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ISLAMIC REPUBLIC OF AFGHANISTAN AFGHANISTAN ENGINEERING SUPPORT PROGRAM (AESP)

SAGAI CROSSING BRIDGE CONSTRUCTION PROJECT

KHOST, AFGHANISTAN
DATE: OCTOBER 8, 2011

FINAL
DESIGN

NO.	DATE	DESCRIPTION	BY
1	10/08/11	FINAL DESIGN	SCW
2			APR

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DRAWN BY:	SUBMITTED BY:	TETRA TECH
CHECKED BY:	CAD FILE NAME:	LT0009-01-G-001



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PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT
COVER SHEET

SHEET
REFERENCE
NUMBER:
**LT0009-01
G-001**

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GENERAL NOTES:

- PROPOSED BRIDGE DESIGN HAS BEEN DESIGNED IN ACCORDANCE WITH 2002 SPECIFICATIONS OF AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS WITH CURRENT INTERIM SPECIFICATIONS (AASHTO).
- FIELD SURVEY OF EXISTING CONDITIONS WAS PERFORMED BY ZURMAT MATERIAL TESTING LABORATORIES IN JUNE 2011. CONTROL POINTS USED FOR SURVEY ARE AS FOLLOWS:
 - CP1
NORTHING 3685504.00
EASTING 583168.00
ELEVATION 1143.000m
 - CP2
NORTHING 3685555.948
EASTING 583343.159
ELEVATION 1187.909m
 - CP3
NORTHING 3685792.806
EASTING 583304.856
ELEVATION 1184.496m
 - CP4
NORTHING 3685763.673
EASTING 583354.66
ELEVATION 1183.167m
- ALL DIMENSIONS AND CONDITIONS MUST BE VERIFIED BY CONTRACTOR IN THE FIELD AND ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF USAID BEFORE PROCEEDING WITH THE AFFECTED PORTION OF THE WORK.
- RESULTS OF THE HYDRAULIC ANALYSIS ARE AS FOLLOWS:
 - WATERSHED AREA: 1511 km²
 - DESIGN FREQUENCY: 100 YEAR STORM
 - DESIGN DISCHARGE: 680 m³/s
 - DESIGN VELOCITY: 3.38 M/S
 - DESIGN WATER ELEVATION: 1186.19m
 - FLOOD DATA: UNKNOWN
 - SCOUR DEPTH AT ABUTMENTS: 3.0m + 1.0m ADDITIONAL
 - SCOUR DEPTH AT PIERS: 1.5m + 0.75m ADDITIONAL
- CONSTRUCTION OF PROPOSED FOUNDATIONS SHALL BE PERFORMED IN THE DRY. CONTRACTOR SHALL CONSTRUCT CONTROL OF WATER SYSTEMS AS REQUIRED.
- CONTRACTOR SHALL RE-ROUTE AND/OR CONTROL SURFACE/GROUNDWATER DURING DRAINAGE CULVERT INSTALLATION.
- CONTRACTOR SHALL INFORM USAID OF ALL DISCREPANCIES BETWEEN DRAWINGS PRIOR TO INITIATION OF ANY WORK.
- CONTRACTOR SHALL IMMEDIATELY NOTIFY USAID WHEN, IN THE COURSE OF CONSTRUCTION, CONDITIONS ARE UNCOVERED WHICH ARE UNANTICIPATED OR OTHERWISE APPEAR TO PRESENT A DANGEROUS CONDITION.

DESIGN LOADS:

- ALL LOADS IN ACCORDANCE WITH AASHTO 2002.
- DEAD LOADS: SELF WEIGHT
 - LIVE LOADS: AASHTO HS-25 TRUCK, MILITARY LOAD COMBINATION MLC-70
 - LONGITUDINAL FORCE: 5% OF LIVE LOAD
 - SUPERSTRUCTURE WIND LOAD: 2.39 Kpa [50 PSF] TRANSVERSE
0.57 Kpa [12 PSF] LONGITUDINAL
 - SUBSTRUCTURE WIND LOAD: 1.92 Kpa [40 PSF]
 - WIND ON LIVE LOAD: 144 kN/m [100 PLF]
 - STREAM PRESSURE:
Pavg = 477.5 Kg/m² [97.8 PSF]
Pmax = 955.0 Kg/m² [195.6 PSF]
 - SEISMIC DESIGN:
Ss = 0.21g
Si = 0.17g
SPC = B
PGA = 0.17g (20% EXCEEDANCE WITHIN 50 YEARS)

FOUNDATION NOTES:

- "GEOTECHNICAL REPORT" DATED JUNE 15, 2011, WAS PREPARED BY ZURMAT MATERIAL TESTING LABORATORIES. THE GEOTECHNICAL INVESTIGATION INCLUDED PERFORMING TEST PITS, BORINGS AND LABORATORY TESTING. BORING LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
- THE FOLLOWING GEOTECHNICAL PARAMETERS WERE USED FOR DESIGN OF THE PROPOSED PIERS AND ABUTMENTS:
 - UNIT WEIGHT OF SOIL = 18.6 kN/m³ [118 PCF]
 - ALLOWABLE AVERAGE BEARING CAPACITY FOR PIER FOUNDATIONS = 1.97 kg/cm² [4046 PSF]
 - ALLOWABLE AVERAGE BEARING CAPACITY FOR ABUTMENT FOUNDATIONS = 3.2 kg/cm² [6554 PSF]
 - FRICITION ANGLE = 30°
 - COEFF. OF FRICTION FOR SLIDING = 0.50
 - MODULUS OF SUBGRADE REACTION = 54,289 kN/m³ [220 PCI]
 - Ko = 0.5
 - Ka = 0.33
 - Kp = 2.1
- CONTRACTOR SHALL VERIFY ACTUAL SUBSURFACE CONDITIONS MEET THE ASSUMED GEOTECHNICAL DESIGN PARAMETERS.
- FOOTING SUBGRADE PREPARATION SHALL BE PERFORMED IN THE DRY. CONTROL OF WATER AND DEWATERING WILL BE REQUIRED FOR THE SUBSTRUCTURE CONSTRUCTION. CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO USAID FOR REVIEW.
- ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMIT OF THE FOUNDATIONS AS DIRECTED BY USAID.

ABBREVIATIONS:

ADD'L	ADDITIONAL	MFR.	MANUFACTURER
ALT.	ALTERNATE	MAX	MAXIMUM
BL	BASELINE	MIN.	MINIMUM
BOT	BOTTOM	NO.	NUMBER
B.O.	BOTTOM OF	O.C.	ON CENTER
CLR	CLEAR	U.N.O.	UNLESS NOTED OTHERWISE
CONT	CONTINUOUS	PL	PLATE
COORD	COORDINATE	PROP.	PROPOSED
CTR.	CENTER	PSF	POUNDS PER SQUARE FOOT
DIA.	DIAMETER	REINF	REINFORCING
DWG	DRAWING	SIM	SIMILAR
E.F.	EACH FACE	SQ	SQUARE
EL.	ELEVATION	STD	STANDARD
EQ	EQUAL	STRUCT	STRUCTURAL
E.W.	EACH WAY	T&B	TOP AND BOTTOM
EXIST	EXISTING	T.O.	TOP OF
FDN	FOUNDATION	TYP.	TYPICAL
FIN. GR.	FINISHED GRADE	U.N.O.	UNLESS NOTED OTHERWISE
FTG	FOOTING	VERT.	VERTICAL
INFO	INFORMATION	VIF	VERIFY IN FIELD
JT	JOINT		
CL	CENTERLINE		

SPLICE NOTES:

- THE SPLICE LENGTHS IN THE TABLE BELOW ARE BASED ON NORMAL WEIGHT CONCRETE, UNCOATED BARS, CLEAR SPACING NOT LESS THAN FOUR BAR DIAMETERS, AND CLEAR COVER NOT LESS THAN 40mm.
- WHERE SPACING BETWEEN BARS IS LESS THAN FOUR BAR DIAMETERS, OR CLEAR COVER IS LESS THAN TWO BAR DIAMETERS, INCREASE SPLICE LENGTHS SHOWN BY 50%.
- * HORIZONTAL BARS WITH MORE THAN 300mm OF CONCRETE CAST BELOW THE BARS AS DEFINED BY A.C.I. 318. WHERE HORIZONTAL WALL REINFORCEMENT IS UNIFORMLY SPACED IN A VERTICAL PLANE AT 300mm MAXIMUM SPACING, LENGTHS MAY BE AS FOR 'OTHER BARS'.
- FOR EPOXY COATED BARS, MULTIPLY THE VALUES IN THE TABLE BELOW BY 1.5.

MINIMUM RE-BAR SPLICE LENGTHS mm		
fy = 4218kg/cm ² f'c = 27.5MPa		
BAR SIZE Ø mm	TOP BARS	OTHER BARS
12	815	635
16	1016	788
20	1590	1220
22	1755	1350
25	2037	1567

CAST IN PLACE CONCRETE:

- CONCRETE WORK SHALL CONFORM TO:
ACI 301-05 - SPECIFICATIONS FOR STRUCTURAL CONCRETE.
ACI 318-05 - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY.
- CONCRETE SHALL HAVE A MINIMUM CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS, F'c = 27.5 MPa (4000 PSI). THE MAXIMUM WATER-CEMENT RATIO OF 0.45 (BY WEIGHT).
- HIGH-RANGE WATER REDUCER SHALL CONFORM TO ASTM C 494/C 494M, TYPE F OR G, EXCEPT THAT THE 6-MONTH AND 1-YEAR STRENGTH REQUIREMENTS ARE WAIVED.
- CONCRETE SHALL BE CONTROLLED NORMAL WEIGHT CONCRETE, PROPORTIONED, MIXED AND PLACED UNDER THE SUPERVISION OF AN APPROVED QUALITY CONTROL ENGINEER.
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING:
 - (A) CONCRETE PLACED AGAINST THE EARTH 75mm
 - (B) SIDES OF FOOTINGS, WALLS, PIERS 50mm
 - 18 Ø BAR AND LARGER 50mm
 - 16 Ø BAR AND SMALLER 40mm
- CHAMFER EXPOSED EDGES 25mm U.N.O.
- ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615/A615M, GRADE 413 [60]. SEE SPLICE TABLE FOR LAP LENGTHS. MINIMUM YIELD STRENGTH FY = 198 kg/cm² [60,000 PSI].
- DO NOT WELD OR BEND REINFORCEMENT IN FIELD UNLESS SPECIFICALLY SHOWN OR APPROVED BY ENGINEER.
- REINFORCING BARS EXTEND 12 BAR DIAMETERS BUT NOT LESS THAN 300mm BEYOND BEND U.N.O.
- NO BARS SHALL BE CUT OR OMITTED IN THE FIELD BECAUSE OF SLEEVES, DUCT OPENINGS OR RECESSES. BARS MAY BE MOVED ASIDE WITHOUT CHANGE IN LEVEL WITH THE APPROVAL OF THE QUALITY CONTROL ENGINEER.
- REINFORCEMENT STEEL SHALL BE CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS. ALL CONSTRUCTION JOINTS SHALL BE KEYS U.N.O.
- WHERE VERTICAL CONSTRUCTION JOINTS ARE NOT SHOWN, OR WHEN ALTERNATE LOCATIONS ARE PROPOSED, DRAWINGS SHOWING LOCATION OF CONSTRUCTION JOINTS AND CONCRETE PLACING SEQUENCE SHALL BE SUBMITTED TO USAID FOR APPROVAL PRIOR TO PREPARATION OF THE REINFORCEMENT SHOP DRAWINGS. CONCRETE SHALL BE PLACED WITHOUT HORIZONTAL CONSTRUCTION JOINTS U.N.O.
- ALL KEYS SHALL BE 50mm BY 100mm NOMINAL U.N.O.
- DETAILING, FABRICATION, AND ERECTION OF REINFORCEMENT SHALL CONFORM TO ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 315 DETAILS AND DETAILING OF CONCRETE REINFORCEMENT, AND CRSI MANUAL OF STANDARD PRACTICE.
- CONTRACTOR SHALL COORDINATE LOCATIONS OF SLEEVES, INSERTS, ETC. WITH CONCRETE CONSTRUCTION. NO PIPES SHALL PASS THROUGH CONCRETE WITHOUT THE PERMISSION OF USAID. CONDUIT AND OTHER EMBEDDED ITEMS SHALL BE CLEAN AND FREE OF OIL AND OTHER FOREIGN MATTER SUCH AS LOOSE COATINGS OR RUST, PAINT AND SCALE.
- PROVIDE ALL NECESSARY CHAIRS, CHAIR BARS, SPACERS, ETC., WIRED SECURELY TO HOLD REINFORCEMENT IN POSITION. THESE ACCESSORIES SHALL BE PLASTIC BOOTED WHERE CONCRETE IS TO BE EXPOSED TO WEATHER OR MOISTURE. WIRE TIES SHALL BE 16 GAUGE (1.5mm) OR HEAVIER BLACK ANNEALED STEEL WIRE.
- REINFORCEMENT SHALL BE STORED OFF THE GROUND ON PLATFORMS, SKIDS OR OTHER SUPPORTS.
- ALL EXPOSED SUPERSTRUCTURE CONCRETE SURFACES SHALL BE SEALED IN ACCORDANCE WITH THE SPECIFICATIONS.

FINAL DESIGN

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10/06/11	FINAL DESIGN	A	SWM

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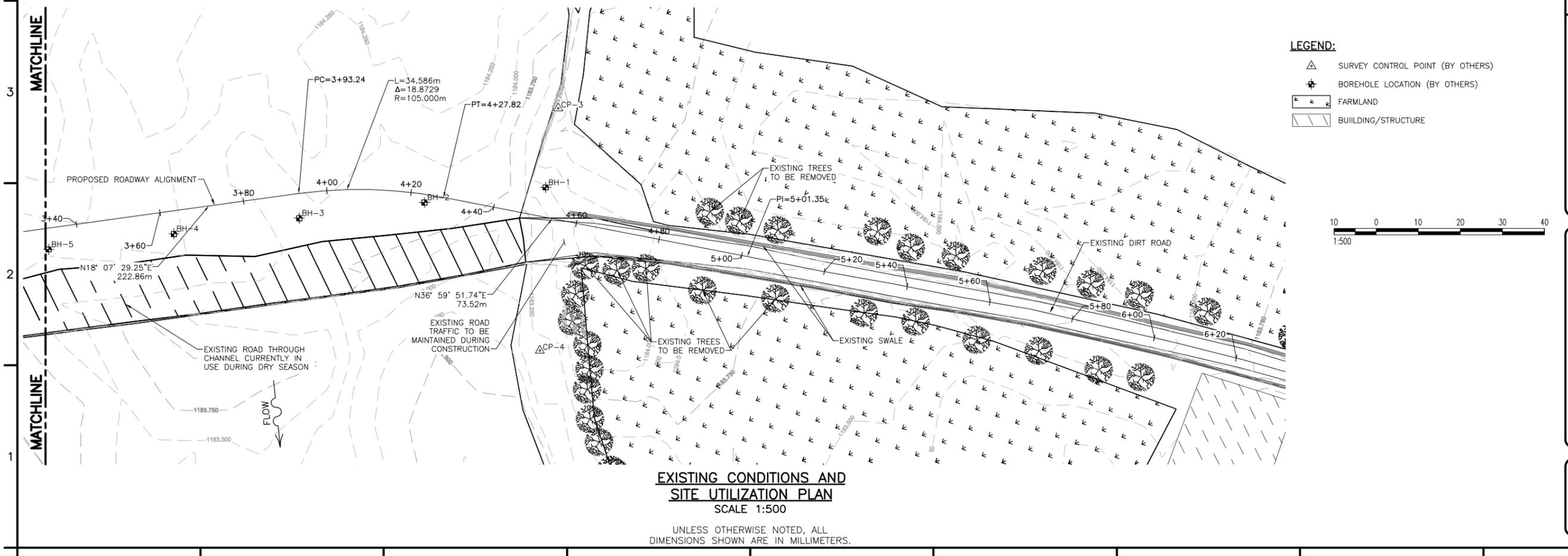
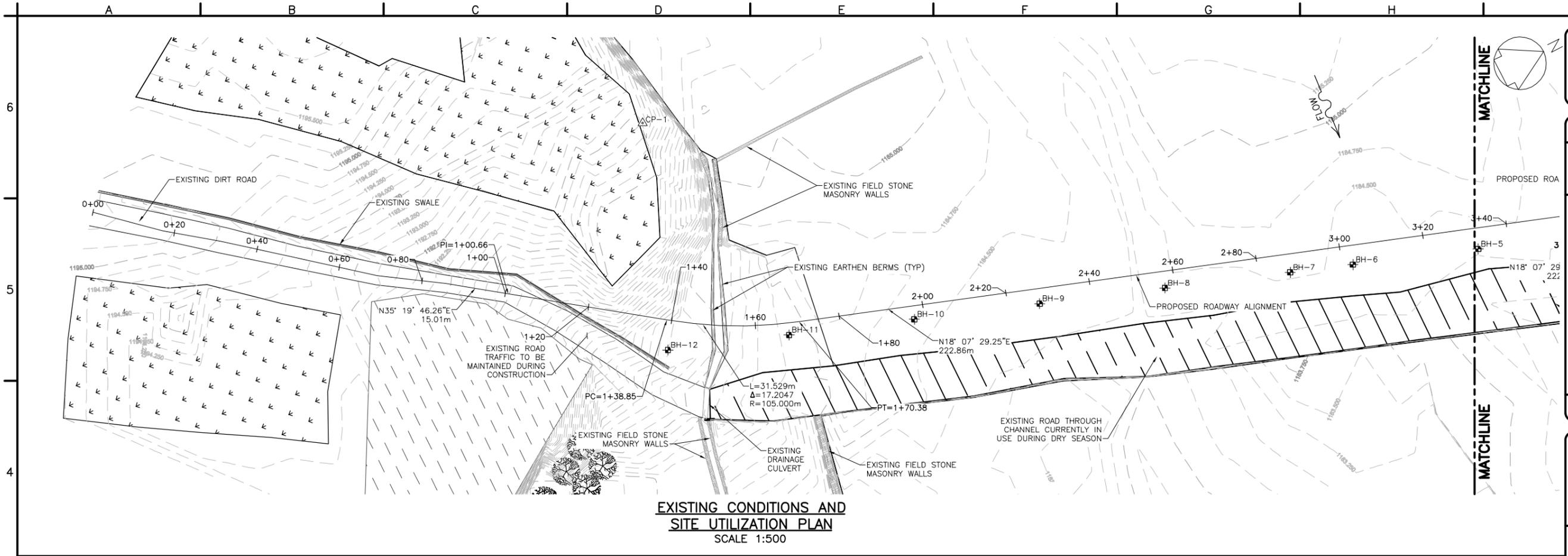


PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT
GENERAL NOTES
AND ABBREVIATIONS

