

# KARACHI WATER AND SEWERAGE BOARD (KW&SB)



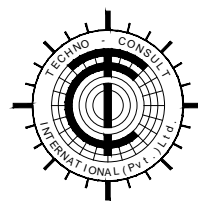
## Greater Karachi Sewerage Plan S-III (MS - VI)

Construction Of New HDPE Rising Main and  
Allied Works Along Manzoor Colony Drain From TP - II To MS-III

### TENDER DRAWINGS

VOLUME - III

DECEMBER, 2018



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**WATER & ENERGY DIVISION**

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GENERAL DRAWINGS

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TENDER DRAWINGS

0	ISSUED FOR TENDER		Dec, 18
No.	Revision	By	Date


Client :

KARACHI WATER & SEWERAGE BOARD

Project :

GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-III

Consultants :

Techno-Consult International (Pvt.) Ltd.  
In association with  
WS Atkins International U.K.  
NEC Consultants

Drawing Title :

LIST OF DRAWINGS

Designed By : SM.

Date : December, 2018

Drawn By : RA.

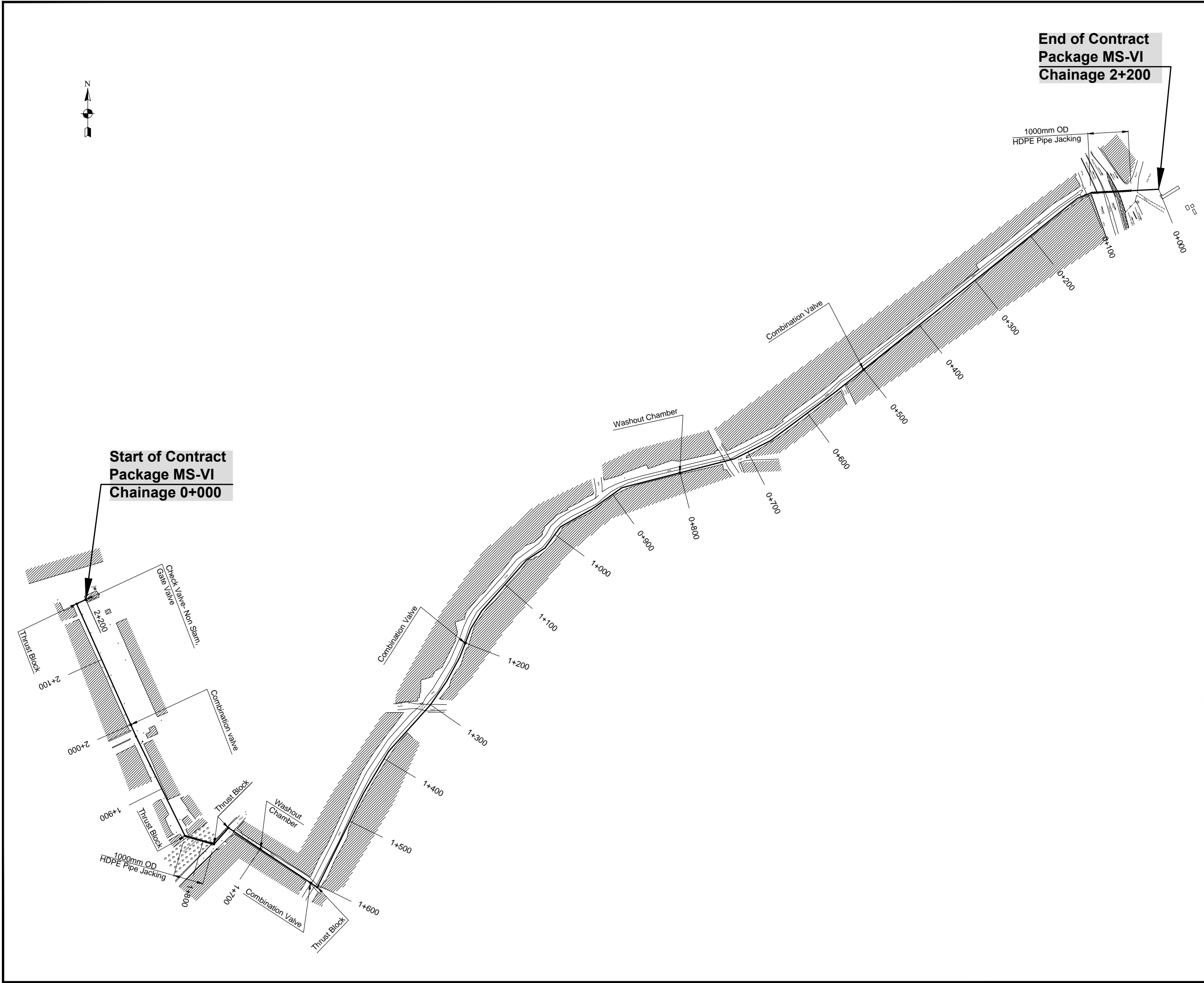
Scale :

Checked By : SSH.

Drg No : S-III/MS-VI/GEN/001

Revision : 0

Approved By : MBL.



TENDER DRAWINGS

0	ISSUED FOR TENDER	Dec, 18
No.	Revision	By Date

Client :  **KARACHI WATER & SEWERAGE BOARD**

Project : **GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-II**

Consultants :  **Techno-Consult International (Pvt.) Ltd.**  
In association with **WS Atkins International U.K. NEC Consultants**

Drawing Title : <b>PROPOSED LAYOUT PLAN</b>		
Designed By : AH.	Date : December, 2018	
Drawn By : RA.	Scale :	
Checked By : MR.	Drg No :	Revision
Approved By : MBL.	S-III/MS-VI/GEN/002	0

SYMBOLS

METALLED ROAD	
KACHA TRACK	
PROPOSED PIPELINE	
NULLAH	
FOOT BRIDGE	
ARCH / SLAB / BOX CULVERT	
PIPE CULVERT	
BENCH MARK	
TRAVERSE POINT	
ELECTRIC LINE / POLE	
TELEPHONE LINE / POLE	
MANHOLE	
HIGH TENSION ELECTRIC TOWER	
TREES	
NORTH	

ABBREVIATIONS



P.R.C.C.	PRESTRESSED REINFORCED CEMENT CONCRETE	M.S.	MILD STEEL
G.I.	GALVANIZED IRON	BM	BENCH MARK
Ch	CHAINAGE	CJ	CONSTRUCTION JOINT
CL	CENTER LINE	cu.m	CUBIC METER
cm	CENTIMETER	DRG	DRAWING
D/S	DOWN STREAM	M.G.D.	MILLION GALLONS PER DAY
E	EXTERNAL DISTANCE, EAST, EASTING	EJ	EXPANSION JOINT
EL	ELEVATION	SYP.	SYPHON
O.F.	OUTER FACE	I.F.	INNER FACE
Ht	HEIGHT	I.L.	INVERT LEVEL
km	KILOMETER	KN	KILONEWTON
LHC	LEFT HAND CURVE	m	METER
MH	MANHOLE	mm	MILLIMETER
N	NORTH, NORTHING	NSL	NATURAL SURFACE LEVEL
N/Sq. mm	NEWTON PER SQUARE MILLIMETER	N.T.S.	NOT TO SCALE
PBM	PERMANENT BENCH MARK	PGL	PROPOSED GROUND LEVEL
PRM	PERMANENT REFERENCE MONUMENT	R	RADIUS
RD	REDUCED DISTANCE	RHC	RIGHT HAND CURVE
R.O.W.	RIGHT OF WAY	SM	SQUARE METER
STN	STATION (CHAINAGE)	TBM	TEMPORARY BENCH MARK
C/C	CENTER TO CENTER	U/S	UPSTREAM
BD	BED LEVEL	NGL	NATURAL GROUND LEVEL
FRL	FINISHED ROAD LEVEL	EW	EACH WAY
EF	EACH FACE	BF	BOTH FACE
Z	HORIZONTAL COMPONENTS OF ANY GIVEN SIDE SLOPE		LEVEL PLAN
Ø	DIA		LEVEL (ELEVATION)

GENERAL NOTES

1. EXCEPT WHERE INDICATED, ALL DIMENSIONS AND UNITS ARE IN METRIC SYSTEM OF MEASUREMENT.
2. THE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE CONDUIT DRAWINGS OF PROJECT. ANY DISCREPANCY NOTED SHALL BE REPORTED TO THE ENGINEER FOR CLARIFICATION PRIOR TO CONSTRUCTION.
3. NOTES GIVEN IN THIS DRAWING ARE APPLICABLE TO ALL DRAWINGS UNLESS NOTED OTHERWISE.
4. TOPOGRAPHIC INFORMATION & FEATURES ON THESE DRAWINGS HAVE BEEN BASED ON SURVEY. FEATURES ENCOUNTERED AT SITE BUT NOT MENTIONED IN DRAWINGS SHALL BE DEALT WITH IN MANNER GIVEN IN DRAWINGS & SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER.
5. NSL WHEREVER MENTIONED ON THE DRAWINGS SHALL MEAN EXISTING GROUND LEVEL.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CHECK AND VERIFY LOCATION OF ANY OVER / UNDERGROUND UTILITIES WHETHER SHOWN ON THE DRAWINGS OR NOT AND TAKE DUE CARE TO PROTECT THESE AGAINST DAMAGE DURING CONSTRUCTION, CONTRACTOR MUST ASCERTAIN ON HIS OWN THE CORRECT POSITION OF THE CROSSINGS AND TAKE INTO ACCOUNT IN HIS PRICES ANY UTILITIES TO BE PROTECTED.
7. ALL SUB SURFACE INFORMATION SHOWN ON THE DRAWINGS OR INDICATED IN ANY OTHER WAY, REPRESENT THE RESULTS AND INTERPRETATION OF AN INVESTIGATION PROGRAM CARRIED OUT SOLELY FOR THE PURPOSES OF STUDY AND DESIGN. SUCH INFORMATION IS INCLUDED SOLELY TO INDICATE THE INTENT OF THE DESIGN & FOR THE CONVENIENCE OF THE CONTRACTOR. THERE IS NO WARRANTY OR GUARANTEE THAT UNFORESEEN CONDITIONS MAY NOT OCCUR OR THAT MATERIAL OTHER THAN, OR IN PROPORTIONS DIFFERENT FROM THOSE INDICATED, MAY NOT OCCUR.
8. THE ENGINEER MAY VARY THE GRADES, SLOPES, FOUNDATIONS, LEVELS AND OTHER FEATURES OF DESIGN, AS NECESSARY, TO CONFORM TO THE VARYING SITE CONDITIONS DURING THE EXECUTION OF WORK. ALL SUCH CHANGES SHALL BE GOVERNED BY THE RELEVANT CONTRACT CONDITIONS.
9. ALL FILL AND CUT SLOPES ARE TO BE TRIMMED AND BLENDED TO MEET EXISTING CONDITIONS AS DIRECTED BY THE ENGINEER. ALL AREAS DISTURBED BY THE CONSTRUCTION SHALL BE GRADED AND FINISHED AS INDICATED ON THE TYPICAL SECTIONS OR AS DIRECTED BY THE ENGINEER.
10. ALL GROUND ELEVATIONS ARE BASED ON FIELD SURVEYS. THE QUANTITIES OF CUT & FILL SHALL BE VERIFIED JOINTLY BY THE CONTRACTOR AND THE ENGINEER ON THE BASIS OF JOINT SURVEYS.
11. THE ENGINEER SHALL DETERMINE IN THE FIELD THE FINAL LOCATION, AXIS, ORIENTATION (OR DIRECTION OF FLOW) & THE INVERT ELEVATIONS OF ALL STRUCTURES. THE ENGINEER MAY ALSO ADD, DELETE OR ALTER SIZES OR TYPE OF THE STRUCTURES AS SHOWN ON THE PLANS WHERE HE MAY DEEM NECESSARY. ALL SUCH CHANGES SHALL BE GOVERNED BY THE RELEVANT CONDITIONS OF THE CONTRACT.
12. THE LOCATIONS, ELEVATIONS, SKEW ANGLE & GRADES OF ALL STRUCTURES SHALL BE CHECKED DURING STAKE OUT SURVEY BEFORE EXECUTION OF THE WORKS SUFFICIENTLY IN ADVANCE. ADJUSTMENTS IN THE EXISTING DRAWINGS IF ANY, SHALL BE APPROVED BY THE ENGINEER BEFORE EXECUTION.
13. THE LOCATIONS OF EXISTING PIPE LINES AND OTHER UTILITIES HAVE BEEN SHOWN APPROXIMATELY. CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS BY TRIAL PITS AND TAKE APPROPRIATE MEASURES AS NOT TO THE DAMAGE THE EXISTING PIPELINES / UTILITY LINES.
14. IN CASE UNSUITABLE SOIL IS ENCOUNTERED, AT THE TRENCH BED LEVEL. CONTRACTOR SHALL SEEK APPROVAL OF ENGINEER FOR ALL REMEDIAL MEASURES.
15. THE CONTRACTOR MUST SEEK PRIOR APPROVAL FROM THE ENGINEER FOR EXECUTION OF ANY WORK DEVIATING FROM THE SPECIFICATION & DRAWINGS.
16. THE CONTRACTOR SHALL ENGAGE A QUALIFIED SURVEYOR APPROVED BY THE ENGINEER TO SET OUT THE WORKS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LEVELS ON SITE AND RESOLVE ALL DISCREPANCIES WITH THE ENGINEER BEFORE COMMENCEMENT OF WORKS.
17. FOR PURPOSES OF THIS CONTRACT, THE ADDITIONAL PLANS AND DRAWINGS SHALL BE ISSUED TO THE CONTRACTOR DURING THE COURSE OF THE WORKS AS DEEMED NECESSARY BY THE ENGINEER.
18. LOCATION OF CHAMBERS CHANNELS, STRUCTURES & OTHER WORKS SHOWN ON PLAN ARE APPROXIMATE. HOWEVER, ACTUAL POSITION OF THESE FEATURES SHALL BE FINALIZED AT SITE UPON JOINT SURVEY.
19. PROVISION OF STONE SOLING TO BE DECIDED BY THE ENGINEER ON REVIEW OF SUB SURFACE INVESTIGATION REPORT TO BE SUBMITTED BY THE CONTRACTOR.

TENDER DRAWINGS

0	ISSUED FOR TENDER		Dec, 18
No.	Revision	By	Date

Client :  <b>KARACHI WATER &amp; SEWERAGE BOARD</b>		
Project : <b>GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-II</b>		
Consultants :  <b>Techno-Consult International</b> In association with <b>WS Atkins International U.K.</b> <b>NEC Consultants</b>		
Drawing Title :  <b>GENERAL NOTES (SHEET 1 OF 2)</b>		
Designed By : SM.	Date : December, 2018	
Drawn By : RA.	Scale : N.T.S.	
Checked By : SSH.	Drg No :	Revision
Approved By : MBL.	S-III/MS-VI/GEN/003-01	0

# GENERAL NOTES

20. EARTHWORKS:

- (a) CONTRACTOR WILL BE RESPONSIBLE FOR THE STABILITY OF EXISTING BUILDINGS AND STRUCTURES DURING CONSTRUCTION.
- (b) EXCAVATED MATERIAL MAY BE USED FOR BACKFILLING TO STRUCTURES OR EARTH FILLING IN EMBANKMENTS ONLY AFTER THE APPROVAL OF THE ENGINEER.
- (c) SITES FOR BORROW FILL MATERIALS SHALL BE SELECTED IN CONSULTATION AND WITH APPROVAL OF THE ENGINEER.
- (d) NO BACKFILL SHALL BE PLACED NEXT TO ANY CAST IN PLACE CONCRETE UNLESS THE CONCRETE ATTAINS ITS FULL 28 DAYS STRENGTH.

21. STEEL REINFORCEMENT:

- (a) ALL REINFORCEMENT SHALL BE HIGH YIELD DEFORMED BARS CONFORMING TO ASTM A-615 WITH MINIMUM YIELD STRENGTH OF 420N/mm<sup>2</sup>.

