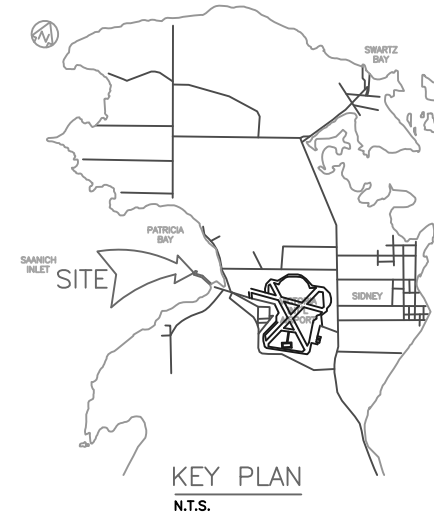




Fisheries and Oceans  
Canada

Pêches et Océans  
Canada

# Institute of Ocean Sciences (IOS) Marine Facility Water System Upgrade



DRAWING No.:

TITLE:

C-000	COVER SHEET
C-001	PLAN – DEMOLITION
C-002	DETAILS – DEMOLITION PLAN
C-003	SITE PLAN – PROPOSED UPGRADES
C-004	PLAN – FIXED WHARF AND FLOAT D
C-005	SECTIONS AND DETAILS – FIXED WHARF
C-006	PLAN – CAUSEWAY AND FLOATS
C-007	SECTIONS AND DETAILS – CAUSEWAY AND FLOATS
C-008	DETAILS – SHEET 1
C-009	DETAILS – SHEET 2
C-010	DETAILS – SHEET 3

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Canada



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#	Revisions	Date
1	ISSUED FOR TENDER	10/06/20
2	ISSUED FOR TENDER	10/06/20
3	ISSUED FOR TENDER	10/06/20
4	ISSUED FOR TENDER	10/06/20
5	ISSUED FOR TENDER	10/06/20
6	ISSUED FOR TENDER	10/06/20

**FISHERIES AND OCEANS**

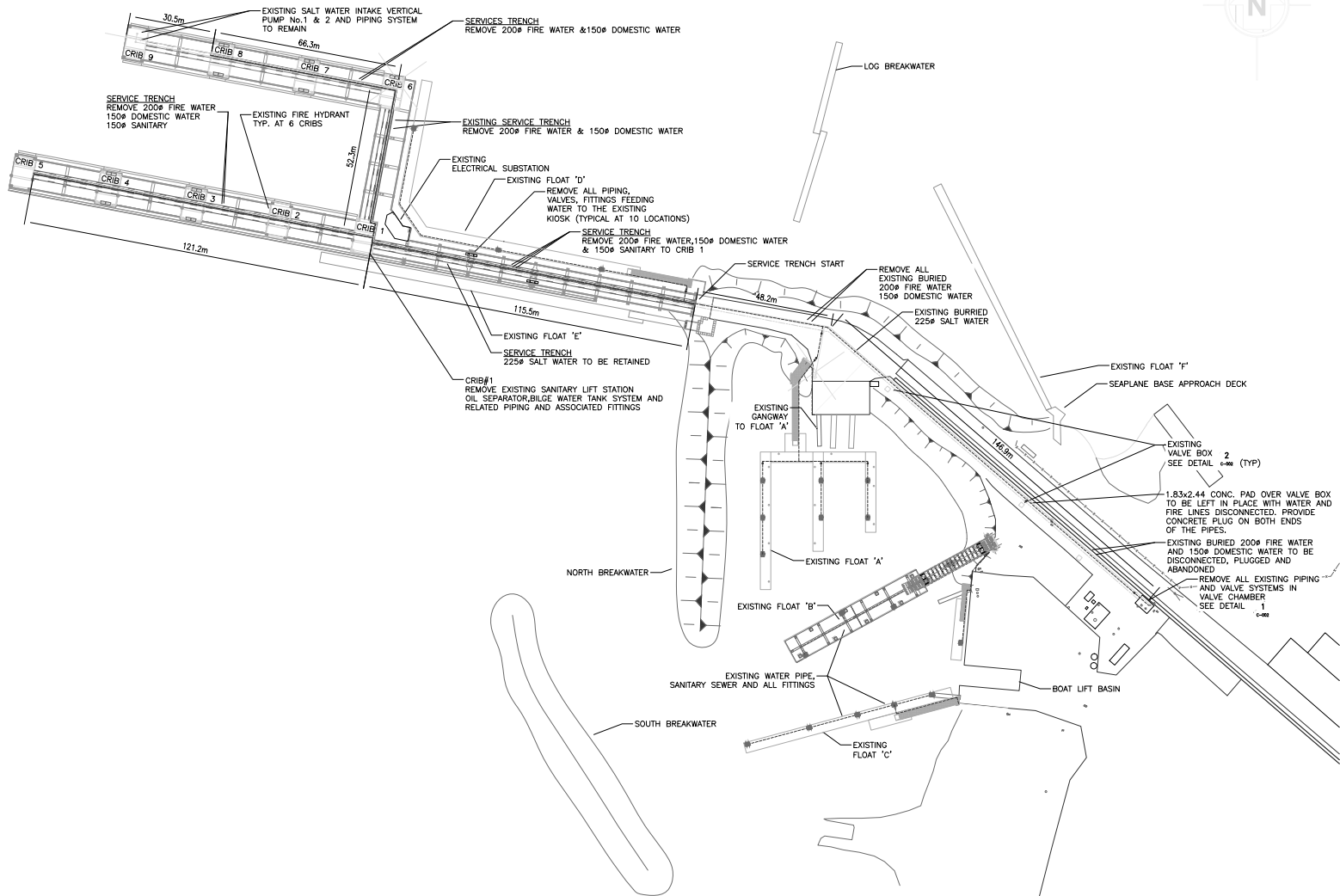
Project title/Titre du projet  
**INSTITUTE OF OCEAN SCIENCES (IOS)  
MARINE FACILITY WATER  
SYSTEM UPGRADE**

Contract Signature Only  
Designed by/Conçu par  
SONNY MANGAT / AUGUST 20, 2019  
Drawn by/Dessiné par  
ALJAFITSEV / AUGUST 20, 2019  
BPC Project Manager/Administrateur de Projets 19000  
MICHAEL LIANG  
Engineer/Ingénieur  
Drawing title/Titre de dessin  
**COVER SHEET**

