

DUSUP GUIDELINES FOR STRUCTURES CLOSE TO DUSUP CORRIDOR

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1 INTRODUCTION

Dubai Supply Authority (DUSUP) provides energy supply (Natural Gas) to Emirate of Dubai to meet the needs of electricity generation and water desalination through its pipeline network. Through the production of natural gas (which is processed into gas and condensate products), the purchase of pipeline gas and LNG (and its regasification), gas storage and the operation of the pipeline network, DUSUP plays a key role in the growth and development of Dubai.

DUSUP has assigned Dubai Petroleum Establishment (DPE) the responsibility for operating DUSUP assets and authorised DPE to manage all emergency events occurring on its own operated facilities, pipelines and assets within pipeline corridors in liaison with other governmental entities.

DPE-DUSUP designs, operates and maintains DUSUP's onshore pipelines and related facilities to International Standards in order to ensure an uninterrupted flow of gas and other hydrocarbons across Dubai.

There are approximately 700 kilometres of onshore hydrocarbon pipelines operating in Dubai. The gas pipelines operate at high-pressures up to 960-psig and transport highly explosive and flammable natural gas. A number of jet fuel and fuel oil pipelines share the corridors with the gas and condensate pipelines.

2 PURPOSE

The purpose of this guideline is to assist DUSUP/DPE NOC staff for NOC review and field staff for monitoring safe execution of construction of structures adjacent to DUSUP corridor, and a guide for NOC applicants (Consultants & Contractors) on the requirements for NOC application acceptance.

3 REFERENCES

DUSUP NOC Standard Conditions - DP-OPSON-0056

4 ABBREVIATIONS & DEFINATIONS

4.1 Abbreviations:

Abbreviation	Description
ALARP	As Low As Reasonably Practicable
CDM	Cement Deep Mixing
DPE	Dubai Petroleum Establishment
EMARAT	Emirates General Petroleum Corporation
EMDAD	EMARAT, Air BP and Shell Joint Venture
ENOC	Emirates National Oil Company
e-NOC	Electronic NOC
GCS	Gas Control Station
HSE	Health, Safety and Environment
MS	Method Statement

MSRA	Method Statement and Risk Assessment
NOC	No Objection Certificate
PPE	Personal Protective Equipment
PTW	Permit to Work
RA/TRA	Risk Assessment/ Task Based Risk Analysis
ROW	Road Right of Way (of RTA)
RTA	Roads and Transport Authority

4.2 Definitions:

Term	Definition
Accident	The unexpected and undesirable occurrence directly associated with DUSUP operations and DUSUP asset/facility, which results or may result in human casualties or damage to property.
ALARP	In risk assessment when the risk is assessed and controlled the residual risk shall be reduced to ALARP(as low as reasonably practicable)
Berm	A soil bund built over the pipeline as a protection cover.
Construction	The erection of any new buildings or structures, or the variations to the Infrastructure facilities or existing asset.
Consultant	A natural or legal person who is offering advice/consultation on engineering, technical, or any other matter related to design and construction.
Contractor	An organization designated by the Owner or the Operator for the purpose of carrying out the works related to Construction, or execution of any work that requires obtaining of No Objection Certificates from the DUSUP.
Control Measure	Provisions to reduce identified risks.
CDM (Cement Deep Mixing)	Cement Deep Mixing is a ground improvement method by mixing cement slurry with soft soil.
DPE	Dubai Petroleum Establishment responsible for the Operation of DUSUP Asset.
DUSUP Corridor	DUSUP Corridor is the land allocated by Dubai Municipality or other statutory government authority to DUSUP for the construction, operation and maintenance of gas and fuel pipelines in the emirates of Dubai.
e-NOC	The electronic NOC application that can be submitted via the online system: https://noc.rta.ae/RTAeNOC/Webpages/common/login/login.aspx
Hazard	A Hazard is any source of potential damage, harm or adverse effects on people, property environment or organization.