22. STRUCTURAL CONCRETE:

- (a) ALL STRUCTURAL CONCRETE SHALL BE GRADE C35A.
- (b) WORKING CUBE STRENGTH AT 28 DAYS NOT LESS THAN 38.2 MPa.
- (c) MIX DESIGN AVERAGE OF NINE CUBES NOT LESS THAN 46.5 MPa.

23. BLINDING CONCRETE:

- (a) SULPHATE RESISTING CEMENT.
- (b) WORKING CUBE STRENGTH AT 28 DAYS NOT LESS THAN 12 MPa.
- (c) THICKNESS 100mm UNLESS NOTED OTHERWISE.

24. STONE SOLING:

- (a) ROUND AND DURABLE ROCK PROPERLY SHAPED OR BOULDER MAXIMUM SIZE 150-200. HANDPACKED ON PREPARED SUBGRADE MAXIMUM DIMENSION KEPT IN VERTICAL POSITION ENSURING VARIATION IN SIZE OF STONE DOES NOT EXCEED ± 25mm.
- (b) COARSE SAND OR ROCK DUST TO FILL INTERSTICES. FILLER MATERIAL SHALL BE DRY AND IN FREE FLOW CONDITION.
- (c) SOLING STONE ROLLED UNDER A 6 TONNE ROLLER WHILE FILLER MATERIAL IS ADDED. ENSURE INTERSTICES ARE FILLED AND DOES NOT ABSORB MORE MATERIAL.
- (d) AREA WATERED AND ROLLING CONTINUED TO ACHIEVE SMOOTH SURFACE.

25. FORM TIE ASSEMBLIES AND SYSTEM IN LIQUID CONTAINMENT STRUCTURE SHALL BE SUITABLE FOR PROVIDING A LIQUID - TIGHT STRUCTURE. FORM TIES SHALL LEAVE NO METAL OR OTHER MATERIAL EXCEPT CONCRETE WITHIN 40mm OF FORMED SURFACE.

26. EXTERNAL SURFACE IN CONTACT WITH SOIL SHALL BE TREATED WITH TWO COATS OF BITUMINOUS PAINT.

27. ALL EXPANSION JOINTS:

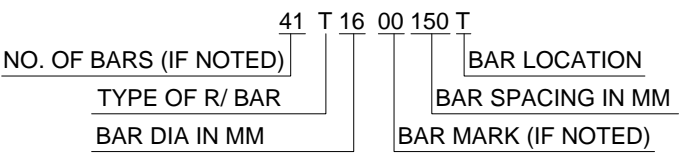
- EXPANSIONS JOINT GAP OF 25mm SHALL BE MAINTAINED BY RESIN BONDED CORK FILLER SHEET.
- (a) ALL HORIZONTAL AND VERTICAL EXPANSION JOINTS OF ENVIRONMENTAL STRUCTURE SHALL HAVE CONTINUOUS WATER STOP AND SEALANT.
  - (b) BASE SHALL HAVE WATER STOP (REAR GUARD) ON FLOOR AND SEALANT ON THE TOP FACE.
  - (c) WALL SHALL HAVE PVC WATER STOP IN THE CENTER OF THE WALL AND SEALANT AT BOTH EXPOSED CONCRETE SURFACES.
  - (d) PVC TENSILE STRENGTH 15Mpa ELONGATION AT BREAK 300%.

28. ELASTOMERIC JOINT SEALANT AT EXPOSED FACE OF ALL JOINTS SHALL BE USED AS PE MANUFACTURER SPECIFICATION OR EQUIVALENT APPROVED BY THE ENGINEER.

29. CONCRETE COVER:

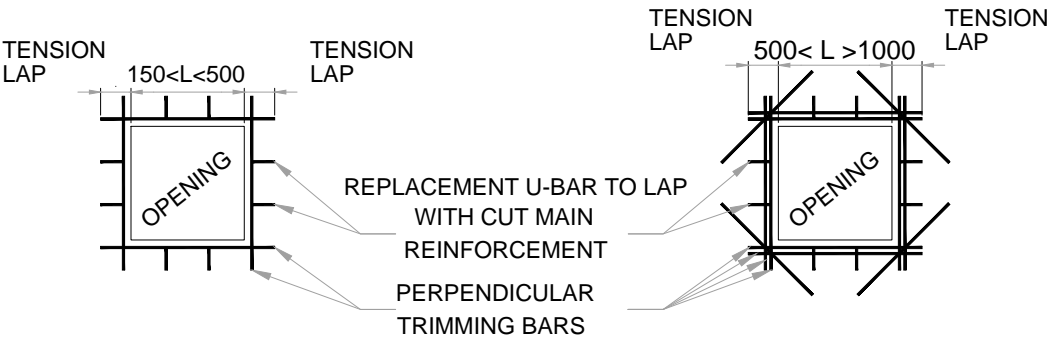
- REINFORCEMENT ARE AS FOLLOWS:
- (a) CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH = 75 mm
  - (b) CONCRETE EXPOSED TO BUT NOT CAST AGAINST EARTH = 50 mm
  - (c) CONCRETE EXPOSED TO LIQUID = 50 mm
  - (d) CONCRETE NOT EXPOSED TO LIQUID / EARTH = 30 mm

30. REINFORCING STEEL BAR TO BE READ THUS.



31. STANDARD TRIMMING DETAIL FOR STRUCTURAL OPENINGS.

- (a) ADDITIONAL TRIMMER BARS TO STRUCTURAL OPENINGS SHALL BE PROVIDED AS DETAILED HERE IN. DIAMETER AND GRADE OF TRIMMER BARS REINFORCEMENT SHALL BE THE SAME AS THE MAXIMUM DIAMETER REINFORCING BARS OF THE STRUCTURE THROUGH WHICH THE OPENING IS FORMED.
- (b) NO TRIMMER BARS ARE REQUIRED FOR OPENINGS NOT GREATER THAN 150mm BUT NO REINFORCING BARS SHALL BE CUT. REINFORCING BARS SHALL BE ADJUSTED IN POSITION TO AVOID OPENING.
- (c) UNLESS OTHERWISE SHOWN ON THE STRUCTURAL DRAWINGS, TRIMMING BAR DETAILS FOR THE DIFFERENT SIZE OPENINGS ARE AS SHOWN.



L- MAXIMUM DIMENSION OF OPENING

150mm < MAX DIMENSION OF OPENING <500mm

ADDITIONAL REINFORCEMENT  
ONE NO. TRIMMING BAR ON EACH SIDE AND EACH FACE OF THE OPENING. DIAMETER (Ø) OF TRIMMING BARS SHALL BE GREATEST DIAMETER OF AFFECTED STRUCTURE.

500mm < MAX DIMENSION OF OPENING <1000mm

ADDITIONAL REINFORCEMENT  
TWO NO. TRIMMING BAR ON EACH SIDE AND EACH FACE OF THE OPENING. DIAMETER (Ø) OF TRIMMING BARS SHALL BE GREATEST DIAMETER OF AFFECTED STRUCTURE.

MAX DIMENSION OF OPENING >1000mm

IN CASE DIMENSIONS OF OPENING IS GREATER THAN 100mm, REVIEW DESIGN ENGINEER.

NOTES ON REPLACEMENT BARS

- (a) NUMBER OF REPLACEMENT U -BARS SHALL NOT BE LESS THAN NOS OF BARS CUT BY OPENING.
- (b) SHALL BE EQUAL TO THE GREATEST DIAMETER OF BARS CUT BY THE OPENING.
- (c) PREPENDICULAR TRIMMING BARS SHALL BE PROVIDED AS SHOWN ABOVE AND ON EACH FACE OF THE STRUCTURE.

## TENDER DRAWINGS

0	ISSUED FOR TENDER	Dec, 18
No.	Revision	By Date

Client :  KARACHI WATER & SEWERAGE BOARD

Project : **GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-III**

Consultants :  **Techno-Consult International**  
In association with  
**WS Atkins International U.K.**  
NEC Consultants

Drawing Title : **GENERAL NOTES (SHEET 2 OF 2)**

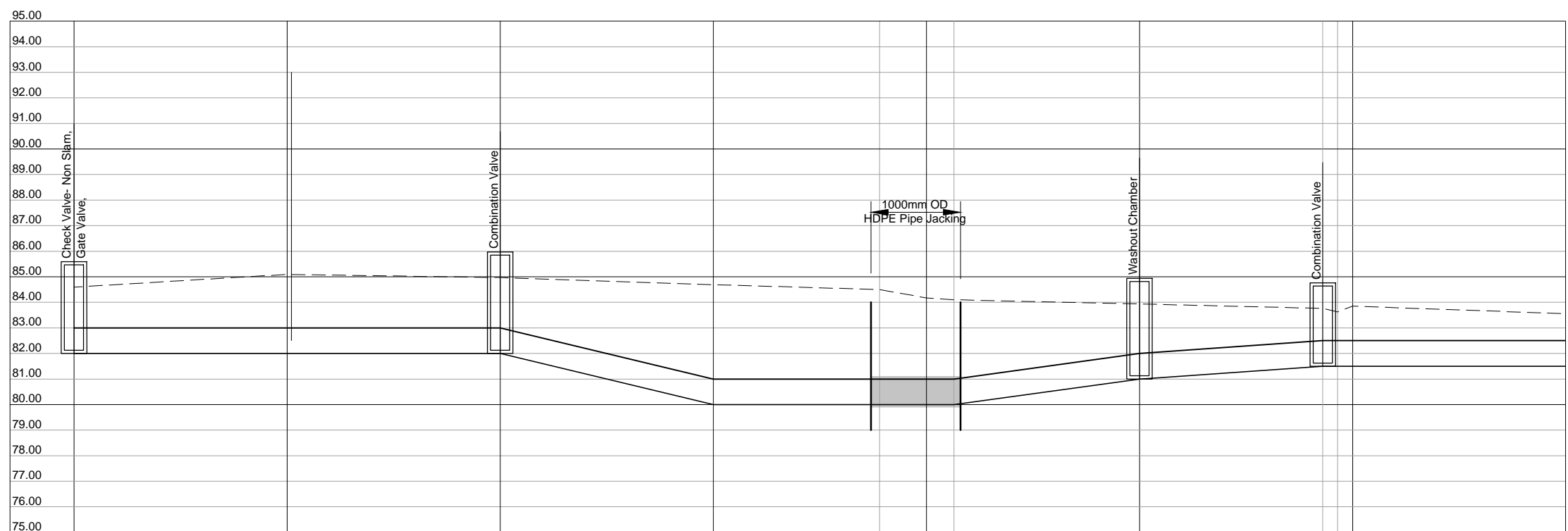
Designed By : SM.	Date : December, 2018
Drawn By : RA.	Scale : N.T.S.
Checked By : SSH.	Drg No : SH/MS-VI/GEN/003-02
Approved By : MBL.	Revision : 0

# PLAN & PROFILES



Start of Contract  
Package MS-VI  
Chainage 2+200

Match Line  
Chainage 1+500



DESIGN DATA	Pipe Type / Dia		← 1000mm OD HDPE Pipe →									
	Pipe Level (m)	Crown	83.000	83.000	83.000	81.000	81.000	81.000	81.000	82.000	82.500	82.500
		Invert	82.000	82.000	82.000	80.000	80.000	80.000	80.000	81.000	81.500	81.500
	Natural Surface Level NSL (m)		84.594	85.094	84.970	84.692	84.500	84.173	84.102	83.936	83.764	83.556
	Distance (m)		2+200	2+100	2+000	1+900	1+822	1+800	1+787	1+700	1+614	1+500

Notes:

1. Location of Manhole may be adjusted as per site requirement.
2. Connections found during construction other than mentioned in plan and profile should be connected to the nearest manholes of proposed S-III conduit.
3. Any water supply or other utility services encountered along the alignment of proposed S-III conduit during the site survey or execution of works, the matter should be immediately brought in the knowledge of Engineer / Employer for disposal, before carrying any permanent works.
4. Where clearance of S-III from edge of S-II is less than 9.0 meters the fill adjacent to S-II Conduit will be removed upto 1.20 meters depth above the top of this Conduit over a width of 5.0 meters from the outer edge. On completion of S-III Conduit it shall be backfilled to ground level.

## TENDER DRAWINGS

0	ISSUED FOR TENDER	Dec, 18
No.	Revision	By Date

Client :  
 **KARACHI WATER & SEWERAGE BOARD**

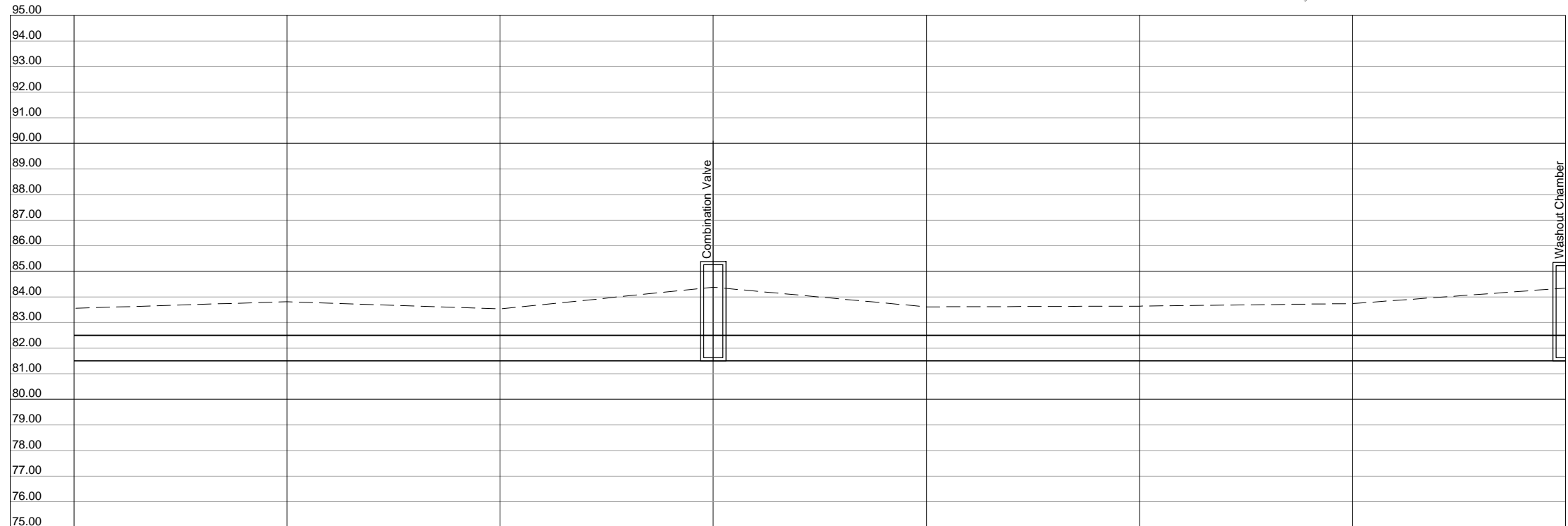
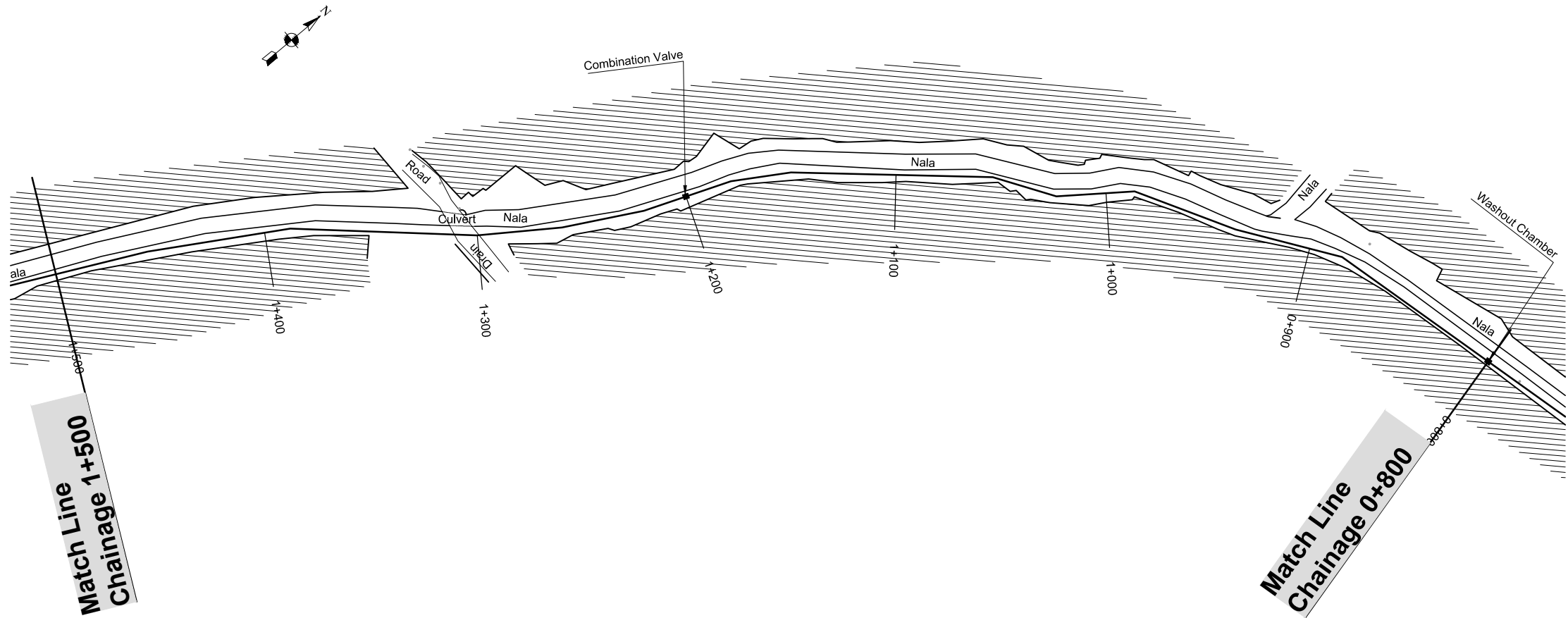
Project :  
**GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-II**