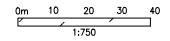
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Sheet/Feuille: **C-000**  
Drawing No./No. de Dessin: **3**  
OF 10

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**DEMOLITION PLAN**  
SCALE: 1:750



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Rev.	Description/Description	Date/Date
5		
4		
3	REVISED ISSUED FOR TENDER	20/06/28
2	REVISED ISSUED FOR TENDER	20/05/13
1	ISSUED FOR TENDER	18/11/30
0	ISSUED FOR TSS REVIEW	18/08/18

**FISHERIES AND OCEANS**

Project Title/Titre du projet

**INSTITUTE OF OCEAN SCIENCES (IOS)  
MARINE FACILITY WATER  
SYSTEM UPGRADE**

Consultant Signature Only

Designed by/Conçue par  
SUNNY MANGAT / AUGUST 19, 2019

Drawn by/Dessiné par  
ALBERTSEV / AUGUST 19, 2019

DFO Project Manager/Administrateur de Projet /PSOC  
MICHAEL LIANG

Regional Manager, Analytical and Engineering Services  
Contrôleur Régional, Services d'Analyse et d'Ingénierie, PSOC

Drawing Title/Titre du dessin

**PLAN -  
DEMOLITION**

Project No./No. du projet DFO: F1700-195235	Sheet/Fauille <b>C-001</b>	Revision No./ No. de Révision <b>0</b>
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*[Signature]*

5		
4		
3	REVISED ISSUED FOR TENDER	20/06/28
2	REVISED ISSUED FOR TENDER	20/05/13
1	ISSUED FOR TENDER	18/11/30
0	ISSUED FOR 75% REVIEW	18/08/20
Revised/ Revisions	Description/Description	Date/Date

**FISHERIES AND OCEANS**

Project Title/Titre du projet

**INSTITUTE OF OCEAN SCIENCES (IOS)  
MARINE FACILITY WATER  
SYSTEM UPGRADE**

Consultant Signature Only

Designed by/Conçue par  
SUNNY MANGAT / AUGUST 20, 2019

Drawn by/Dessiné par  
ALJIBRETEV / AUGUST 20, 2019

DFO Project Manager/Administrateur de Projet IPSSC  
MICHAEL LIANG

Original Manager, Architectural and Engineering Services  
Contrôleur Régional, Services d'ingénierie et de génie, IPSSC

Drawing Title/Titre du dessin

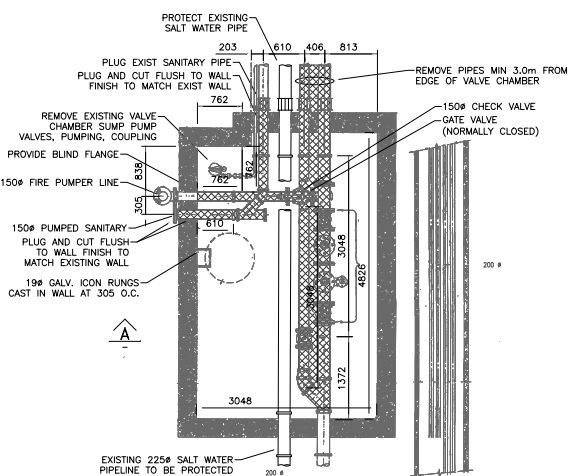
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Project No./No. du  
DFO: F1700 - 195255

Sheet/Feuille  
**C-002**

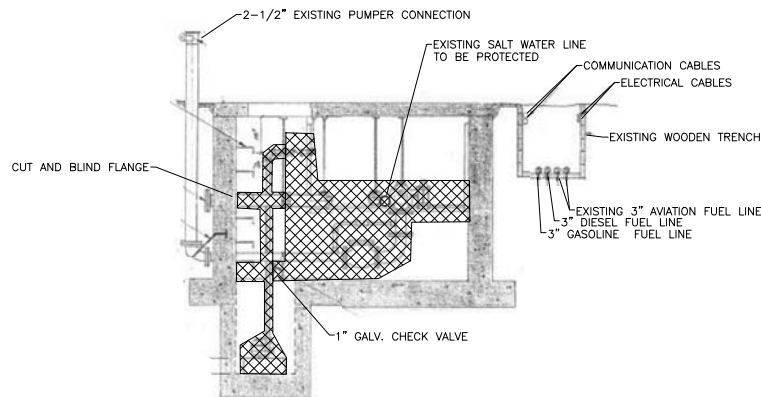
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L.S. Révision  
no. **0**

OF 10

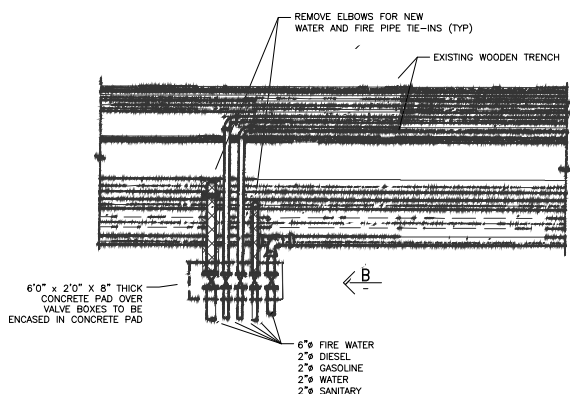


**VALVE CHAMBER - PLAN**

DETAIL 1  
NTS

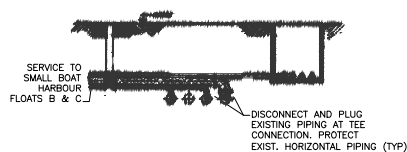


**SECTION A**  
NTS



**VALVE BOX - PLAN**

DETAIL 2  
NTS



**SECTION B**  
NTS

LEGEND:  
[Hatched Box] TO BE REMOVED





Mangat Environmental Solution Inc.