No Objection Certificate (NOC)	A document approved by the DUSUP through e-NOC, for the technical design of proposed development or authorizing a contractor to carry out a Construction/Restricted Activity within the NOC Zones.
NOC Zone	DUSUP NOC Zones are : <ul style="list-style-type: none"> • 60 meter either side from the center of pipelines or 60m from DUSUP Corridor limit, whichever is greater. • 10 meter either side of the pipelines located within DEWA or EGA (DUBAL) Plot limits. • 5 meter either side from the center of 8" Shell pipeline (Abandoned, Positively Isolated). • 300 meter for High Voltage Over Head Lines parallel to hydrocarbon pipelines/pipeline corridor. • 500 meter for Subsea Pipelines. • 500 meter for Land Use Planning adjacent to DUSUP Pipeline/Pipeline Corridor.
Permit to Work (PTW)	A written or digital approval granted by DPE that authorises a person or persons to carry out specific work within a specified time frame within the proximity of DUSUP asset/plot boundary limit.
Patrol staff, Pipeline Representative or Pipeline Operator	The staff designated by DUSUP the duties of witnessing NOC works for compliance with NOC conditions and monitoring the safety of the pipelines.
Risk	A situation involving exposure to danger
Risk Assessment	A report prepared by the Applicant/Customer seeking DUSUP NOCs, identifying potential risks and mitigation measures involved in carrying out any Construction or Restricted Activity within the DUSUP NOC Zones.
Safety	The absence of any risk of harm or damage to the people, DUSUP asset/Infrastructure that is deemed unacceptable as per the DUSUP/DPE Safety Regulation or Standard Operating Procedure.
Soft Soil	Soft soil is a soil that is susceptible to excessive penetration of water due to its density or composition. e.g. Sandy soil, gravel.
Utilities	Utilities are means of supply of essential services such as electricity & communication through cables, water, drainage and natural gas or fuel oil through the pipelines.
Utility Owners	Owners of utilities such as: drainage lines (DM), Electricity & Water(DEWA), ITS Services(RTA), Telephone(Etisalat, Du), Other communication cables(UAE Armed Forces), etc.,
Witnessing Zone	Work within 10 meters of hydrocarbon pipeline can only be carried in the presence (witnessing) of DUSUP Pipeline Representative in order to witness and record safe implementation of NOC work.

5 STRUCTURES CLOSE TO DUSUP CORRIDOR

New structures may be constructed outside and adjacent to the DUSUP corridor. The design and construction of such structures require review and approval through the NOC process.

Approval of such structures adjacent or close to the DUSUP corridor limit shall not infringe upon DUSUP's right to unrestricted use of corridor for the operation and maintenance of existing pipelines, and the construction of future pipelines.

Any structure close to the pipeline corridor must be fully supported off the corridor to enable excavation up to 3.5m deep along the pipeline corridor edge.

Following are the various types of constructions covered under this guideline document:

- a) Fence & Boundary wall
- b) Buildings
- c) Underground Storage tank
- d) Storm water /Dewatering Pond near Pipeline Corridor.
- e) Soil Embankment Parallel to Pipeline
- f) Utilities Parallel to Pipeline /Pipeline Corridor.

Subsequent sections stipulate the minimum requirements to be followed in order to obtain an NOC.

6 NOC TYPES & SUBMISSION REQUIREMENTS

For a structure adjacent or close to the DUSUP corridor limit, following DUSUP NOCs are applicable:

- Informational NOC
- Preliminary Design NOC
- Final Design NOC
- Construction NOC
- Final Clearance NOC / NOC Close-out

6.1 Information NOC

Existing, planned pipeline and related facility information along with the corresponding DUSUP Guidelines and Standard DUSUP NOC Conditions are shared with the applicants (consultant or contractor) for the design and construction of proposed work through the RTA's e-NOC System.

6.1.1 Information NOC - Submission Requirements

- a) AutoCAD drawing on DLTM coordinates datum showing the proposed Project Limit Plan for issuing Pipeline Information.
- b) Pdf file of drawing showing proposed Project Limit Plan for issuing Pipeline Information.
- c) For issuing Pipeline information, it is mandatory for the applicant to submit a confidentiality undertaking letter as per the DUSUP approved letter template. The Confidentiality Undertaking Letter template can be downloaded from DUSUP website using link: <https://www.dusup.ae/noc>
- d) Undertaking letter must be submitted with company stamp and signed by the authorized company representative.

Note: Information NOC will be issued with DUSUP Standard NOC Conditions, AutoCAD file of existing pipeline information, corridor limits, corridor fence and gate locations, desert crossings and other facilities such as valve station fence and pigging facilities and applicable guidelines.

6.2 Preliminary Design NOC

Preliminary Design NOCs are initial design proposals seeking input and approval in order to proceed with the Final Design.

6.2.1 Preliminary Design - Submission Requirements

- a) Key Plan showing project location.
- b) General Layout Plan incorporating existing site conditions, proposed work, DUSUP corridor limit, pipelines/ facilities as provided in the Information NOC.
- c) AutoCAD file of General Layout Plan drawing prepared on DLTM coordinates datum.
- d) Typical Cross Section drawings showing details provided via Information NOC, i.e., DUSUP corridor fence, existing HC pipelines in the proximity of proposed work and proposed structure.
- e) Include applicable notes from the DUSUP Standard NOC Conditions and relevant DUSUP Guidelines in the drawing (refer to DUSUP webpage: <https://www.dusup.ae/noc>).