Consultants :  
 **Techno-Consult International**  
In association with  
**WS Atkins International U.K. NEC Consultants**

Drawing Title :  
**PLAN & PROFILE  
RD. From 2+200 TO 1+500**

Designed By : AH.	Date : December, 2018
Drawn By : FA.	Scale :
Checked By : UAS.	Drg No : S-III/MS-VI/PP/101
Approved By : MBL.	Revision : 0





DESIGN DATA	Pipe Type / Dia		<div>1000mm OD HDPE Pipe</div>									
	Pipe Level (m)	Crown	82.500	82.500	82.500	82.500	82.500	82.500	82.500	82.500	82.500	
		Invert	81.500	81.500	81.500	81.500	81.500	81.500	81.500	81.500	81.500	
	Natural Surface Level NSL (m)		83.556	83.813	83.530	84.381	83.613	83.641	83.741	84.347		
	Distance (m)		1+500	1+400	1+300	1+200	1+100	1+000	0+900	0+800		

- Notes:
1. Location of Manhole may be adjusted as per site requirement.
  2. Connections found during construction other than mentioned in plan and profile should be connected to the nearest manholes of proposed S-III conduit.
  3. Any water supply or other utility services encountered along the alignment of proposed S-III conduit during the site survey or execution of works, the matter should be immediately brought in the knowledge of Engineer / Employer for disposal, before carrying any permanent works.
  4. Where clearance of S-III from edge of S-II is less than 9.0 meters the fill adjacent to S-II Conduit will be removed upto 1.20 meters depth above the top of this Conduit over a width of 5.0 meters from the outer edge. On completion of S-III Conduit it shall be backfilled to ground level.

TENDER DRAWINGS

0

No.

ISSUED FOR TENDER

Revision

By

Dec, 18

Date

Client :



KARACHI WATER & SEWERAGE BOARD

Project :

GREATER KARACHI SEWERAGE PLAN S-III

(MS-VI) Construction Of New HDPE Rising Main and

Allied Works Along Manzoor Colony Drain From TP - II To MS-III

Consultants :



Techno-Consult International

In association with

WS Atkins International U.K.

NEC Consultants

Drawing Title :

PLAN & PROFILE

RD. From 1+500 TO 0+800

Designed By : AH.

Date : December, 2018

Drawn By : FA.

Scale :

Checked By : UAS.

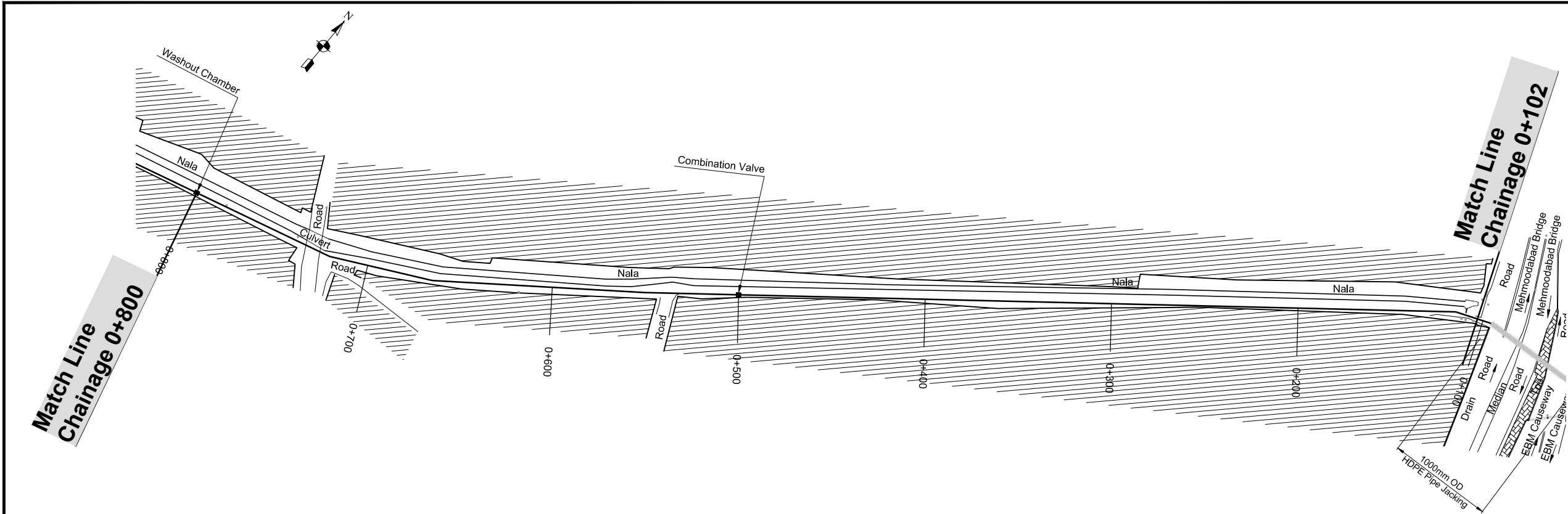
Drg No :

Revision

Approved By : MBL.

S-III/MS-VI/PP/102

0



- Notes:
1. Location of Manhole may be adjusted as per site requirement.
  2. Connections found during construction other than mentioned in plan and profile should be connected to the nearest manholes of proposed S-III conduit.
  3. Any water supply or other utility services encountered along the alignment of proposed S-III conduit during the site survey or execution of works, the matter should be immediately brought in the knowledge of Engineer / Employer for disposal, before carrying any permanent works.
  4. Where clearance of S-III from edge of S-II is less than 9.0 meters the fill adjacent to S-II Conduit will be removed upto 1.20 meters depth above the top of this Conduit over a width of 5.0 meters from the outer edge. On completion of S-III Conduit it shall be backfilled to ground level.



DESIGN DATA	Pipe Type / Dia		1000mm OD HDPE Pipe									
	Pipe Level (m)	Crown	82.500	83.300	83.000	83.000	83.000	83.000	83.000	81.000		
		Invert	81.500	82.000	82.000	82.000	82.000	82.000	82.000	80.000		
	Natural Surface Level NSL (m)		84.347	84.383	84.278	84.289	84.536	84.520	84.454	85.469		
	Distance (m)		0+800	0+700	0+600	0+500	0+400	0+300	0+200	0+102		

TENDER DRAWINGS

0

ISSUED FOR TENDER

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Client :



KARACHI WATER & SEWERAGE BOARD

Project :

GREATER KARACHI SEWERAGE PLAN S-III

(MS-VI) Construction Of New HDPE Rising Main and

Allied Works Along Manzor Colony Drain From TP - II To MS-III

Consultants :



Techno-Consult International

In association with

WS Atkins International U.K.

NEC Consultants

Drawing Title :

PLAN & PROFILE

RD. From 0+800 TO 0+102

Designed By : AH.

Date : December, 2018

Drawn By : FA.

Scale :

Checked By : UAS.

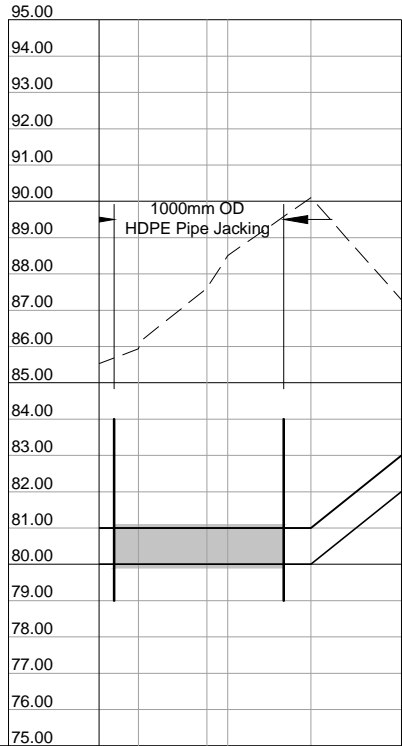
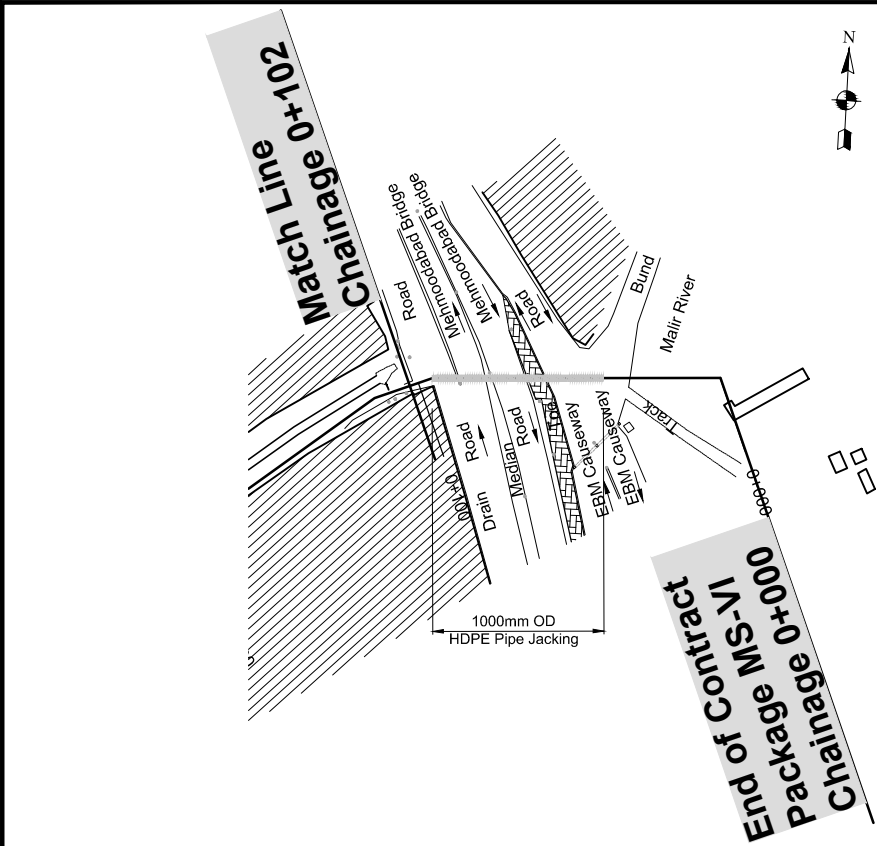
Drg No :

Revision

Approved By : MBL.

S-III/MS-VI/PP/103

0



DESIGN DATA	Pipe Type / Dia		←1000mm OD HDPE Pipe→				
	Pipe Level (m)	Crown	81.000	81.000	81.000	81.000	83.000
		Invert	80.000	80.000	80.000	80.000	82.000
	Natural Surface Level NSL (m)		85.469	85.936	87.610	88.500	87.285
	Distance (m)		0+102	0+087	0+064	0+057	0+000

Notes:

1. Location of Manhole may be adjusted as per site requirement.
2. Connections found during construction other than mentioned in plan and profile should be connected to the nearest manholes of proposed S-III conduit.
3. Any water supply or other utility services encountered along the alignment of proposed S-III conduit during the site survey or execution of works, the matter should be immediately brought in the knowledge of Engineer / Employer for disposal, before carrying any permanent works.
4. Where clearance of S-III from edge of S-II is less than 9.0 meters the fill adjacent to S-II Conduit will be removed upto 1.20 meters depth above the top of this Conduit over a width of 5.0 meters from the outer edge. On completion of S-III Conduit it shall be backfilled to ground level.

TENDER DRAWINGS

0	ISSUED FOR TENDER		Dec, 18
No.	Revision	By	Date

Client :



KARACHI WATER & SEWERAGE BOARD

Project :

**GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-II**

Consultants :



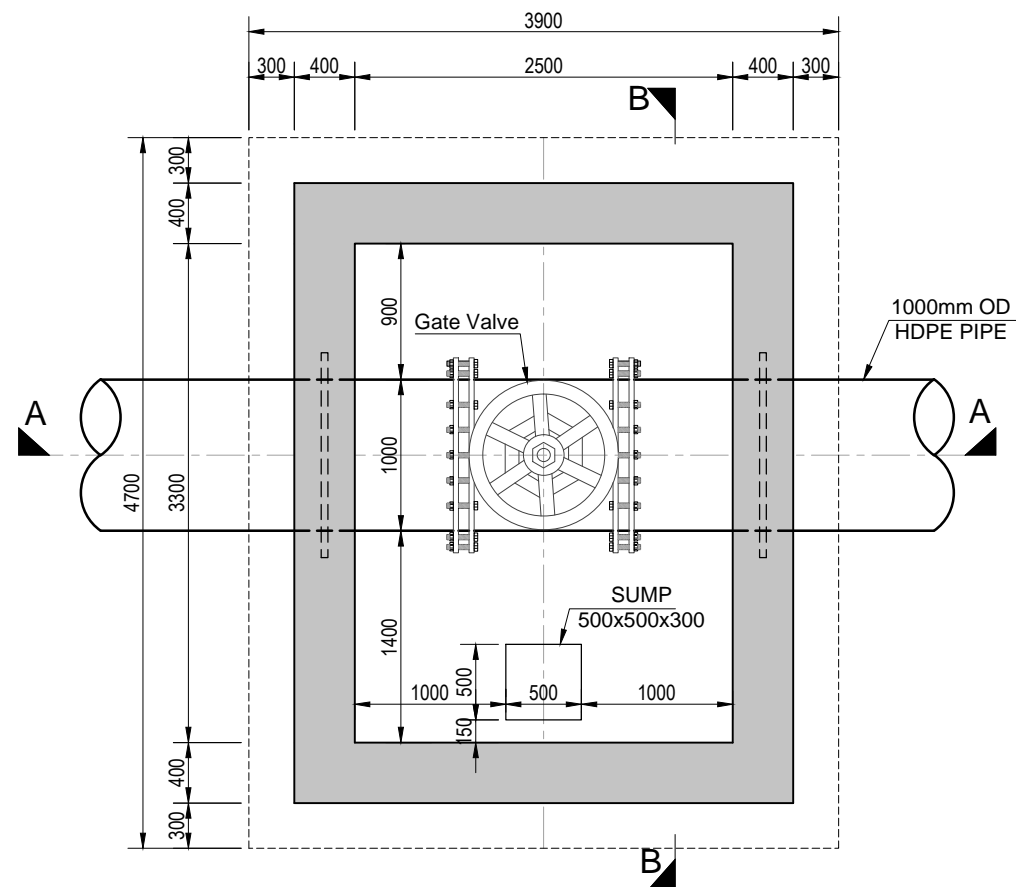
**Techno-Consult International**  
In association with  
**WS Atkins International U.K.**  
**NEC Consultants**