Revisión / Revision	Description / Description	Date / Date
5		
4		
3	REVISED ISSUED FOR TENDER	20/06/20
2	REVISED ISSUED FOR TENDER	20/05/13
1	ISSUED FOR TENDER	18/11/30
0	ISSUED FOR 75% REVIEW	18/08/20

**FISHERIES AND OCEANS**

Project Title/Titre du projet

**INSTITUTE OF OCEAN SCIENCES (IOS)  
MARINE FACILITY WATER  
SYSTEM UPGRADE**

Consultant Signature Only

Designed by/Concept par  
SUNNY MANGAT / AUGUST 20, 2019

Drawn by/Dessiné par  
ALBERTSIEV / AUGUST 20, 2019

DFO Project Manager/Administrateur de Projet /PSOC  
MICHAEL LANG

Professional Engineer / Ingénieur en Génie Civil, 1950C  
MICHAEL LANG

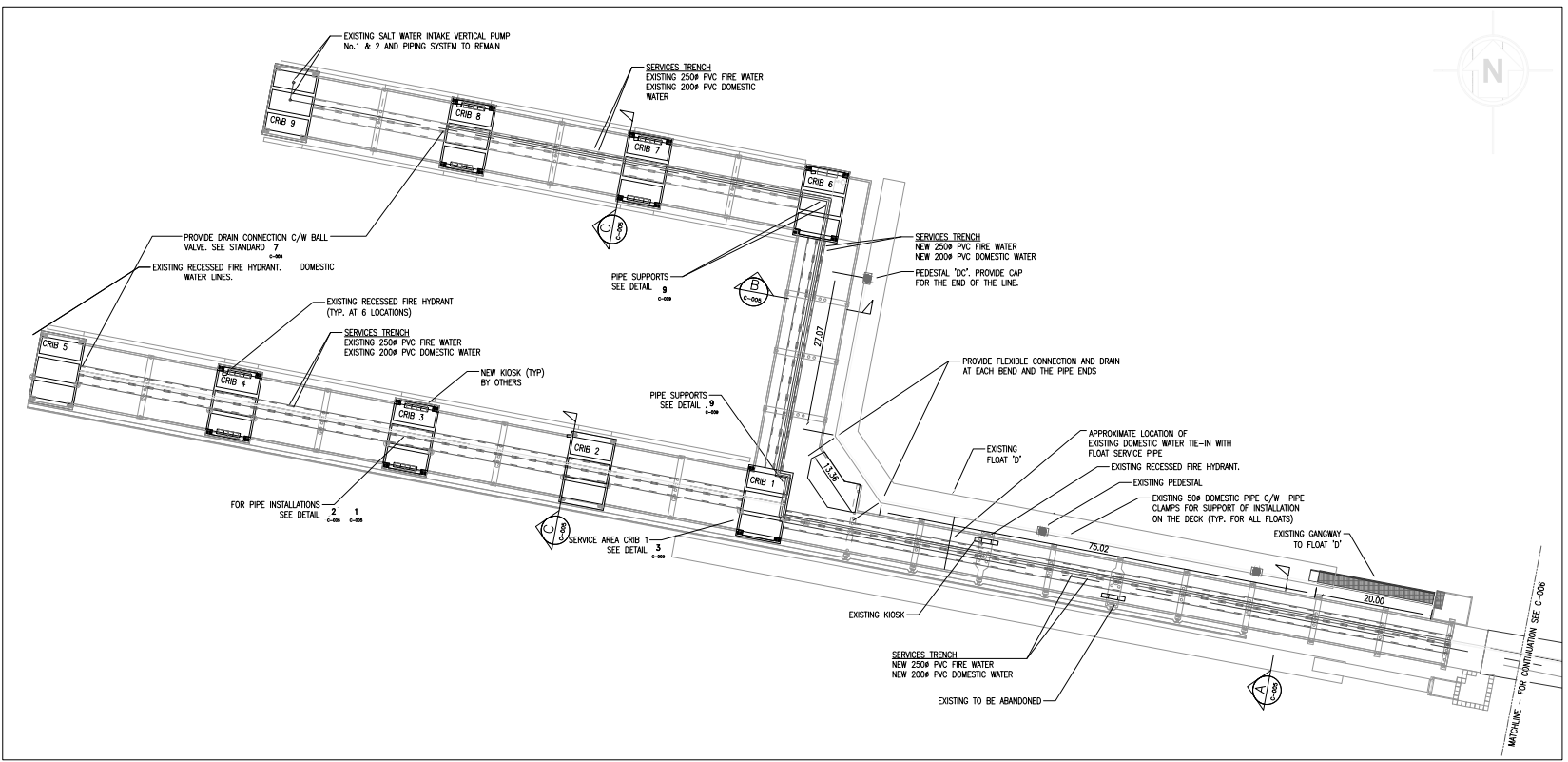
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**PLAN -  
FIXED WHARF AND FLOAT D**

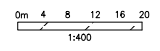
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DFO: F1700-195235	<b>C-004</b>	<b>0</b>

OF 10

DMS000000



**PLAN - FIXED WHARF**  
SCALE: 1:400



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Mangat Environmental Solution Inc.



*S. Mangat*

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2	REVISED ISSUED FOR TENDER	20/05/13
1	ISSUED FOR TENDER	18/11/30
0	ISSUED FOR 75% REVIEW	18/08/30
Revised/Issued	Description/Description	Date/Date

Client/Client

FISHERIES AND OCEANS

Project Title/Titre du projet

INSTITUTE OF OCEAN SCIENCES (IOS)  
MARINE FACILITY WATER  
SYSTEM UPGRADE

Consultant Signature Only

Designed by/Concept par  
SUNNY MANGAT / AUGUST 20, 2019

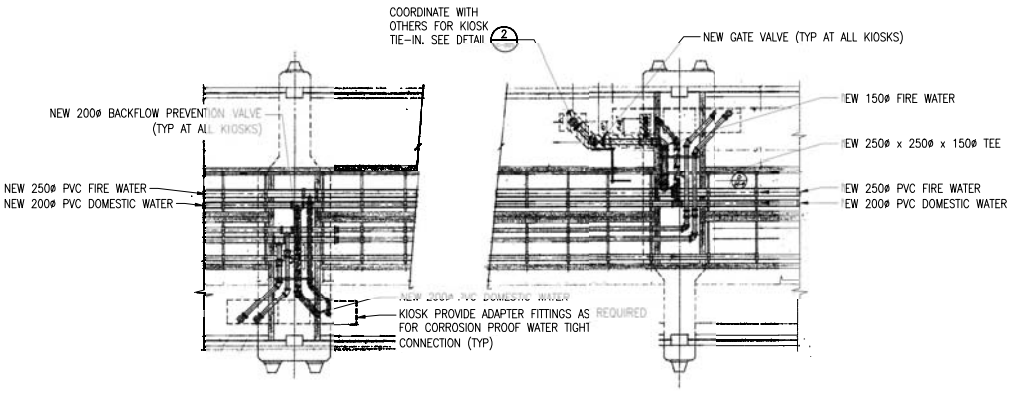
Drawn by/Dessiné par  
A. KUBITSKIY / AUGUST 20, 2019

