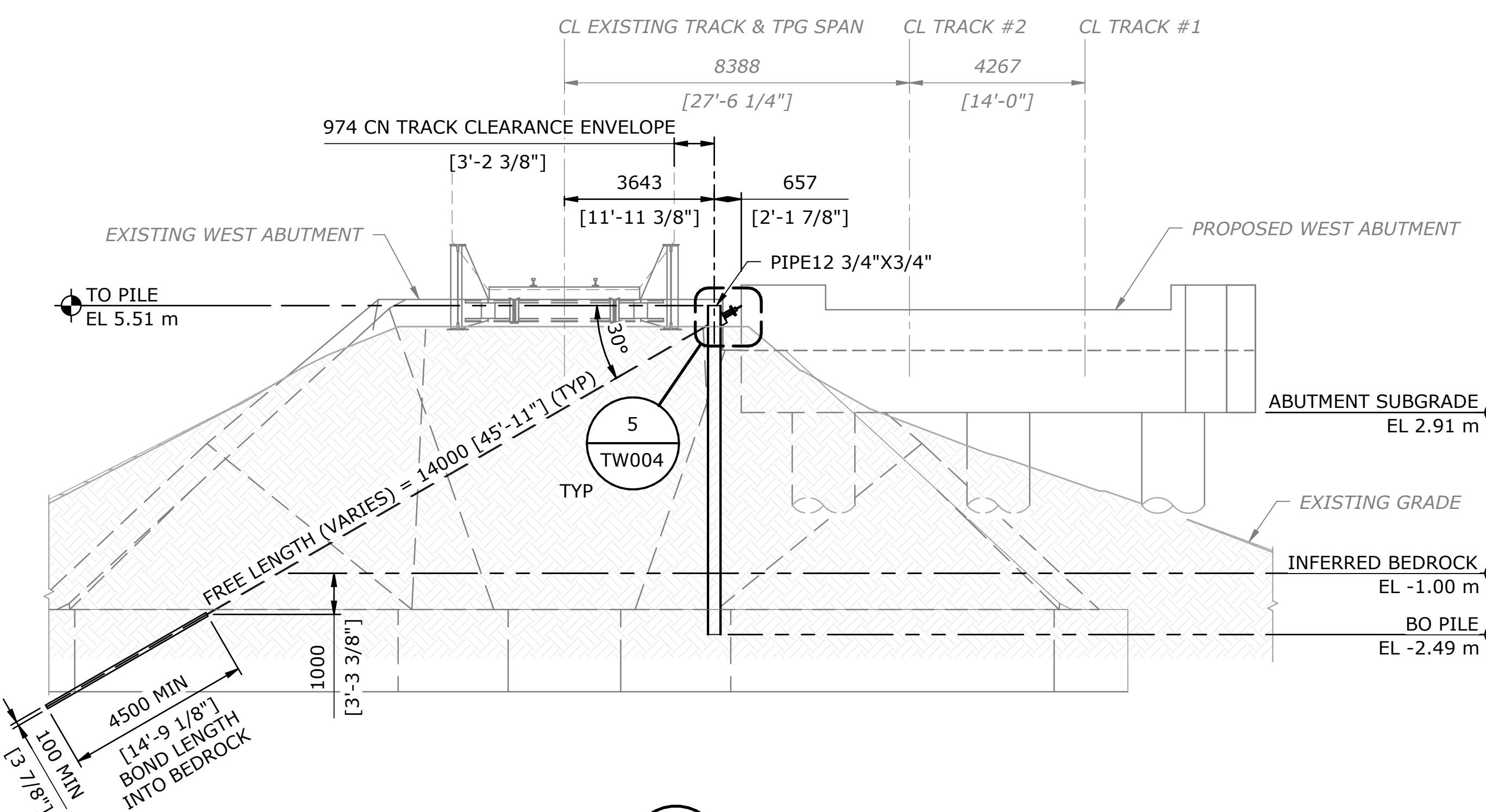
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EAST ABUTMENT SECTION