Drawing Title :

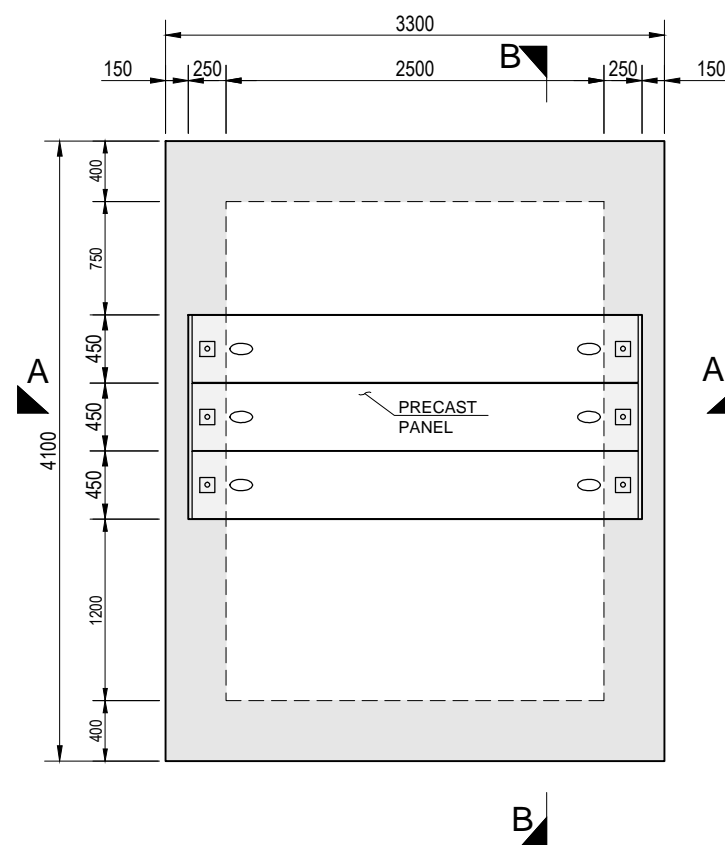
**PLAN & PROFILE**  
**RD. From 0+102 TO 0+000**

Designed By : AH.	Date : December, 2018	
Drawn By : FA.	Scale :	
Checked By : UAS.	Drg No :	Revision
Approved By : MBL.	S-III/MS-VI/PP/104	0

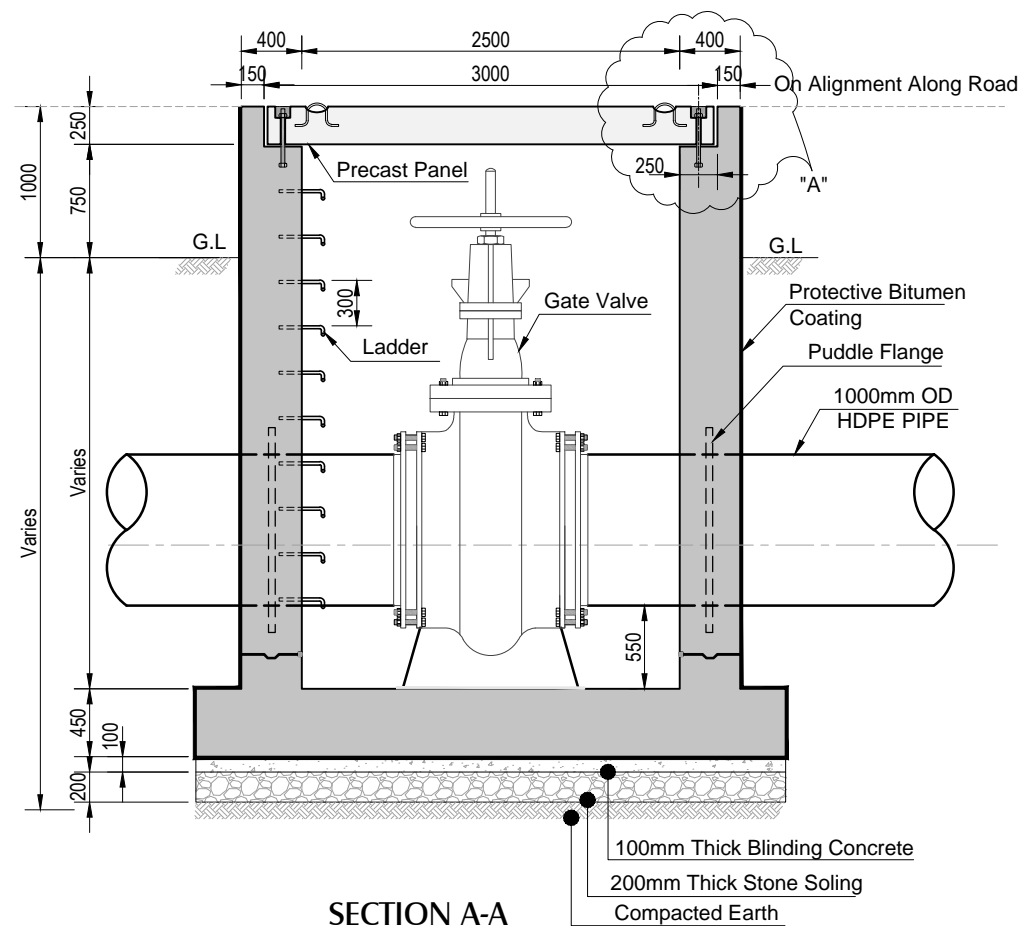
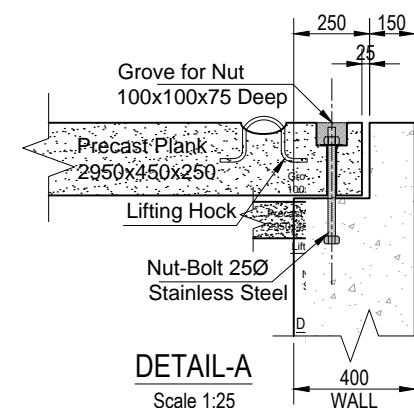
# STRUCTURAL DRAWINGS



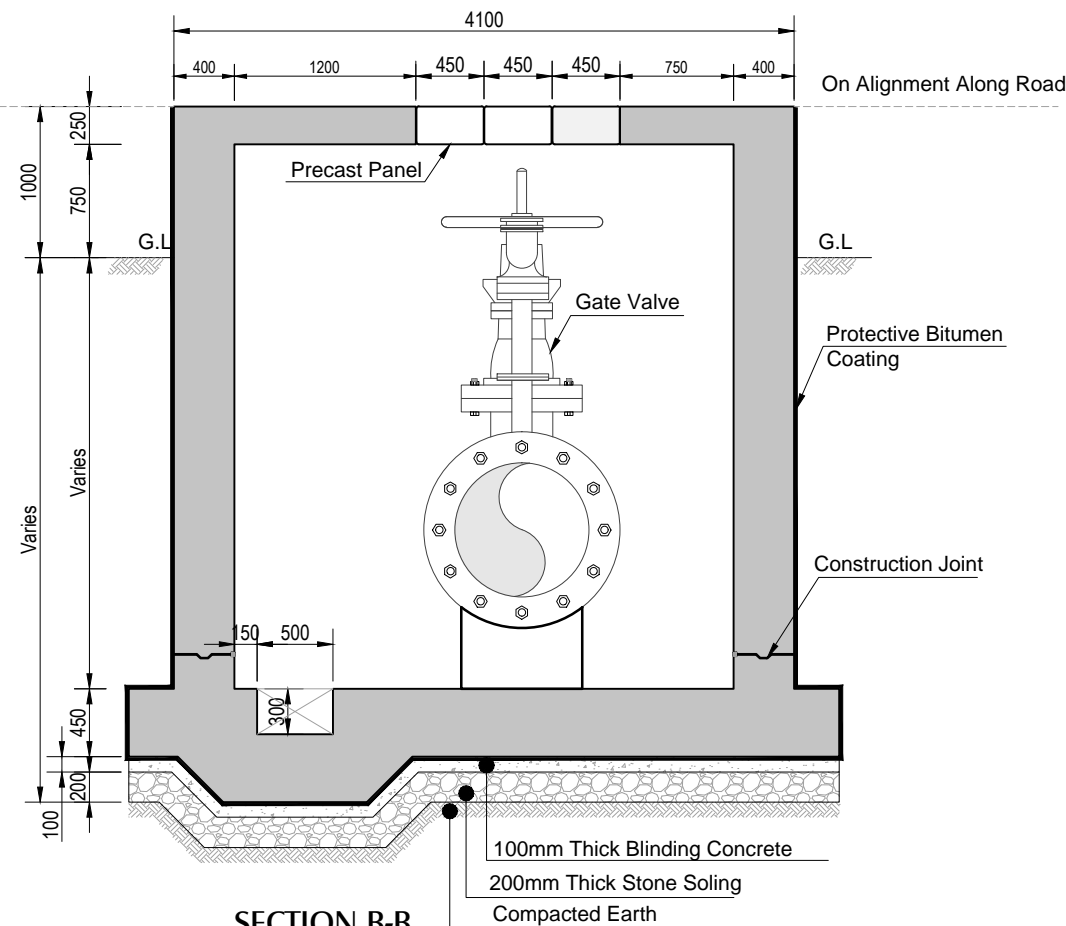
**Base Plan of Valve Chamber**  
Scale 1 : 50



**Top Plan of Valve Chamber**  
Scale 1 : 50



**SECTION A-A**  
Scale 1 : 50



**SECTION B-B**  
Scale 1 : 50

Notes :-

- For General Notes Refer Drawing No. S-III/MS-VI/GEN/003-01 & 003-02.
- All dimensions are in Millimeters.
- This drawing is to be read in conjunction with the combined wastewater network drawings.
- Structural concrete class 35/20
  - Minimum cement content 370 Kg/m<sup>3</sup>
  - Maximum cement content 400 Kg/m<sup>3</sup>
  - Maximum free water/cement ratio 0.55
  - Working concrete cube strength at 28 days not less than 38.2 N/mm<sup>2</sup>.
- Blinding concrete:
  - Working concrete cube strength at 28 days not less than 12 N/mm<sup>2</sup>.
- Reinforcing steel
  - All reinforcing steel shall be high yield deformed bars conforming to ASTM A-615 with minimum yield strength of 420N/mm<sup>2</sup>.
- All structures in contact with earth shall be bituminous painted as specified.
- Stone soling shall be done wherever required and as directed by the engineer.
- Slope to be Checked before Pipe Laying.

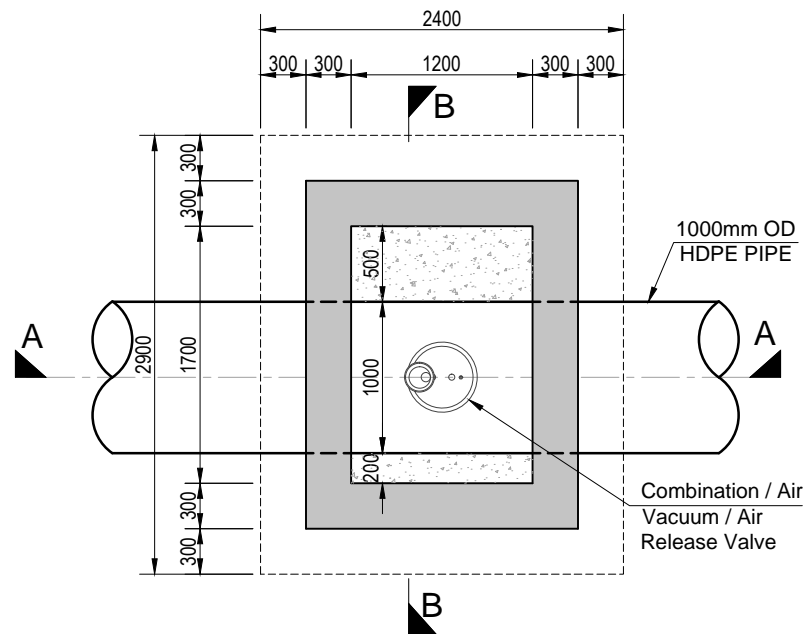
## TENDER DRAWINGS

0	ISSUED FOR TENDER	Dec, 18
No.	Revision	By Date

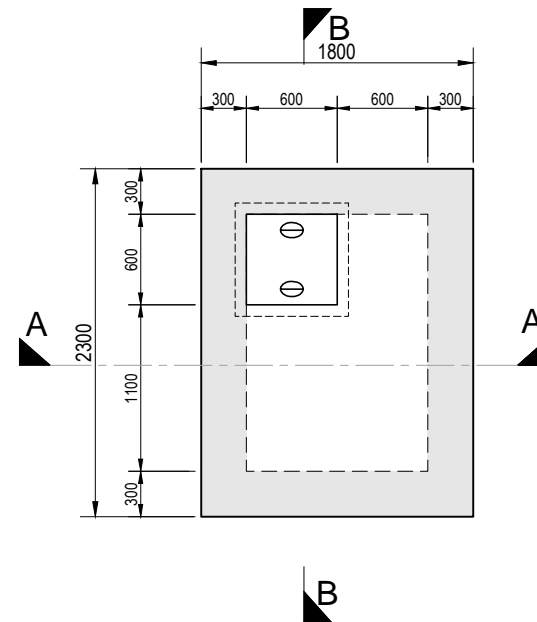
Client :	KARACHI WATER & SEWERAGE BOARD
Project :	GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-III
Consultants :	Techno-Consult International (Pvt.) Ltd. In association with WS Atkins International U.K. NEC Consultants

Drawing Title : **GATE VALVE CHAMBER, PLAN & SECTIONS**

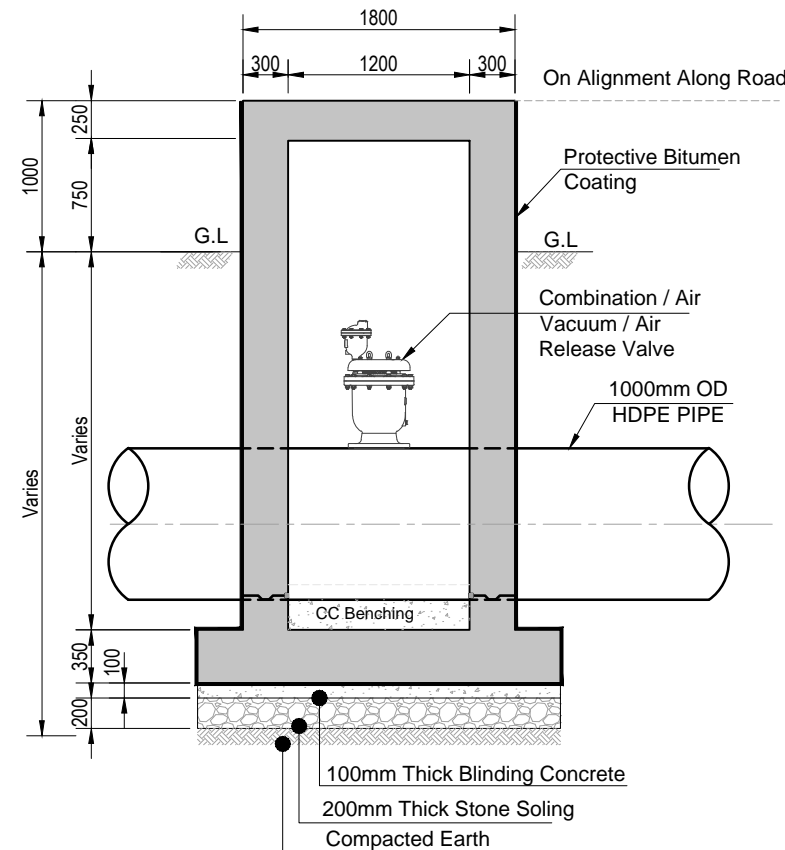
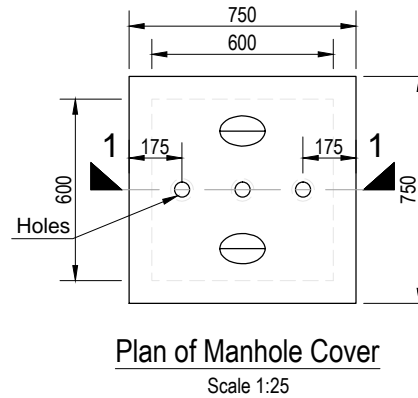
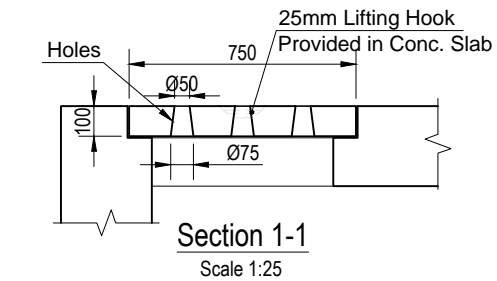
Designed By : SM.	Date : December, 2018
Drawn By : RA.	Scale : AS NOTED
Checked By : SSH.	Drp No : S-III/MS-VI/STR/001
Approved By : MBL.	Revision : 0