DFO Project Manager/Administrateur de Projets 1P500  
MICHAEL LIANG

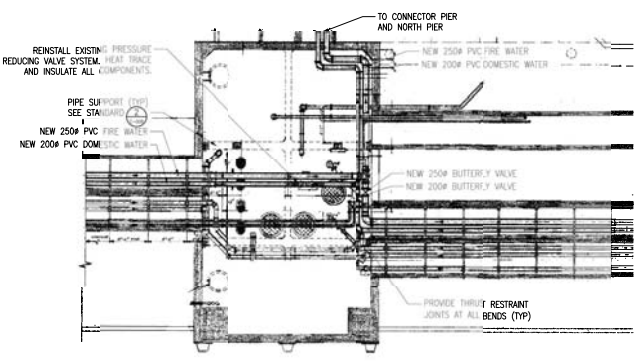
Regional Manager, Architectural and Engineering Services  
Contrôleur Régional, Services d'architectural et de génie, 1P500

Drawing Title/Titre du dessin  
SECTIONS AND DETAILS -  
FIXED WHARF

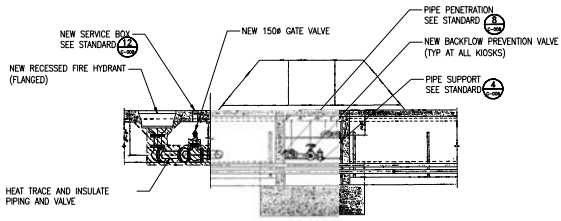
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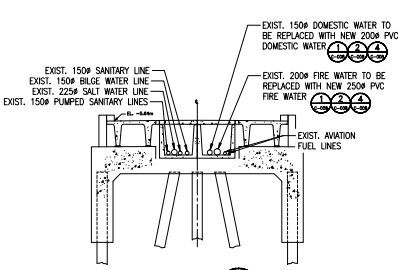
CRIB INSTALLATION - PLAN  
DETAIL 1  
1:50 TYPICAL FOR 12 KIOSKS



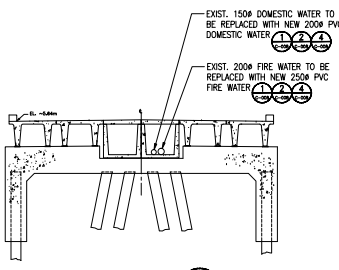
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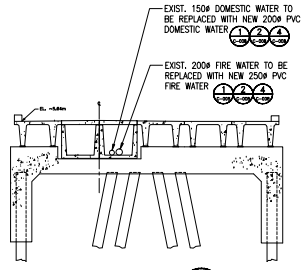
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NOTE: TWO (2) PROVIDED UNDER PHASE 1



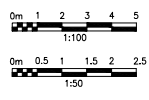
SECTION A  
1:100 C-004



SECTION B  
1:100 C-004



SECTION C  
1:100 C-004



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 Project: F1700 - 195255





Mangat Environmental Solution Inc.



Revisión/Revision	Descripción/Description	Fecha/Date
5		
4		
3	REVISED ISSUED FOR TENDER	20/06/20
2	REVISED ISSUED FOR TENDER	20/05/13
1	ISSUED FOR CONSTRUCTION	18/11/30
0	ISSUED FOR TSS REVIEW	18/08/20

**FISHERIES AND OCEANS**

Project Title/Titre du projet

**INSTITUTE OF OCEAN SCIENCES (IOS)  
MARINE FACILITY WATER  
SYSTEM UPGRADE**

Consultant Signature Only

Designed by/Concept par  
SUNNY MANGAT / AUGUST 20, 2019

Drawn by/Dessiné par  
ALBERTSEV / AUGUST 20, 2019

DFO Project Manager/Administrateur de Projet /PSOC  
MICHAEL LIANG

Regional Manager, Architectural and Engineering Services  
Contrôleur Régional, Services d'architectural et de génie, PSOC