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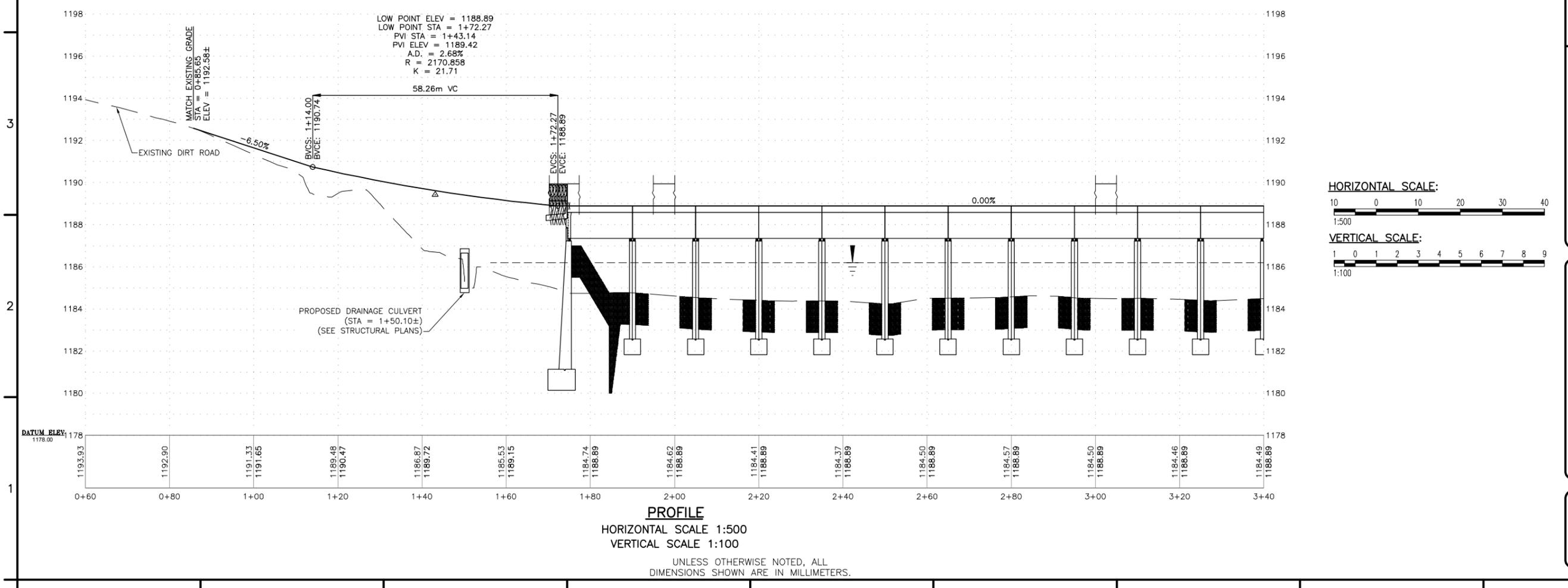
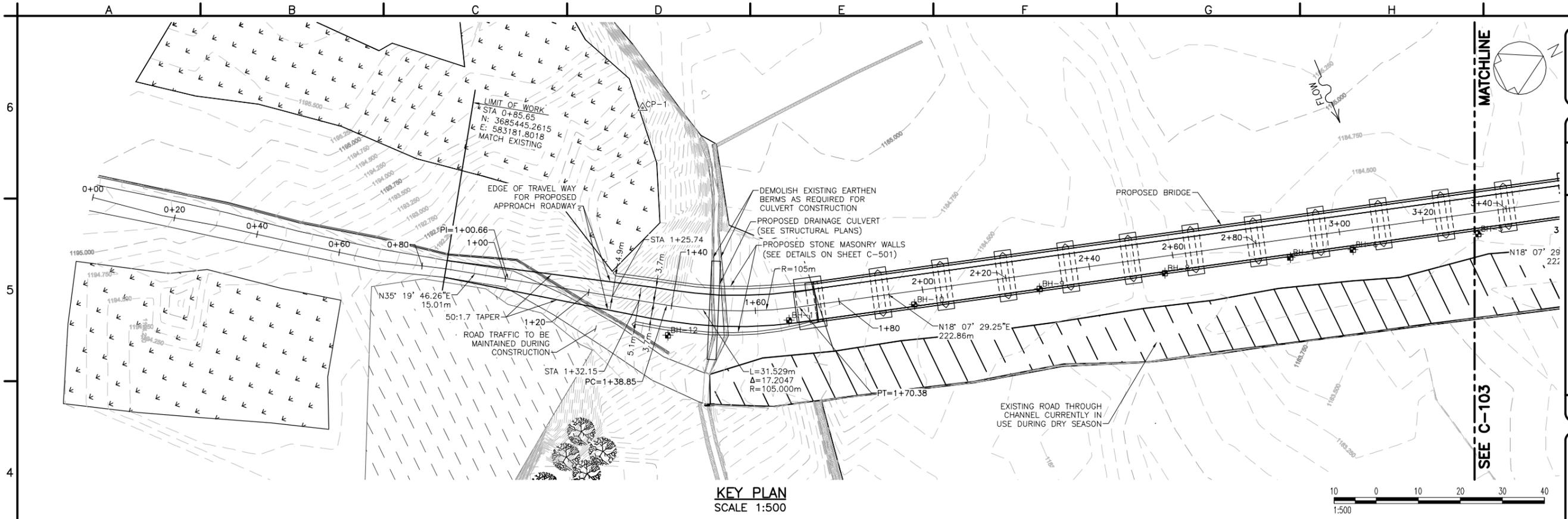
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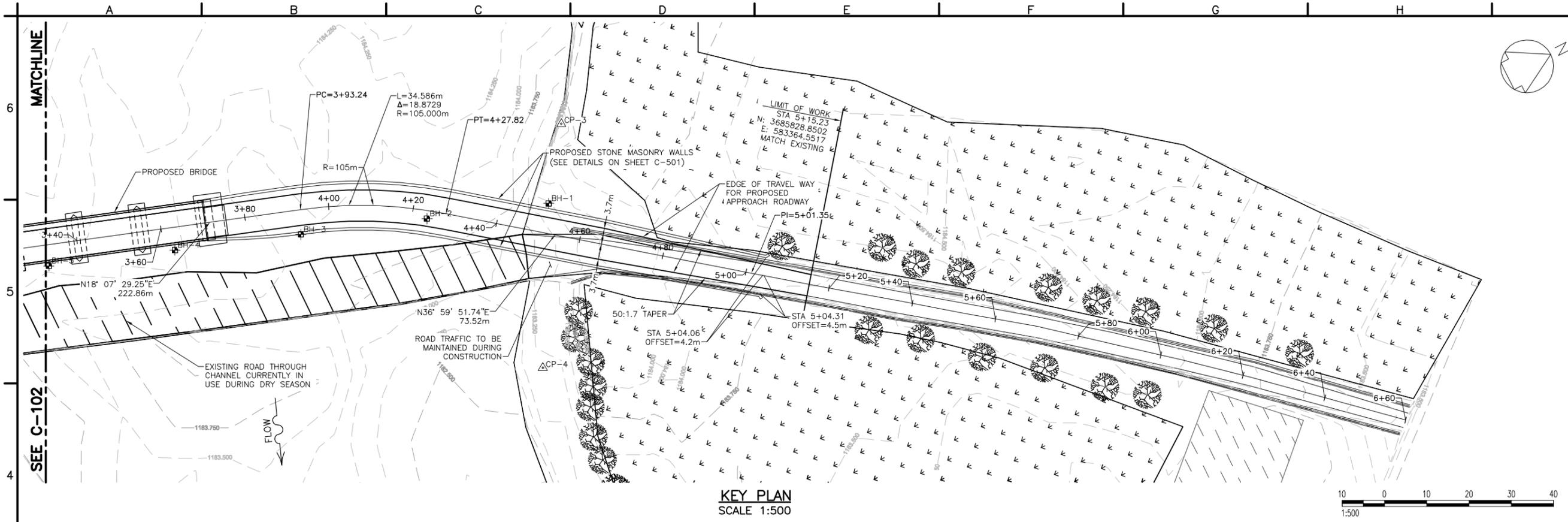
EXISTING CONDITIONS AND
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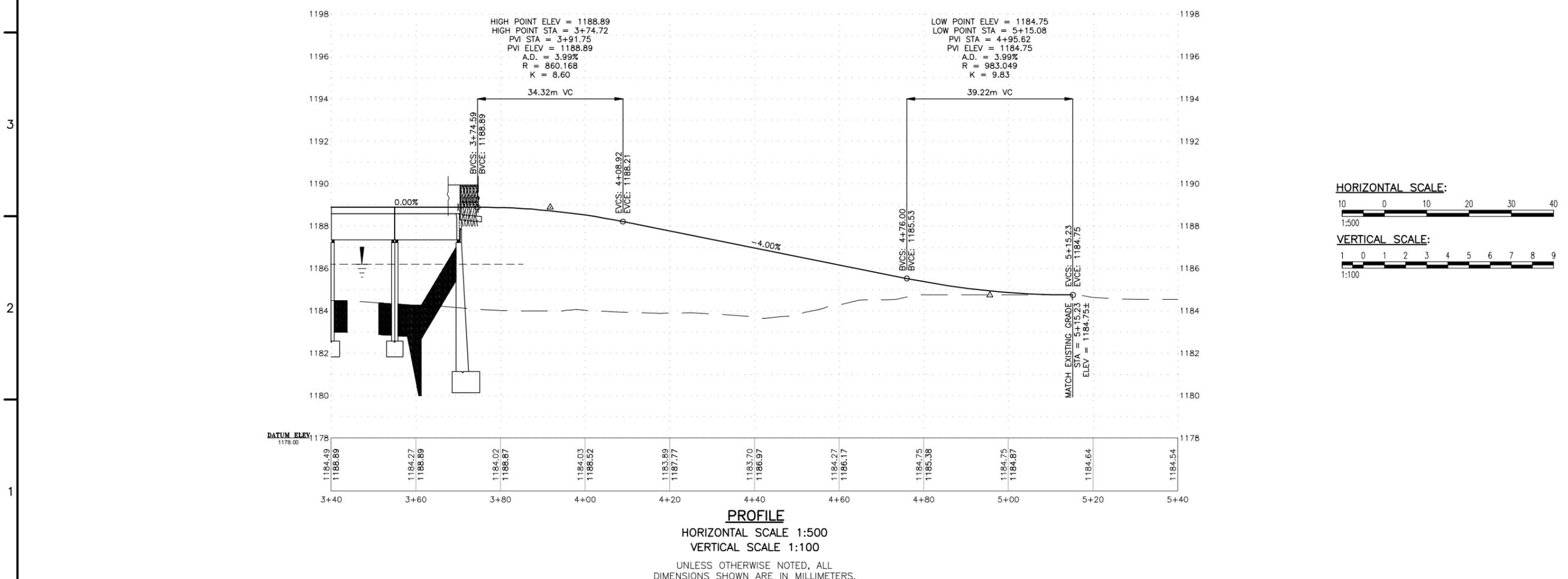


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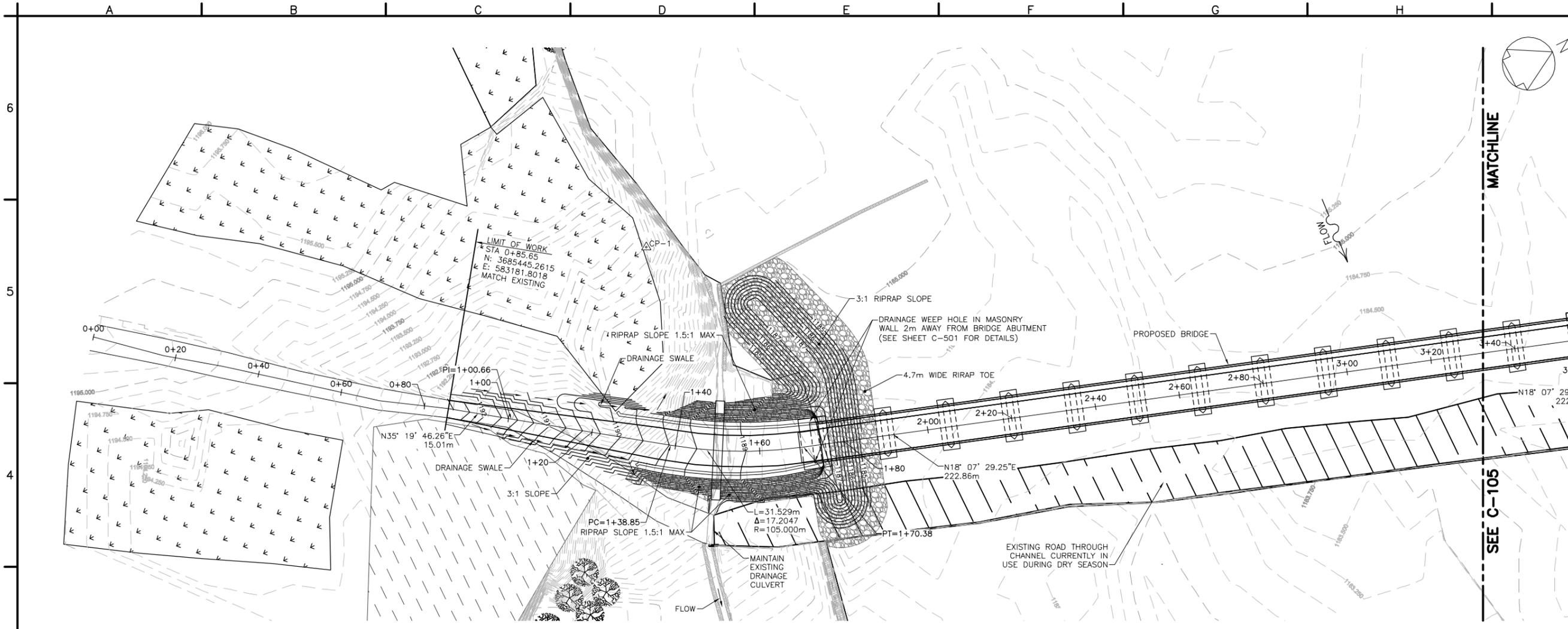
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KEY PLAN AND PROFILE
SHEET 2 OF 2

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GRADING PLAN
SCALE 1:500

NOTE:
EMBANKMENT RIPRAP 1.5:1 SLOPE IS BASED ON ANGULAR RIPRAP. IF THE CONTRACTOR USES ROUNDED RIPRAP, THE EMBANKMENT SLOPES SHALL BE GRADED A 2:1 MAX. CONTRACTOR TO UPDATE CULVERT LENGTH, FILL AND RIPRAP QUANTITY, AND OTHER ASSOCIATED MATERIALS AND COSTS. SEE RIPRAP SPECIFICATION FOR ADDITIONAL REQUIREMENTS. ALL COSTS ASSOCIATED WITH THE ROUNDED RIPRAP OPTION SHALL BE BOURNE BY THE CONTRACTOR.

- LEGEND:**
- SURVEY CONTROL POINT (BY OTHERS)
 - BOREHOLE LOCATION (BY OTHERS)
 - FARMLAND
 - BUILDING/STRUCTURE



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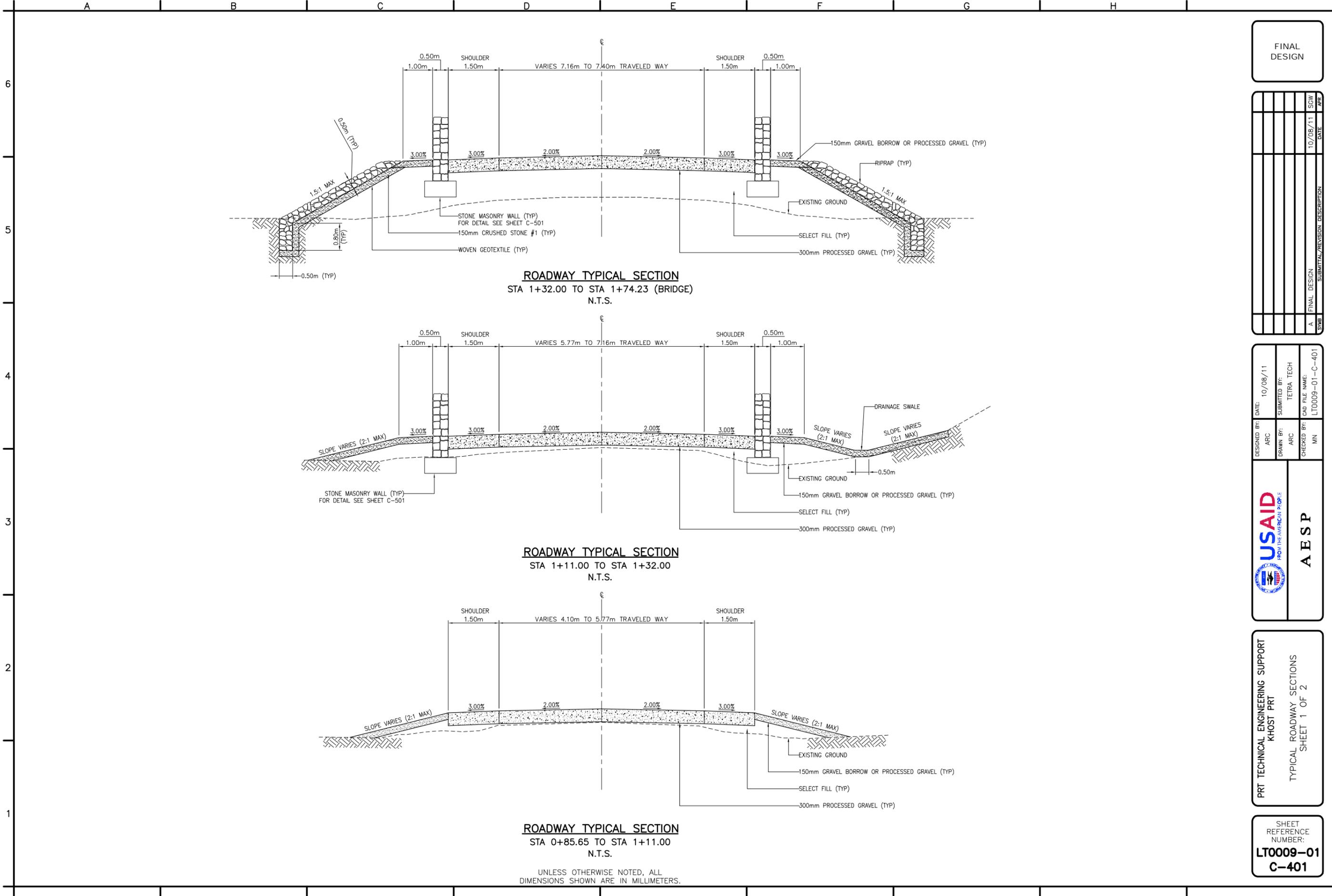
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GRADING PLAN
SHEET 1 OF 2

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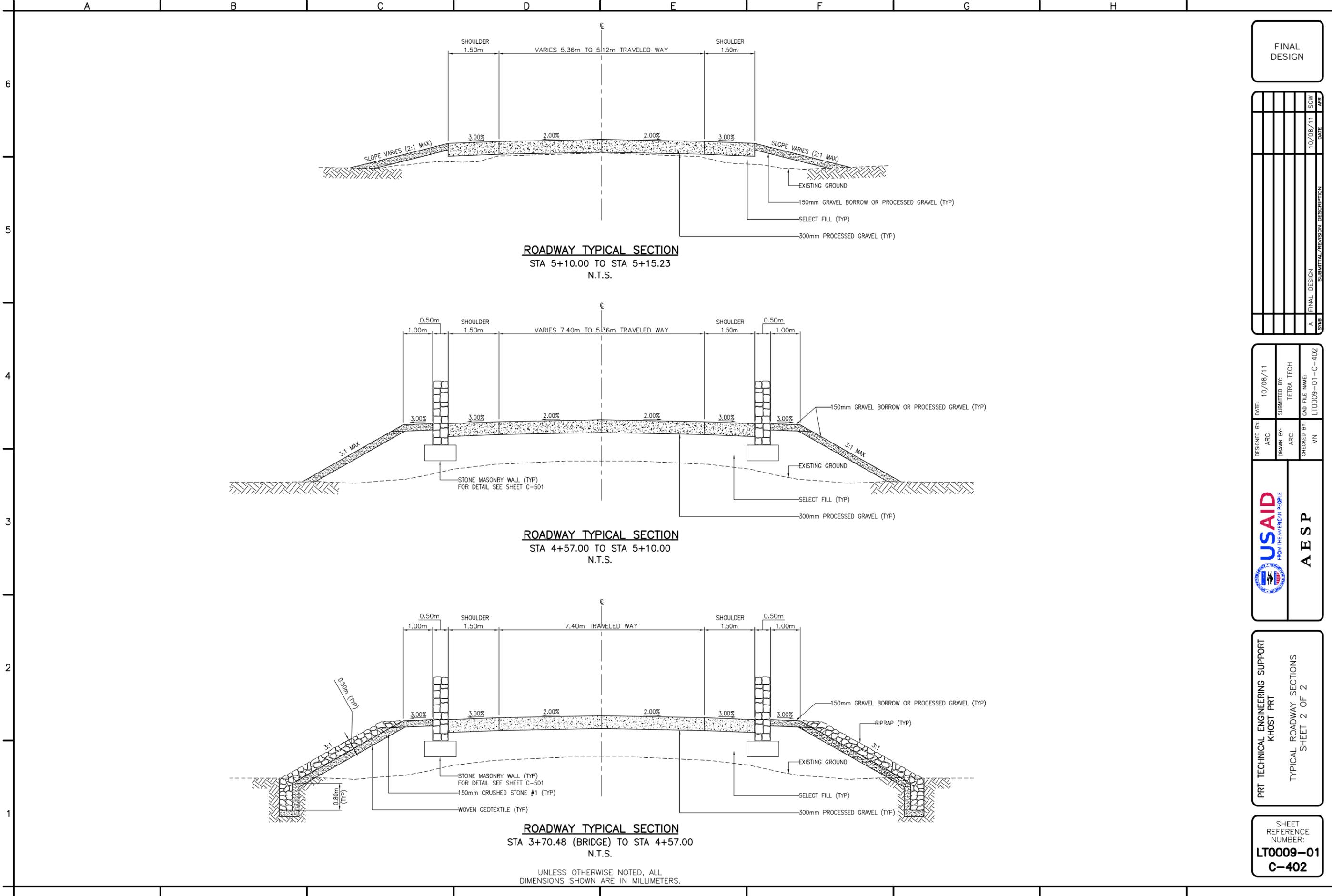
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TYPICAL ROADWAY SECTIONS
SHEET 1 OF 2