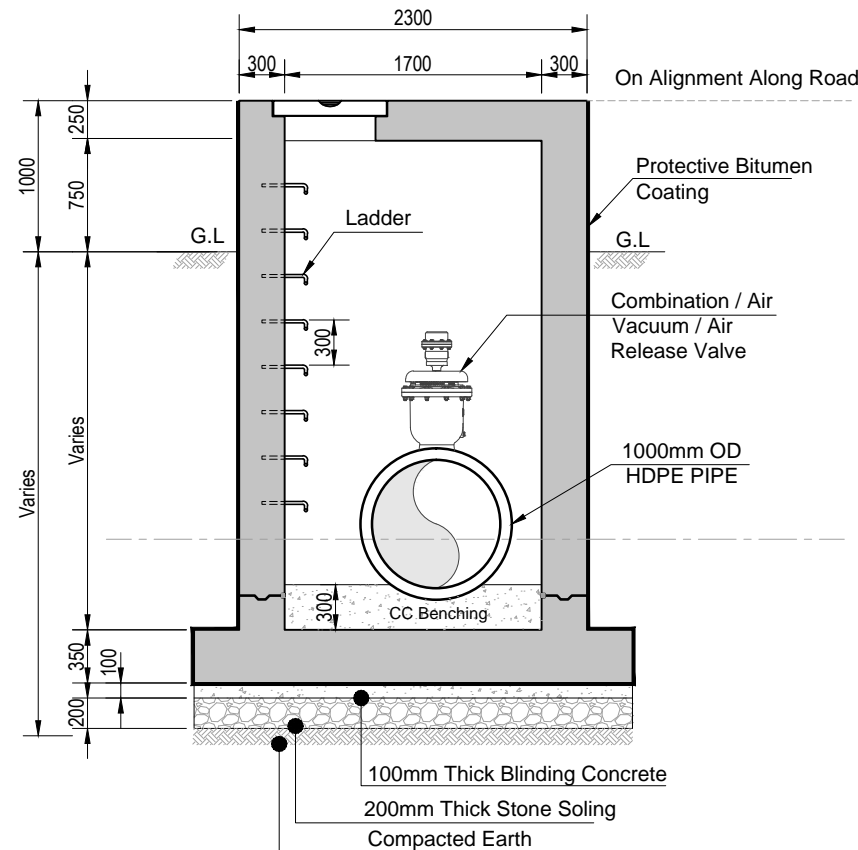
**Base Plan Of Combination / Air Vacuum / Air Release Valve Chamber**  
Scale 1 : 50



**Top Plan Of Air Release Valve Chamber**  
scale 1 : 50



**SECTION A-A**  
Scale 1 : 50



**SECTION B-B**  
Scale 1 : 50

Notes :-

- For General Notes Refer Drawing No. S-III/MS-VI/GEN/003-01 & 003-02.
- All dimensions are in Millimeters.
- This drawing is to be read in conjunction with the combined wastewater network drawings.
- Structural concrete class 35/20
  - Minimum cement content 370 Kg/m<sup>3</sup>
  - Maximum cement content 400 Kg/m<sup>3</sup>
  - Maximum free water/cement ratio 0.55
  - Working concrete cube strength at 28 days not less than 38.2 N/mm<sup>2</sup>.
- Blinding concrete:
  - Working concrete cube strength at 28 days not less than 12 N/mm<sup>2</sup>.
- Reinforcing steel
  - All reinforcing steel shall be high yield deformed bars conforming to ASTM A-615 with minimum yield strength of 420N/mm<sup>2</sup>.
- All structures in contact with earth shall be bituminous painted as specified.
- Stone soling shall be done wherever required and as directed by the engineer.
7. Slope to be Checked before Pipe Laying.

## TENDER DRAWINGS

0	ISSUED FOR TENDER	Dec, 18
No.	Revision	By Date

Client :  
  
**KARACHI WATER & SEWERAGE BOARD**

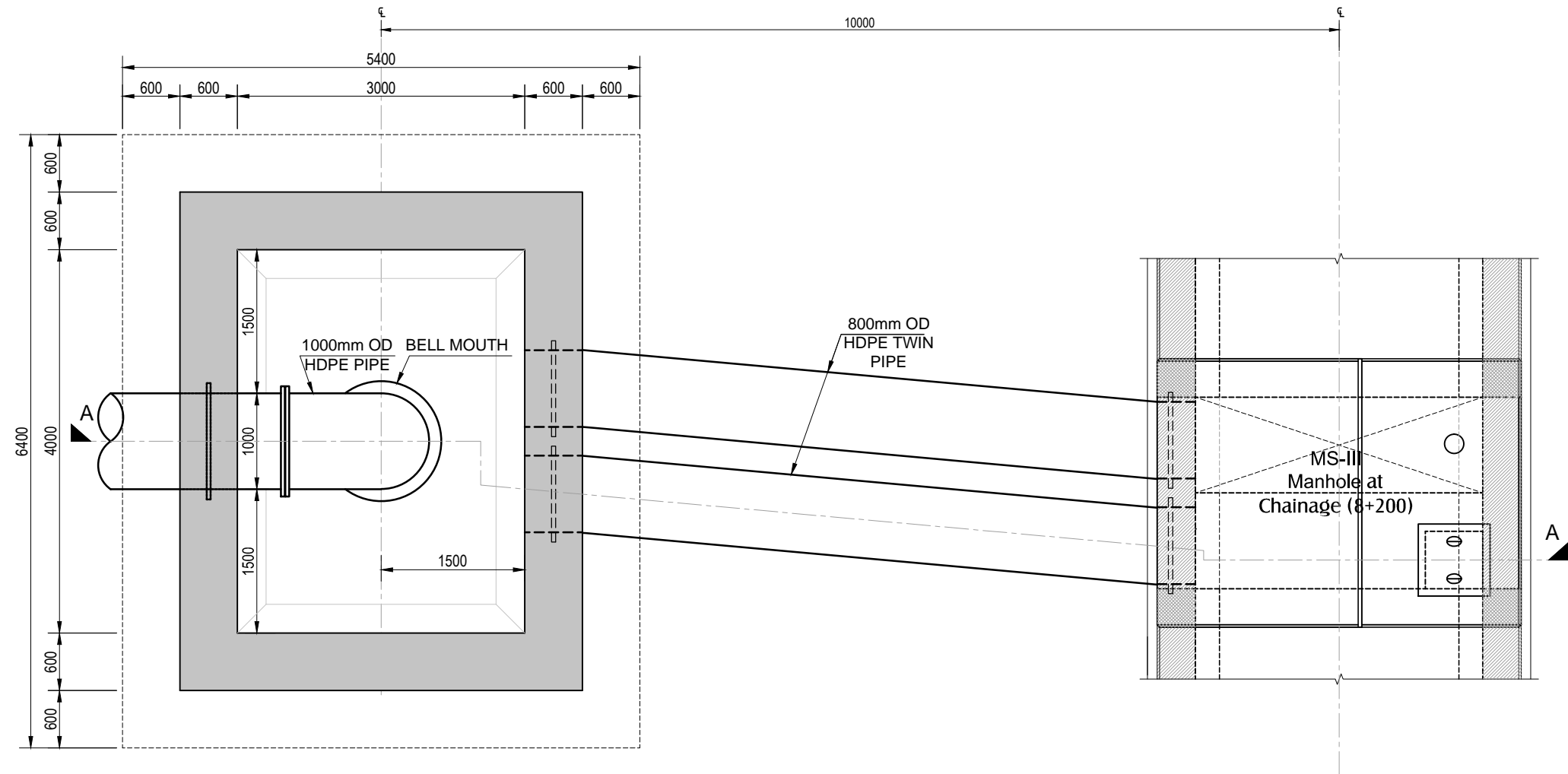
Project :  
**GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-III**

Consultants :  
  
**Techno-Consult International**  
 In association with  
**WS Atkins International U.K.**  
**NEC Consultants**

Drawing Title :  
**COMBINATION / AIR VACUUM / AIR RELEASE VALVE CHAMBER PLAN & SECTIONS**

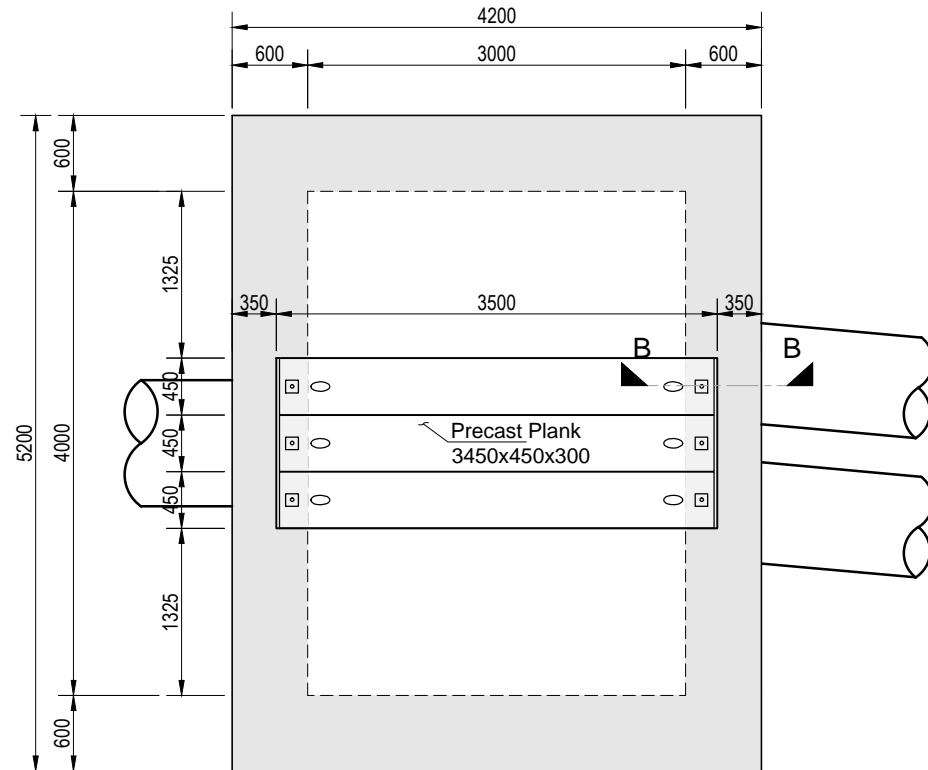
Designed By : SM.	Date : December, 2018	
Drawn By : RA.	Scale : AS NOTED	
Checked By : SSH.	Drp No :	Revision
Approved By : MBL.	S-III/MS-VI/STR/002	0





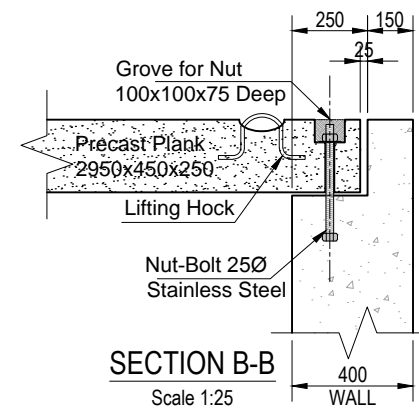
**PLAN OF DISCHARGE CHAMBER**

Scale 1 : 60



**TOP SLAB PLAN OF DISCHARGE CHAMBER**

Scale 1 : 60



Notes :-

- For General Notes Refer Drawing No. S-III/MS-VI/GEN/003-01 & 003-02.
- All dimensions are in Millimeters.
- This drawing is to be read in conjunction with the combined wastewater network drawings.
- Structural concrete class 35/20
  - Minimum cement content 370 Kg/m<sup>3</sup>
  - Maximum cement content 400 Kg/m<sup>3</sup>
  - Maximum free water/cement ratio 0.55
  - Working concrete cube strength at 28 days not less than 38.2 N/mm<sup>2</sup>.
- Blinding concrete:
  - Working concrete cube strength at 28 days not less than 12 N/mm<sup>2</sup>.
- Reinforcing steel
  - All reinforcing steel shall be high yield deformed bars conforming to ASTM A-615 with minimum yield strength of 420N/mm<sup>2</sup>.
- All structures in contact with earth shall be bituminous painted as specified.
- Stone soling shall be done wherever required and as directed by the engineer.
7. Slope to be Checked before Pipe Laying.

## TENDER DRAWINGS

0	ISSUED FOR TENDER		Dec, 18
No.	Revision	By	Date

Client :  **KARACHI WATER & SEWERAGE BOARD**

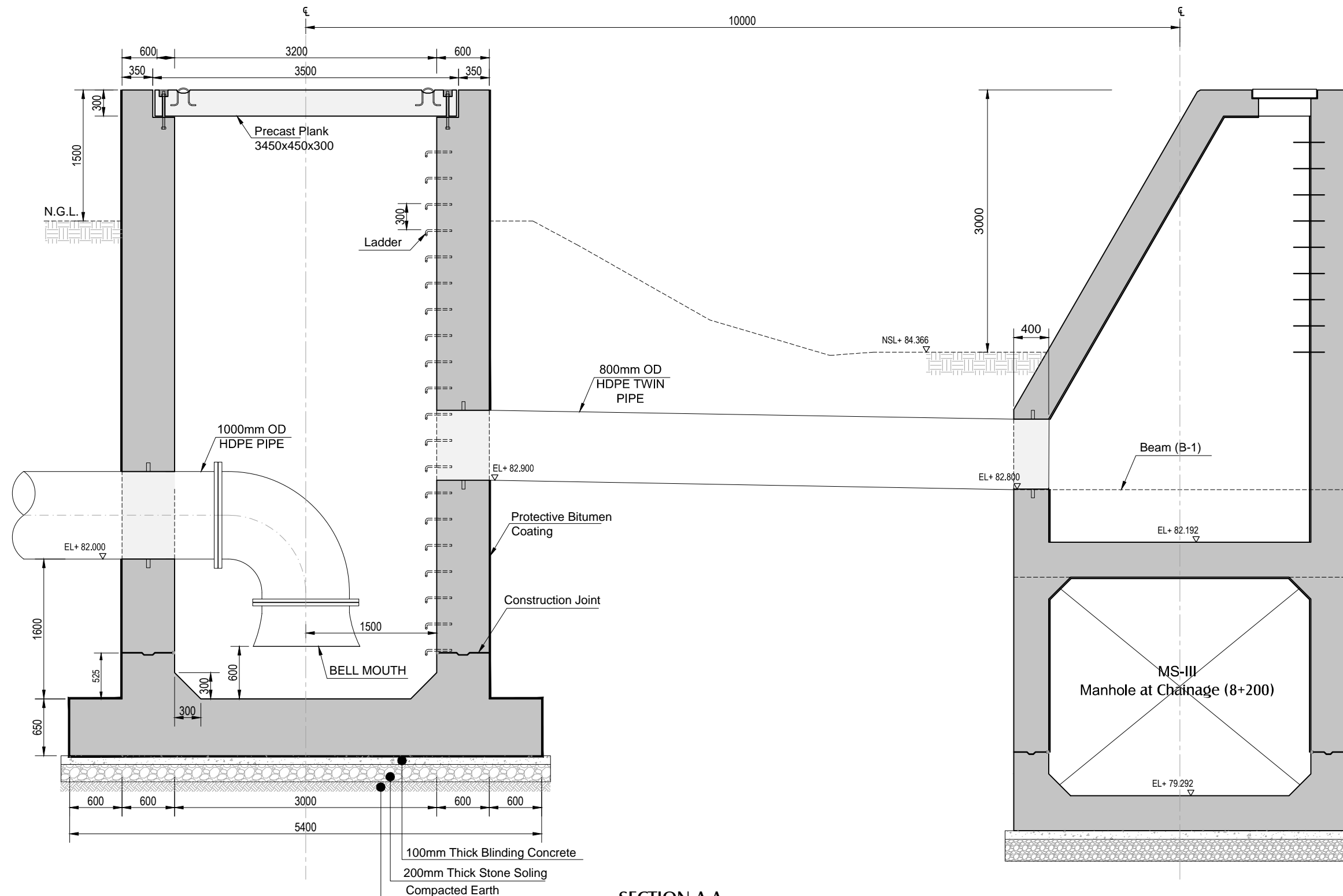
Project : **GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-II**