Drawing Title/Titre du dessin

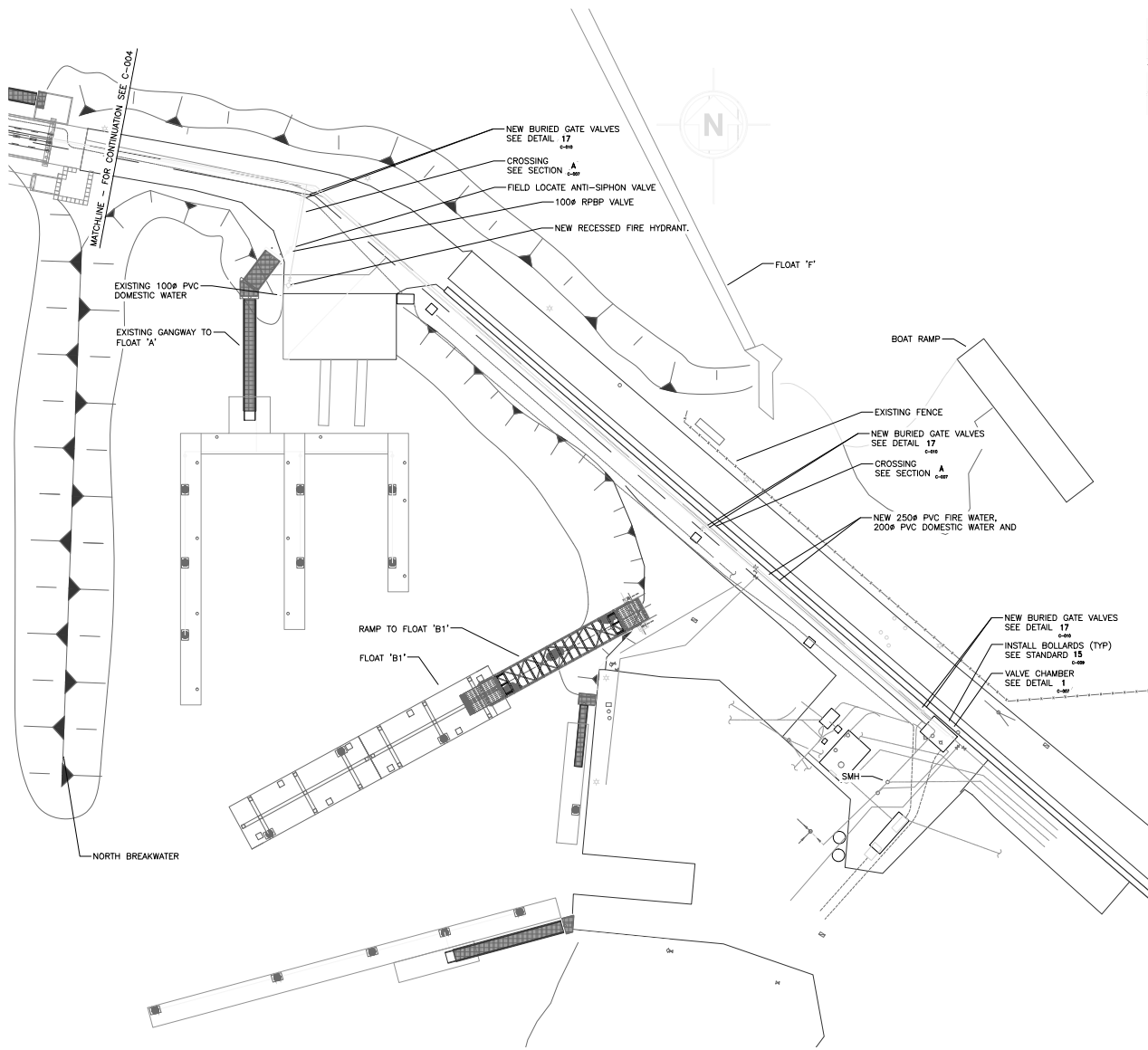
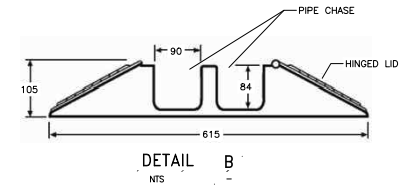
**PLAN -  
CAUSEWAY AND FLOATS**

Project No./No. du projet  
DFO: F1700-195255

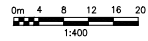
Sheet/Feuille  
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Revision No./  
No. de révisión  
**0**

OF 10



**PLAN - CAUSEWAY**  
SCALE: 1:400





Mangat Environmental Solution Inc.



*(Signature)*

Revision/Revisions	Description/Description	Date/Date
5		
4		
3	REVISED ISSUED FOR TENDER	20/06/20
2	REVISED ISSUED FOR TENDER	20/05/13
1	ISSUED FOR TENDER	18/11/30
0	ISSUED FOR 75% REVIEW	18/08/20

**FISHERIES AND OCEANS**

Project Title/Titre du projet

**INSTITUTE OF OCEAN SCIENCES (IOS)  
MARINE FACILITY WATER  
SYSTEM UPGRADE**

Consultant Signature Only

Designed by/Conçue par  
SUNNY MANGAT / AUGUST 20, 2019

Drawn by/Dessiné par  
LAURETTEV / AUGUST 20, 2019

DFO Project Manager/Administrateur de Projets TP50C  
MICHAEL LANG

Regional Manager, Architectural and Engineering Services  
Gestionnaire Régional, Services d'architecture et de génie, TP50C

Drawing Title/Titre du dessin

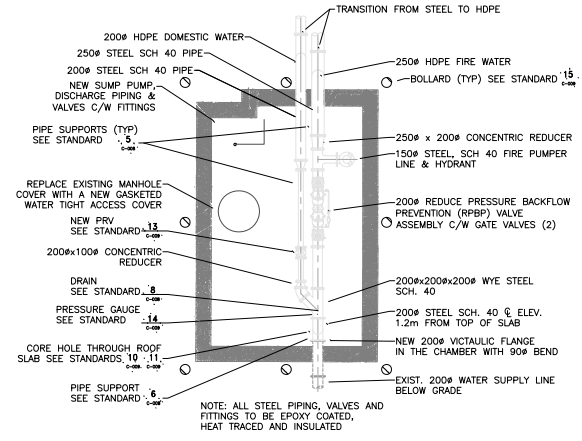
**SECTIONS AND DETAILS-  
CAUSEWAY AND FLOATS**

Project No./No. du projet  
DFO: F1700 - 195255

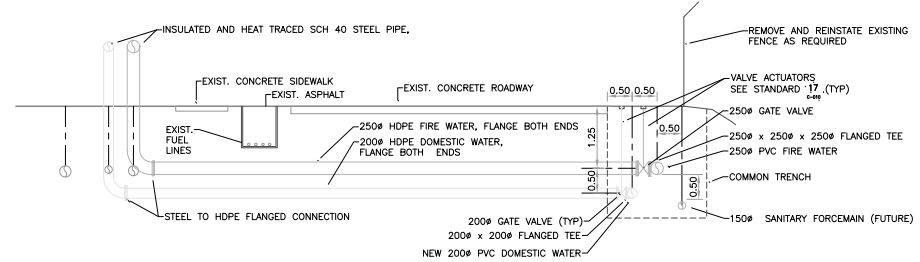
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**C-007**

