

STRUCTURAL NOTES

GENERAL

- ALL DIMENSIONS ARE GENERALLY IN METERS (m) UNLESS OTHERWISE INDICATED
- FOR VERTICAL AND HORIZONTAL ALIGNMENT, DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL DRAWINGS.
- DRAWINGS ARE GENERALLY MADE TO SCALE, HOWEVER, NO DIMENSION SHOULD BE SCALED FROM DRAWINGS UNLESS SHOWN OTHERWISE.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS & ELEVATIONS SHOWN ON DRAWINGS AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORK.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PREPARE ALL NECESSARY DESIGNS AND DRAWINGS TO THE APPROVAL OF THE ENGINEER.
- ALL CONSTRUCTION MATERIALS TO WHICH REFERENCE IS MADE IN THE DRAWINGS, AND IN THE TYPICAL DETAILS SHALL CONFORM TO THE APPLICABLE CODES AND STANDARDS FOR CONSTRUCTION, AND TO THE SPECIFICATIONS.

DESIGN CRITERIA

- STRUCTURAL DESIGN WAS BASED ON "THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES BY THE " AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS. AASHTO LRFD FORTH EDITION (2007).
- THE FOLLOWING CODES COULD BE USED AS REFERENCES TO BE CONSULTED FOR MORE SPECIALIZED ASPECTS:
 - AASHTO LRFD BRIDGES DESIGN SPECIFICATIONS 2007 (SI UNITS).
 - JORDANIAN CODE FOR HIGHWAY BRIDGES.
 - CODE OF REINFORCED & PLAIN CONCRETE JORDANIAN CODE.
 - AMERICAN CONCRETE INSTITUTE CODE FOR CONCRETE STRUCTURE (ACI 318-08).

CONCRETE COVER

- MINIMUM CLEAR COVER TO REINFORCEMENT, UNLESS OTHERWISE SPECIFIED, SHALL BE AS FOLLOWS:

ELEMENT TYPE	CLEAR COVER (mm)
DECK SLAB	35
REINFORCED BEAMS AND DIAPHRAGMS	40
PARAPETS, BARRIERS	35
PIERS AND CAPS	60
ABUTMENTS AND RETAINING WALLS STEMS	60
ABUTMENTS AND RETAINING WALLS FOUNDATION	75
UNDERPASS SLABS	40
UNDERPASS WALLS	60
UNDERPASS FOUNDATION	75
APPROACH SLAB	35

LOADING CASES AND DEFINITIONS:

MATERIAL UNIT WEIGHT:

- CONCRETE =25kN/M³
- ASPHALT =22kN/M³
- SOIL =19kN/M³

SEISMIC LOADING:

- SEISMIC ZONE.....2A
- ACCELERATION COEFFICIENT (A).....0.19
- SOIL PROFILE TYPE.....SII
- OCCUPANCY CATEGORY.....ESSENTIAL
- RESPONSE MODIFICATION FACTOR, R.....2

WIND LOADING:

- BASIC WIND SPEED (V10).....160 km/hr

BREAKING FORCE.

CENTRIFUGAL FORCE.

UNIFORM TEMPERATURE:

- TEMPERATURE FALL.....30 C
- TEMPERATURE RISE.....30 C

TEMPERATURE GRADIENT:

- POSITIVE VALUE (T1).....30 C
- POSITIVE VALUE (T2).....7.8 C
- NEGATIVE VALUE (T1).....6 C
- NEGATIVE VALUE (T2).....1.56 C

COLLISION LOADING:

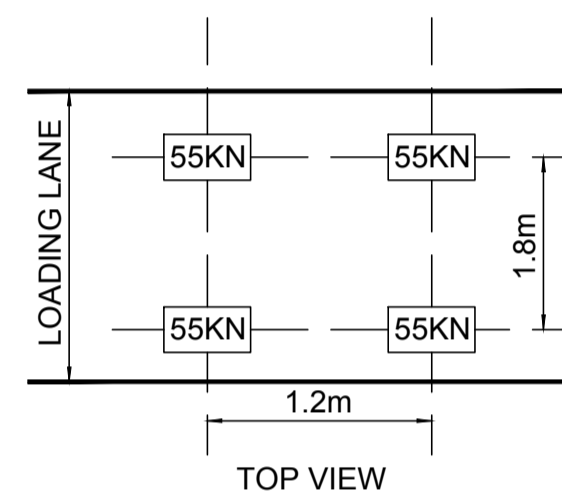
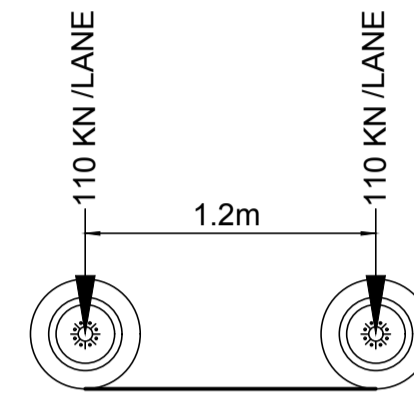
- COLLISION FORCE.....1800kN

PRE-STRESS LOADING.

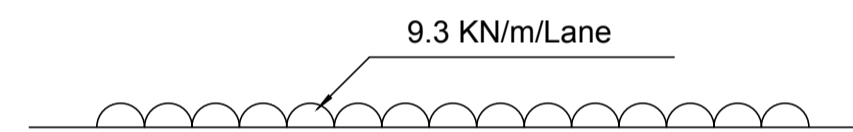
CREEP AND SHRINKAGE LOADING.

VEHICULAR LOADING:

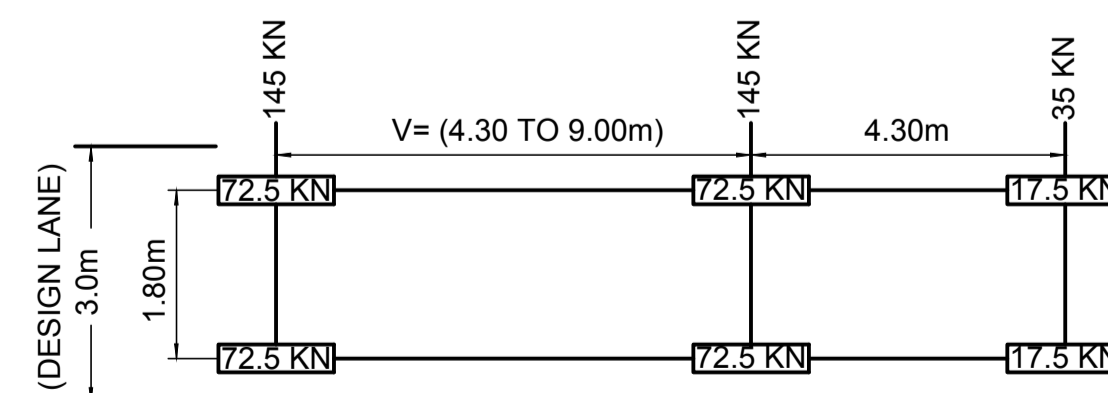
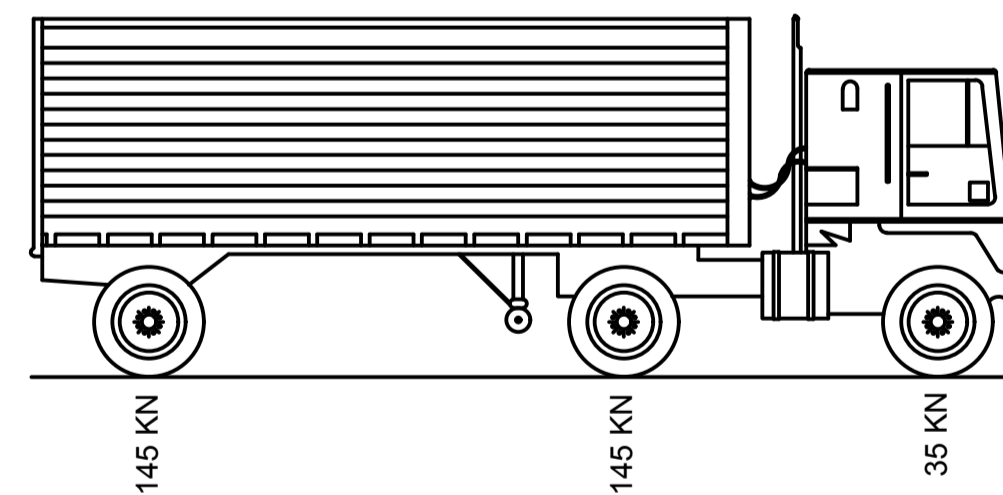
- TANDEM LOADING



- LANE LOADING



- TRUCK LOADING (HS20-44)



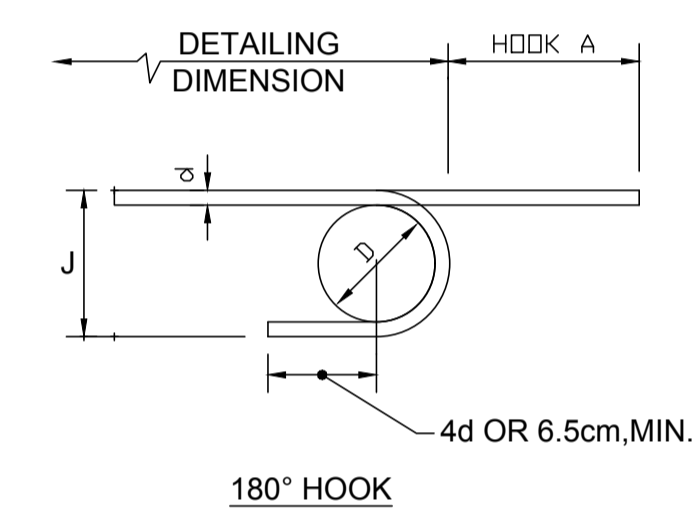
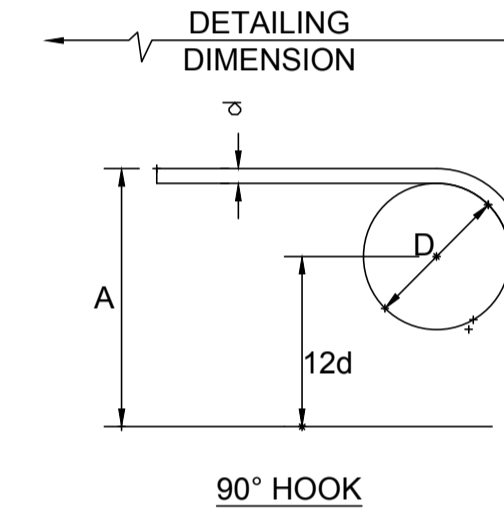
DESIGN DEAD LOAD INCLUDES ADDITIONAL 5.0 cm FUTURE EXTRA WEARING SURFACE.

- DESIGN LIVE LOAD INCLUDES AASHTO LRFD PLUS 50% INCREASE ON THE STANDARD WHEEL LOAD AS PER THE MINISTRY OF PUBLIC WORKS REQUIREMENTS.
- A DYNAMIC LOAD ALLOWANCE EQUAL TO 33%.

REINFORCING BARS

REINFORCEMENT DEVELOPMENT AND LAP SPLICE LENGTHS

BAR SIZE mm	DEVELOPMENT LENGTH			LAP SPLICE LENGTH		
	COMP.	TENSION BARS		COMP.	TENSION BARS	
	NOT ENCLOSED	TOP BARS	OTHER BARS	NOT ENCLOSED	TOP BARS	OTHER BARS
12	270	340	300	360	440	390
16	360	460	330	480	600	430
20	460	660	470	600	860	610
25	570	1030	740	740	1340	960
32	730	1690	1210	950	2200	1570
36	820	2140	1530	1070	2780	1990
40	910	2420	1730	1190	3150	2250



REINFORCEMENT STANDARD HOOK DETAILS

BAR SIZE mm	D=6d FOR 8 TO 25 D=8d FOR 30 TO 32 STANDARD 180° HOOK			D=6d FOR 8 TO 25 D=8d FOR 30 TO 32 STANDARD 90° HOOK	
	HOOK A	J	D	A	D
	8	130	64	48	128
10	140	80	60	160	60
12	150	96	72	192	74
14	165	112	84	224	84
16	180	128	96	256	96
20	230	160	120	320	120
25	280	200	150	400	150
30	410	300	240	510	240
32	440	320	256	544	256

d= BAR DIAMETER
D= BEND DIAMETER

NOTES:-

CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-

Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

GENERAL STRUCTURAL NOTES
SHEET (1 OF 2)

Consultant:



Design: Drawn by: CAD Checked:

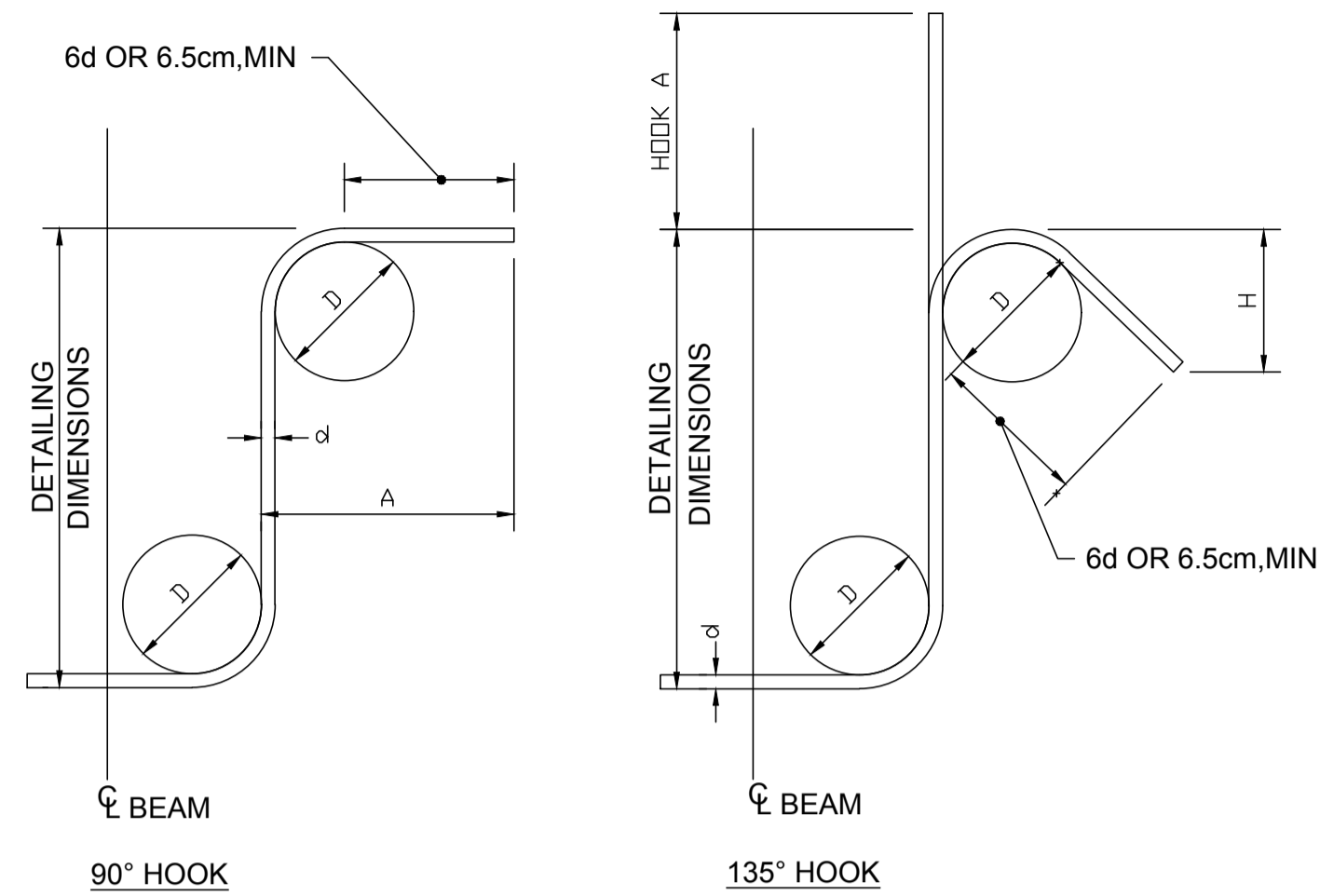
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Drawing Number: S-00A Rev.:

STRUCTURAL NOTES

REINFORCING BARS



NOTE : TIE BENDS ARE SIMILAR TO STIRRUP HOOK SHOWN

REINFORCEMENT STIRRUP AND TIE HOOK DIMENSIONS

BAR SIZE mm	D	90° HOOK		135° HOOK	
		A	HOOK A	HOOK A	H
8	40	100	110	70	70
10	50	110	120	80	75
12	60	120	130	90	80
14	65	135	145	100	90
16	70	150	160	110	100
20	80	180	210	130	130

EARTHWORKS AND SURFACE FINISH

- CONTRACTOR SHALL SUBMIT SHORING SYSTEM IF NEEDED FOR APPROVAL OF THE ENGINEER.
- EXCAVATIONS SHALL TAKE FULL ACCOUNT OF ADJACENT PROPERTIES & THEIR FOUNDATIONS, SURROUNDING ROADS & ADJACENT SERVICES.
- ALL SHALLOW HOLES TO BE BACKFILLED WITH LEAN MIX CONCRETE.
- ROCK JOINTS (IF ANY) SHALL BE PROPERLY CLEANED AND FILLED WITH THIN SAND CEMENT MORTAR.
- FILL IS NOT TO BE PLACED BEHIND R.C WALLS OR PITS UNTIL THE CONCRETE HAS REACHED FULL DESIGN STRENGTH.
- BACKFILL BEHIND WALLS SHALL MEET THE SOIL REPORT RECOM.
- FOUNDATION SHOULD NEVER BE DIRECTLY LAID ON THE EXISTING FILL MATERIALS.
- BEARING CAPACITY IS EQUAL TO (3.0) kg/cm² ACCORDING TO SOIL REPORT PREPARED BY ARAB CENTER FOR ENGINEERING STUDIES. REPORT NO. S16000152 DATED 2nd / NOV. 2016.
- THE CONTRACTOR SHOULD VERIFY THE BEARING CAPACITY AND LEVELS OF FOUNDATION AT EACH PIER AND ABUTMENT.
- IN THE EVENT THAT THE SOIL ALLOWABLE BEARING CAPACITY FOR FOOTINGS FOUND TO BE LESS THAN THE DESIGN PRESSURE SPECIFIED IN THE DESIGN DRAWINGS, THE DEPTH OR DIMENSIONS OF FOOTING OR BASE SHALL BE CHANGED BY THE ENGINEER.
- UNLESS NOTED OTHERWISE, FOUNDATIONS ARE TO BE CENTERED UNDER COLUMNS AND WALLS.
- MINIMUM FOUNDATION COVER SHALL NOT BE LESS THAN 0.70 METER
- ANY ENCOUNTERED CAVITIES DUE TO NATURE OR EXISTING STRUCTURES SHALL BE FILLED WITH CYCLOPEAN CONCRETE AS PER SPECS.
- COOL TAR BITUMEN OF WATERPROOFING FOR BURIED STRUCTURE SHALL SATISFY THE REQUIREMENT OF ASTM D450-78 TYPE II.
- ALL EXPOSED CONCRETE SURFACE SHALL BE FINISHED AS PER SPECIFICATION. THE EXPOSED SURFACES SHALL BE PROTECTED BY ANTI-CARBONATION PAINT AS PER MANUFACTURERS INSTRUCTIONS. THE PAINT SHOULD HAVE PRIM COAT AND TOP COAT.
- ALL CONCRETE SURFACES SUBJECTED TO EARTH FILL (EXCEPT PILES) SHALL BE PROTECTED BY BITUMINOUS PAINT -3 COATS- AS INDICATED IN THE SPECIFICATION. THE BITUMINOUS PAINT SHALL BE PROTECTED BY PROTECTION BOARD. THE CONTRACTOR SHALL SUBMIT TYPE OF PROTECTION BOARDS TO THE ENGINEER FOR APPROVAL.

FORMWORK

- THE FORMWORK FOR ALL EXPOSED CONCRETE SURFACES SHALL LEAVE NO STAIN ON THE CONCRETE AND SHALL BE JOINED AND FIXED SUCH THAT IT IMPARTS NO BLEMISHES.
- ALL EXPOSED CONCRETE SURFACES ABOVE GROUND LEVEL TO BE SMOOTH FAIR FACED TO THE APPROVAL OF THE ENGINEER.
- ALL EXPOSED CORNERS TO HAVE 25X25mm CHAMFERS .

DESIGN STRESSES

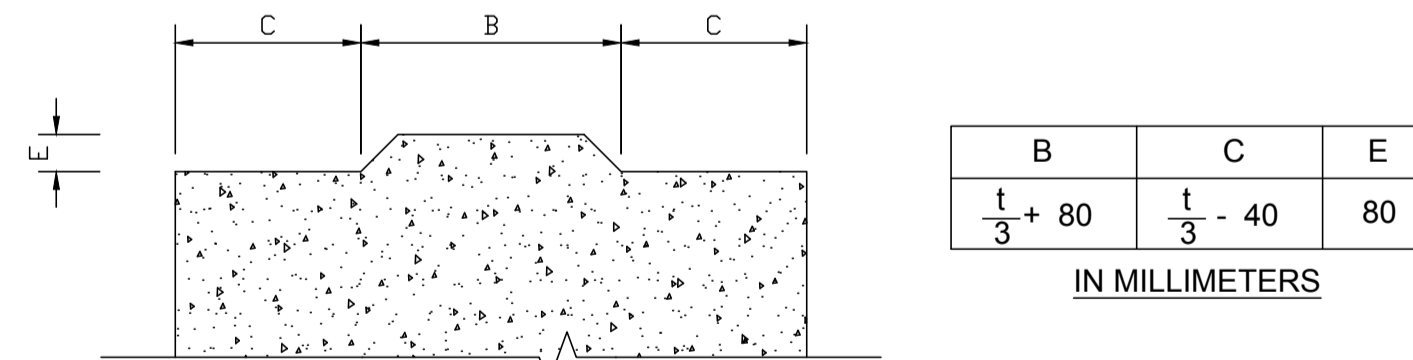
DESIGN STRESSES ARE BASED ON CYLINDER COMPRESSIVE STRESS. SEE CLASSES OF CONCRETE BELOW FOR MORE INFORMATION:-

- REINFORCING STEEL (NON-PRESTRESSED). $f_y = 460 \text{ N/mm}^2$
- PRESTRESSING STEEL (G 270). $f_s = 1860 \text{ N/mm}^2$
- POST-TENSIONED CONCRETE. $f'_c = 36 \text{ N/mm}^2$
- REINFORCED, NON POST-TENSIONED CONCRETE (ABUTMENTS, FOOTINGS, UNDERPASSES) $f'_c = 30 \text{ N/mm}^2$
- REINFORCED, NON POST-TENSIONED CONCRETE (PIERS, BENT BEAMS, AND COLUMN CAP (HUNCH)) $f'_c = 36 \text{ N/mm}^2$
- REINFORCED, NON POST-TENSIONED CONCRETE (BRIDGE BARRIERS, APPROACH SLABS & WING WALLS) $f'_c = 28 \text{ N/mm}^2$
- NON REINFORCED CONCRETE (BLINDING CONCRETE). (USING SULFATE RESISTING CEMENT) $f'_c = 15.0 \text{ N/mm}^2$

- REINFORCING STEEL BARS SHALL BE DEFORMED BARS OF HIGH TENSILE STRENGTH (GRADE 60) CONFORMING TO JSS/441/2001 OR AASHTO M31M (ASTM, A615M).
- LOCATION OF REINFORCEMENT LAP SPLICES & CONSTRUCTION JOINTS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.
- WELDED WIRE FABRIC MESH REINFORCEMENT, WHERE EVER IS REQUIRED, SHALL CONFORM TO JORDANIAN STANDARD SPECIFICATION 441/2001.

CONSTRUCTION AND EXPANSION JOINTS

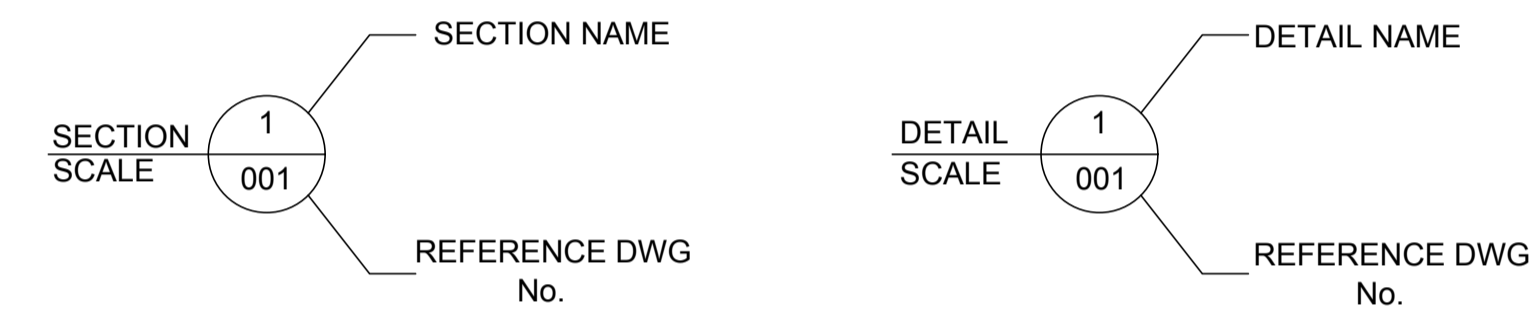
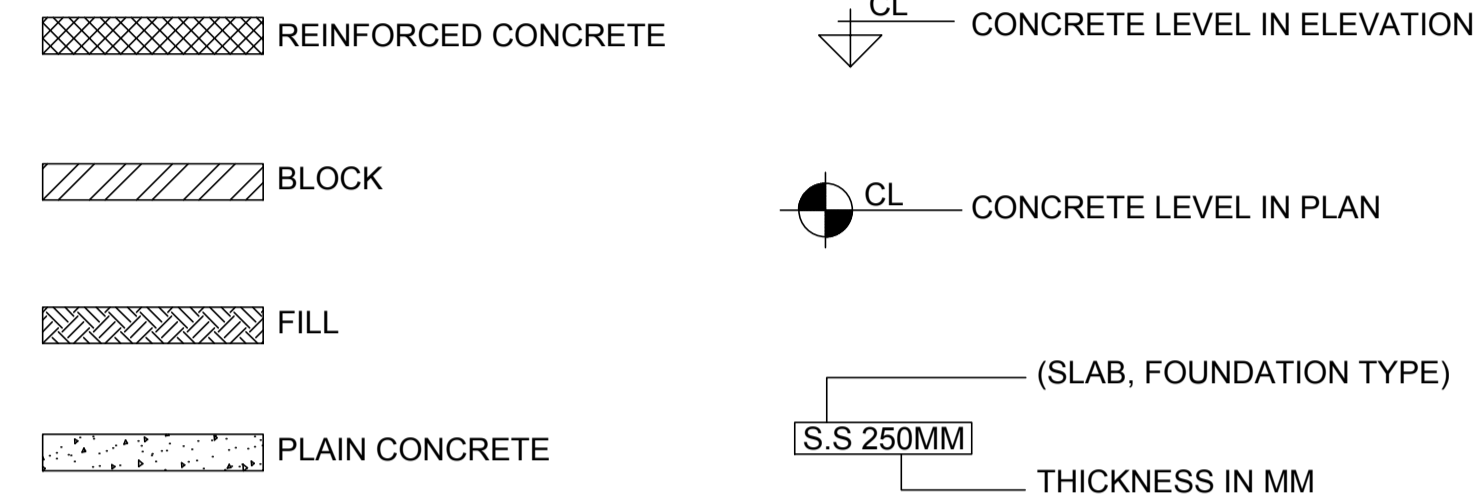
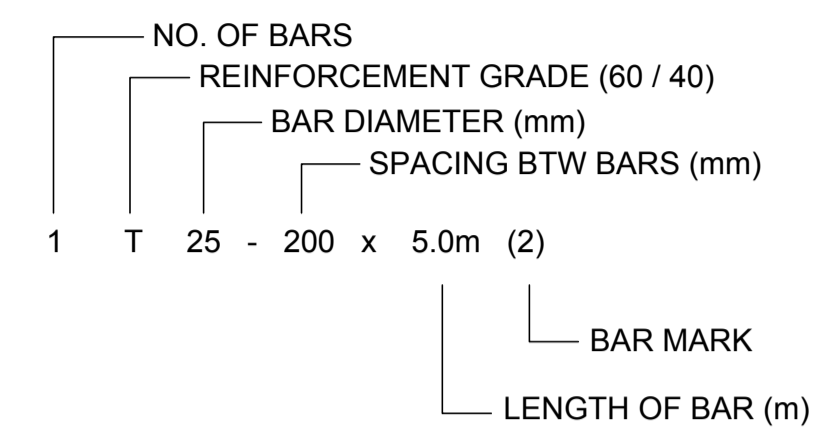
- ALL CONSTRUCTION AND EXPANSION JOINTS SHALL BE PLACED AS SHOWN ON THE DRAWINGS AND AS PROVIDED IN THE SPECS. AND DIRECTED BY THE ENGINEER.
- CONSTRUCTION JOINTS SHALL BE SPACED AT NOT LESS THAN 6.0 METERS OR MORE THAN 25 METERS. WHERE WATER LEAKAGE HAS TO BE PREVENTED.
- APPROVED SEALANT OR SPECIAL RUBBER PADS SHALL BE PLACED WHEREVER INDICATED ON THE DRAWINGS AT CONSTRUCTION, CONTROL ISOLATION AND MOVEMENT JOINTS IN ACCORDANCE WITH THE STANDARD DETAILS AND SPECIFICATION.
- UNLESS OTHERWISE INDICATED DRAWINGS, THE SHEAR KEY DIMENSIONS SHALL BE AS FOLLOWS:



SYMBOLS AND ABBREVIATION

C.J	CONTRACTION /CONSTRUCTION JOINT	MM	MILLIMETER
EXP.J	EXPANSION JOINT	D.L	DEAD LOAD
E.F	EACH FACE	L.L	LIVE LOAD
E.W.	EACH WAY	P.G.L.	PROFILE GRADE LINE
EL.	ELEVATION	ABUT	ABUTMENT
FGL.	FINISHED GRADE/GROUND LEVEL	S.	STIRRUPS
NGL.	NATURAL GROUND LEVEL	CL.	CLEAR
REINF.	REINFORCEMENT	L	SPAN LENGTH
TYP.	TYPICAL	T.	TOP
T	STEEL GRADE 60	B.	BOTTOM
R	STEEL GRADE 40	P.G.E	PROFILE GRADE ELEVATION
SC	SHAPE CODE	NTS	NOT TO SCALE
		CM	CENTIMETER

REINFORCEMENT INDICATION:

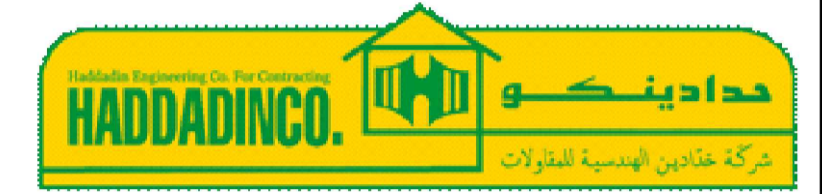


PRESTRESSING REINFORCEMENT AND POST - TENSIONING SYSTEM

- ALL VERTICAL PROFILES ARE MEASURED FROM THE TOP FIBER OF VOIDED DECK TO THE CENTER OF DUCT.
- POST-TENSIONING DUCT HAS A DIAMETER OF 100 MM.
- EACH POST-TENSIONING DUCT CONTAINS 13 LOW-RELAXATION 0.6" STRANDS IN ACCORDANCE WITH ASTM A416 WITH AN ULTIMATE TENSILE STRESS OF (1860 MPA).
- STRESSING OF STRANDS SHALL BE DONE AFTER THE CONCRETE REACH 80% OF ITS CYLINDRICAL COMPRESSIVE STRENGTH.
- POST-TENSIONING DUCTS SHALL BE GROUTED AFTER STRESSING WITH A MIX OF: WATER, POZZOLANIC CEMENT, AND NON-SHINK MATERIAL; I.E. (HF-1) IS RECOMMENDED.
- APPLIED JACKING FORCE BEHIND ANCHOR TO BE (75% OF BREAKING LOAD) FOR EACH 15.24mm DIAMETER STRAND (NOMINAL AREA 140mm²).
- RESULTS OF STRESSING EXTENSIONS SHALL BE FORWARDED IMMEDIATELY TO THE ENGINEER FOR APPROVAL.
- THE TENSIONING JACKS SHALL BE AS RECOMMENDED BY THE CABLE MANUFACTURER, SUBJECTED TO THE ENGINEERS APPROVAL, AND THE BRIDGE ENDS SHALL BE ADDITIONALLY REINFORCED, AS REQUIRED, TO FIT MANUFACTURER'S ANCHORAGE SYSTEM.
- THE CONTRACTOR SHOULD SUBMIT TO THE ENGINEER FOR APPROVAL, PRIOR TO THE COMMENCEMENT OF WORK, THE POST TENSIONING SYSTEM TO BE USED TOGETHER WITH DETAILED CALCULATIONS AND SHOP WORKING DRAWINGS FOR ALL NECESSARY DETAILS INCLUDING THOSE FOR END ANCHORAGES, ELONGATIONS, JACKING, TENDON ARRANGEMENT AND PRESTRESSING SEQUENCE & PROCEDURE.
- APPROVED DETAILS OF RECESS BOX & ANCHORAGE ADDITIONAL REINFORCEMENT SHALL BE PROVIDED BY THE ENGINEER.
- TENDON CONDUITS DIAMETER=100mm.
- THE RECESSES FOR THE ANCHORS SHALL BE FILLED WITH PORTLAND CEMENT CONCRETE AND DEVELOPED TO SUIT THE PROPOSED SYSTEM.
- VOIDER MATERIAL SHALL BE GALVANIZED STEEL WITH THICKNESS OF ONE MILLIMETER
- ALL ACCESSORIES RELATED TO PRESTRESSED STRUCTURE SHALL BE INCLUDED IN THE PRICE PRESTRESSED CONCRETE INCLUDING STRANDS.
- TENDON JACKING LOAD FOR 13 STRANDS TENDON: $P_j = 13 \times 140 \times 0.75 \times 1860 \times 10^{-3} = 2538.9 \text{ KN}$
- WOBBLE COEFFICIENT (K) = 0.0017/M
- FRICTION CURVATURE COEFFICIENT (M) = 0.2
- ANCHORAGE SLIP=6mm

NOTES:-

CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-

Purpose Of Issue	Rev.	Date	Approved

Client:

Project: **STRUCTURAL DESIGN SERVICES FOR AMMAN BRT**

Package: **PRESS TUNNEL**

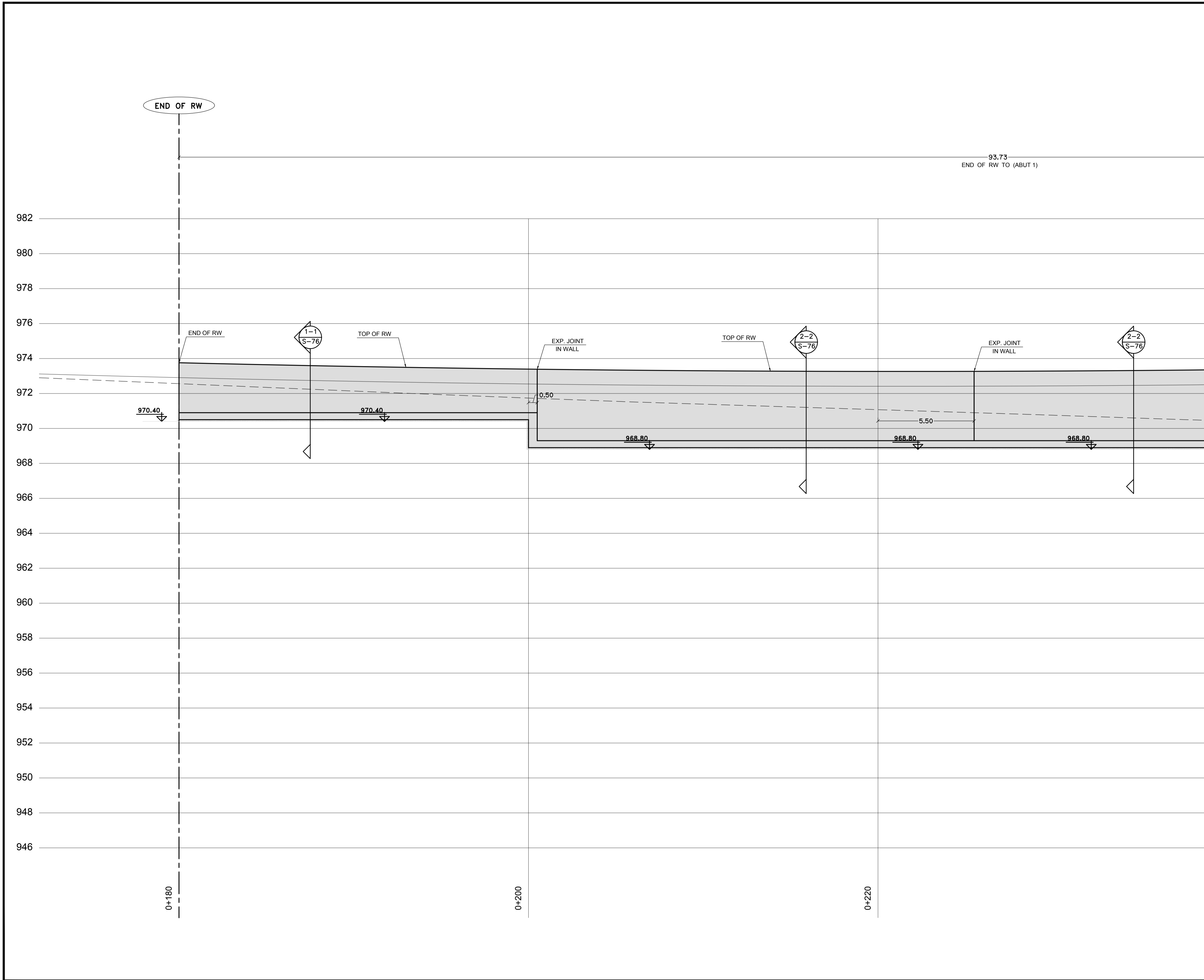
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Consultant: **ster davis gleave**

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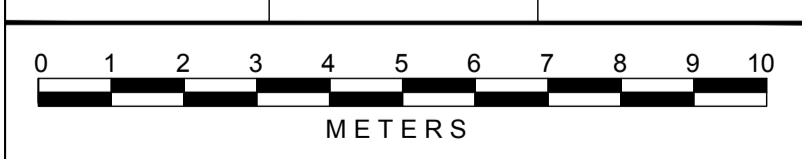
Package:
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Title:
BRIDGE PROFILE
SHEET (1 OF 14)

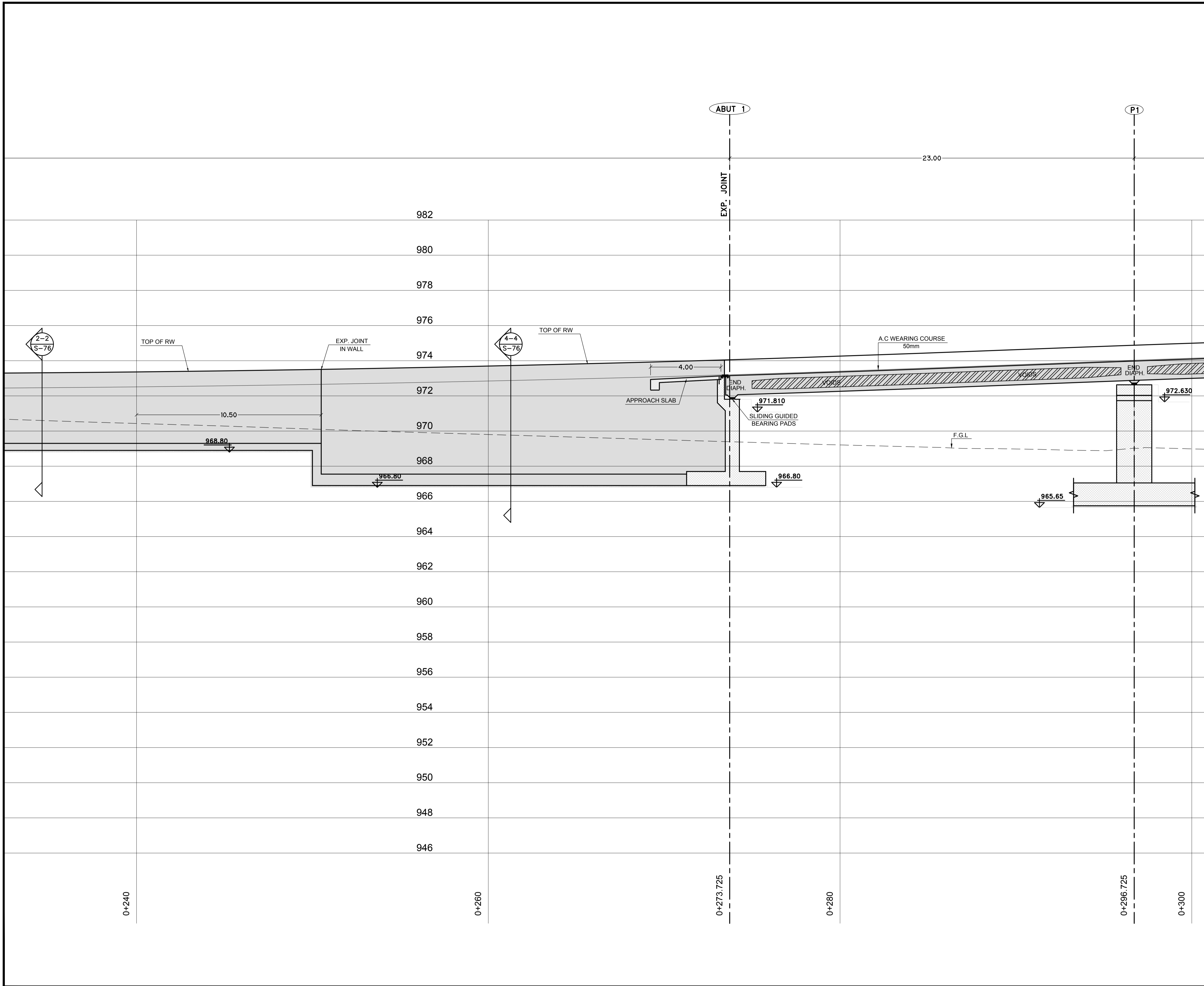
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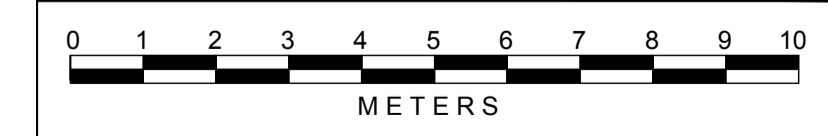
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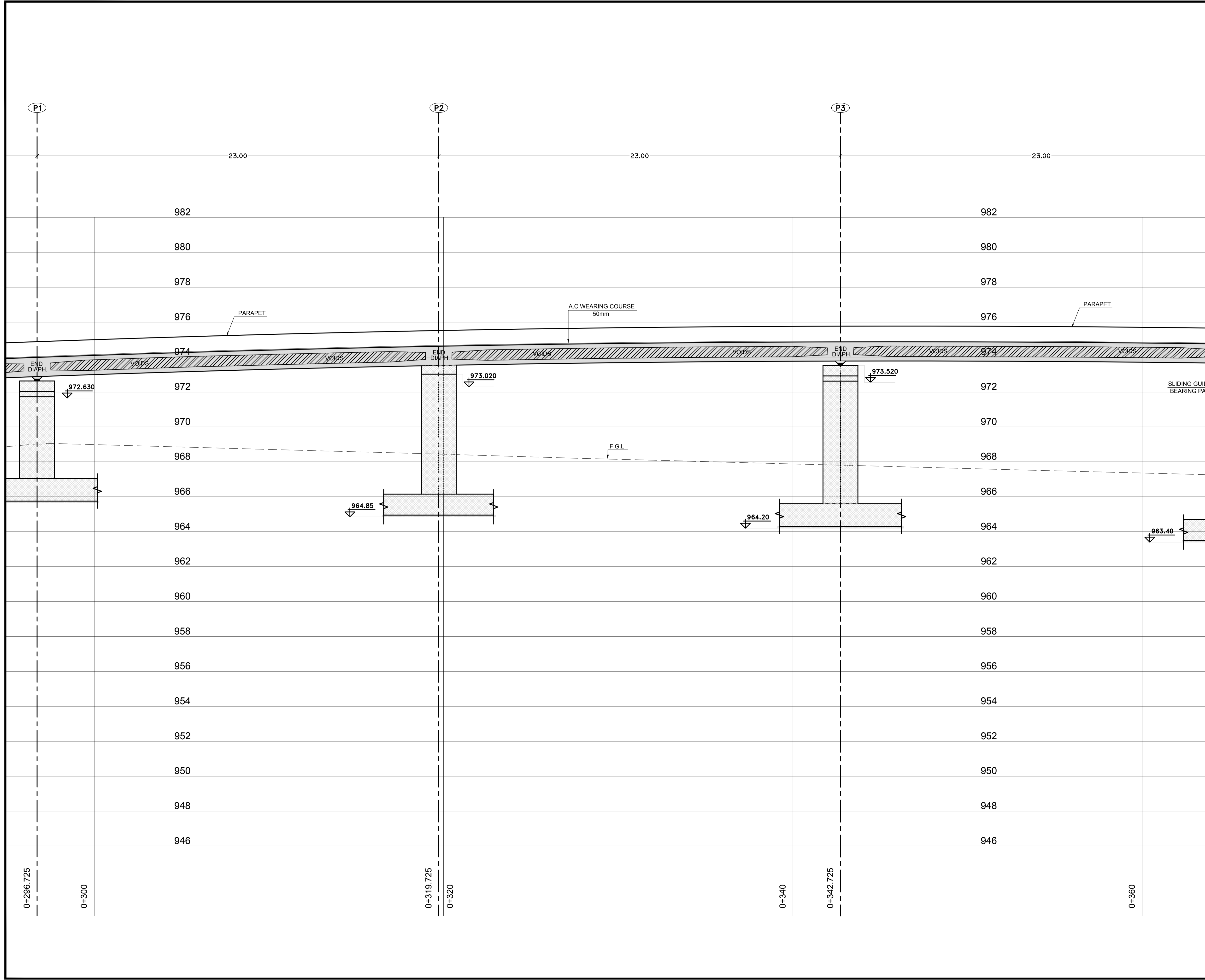
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KEY MAP:-

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GREATER AMMAN MUNICIPALITY

Project:
STRUCTURAL DESIGN SERVICES FOR
AMMAN BRT

Package:
PRESS TUNNEL

Title:
BRIDGE PROFILE
SHEET (3 OF 14)

Consultant:

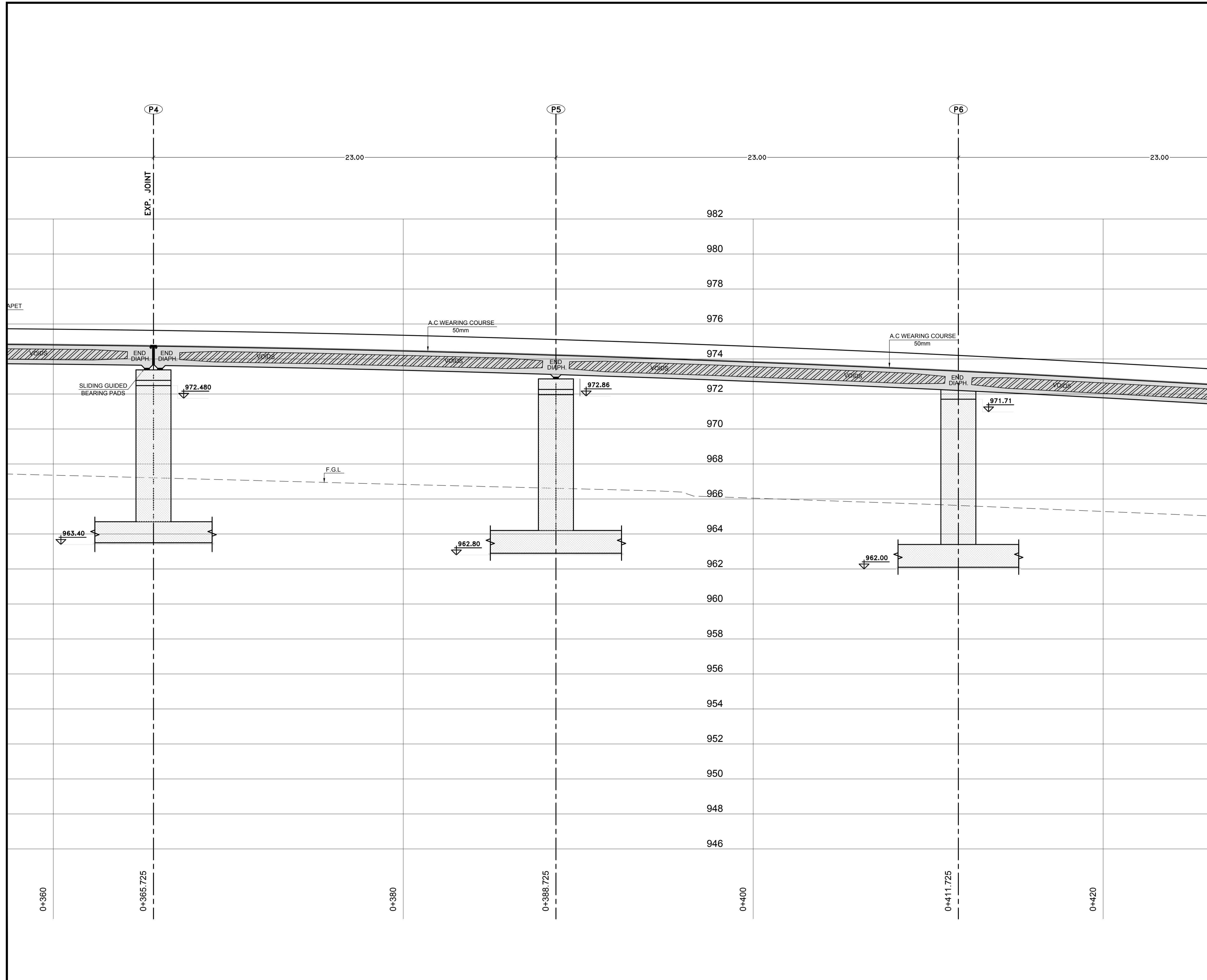
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S-16




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Project: STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package: PRESS TUNNEL

Title: BRIDGE PROFILE SHEET (4 OF 14)

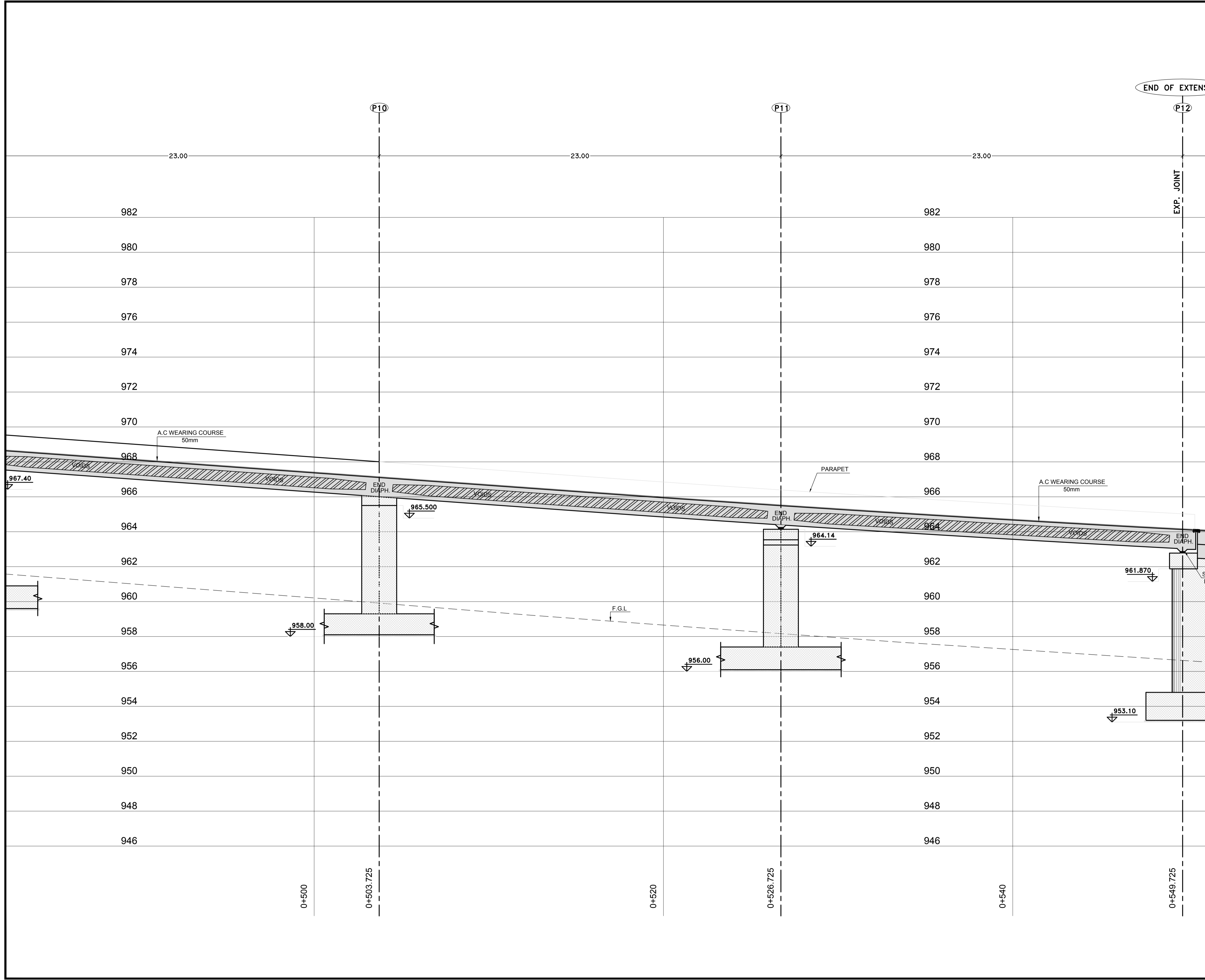
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METERS

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STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

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BRIDGE PROFILE SHEET (6 OF 14)

Consultant:

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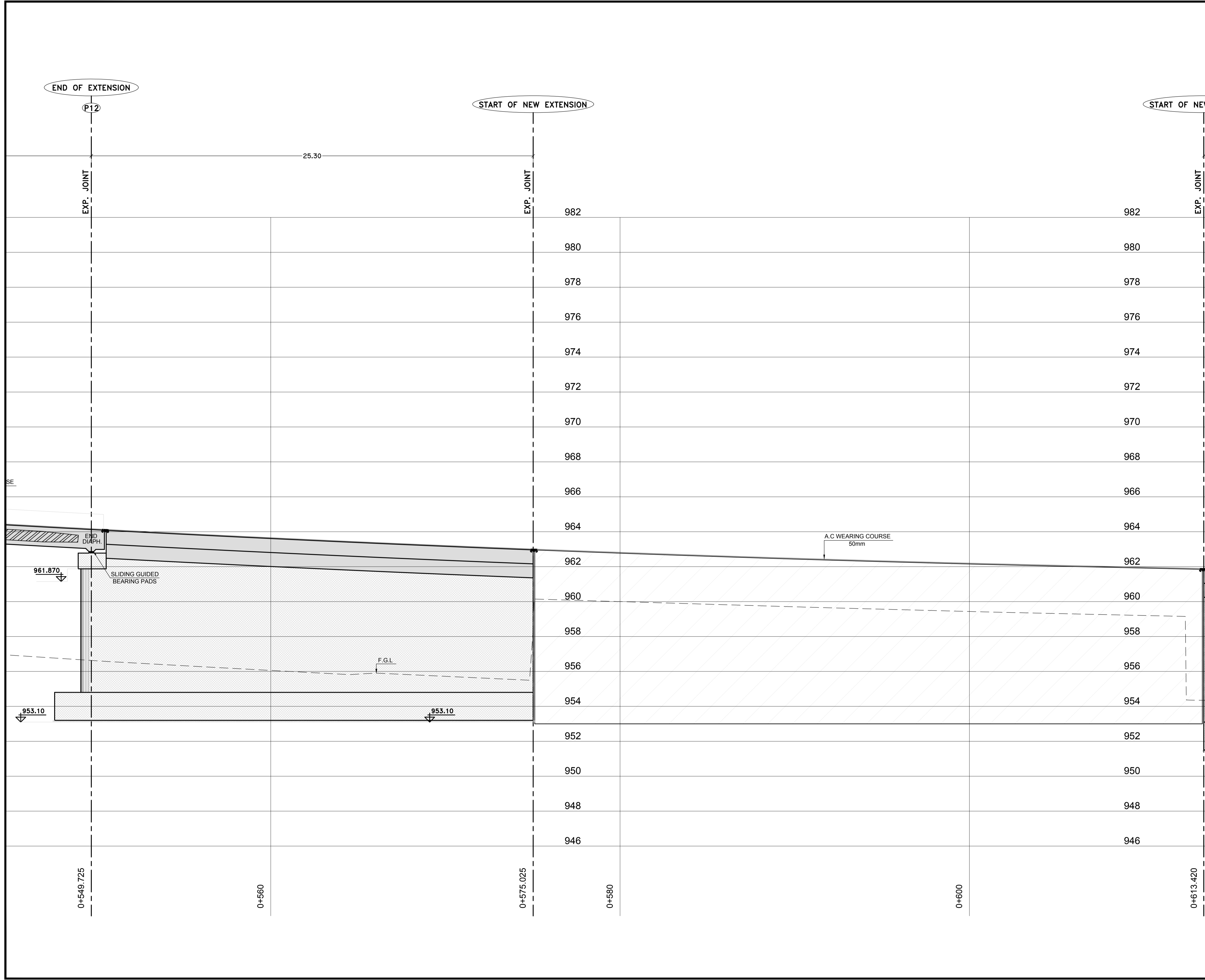
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S-19




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Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT



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BRIDGE PROFILE SHEET (7 OF 14)

Consultant:

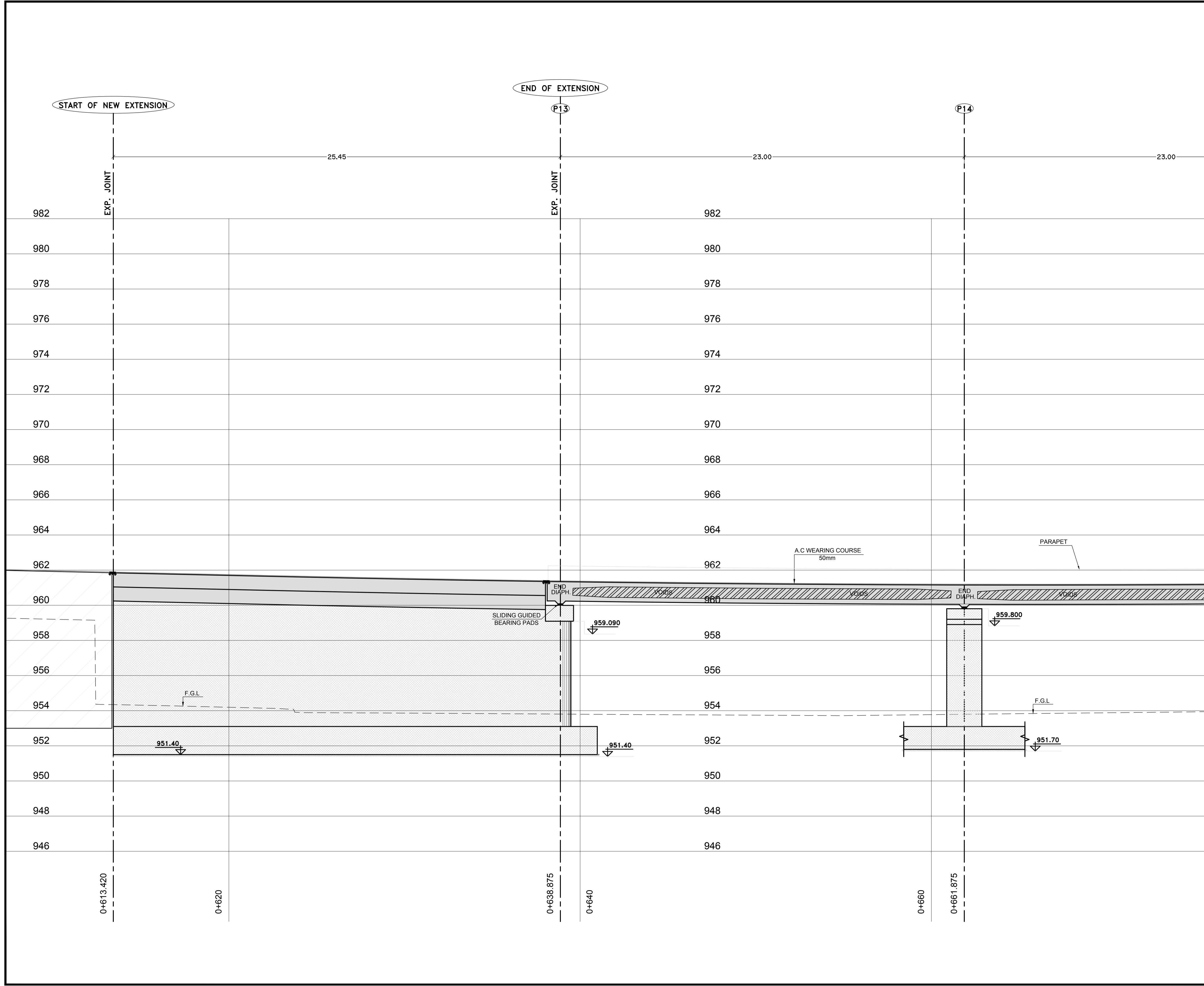



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STRUCTURAL DESIGN SERVICES FOR AMMAN BRT


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BRIDGE PROFILE SHEET (8 OF 14)