Consultants :  **Techno-Consult International**  
In association with  
**WS Atkins International U.K. NEC Consultants**

Drawing Title : **CONNECTION OF MS-VI TO MS-III DISCHARGE CHAMBER PLAN & DETAILS**

Designed By : SM.	Date : December, 2018	
Drawn By : RA.	Scale : AS NOTED	
Checked By : SSH.	Drg No :	Revision
Approved By : MBL.	S-III/MS-VI/STR/003-01	0





SECTION A-A  
Scale 1 : 50

Notes :-

- For General Notes Refer Drawing No. S-III/MS-VI/GEN/003-01 & 003-02.
- All dimensions are in Millimeters.
- This drawing is to be read in conjunction with the combined wastewater network drawings.
- Structural concrete class 35/20
  - Minimum cement content 370 Kg/m<sup>3</sup>
  - Maximum cement content 400 Kg/m<sup>3</sup>
  - Maximum free water/cement ratio 0.55
  - Working concrete cube strength at 28 days not less than 38.2 N/mm<sup>2</sup>.
- Blinding concrete:
  - Working concrete cube strength at 28 days not less than 12 N/mm<sup>2</sup>.
- Reinforcing steel
  - All reinforcing steel shall be high yield deformed bars conforming to ASTM A-615 with minimum yield strength of 420N/mm<sup>2</sup>.
- All structures in contact with earth shall be bituminous painted as specified.
- Stone soling shall be done wherever required and as directed by the engineer.
7. Slope to be Checked before Pipe Laying.

TENDER DRAWINGS

No.	ISSUED FOR TENDER	Revision	By	Date
0				Dec, 18

Client :



KARACHI WATER & SEWERAGE BOARD

Project :

**GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-III**

Consultants :

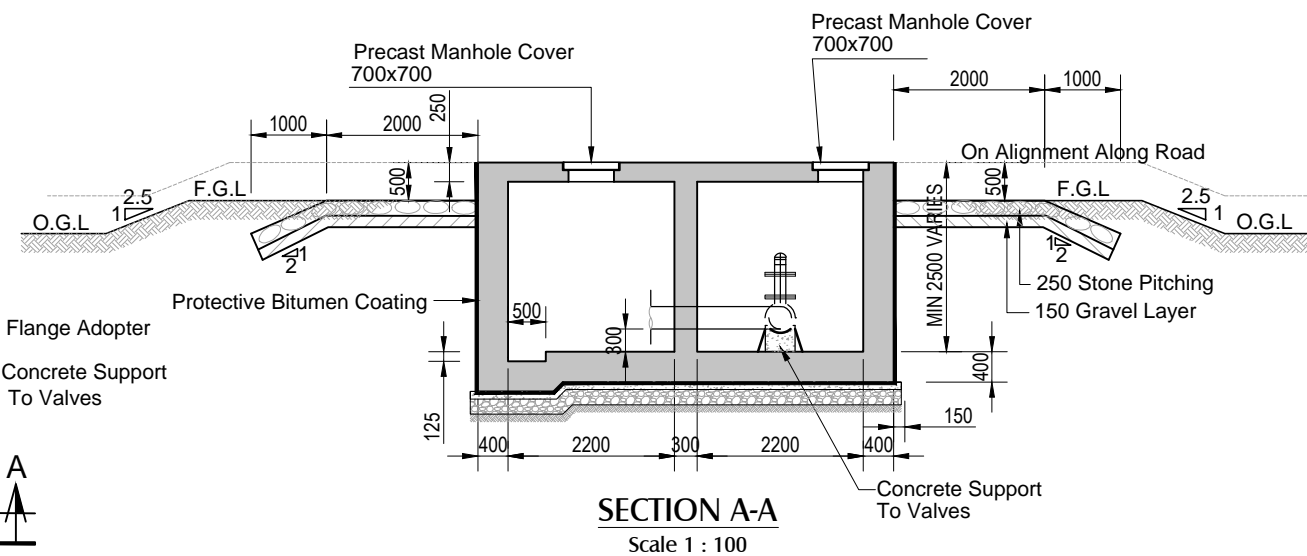
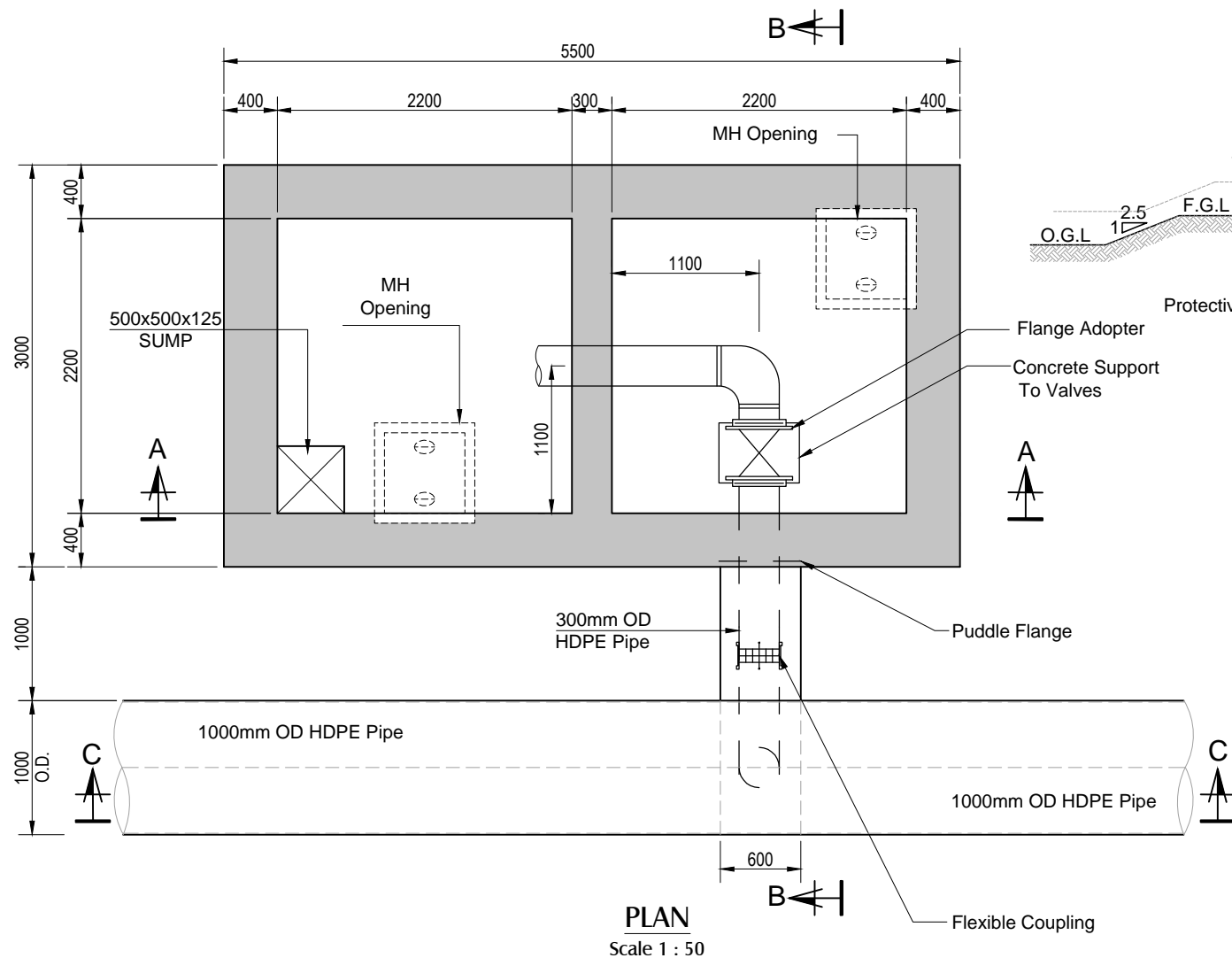
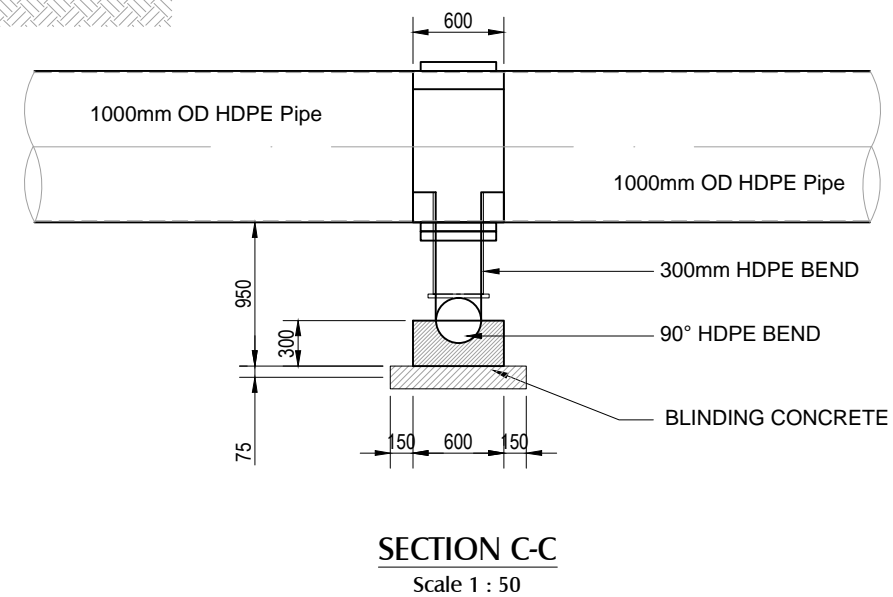
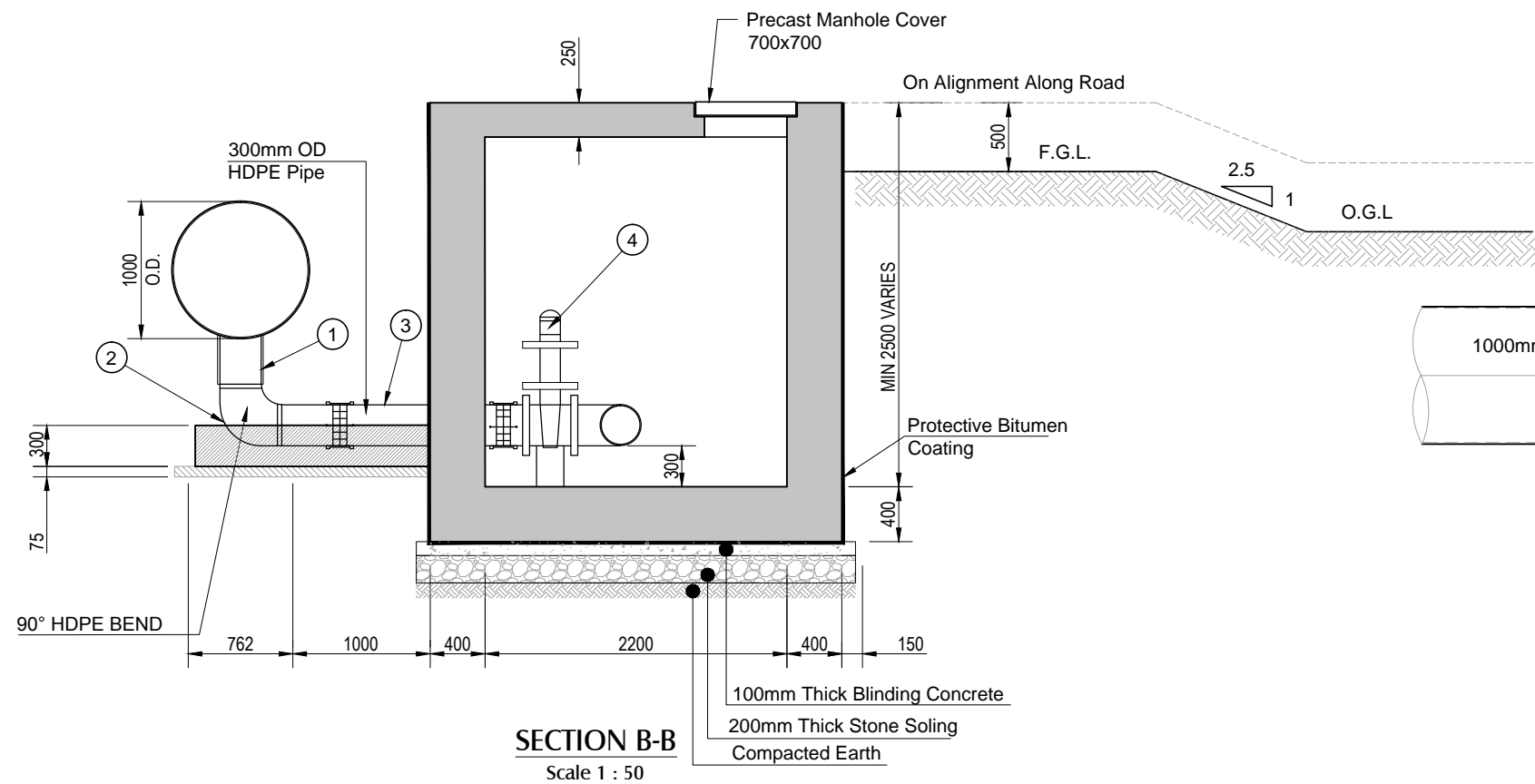


**Techno-Consult International**  
In association with  
**WS Atkins International U.K.**  
**NEC Consultants**

Drawing Title :

**CONNECTION OF MS-VI TO MS-III  
SECTION A-A**

Designed By : SM.	Date : December, 2018		
Drawn By : RA.	Scale : AS NOTED		
Checked By : SSH.	Drp No :		Revision
Approved By : MBL.	S-III/MS-VI/STR/003-02		0



Notes :-

- For General Notes Refer Drawing No. S-III/MS-VI/GEN/003-01 & 003-02.
- All dimensions are in Millimeters.
- This drawing is to be read in conjunction with the combined wastewater network drawings.
- Structural concrete class 35/20
  - Minimum cement content 370 Kg/m<sup>3</sup>
  - Maximum cement content 400 Kg/m<sup>3</sup>
  - Maximum free water/cement ratio 0.55
  - Working concrete cube strength at 28 days not less than 38.2 N/mm<sup>2</sup>.
- Blinding concrete:
  - Working concrete cube strength at 28 days not less than 12 N/mm<sup>2</sup>.
- Reinforcing steel
  - All reinforcing steel shall be high yield deformed bars conforming to ASTM A-615 with minimum yield strength of 420N/mm<sup>2</sup>.
- All structures in contact with earth shall be bituminous painted as specified.
- Stone soling shall be done wherever required and as directed by the engineer.
7. Slope to be Checked before Pipe Laying.