6.3 Final Design NOC

Final Design NOC is submitted after incorporating Preliminary Design NOC conditions. A check list for Preliminary Design NOC conditions compliance shall be included in the submission of the Final Design NOC.

6.3.1 Final Design NOC - Submission Requirements

- a) Key Plan showing project location.
- b) General Layout Plan incorporating existing site condition, proposed work, DUSUP corridor limit, pipelines/ facilities as provided in Information NOC. Any man holes/valve chambers/shafts in the proximity of corridor and separation distance from the corridor/existing pipelines must be included in the drawings. DP-OPSON-0158 Guidelines for Utilities Crossing Hydrocarbon Pipelines shall be referred to for location of manholes / valves chambers within DUSUPs corridor limit.
- c) AutoCAD file of General Layout Plan drawing prepared on DLTM coordinates datum.
- d) Cross Section drawing showing DUSUP corridor fence, existing ground elevation of DUSUP corridor and adjacent plot, proposed structure adjacent to DUSUP corridor, depth of foundation with respect to existing DUSUP corridor elevation, separation distance from nearest HC pipelines as provided through the Information NOC and any element of work that may have direct or indirect effect on the existing DUSUP pipeline or DUSUP assets.
- e) Include applicable design requirements and notes mentioned in the DUSUP Standard NOC Conditions and DUSUP Guidelines, in the drawing.
- f) Checklist for Preliminary Design NOC conditions compliance.

6.4 Construction NOC

Valid Construction NOC must be available at site before commencement of any construction activities within the DUSUP NOC Zones.

6.4.1 Construction NOC - Submission Requirements

Construction NOC submission must include but not limited to following:

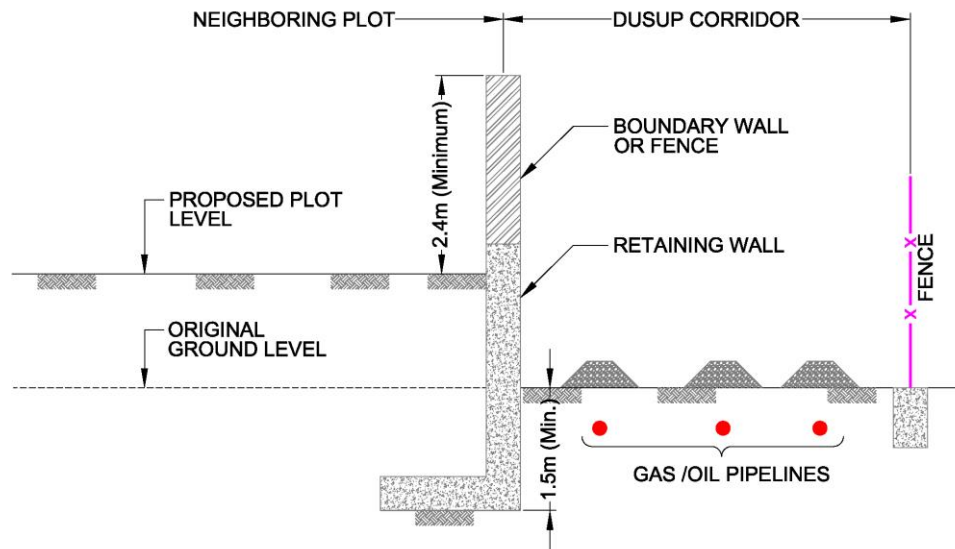
- a) Completed checklist for Design NOC condition compliance.
- b) Key Plan Showing Project Location.
- c) General Layout Plan incorporating existing and proposed work, DUSUP corridor limit, separation distance from the existing corridor fence and pipelines/facilities as approved in Final Design NOC.
- d) Detail Cross Section drawing showing, but not limited to following:
 - DUSUP corridor fence.
 - Existing nearest pipeline.
 - Existing ground elevation on DUSUP corridor side and adjacent plot,
 - Proposed structure, foundation elevation and finished ground elevation on inside and outside DUSUP corridor side.
 - Any element of work that may have direct or indirect effect on the existing DUSUP pipeline or DUSUP assets.
 - Trench protection details, as applicable.
 - Dewatering details, if applicable.
 - Job specific and location specific method statement and risk assessment reviewed and approved by the consultant or client.
- e) Include applicable notes from the DUSUP Standard NOC Conditions in the drawing.