Revision no./  
Le Révision  
**0**

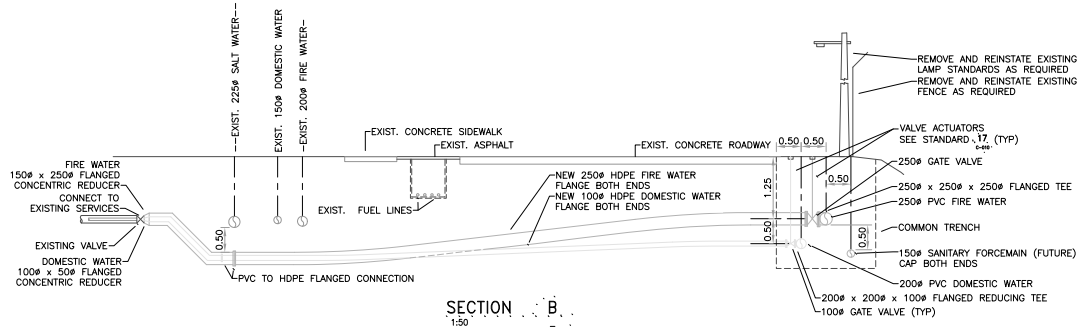
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**VALVE CHAMBER - PLAN  
DETAIL 1:50**



**SECTION A  
1:50**

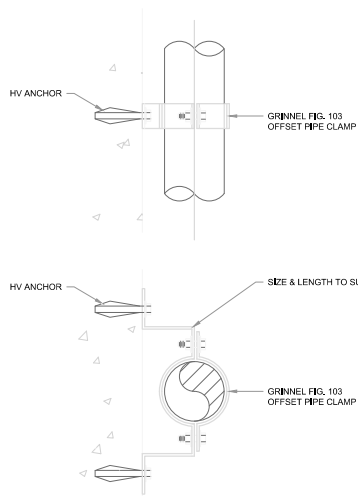


**SECTION B  
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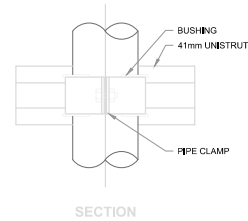
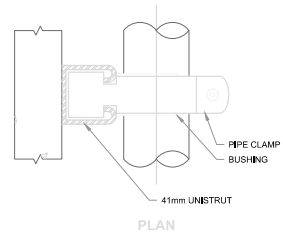
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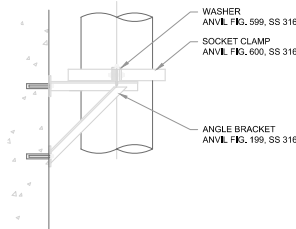
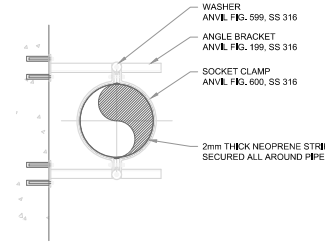


- NOTES:
- SUITABLE FOR PIPES 250 TO 3000
  - GALVANIZE ALL METAL PARTS AND HARDWARE
  - SUITABLE FOR WALL OR FLOOR SUPPORTED PIPE
  - FOR WOOD STRUCTURE SUPPORTED PIPE PROVIDE SS316 75mm SCREWS C/W WASHERS INSTEAD OF HV ANCHORS

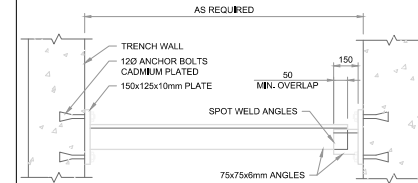
OFFSET PIPE SUPPORT 1  
NTS



WALL MOUNTED PIPE SUPPORT 2  
NTS

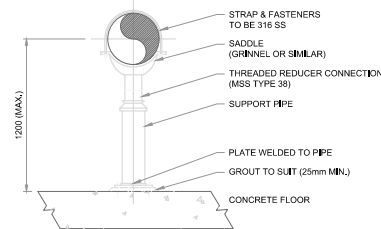


VERTICAL PIPE SUPPORT 3  
NTS



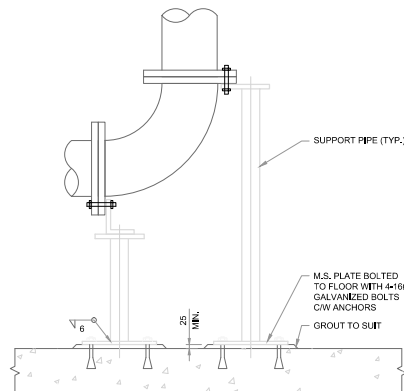
NOTE: ALL PARTS TO BE GALVANIZED.

TRENCH PIPE SUPPORT 4  
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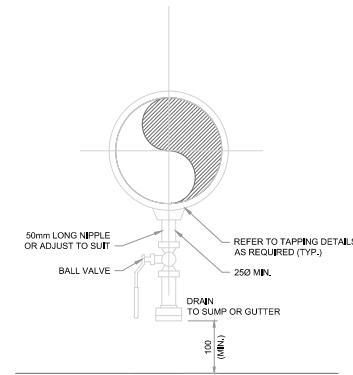
PIPE SIZE (mm)	SUPPORT PIPE (mm)	PLATE SIZE (mm)
50	38	150 X 150 X 9.5
75	50	250 X 250 X 9.5
100	75	250 X 250 X 9.5
150	100	250 X 250 X 9.5
200	150	250 X 250 X 9.5
250	200	300 X 300 X 9.5

ADJUSTABLE PIPE SUPPORT 5  
NTS



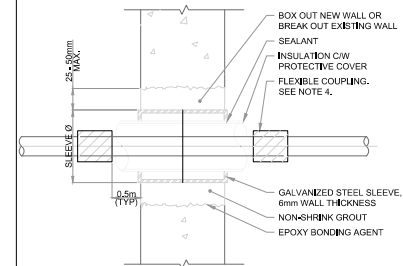
PIPE SIZE (mm)	SUPPORT PIPE (mm)	PLATE SIZE (mm)	MAXIMUM SUPPORT PIPE LENGTH (mm)
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150	50 SCH 40	150 X 150 X 10	1525
200	100 SCH 40	250 X 250 X 10	1625
250	100 SCH 40	250 X 250 X 10	1625
300	100 SCH 40	250 X 250 X 10	1830
350	100 SCH 40	250 X 250 X 10	1830
400	100 SCH 40	250 X 250 X 10	1830
500	100 SCH 40	250 X 250 X 10	1830
600	150 SCH 40	300 X 300 X 10	1830
750	150 SCH 40	300 X 300 X 10	1830
900	150 SCH 40	300 X 300 X 10	1830

BASE ELBOW SUPPORT 6  
NTS



NOTE: WHEN SERVICE PIPE IS MORE THAN 1800 mm ABOVE FLOOR, DRAIN SHALL BE PIPED DOWN NEAREST WALL WITH A VALVE 1200 mm ABOVE FINISHED FLOOR.

