United Nations Development Programme (UNDP)

Programme of Assistance to the Palestinian People

Consulting Engineer

Client: Municipality of Beit Jala

Project:

Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571

Wadi Beit Jala Bethlehem City

No.	Suffix	Drawing No.	Drawing Title
Drawing Name: Drawing Details For Kafr al-Labad			
1	D	1	General Notes
2	D	2	Sewer Trench Detail
3	D	3	Trench Excavation Detail For Slope >15%
4	D	4	Civil Detail
5	D	5	Sewer Manhole Detail
6	D	6	Cast In Situ Sewer Manhole Detail
7	D	7	Locations Electromagnetic Flow Sensor
8	D	8	Electromagnetic Flow Sensor Plan Detail
9	D	9	Electromagnetic Flow Sensor Section Detail

United Nations Development Programme (UNDP)
Programme of Assistance to the Palestinian People

Consulting Engineer

WeeCon

Client Municipality of Qalqelya

Project
Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571
Wadi Beit Jala Bethlehem City

Drawing name
List of Drawings

Date / Signature
Dec. 2018

Designed by: Ammar kukhun
Checked by: Ammar Kukhun
Drawn by : Yara Dhoon
Approved by: Ammar kukhun

Drawing No.
Index 00

GENEARL

1. ALL DIMENSIONS SHOWN ON STANDARD DETAIL DRAWINGS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED

2. ALL CONCRETE MATERIALS WHICH ARE IN CONTACT WITH SEWER SHALL BE SULFATE RESISTANCE CEMENT.

3. STEEL REINFORCEMENT SHALL BE GRADE 4200 kg/cm2 ACCORDING TO ASTM A615 OR EQUIVALENT

4. ALL MANHOLES/CHAMBERS, TANKS, AND ANY SURFACE CONTACTED WITH SEWAGE SHALL BE INTERNALLY TAR-EPOXY COATED AS SPECIFIED (2 COATS 250µm EACH COAT).

5. EXTERNAL CONCRETE SURFACES BELOW GROUND SHALL BE PROTECTED WITH COLD BITUMINOUS ((1000 µm) MINIMUM THICKNESS) WATERPROOF TANKING MEMBRANE AS SPECIFIED.

6. A BACKDROP OR BRANCH SEWER INLET SHALL HAVE LEVEL SOFFITS WITH A LARGER PIPE DIAMETER. THE BACKDROP OR BRANCH SEWERS SHALL HAVE INVERT LEVELS AT MAIN SEWER SPRING LINES ON PIPES OF THE SAME DIAMETER.

7. ALL SEWERAGE MANHOLES AND INSPECTION CHAMBERS SHALL BE FITTED WITH CAST IRON COVER AND FRAMES WITH A CLEAR OPENING OF 600 x 600mm

8. CONCRETE SUPPORT SHALL BE PROVIDED FOR TEH PRESSURE PIPE LINES WHERE EVER PRESSURE LINE IS LAYING ABOVE THE GROUND

9. CONCRETE SURROUND SHALL BE PROVIDED (TO SEWER PIPES WHERE THE COVER IS LESS THAN 0.7 METERS FOR PIPE DIAMETER <150mm AND 0.9 METERS FOR PIPE DIAMETER ⩾150mm) THE PIPELINES LIE WITHIN A STRIP OF 20 METRE EACH SIDE OF THE CENTERLINE OF ROAD CORRIDORS.

10. OVER-EXCAVATION BELOW PIPELINES AT MANHOLE EXCAVATIONS SHALL BE FILLED WITH TYPE 'B150' CONCRETE TO THE PIPE TRENCH FORMATION LEVEL OVER THE TRENCH WIDTH.

11. w\c RATIO MAX (45%)

12. MIN CONCRETE COVER TO REINFORCEMENT IS 50mm

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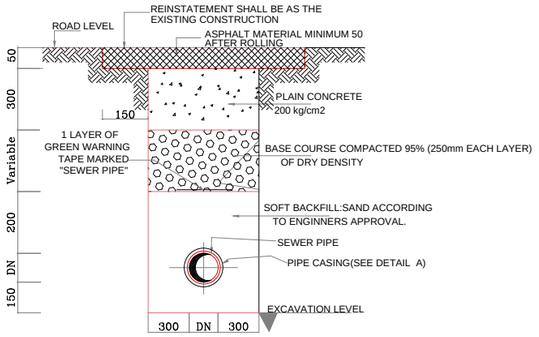
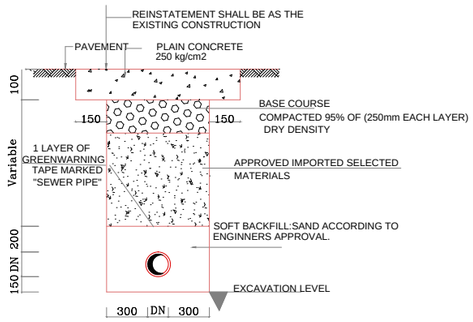
Client: Municipality of Qalqelya

Project:
Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571
Wadi Beit Jala Bethlehem City

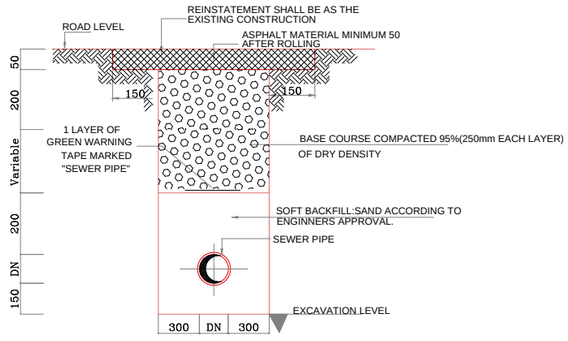
Drawing name	Date / Signature
General Notes	Dec. 2018
Designed by: Ammar kukhun	Drawing No.
Checked by: Ammar Kukhun	
Drawn by : Yara Dhoon	001 D
Approved by: Ammar kukhun	