Note, no structure at the edge of the pipeline corridor shall be such that it will hinder construction of future pipelines within DUSUP corridor.

7 FENCE & BOUNDARY WALL

- a) When a plot adjacent to DUSUP corridor is to be developed at a raised elevation, the design of plot boundary wall at the common plot/corridor limit shall be designed by duly considering that the DUSUP corridor will be fully populated with the hydrocarbon pipelines in future and pipeline construction and operation may require approximately 3.0 to 3.5 meter deep excavation along the corridor limit. The boundary wall foundation at the corridor limit for all cases shall be minimum 1.5 meter deep from the existing DUSUP corridor elevation, to allow for angle of repose. No soil backfill or embankment within the corridor to support the boundary wall is permitted.
- b) When a plot adjacent to DUSUP corridor is developed at same level of DUSUP corridor the boundary wall foundation must be a minimum 1.5 meters deep from the existing DUSUP corridor level along the corridor limit in order to protect the adjacent plot boundary wall from undermining during the construction of new pipeline along the edge of corridor.

- c) Boundary wall or fence shall be 2.4 m in height from proposed adjacent plot level and can be a wall structure, fence, or mixture of both.



RETAINING WALL AT DUSUP CORRIDOR

- d) For circumstances whereby the existing fence requires to be moved as it is overlapping with the developers plot, NOC Engineer shall review the demarcation certificate provided by contractor during the construction NOC stage to ensure that the fence location is correctly placed. Once the construction is complete, NOC Engineer shall request the updated fence demarcation certificate (as part of NOC close out) from contractor to ensure that the fence is correctly placed and consistent with the demarcation certificate provided during the construction phase. DUSUP GIS Specialist will then appropriately update the DUSUP Corridor fence limits in the DUSUP GIS.

7.1 Construction NOC Conditions

- Prior to the commencement of the work near DUSUP corridor fence, a joint inspection of existing DUSUP fence shall be carried out with DUSUP and Contractors representatives, and the condition of the corridor fence agreed and recorded; upon completion of the works a further joint inspection of the fence shall be carried out to determine if there has been any damage to the pipeline corridor fence as a result of contractors work. Any damage to the corridor fence shall be rectified by contractor at no cost to DUSUP.
- Any damage to the existing pipeline corridor fence as a result of the work must be repaired or replaced utilizing the same material specification mentioned in the DUSUP Fence Details drawing reference 900-08-017- Sheet 1 & 2 (See Attachment 1 & 2) to the satisfaction of DUSUP and all costs shall be borne by the contractor. Unless and otherwise agreed by DUSUP all fence repair or replacement shall be carried out by an approved fencing contractor.
- When a section of corridor fence to be replaced with new boundary wall of a plot, the tie-in details of fence to the proposed boundary wall shall be agreed with DUSUP in advance and tie-in must be carried out as per the best industrial practice to the satisfaction of DUSUP. A

corner post with bracing must be included at the tie-in locations as shown in DUSUP standard drawing reference 900-08-017- Sheet 1 of 2 (See Attachment 1)

- d) If a section of corridor fence is to be replaced with new boundary wall, the existing fence must be carefully removed, transported and handed over to DUSUP Jebel Ali Pipeline Office in Jebel Ali Industrial Area First at no cost to DUSUP.
- e) During the replacement of existing fence and construction of boundary wall, DUSUP corridor must be secured with approved temporary fence at agreed location. At no point shall the DUSUP corridor be left open and exposed.

If the DM approved compound wall design is revised to meet the DUSUP requirements, and if the elevation difference between the two plots exceeds 1.0m, DM re-approval is recommended. Otherwise the project consultant must review and certify the design for DUSUP consideration.

8 BUILDINGS

When a plot adjacent to DUSUP corridor is to be developed for the construction of buildings, the proposal shall be reviewed as per the DUSUP Guidelines for Land Use Planning - DPE-OPSON-0160. Additionally, the design, layout and use for the buildings must be reviewed considering the following but not limited to:

- a) Hazards related to installation of tower crane during the construction near pipeline corridor.
- b) Use of heavy vehicle traffic/construction plant in the proximity of pipelines/corridor.
- c) Security of pipeline corridor.
- d) Storage of inflammable material in the proximity of pipeline corridor. No flammable material shall be stored within 10 m of the DUSUP fence / facility.
- e) Short time and longtime use of vibratory plant within 10 meters distance of pipeline or pipeline corridor (e.g. Vibro-compaction for ground improvement, Plant / Workshop buildings).
- f) Possibility of storm water discharge and flooding of corridor / washing away of pipeline berm.
- g) Major dewatering works adjacent to corridor can cause the ground to lose structural integrity, which causes ground settling.
- h) For temporary parking during the construction of the buildings, no smoking shall be allowed in the vicinity of the pipeline corridor.
- i) For any building work in the vicinity of the Pipeline Corridor, the pipeline corridor shall be defined as a 'no lifting zone', and the crane working area shall not be above the corridor fence or limit.