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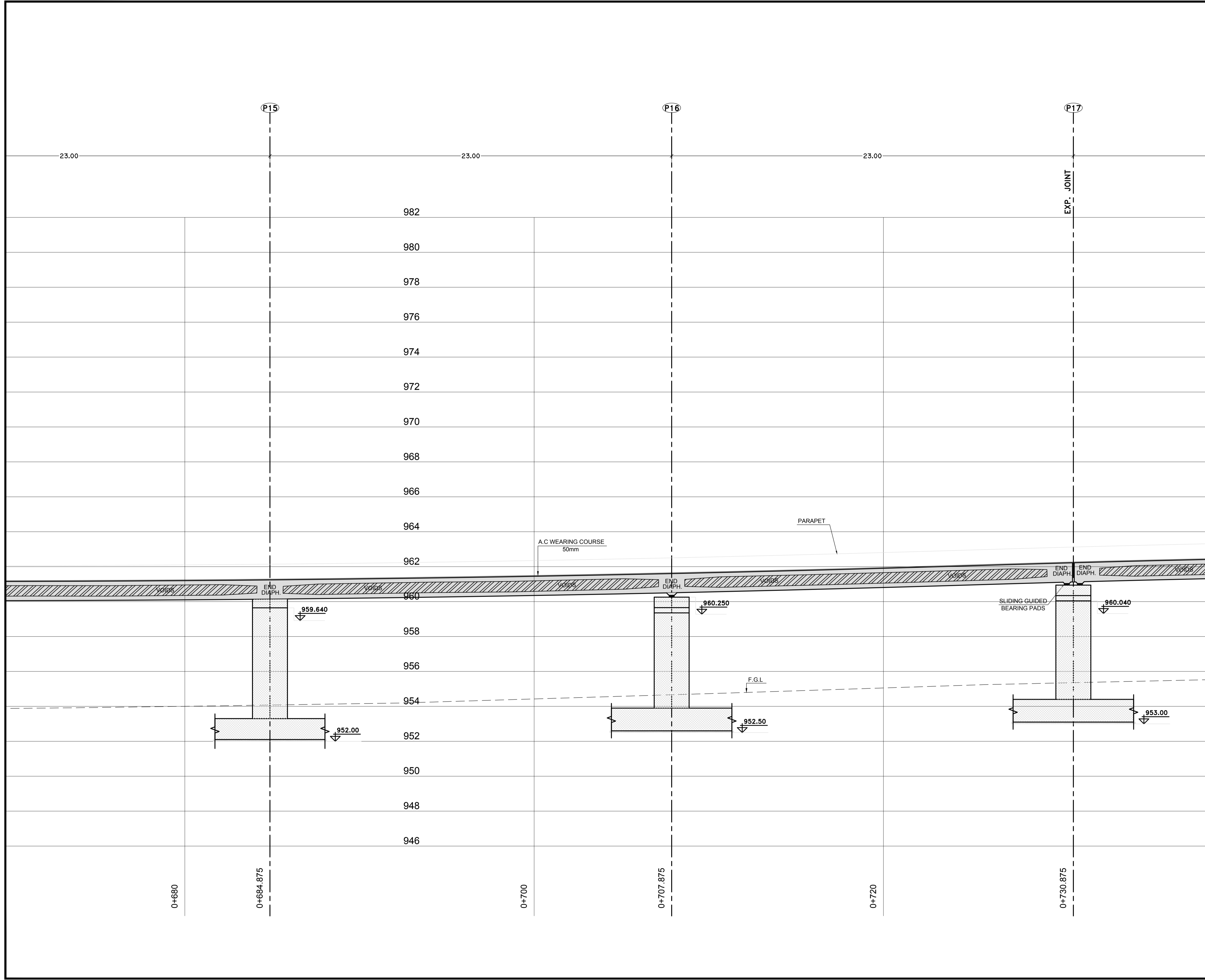
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S-21



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Purpose Of Issue

Client:

GREATER AMMAN MUNICIPALITY

Project: STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package: PRESS TUNNEL

Title: BRIDGE PROFILE SHEET (9 OF 14)

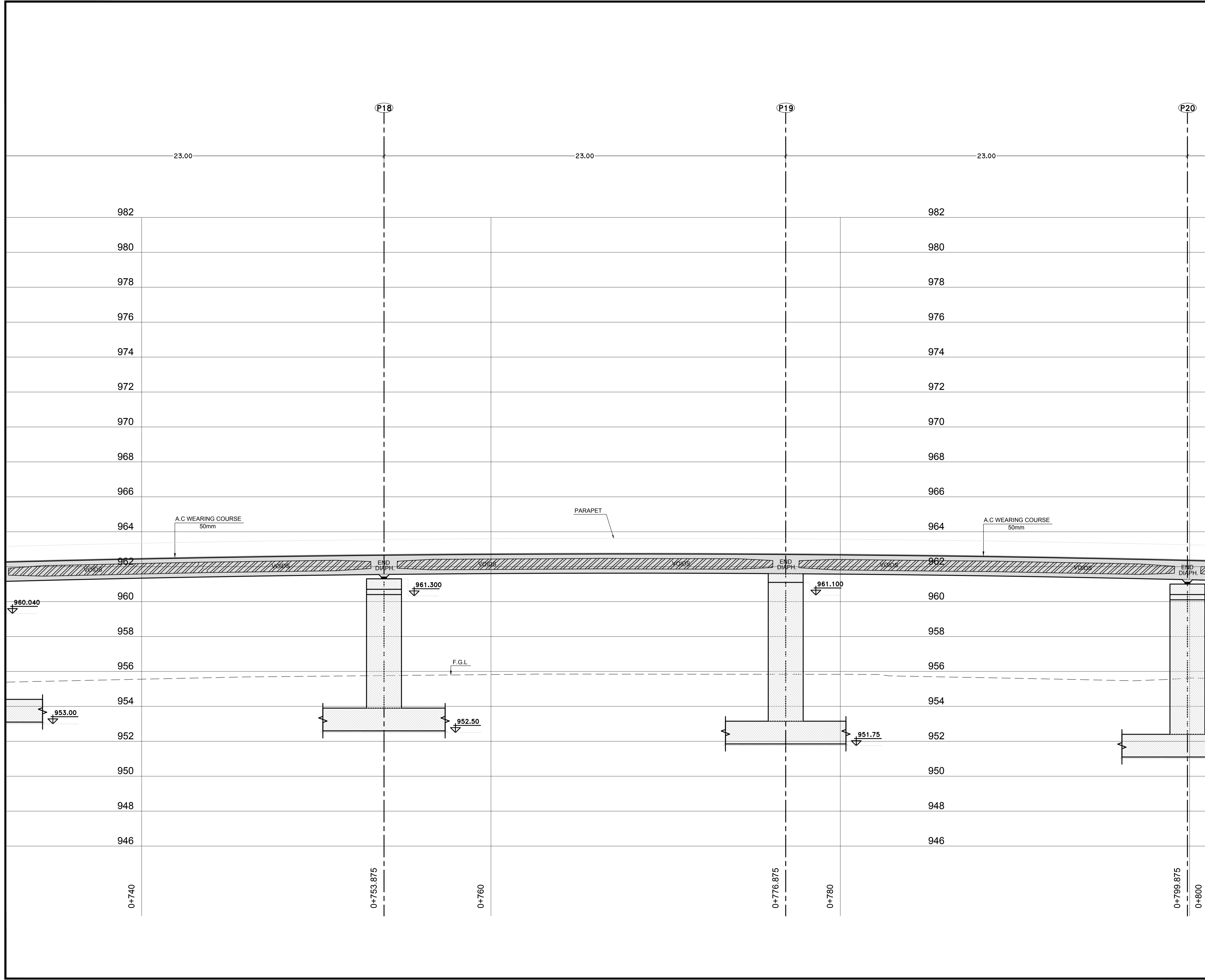
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Scale: Date: AUG. 2017 Approved:




Drawing Number: S-22 Rev.:




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CONTRACTOR:




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GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT


Package:

PRESS TUNNEL


Title:

BRIDGE PROFILE SHEET (10 OF 14)

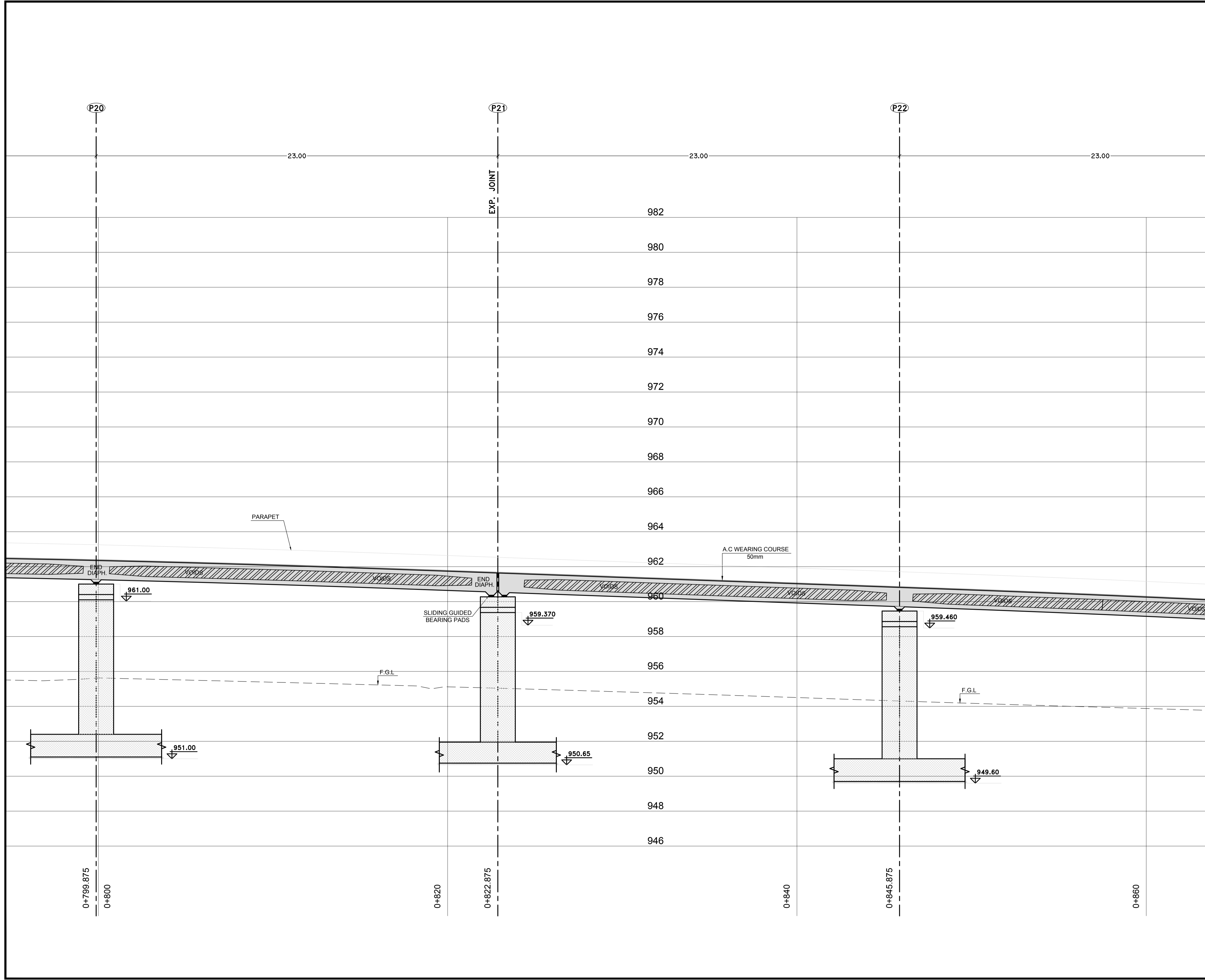
Consultant:



Design:	Drawn by: CAD	Checked:
Scale: 1:100	Date: AUG. 2017	Approved:




Drawing Number: S-23 Rev.:




NOTES:-

CONTRACTOR:




CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-

Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT


Package:

PRESS TUNNEL

Title:


BRIDGE PROFILE SHEET (11 OF 14)

Consultant:

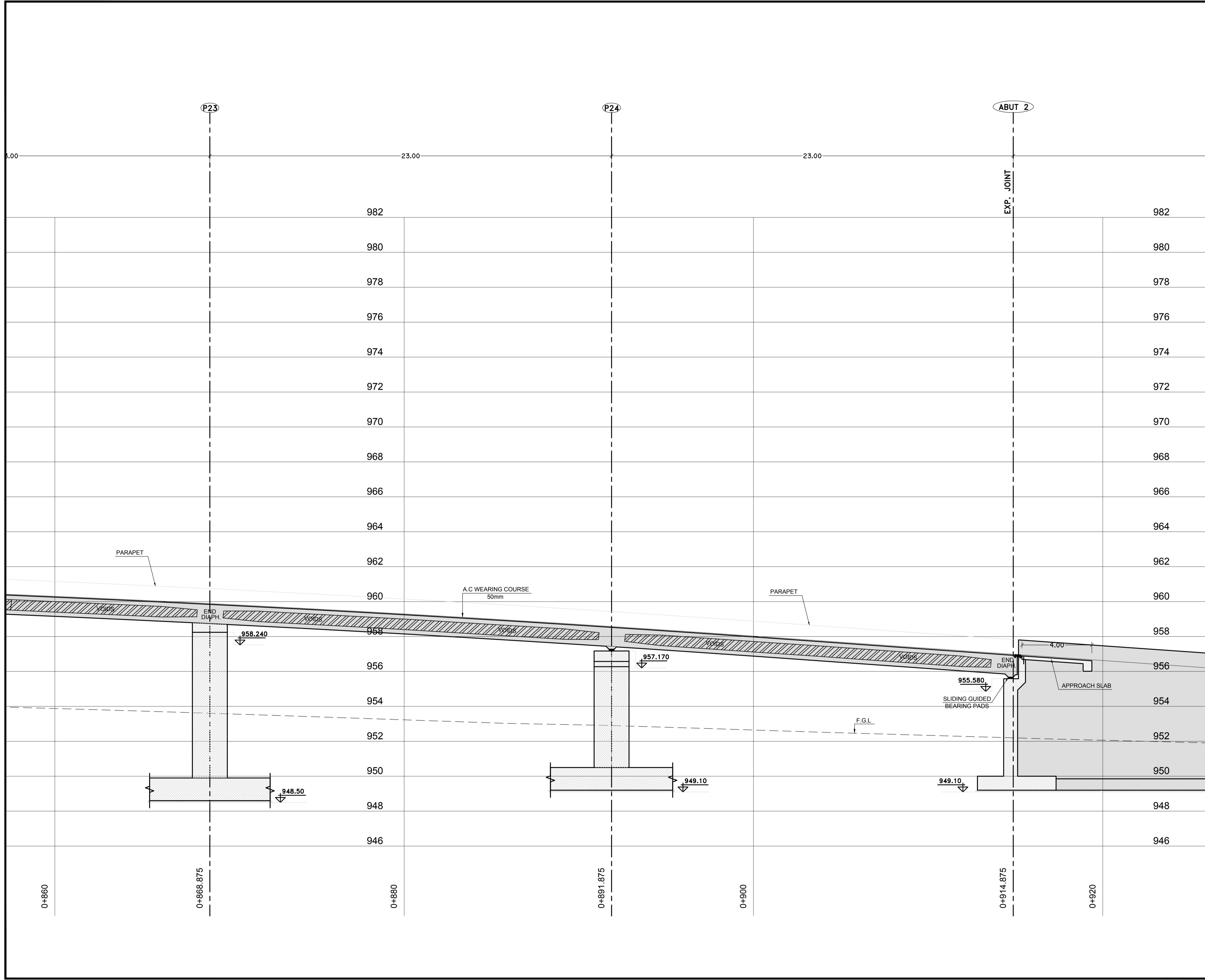


Design: Drawn by: CAD Checked:

Scale: 1:100 Date: AUG. 2017 Approved:




Drawing Number: S-24 **Rev.:**




NOTES:-

CONTRACTOR:




CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-

Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT


Package:

PRESS TUNNEL

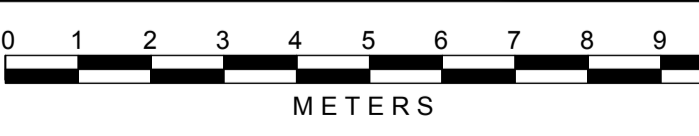
Title:

BRIDGE PROFILE SHEET (12 OF 14)

Consultant:



Design:	Drawn by: CAD	Checked:
Scale: 1:100	Date: AUG. 2017	Approved:



Drawing Number: S-25

Rev.:

NOTES:-

120.13
END OF RW TO (ABUT 2)

CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-

Purpose Of Issue Rev. Date Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

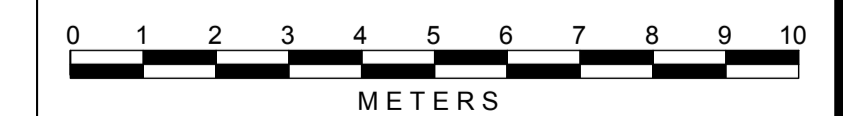
BRIDGE PROFILE SHEET (13 OF 14)

Consultant:

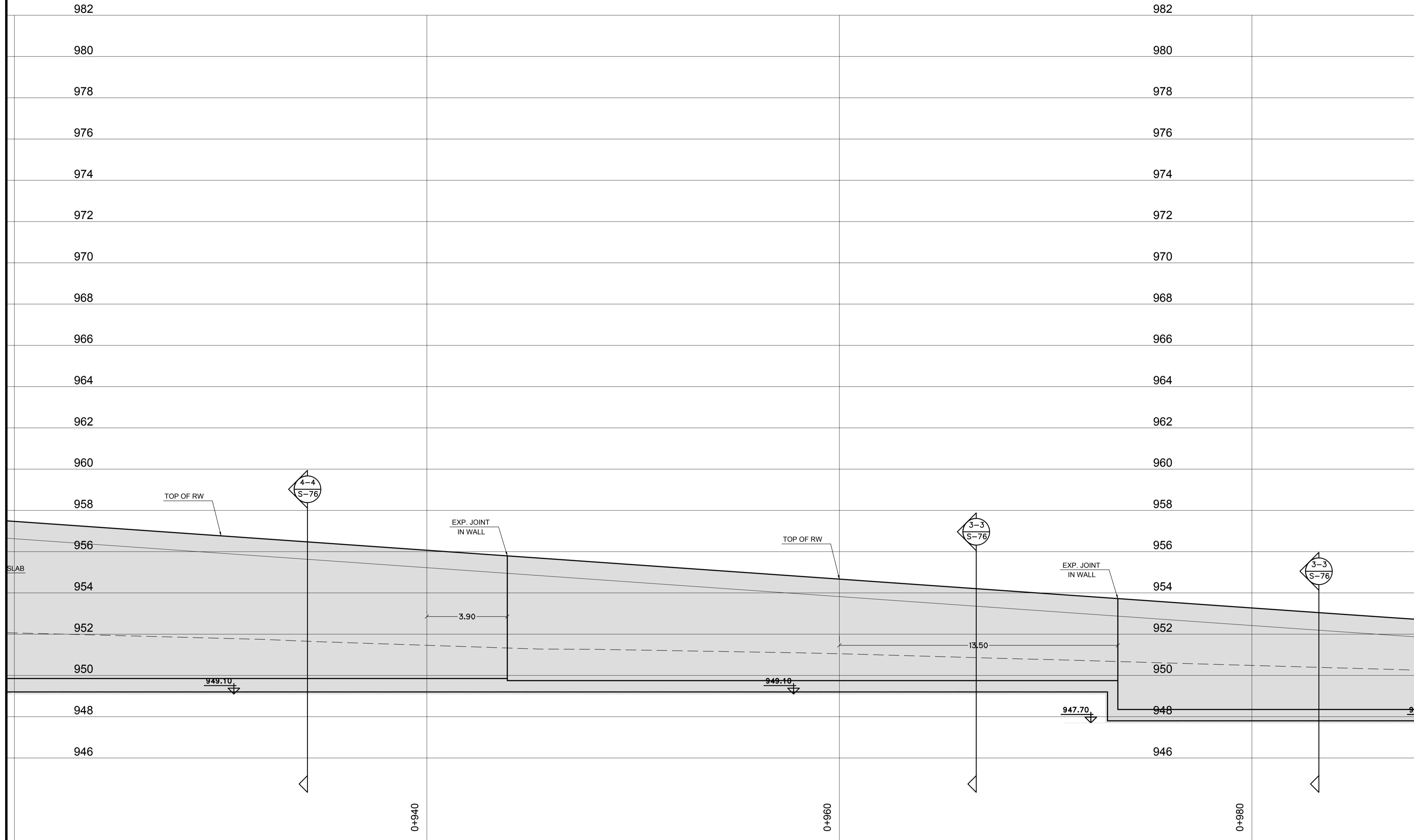


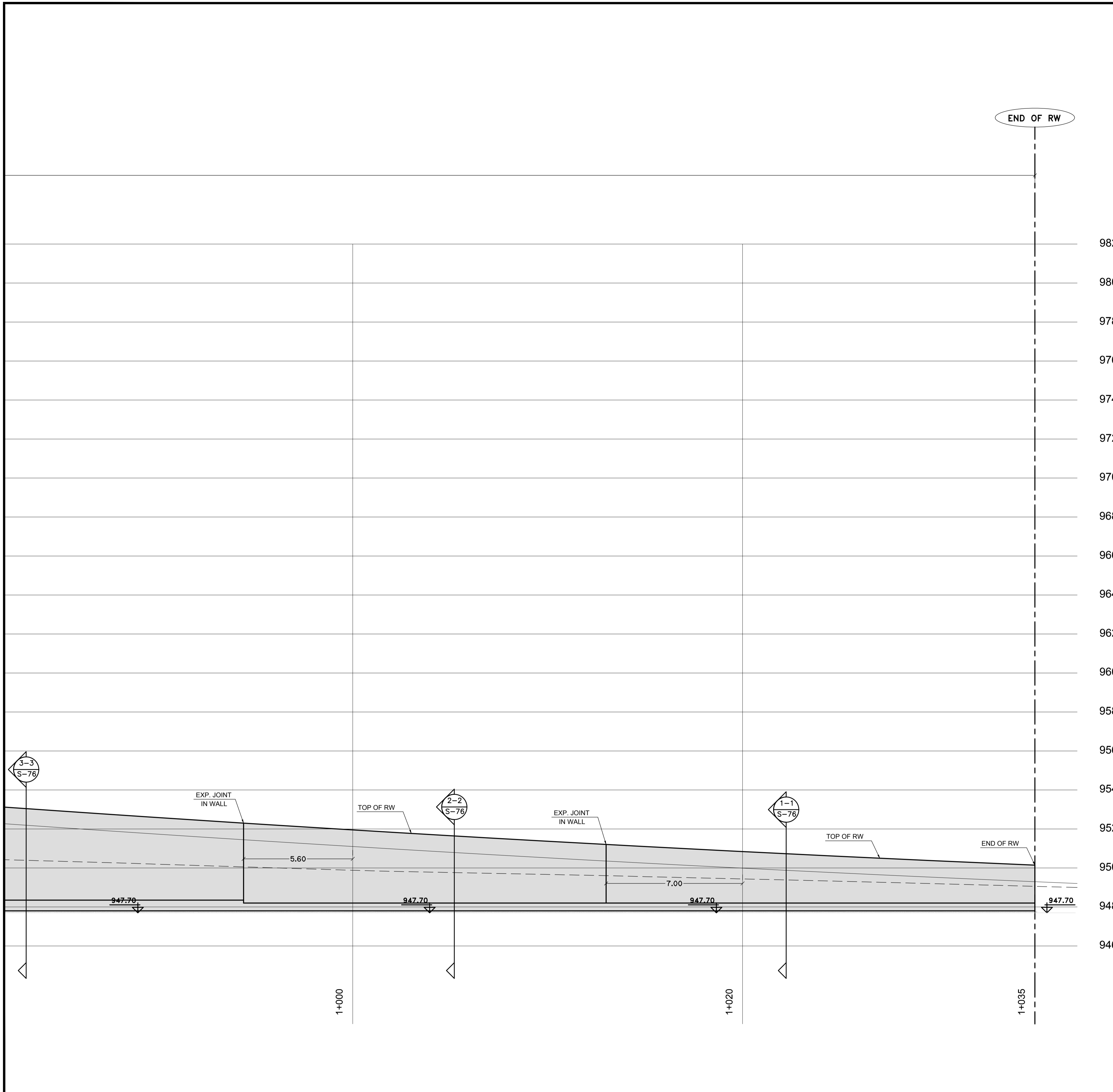
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Scale: 1:100 Date: AUG. 2017 Approved:



Drawing Number: S-26 Rev.:





NOTES:-

CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-

Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

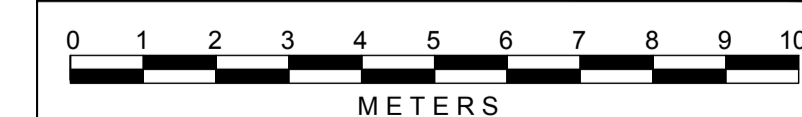
BRIDGE PROFILE SHEET (14 OF 14)

Consultant:



Design: Drawn by: CAD Checked:

Scale: 1:100 Date: AUG. 2017 Approved:



Drawing Number: S-27 Rev.:

KEY MAP REF.
1

NOTES:-

CONTRACTOR:

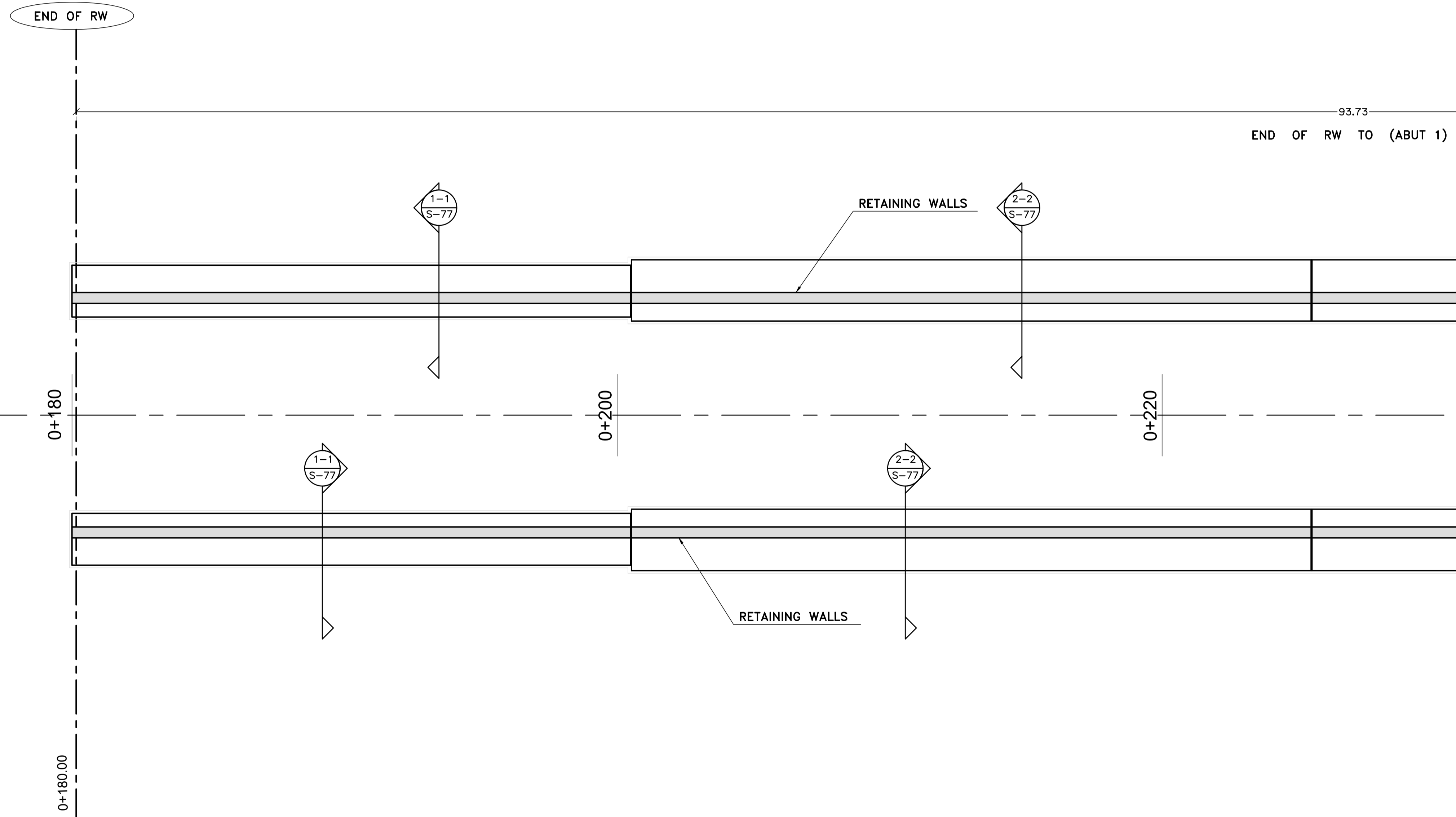
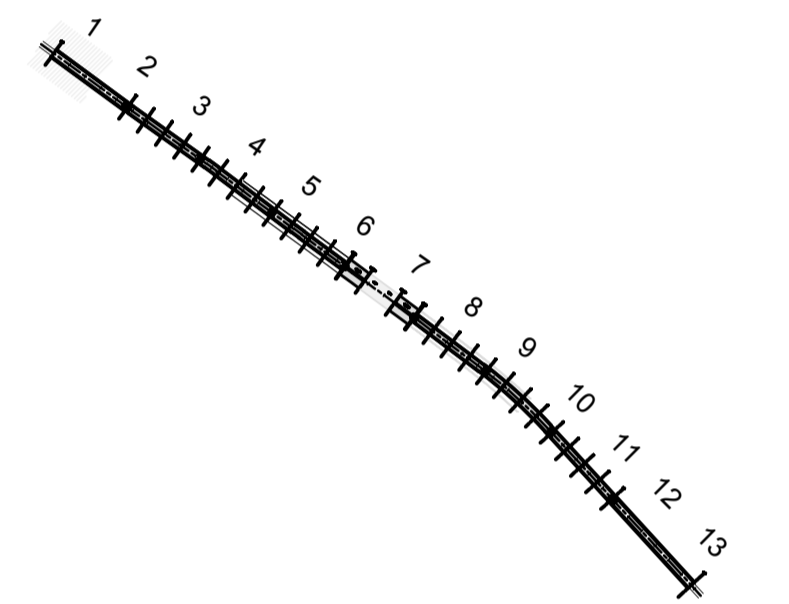


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KEY MAP:-



Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT SHEET (1 OF 13)

Consultant:



Design:	Drawn by: CAD	Checked:
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Scale: 1:100	Date: AUG. 2017	Approved:
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Drawing Number: S-29	Rev.:
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KEY MAP REF.
2