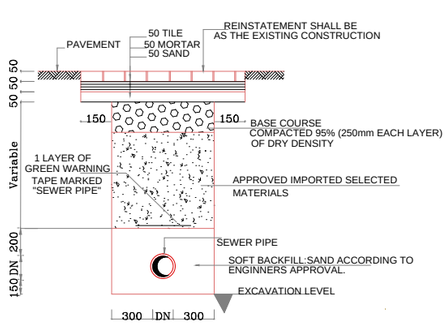
FOR PIPES CROSSING STREETS
AT SKEW OR RIGHT ANGLE
REFER TO DETAIL A
SCALE: NTS



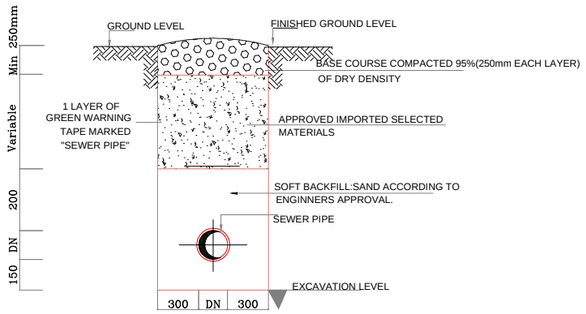
TYPICAL PIPE TRENCH IN CONCRETE TILES
SCALE: NTS



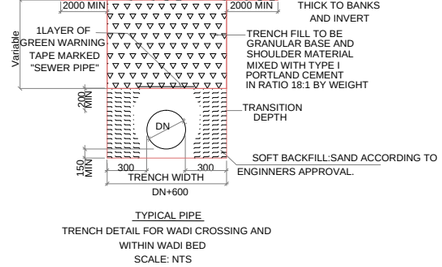
TYPICAL PIPE TRENCH
ALONG STREET (IN OR ADJACENT TO ASPHALTED
(BACKFILLING) OR BASECOARSE AND DIRT STREETS)
SCALE: NTS



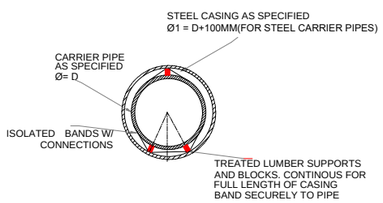
TYPICAL PIPE TRENCH IN SIDEWALKS
SCALE: NTS



TYPICAL PIPE TRENCH
ALONG NATURAL GROUND
SCALE: NTS

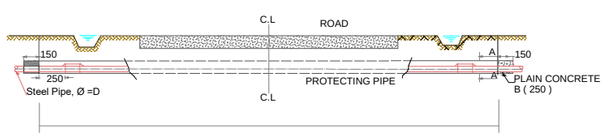


TYPICAL PIPE
TRENCH DETAIL FOR WADI CROSSING AND
WITHIN WADI BED
SCALE: NTS



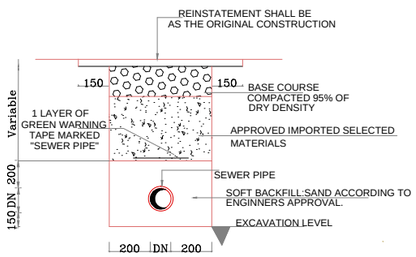
DETAIL A

SEWER PIPELINE CROSSING HIGHWAYS



CROSS SECTION IN ROAD AND HIGHWAYS

DETAIL A



HOUSE CONNECTION TYPICAL PIPE TRENCH
SCALE: NTS

LEGEND

ALL DIMENSION IN mm UNLESS OTHERWISE INDICATED

DN = NOMINAL DIAMETER OF PIPES

T = PIPE'S WALL THICKNESS

BC = EXTERNAL DIAMETER OF PIPES

N.G. = NATURAL GROUND

uPVC = UNPLASTICIZED POLYVINYL CHLORIDE

HDPE = HIGH DENSITY POLYETHYLENE PIPE

CP = CONCRETE PIPE

RCE = REINFORCED CONCRETE ENCASEMENT

United Nations Development Programme (UNDP)
Programme of Assistance to the Palestinian People

Consulting Engineer

WeeCon

Client: Municipality of Qalqelya

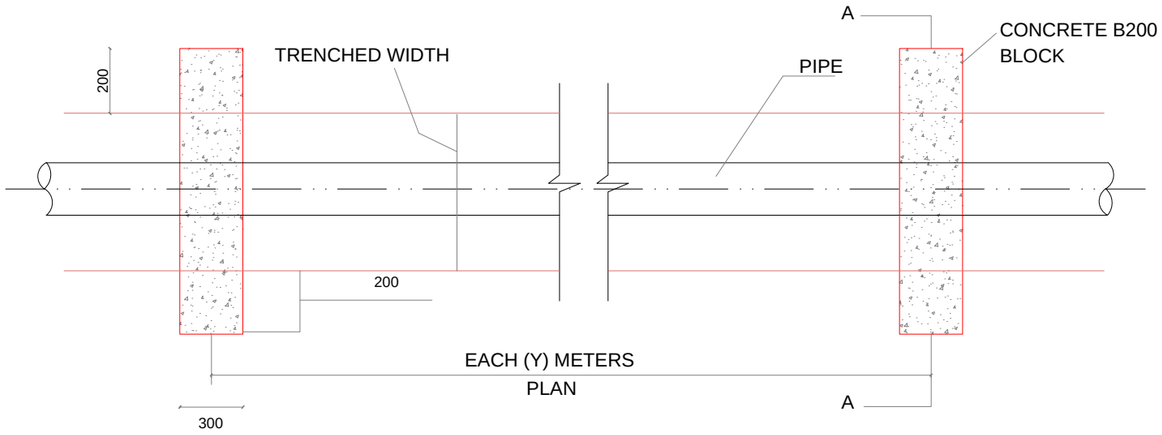
Project
Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571
Wadi Beit Jala Bethlehem City