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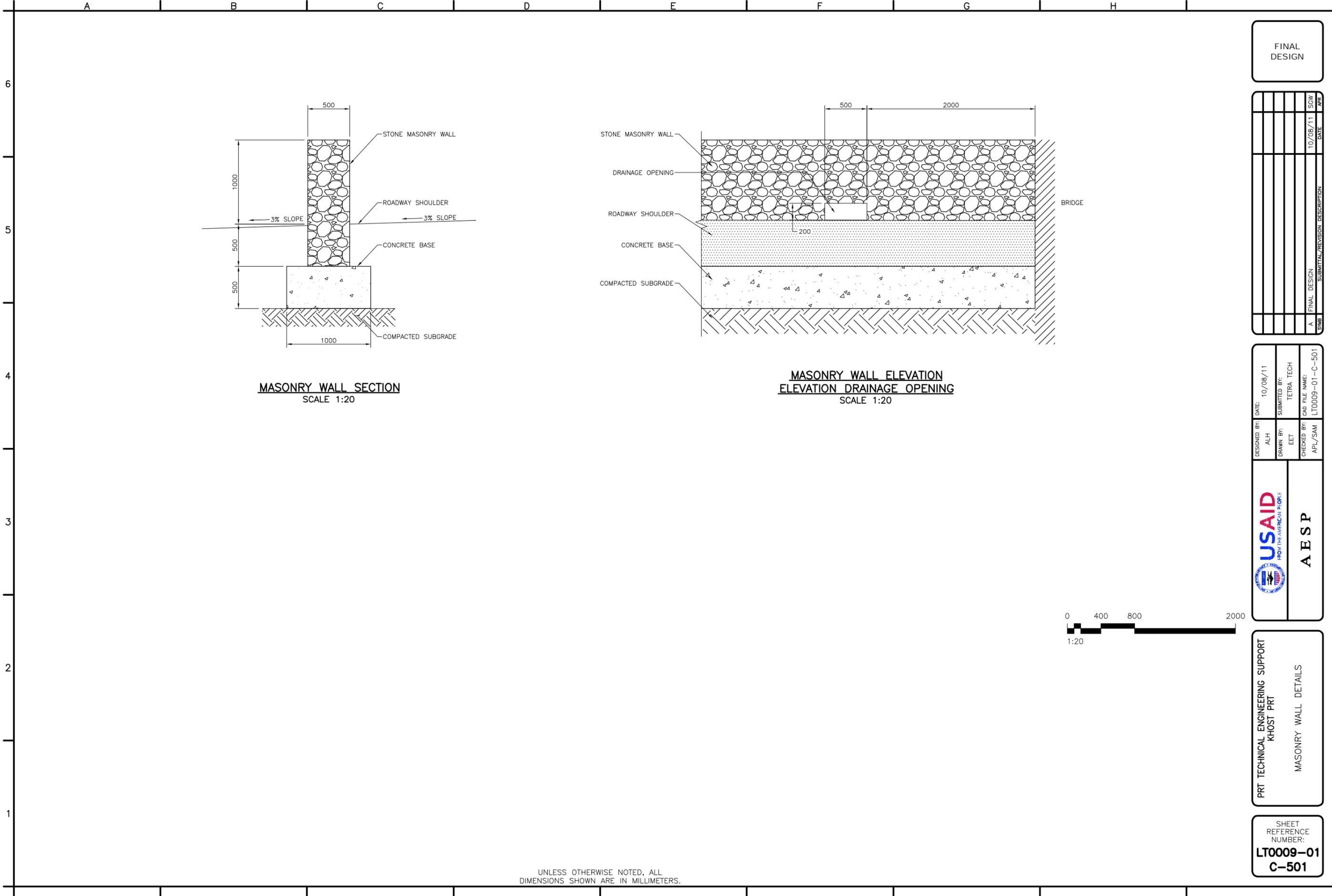
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TYPICAL ROADWAY SECTIONS
SHEET 2 OF 2

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MASONRY WALL SECTION
SCALE 1:20

**MASONRY WALL ELEVATION
ELEVATION DRAINAGE OPENING**
SCALE 1:20



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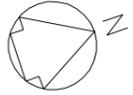
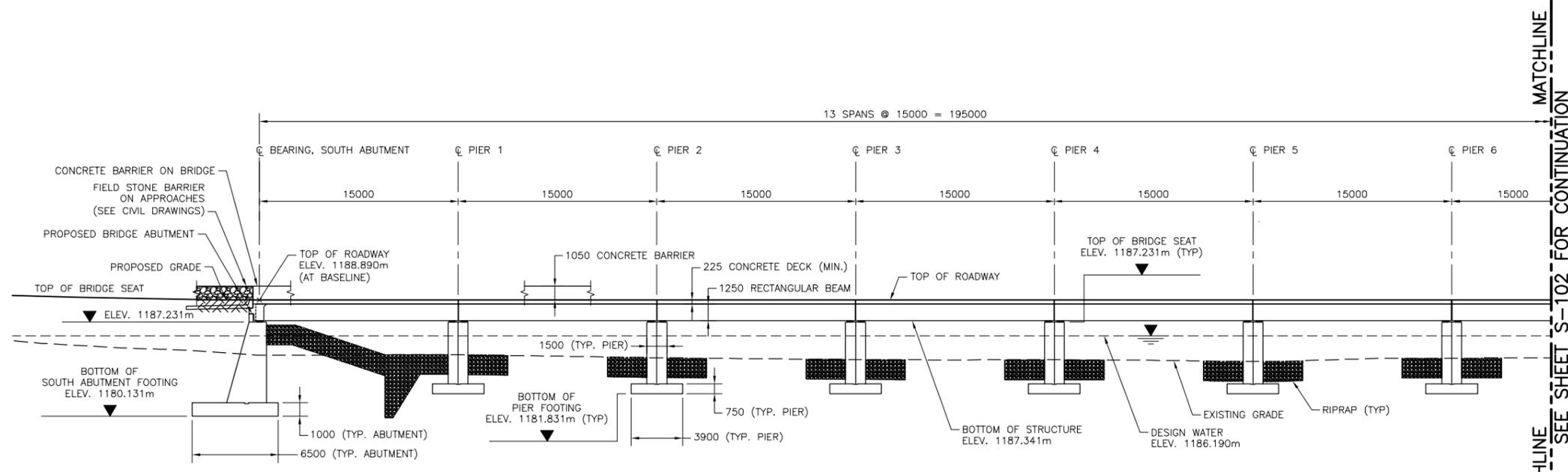
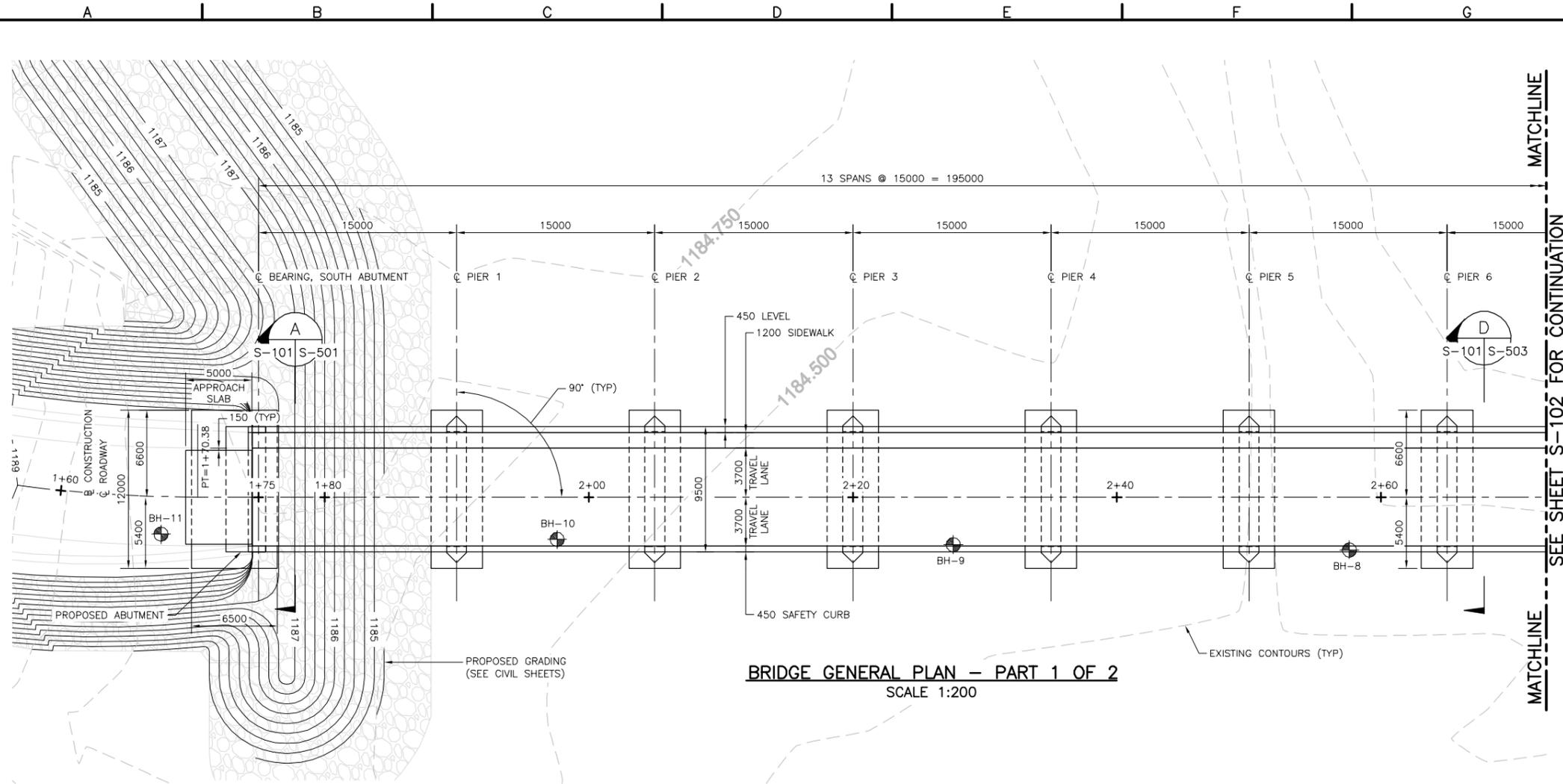
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 KHOST PRT
 MASONRY WALL DETAILS

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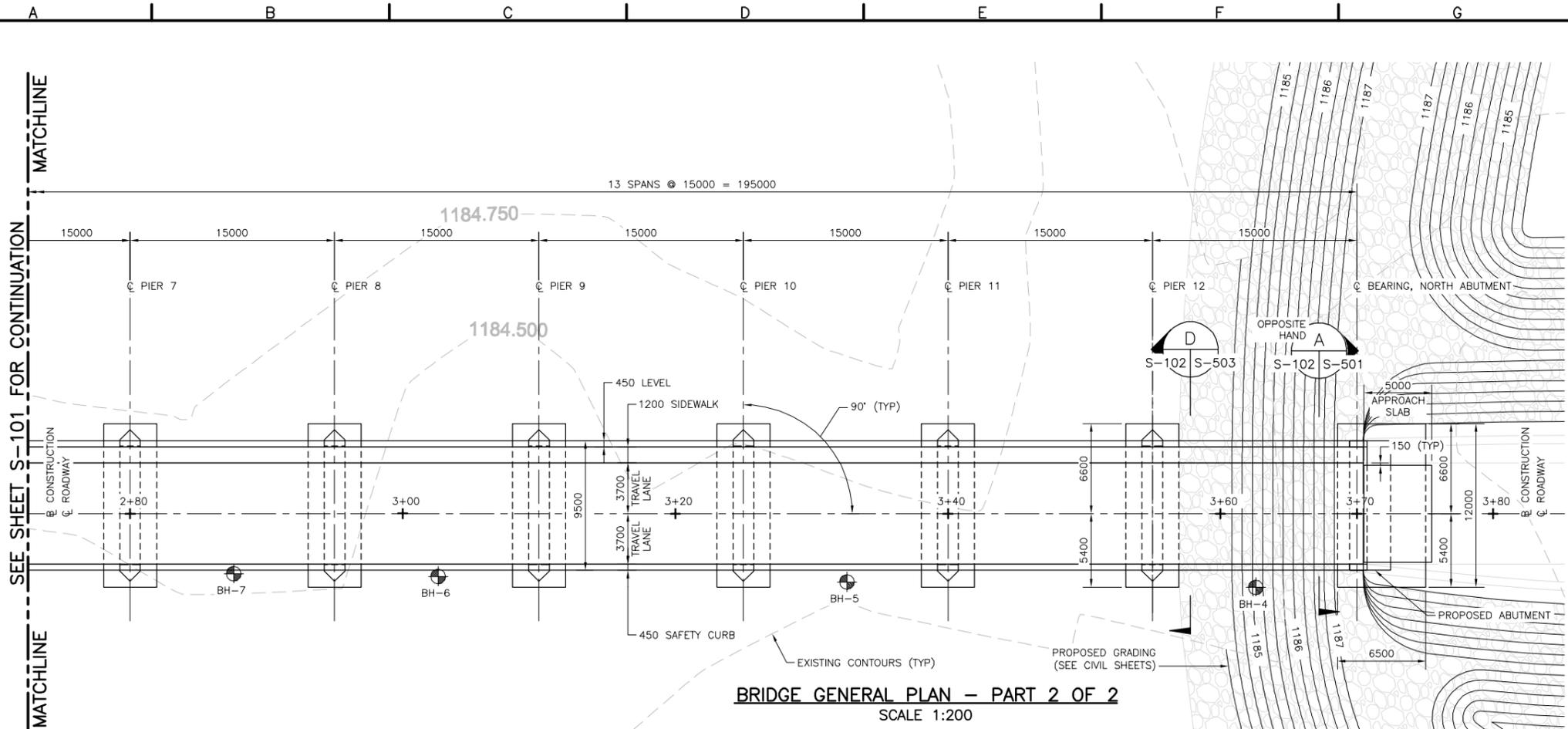
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BRIDGE GENERAL PLAN
AND ELEVATION
SHEET 1 OF 2

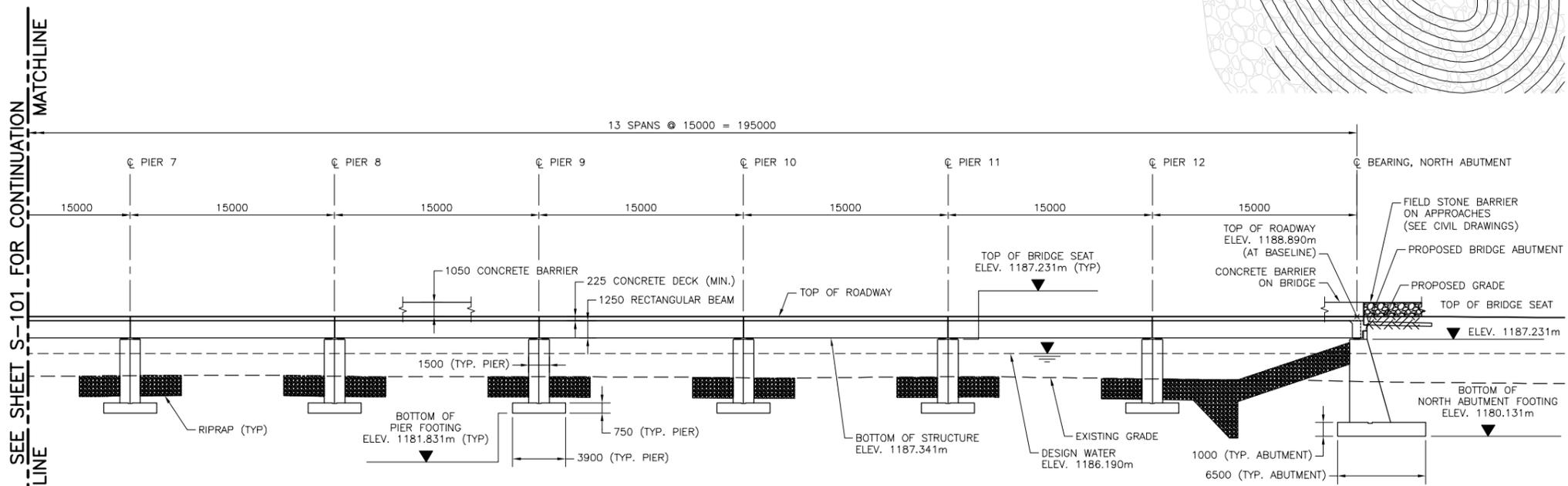
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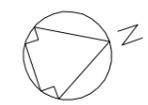


BRIDGE GENERAL PLAN - PART 2 OF 2
SCALE 1:200



BRIDGE ELEVATION - PART 2 OF 2
SCALE 1:200

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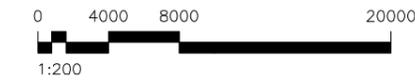
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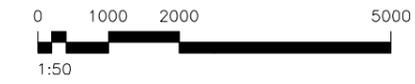
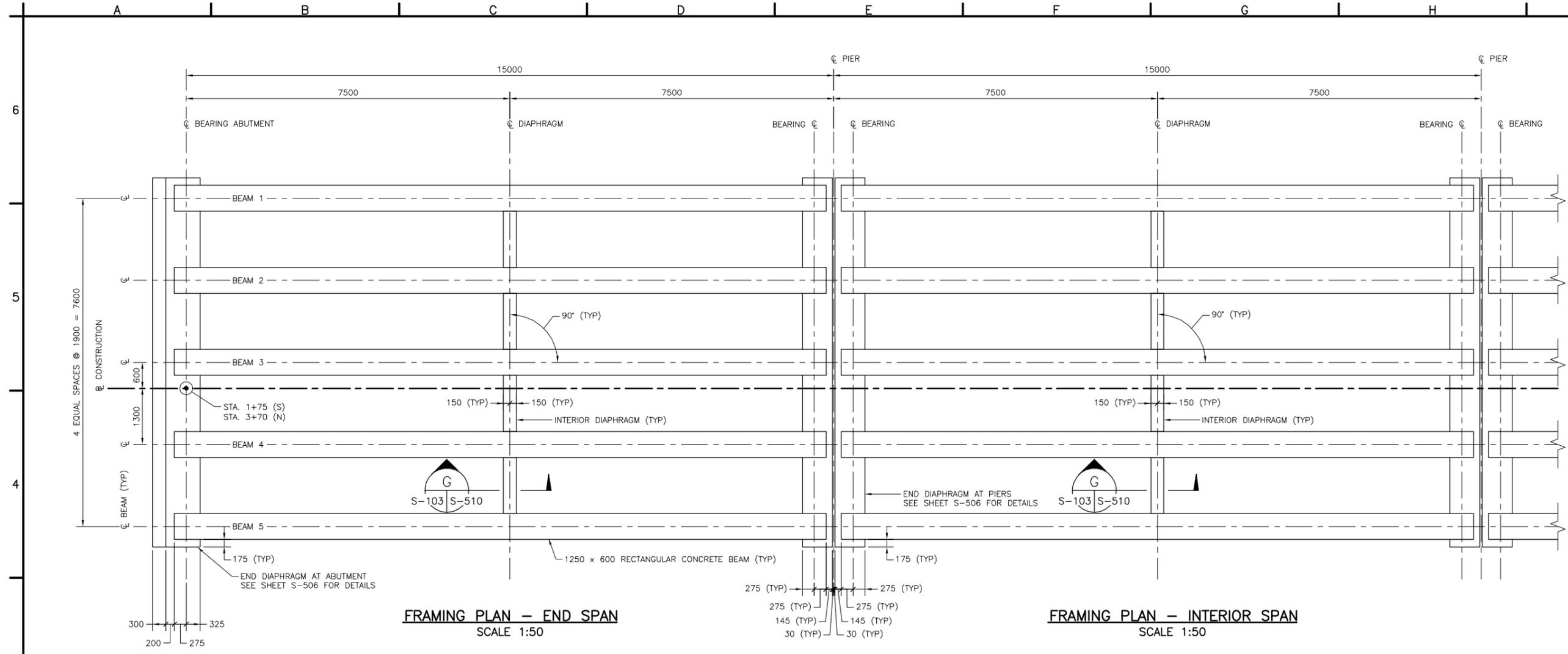
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PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT
BRIDGE GENERAL PLAN
AND ELEVATION
SHEET 2 OF 2