#### SUMMARY OF FITTING

S.NO	DESCRIPTION	QUANTITY
1	300mm (HDPE) FLANGE ADOPTER	1
2	HDPE OD 300 BEND	2
3	OD 300 HDPE PIPE	2
4	300mm DIA FLANGED GATE VALVE	1

#### TENDER DRAWINGS

No.	ISSUED FOR TENDER	Revision	By	Date
0	ISSUED FOR TENDER			Dec, 18

Client : **KARACHI WATER & SEWERAGE BOARD**

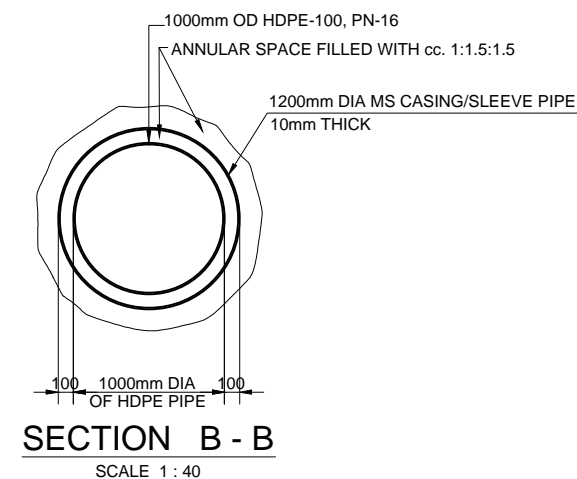
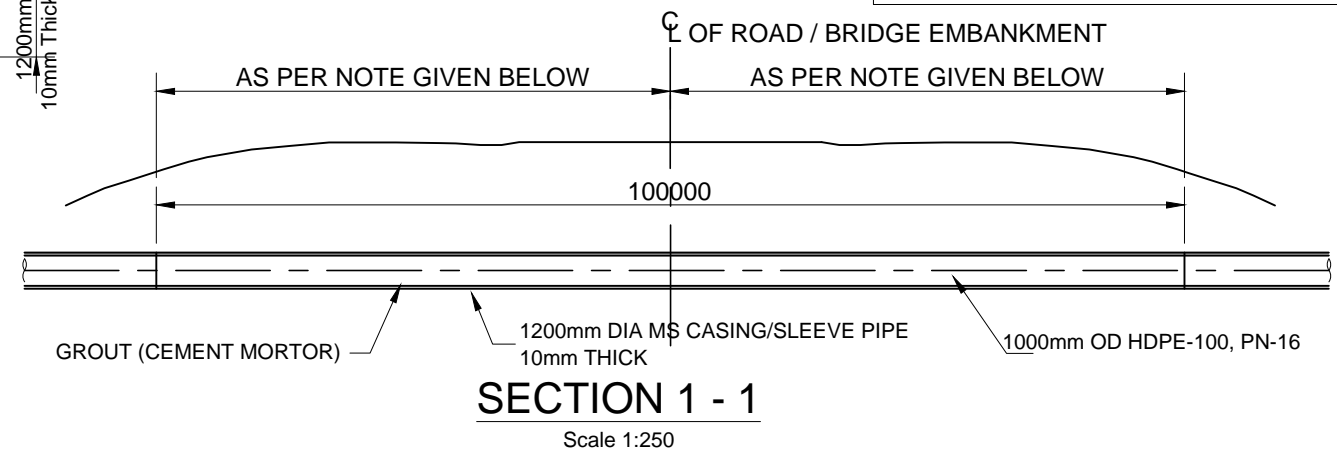
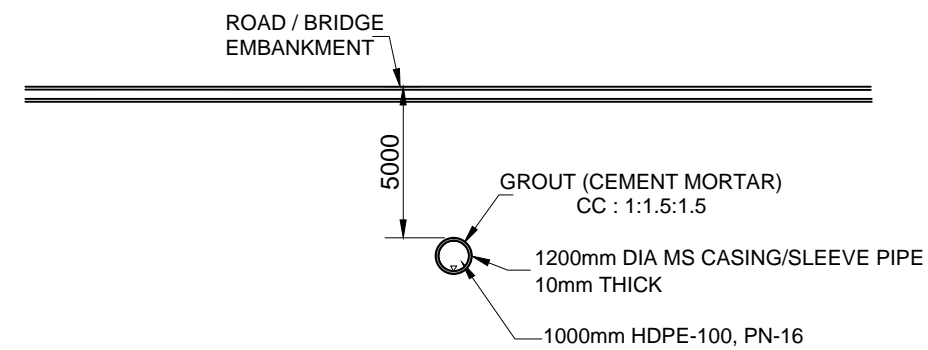
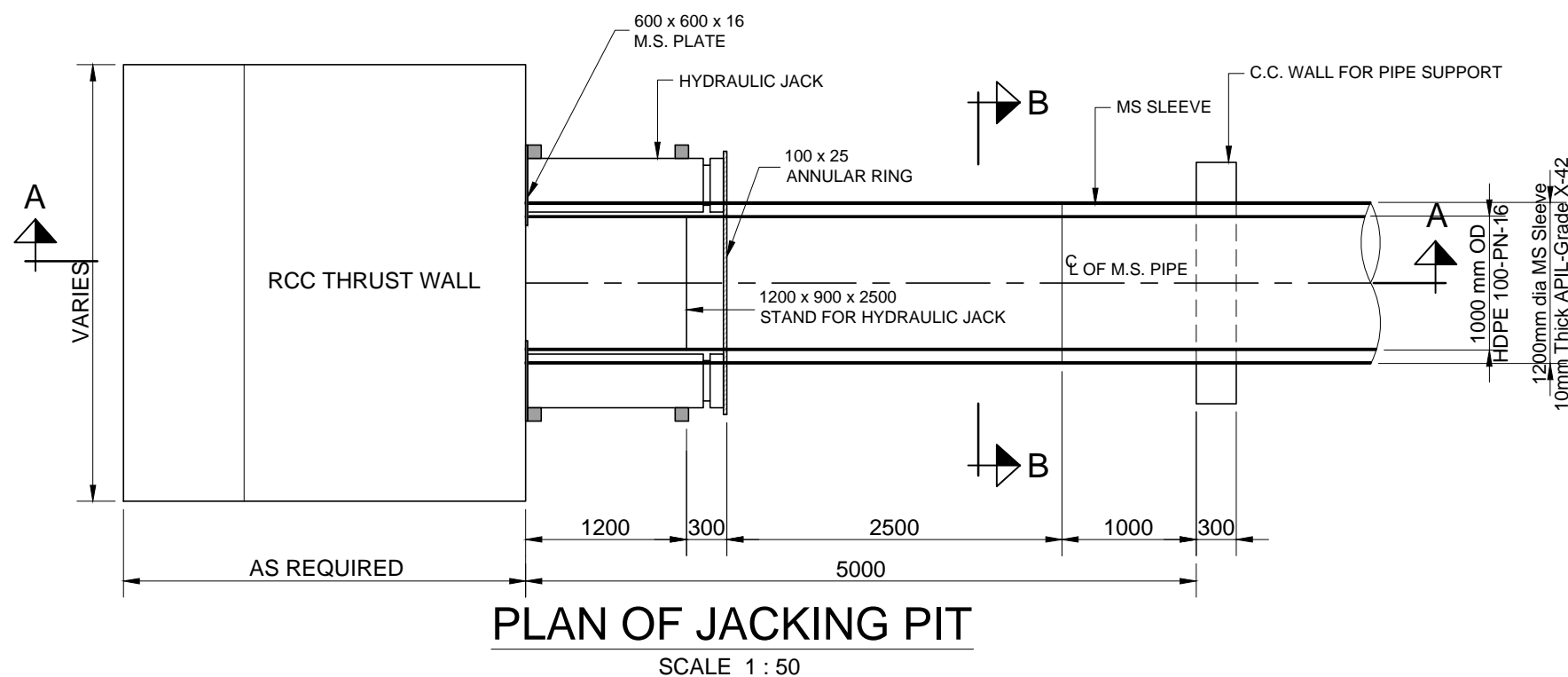
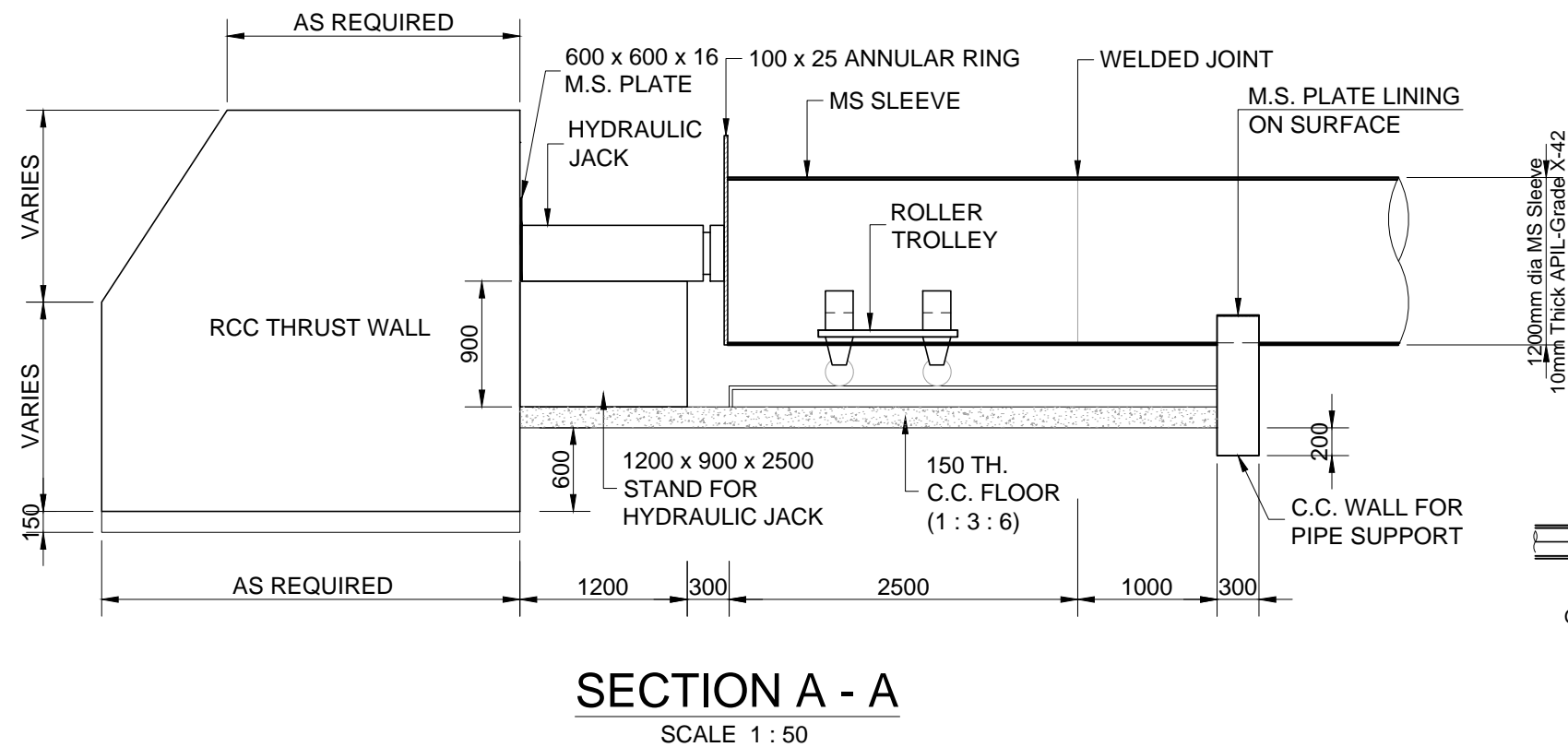
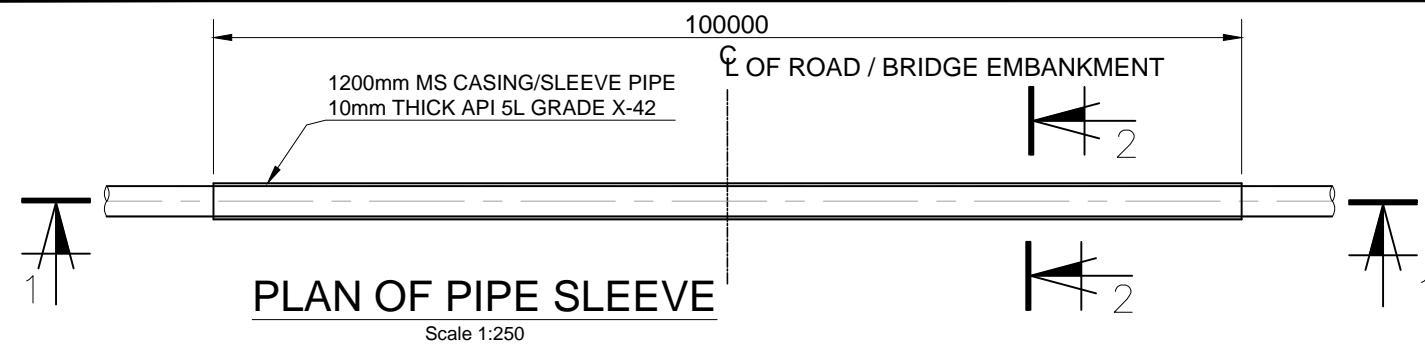
Project : **GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-III**

Consultants : **Techno-Consult International**  
In association with **WS Atkins International U.K.**  
**NEC Consultants**

Drawing Title : **TYPICAL WASHOUT CHAMBER PLAN & SECTIONS**

Designed By : SM.	Date : December, 2018
Drawn By : RA.	Scale : AS NOTED
Checked By : SSH.	Drg No : S-III/MS-VI/STR/004
Approved By : MBL.	Revision : 0

# MISCELLANEOUS DRAWINGS



## NOTES :

1. All dimensions are in mm shown otherwise.
2. The drawing shows general guide lines for pipe jacking the contractor to submit his detailed method statement, drawings with supporting calculation for engineers approval.
3. The dimensions of pipe jacking (length of pipe jacking, earth cover over pipes and the distance between jacked pipe) shown on this drawing are provisional. Actual dimensions shall be as required on site.