DRAIN CONNECTION 7  
NTS



NOTES:

- NEW OR EXISTING CONCRETE OR MASONRY WALLS.
- INSULATED PIPE
  - DRY TO DRY
- PROVIDE FLEXIBLE COUPLING (SAME PRESSURE RATING AS THE PIPE) ON EACH END OF THE CONCRETE WALL PENETRATION. COUPLING SHALL PROVIDE BOTH ANGULAR AND AXIAL DEFLECTION CAPABILITY.

NOMINAL PIPE I.D. (mm)	INSULATION THICKNESS	WALL SLEEVE Ø (mm)
32	25	100
38	25	125
50	25	125
65	25	150
75	25	150
100	25	200
150	25	250
200	25	300

WALL PENETRATION - INSULATED PIPE 8  
NTS



Mangat Environmental Solution Inc.

NOTES:

- ALL PIPE SUPPORT MATERIAL TO BE GALVANIZED STEEL



Revised/Revised	Description/Description	Date/Date
5		
4		
3		
2	REVISED ISSUED FOR TENDER	20/06/20
1	ISSUED FOR TENDER	18/11/20
0	ISSUED FOR 75% REVIEW	18/08/20

FISHERIES AND OCEANS

Project Title/Titre du projet

INSTITUTE OF OCEAN SCIENCES (IOS)  
MARINE FACILITY WATER  
SYSTEM UPGRADE

Consultant Signature Only

Designed by/Concept par  
SUNNY MANGAT / AUGUST 20, 2019

Drawn by/Dessiné par  
ALBERTSEV / AUGUST 20, 2019

DFO Project Manager/Administrateur de Projet P250C  
MICHAEL LIANG

Regional Manager, Architecture and Engineering Services  
Géomatics, Pélagiques, Systèmes d'infrastructure et de grille, P250C

Drawing Title/Titre du dessin

DETAILS - SHEET 1

Project No./No. du  
DFO: F1700-195255

Sheet/Feuille  
C-008

Revision No./  
No. de révis.  
0

OF 10



Mangat Environmental Solution Inc.  
2995, 140 Str, Surrey BC, V4P 2C3



5		
4		
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2	REVISED FOR TENDER	20/06/18
1	ISSUED FOR TENDER	18/11/20
0	ISSUED FOR 75% REVIEW	18/08/20
Revised/ Revisions	Description/Description	Date/Date

**FISHERIES AND OCEANS**

Project Title/Titre du projet

**INSTITUTE OF OCEAN SCIENCES (IOS)  
MARINE FACILITY WATER  
SYSTEM UPGRADE**

Consultant Signature Only

Designed by/Concept par  
SUNNY MANGAT / AUGUST 20, 2019

Drawn by/Designé par  
ALBERTSEV / AUGUST 20, 2019

DFO Project Manager/Administrateur de Projet TP50C  
MICHAEL LIANG

Regional Manager, Architecture and Engineering Services  
Contrôleur Régional, Services d'architecture et d'ingénierie, 1950C

Drawing Title/Titre du dessin

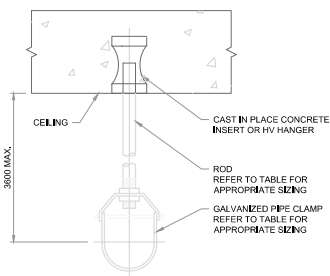
**DETAILS - SHEET 2**

Project No./No. du projet  
DFO: F1700-195255

Sheet/Feuille  
**C-009**

Revision No./  
Révision no.  
**0**

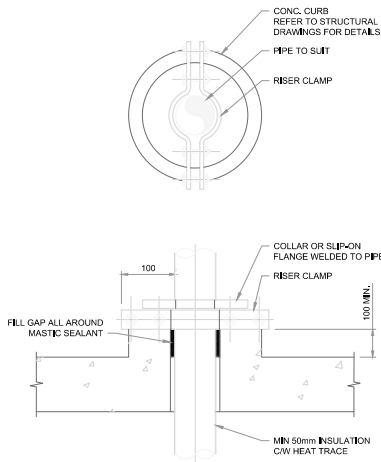
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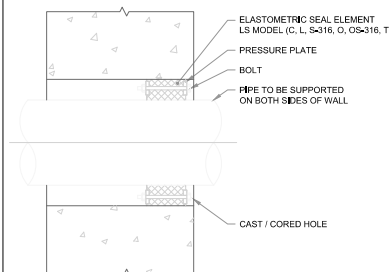
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50	8.4	280
75	12.0	510
100	16.3	800
150	20.0	1230
200	22.0	1710
250	25.0	2250
300	25.0	2250
350	25.0	2250
400	25.0	2250
450	25.0	2250
500	32.0	3630
600	32.0	3630

GRINNEL OR SIMILAR, SAFETY FACTOR = 5

**SINGLE PIPE HANGER 9**  
NTS



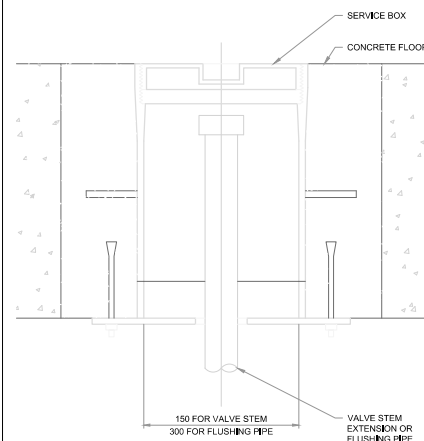
**FLOOR PENETRATION SUPPORT 10**  
NTS



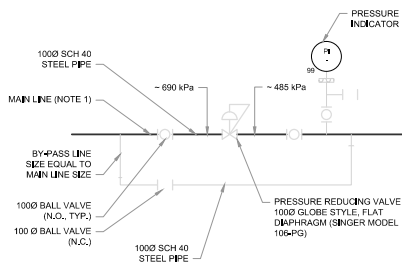
LS MODEL	SEAL ELEMENT	BOLTS / NUTS	PRESSURE PLATE
C	EPDM (BLACK)	ZINC DECHROMATE/ORGANIC COATED CARBON STEEL BOLT	REINFORCED NYLON POLYMER
L	EPDM (BLACK)	ZINC DECHROMATE/ORGANIC COATED CARBON STEEL BOLT	REINFORCED NYLON POLYMER
O	NITRILE	ZINC DECHROMATE/ORGANIC COATED CARBON STEEL BOLT	REINFORCED NYLON POLYMER
T	SILICONE	ZINC DECHROMATE/ORGANIC COATED CARBON STEEL BOLT	STEEL, ZINC DECHROMATE
(CLO) *	SEE MODEL OPTIONS	316 STAINLESS STEEL	REINFORCED NYLON POLYMER