NOTES:-

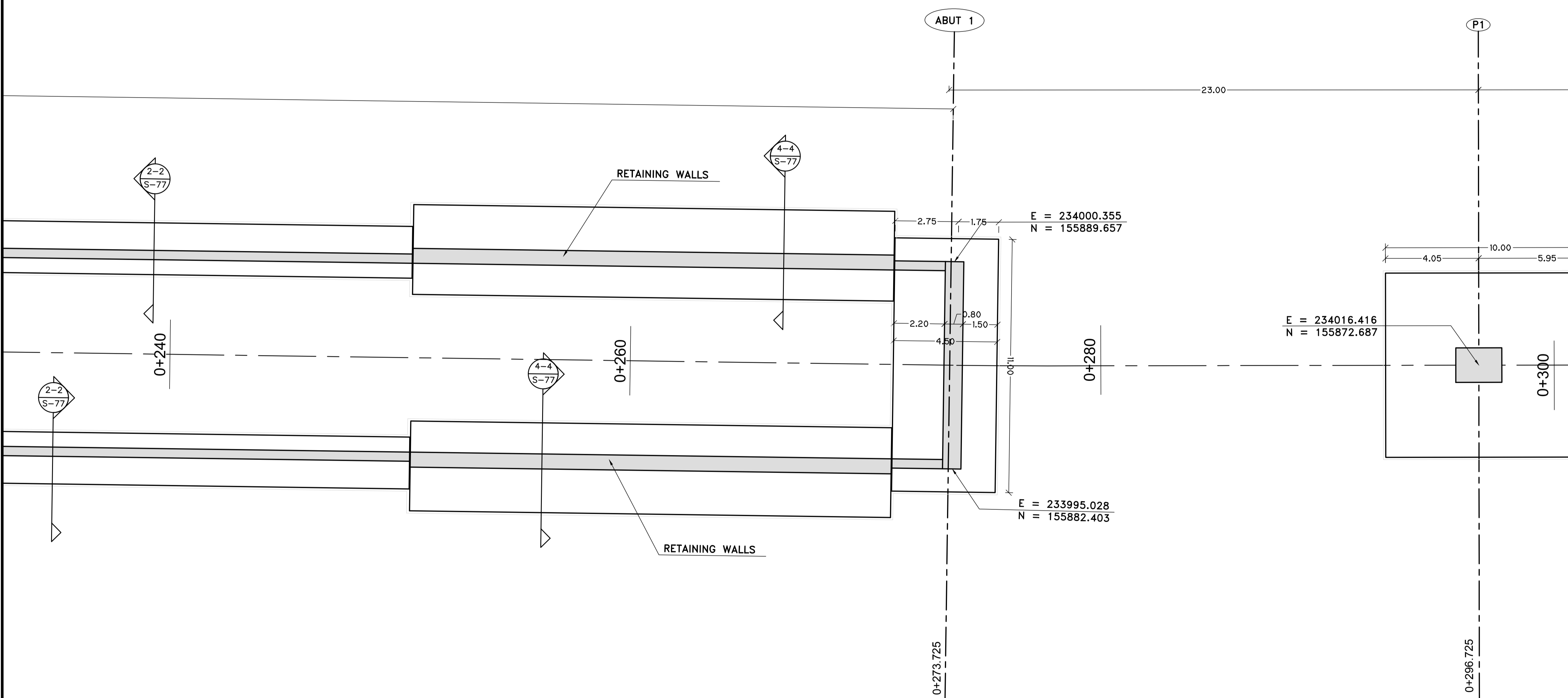
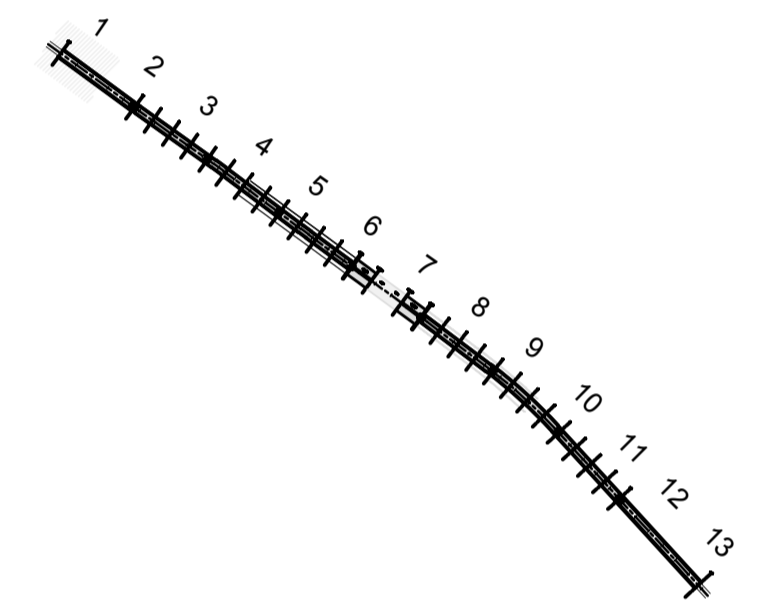
CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-



Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT SHEET (2 OF 13)

Consultant:

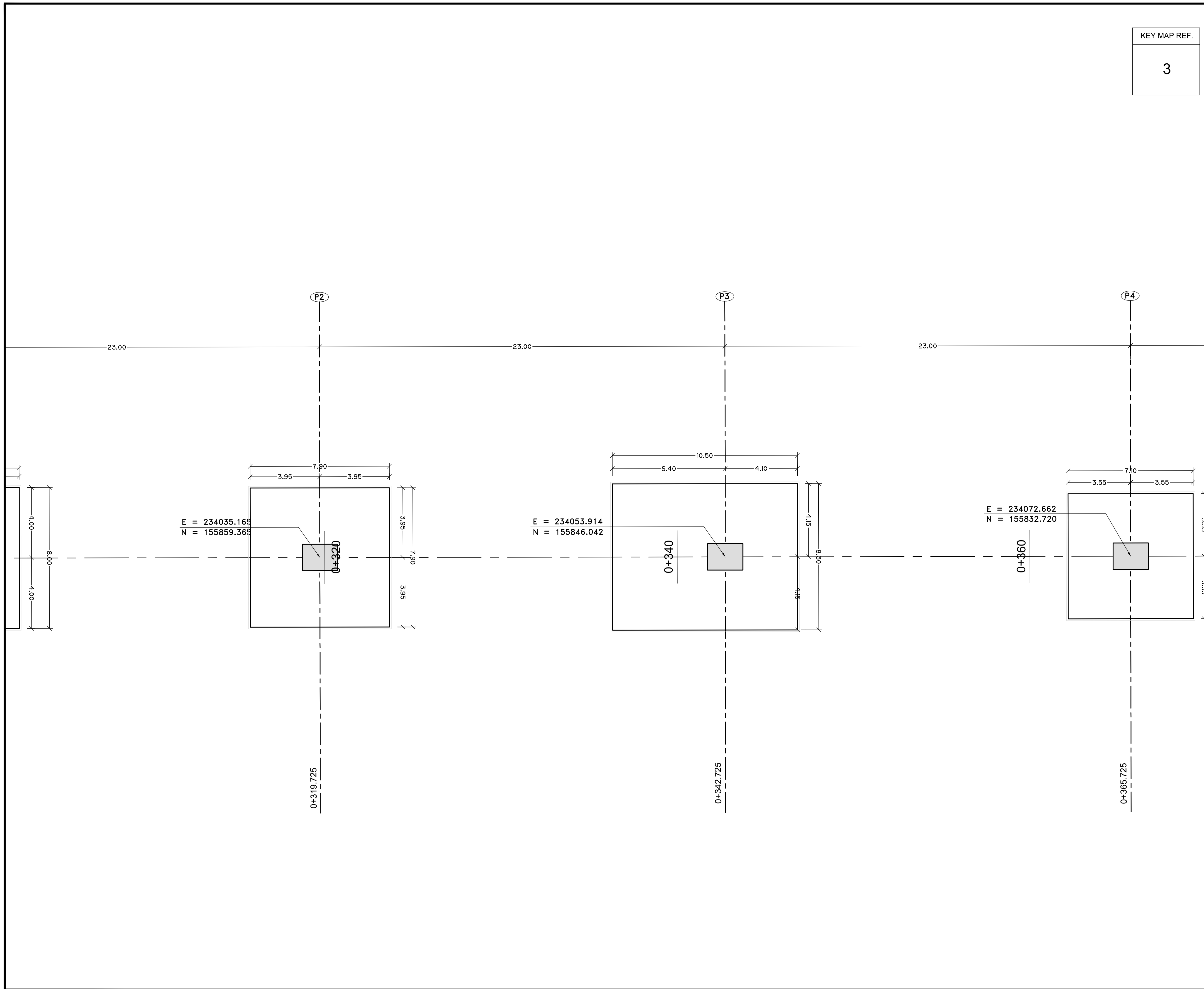


Design:	Drawn by:	Checked:
	CAD	

Scale:	Date:	Approved:
1:100	AUG. 2017	



Drawing Number:	Rev.:
S-30	



NOTES:-

CONTRACTOR:

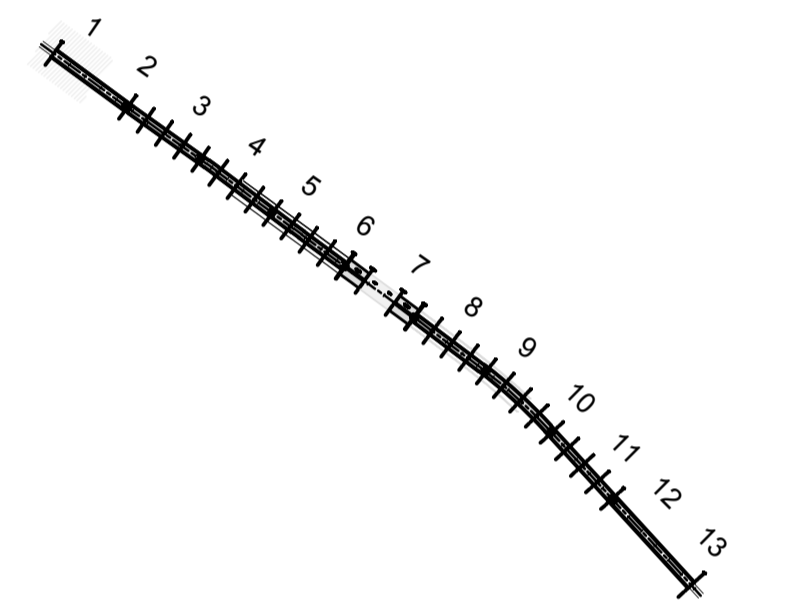


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KEY MAP:-



Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT SHEET (3 OF 13)

Consultant:



Design: Drawn by: CAD Checked:

Scale: 1:100 Date: AUG. 2017 Approved:



Drawing Number: S-31 Rev.:

KEY MAP REF.

4

NOTES:-

CONTRACTOR:

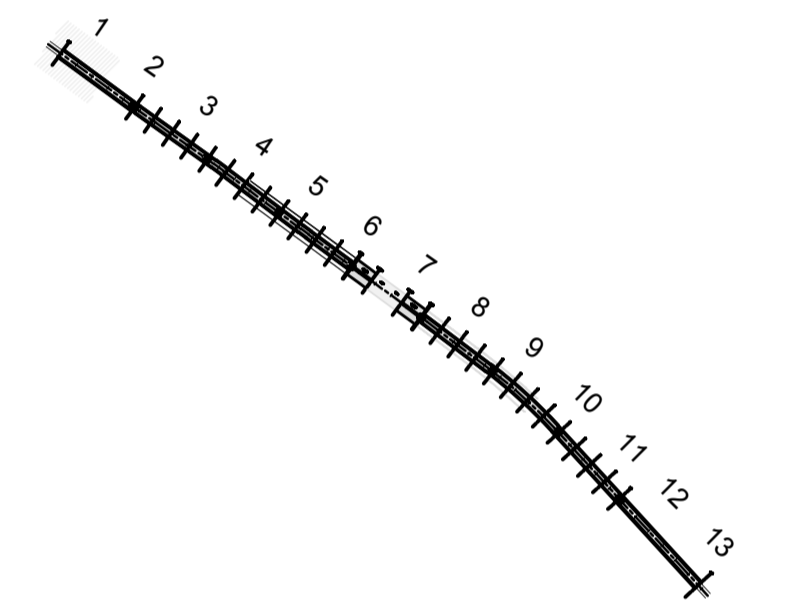


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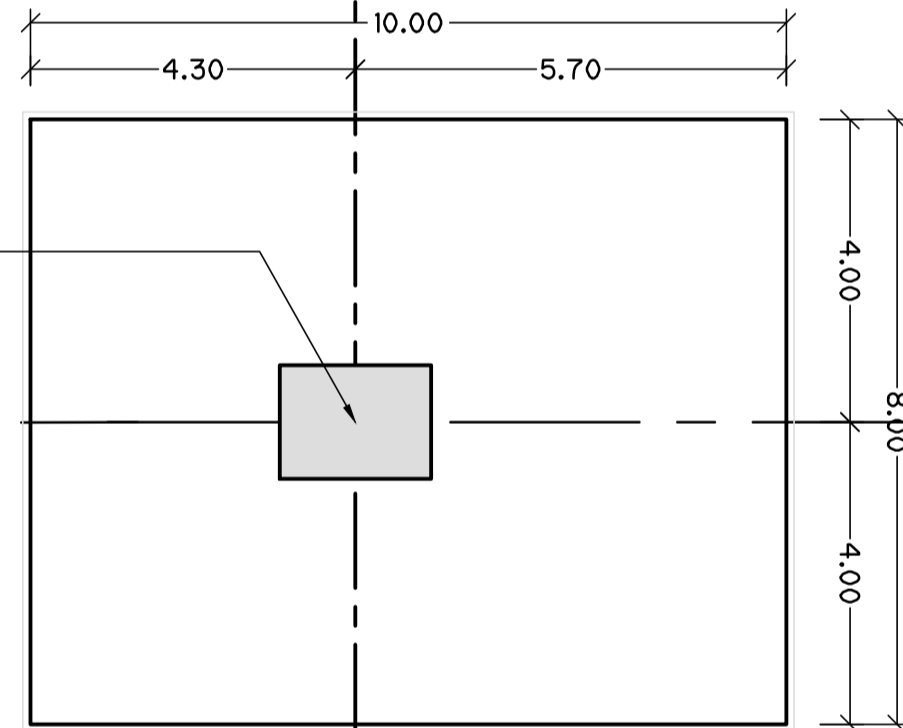
KEY MAP:-



23.00
CL OF PIER TO CL OF PIER

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N = 155819.208

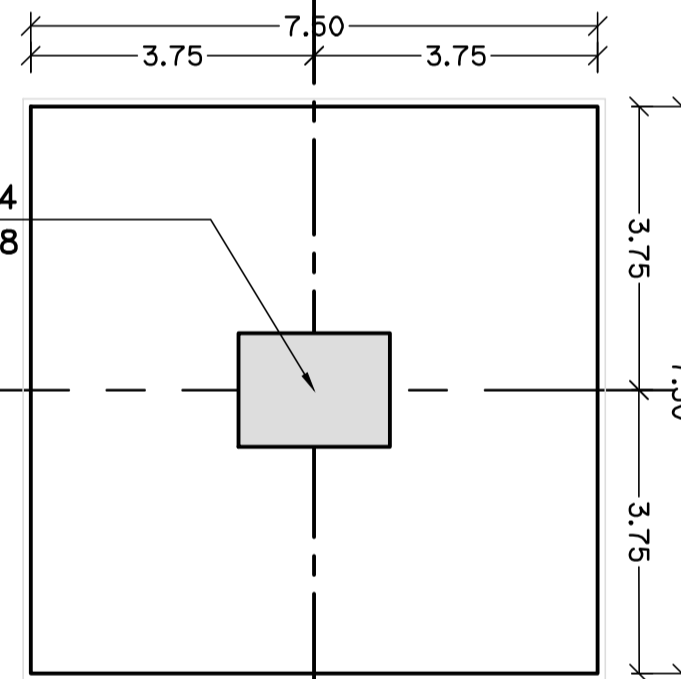
0+380



0+388.725

0+400

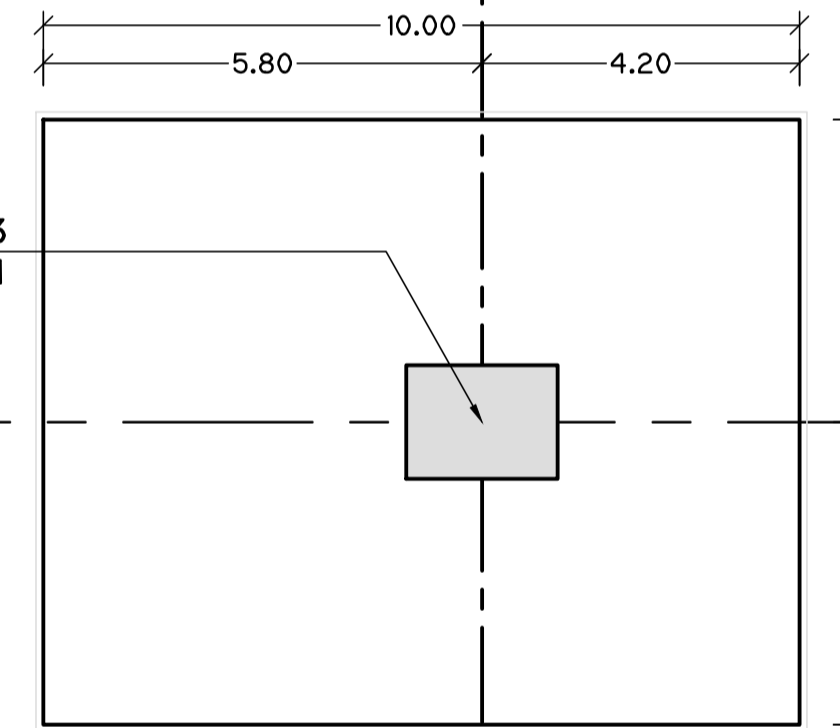
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N = 155819.208



0+411.725

0+420

E = 234128.083
N = 155791.621



0+434.725

EXISTING RETAINING WALL
TUNNEL WINGS

EXISTING RETAINING WALL
TUNNEL WINGS

Purpose Of Issue Rev. Date Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:
STRUCTURAL DESIGN SERVICES FOR
AMMAN BRT

Package:
PRESS TUNNEL

Title:
FOUNDATION LAYOUT
SHEET (4 OF 13)

Consultant:
ster davies gleave
engicon

Design: Drawn by: CAD Checked:

Scale: 1:100 Date: AUG. 2017 Approved:



Drawing Number: S-32 Rev.:

KEY MAP REF.

5

NOTES:-

CONTRACTOR:

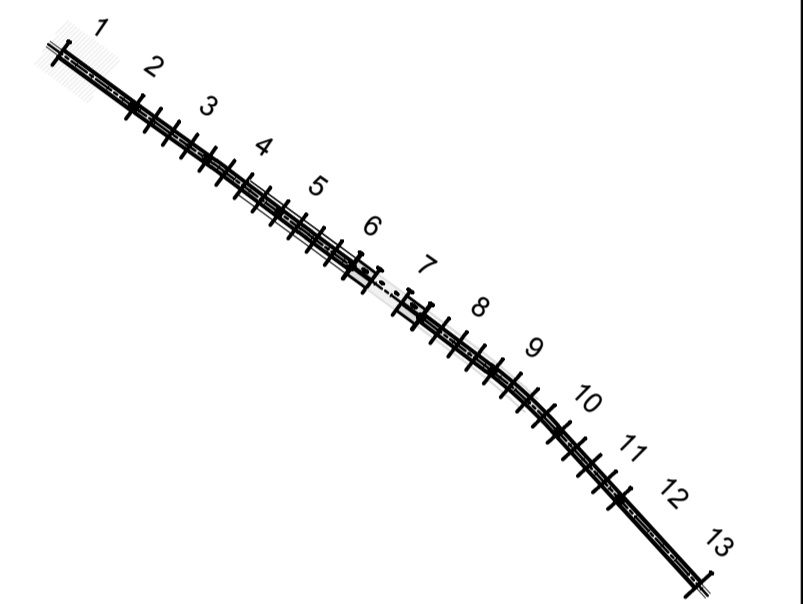


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KEY MAP:-



Purpose Of Issue Rev. Date Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR
AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT
SHEET (5 OF 13)

Consultant:

steer davis gleave



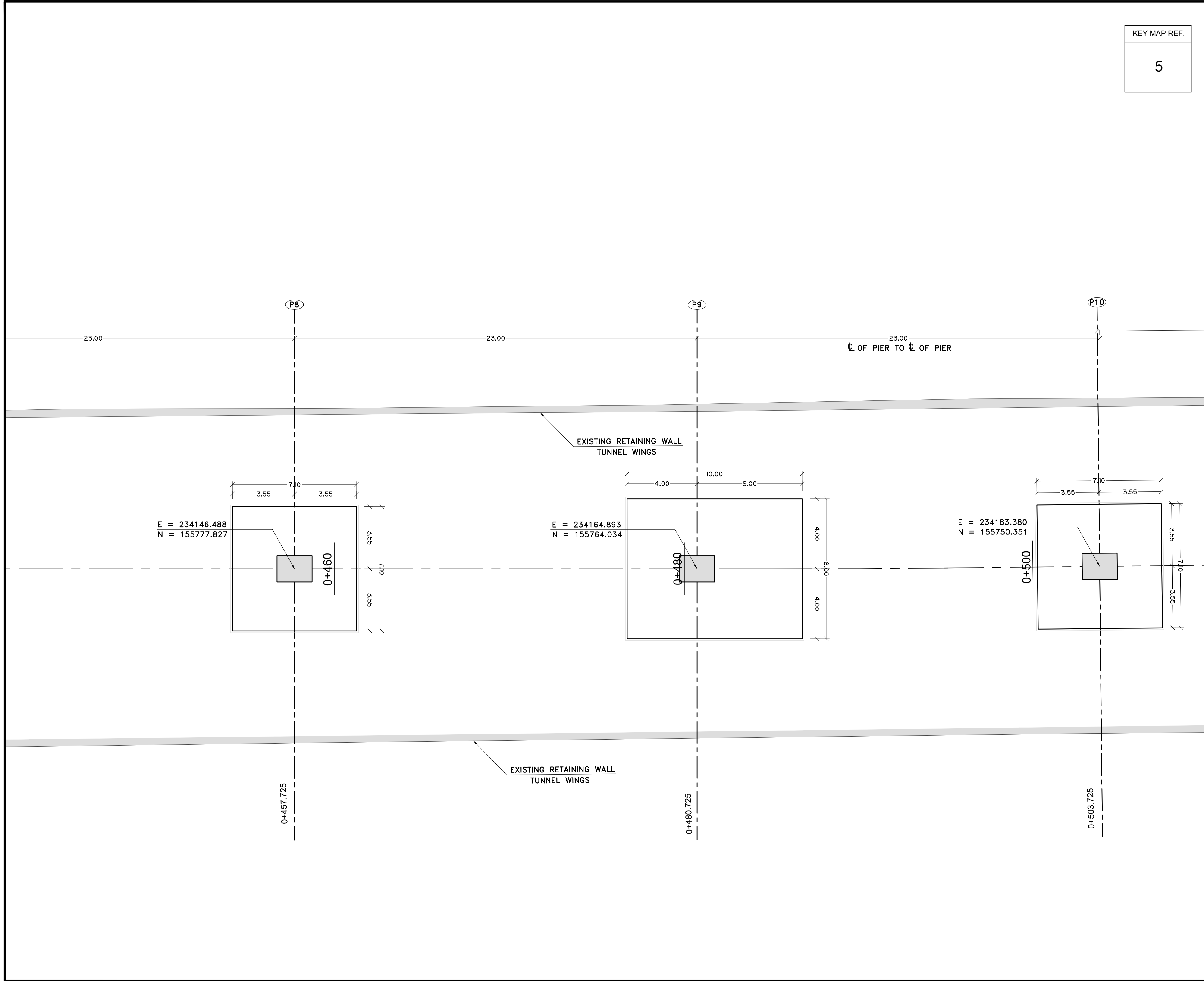
Design: Drawn by: CAD Checked:

Scale: 1:100 Date: AUG. 2017 Approved:



Drawing Number: Rev.:

S-33



E = 234146.488
N = 155777.827

P8

0+457.725

0+460

E = 234164.893
N = 155764.034

P9

0+480.725

0+480

E = 234183.380
N = 155750.351

P10

0+503.725

0+500

KEY MAP REF.
6

NOTES:-

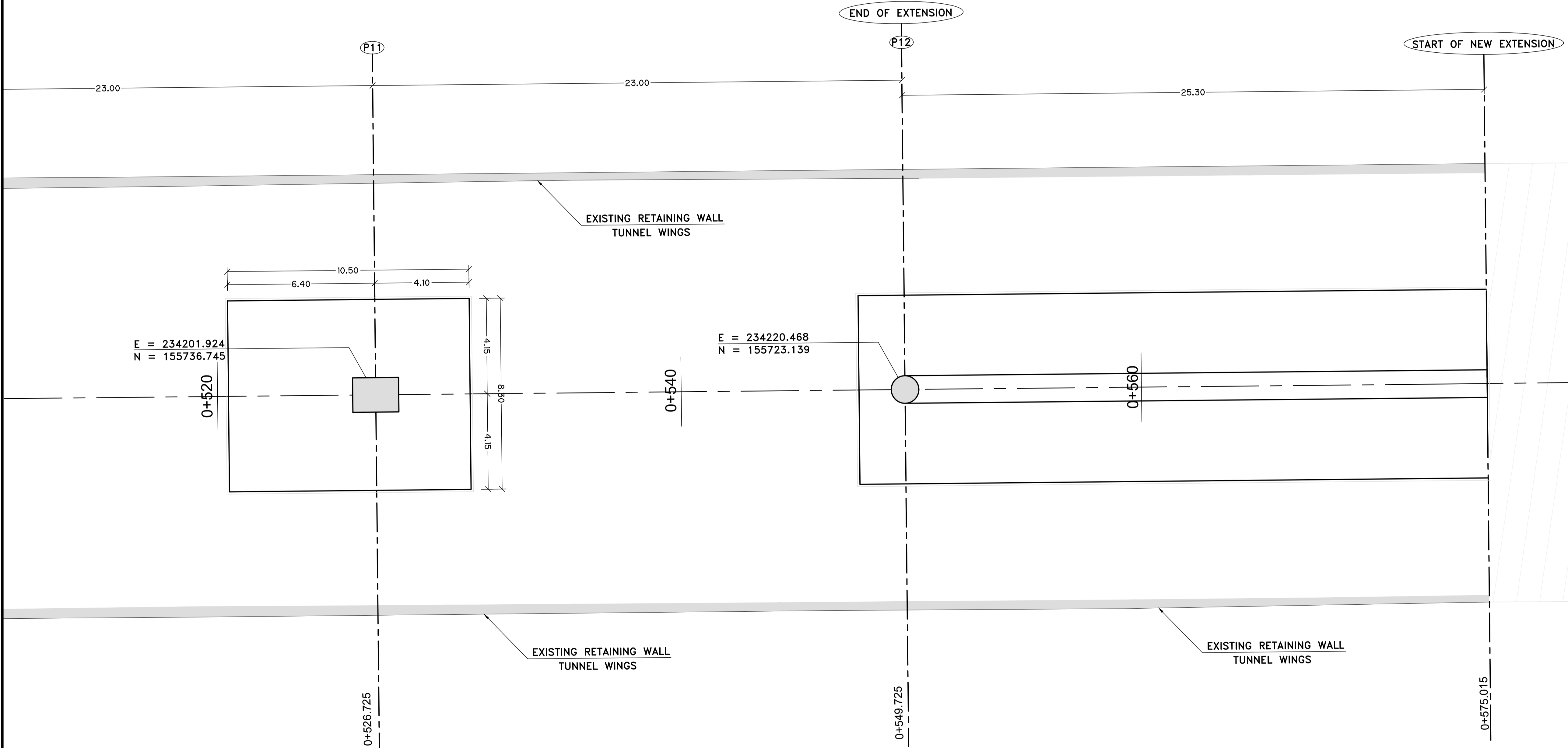
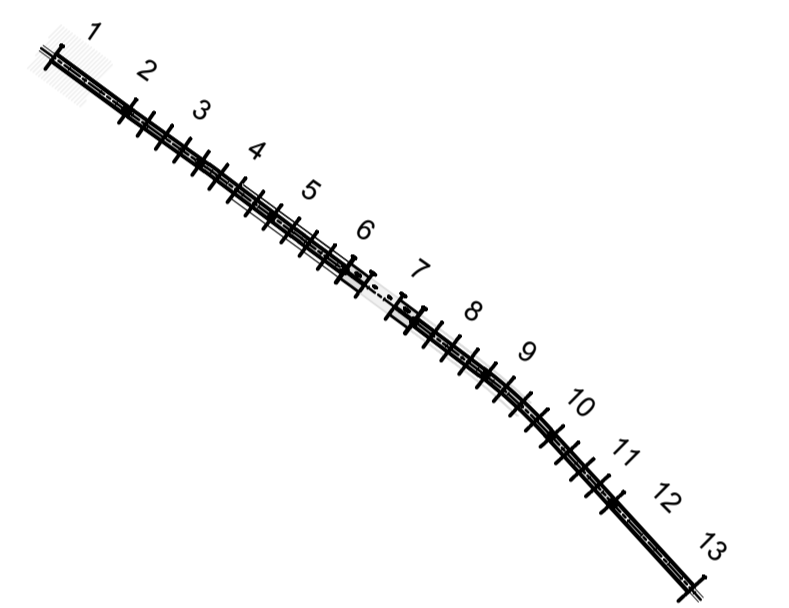
CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-



Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT SHEET (6 OF 13)

Consultant:



Design:	Drawn by: CAD	Checked:
Scale: 1:100	Date: AUG. 2017	Approved:



Drawing Number:	Rev.:
S-34	

KEY MAP REF.
7

NOTES:-

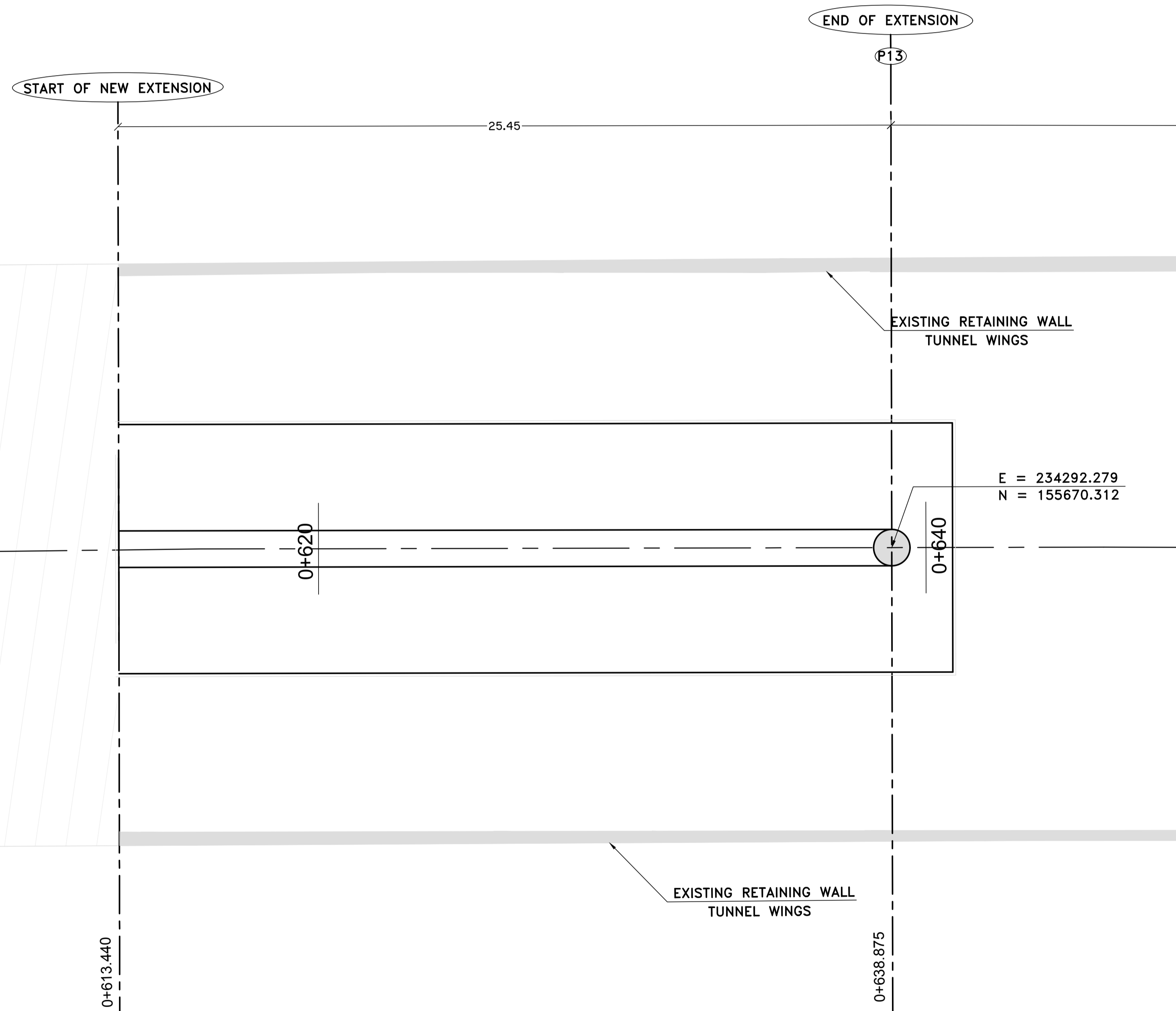
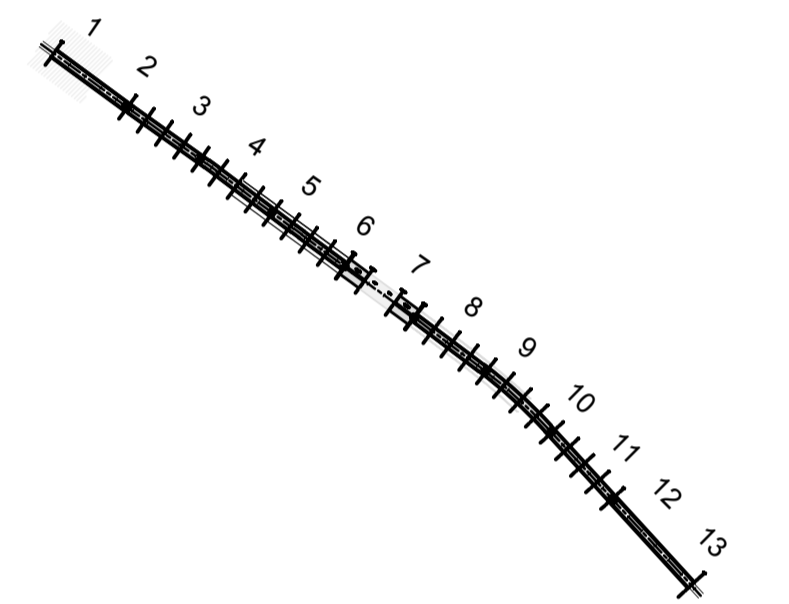
CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-



Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT SHEET (7 OF 13)

Consultant:



Design:	Drawn by: CAD	Checked:
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Scale: 1:100	Date: AUG. 2017	Approved:
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Drawing Number: S-35	Rev.:
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KEY MAP REF.