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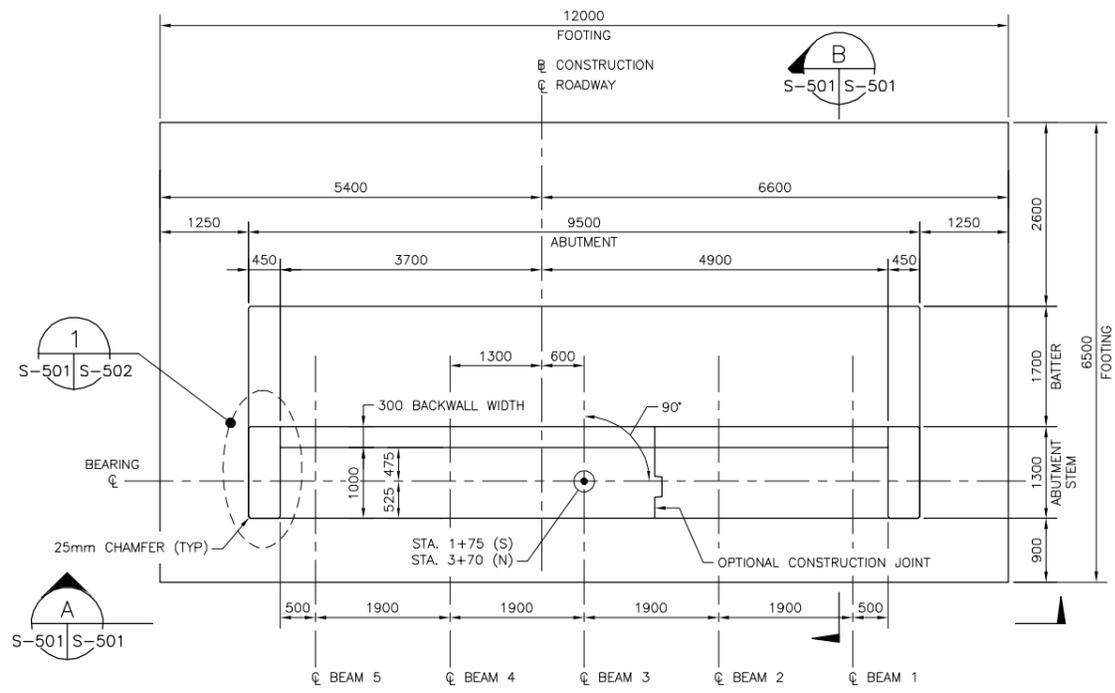
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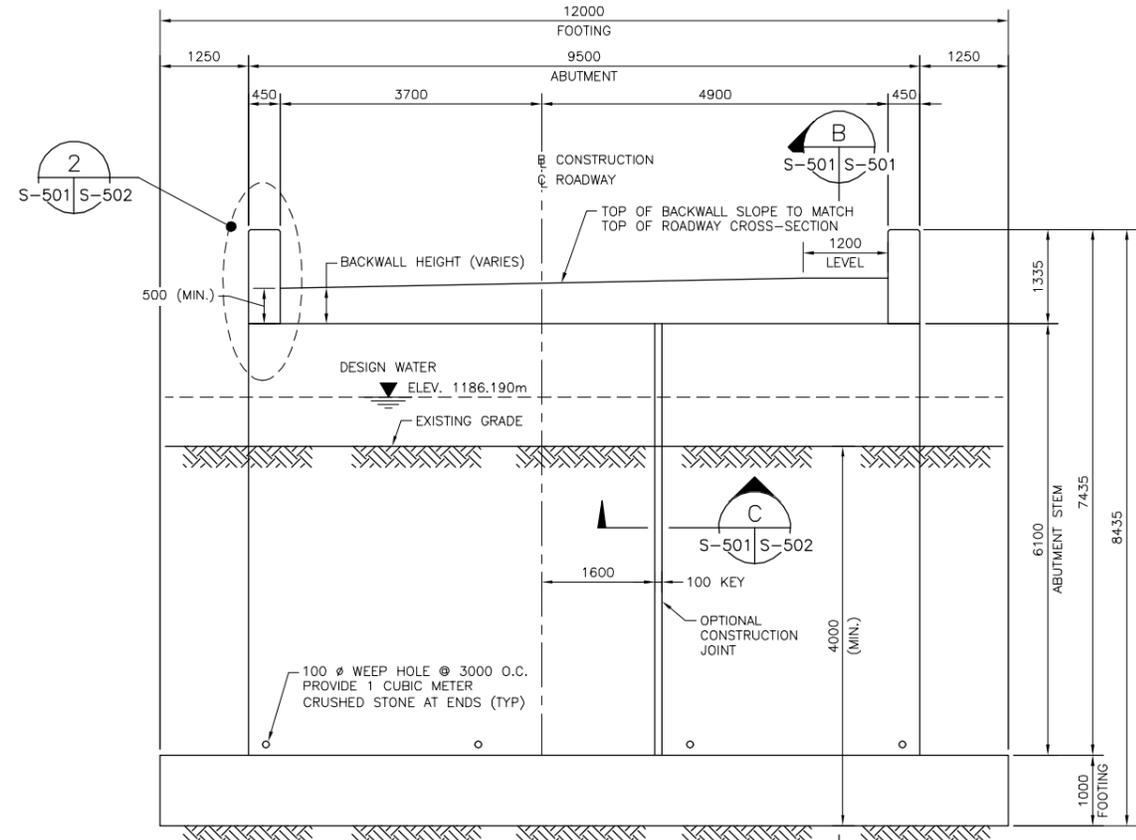
PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT
SUPERSTRUCTURE
FRAMING PLAN

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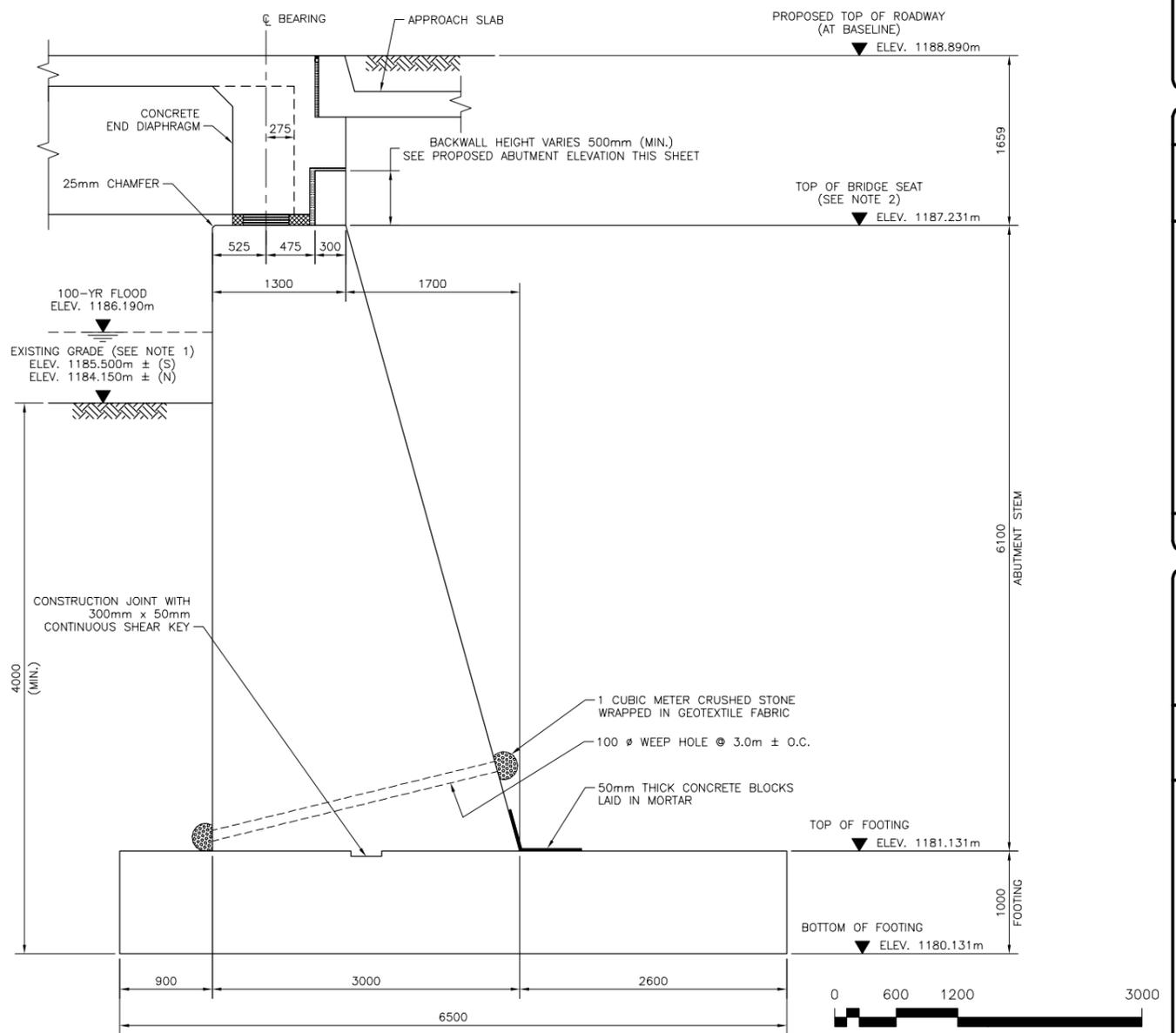
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NOTE: SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR.
PROPOSED ABUTMENT PLAN
 SCALE 1:50

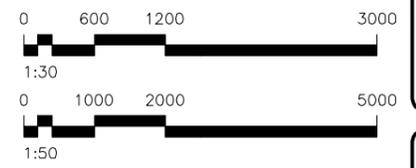


NOTE: SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR.
PROPOSED ABUTMENT ELEVATION
 SCALE 1:50 S-101, S-102, S-501 S-501



PROPOSED ABUTMENT SECTION
 SCALE 1:30 S-501 S-501

- NOTE:**
- FOR RIPRAP LIMITS IN FRONT OF ABUTMENT, SEE DETAILS ON SHEET S-505.
 - NORTH ABUTMENT SHOWN. AT SOUTH ABUTMENT (FIXED BEARINGS), THE BRIDGE SEAT IS LOWER. SEE SIMILAR DETAILS ON S-511.



FINAL DESIGN

DATE	DESCRIPTION
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CHECKED BY:	APL/SAM	CAD FILE NAME:	LT0009-01-S-501

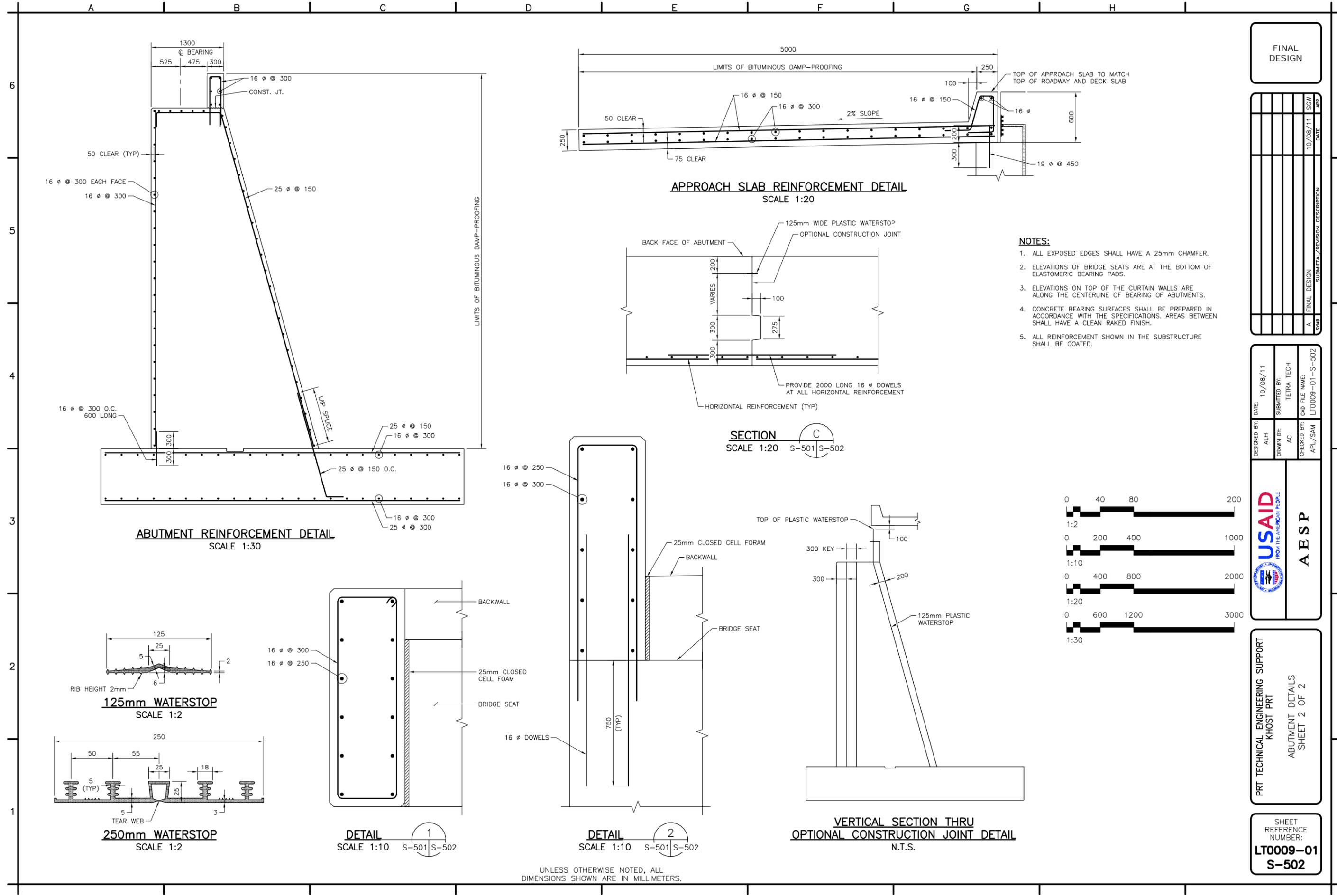
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PRT TECHNICAL ENGINEERING SUPPORT
 KHOST PRT
 ABUTMENT DETAILS
 SHEET 1 OF 2

SHEET REFERENCE NUMBER:
LT0009-01 S-501

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- NOTES:**
1. ALL EXPOSED EDGES SHALL HAVE A 25mm CHAMFER.
 2. ELEVATIONS OF BRIDGE SEATS ARE AT THE BOTTOM OF ELASTOMERIC BEARING PADS.
 3. ELEVATIONS ON TOP OF THE CURTAIN WALLS ARE ALONG THE CENTERLINE OF BEARING OF ABUTMENTS.
 4. CONCRETE BEARING SURFACES SHALL BE PREPARED IN ACCORDANCE WITH THE SPECIFICATIONS. AREAS BETWEEN SHALL HAVE A CLEAN RAKED FINISH.
 5. ALL REINFORCEMENT SHOWN IN THE SUBSTRUCTURE SHALL BE COATED.

FINAL DESIGN

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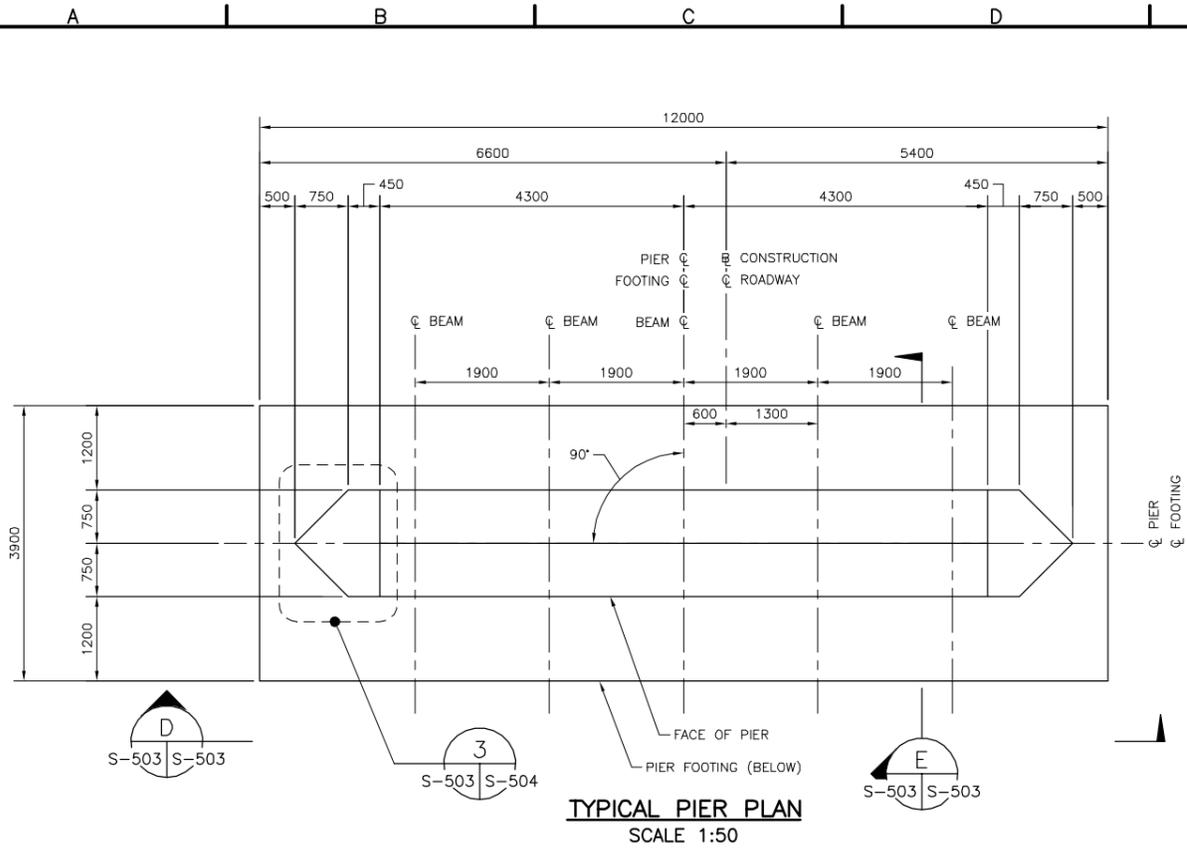
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PRT TECHNICAL ENGINEERING SUPPORT
 KHOST PRT
 ABUTMENT DETAILS
 SHEET 2 OF 2

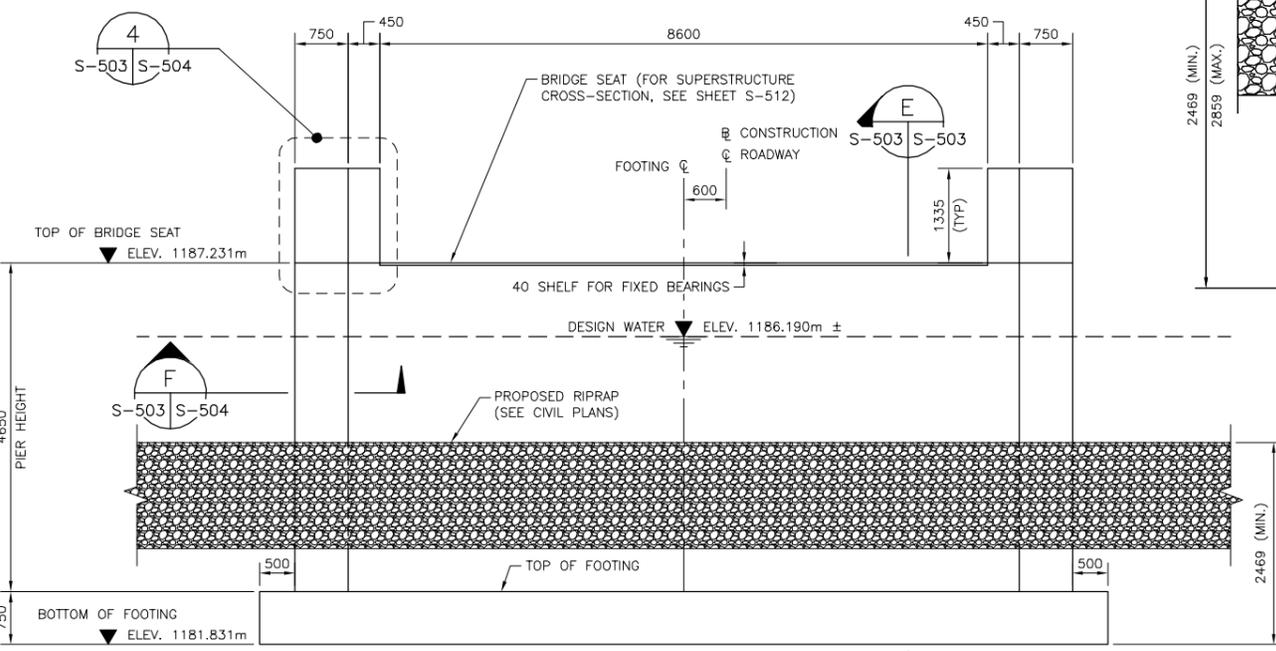
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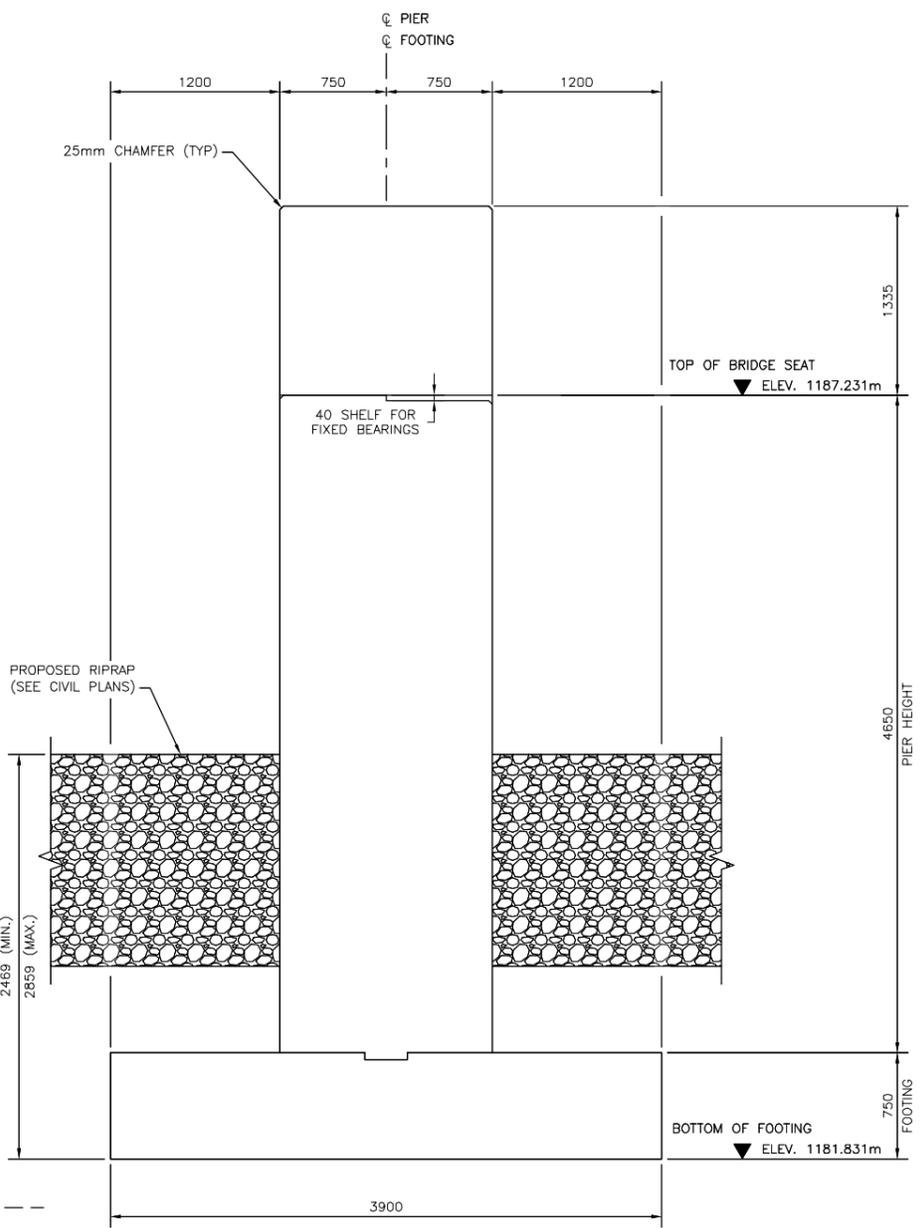
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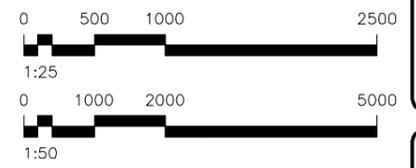
TYPICAL PIER PLAN
SCALE 1:50