Drawing name
Sewer Collection System
Sewer Trench Detail

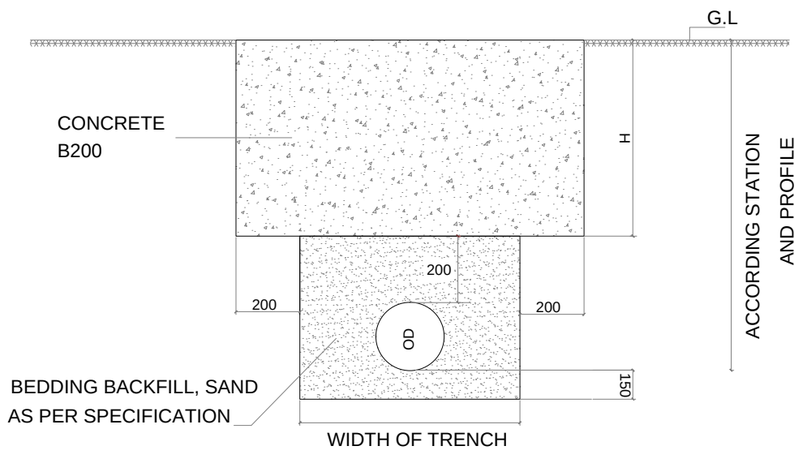
Date / Signature
Dec. 2018

Designed by: Ammar kukhun
Checked by: Ammar Kukhun
Drawn by : Yara Dhoon
Approved by: Ammar kukhun

Drawing No.
002 D



Y: CONCRETE BLOCK EACH 10M CENTER TO CENTER ON GRADES GREATER THAN 15% TO 20%
Y: CONCRETE BLOCK EACH 12M CENTER TO CENTER ON GRADES GREATER THAN 21% TO 34%
Y: CONCRETE BLOCK EACH 8M CENTER TO CENTER ON GRADES GREATER THAN35% TO 49%
Y: CONCRETE BLOCK EACH 5.3M CENTER TO CENTER ON GRADES GREATER THAN 50% AND OVER



SECTION A-A

NOTES:

1- DISTANCE H, TO BE NOT LESS THAN 500mm FOR PIPE DIAMETER LESS 150mm AND NOT LESS THAN 700mm FOR PIPE DIAMETER OR GREATER THAN 150mm

2- FOR PIPES PASSING THROUGH ROADS, THE FINAL LAYER TO BE ASPHALT WITH A MIN THICKNESS ACCORDING TO THE TRENCHES DRAWINGS AND SPECS.

LEGEND

ALL DIMENSION IN mm UNLESS OTHERWISE INDICATED

OD OUTER DIAMETER

United Nations Development Programme (UNDP)
Programme of Assistance to the Palestinian People

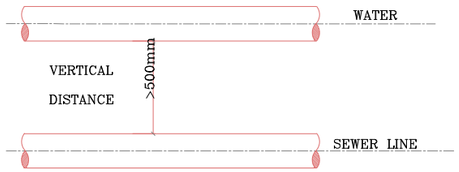
Consulting Engineer

WeeCon

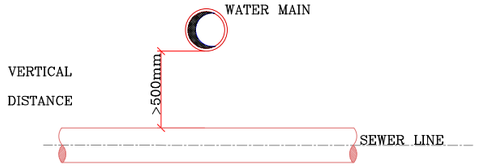
Client: Municipality of Qalqelya

Project:
Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571
Wadi Beit Jala Bethlehem City

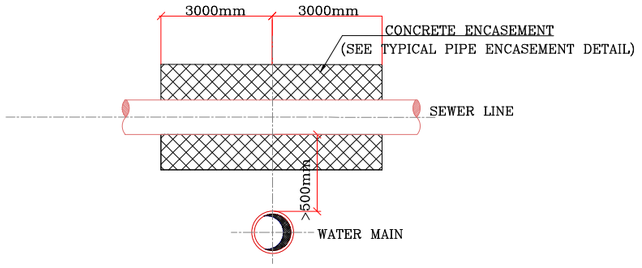
Drawing name	Date / Signature
Trench Excavation Detail For Slope > 15%	Dec. 2018
Designed by: Ammar kukhun	Drawing No.
Checked by: Ammar Kukhun	003 D
Drawn by : Yara Dhoon	
Approved by: Ammar kukhun	



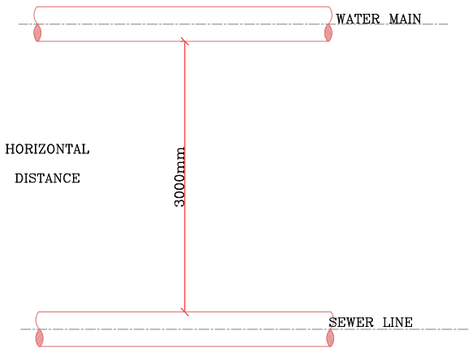
WATER LINE CROSSING OVER SEWER
(SIDE VIEW IN TRENCH)