8

NOTES:-

CONTRACTOR:

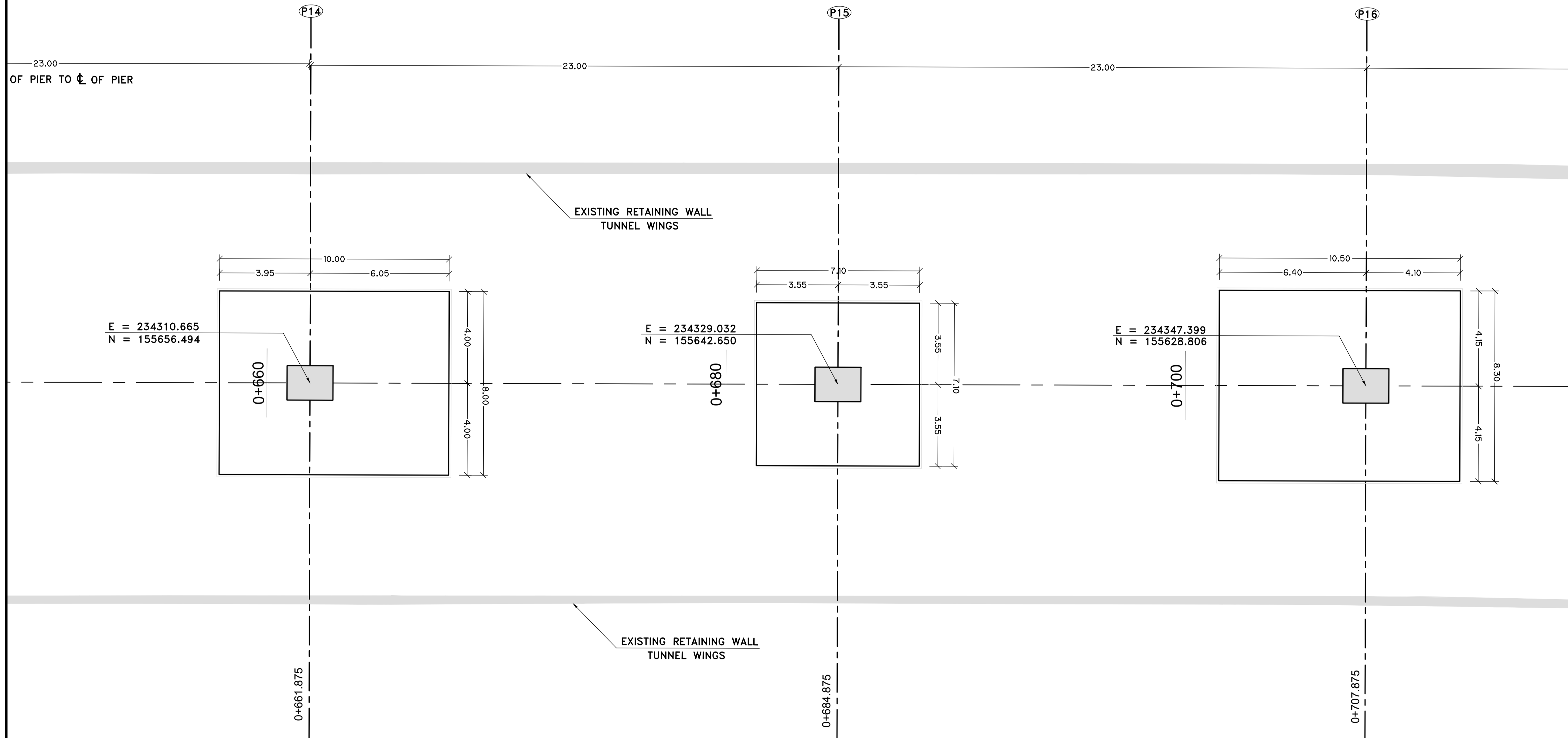
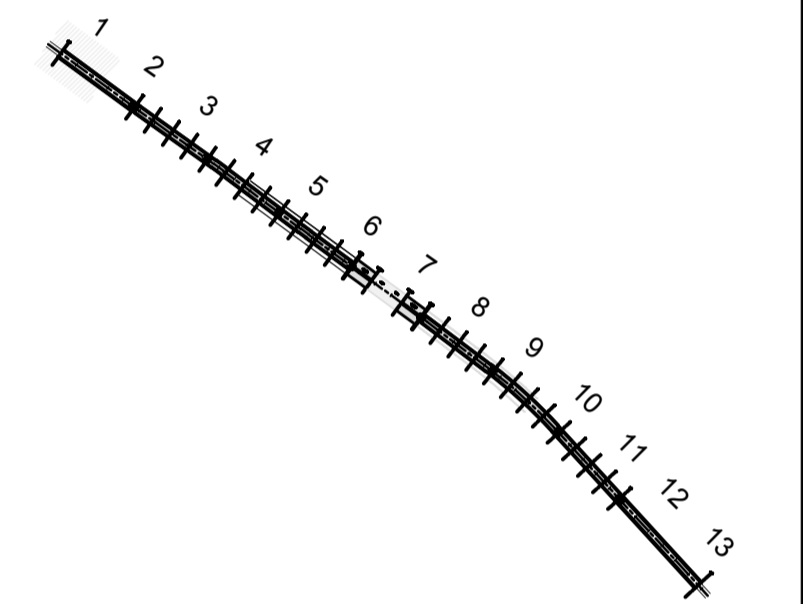


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KEY MAP:-



Purpose Of Issue Rev. Date Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT SHEET (8 OF 13)

Consultant:

steer davies gleave



Design: Drawn by: CAD Checked:

Scale: 1:100 Date: AUG. 2017 Approved:



Drawing Number: Rev.:

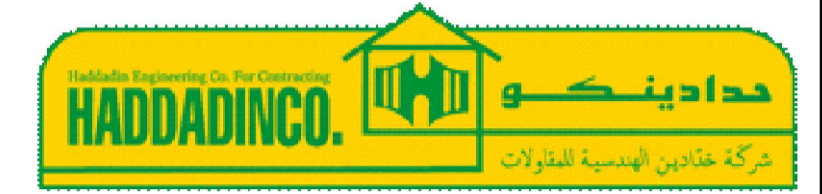
S-36

KEY MAP REF.

9

NOTES:-

CONTRACTOR:

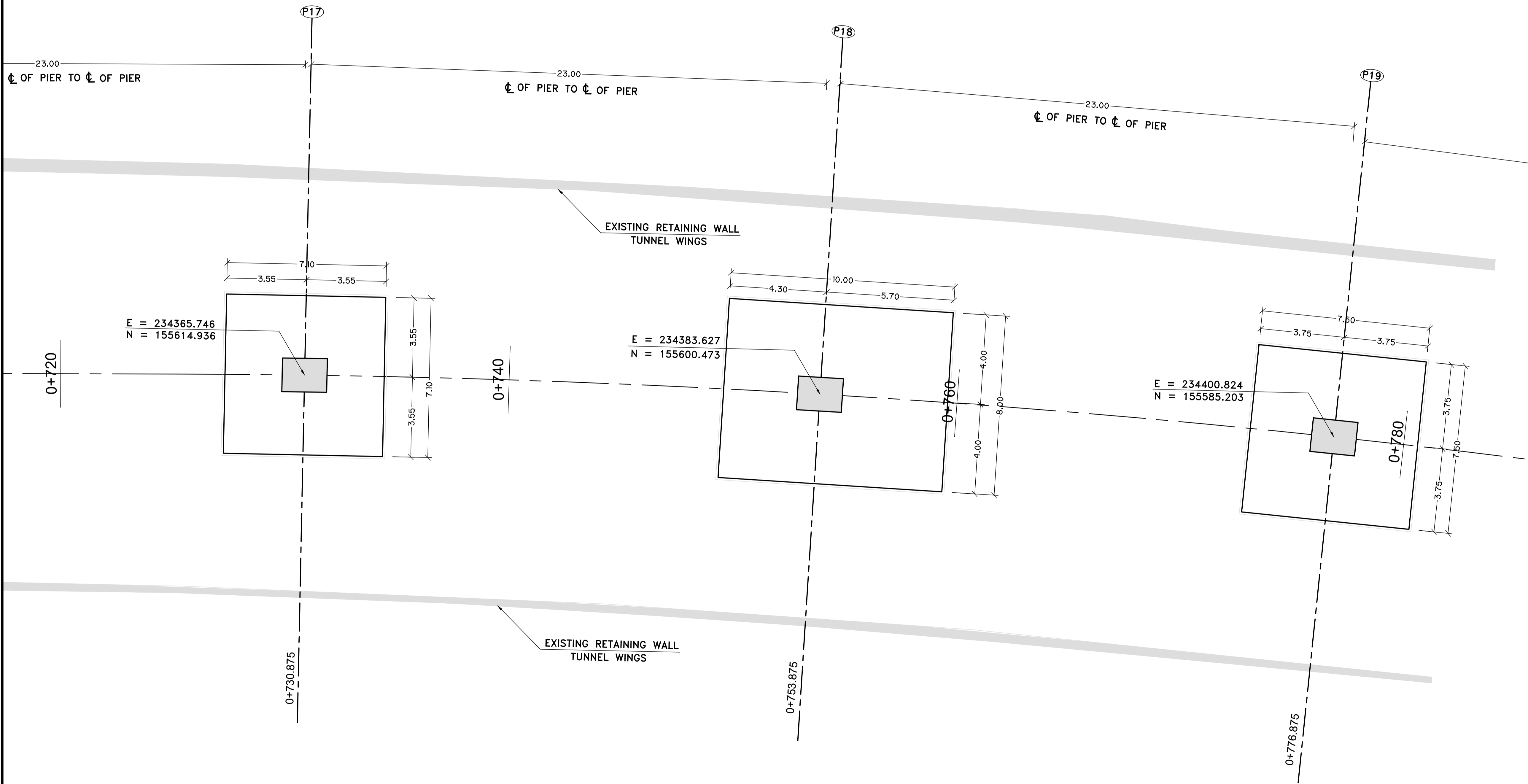
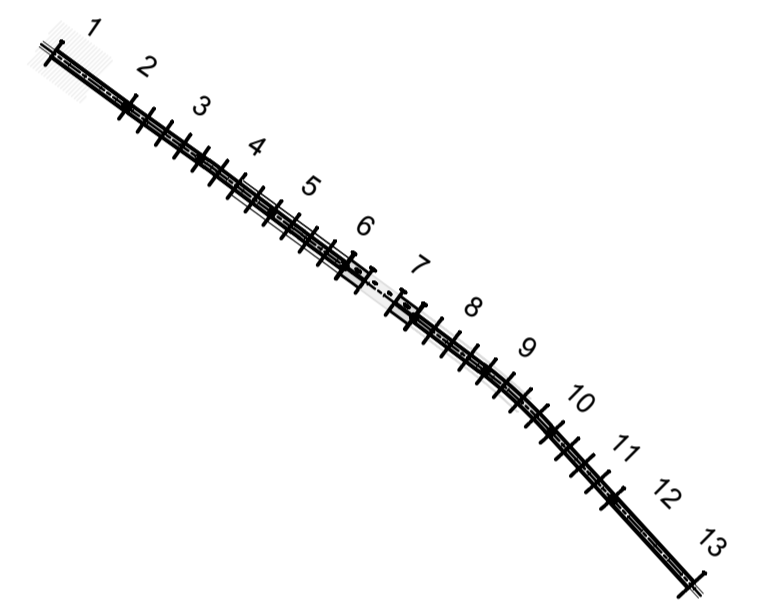


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Engineering Solutions & Consulting

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KEY MAP:-



Purpose Of Issue Rev. Date Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR
AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT
SHEET (9 OF 13)

Consultant:



Design: Drawn by: CAD Checked:

Scale: 1:100 Date: AUG. 2017 Approved:



Drawing Number: Rev.:

S-37

KEY MAP REF.

10

NOTES:-

CONTRACTOR:

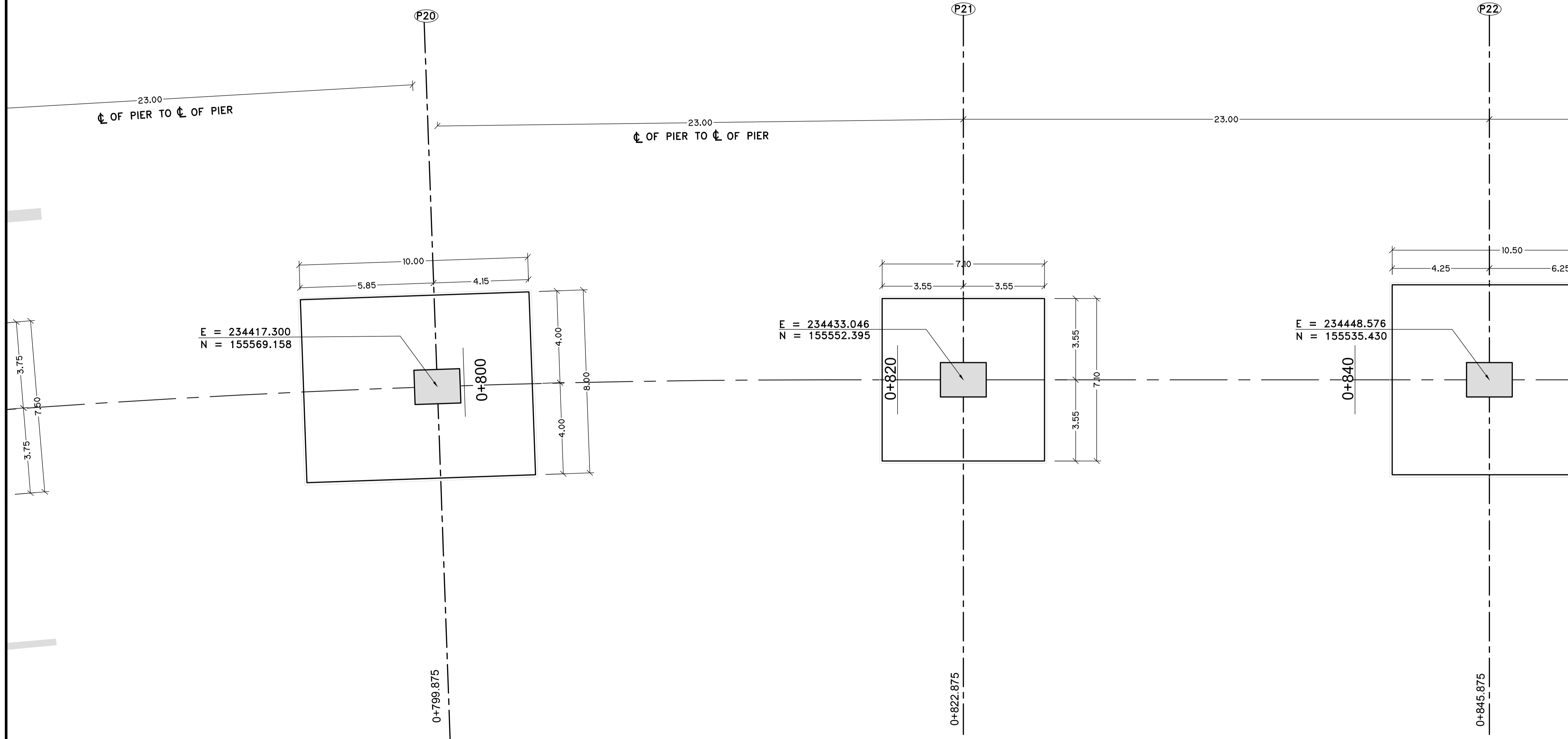
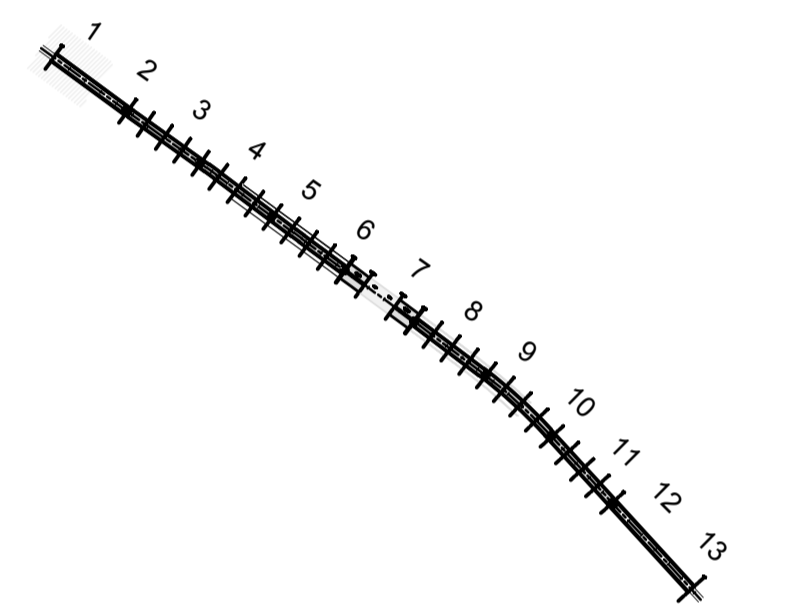


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KEY MAP:-



Purpose Of Issue

Rev. Date Approved



GREATER AMMAN MUNICIPALITY

Project:
STRUCTURAL DESIGN SERVICES FOR
AMMAN BRT

Package:
PRESS TUNNEL

Title:
FOUNDATION LAYOUT
SHEET (10 OF 13)

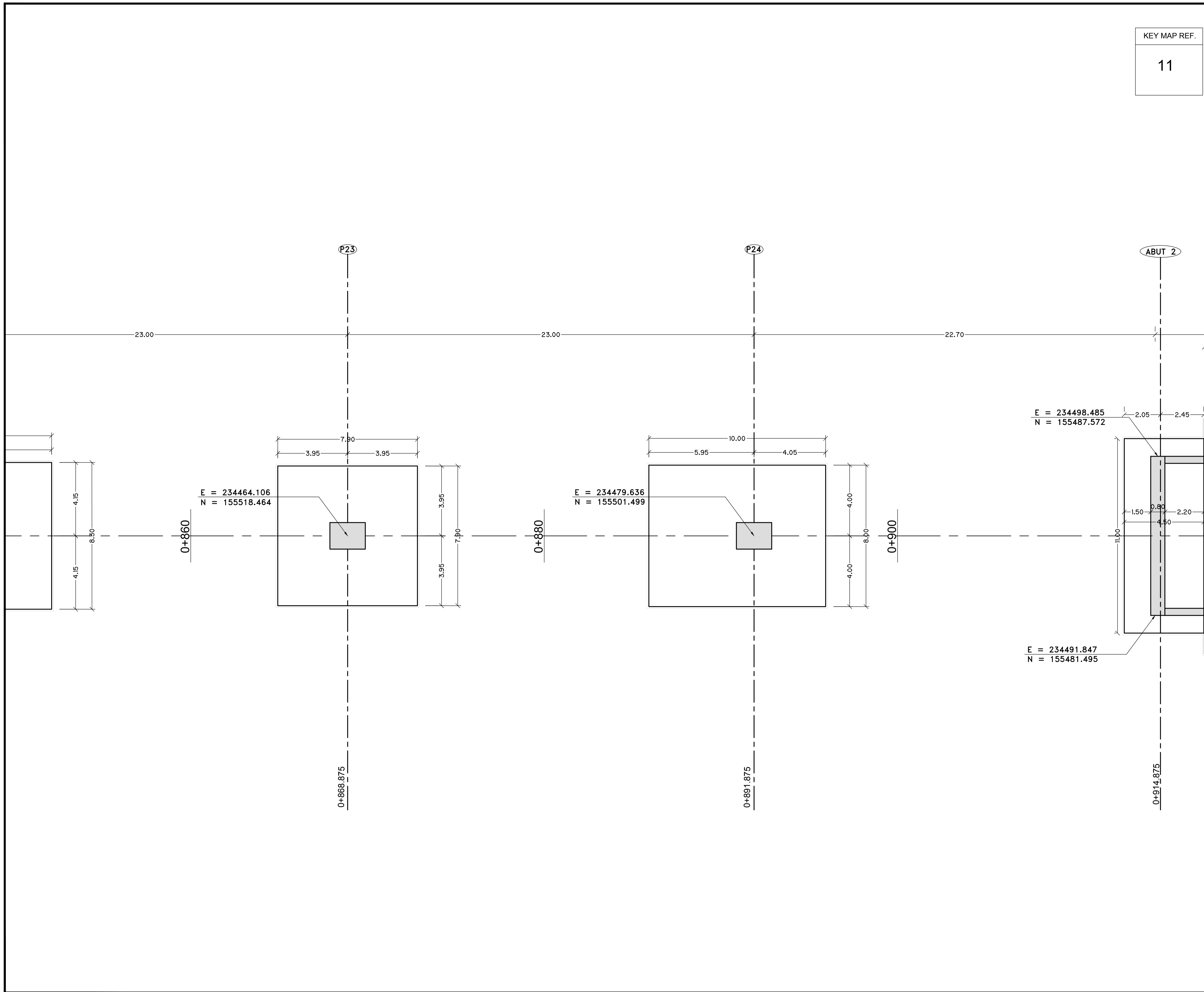
Consultant:

Design: Drawn by: CAD Checked:

Scale: 1:100 Date: AUG. 2017 Approved:



Drawing Number: S-38 Rev.:



NOTES:-

KEY MAP REF.

11

CONTRACTOR:

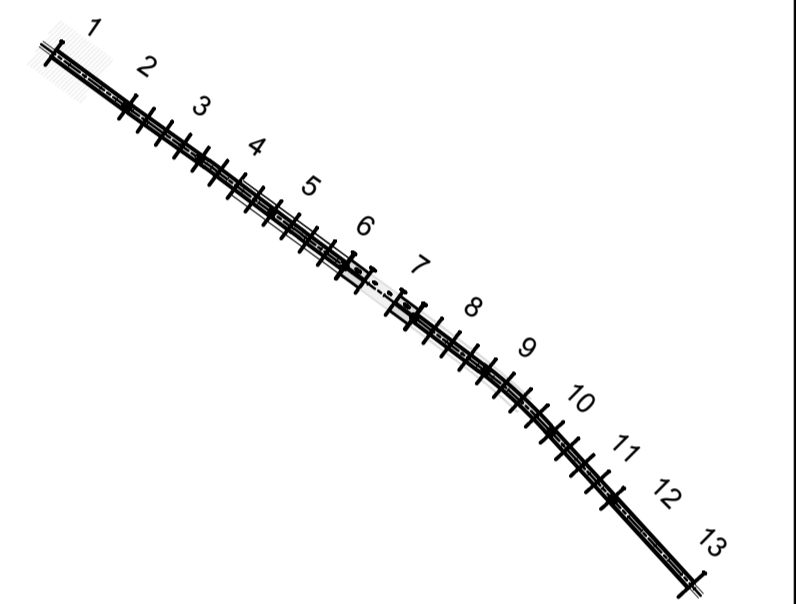


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KEY MAP:-



Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR
AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT
SHEET (11 OF 13)

Consultant:



Design: Drawn by: CAD Checked:

Scale: 1:100 Date: AUG. 2017 Approved:



Drawing Number: S-39 Rev.:

KEY MAP REF.

12

NOTES:-

CONTRACTOR:

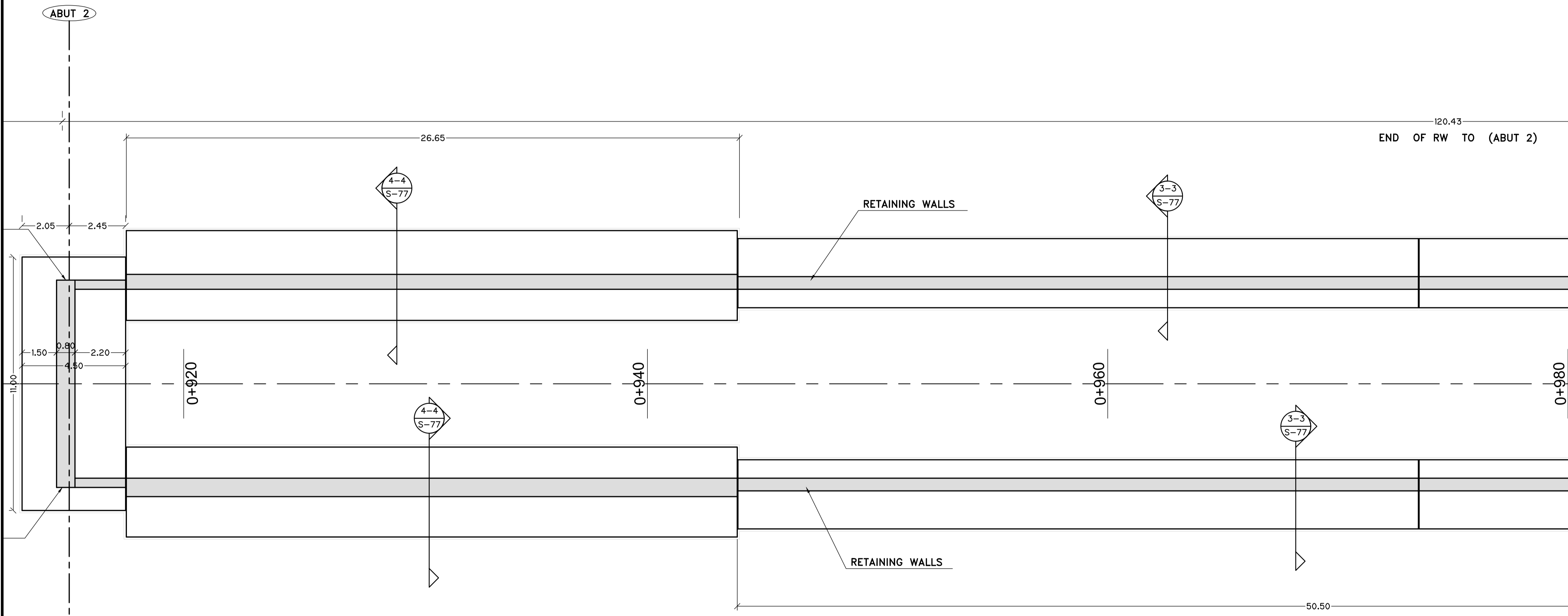
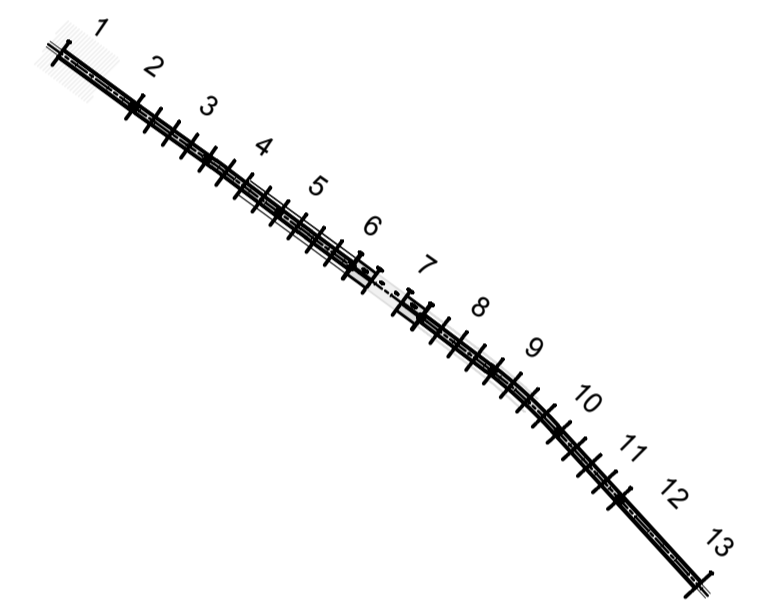


CONTRACTOR'S SUBCONSULTANT :

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KEY MAP:-



Purpose Of Issue

Rev.

Date

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Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR
AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT
SHEET (12 OF 13)

Consultant:

steer davies gleave



Design:

Drawn by:

Checked:

Scale:

1:100

Date:

AUG. 2017

Approved:



Drawing Number:

S-40

Rev.:

KEY MAP REF.