TYPICAL PIER ELEVATION
SCALE 1:50



TYPICAL PIER SECTION
SCALE 1:25



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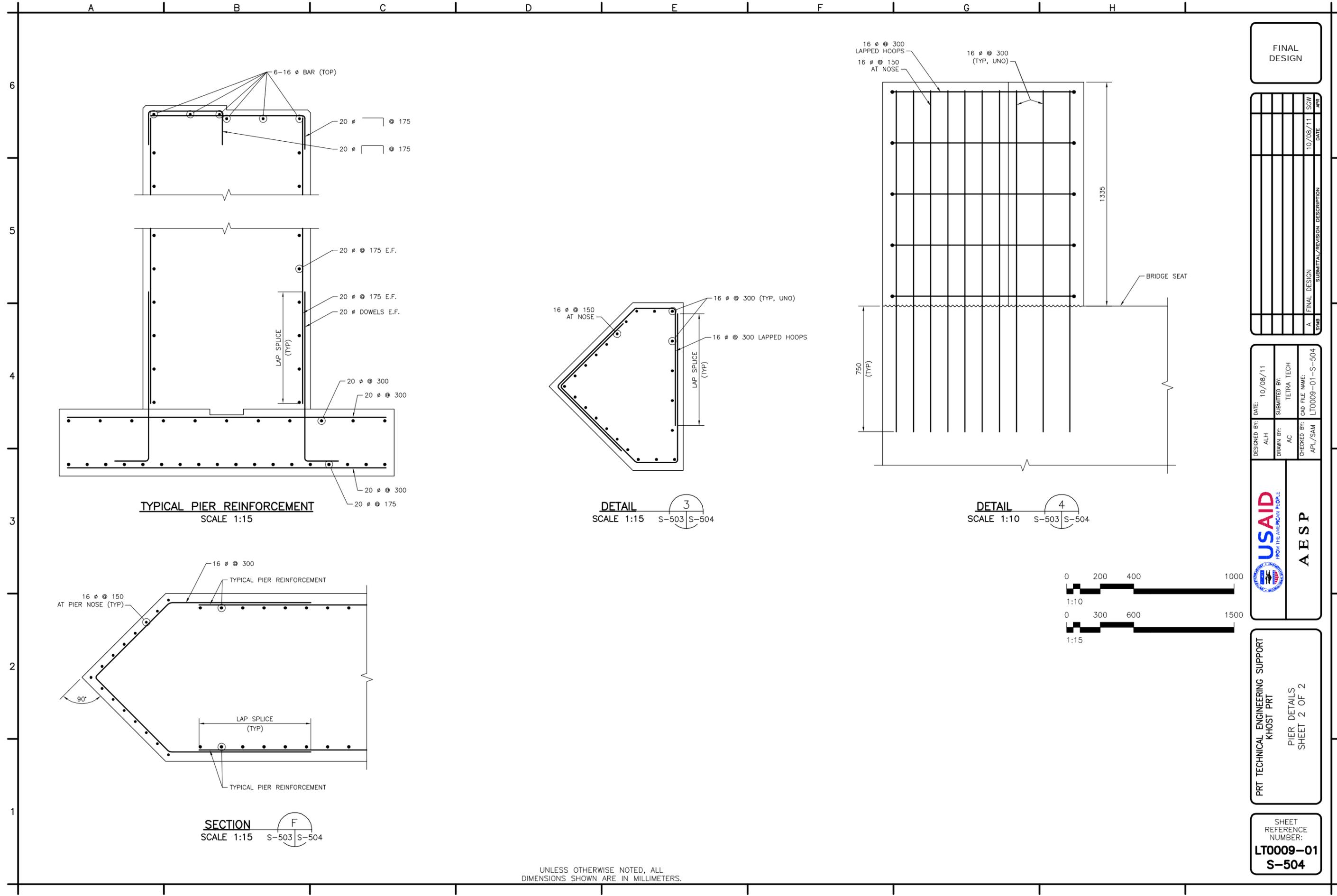
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PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT
PIER DETAILS
SHEET 1 OF 2

SHEET REFERENCE NUMBER:
LT0009-01 S-503

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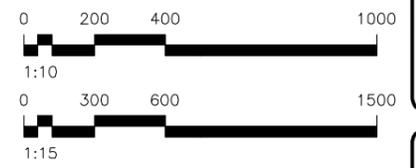


TYPICAL PIER REINFORCEMENT
SCALE 1:15

DETAIL 3
SCALE 1:15 S-503 S-504

DETAIL 4
SCALE 1:10 S-503 S-504

SECTION F
SCALE 1:15 S-503 S-504



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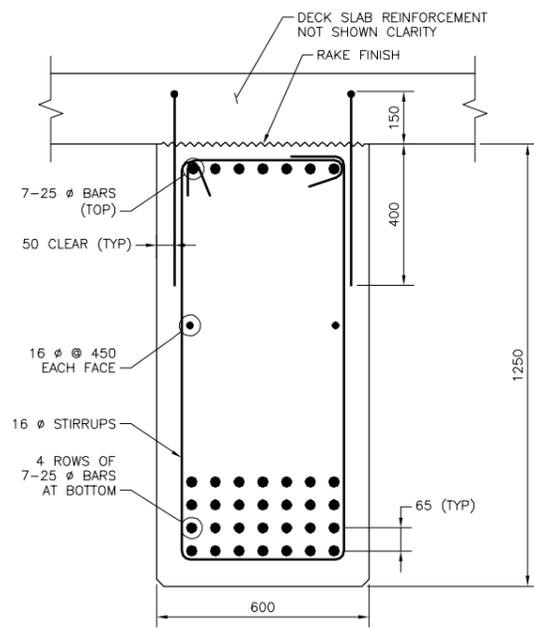
PRT TECHNICAL ENGINEERING SUPPORT KHOST PRT	PIER DETAILS SHEET 2 OF 2
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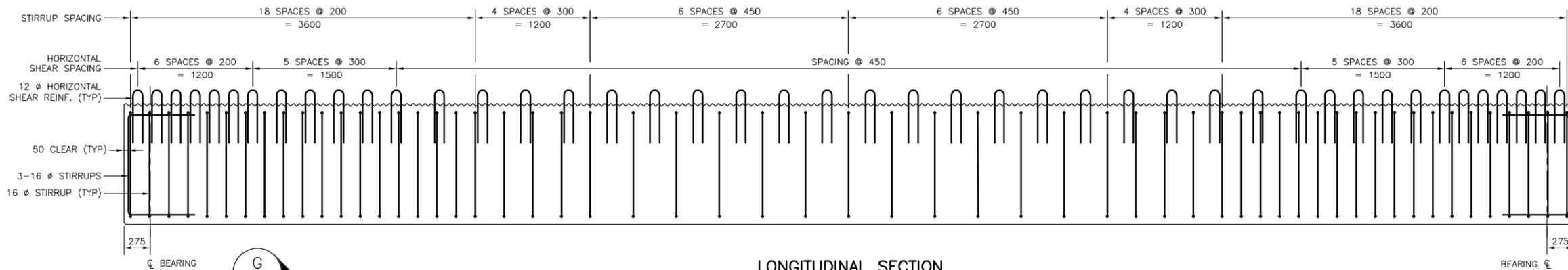
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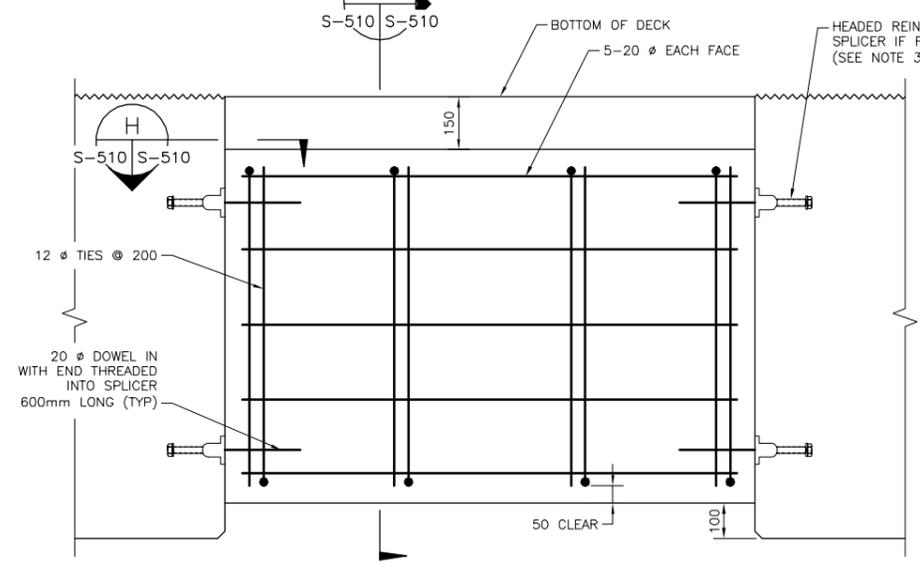
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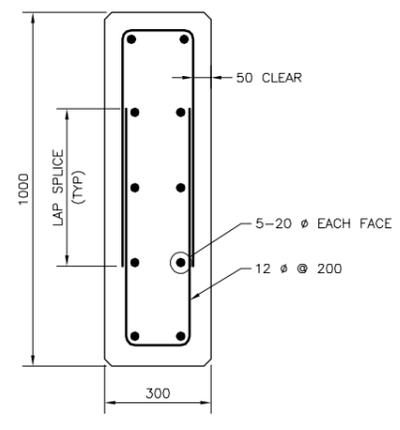
TYPICAL BEAM REINFORCEMENT
SCALE 1:10



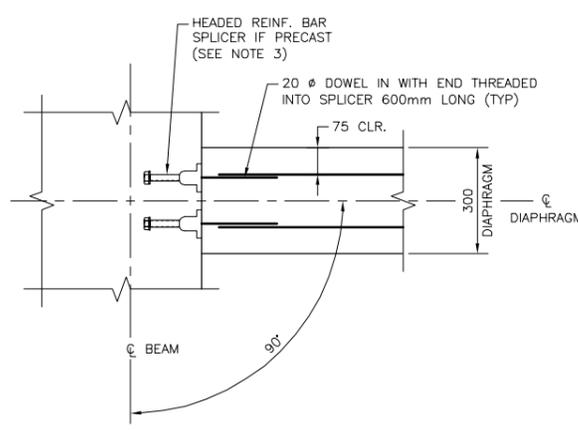
LONGITUDINAL SECTION
SCALE 1:25



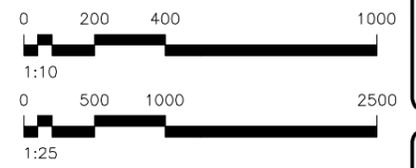
INTERMEDIATION DIAPHRAGM
SCALE 1:10



SECTION
SCALE 1:10 S-103, S-510 S-510



SECTION
SCALE 1:10 S-510 S-510



NOTES:

1. THE TOP OF ALL BEAMS SHALL BE GIVEN A RAKED FINISH (6mm AMPLITUDE) ACROSS THE WIDTH (PERPENDICULAR TO THE BEAM'S AXIS).
2. IF THE BEAMS ARE PRECAST, THE FABRICATOR IS FULLY RESPONSIBLE FOR THE DESIGN OF THE LIFTING DEVICES WHICH SHALL BE ADEQUATE FOR THE SAFETY FACTORS REQUIRED BY THE ERECTION PROCEDURE.
3. HEADED REINFORCEMENT BAR SPLICERS SHALL BE CAST INTO THE PRECAST BEAMS BY THE FABRICATOR. THEY SHALL BE EMBEDDED AS REQUIRED TO PROVIDE A MINIMUM ULTIMATE TENSILE CAPACITY OF 80 kN SPECIFIED BY THE MANUFACTURER.

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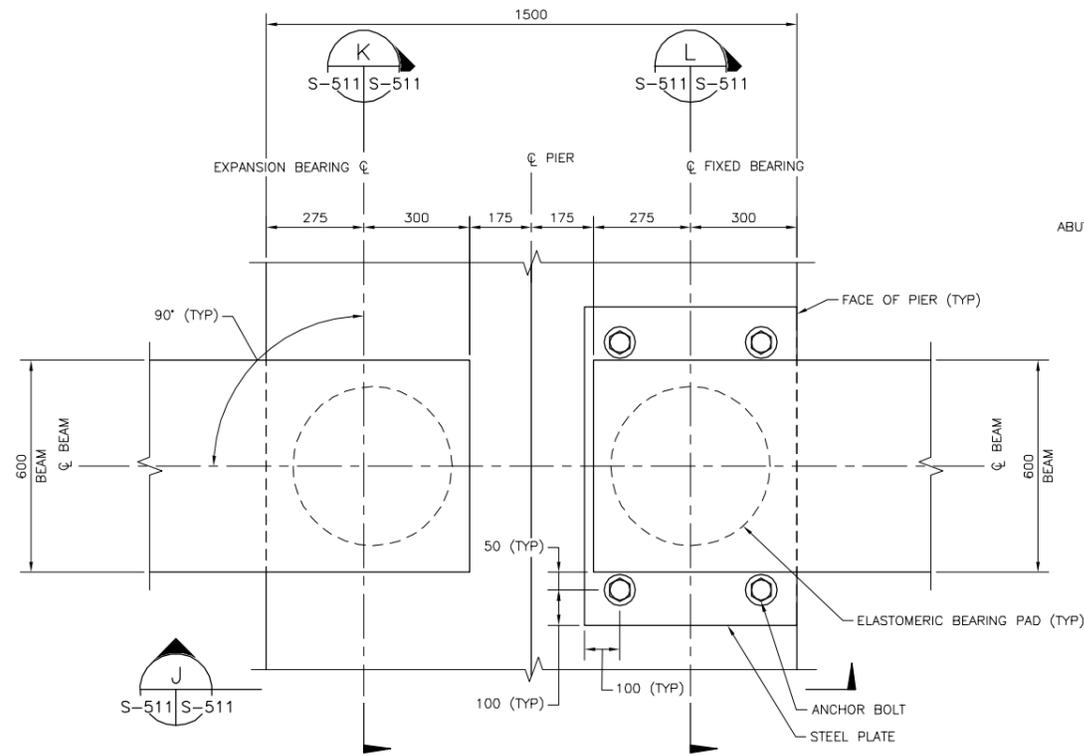
PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT

BEAM DETAILS

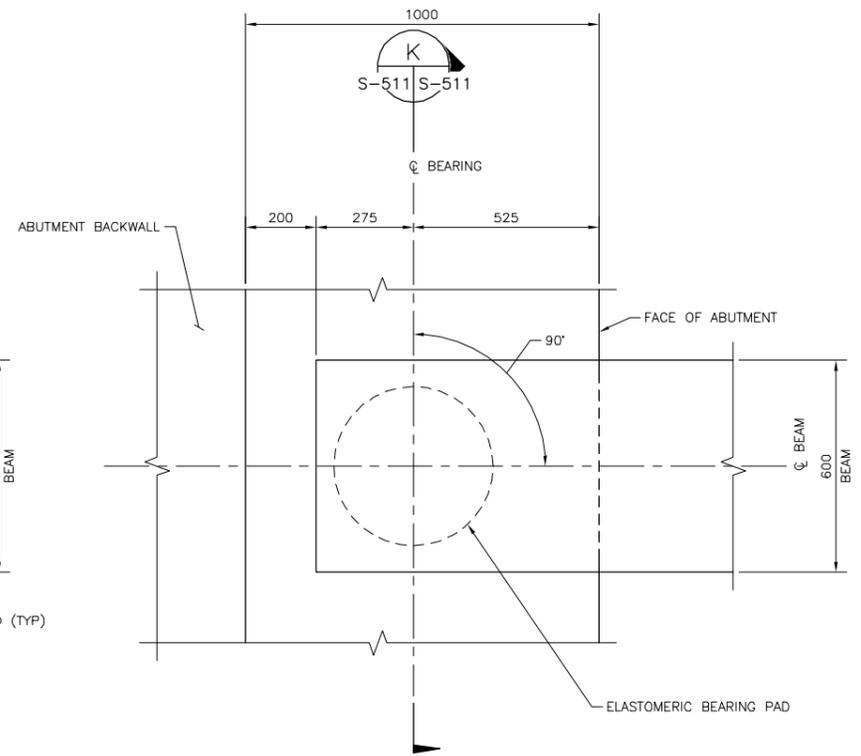
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LT0009-01 S-510

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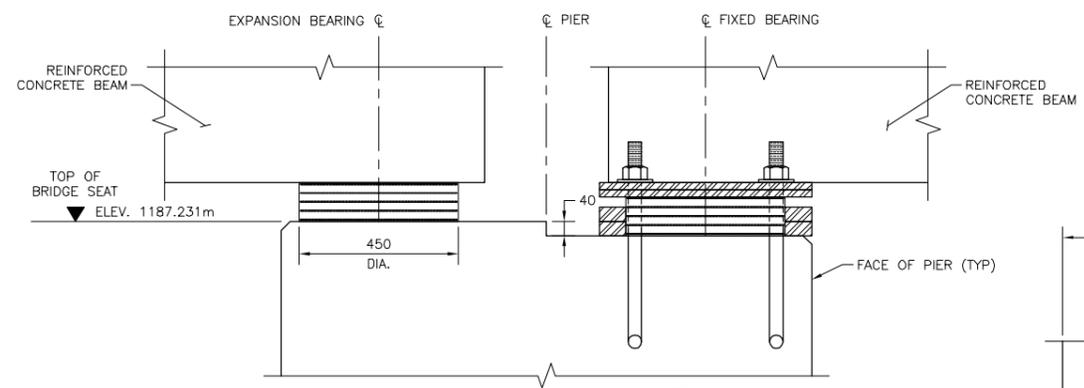
BEAM/BEARING DETAIL AT PIERS
SCALE 1:10



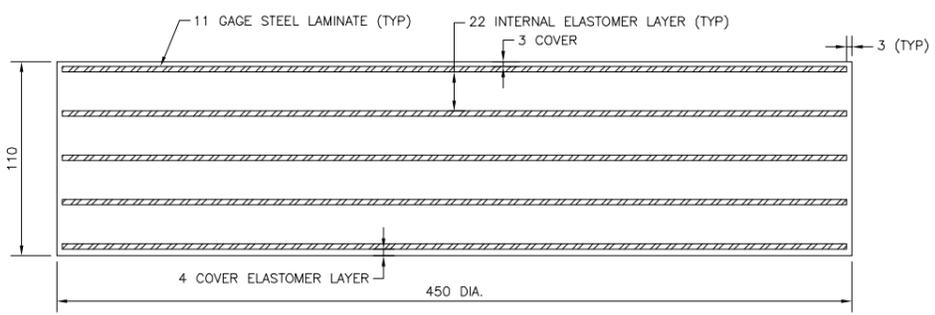
BEAM/BEARING DETAIL AT ABUTMENTS
SCALE 1:10

NOTE: EXPANSION BEARING DETAIL SHOWN, FIXED BEARING SIMILAR.

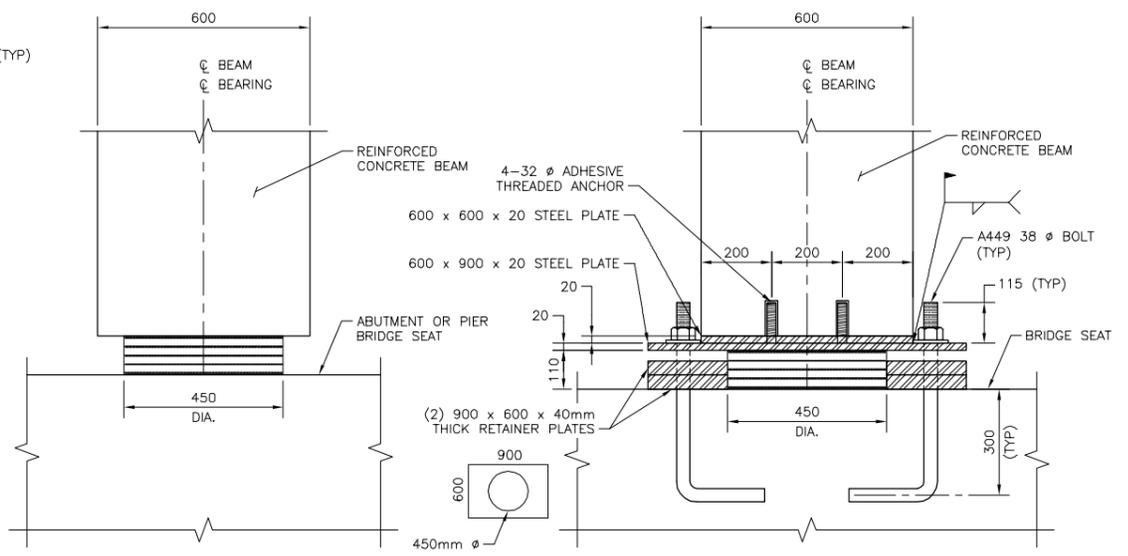
- BEARING NOTES:**
- ELASTOMER SHALL HAVE A HARDNESS OF 60 DUROMETER.
 - STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36 OR HIGHER.
 - THE COMPRESSIVE DESIGN LOAD ON THE BEARING PAD 151.4K KIPS. THE COMPRESSIVE DESIGN STRESS IS THE RESULT OF DIVIDING THE COMPRESSIVE DESIGN LOAD BY THE AREA OF THE PAD AND IS EQUAL TO 0.614 KSI.
 - EACH SPAN SHALL HAVE A FIXED BEARING AT THE SOUTH END AND AN EXPANSION BEARING AT THE NORTH END.