- NOTES:**
- CONCRETE WALL
  - STEEL, STAINLESS STEEL, DUCTILE IRON, PVC OR FRP PIPE; NON-INSULATED
  - CONDITION
    - DRY TO DRY
    - WET TO DRY
    - HORIZONTAL OR VERTICAL
    - INTERIOR TO EXTERIOR

**CORED PENETRATION - LINKSEAL 11**  
NTS

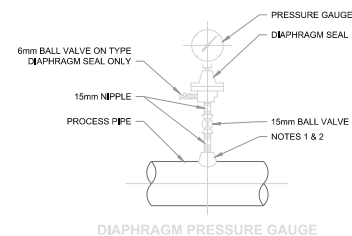


**SERVICE BOX 12**  
NTS

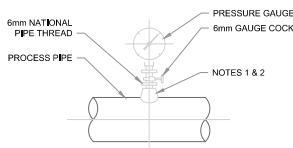


- NOTES:**
- TYPICAL ARRANGEMENT FOR LINE SIZES FROM 100 - 1500.
  - ENSURE THAT PIPING AROUND VALVES IS WELL SUPPORTED.

**PRV INSTALLATION 13**  
NTS



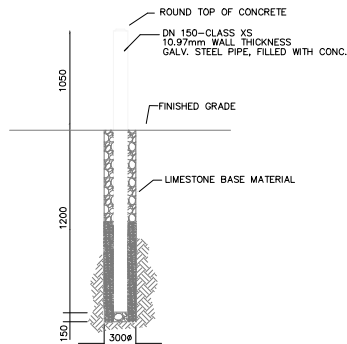
**DIAPHRAGM PRESSURE GAUGE**



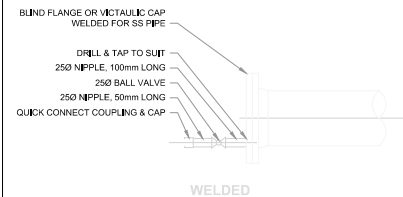
**PRESSURE GAUGE**

- NOTES:**
- FOR STEEL, GALVANIZED STEEL, AND PVC 65mm AND SMALLER USE A BUSHING IN A TEE.
  - FOR DUCTILE IRON AND FIBERGLASS REINFORCED PLASTIC PIPE, ALL SIZES, USE PIPE SADDLE WITH BUSHING.
  - FOR STEEL AND STAINLESS STEEL PIPES 80mm AND LARGER, AND PRESSURE VESSELS, USE THRO-ON-LET AS SHOWN.
  - PROVIDE SNUBBER FOR POSITIVE DISPLACEMENT PUMP INSTALLATIONS.

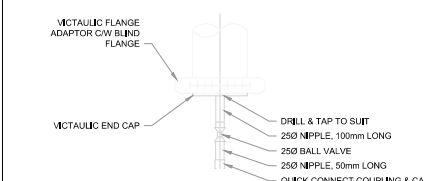
**PRESSURE GAUGE 14**  
NTS



**BOLLARD INSTALLATION 15**  
NTS



**WELDED**



**VICTAULIC**

**PIPE FLUSHING CONNECTIONS 16**  
NTS



Mangat Environmental Solution Inc.



*[Signature]*

5		
4		
3		
2	REVISED ISSUED FOR TENDER	20/06/20
1	ISSUED FOR TENDER	18/11/20
0	ISSUED FOR 75% REVIEW	18/08/20
Revised/ Revisions	Description/Description	Date/Date

Client/Client

**FISHERIES AND OCEANS**

Project Title/Titre du projet

**INSTITUTE OF OCEAN SCIENCES (IOS)  
MARINE FACILITY WATER  
SYSTEM UPGRADE**

Consultant Signature Only

Designed by/Concept par  
SUNNY MANGAT / AUGUST 20, 2019

Drawn by/Dessiné par  
ALBERTSEV / AUGUST 20, 2019

DFO Project Manager/Administrateur de Projet IP50C  
MICHAEL LIANG

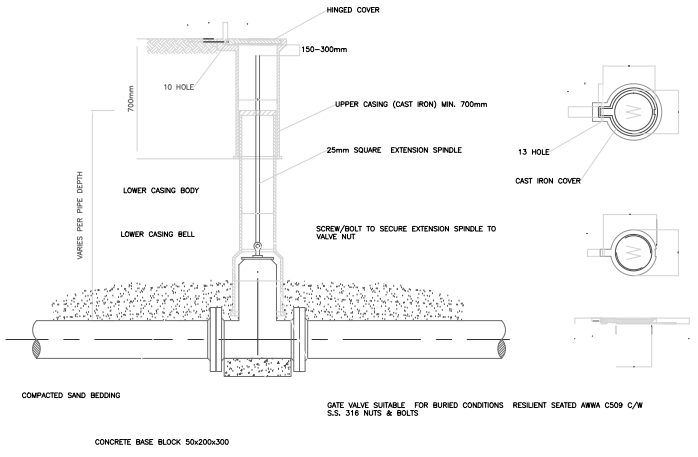
Regional Manager, Architectural and Engineering Services  
Chercheur principal, Services d'architectural et de génie, IP50C

Drawing title/Titre du dessin  
**DETAILS - SHEET 3**

Project No./No. du  
DFO: F1700-195255

Sheet/Feuille  
**C-010**  
OF 10

Revision no./  
No. de révis.  
**0**



**GATE VALVE INSTALLATION** 17  
NTS