13

NOTES:-

CONTRACTOR:

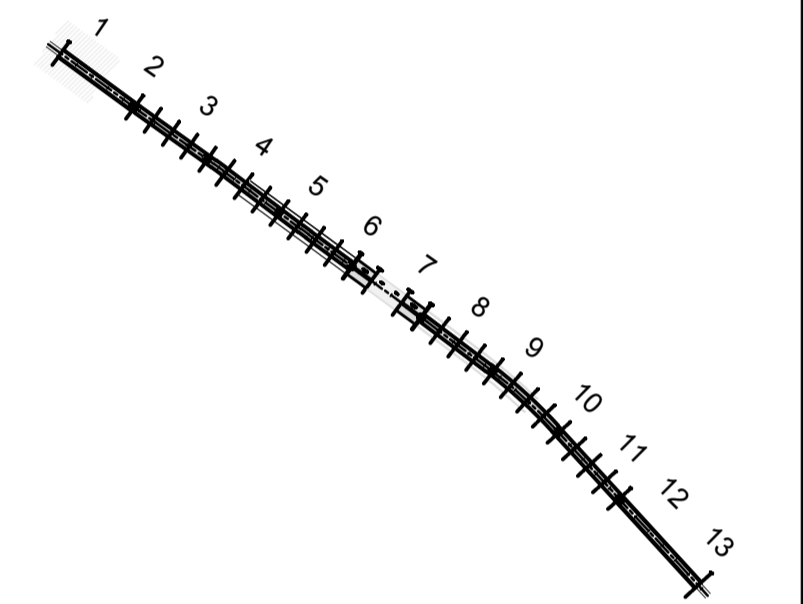


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KEY MAP:-



END OF RW

RETAINING WALLS

RETAINING WALLS

1+000

1+020

1+040

1+035

Purpose Of Issue Rev. Date Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR
AMMAN BRT

Package:

PRESS TUNNEL

Title:

FOUNDATION LAYOUT
SHEET (13 OF 13)

Consultant:



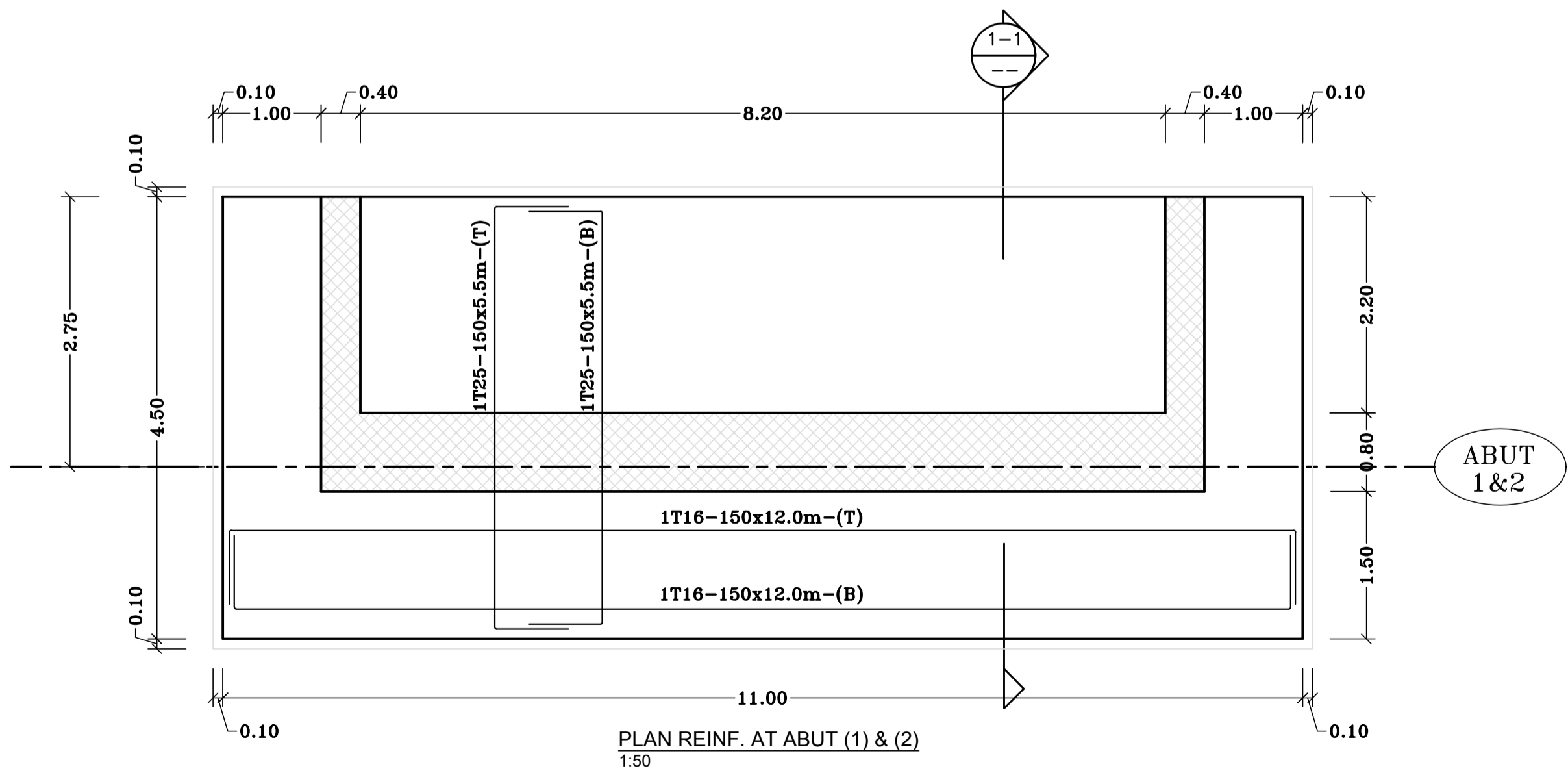
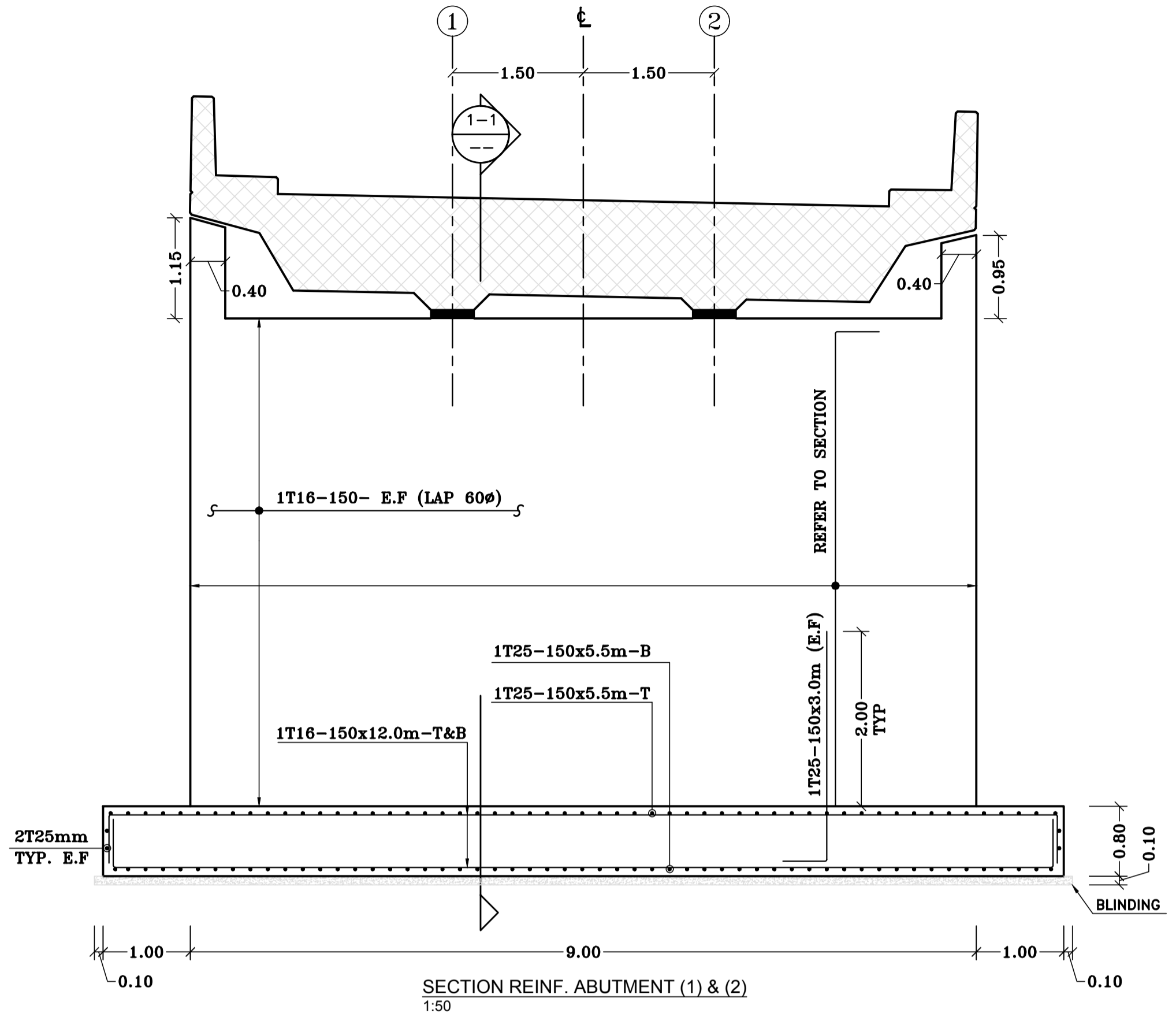
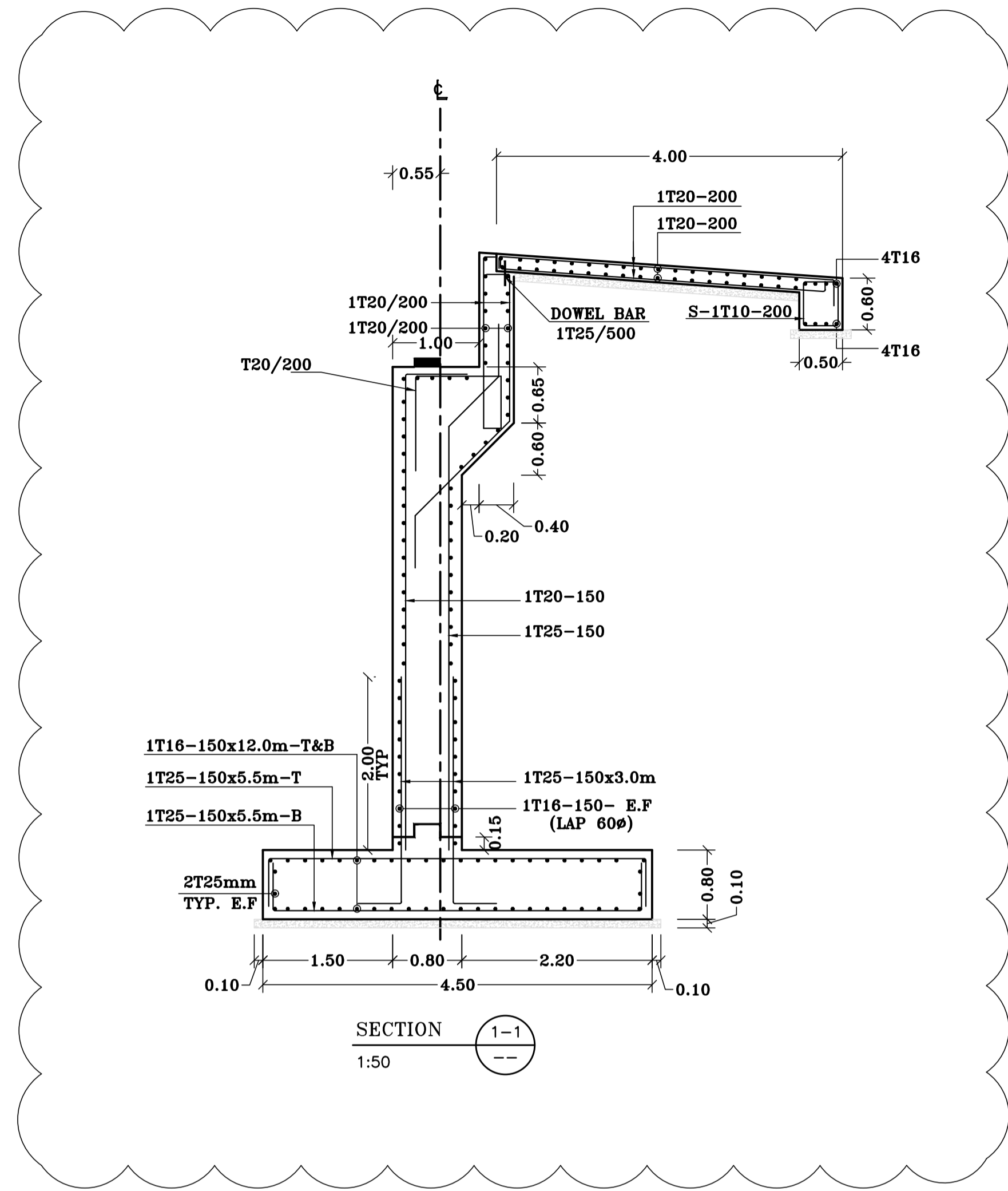
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Scale: 1:100 Date: AUG. 2017 Approved:



Drawing Number: Rev.:

S-41



NOTES:-

CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-

Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

ABUTMENTS STRUCTURAL DETAILS

Consultant:



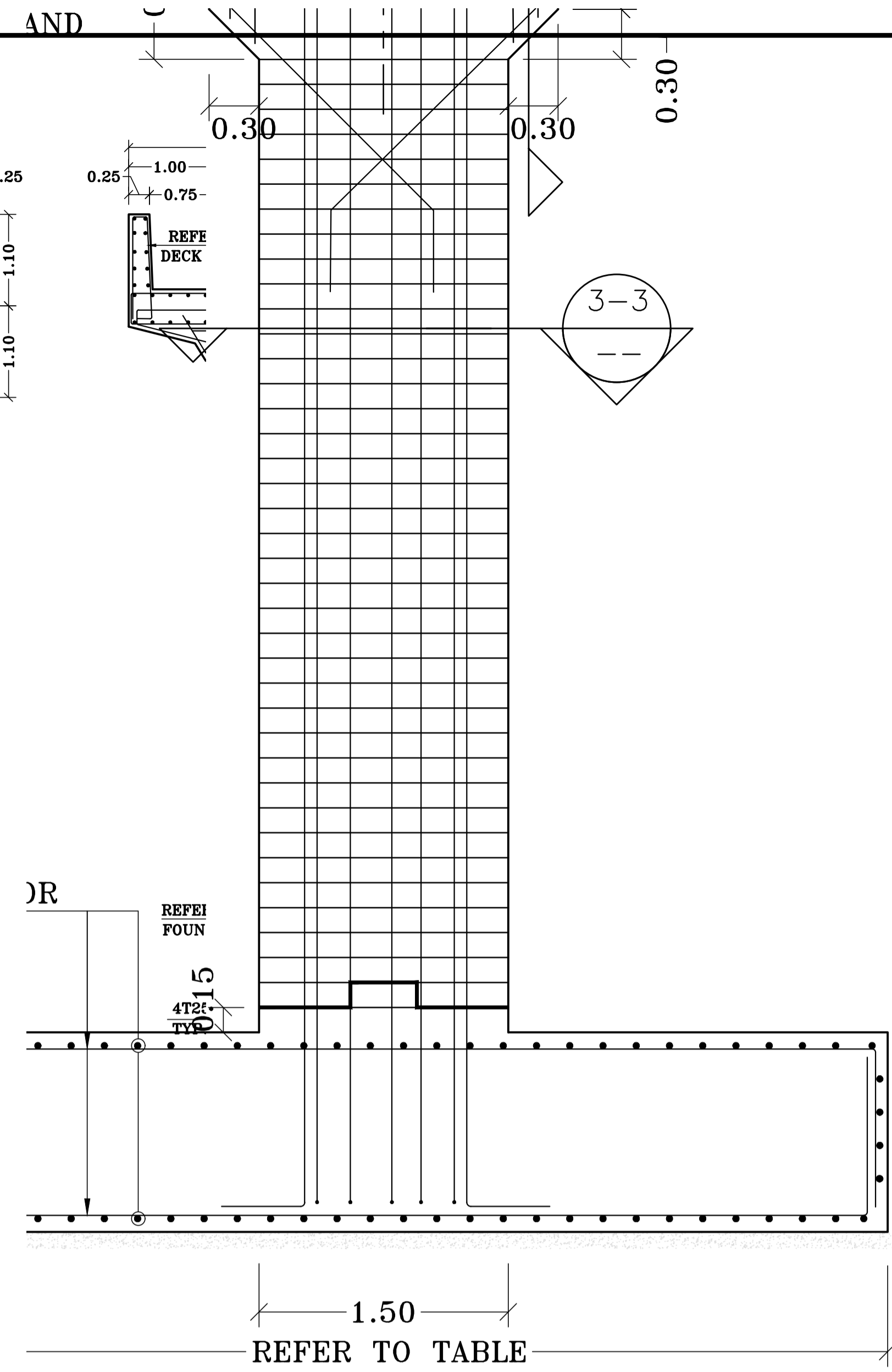
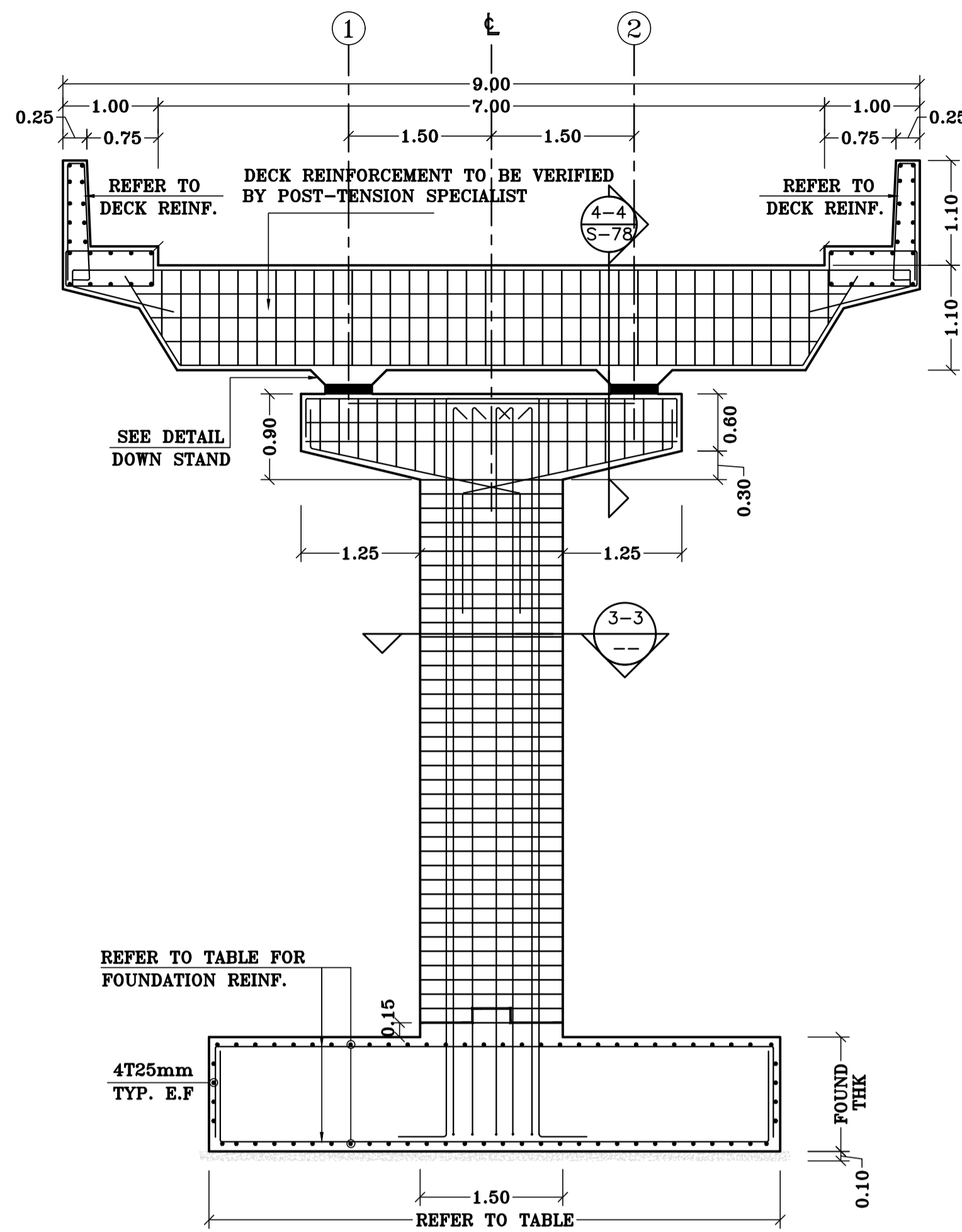
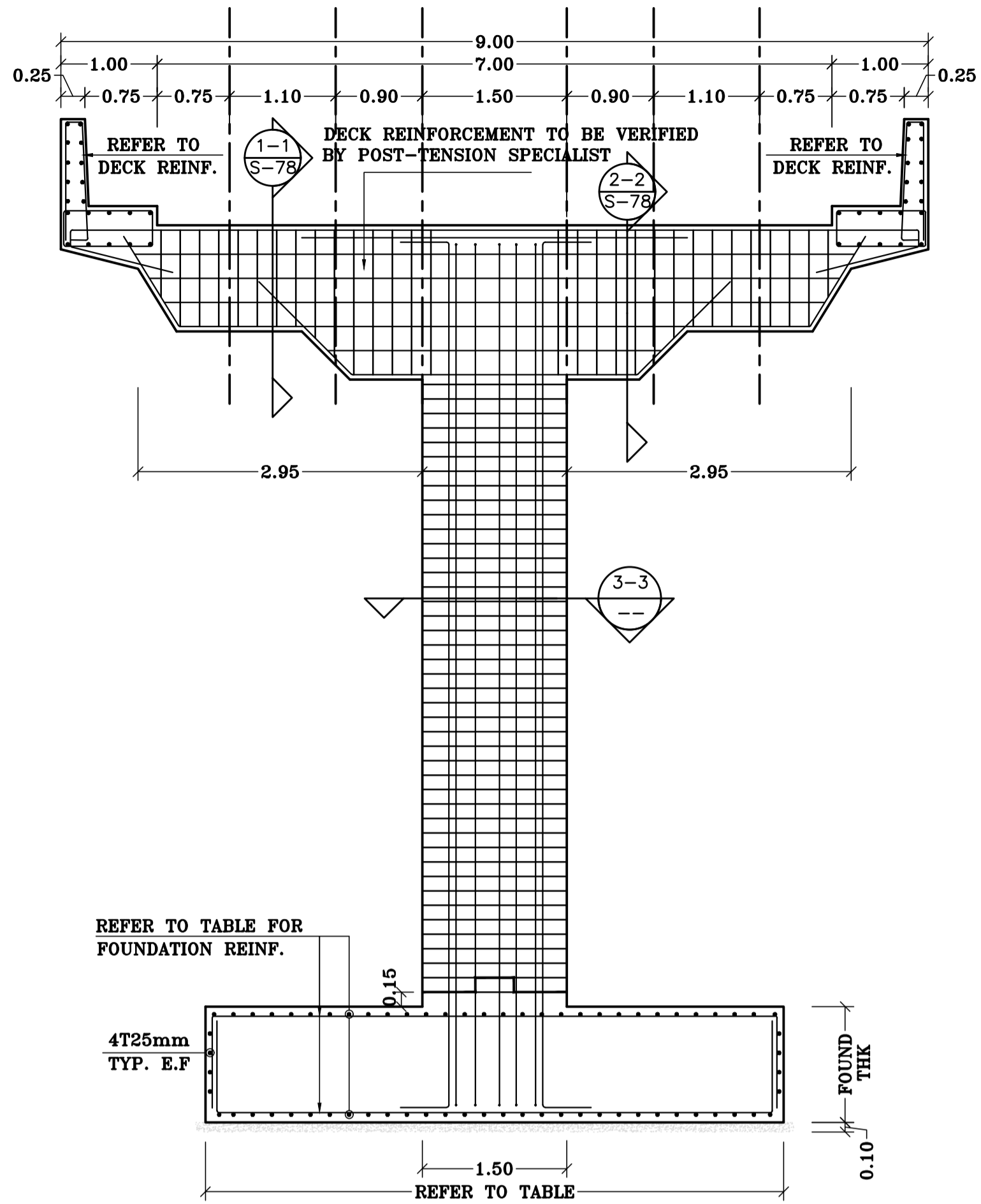
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Scale: 1:25 Date: AUG. 2017 Approved:



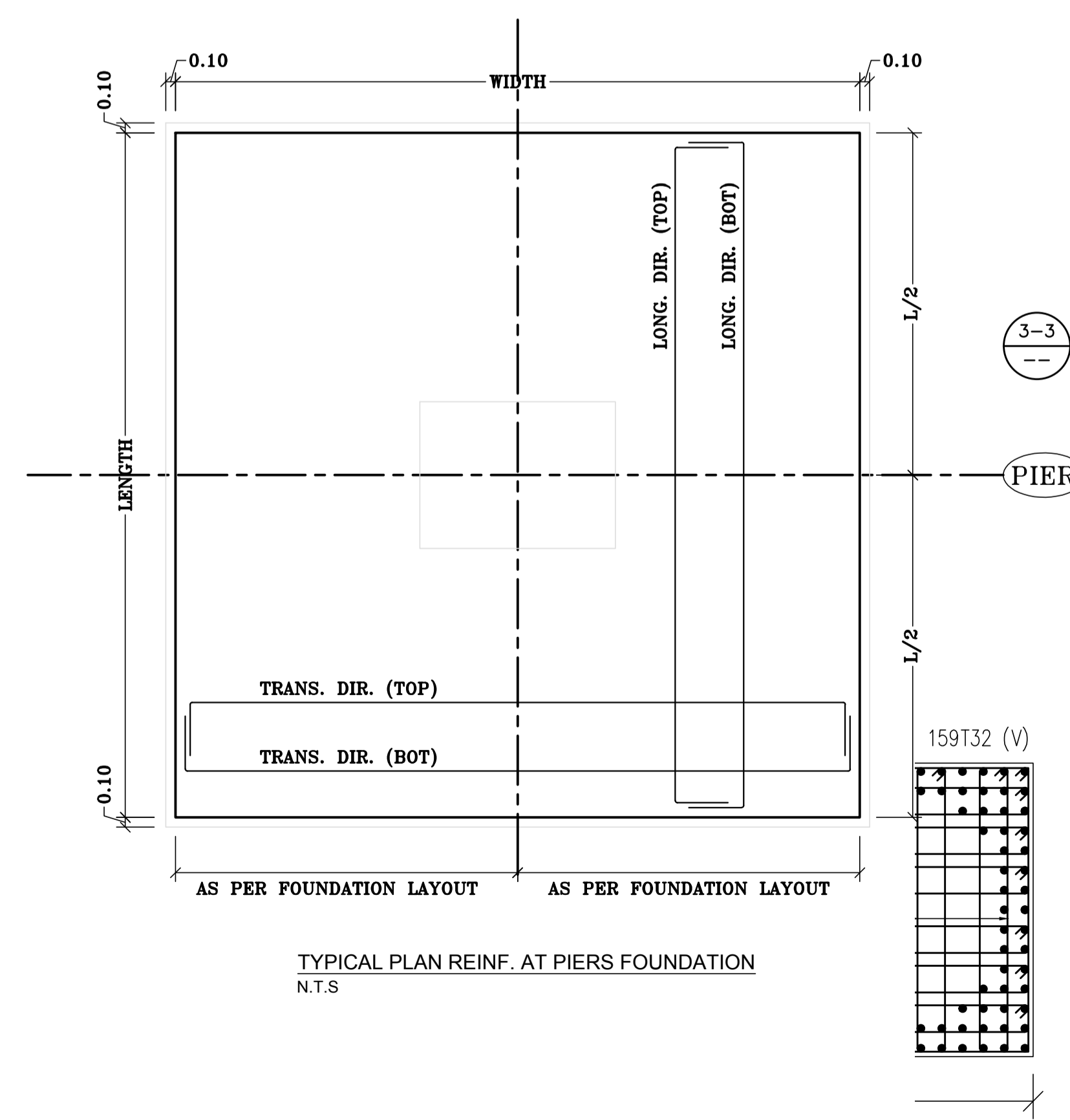
Drawing Number: S-69 Rev.:

S-69



PIER No.	LENGTH (m)	WIDTH (m)	THK (m)	LONG REINF. BOT. Y-DIR.	LONG REINF. TOP. Y-DIR.	TRANS REINF. BOT. X-DIR.	TRANS REINF. TOP. X-DIR.
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2	7.9	7.9	1.4	1T25-150	1T18-150	1T25-150	1T18-150
3	10.5	8.3	1.5	1T32-150	1T18-150	1T32-150	1T18-150
4	7.1	7.1	1.2	1T25-150	1T18-150	1T25-150	1T18-150
5	10	8	1.5	1T32-200	1T18-150	1T32-200	1T18-150
6	7.5	7.5	1.6	1T25-150	1T18-150	1T25-150	1T18-150
7	10	8	1.6	1T32-200	1T18-150	1T32-200	1T18-150
8	7.1	7.1	1.3	1T25-150	1T18-150	1T25-150	1T18-150
9	10	8	1.5	1T32-200	1T18-150	1T32-125	1T18-150
10	7.1	7.1	1.5	1T25-150	1T18-150	1T25-150	1T18-150
11	10.5	8.3	1.5	1T32-150	1T18-150	1T32-150	1T18-150
12	REFER TO NEW EXTENSION DETAILS						
13	REFER TO NEW EXTENSION DETAILS						
14	10	8	1.5	1T32-150	1T25-150	1T32-100	1T25-150
15	7.1	7.1	1.4	1T25-150	1T18-150	1T25-150	1T18-150
16	10.5	8.3	1.6	1T32-150	1T18-150	1T32-150	1T18-150
17	7.1	7.1	1.3	1T25-150	1T18-150	1T25-150	1T18-150
18	10	8	1.6	1T32-200	1T18-150	1T32-200	1T18-150
19	7.5	7.5	1.6	1T32-200	1T18-150	1T32-200	1T18-150
20	10	8	1.6	1T32-200	1T18-150	1T32-200	1T18-150
21	7.1	7.1	1.2	1T32-200	1T20-150	1T32-200	1T20-150
22	10.5	8.3	1.5	1T32-150	1T18-150	1T32-150	1T18-150
23	7.9	7.9	1.4	1T32-200	1T18-150	1T32-200	1T18-150
24	10	8	1.6	1T32-200	1T18-150	1T32-200	1T18-150

PIERS FOOTINGS SCHEDULE OF REINFORCEMENT
N.T.S



TYPICAL PLAN REINF. AT PIERS FOUNDATION
N.T.S

NOTES:-

CONTRACTOR:

 شركة هادادين الهندسية للمقاولات

CONTRACTOR'S SUBCONSULTANT:

 Engineering Solutions & Consulting
 TEL: +962 6 5155818 FAX: +962 6 5155818 E-Mail: info@Esc-solution.co
 Queen Rania Al Abdallah Street P.O.Box 874 Amman 11941 Jordan Web: www.Esc-solution.co

KEY MAP:-

Purpose Of Issue	Rev.	Date	Approved

Client:

 أمانة عمان الكبرى
 GREATER AMMAN MUNICIPALITY

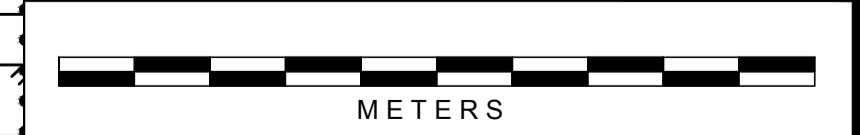
Project:
 STRUCTURAL DESIGN SERVICES FOR
 AMMAN BRT