SECTION J
SCALE 1:10

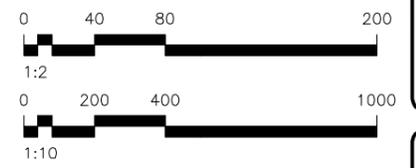


ELASTOMERIC BEARING PAD DETAIL
SCALE 1:2



BEAM/EXPANSION BEARING SECTION
SCALE 1:10

BEAM/FIX BEARING SECTION
SCALE 1:10



FINAL DESIGN

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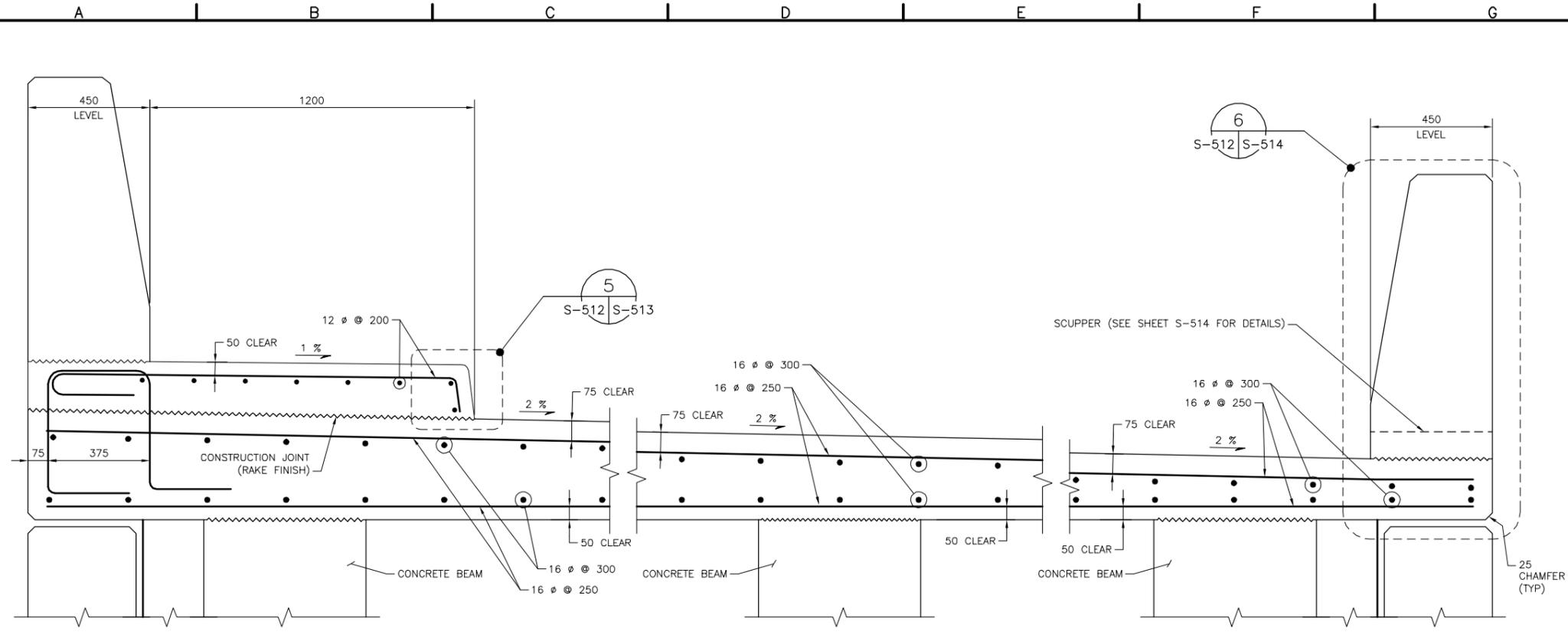
PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT

BEARING DETAILS

SHEET REFERENCE NUMBER:
LT0009-01 S-511

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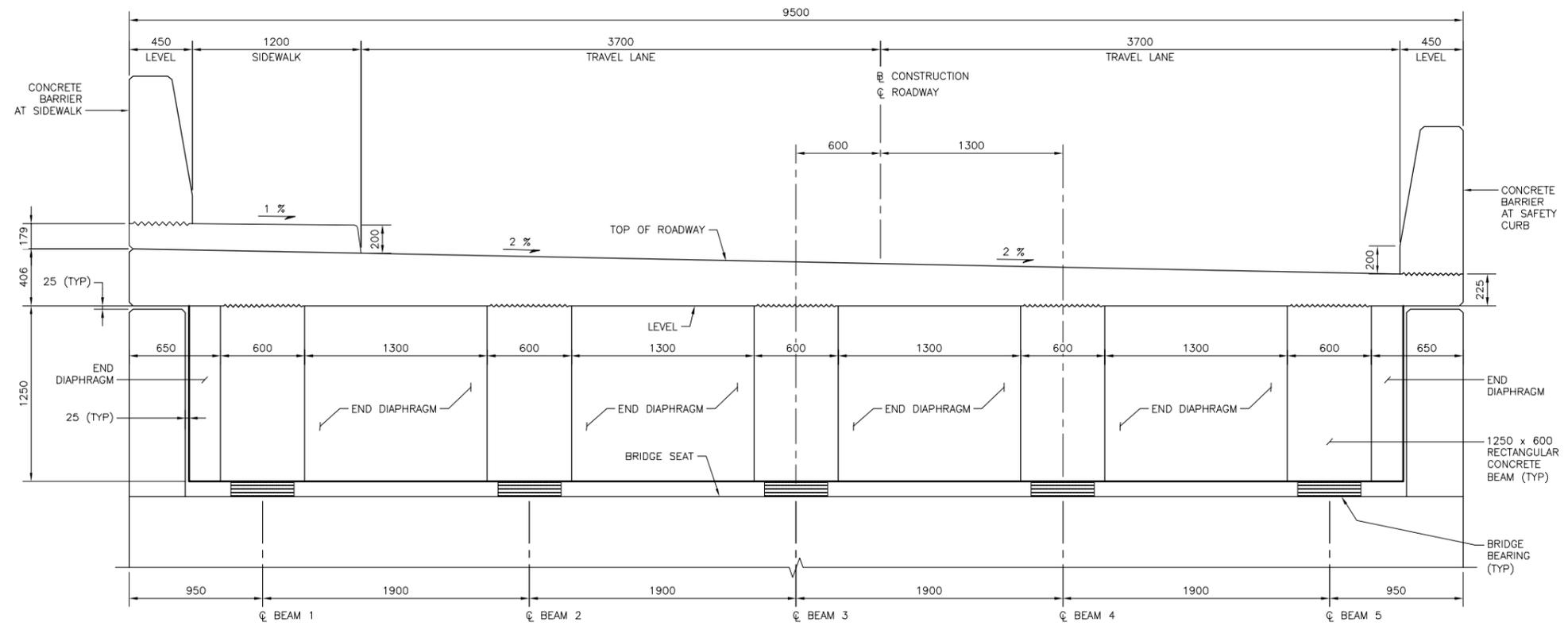
SECTION THRU SIDEWALK
SCALE 1:10

SECTION THRU DECK
SCALE 1:10

SECTION THRU SAFETY CURB
SCALE 1:10

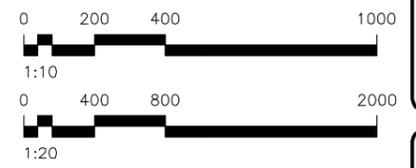
NOTES:

- LONGITUDINAL REINFORCEMENT SHALL BE PLACED PARALLEL TO THE ϕ OF CONSTRUCTION. MAIN REINFORCEMENT SHALL BE PLACED PERPENDICULAR TO THE ϕ OF CONSTRUCTION.
- ALL REINFORCEMENT AND SUPPORT DEVICES SHALL BE COATED. SUPPORT DEVICES SHALL BE SPACED @ 1200mm O.C. MAXIMUM
- THE FINISHED SURFACE OF THE BRIDGE DECK SHALL BE SMOOTH.
- TOP LAYER OF MAIN REINFORCEMENT SHALL BE LAPPED IN THE CENTER OF A BAY, AND THE BOTTOM LAYER OF MAIN REINFORCEMENT SHALL BE LAPPED OVER A BEAM. ALL LAPS IN THE MAIN REINFORCEMENT SHALL BE STAGGERED. SEE GENERAL NOTES FOR LAP LENGTHS, SHEET G-03.
- BRIDGE DECK SLAB FOR EACH SPAN SHALL BE PLACED IN ONE CONTINUOUS OPERATION WITH THE APPROVAL USAID PROVIDED THAT THE INITIAL SET ($F_c = 500$ PSI) OF ALL CONCRETE DOES NOT OCCUR UNTIL AFTER THE COMPLETION OF THE PLACEMENT. AN APPROVED RETARDER SHALL BE USED, WHEN NECESSARY, TO RETAIN THE WORKABILITY OF THE CONCRETE.
- THE SURFACE OF THE PREVIOUSLY CAST CONCRETE SHALL BE BLAST CLEANED, ROUGHENED, WETTED WITH CLEAN WATER, AND THEN FLUSHED WITH A MORTAR COMPOSED OF EQUAL PARTS OF THE CEMENT AND SAND SPECIFIED FOR THE NEW CONCRETE, BEFORE NEW CONCRETE IS PLACED ADJACENT THERETO. NEW CONCRETE SHALL BE PLACED BEFORE MORTAR HAS TAKEN INITIAL SET.
- IN LIEU OF THE MORTAR, AN EPOXY ADHESIVE SUITABLE FOR BONDING FRESH CONCRETE TO HARDENED CONCRETE FOR LOAD BEARING APPLICATIONS MAY BE USED. THE EPOXY ADHESIVE SHALL CONFORM TO AASHTO M 235 TYPE V AND SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- DOWEL BAR SPLICERS SHALL BE USED WHERE USE OF LAP SPLICES IS NOT FEASIBLE.



SUPERSTRUCTURE CROSS-SECTION
SCALE 1:20

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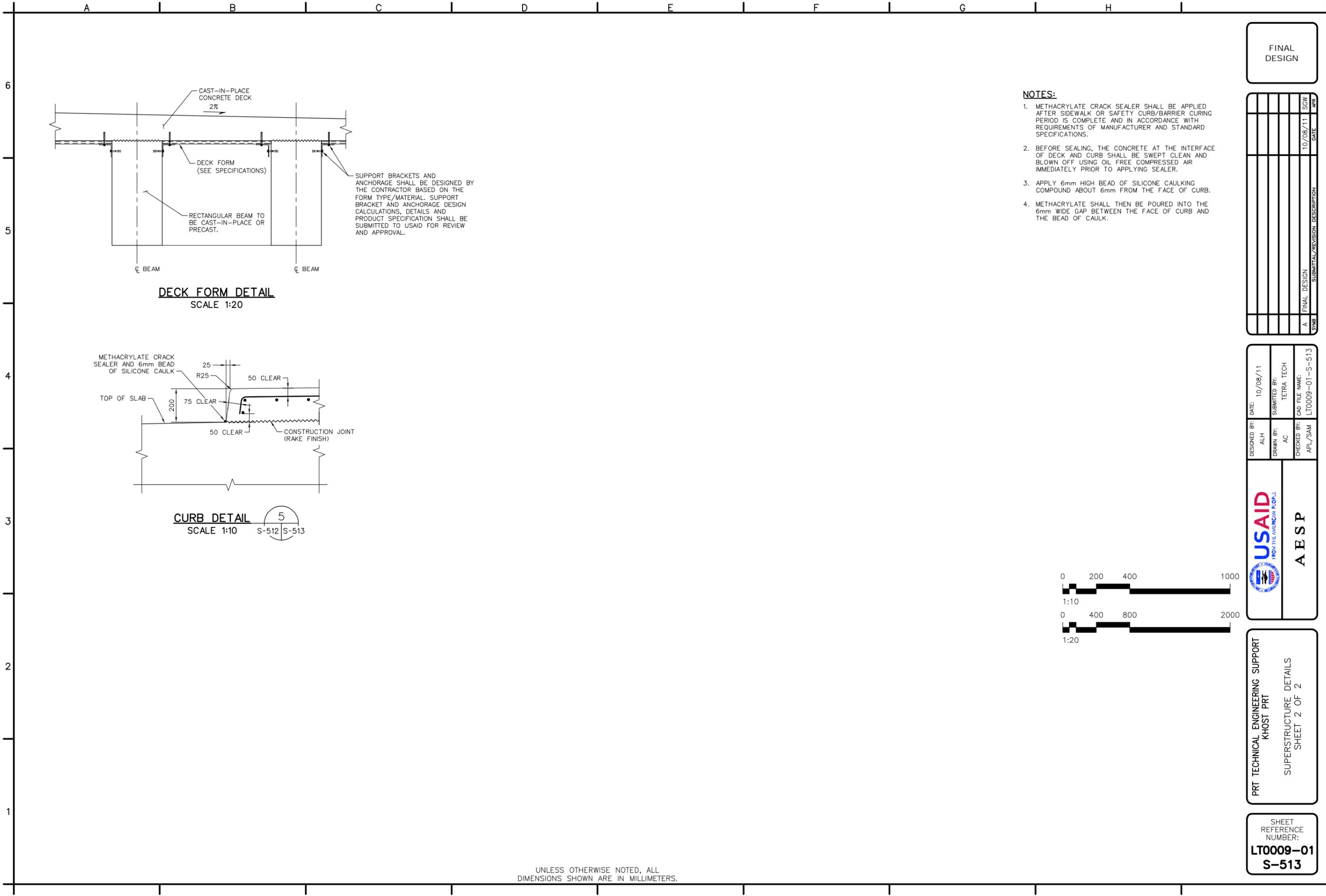
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SUPERSTRUCTURE DETAILS
SHEET 1 OF 2

SHEET REFERENCE NUMBER:
LT0009-01 S-512

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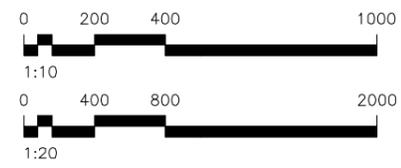


DECK FORM DETAIL
SCALE 1:20

CURB DETAIL
SCALE 1:10

5
S-512 | S-513

- NOTES:**
- METHACRYLATE CRACK SEALER SHALL BE APPLIED AFTER SIDEWALK OR SAFETY CURB/BARRIER CURING PERIOD IS COMPLETE AND IN ACCORDANCE WITH REQUIREMENTS OF MANUFACTURER AND STANDARD SPECIFICATIONS.
 - BEFORE SEALING, THE CONCRETE AT THE INTERFACE OF DECK AND CURB SHALL BE SWEEPED CLEAN AND BLOWN OFF USING OIL FREE COMPRESSED AIR IMMEDIATELY PRIOR TO APPLYING SEALER.
 - APPLY 6mm HIGH BEAD OF SILICONE CAULKING COMPOUND ABOUT 6mm FROM THE FACE OF CURB.
 - METHACRYLATE SHALL THEN BE Poured INTO THE 6mm WIDE GAP BETWEEN THE FACE OF CURB AND THE BEAD OF CAULK.



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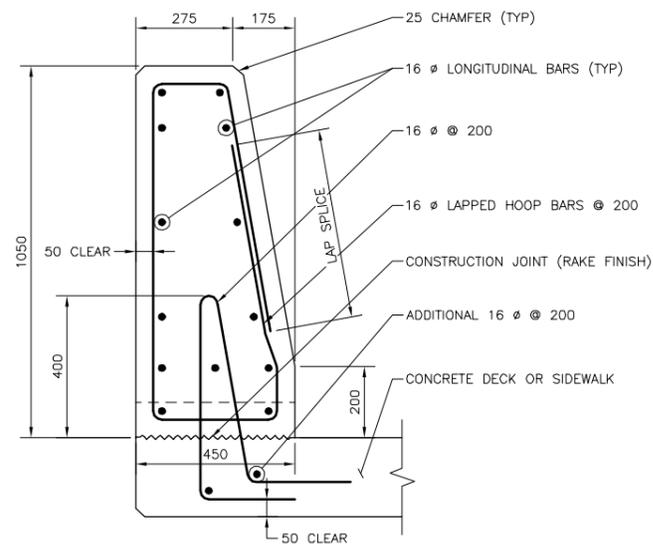
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PRT TECHNICAL ENGINEERING SUPPORT
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SUPERSTRUCTURE DETAILS
SHEET 2 OF 2

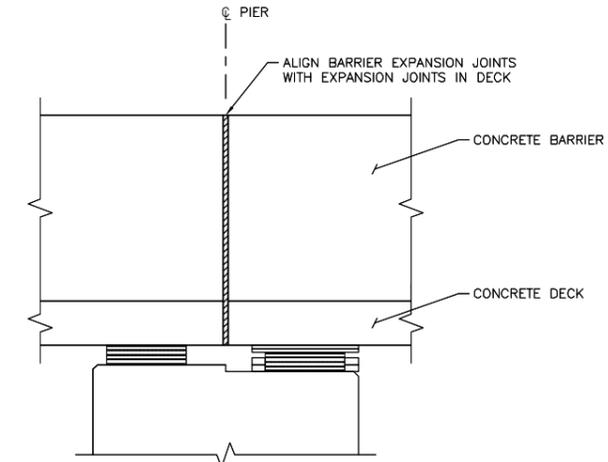
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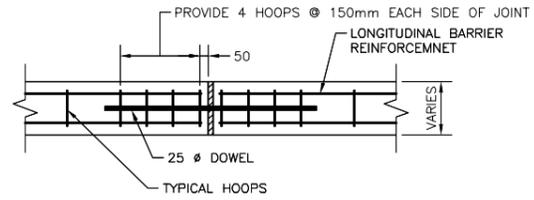
NOTE: DECK REINFORCEMENT NOT SHOWN FOR CLARITY. SEE SEET S-512 FOR DETAILS

CONCRETE BARRIER REINFORCEMENT DETAIL
SCALE 1:10
S-512 | S-514

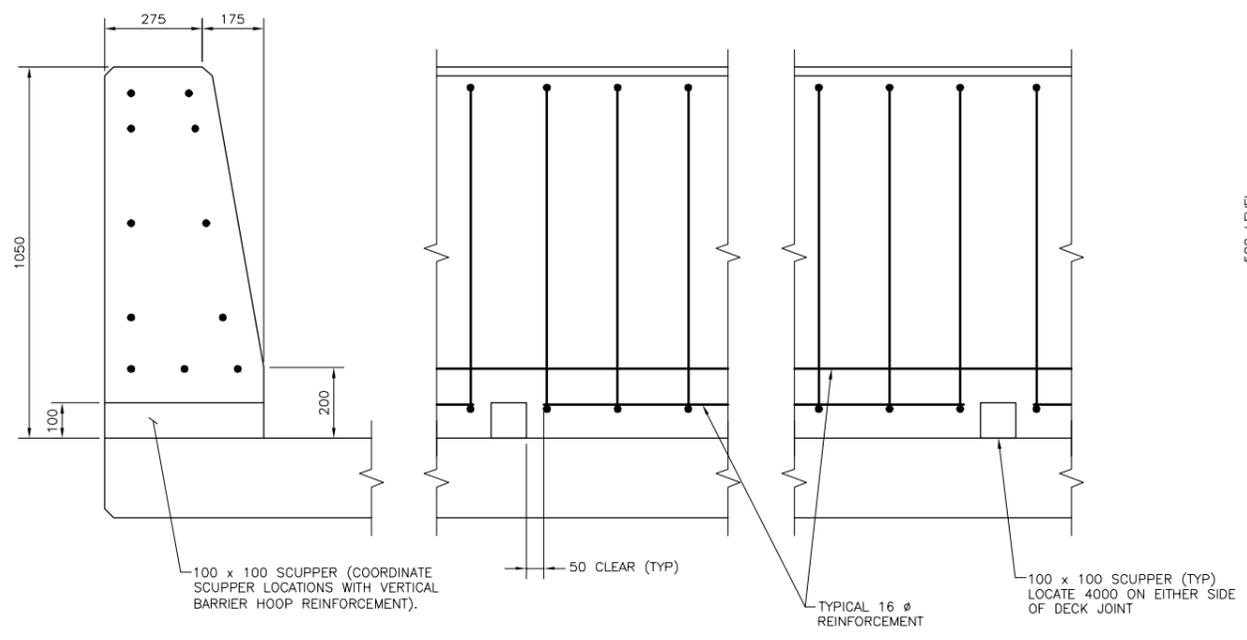


NOTE: SECTION AT PIER SHOWN. SECTION AT ABUTMENT SIMILAR.