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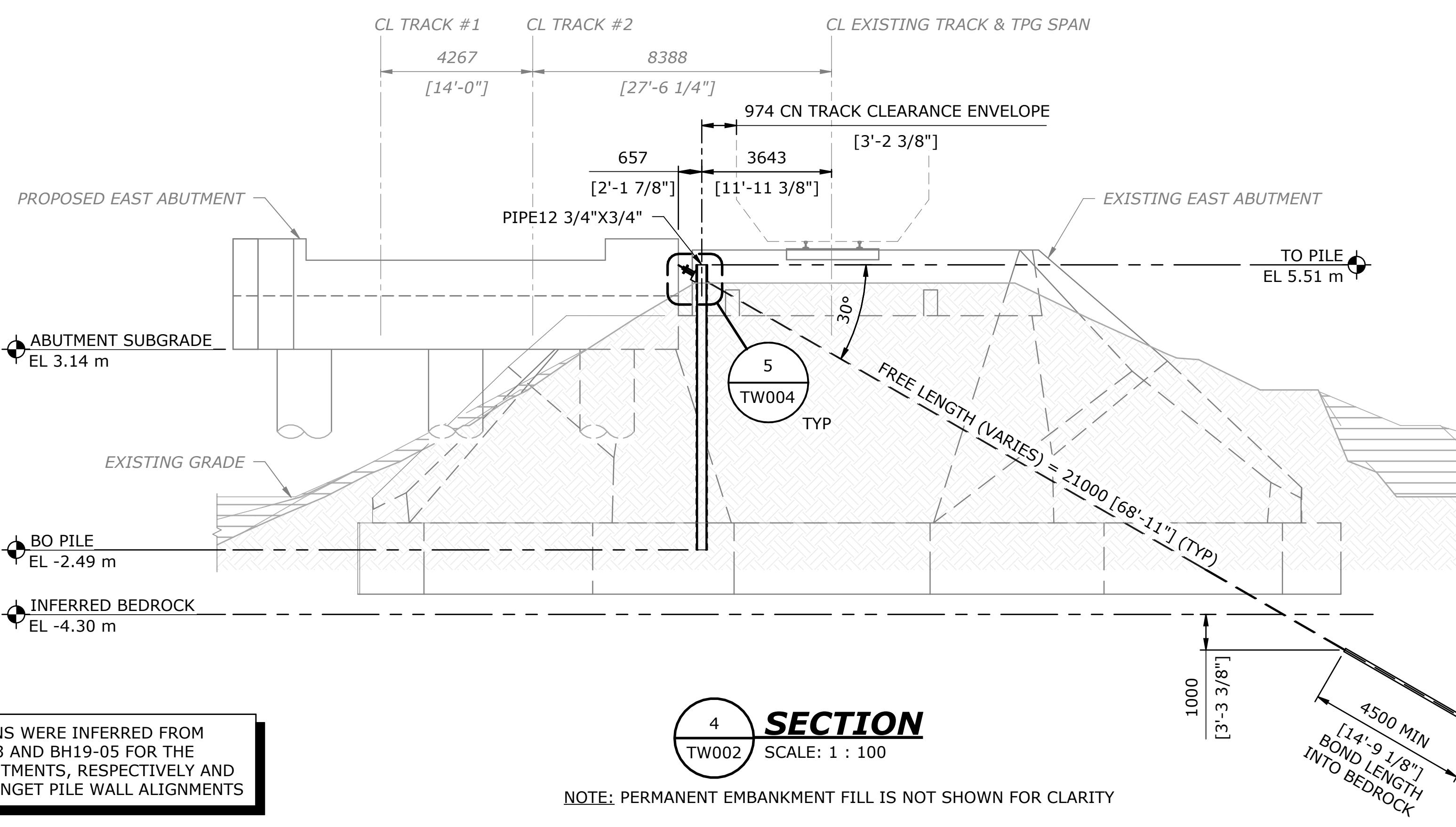
NOTE: PERMANENT EMBANKMENT FILL IS NOT SHOWN FOR CLARITY



SECTION

NOTE: PERMANENT EMBANKMENT FILL IS NOT SHOWN FOR CLARITY

BEDROCK ELEVATIONS WERE INFERRED FROM TEST HOLES BH19-03 AND BH19-05 FOR THE WEST AND EAST ABUTMENTS, RESPECTIVELY AND MAY VARY AT THE TANGET PILE WALL ALIGNMENTS



SECTION

NOTE: PERMANENT EMBANKMENT FILL IS NOT SHOWN FOR CLARITY

Kiewit

PROJECT: ZANARDI RAIL BRIDGE EXPANSION

LOCATION: PRINCE RUPERT, BC

LOCATION: PRINCE RUPERT, BC

**PROJECT TASK:
EAST AND WEST ABUTMENT TEMPORARY SHORING**

SHEET TITLE: SECTIONS

TSCD RISK:

Moderate

JOB-TASK NO:

SHEET ID: TW003

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