Package:
 PRESS TUNNEL

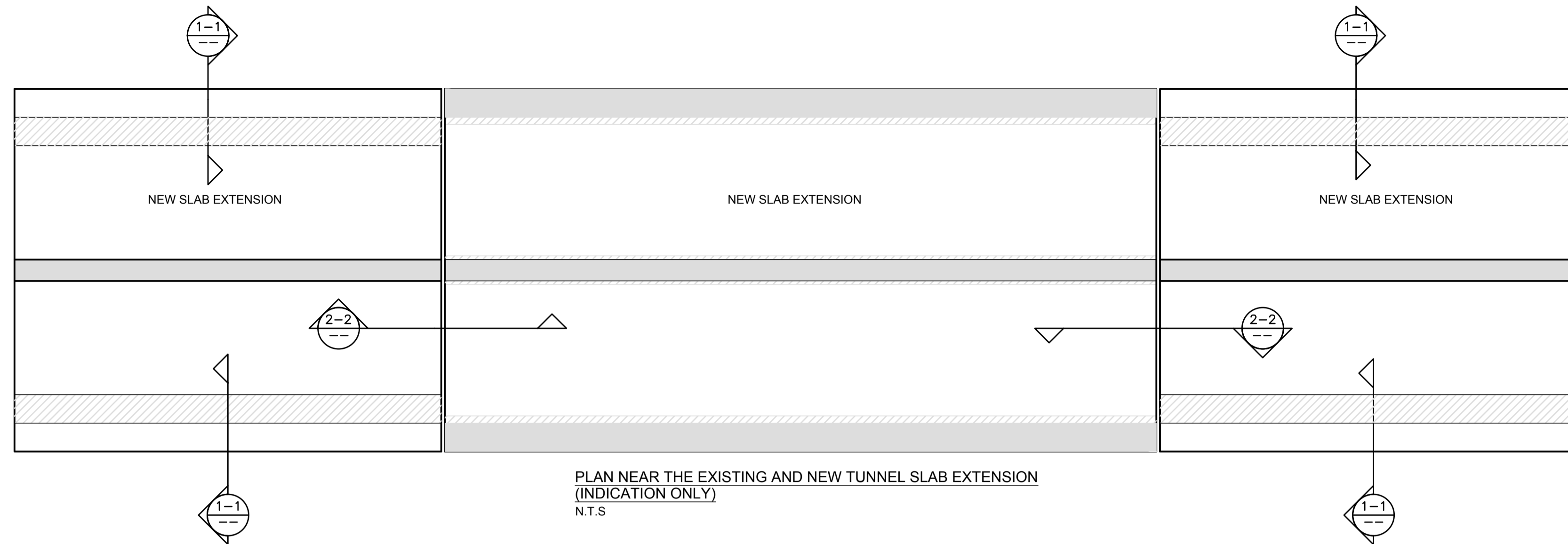
Title:
 PIERS STRUCTURAL DETAILS

Consultant:

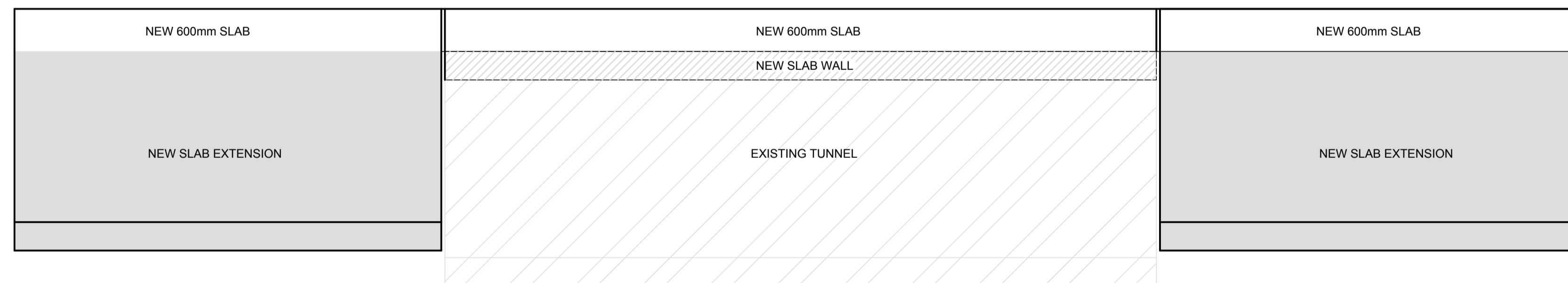

Design: Drawn by: CAD Checked:
 Scale: AS SHOWN Date: AUG. 2017 Approved:



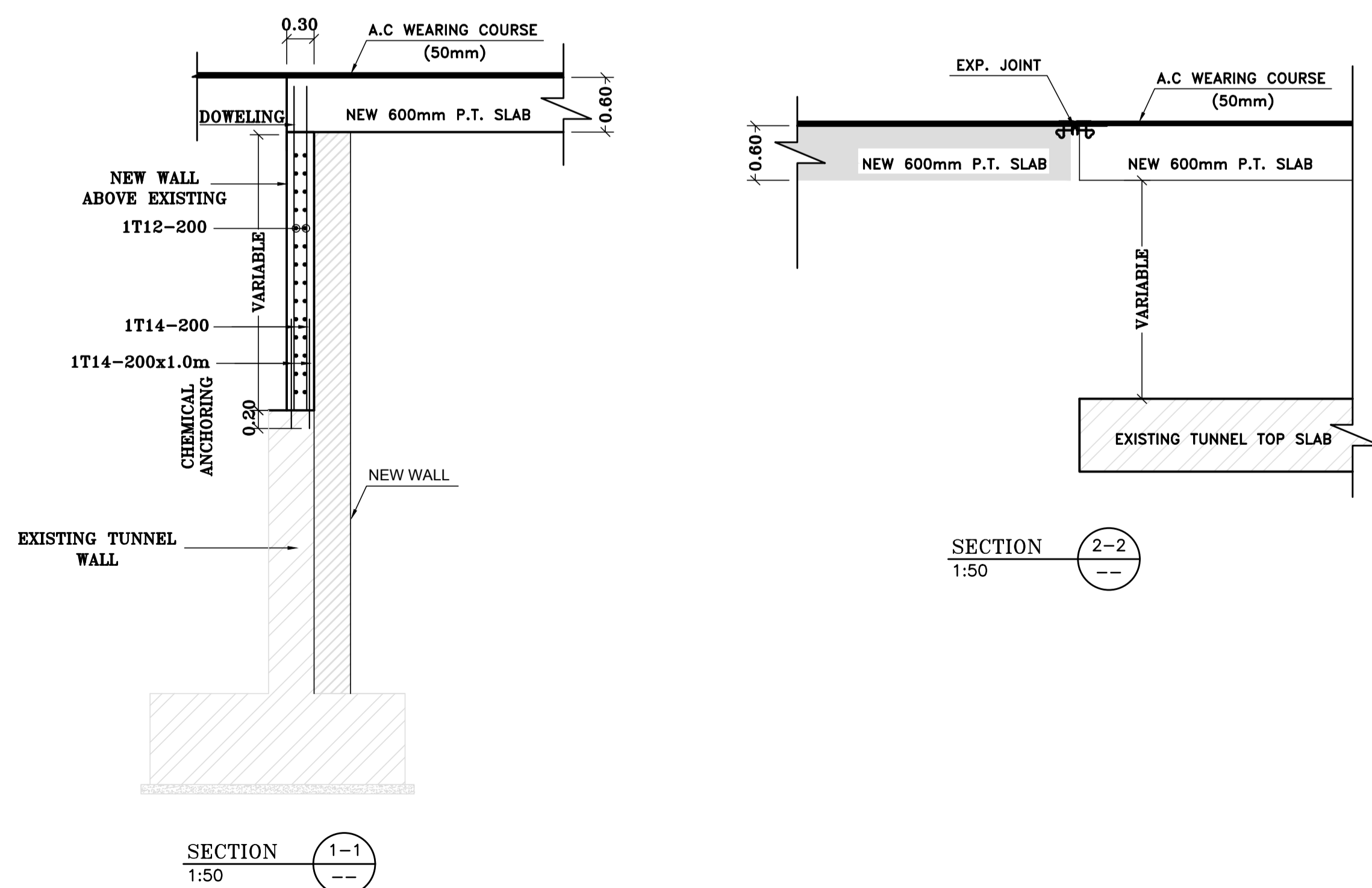
Drawing Number: S-70 Rev.:



PLAN NEAR THE EXISTING AND NEW TUNNEL SLAB EXTENSION
(INDICATION ONLY)
N.T.S



PROFILE NEAR THE EXISTING AND NEW TUNNEL SLAB EXTENSION
(INDICATION ONLY)
N.T.S



● THE REQUIRED TESTS TO EVALUATE THE EXISTING TUNNEL CONDITION:

1-COMPRESSIVE STRENGTH TEST ON DRILLED CONCRETE CORES AS FOLLOWINGS:

- a- 4 CORES IN EXISTING TUNNEL SLAB.
- b- 10 CORES IN EXISTING TUNNEL WALLS.
- c- 3 CORES IN EXISTING TUNNEL FOUNDATIONS.

2-EXISTING REINFORCED BARS YIELD STRENGTH AND CORROSION TEST ON 4 SAMPLES.

3-REPAR MAPPING SCANNING SURVEY TO DETERMINE DIAMETER AND SPACING OF EXISTING TUNNEL REINFORCEMENT BARS IN BOTH LONGITUDINAL AND TRANSVERSE DIRECTION IN THE TWO FACES .

**ALL REQUIRED TESTS TO BE COMPATIBLE WITH THE STANDARDS SPECIFICATIONS AND REQUIREMENTS.

NOTES:-

CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



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Queen Rania Al Abdallah Street P.O.Box 874 Amman 11941 Jordan Web: www.Esc-solution.co

KEY MAP:-

Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

Title:

TUNNEL SLAB NEW EXTENSION SHEET (6 OF 6)

Consultant:

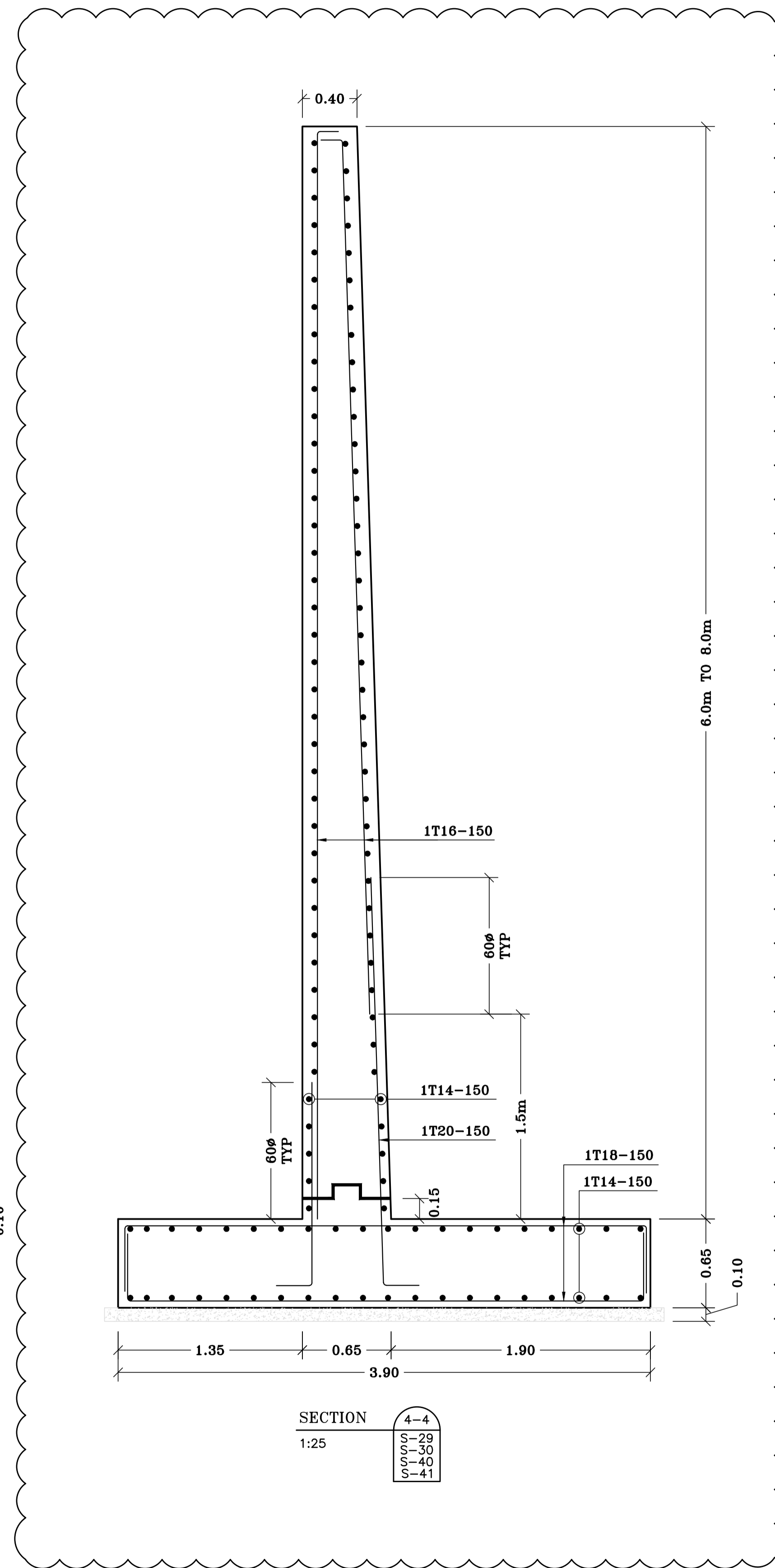
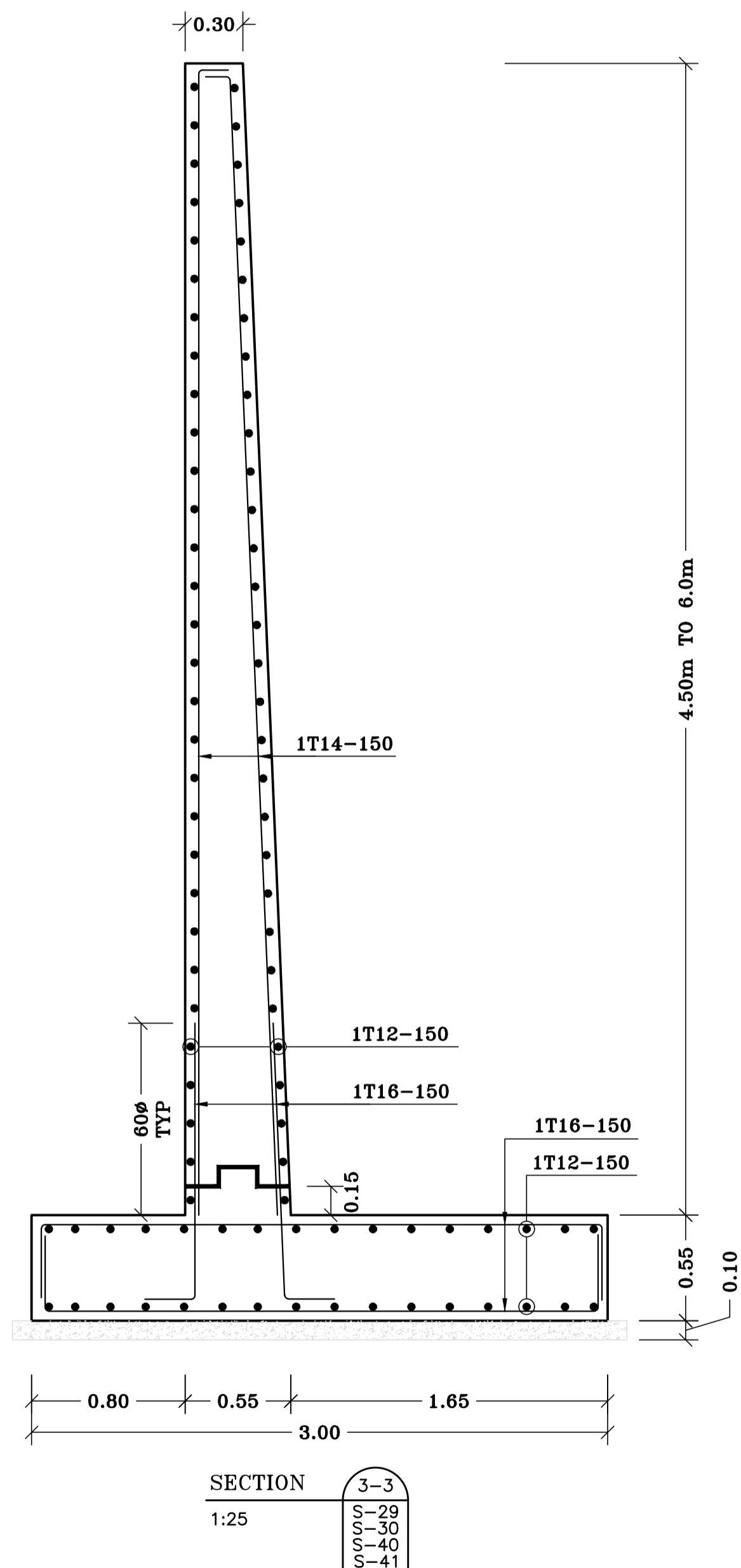
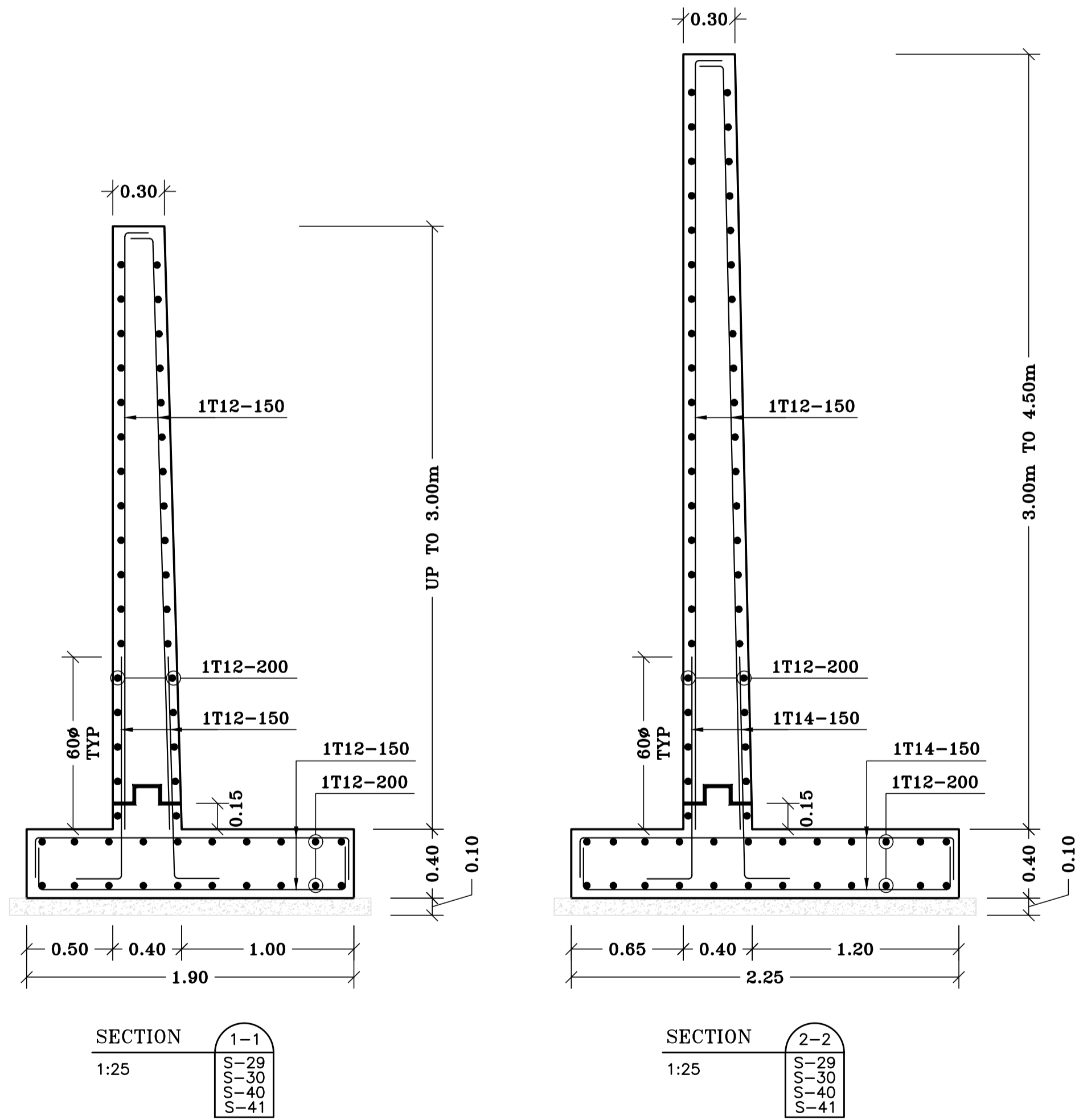


Design: Drawn by: CAD Checked:

Scale: AS SHOWN Date: AUG. 2017 Approved:



Drawing Number: S-76 Rev.:



NOTES:-

CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :

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KEY MAP:-

Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR
AMMAN BRT

Package:

PRESS TUNNEL

Title:

WING WALLS STRUCTURAL
DETAILS

Consultant:

steer davies gleave



Design:

Drawn by:

Checked:

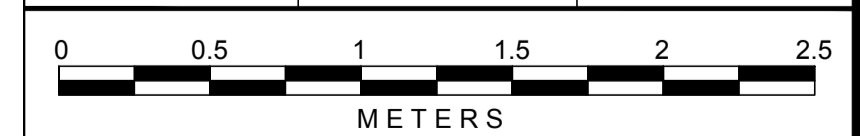
Scale:

1:25

Date:

Approved:

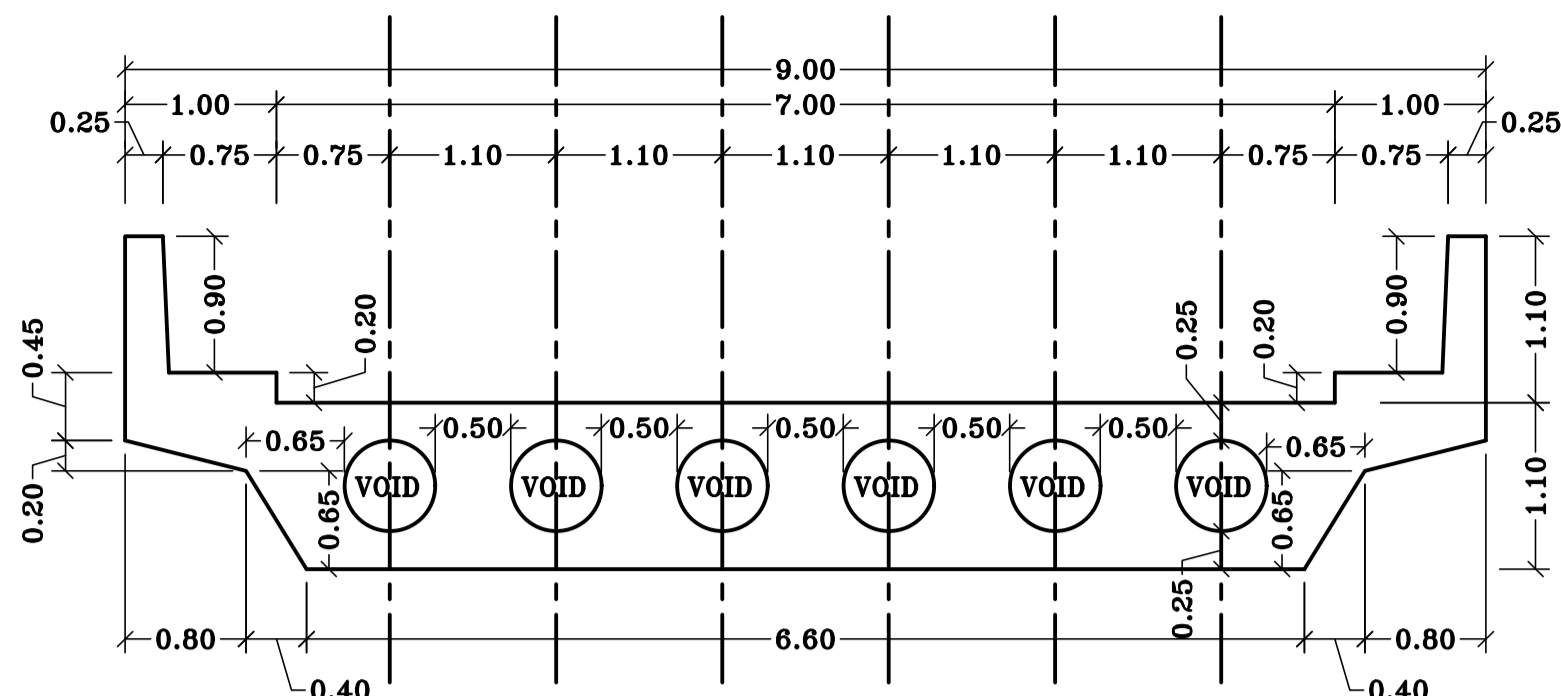
AUG. 2017



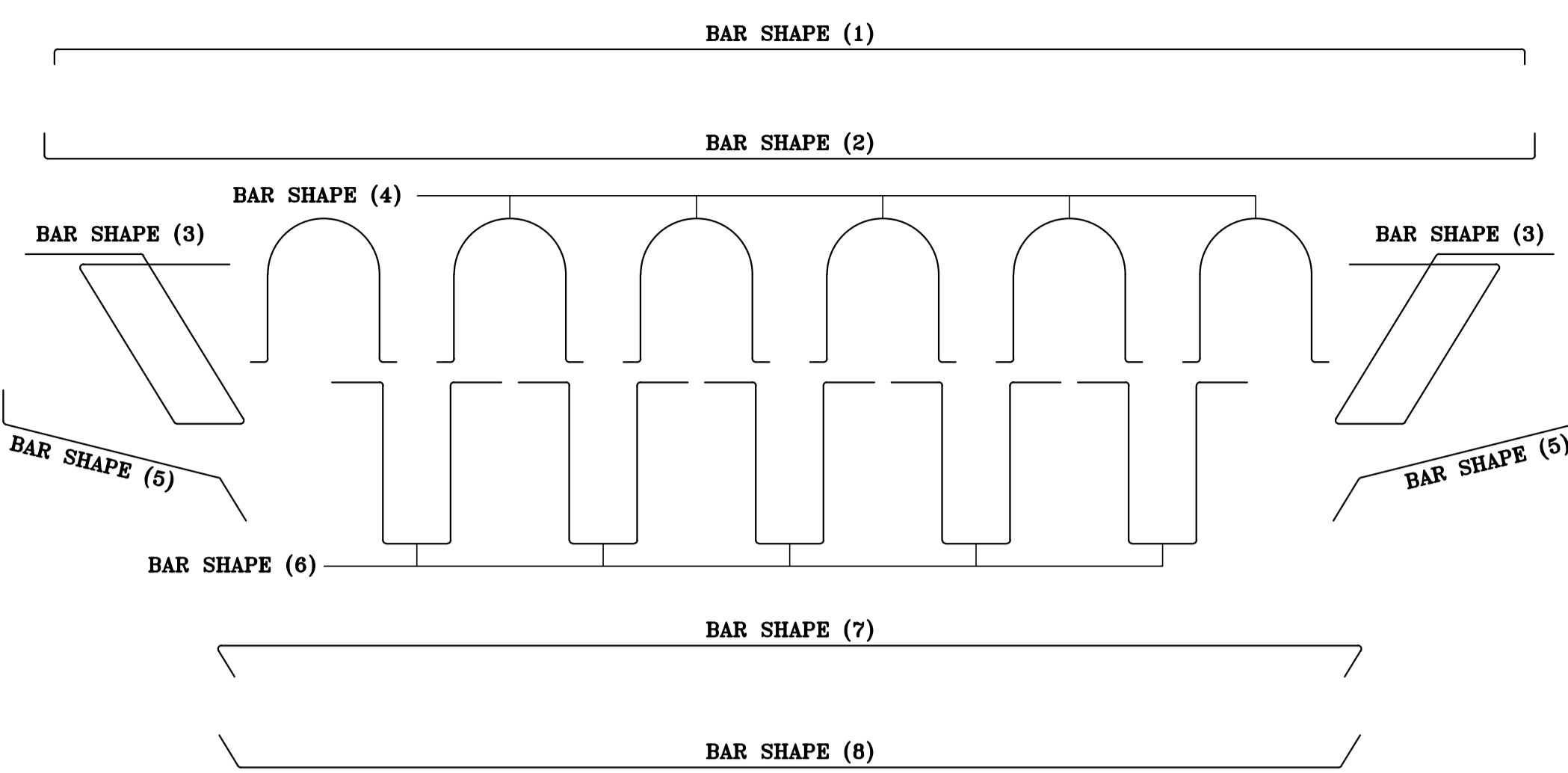
Drawing Number:

S-77

Rev.:



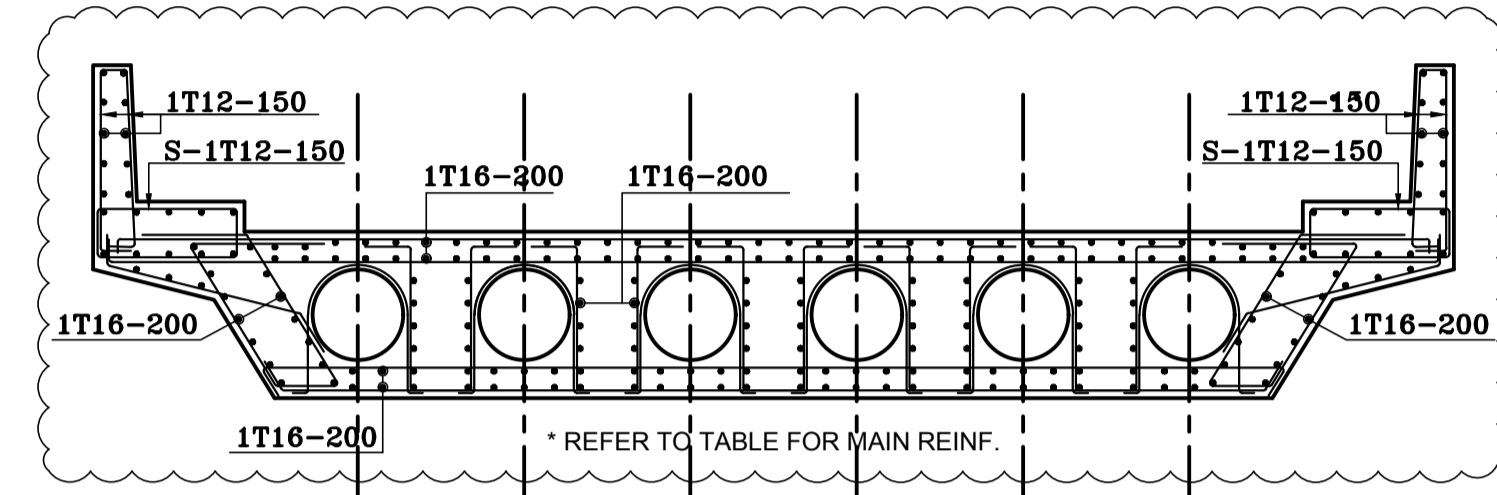
REINFORCEMENT TO BE VERIFIED BY P.T. SPECIALIST.