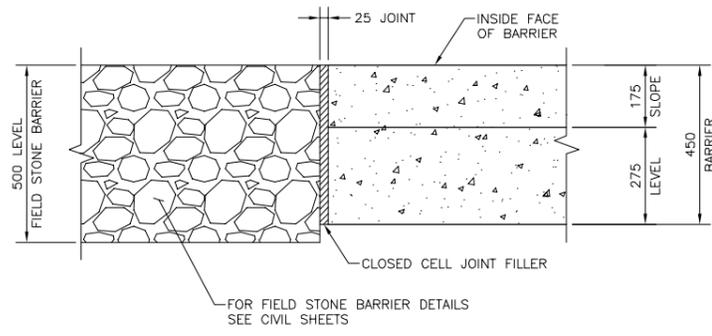
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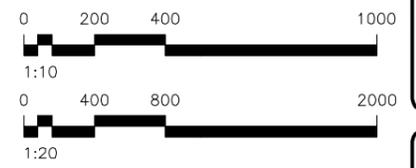
EXPANSION JOINT DETAILS
SCALE 1:20



SCUPPER DETAILS
SCALE 1:10



BRIDGE BARRIER PLAN INTERFACE AT APPROACHES
SCALE 1:10



- NOTES:**
- LONGITUDINAL REINFORCEMENT SHALL BE CONTINUOUS EXCEPT AT EXPANSION JOINT. SEE SHEET G-03 FOR LAP LENGTHS.
 - SCUPPERS ARE PLACED 4000 FROM EACH PIER AND ONLY THRU SAFETY CURB SIDE OF THE DECK.

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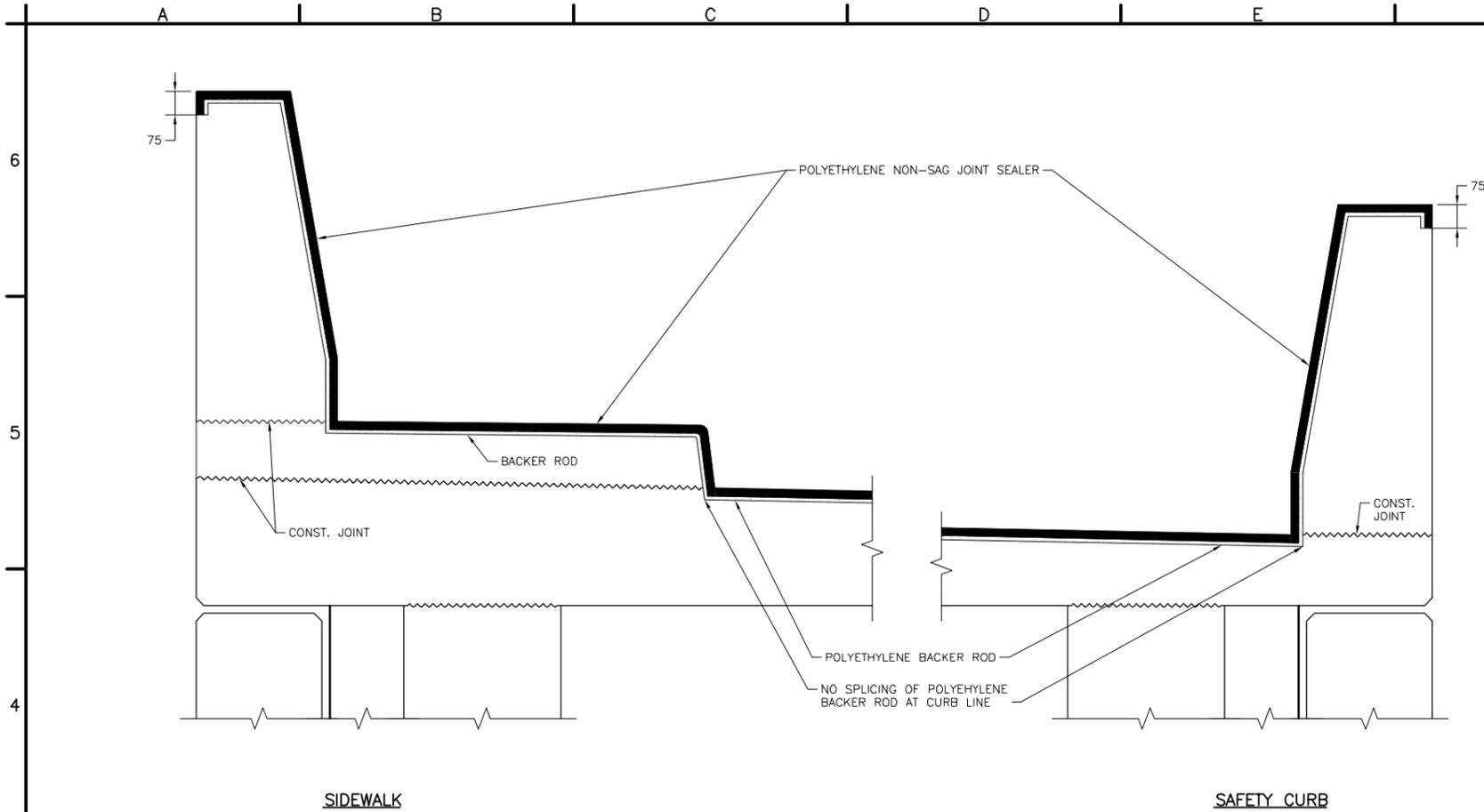
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KHOST PRT
BRIDGE BARRIER DETAILS

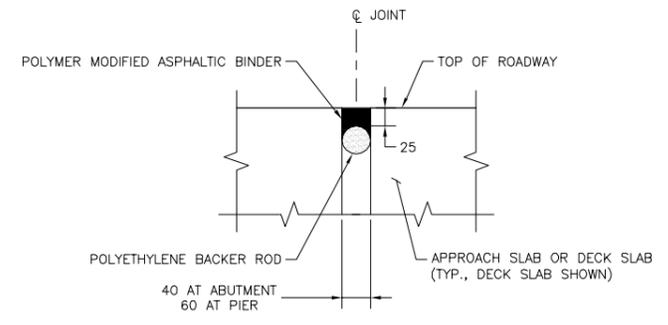
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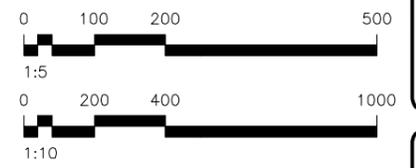
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JOINT DETAIL AT CONCRETE BARRIER
SCALE 1:10



ASPHALTIC BRIDGE JOINT DETAIL
SCALE 1:5



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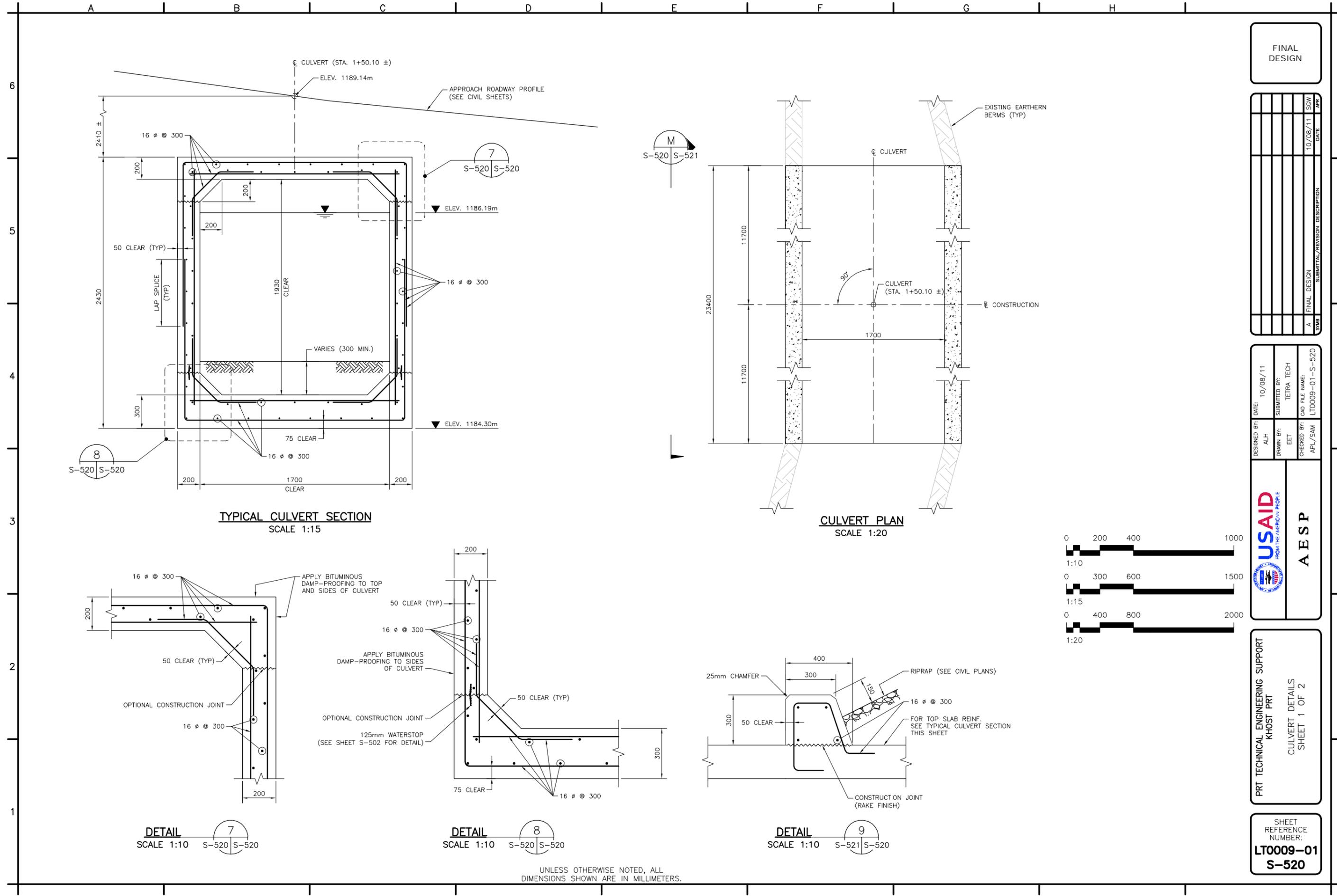
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PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT

JOINT DETAILS

SHEET REFERENCE NUMBER:
LT0009-01 S-515

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CHECKED BY:	APL/SAM	CAD FILE NAME:	LT0009-01-S-520

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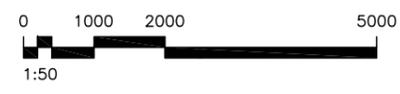
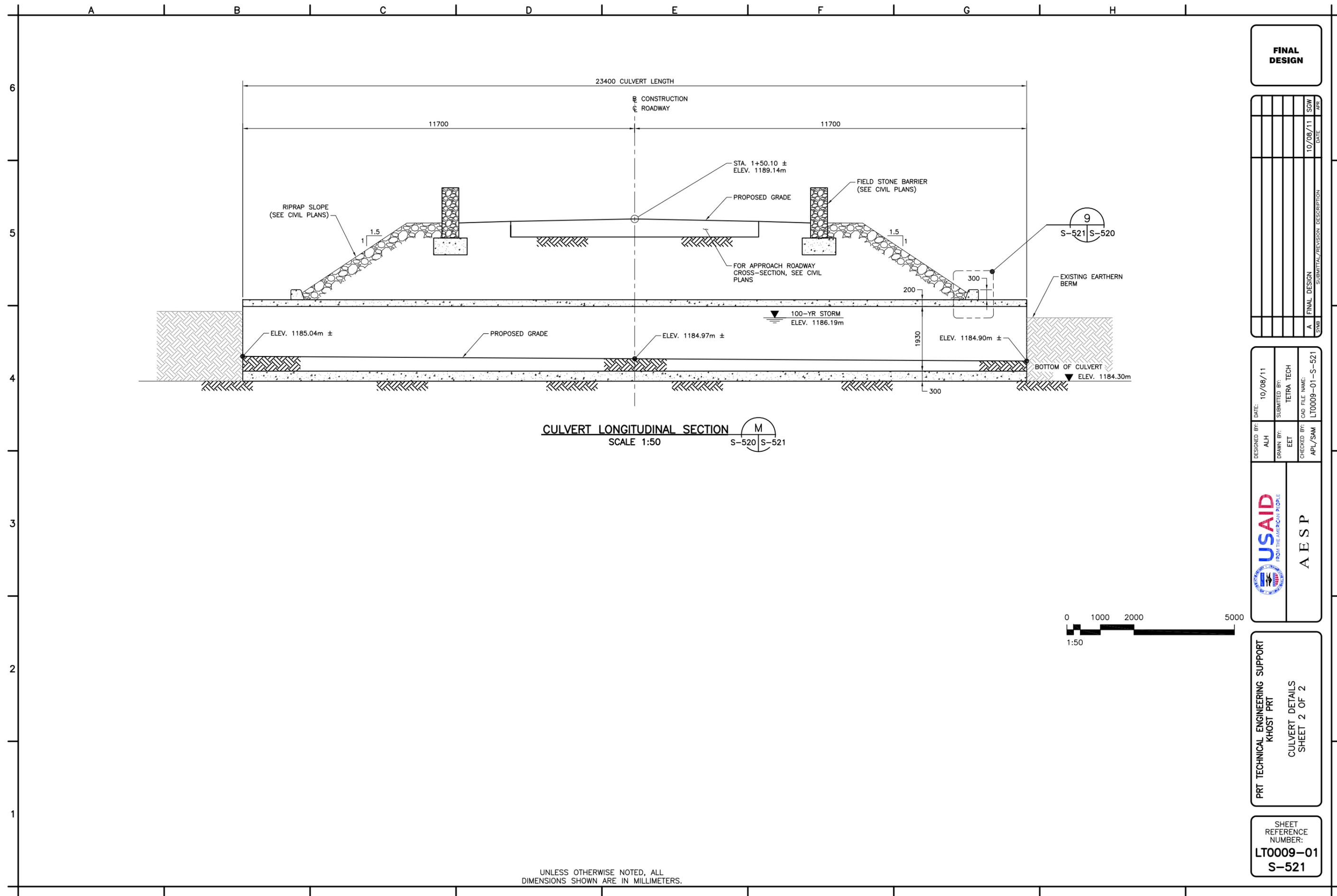
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PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT
CULVERT DETAILS
SHEET 1 OF 2

SHEET REFERENCE NUMBER:
LT0009-01 S-520

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

FINAL DESIGN

NO.	DATE	DESCRIPTION
1	10/06/11	FINAL DESIGN

DESIGNED BY: ALH	DATE: 10/08/11
DRAWN BY: EET	SUBMITTED BY: TETRA TECH
CHECKED BY: APL/SAM	CAD FILE NAME: LT0009-01-S-521

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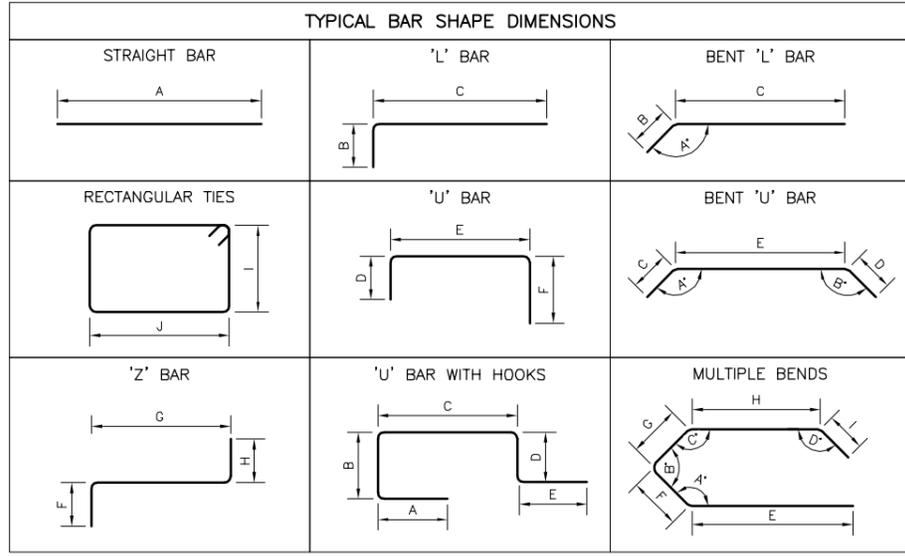
PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT
CULVERT DETAILS
SHEET 2 OF 2

SHEET REFERENCE NUMBER:
**LT0009-01
S-521**

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A B C D E F G H

6



REINFORCING BARS		
BAR SIZE DESIGNATION	DIAMETER [inch]	CROSS SECTIONAL AREA mm ² [in]
10 #	10 [0.3937]	79 [0.1217]
12 #	12 [0.4724]	113 [0.1753]
16 #	16 [0.6299]	201 [0.3116]
20 #	20 [0.7874]	314 [0.4869]
22 #	22 [0.8661]	380 [0.5892]
25 #	25 [0.9843]	491 [0.7609]

- NOTES:**
- ALL REINFORCING STEEL SHALL BE GRADE 60.
 - UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET - STEEL BARS FOR CONCRETE REINFORCEMENT," AASHTO M 31 (ASTM A 615).
 - FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "O" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE, SEE CURRENT (1990) CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE," PAGE 6-4.
 - BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
 - ALL DIMENSIONS ARE OUT-TO-OUT OF BAR.
 - TOTAL BAR LENGTH IS SUMMATION OF BAR DIMENSIONS.
 - REINFORCEMENT TABLE BELOW SHOWS BAR QUANTITIES FOR TYPICAL ABUTMENT.

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1

TYPICAL ABUTMENT REINFORCEMENT SCHEDULE

BAR MARK	BAR DESCRIPTION	BAR SHAPE	BAR	BAR DIMENSION										BAR LENGTH	QUANTITY OF BARS	NOTE	
				A	B	C	D	E	F	G	H	I	J				
25FBT	FOOTING BOTTOM TRANSVERSE	STRAIGHT BAR	25 #	6400	-	-	-	-	-	-	-	-	-	-	6400	41	DETAILS ON SHEET S-502
16FBL	FOOTING BOTTOM LONGITUDINAL	STRAIGHT BAR	16 #	11900	-	-	-	-	-	-	-	-	-	-	11900	23	DETAILS ON SHEET S-502
25FTT	FOOTING TOP TRANSVERSE	STRAIGHT BAR	25 #	6400	-	-	-	-	-	-	-	-	-	-	6400	81	DETAILS ON SHEET S-502
16FTL	FOOTING TOP LONGITUDINAL	STRAIGHT BAR	16 #	11900	-	-	-	-	-	-	-	-	-	-	11900	23	DETAILS ON SHEET S-502
16DF	FOOTING DOWEL (FRONT)	STRAIGHT BAR	16 #	600	-	-	-	-	-	-	-	-	-	-	600	33	DETAILS ON SHEET S-502
25FDB	FOOTING DOWEL (BACK)	BENT 'L' BAR	25 #	106"	425	2024	-	-	-	-	-	-	-	-	2449	64	DETAILS ON SHEET S-502
16SFV	STEM FRONT VERTICAL	STRAIGHT BAR	16 #	6000	-	-	-	-	-	-	-	-	-	-	6000	33	DETAILS ON SHEET S-502
16SFH	STEM FRONT HORIZONTAL	STRAIGHT BAR	16 #	9400	-	-	-	-	-	-	-	-	-	-	9400	21	DETAILS ON SHEET S-502
25SBV	STEM BACK VERTICAL	STRAIGHT BAR	25 #	6230	-	-	-	-	-	-	-	-	-	-	6230	64	DETAILS ON SHEET S-502
16SBH	STEM BACK HORIZONTAL	STRAIGHT BAR	16 #	9400	-	-	-	-	-	-	-	-	-	-	9400	22	DETAILS ON SHEET S-502
16STT	STEM TOP TRANSVERSE	'U' BAR	16 #	-	-	-	425	1200	300	-	-	-	-	-	1800	33	DETAILS ON SHEET S-502
16STL	STEM TOP LONGITUDINAL	STRAIGHT BAR	20 #	9400	-	-	-	-	-	-	-	-	-	-	9400	3	DETAILS ON SHEET S-502
16BH	BACKWALL HORIZONTAL (F&B)	STRAIGHT BAR	16 #	8500	-	-	-	-	-	-	-	-	-	-	8500	6	DETAILS ON SHEET S-502
16BVD	BACKWALL VERTICAL DOWEL	'U' BAR	16 #	-	-	-	1200	200	1200	-	-	-	-	-	2600	30	DETAILS ON SHEET S-502
16CWH	CHECKWALL HORIZONTAL	RECTANGULAR TIES	16 #	-	-	-	-	-	-	-	-	350	1200	3250	12	DETAILS ON SHEET S-502	
16CWV	CHECKWALL VERTICAL	'U' BAR	16 #	-	-	-	1235	350	1235	-	-	-	-	2820	12	DETAILS ON SHEET S-502	
16CWD	CHECKWALL DOWEL	STRAIGHT BAR	16 #	1500	-	-	-	-	-	-	-	-	-	1500	24	DETAILS ON SHEET S-502	
16CJD	CONSTRUCTION JOINT DOWEL	STRAIGHT BAR	16 #	2000	-	-	-	-	-	-	-	-	-	2000	21	DETAILS ON SHEET S-502	

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

FINAL DESIGN

DATE	DESCRIPTION	BY
10/06/11	FINAL DESIGN	SCW
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DESIGNED BY: ALH DATE: 10/08/11
 DRAWN BY: AC SUBMITTED BY: TETRA TECH
 CHECKED BY: APL/SAM CAD FILE NAME: LT0009-01-S-530

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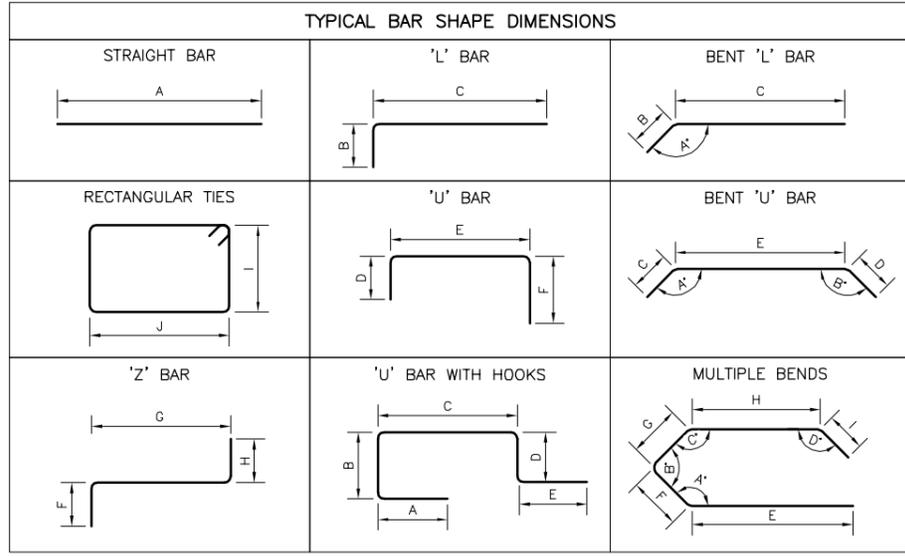
PRT TECHNICAL ENGINEERING SUPPORT
 KHOST PRT
 TYPICAL ABUTMENT REINFORCEMENT SCHEDULE

SHEET REFERENCE NUMBER:
LT0009-01 S-530

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A B C D E F G H

6



REINFORCING BARS		
BAR SIZE DESIGNATION	DIAMETER [inch]	CROSS SECTIONAL AREA mm ² [in]
10 #	10 [0.3937]	79 [0.1217]
12 #	12 [0.4724]	113 [0.1753]
16 #	16 [0.6299]	201 [0.3116]
20 #	20 [0.7874]	314 [0.4869]
22 #	22 [0.8661]	380 [0.5892]
25 #	25 [0.9843]	491 [0.7609]

NOTES:

1. ALL REINFORCING STEEL SHALL BE GRADE 60.
2. UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET - STEEL BARS FOR CONCRETE REINFORCEMENT," AASHTO M 31 (ASTM A 615).
3. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "0" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE, SEE CURRENT (1990) CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE," PAGE 6-4.
4. BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
5. ALL DIMENSIONS ARE OUT-TO-OUT OF BAR.
6. TOTAL BAR LENGTH IS SUMMATION OF BAR DIMENSIONS.
7. REINFORCEMENT TABLE BELOW SHOWS BAR QUANTITIES FOR TYPICAL PIER.