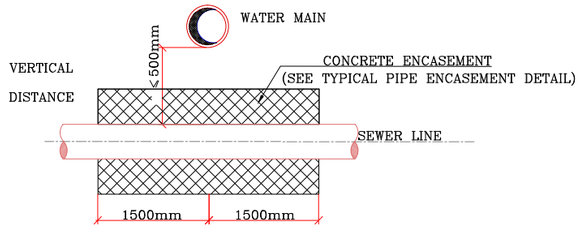
WATER LINE CROSSING OVER SEWER
(SIDE VIEW IN TRENCH)



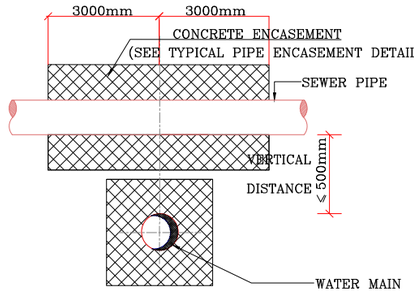
WATER LINE CROSSING BELOW SEWER
(SIDE VIEW IN TRENCH)



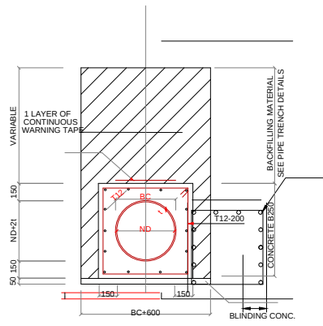
WATER LINE CROSSING OVER SEWER
(TOP VIEW IN TRENCH)



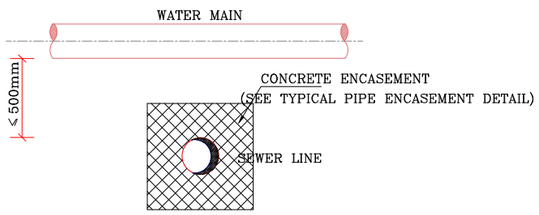
WATER LINE CROSSING OVER SEWER
(HORIZONTAL/VERTICAL CLEARANCES UNATTAINABLE)



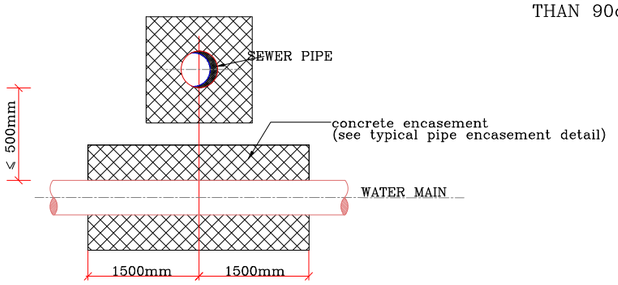
WATER LINE CROSSING BELOW SEWER
(VERTICAL CLEARANCE UNATTAINABLE)



TYPICAL PIPE ENCASEMENT DETAIL
CROSSING :
1-WATER\SEWER CROSSING
2-WHEN MIN COVER LESS THAN
70cm FOR ø<150mm OR LESS
THAN 90cm FOR ø≥150mm



WATER LINE CROSSING OVER SEWER
(HORIZONTAL/VERTICAL CLEARANCES UNATTAINABLE)



WATER LINE CROSSING BELOW SEWER
(VERTICAL CLEARANCE UNATTAINABLE)

LEGEND

ALL DIMENSION IN mm UNLESS OTHERWISE INDICATED

DN = NOMINAL DIAMETER OF PIPES

T = PIPE'S WALL THICKNESS

BC = EXTERNAL DIAMETER OF PIPES

N.G. = NATURAL GROUND

uPVC = UNPLASTICIZED POLYVINYL CHLORIDE

HDPE = HIGH DENSITY POLYETHYLENE PIPE

CP = CONCRETE PIPE

RCE = REINFORCED CONCRETE ENCASEMENT

United Nations Development Programme (UNDP)
Programme of Assistance to the Palestinian People

Consulting Engineer

WeeCon

Client: Municipality of Qalqelya

Project:
Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571
Wadi Beit Jala Bethlehem City

Drawing name:
Sewer Collection System
Civil Detail

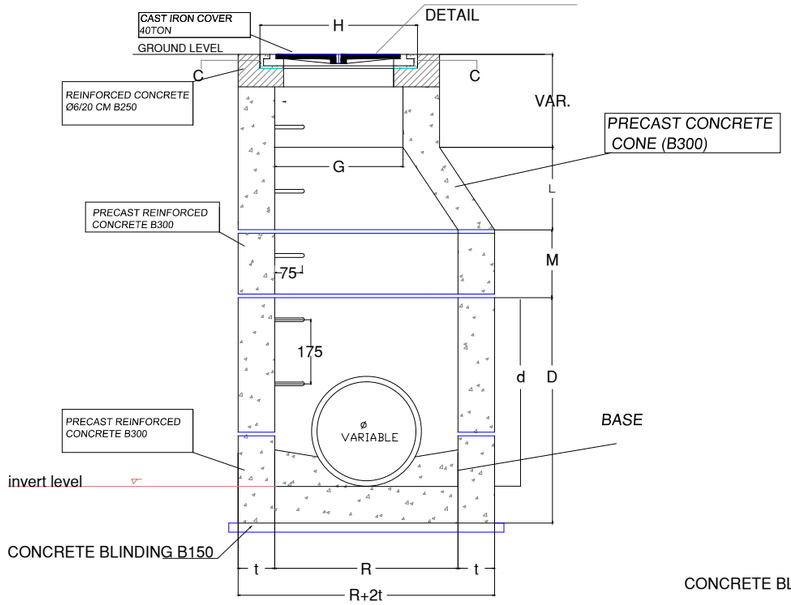
Date / Signature
Dec. 2018

Designed by: Ammar kukhun
Checked by: Ammar Kukhun
Drawn by : Yara Dhoon
Approved by: Ammar kukhun