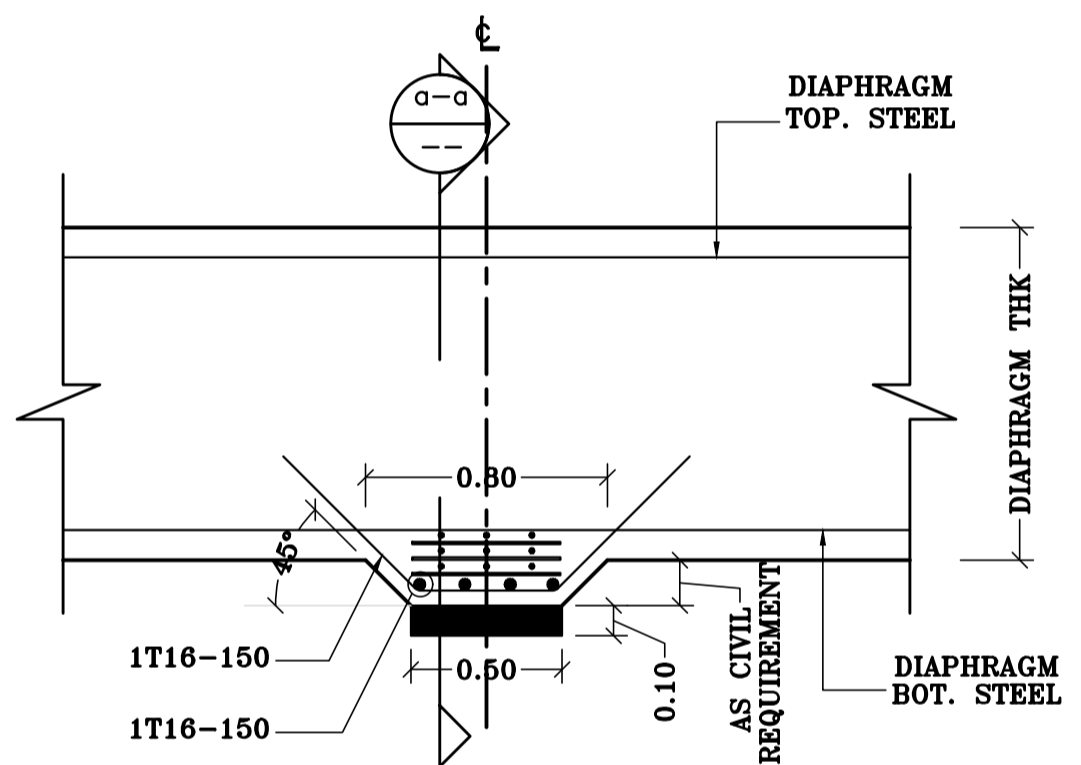
REINFORCEMENT TO BE VERIFIED BY POST-TENSION SPECIALIST

BAR SHAPE No.	LOCATION	LENGTH (m)	REINF.	REMARKS
1	T	9.0	1T16-150	
2	B	9.0	1T16-150	
3	--	4.5	1T16-150	
4	--	2.25	1T12-2000	
5	B	2.0	1T16-150	
6	--	3.0	1T16-150	
7	T	7.0	1T16-150	
8	B	7.0	1T16-150	

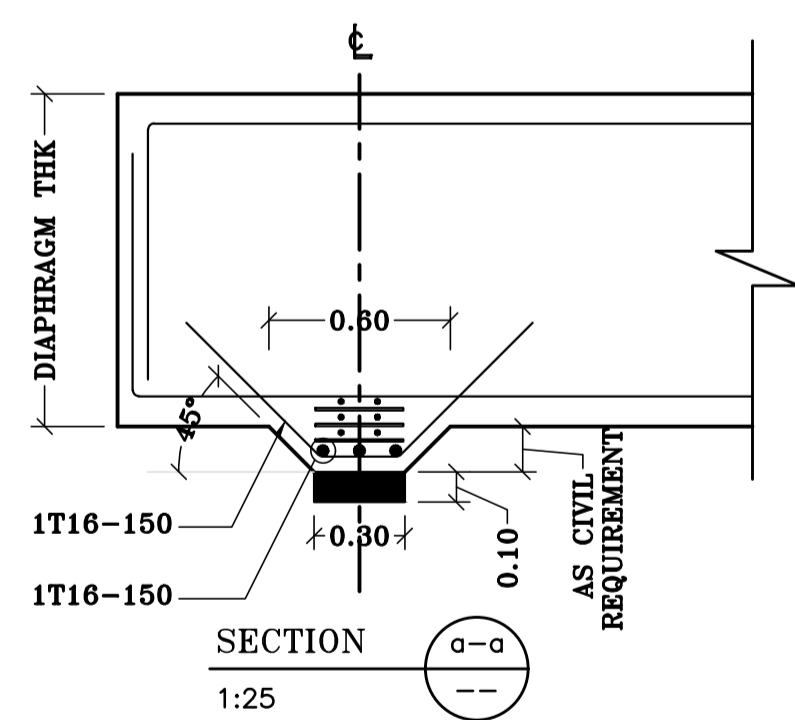
BAR SCHEDULE FOR DECK SLAB RINF. N.T.S



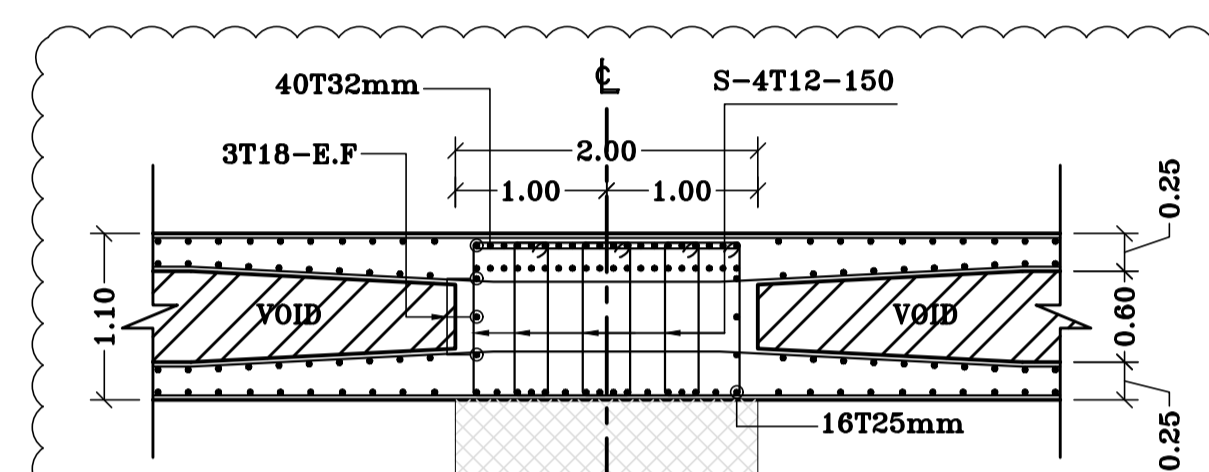
REINF. SECTION IN DECK SLAB 1:50



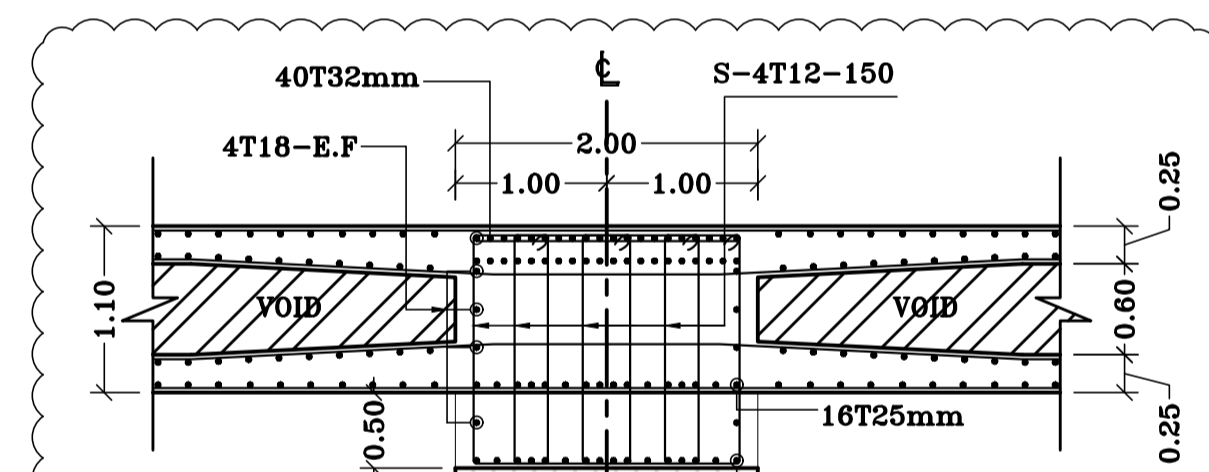
DOWN STAND TYPICAL DETAIL 1:25



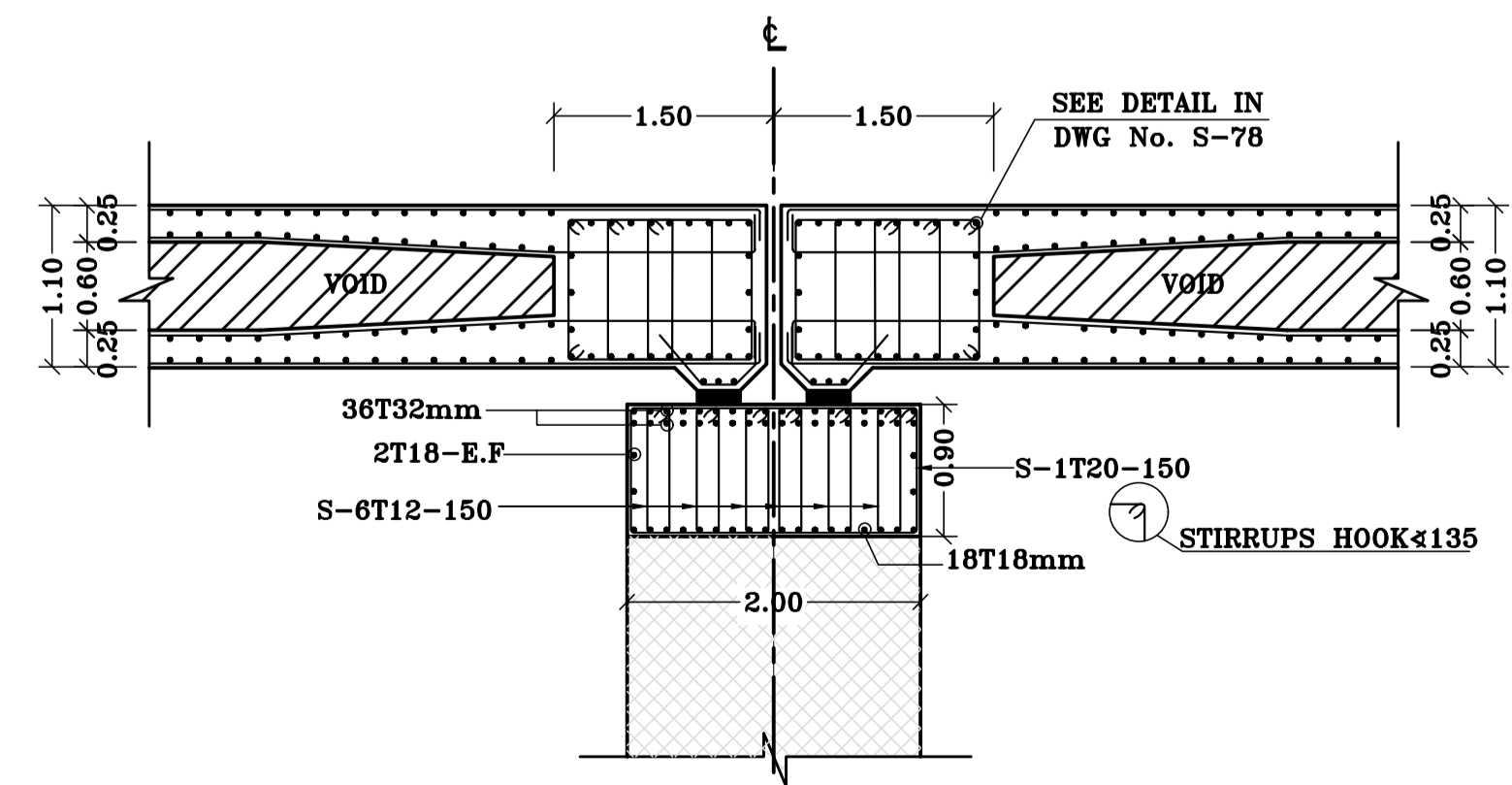
SECTION 1:25



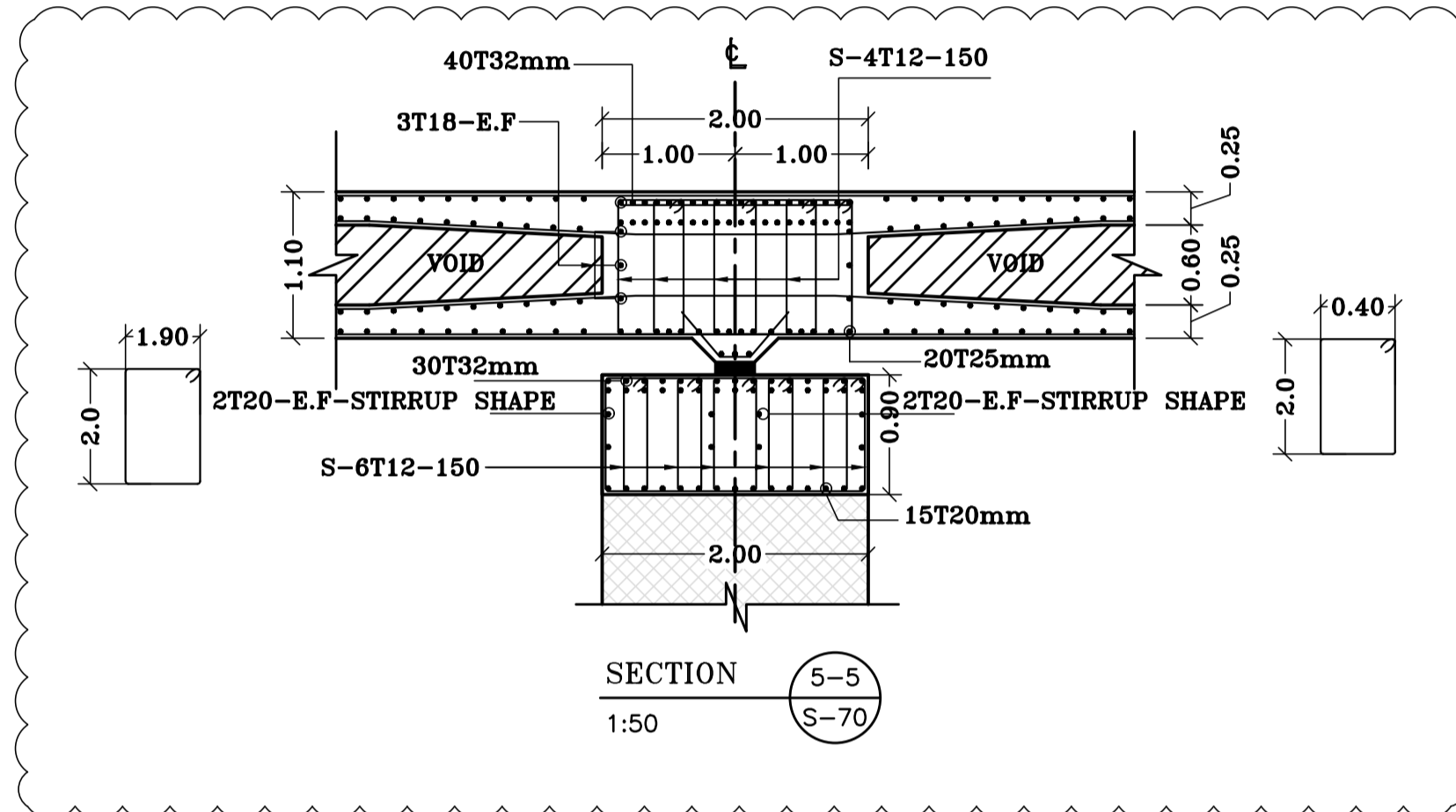
SECTION 1-1 S-70 1:50



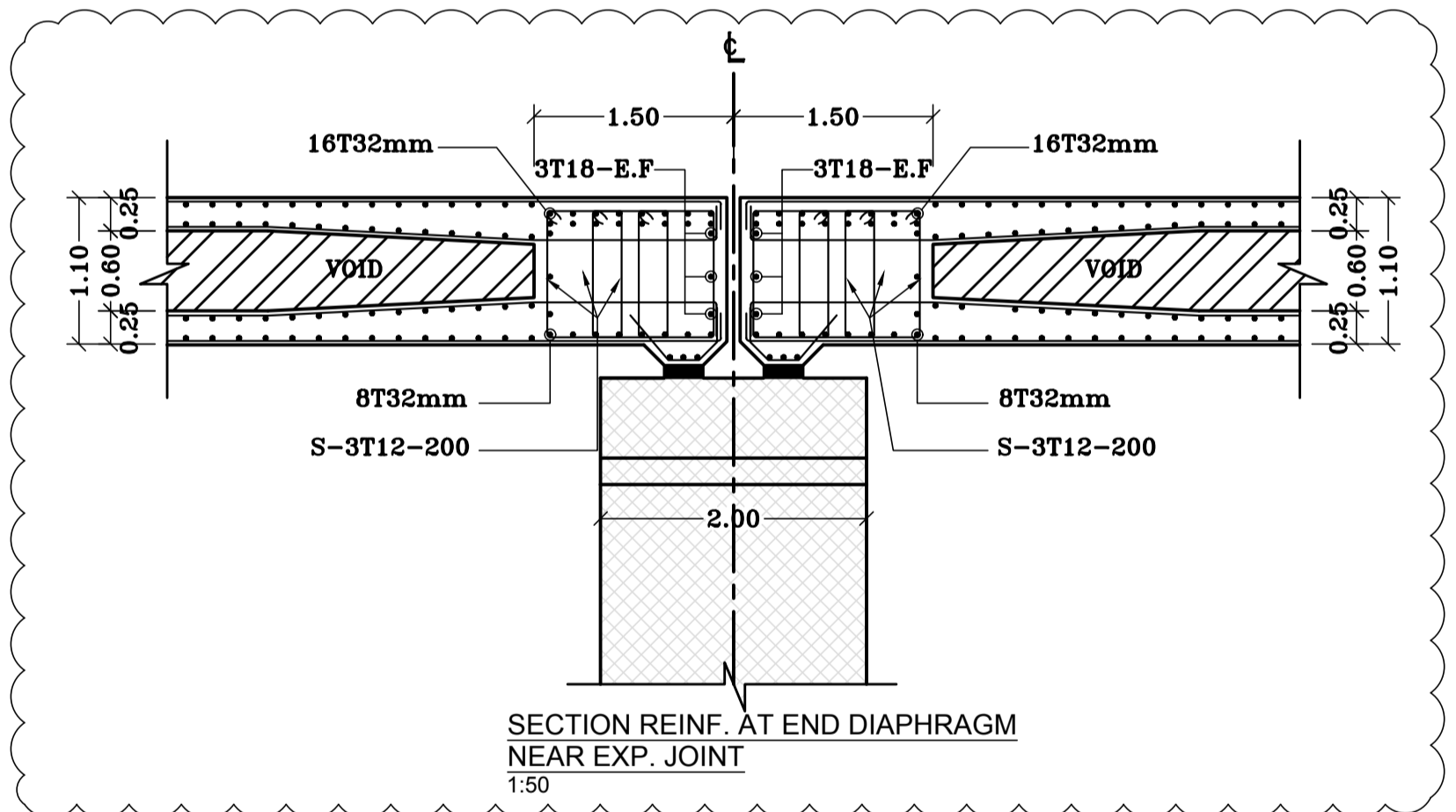
SECTION 2-2 S-70 1:50



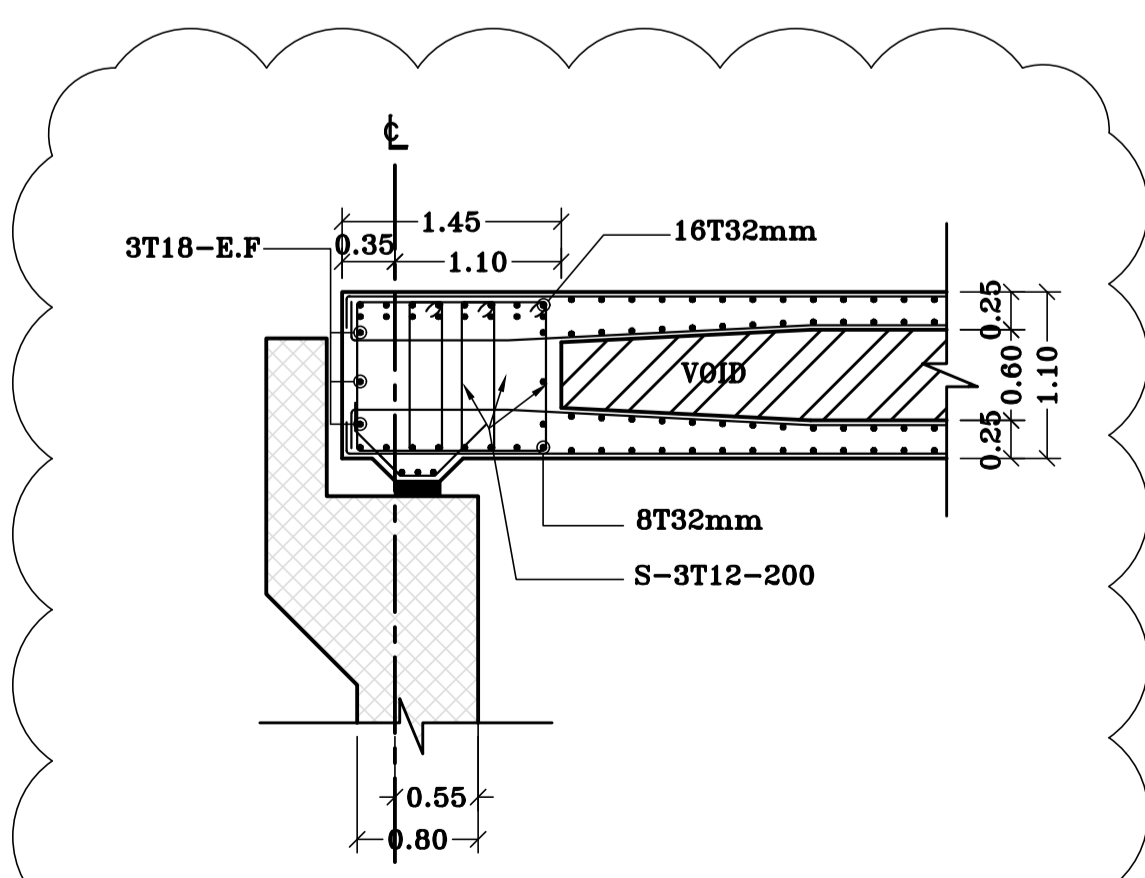
SECTION 4-4 S-70 1:50



SECTION S-5 S-70 1:50



SECTION REINF. AT END DIAPHRAGM NEAR EXP. JOINT 1:50



SECTION REINF. AT END DIAPHRAGM NEAR ABUTMENTS 1:50

NOTES:-

CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-

Purpose Of Issue	Rev.	Date	Approved

Client:



GREATER AMMAN MUNICIPALITY

Project:

STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package:

PRESS TUNNEL

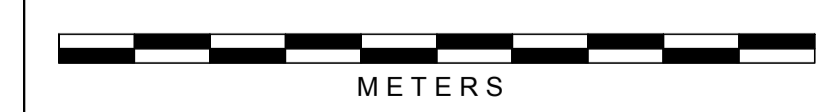
Title:

BRIDGE DECK STRUCTURAL DETAILS

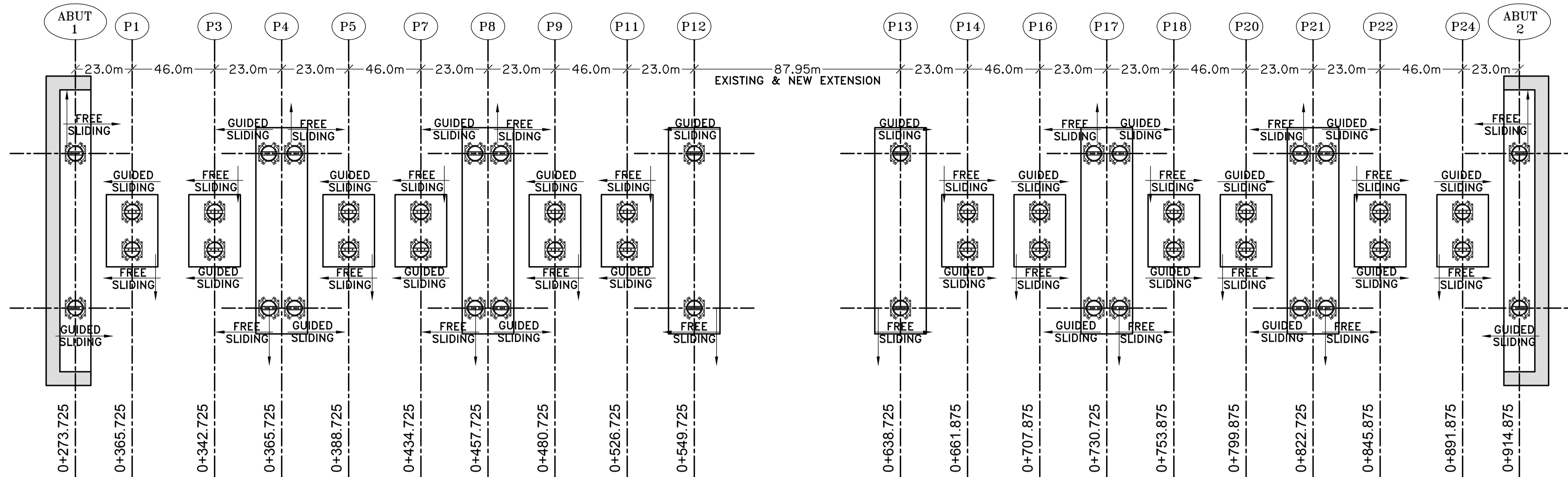
Consultant:



Design:	Drawn by: CAD	Checked:
Scale: AS SHOWN	Date: AUG. 2017	Approved:



Drawing Number:	S-78	Rev.:
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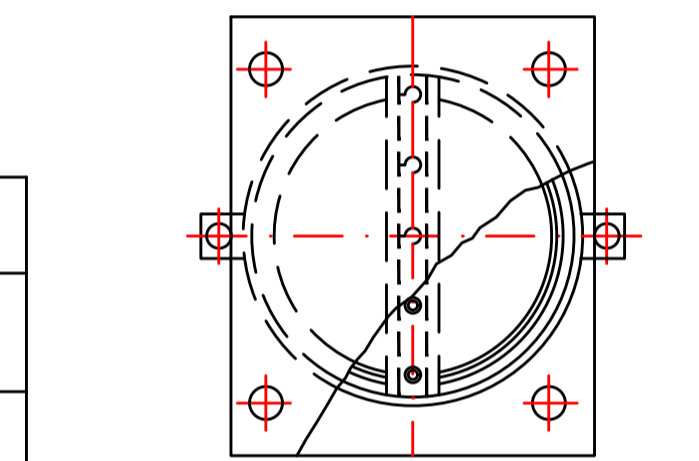


BEARING PADS INDICATION PLAN
N.T.S

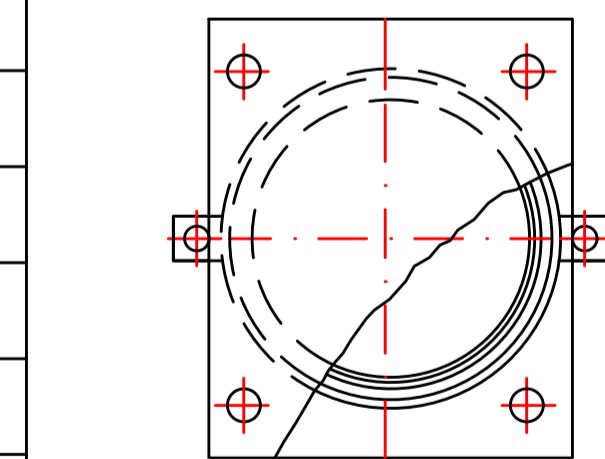
ABUT /PIER No.	LOCATION (STA.)	PAD TYPE	No. OF PADS	SERVICE	
				VERTICAL LOAD PER PAD (KN)	HORIZONTAL LOAD PER PAD (KN)
ABUTMENT (1)	0 + 273.725	SLIDING GUIDED	1	2500	250
		FREE SLIDING	1	2500	---
PIER (1)	0+296.725	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (3)	0+342.725	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (4)	0 + 365.725	SLIDING GUIDED	2	2500	250
		FREE SLIDING	2	2500	---
PIER (5)	0+388.725	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (7)	0+434.725	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (8)	0 + 457.725	SLIDING GUIDED	2	2500	250
		FREE SLIDING	2	2500	---
PIER (9)	0+480.725	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (11)	0+526.725	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (12)	0 + 549.725	SLIDING GUIDED	1	2500	250
		FREE SLIDING	1	2500	---

BEARING PADS SCHEDULE
N.T.S

ABUT /PIER No.	LOCATION (STA.)	PAD TYPE	No. OF PADS	SERVICE	
				VERTICAL LOAD PER PAD (KN)	HORIZONTAL LOAD PER PAD (KN)
PIER (13)	0 + 638.875	SLIDING GUIDED	1	2500	250
		FREE SLIDING	1	2500	---
PIER (14)	0+661.875	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (16)	0+707.875	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (17)	0 + 730.875	SLIDING GUIDED	2	2500	250
		FREE SLIDING	2	2500	---
PIER (18)	0+753.875	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (20)	0+799.875	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (21)	0 + 822.875	SLIDING GUIDED	2	2500	250
		FREE SLIDING	2	2500	---
PIER (22)	0+845.875	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
PIER (24)	0+891.875	SLIDING GUIDED	1	4500	450
		FREE SLIDING	1	4500	---
ABUTMENT (2)	0 + 914.875	SLIDING GUIDED	1	2500	250
		FREE SLIDING	1	2500	---



SLIDING GUIDED BEARING
REPLACEABLE BEARING



FREE SLIDING BEARING
REPLACEABLE BEARING

NOTES:-

CONTRACTOR:



CONTRACTOR'S SUBCONSULTANT :



KEY MAP:-

BEARING PADS MODIFICATION	2	27/10/2017	
Purpose Of Issue	Rev.	Date	Approved

Client:  GREATER AMMAN MUNICIPALITY

Project: STRUCTURAL DESIGN SERVICES FOR AMMAN BRT

Package: PRESS TUNNEL

Title: BEARING PADS INDICATION PLAN AND LOADS SCHEDULE

Consultant:  

Design:	Drawn by: CAD	Checked:
Scale:	Date: AUG. 2017	Approved:



Drawing Number:	S-83	Rev.:	2
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