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1

TYPICAL PIER REINFORCEMENT SCHEDULE

BAR MARK	BAR DESCRIPTION	BAR SHAPE	BAR	BAR DIMENSION										BAR LENGTH	QUANTITY OF BARS	NOTE	
				A	B	C	D	E	F	G	H	I	J				
20FBT	FOOTING BOTTOM TRANSVERSE	STRAIGHT BAR	20 #	3800	-	-	-	-	-	-	-	-	-	-	3800	41	DETAILS ON SHEET S-504
20FBL	FOOTING BOTTOM LONGITUDINAL	STRAIGHT BAR	20 #	11900	-	-	-	-	-	-	-	-	-	-	11900	23	DETAILS ON SHEET S-504
20FTT	FOOTING TOP TRANSVERSE	STRAIGHT BAR	20 #	3800	-	-	-	-	-	-	-	-	-	-	3800	41	DETAILS ON SHEET S-504
20FTL	FOOTING TOP LONGITUDINAL	STRAIGHT BAR	20 #	11900	-	-	-	-	-	-	-	-	-	-	11900	14	DETAILS ON SHEET S-504
20FD	FOOTING DOWELS	'L' BAR	20 #	-	300	1970	-	-	-	-	-	-	-	-	2270	144	DETAILS ON SHEET S-504
20PV	PIER VERTICAL (F&B)	STRAIGHT BAR	20 #	4500	-	-	-	-	-	-	-	-	-	-	4500	110	DETAILS ON SHEET S-504
20PH	PIER HORIZONTAL (F&B)	STRAIGHT BAR	20 #	9400	-	-	-	-	-	-	-	-	-	-	9400	54	DETAILS ON SHEET S-504
16PHT	PIER HORIZONTAL TOP	STRAIGHT BAR	16 #	9400	-	-	-	-	-	-	-	-	-	-	9400	6	DETAILS ON SHEET S-504
20PTL	PIER TOP L	'L' BAR	20 #	-	300	1400	-	-	-	-	-	-	-	-	1700	50	DETAILS ON SHEET S-504
20PTU	PIER TOP U	'U' BAR	20 #	-	-	-	300	650	300	-	-	-	-	-	1250	50	DETAILS ON SHEET S-504
16PNV	PIER NOSE VERTICAL	STRAIGHT BAR	16 #	4510	-	-	-	-	-	-	-	-	-	-	4510	30	DETAILS ON SHEET S-504
16PNH	PIER NOSE HORIZONTAL	MULTIPLE BENDS	16 #	135'	90'	135'	0'	840	679	679	840	0	-	-	3038	34	DETAILS ON SHEET S-504
16CWV	CHECKWALL VERTICAL	STRAIGHT BAR	16 #	1585	-	-	-	-	-	-	-	-	-	-	1585	46	DETAILS ON SHEET S-504
16CWLH	CHECKWALL LAPPED HOOPS	MULTIPLE BENDS	16 #	90'	135'	90'	0'	600	679	350	1000	0	-	-	2629	24	DETAILS ON SHEET S-504

FINAL DESIGN

DATE	DESCRIPTION	BY
10/06/11	FINAL DESIGN	SCW
		APR

DESIGNED BY: ALH	DATE: 10/08/11
DRAWN BY: AC	SUBMITTED BY: TETRA TECH
CHECKED BY: APL/SAM	CAD FILE NAME: LT0009-01-S-531

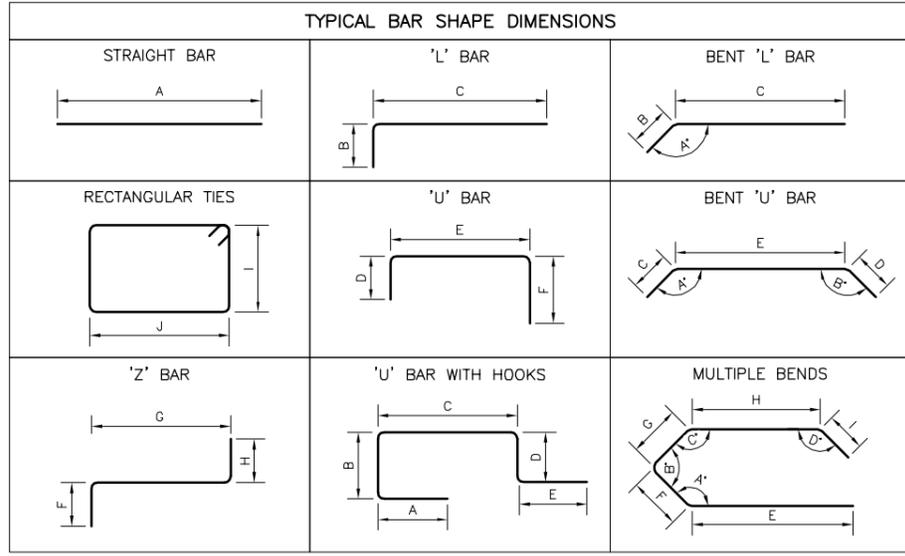
PRT TECHNICAL ENGINEERING SUPPORT
KHOST PRT
TYPICAL PIER REINFORCEMENT SCHEDULE

SHEET REFERENCE NUMBER:
LT0009-01 S-531

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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A B C D E F G H



REINFORCING BARS		
BAR SIZE DESIGNATION	DIAMETER [inch]	CROSS SECTIONAL AREA mm ² [in]
10 #	10 [0.3937]	79 [0.1217]
12 #	12 [0.4724]	113 [0.1753]
16 #	16 [0.6299]	201 [0.3116]
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 - TOTAL BAR LENGTH IS SUMMATION OF BAR DIMENSIONS.
 - REINFORCEMENT TABLE BELOW SHOWS BAR QUANTITIES FOR TYPICAL SPAN.

TYPICAL SUPERSTRUCTURE INTERIOR SPAN REINFORCEMENT SCHEDULE (X11)																		
BAR MARK	BAR DESCRIPTION	BAR SHAPE	BAR	BAR DIMENSION										BAR LENGTH	QUANTITY OF BARS	NOTE		
				A	B	C	D	E	F	G	H	I	J					
16PEDMH	PIER END DIAPHRAGM MAIN HORI.	STRAIGHT BAR	16 #	8450	-	-	-	-	-	-	-	-	-	-	-	8450	14 (7*2)	DETAILS ON SHEET S-506
16PEDLH	PIER END DIAPHRAGM LONG HORI.	STRAIGHT BAR	16 #	1200	-	-	-	-	-	-	-	-	-	-	-	1200	24 (12*2)	DETAILS ON SHEET S-506
16PEDSH	PIER END DIAPHRAGM SHORT HORI.	STRAIGHT BAR	16 #	75	-	-	-	-	-	-	-	-	-	-	-	75	12 (6*2)	DETAILS ON SHEET S-506
16PEDS	PIER END DIAPHRAGM STIRRUP	'U' BAR	16 #	-	-	-	595	1355	595	-	-	-	-	-	-	2545	128 (64*2)	DETAILS ON SHEET S-506
20IDH	INTERIOR DIAPHRAGM HORIZONTAL	STRAIGHT BAR	20 #	1200	-	-	-	-	-	-	-	-	-	-	-	1200	40 (10*4)	DETAILS ON SHEET S-510
12IDS	INTERIOR DIAPHRAGM STIRRUP	'U' BAR	12 #	-	-	-	900	200	900	-	-	-	-	-	-	2000	56 (14*4)	DETAILS ON SHEET S-510
20IDD	INTERIOR DIAPHRAGM DOWEL	STRAIGHT BAR	20 #	600	-	-	-	-	-	-	-	-	-	-	-	600	32 (8*4)	DETAILS ON SHEET S-510
25BH1	BEAM HORIZONTAL 1 (T&B)	STRAIGHT BAR	25 #	11900	-	-	-	-	-	-	-	-	-	-	-	11900	175 (35*5)	DETAILS ON SHEET S-510
25BHT2	BEAM HORIZONTAL TOP 2	STRAIGHT BAR	25 #	5706	-	-	-	-	-	-	-	-	-	-	-	5236	35 (7*5)	DETAILS ON SHEET S-510
25BHB2	BEAM HORIZONTAL BOTTOM 2	STRAIGHT BAR	25 #	5000	-	-	-	-	-	-	-	-	-	-	-	5000	140 (28*5)	DETAILS ON SHEET S-510
16BH1	BEAM HORIZONTAL 1 (MIDDLE)	STRAIGHT BAR	16 #	11900	-	-	-	-	-	-	-	-	-	-	-	11900	10 (2*5)	DETAILS ON SHEET S-510
16BH2	BEAM HORIZONTAL 2 (MIDDLE)	STRAIGHT BAR	16 #	3832	-	-	-	-	-	-	-	-	-	-	-	3832	10 (2*5)	DETAILS ON SHEET S-510
16BMS	BEAM MAIN STIRRUP	RECTANGULAR TIES	16 #	-	-	-	-	-	-	-	-	500	1150	-	-	3450	285 (57*5)	DETAILS ON SHEET S-510
12BS	BEAM SHEAR	'U' BAR	12 #	-	-	-	550	100	550	-	-	-	-	-	-	1200	410 (82*5)	DETAILS ON SHEET S-510
16BES	BEAM END STIRRUP	'U' BAR	16 #	-	-	-	600	1100	600	-	-	-	-	-	-	2300	30 (6*5)	DETAILS ON SHEET S-510
16DT	DECK TRANSVERSE (T&B)	STRAIGHT BAR	16 #	9350	-	-	-	-	-	-	-	-	-	-	-	9350	122	DETAILS ON SHEET S-512
16DL1	DECK LONGITUDINAL 1 (T&B)	STRAIGHT BAR	16 #	11900	-	-	-	-	-	-	-	-	-	-	-	11900	66	DETAILS ON SHEET S-512
16DL2	DECK LONGITUDINAL 2 (T&B)	STRAIGHT BAR	16 #	4072	-	-	-	-	-	-	-	-	-	-	-	4072	66	DETAILS ON SHEET S-512
16SVD	SIDEWALK VERTICAL DOWEL	'U' BAR WITH HOOKS	16 #	300	485	375	485	300	-	-	-	-	-	-	-	1945	76	DETAILS ON SHEET S-512
16ST	SIDEWALK TRANSVERSE	MULTIPLE BENDS	12 #	90	90	90	0	100	1500	50	300	0	-	-	-	1950	76	DETAILS ON SHEET S-512
12SL1	SIDEWALK LONGITUDINAL 1	STRAIGHT BAR	12 #	11900	-	-	-	-	-	-	-	-	-	-	-	11900	8	DETAILS ON SHEET S-512
12SL2	SIDEWALK LONGITUDINAL 2	STRAIGHT BAR	12 #	3843	-	-	-	-	-	-	-	-	-	-	-	3843	8	DETAILS ON SHEET S-512
16BVD	BARRIER VERTICAL DOWELS	MULTIPLE BENDS	16 #	90	20	270	0	300	550	500	300	0	-	-	-	1650	76	DETAILS ON SHEET S-514
16BS	BARRIER STIRRUP	MULTIPLE BENDS	16 #	102	90	90	90	770	200	950	350	770	-	-	-	3040	76	DETAILS ON SHEET S-514
16BL1	BARRIER LONGITUDINAL 1	STRAIGHT BAR	16 #	11900	-	-	-	-	-	-	-	-	-	-	-	11900	28 (13+15)	DETAILS ON SHEET S-514
16BL2	BARRIER LONGITUDINAL 2	STRAIGHT BAR	16 #	4072	-	-	-	-	-	-	-	-	-	-	-	4072	28 (13+15)	DETAILS ON SHEET S-514
16BLS1	BARRIER LONGITUDINAL @ SCUP. 1	STRAIGHT BAR	16 #	3900	-	-	-	-	-	-	-	-	-	-	-	3900	4 (2*2)	DETAILS ON SHEET S-514
16BLS2	BARRIER LONGITUDINAL @ SCUP. 2	STRAIGHT BAR	16 #	6740	-	-	-	-	-	-	-	-	-	-	-	6800	2 (2*1)	DETAILS ON SHEET S-514

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

FINAL DESIGN

NO.	DATE	DESCRIPTION
1	10/06/11	FINAL DESIGN
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DESIGNED BY: ALH
 DRAWN BY: AC
 CHECKED BY: APL/SAM

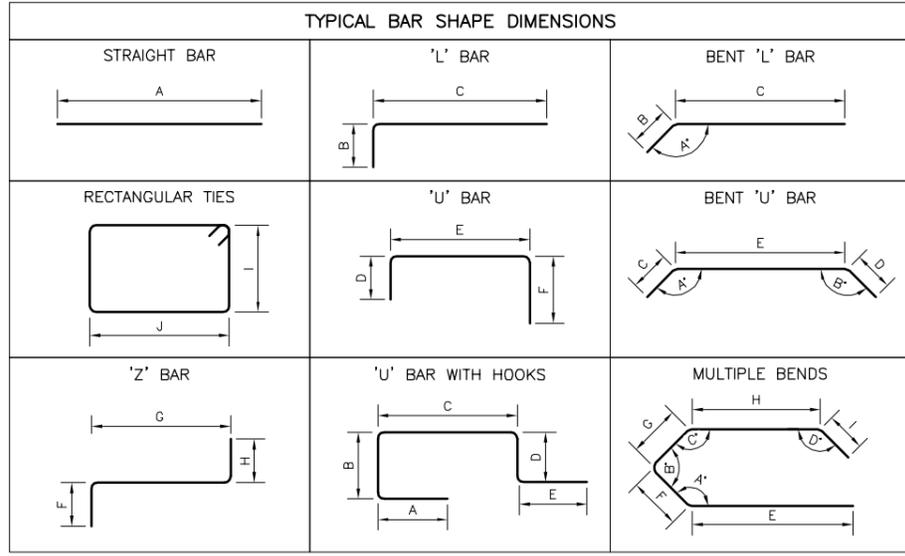
DATE: 10/08/11
 SUBMITTED BY: TETRA TECH
 CAD FILE NAME: LT0009-01-S-532

AESP

PRT TECHNICAL ENGINEERING SUPPORT
 KHOST PRT
 TYPICAL SUPERSTRUCTURE
 INTERIOR SPAN
 REINFORCEMENT SCHEDULE

SHEET REFERENCE NUMBER:
LT0009-01 S-532

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REINFORCING BARS

BAR SIZE DESIGNATION	DIAMETER [inch]	CROSS SECTIONAL AREA mm ² [in]
10 #	10 [0.3937]	79 [0.1217]
12 #	12 [0.4724]	113 [0.1753]
16 #	16 [0.6299]	201 [0.3116]
20 #	20 [0.7874]	314 [0.4869]
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 - TOTAL BAR LENGTH IS SUMMATION OF BAR DIMENSIONS.

CULVERT REINFORCEMENT SCHEDULE

BAR MARK	BAR DESCRIPTION	BAR SHAPE	BAR	BAR DIMENSION										BAR LENGTH	QUANTITY OF BARS	NOTE	
				A	B	C	D	E	F	G	H	I	J				
16BSBT	BASE SLAB BOTTOM TRANSVERSE	'U' BAR	16 #	-	-	-	1585	2000	1585	-	-	-	-	-	5170	79	DETAILS ON SHEET S-520
16BSTT	BASE SLAB TOP TRANSVERSE	STRAIGHT BAR	16 #	2000	-	-	-	-	-	-	-	-	-	-	2000	79	DETAILS ON SHEET S-520
16WIV	WALL INSIDE VERTICAL	STRAIGHT BAR	16 #	2300	-	-	-	-	-	-	-	-	-	-	2300	158	DETAILS ON SHEET S-520
16TSBT	TOP SLAB BOTTOM TRANSVERSE	STRAIGHT BAR	16 #	2000	-	-	-	-	-	-	-	-	-	-	2000	79	DETAILS ON SHEET S-520
16TSTT	TOP SLAB TOP TRANSVERSE	'U' BAR	16 #	-	-	-	1510	2000	1510	-	-	-	-	-	5020	79	DETAILS ON SHEET S-520
16GC	GENERAL CORNER	BENT 'U' BAR	16 #	135'	135'	300	300	325	-	-	-	-	-	-	925	316	DETAILS ON SHEET S-520
16GL	GENERAL LONGITUDINAL	STRAIGHT BAR	16 #	8555	-	-	-	-	-	-	-	-	-	-	8555	180	DETAILS ON SHEET S-520
16CH	CURB HORIZONTAL	STRAIGHT BAR	16 #	2000	-	-	-	-	-	-	-	-	-	-	2000	8	DETAILS ON SHEET S-520
16CD	CURB DOWEL	MULTIPLE BENDS	16 #	90'	90'	108'	252'	300	400	200	315	300	-	1515	16	DETAILS ON SHEET S-520	

APPROACH SLAB REINFORCEMENT SCHEDULE (X2)

BAR MARK	BAR DESCRIPTION	BAR SHAPE	BAR	BAR DIMENSION										BAR LENGTH	QUANTITY OF BARS	NOTE	
				A	B	C	D	E	F	G	H	I	J				
16SL	SLAB LONGITUDINAL (T&B)	STRAIGHT BAR	16 #	4900	-	-	-	-	-	-	-	-	-	-	4900	100	DETAILS ON SHEET S-502
16ST	SLAB TRANSVERSE (T&B)	STRAIGHT BAR	16 #	7300	-	-	-	-	-	-	-	-	-	-	7300	38	DETAILS ON SHEET S-502
20SD	SLAB DOWEL	STRAIGHT BAR	20 #	450	-	-	-	-	-	-	-	-	-	-	450	18	DETAILS ON SHEET S-502
16SS	SLAB STIRRUP	MULTIPLE BENDS	16 #	90'	90'	108'	252'	300	443	150	425	300	-	1618	50	DETAILS ON SHEET S-502	

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

FINAL DESIGN

DATE	DESCRIPTION	BY
10/06/11	FINAL DESIGN	SCW
		APR

DESIGNED BY: ALH DATE: 10/08/11
 DRAWN BY: AC SUBMITTED BY: TETRA TECH
 CHECKED BY: APL/SAM CAD FILE NAME: LT0009-01-S-534

AESP

PRT TECHNICAL ENGINEERING SUPPORT
 KHOST PRT
 CULVERT AND APPROACH SLAB REINFORCEMENT SCHEDULE

SHEET REFERENCE NUMBER:
LT0009-01 S-534