Drawing No.
004 D

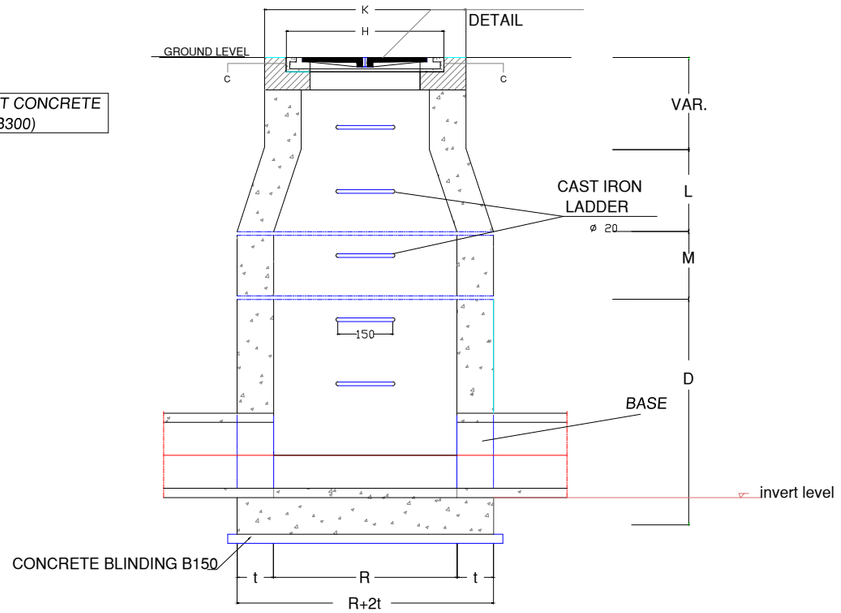
SECTION A-A

HEAVY DUTY, CAST IRON COVER, 40 TON
DIAMETER OF 600 MM WITH FRAME,

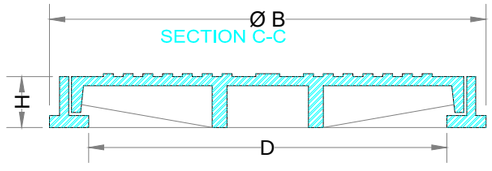


SECTION B-B

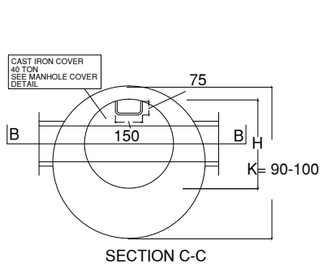
HEAVY DUTY, CAST IRON COVER, 40 TON
DIAMETER OF 600 MM WITH FRAME,

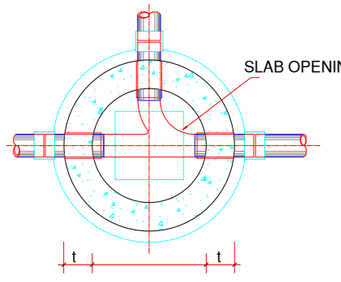


TYPICAL PRECAST MANHOLE FOR 0<H≤3.5m

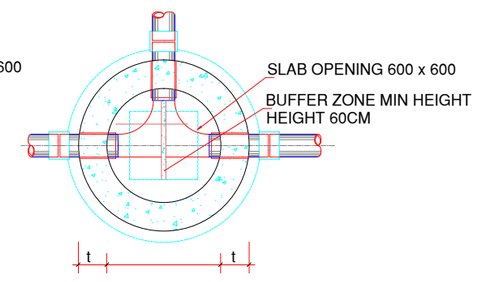


SAMPLE MANHOLE COVER DETAIL





TYPE PLAN FOR MORE
THAN TWO SEWER PIPE IN ONE MANHOLE



SPECIAL PLAN FOR MORE
THAN TWO SEWER PIPE IN ONE MANHOLE

DIM. H cm	WALL WIDTH t cm	HIGHT L cm	HIGHT M cm	WIDTH G cm	HIGHT D cm	HIGHT d cm	DIM. R CM	SYMBOL
Minimum thickness for Base Concrete shall be not less than 20cm Minimum thickness for Wall and Cone shall be not less than 20cm All other Elevations for Manhole as Per Detail D-009								

MANHOLE TABLE

LEGEND

ALL DIMENSION IN mm UNLESS OTHERWISE INDICATED

DN = NOMINAL DIAMETER OF PIPES

T = PIPE'S WALL THICKNESS

BC = EXTERNAL DIAMETER OF PIPES

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RCE = REINFORCED CONCRETE ENCASEMENT

United Nations Development Programme (UNDP)
Programme of Assistance to the Palestinian People