## TENDER DRAWINGS

0	ISSUED FOR TENDER	Dec, 18
No.	Revision	By Date

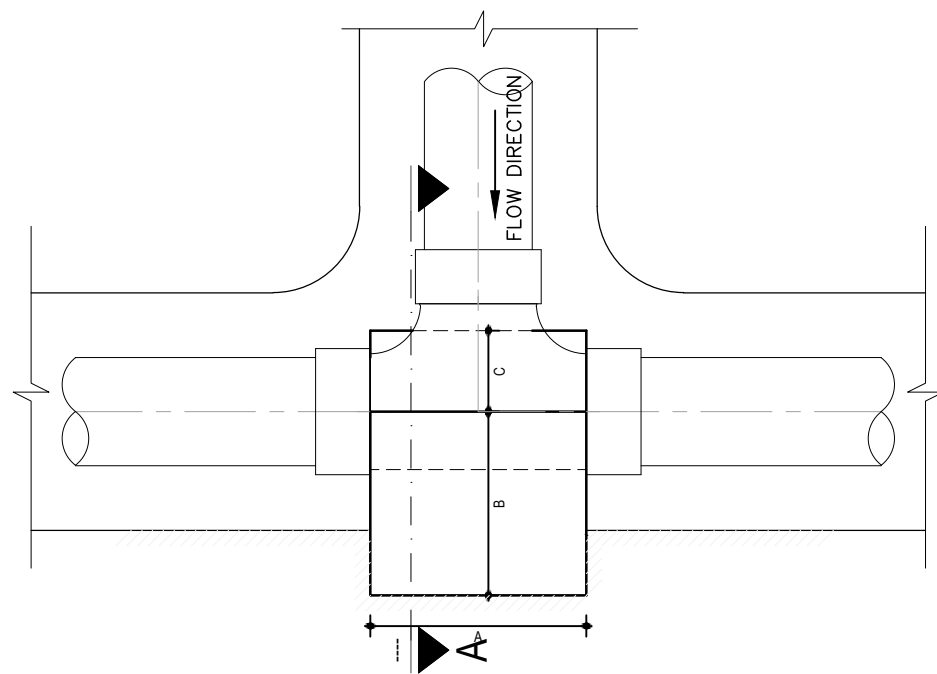
Client :  **KARACHI WATER & SEWERAGE BOARD**

Project : **GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-II**

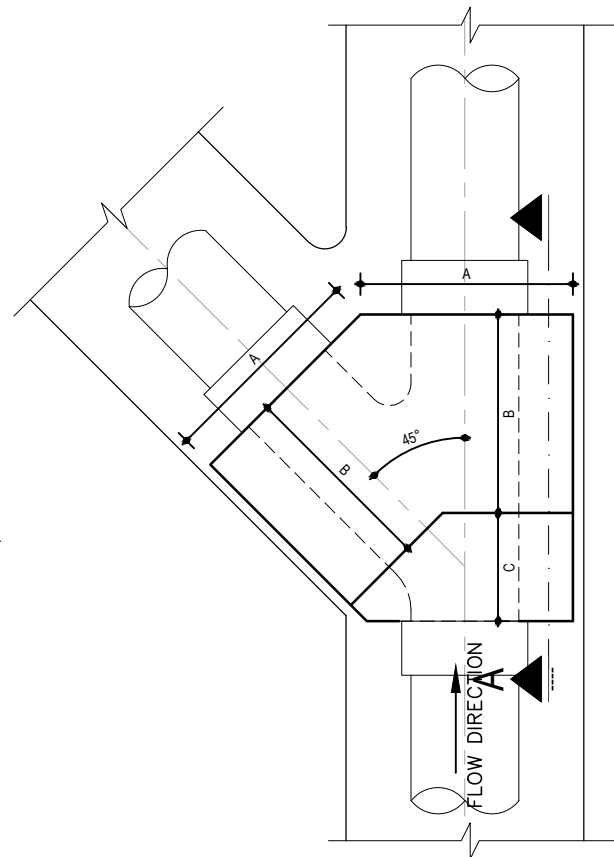
Consultants :  **Techno-Consult International (Pvt.) Ltd.**  
In association with **WS Atkins International U.K. NEC Consultants**

Drawing Title : **PIPE JACKING DETAIL (ONLY FOR GUIDE LINE)**

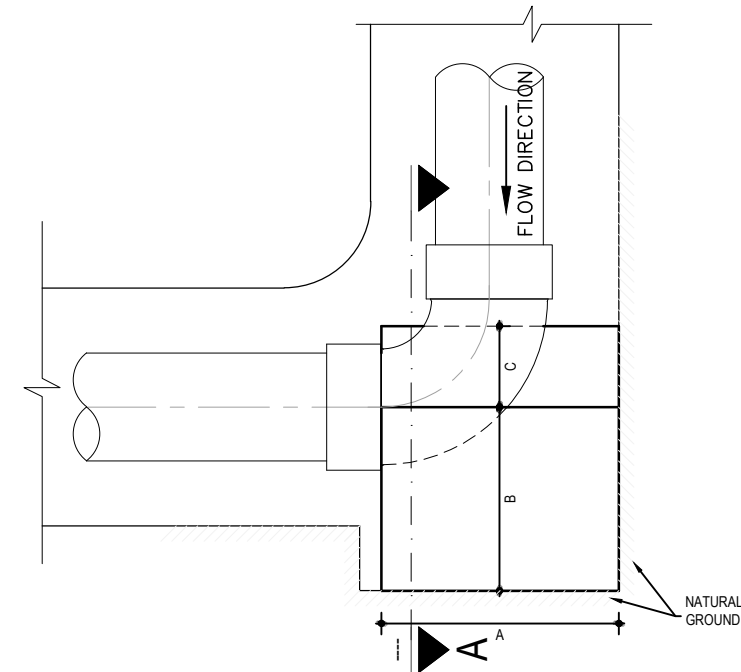
Designed By : SM.	Date : December, 2018
Drawn By : RA.	Scale :
Checked By : SSH.	Drg No : S-III/MS-VI/MIS/001
Approved By : MBL.	Revision : 0



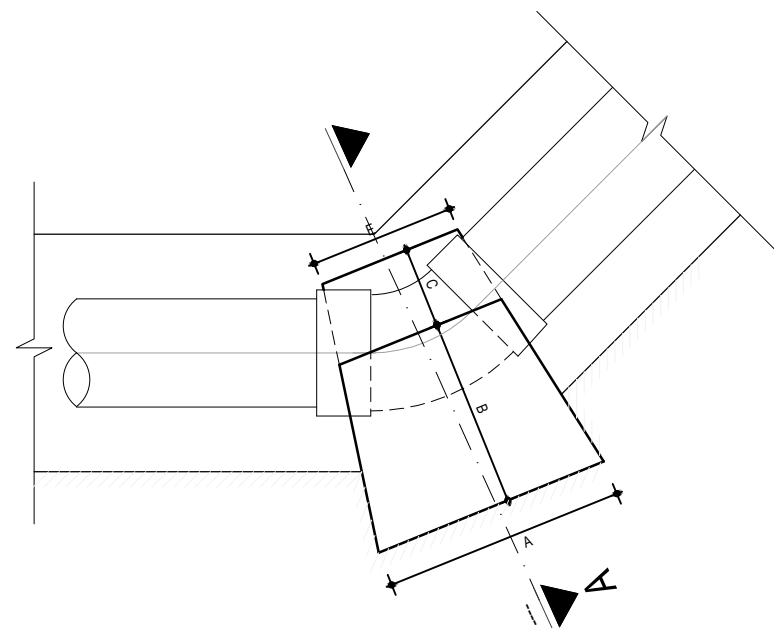
PLAN OF THRUST BLOCK  
(FOR TEE)



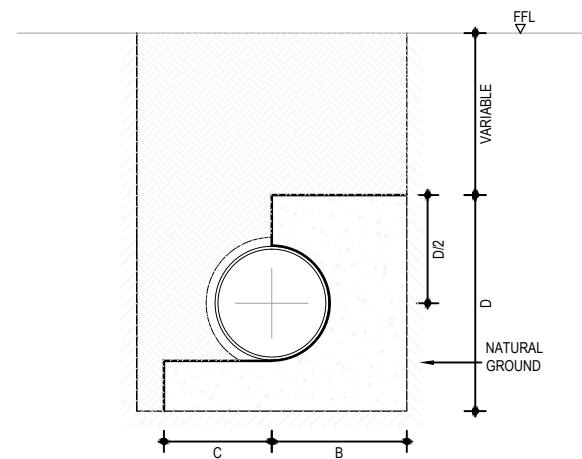
PLAN OF THRUST BLOCK  
(FOR WYE)



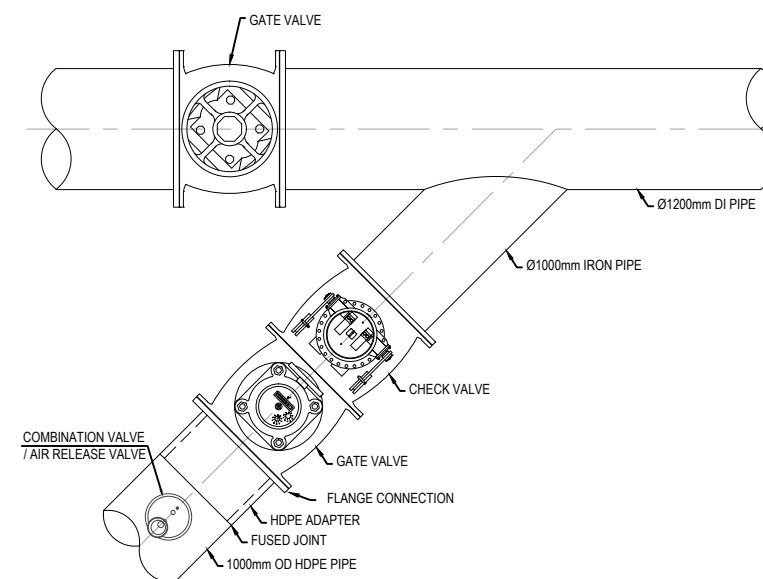
PLAN OF THRUST BLOCK  
(FOR 90° BENDS)



PLAN OF THRUST BLOCK  
(FOR 45° BEND)



SECTION - A  
SCALE 1:35 A-0000



CONNECTION DETAIL DI TO HDPE

PIPE SIZE	AT TEE AND 90° BENDS				AT 45° BENDS					AT WYE BENDS				
	A	B	C	D	A	B	C	D	E	A	B	C	D	E
800	1600	1200	600	1600	1800	1300	600	2000	1000	1800	1300	600	2000	1000
1000	2000	1500	750	2000	2250	1750	750	2500	1250	2250	1750	750	2500	1250
1250	2250	1700	850	2250	2800	2200	950	3000	1500	2800	2200	950	3000	1500
1500	2250	1700	850	2250	2800	2200	950	3000	1500	2800	2200	950	3000	1500

Notes :-

1. For General Notes Refer Drawing No. S-III/MS-VI/GEN/003-01 & 003-02.
2. Valve body may vary based on manufacturer.
3. Non-slam check valve to be installed to prevent excessive transients pressures in the system after approval of engineer.

## TENDER DRAWINGS

No.	ISSUED FOR TENDER	Revision	By	Date
0				Dec, 18

Client :



KARACHI WATER & SEWERAGE BOARD

Project :

**GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-II**

Consultants :



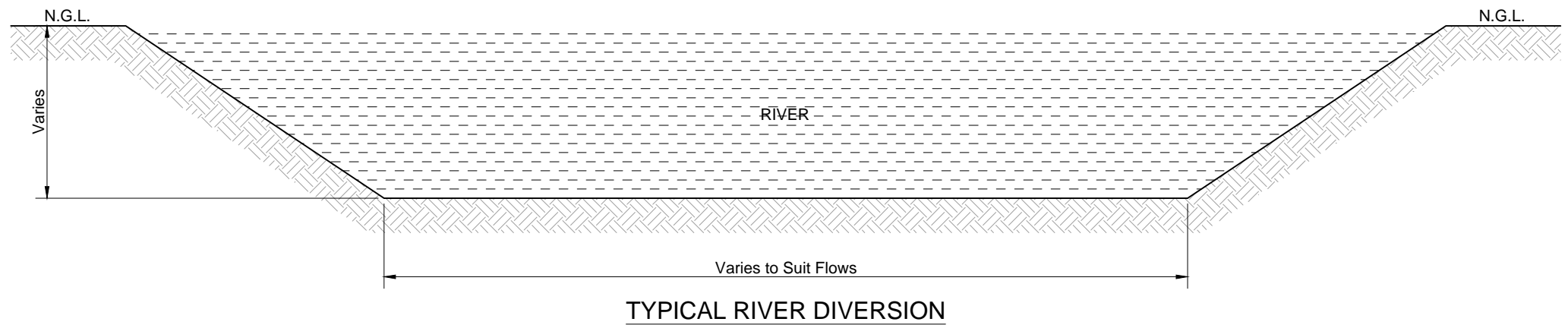
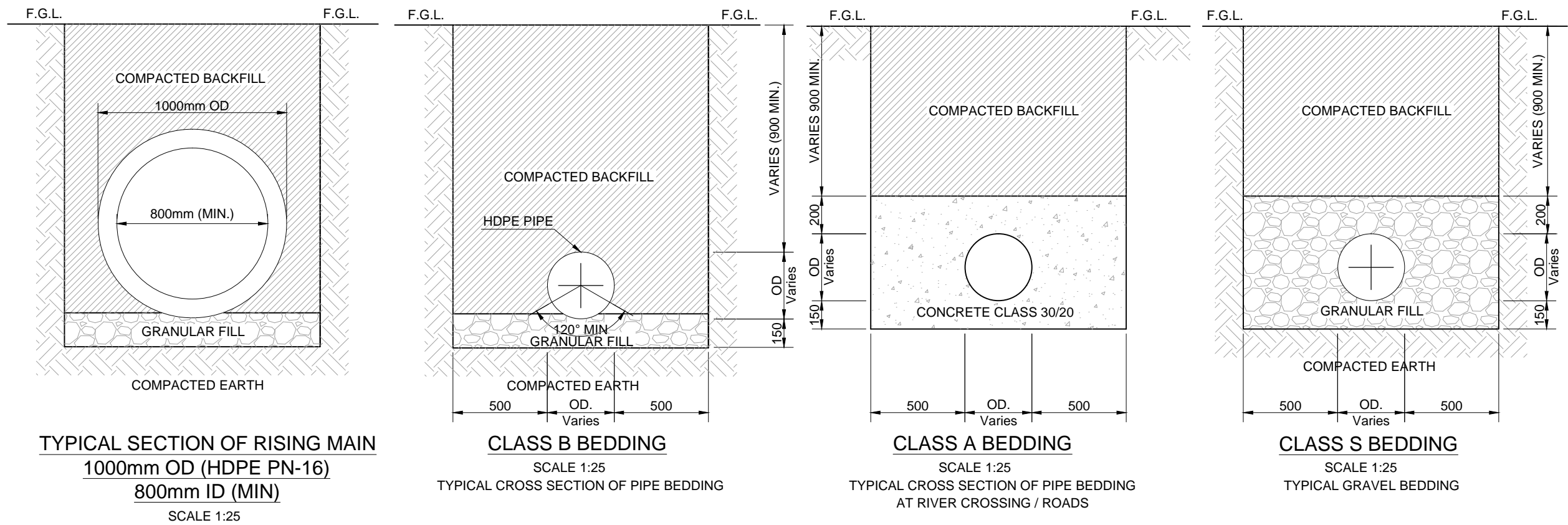
**Techno-Consult International (Pvt.) Ltd.**  
In association with  
**WS Atkins International U.K. NEC Consultants**

Drawing Title :

**THRUST BLOCK & BEND DETAILS**

Designed By : EED	Date : December, 2018		
Drawn By : AJ	Scale :		
Checked By : KM	Drg No :	Revision	
Approved By : IUH	S-III/MS-VI/MIS/002	0	

# INTERCONNECTION PIPE DETAILS



INDICATIVE ONLY, CONTRACTOR HAVE TO DESIGN AND SUBMIT THE SECTION OF DIVERSION CHANNEL PRIOR TO EXECUTION OF WORK.

- Notes :-
1. All dimensions are in mm unless otherwise shown.
  2. For levels & chainages refer drawing for plan and profile.
  3. The granular material shall be evenly spread over the full width of the formation and lightly hand compacted to a level slightly higher than the level corresponding to the underside of the pipe barrel to allow for settlement of the pipe to the correct level.
  4. The granular material for bedding shall consist of durable gravel to the approval of the engineer. Not more than 10% of such material shall pass a BS test sieve with 5mm apertures and all the material shall pass BS test sieve having 20 mm apertures.
  5. The Contractor shall ensure that the material to the sides of the pipes is adequately compacted, and the method of compaction used will be required to achieve not less than 90 % of the maximum dry density as determined from BS 1377 : Part 4.
  6. Under roads /  
River Crossing : Class A Bedding  
Cover > 3m : Class B Bedding  
Cover < 3m : Class S Bedding
- Engineer will determined at site the type of bedding to be provided.

## TENDER DRAWINGS

0	ISSUED FOR TENDER	Dec, 18
No.	Revision	By Date

Client :  
 **KARACHI WATER & SEWERAGE BOARD**

Project :  
**GREATER KARACHI SEWERAGE PLAN S-III (MS-VI) Construction Of New HDPE Rising Main and Allied Works Along Manzoor Colony Drain From TP - II To MS-III**

Consultants :  
 **Techno-Consult International**  
In association with  
**WS Atkins International U.K. NEC Consultants**

Drawing Title :  
**TYPICAL PIPE BEDDING DETAIL & RIVER DIVERSION**

Designed By : SM.	Date : December, 2018
Drawn By : RA.	Scale :
Checked By : SSH.	Drp No : Revision
Approved By : MBL.	S-III/MS-VI/MIS/003 0