Consulting Engineer

WeeCon

Client: Municipality of Qalqelya

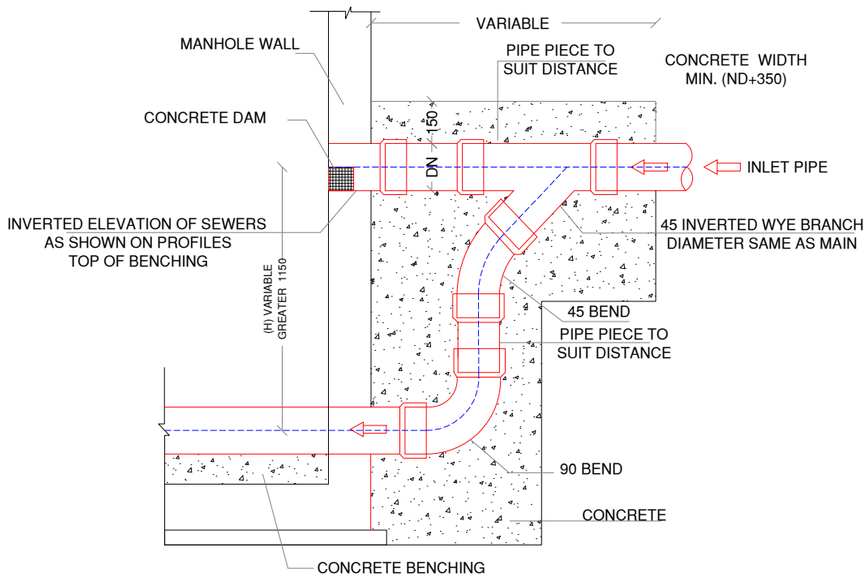
Project:
Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571
Wadi Beit Jala Bethlehem City

Drawing name:
Sewer Collection System
Sewer Manhole Detail

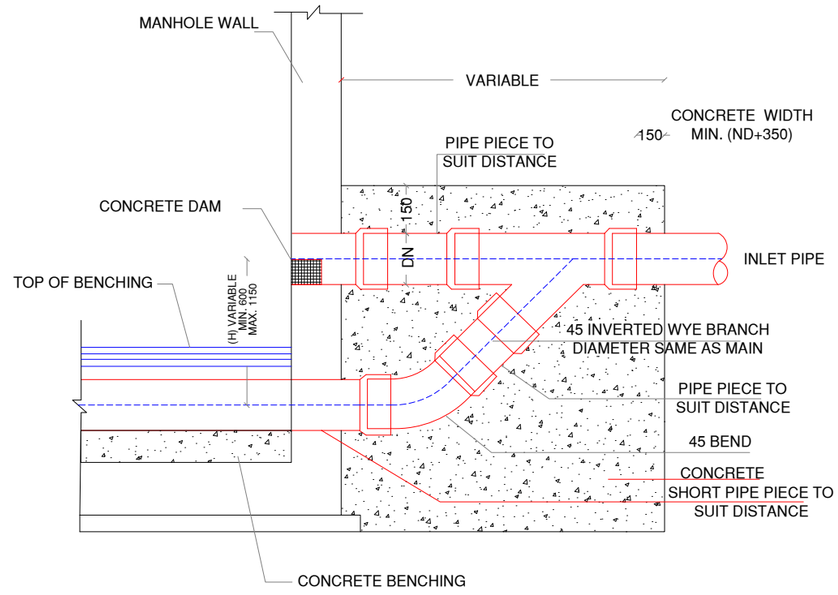
Date / Signature: Dec. 2018

Designed by: Ammar kukhun
Checked by: Ammar Kukhun
Drawn by : Yara Dhoon
Approved by: Ammar kukhun

Drawing No.: 005 D



TYPICAL DROP INLET DETAIL
(TYPE 2) FORH>1150



TYPICAL DROP INLET DETAIL
(TYPE 1) FOR 600≤H≤1150

LEGEND

ALL DIMENSION IN mm UNLESS OTHERWISE INDICATED

DN = NOMINAL DIAMETER OF PIPES

T = PIPE'S WALL THICKNESS

BC = EXTERNAL DIAMETER OF PIPES

N.G. = NATURAL GROUND

uPVC = UNPLASTICIZED POLYVINYL CHLORIDE

HDPE = HIGH DENSITY POLYETHYLENE PIPE

CP = CONCRETE PIPE

RCE = REINFORCED CONCRETE ENCASEMENT

NOTE:

DROP MANHOLES ALSO USED WHEN SLOPE >15%

United Nations Development Programme (UNDP)
Programme of Assistance to the Palestinian People

Consulting Engineer

WeeCon

Client: Municipality of Qalqelya

Project:
Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571
Wadi Beit Jala Bethlehem City

Drawing name	Date / Signature
Sewer Collection System Sewer Drop Manhole Detail	Dec. 2018
Designed by: Ammar kukhun	
Checked by: Ammar Kukhun	Drawing No.
Drawn by : Yara Dhoon	006 D
Approved by: Ammar kukhun	

Location for the proposed flow measurement at Wadi Beit Jala

NOTE:

1-All dimensions in mm unless otherwise indicated

2-Electromagnetic flow Sensor shall be installed according to the manufacture recombination sheet

3-incase section detail presented herein is un comply with the submitted electromagnetic flow sensor by contractor its contractor responsibility to present a detailed drawing on his own cost and shall be approved by the supervising engineer.

4-All concrete mixed shall be B300

United Nations Development Programme (UNDP)
Programme of Assistance to the Palestinian People

Consulting Engineer

WeeCon

Client: Municipality of Qalqelya

Project: Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571 Wadi Beit Jala Bethlehem City

Drawing name: Location for Electromagnetic Flow Sensor To be Installed at Beit Jala and some parts of Bethlehem City (Wadi Beit Jala)

Date / Signature: Dec. 2018

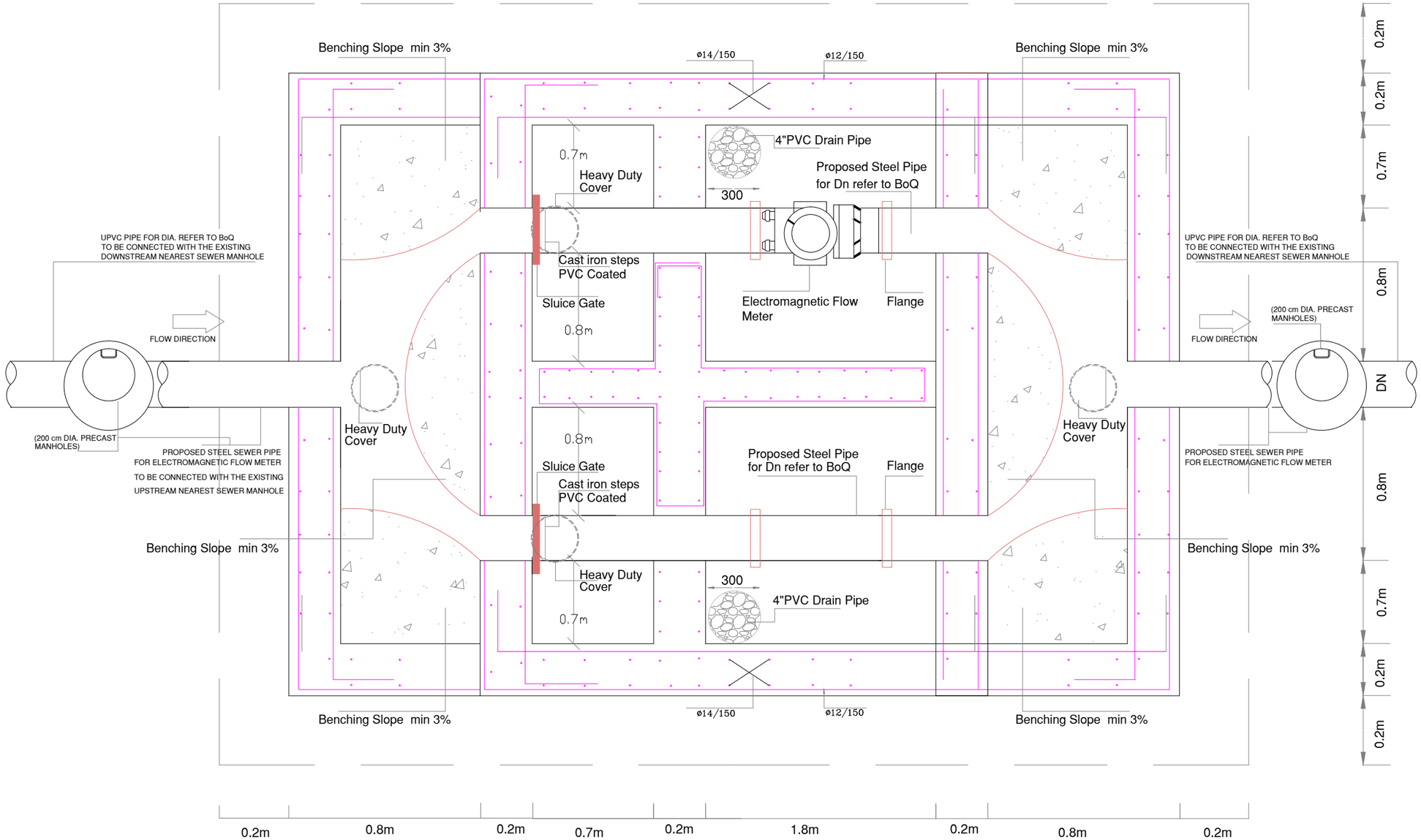
Designed by: Ammar kukhun

Checked by: Ammar Kukhun

Drawn by : Yara Dhoon

Approved by: Ammar kukhun

Drawing No. 007 D



Electromagnetic Flow Sensor Plan Detail

NOTE:

1-All dimensions in mm unless otherwise indicated

2-Electromagnetic flow Sensor shall be installed according to the manufacture recombination sheet

3-incase section detail presented herein is un comply with the submitted electromagnetic flow sensor by contractor its contractor responsibility to present a detailed drawing on his own cost and shall be approved by the supervising engineer.

4-All concrete mixed shall be B300

United Nations Development Programme (UNDP)
Programme of Assistance to the Palestinian People

Consulting Engineer

WeeCon

Client: Municipality of Qalqelya

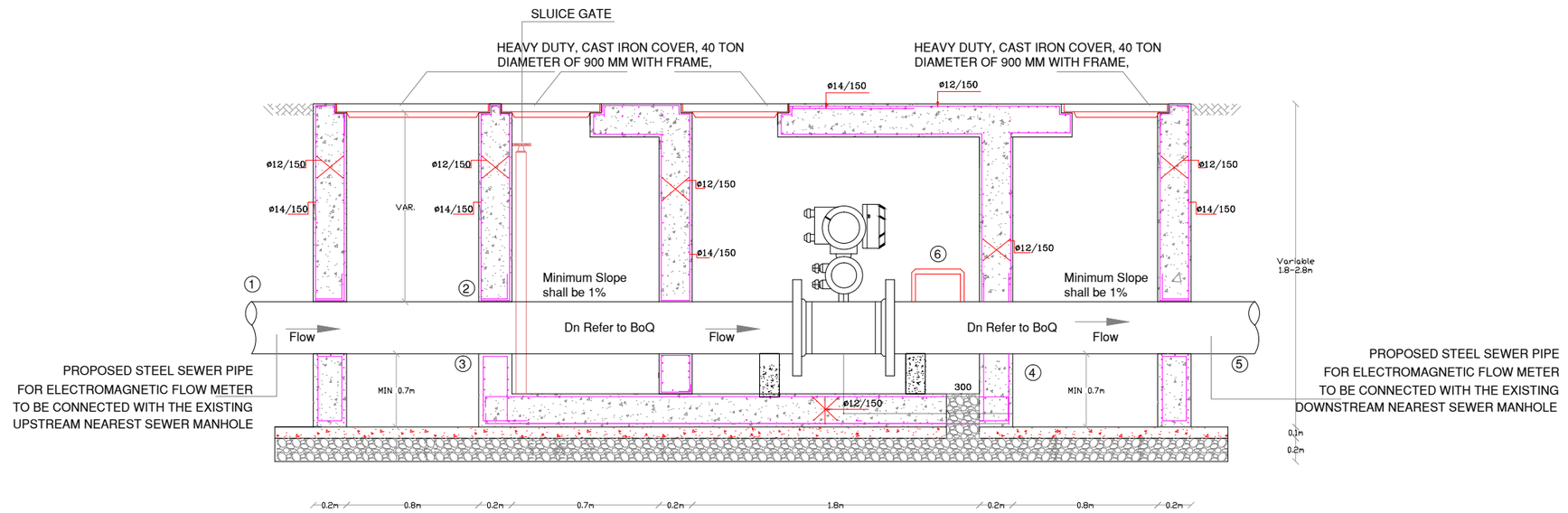
Project:
Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571
Wadi Beit Jala Bethlehem City

Drawing name:
Electromagnetic Flow Sensor Plan Detail
To be Installed at Beit Jala and some parts of Bethlehem City (Wadi Beit Jala)

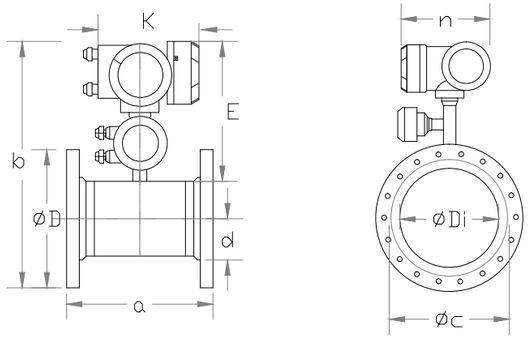
Date / Signature: Dec. 2018

Designed by: Ammar kukhun
Checked by: Ammar Kukhun
Drawn by : Yara Dhoon
Approved by: Ammar kukhun

Drawing No. 008 D



Electromagnetic Flow Sensor Section Detail



Nominal size		Dimensions [mm]						Approx. weight [kg]
DN	PN	a	b	Øc	d	ØD	$ØD_i$	
200	10	350	582	291	146	340	189	40
250	10	400	630	331	166	395	231	54
300	10	500	680	381	191	445	281	66
350	10	500	733	428	214	505	316	95
400	10	600	791	483	242	565	365	115
500	10	600	894	585	293	670	467	145
600	10	600	1003	694	347	780	567	180
700	10	700	1120	812	406	895	666	265
800	10	800	1235	922	461	1015	768	350
900	10	900	1356	1044	532	1115	863	425
1000	10	1000	1447	1132	566	1230	965	520
1200	6	1200	1639	1340	670	1405	1169	659
1400	6	1400	1842	1521	761	1630	1367	835
1600	6	1600	2042	1721	861	1830	1549	1659

Electromagnetic Flow Sensor 2D

Important Note

- Cleaning of flow sensor The flow sensor is highly resistant against dirt and the measurement will rarely be influenced by anything. However, it is advisable to create a possibility for cleaning just in front or behind the sensor

- Regular routine maintenance shall be carried out for the two manholes to prevent from sedimentation

Instructions for Installation

-① sewer manholes with different inlet out let levels

-② if the inlet pipe has a slope > 1%. Make sure that the outlet level of this pipe is bellow the inlet of the Flowmeter

-Slope for ② and ③ shall be 2% minimum

- ③ Inlet Section of Dn refer to BoQ

- ④ Outlet Section of Dn Refer To BoQ

- ⑤ Always free pipe shall be used to prevent back inflow sensor and to keep velocity at the maximum flow at least 1m/s

- ⑥ Opening for cleaning

- The crown of the sewer pipe in 1 shall be always higher than 2 at least 45 cm

- All concrete materials which are in contact with sewer shall be sulfate resistance cement.

- Dimensions that are shown for the Electromagnetic Flow Sensor is not a must Contractor can submit different dimensions that are shown in the table but all shall be approved before the Submission

- Location/s for the Electromagnetic flow meter in drawings D-007 are tentative and subjected to change according to the engineer Instructions, No Extra Costs will be paid for the contractor in case change for location is required by engineer

- Contractor Shall keep the existing Sewer Pipeline in operation during the Construction work, Contractor shall use temporary submersible pump and suction truck whenever its required to prevent over flood of sewer during the construction

-Pipe for Electromagnetic Flow Sensor shall be constructed parallel to the sewer existing Pipe, the existing sewer pipe shall be kept as emergency pipe.

NOTE:

1-All dimensions in mm unless otherwise indicated

2-Electromagnetic flow Sensor shall be installed according to the manufacture recombination sheet

3-incase section detail presented herein is un comply with the submitted electromagnetic flow sensor by contractor its contractor responsibility to present a detailed drawing on his own cost and shall be approved by the supervising engineer.

4-All concrete mixed shall be B300

United Nations Development Programme (UNDP)
Programme of Assistance to the Palestinian People

Consulting Engineer

WeeCon

Client Municipality of Qalqelya

Project
Design Flow Measurement Systems for Trans-Boundary Wastewater Streams Reference No: RFP-PAL-0000049571
Wadi Beit Jala Bethlehem City

Drawing name
Electromagnetic Flow Sensor Detail
To be Installed at Beit Jala and some parts of Bethlehem City (Wadi Beit Jala)

Date / Signature
Dec. 2018

Designed by: Ammar kukhun
Checked by: Ammar Kukhun
Drawn by : Yara Dhoon
Approved by: Ammar kukhun

Drawing No.
009 D