8.1 Underground Storage Tanks

Locating underground fuel storage tanks (e.g. Petrol stations) in the proximity of pipeline corridor may be hazardous as it's servicing, and closure operations may involve explosive vapours or hazardous chemicals, and are potential ignition sources. Leaked fuel to ground may vaporize and bubble up through the soil and may present a risk of fire and explosion. Therefore, the location and design of the underground storage tanks shall be reviewed for safety and risk assessed by the DUSUP Technical Safety TA to ensure that the risk is reduced to ALARP level before approval.

9 STORM WATER/DEWATERING POND NEAR PIPELINE CORRIDOR

Design of storm water or dewatering detention pond adjacent to the DUSUP corridor shall be designed considering following:

- a) If a pond is designed without waterproof lining and the soil condition allows percolation of water to the adjacent area, maximum water level of the pond shall be maintained below adjacent pipeline corridor level and where possible below lowest pipeline level.
- b) The design of at grade retention pond constructed with the soil bund around, in the proximity of pipeline corridor shall be reviewed for failure of bund and flooding of corridor. The design and construction shall be risk assessed to ensure that the risk is reduced to ALARP level before approval.

10 SOIL EMBANKMENT PARALLEL TO PIPELINE

Construction of embankment on soft soil parallel to the existing pipeline may cause deformation of the soil and if the existing pipeline falls within the influence zone, this may result in lateral movement of pipeline. In such cases natural soil may require reinforcement or soil improvement such as CDM (Cement Deep Mixing) columns or other approved method. Such methods shall be approved by the DUSUP Pipeline Technical Authority.

11 UTILITIES PARALLEL TO PIPELINE / PIPELINE CORRIDOR

Refer to DUSUP Guidelines DPE-OPSON-0158; typically no utilities other than HC pipelines are permitted within 10 meters of existing HC pipelines. However other utility corridors may exist within 10 meters and parallel to existing HC pipeline (but not within the Pipeline 5m No Go Zone) taking into account the following:

- a) The design and construction of other utilities within 10 meters (but out with 5 m No Go Zone) of existing pipeline require specific technical review, including construction of any deep manhole / valve chamber, which may affect pipeline corridor fence or facility. The design and construction proposal shall be risk assessed and accepted only after hazard affect is reduced to reach ALARP level.
- b) Existing DUSUP corridor fence in the proximity of proposed utility must be protected during the construction to the satisfaction of DUSUP. Any damage to the existing fence must be rectified or replaced as per DUSUP standard fence drawing (refer to above item 8.1).

12 DUSUP NOC CLOSEOUT

All NOC issued for the work within DUSUP corridor or replacing the fence, within the "No Go Zone" and Utilities constructed close proximity of DUSUP corridor limit/fence must be formally closed as described in DUSUP NOC Standard Conditions.

Any work within 5.0M of DUSUP corridor fence or property shall be field verified by Pipeline Representative during the execution of work and at the completion such work, to ensure that the work is completed as specified in NOC and no damage incurred to DUSUP property from the work.

For DUSUP NOC Close-Out Requirements refer to:

DUSUP NOC Standard Conditions - DP-OPSON-0056

13 DUSUP GUIDELINES

Various Guidelines for DUSUP/DPE Onshore pipelines are being developed for use. Reference can be made to the following link: <https://dusup.ae/dusup-noc-guidelines/>

ATTACHMENT 1: FENCE DETAILS

ELEVATION OF FENCING SYSTEM

DETAILS OF STRETCHER BAR

Sr. No.	Item	Specification
A	PVC Coated (BS) Chain link Fencing	3,55/4,75mm Dia PVC coated (BS) Fence height: 2.4m, Mesh size: 50 X 50mm, (Green colour)
B	Straining Post & Corner/End Posts	76.0mm OD MS Pipe (4.5mm, Thk.) with 2 nos. of 60.0mm OD MS Pipe (2.9mm, Thk.) Brace @ 24m c/c.
C	Intermediate Post	60.0mm OD MS Pipe (2.9mm, Thk.) at 3.0m centers.
D	PVC Coated (BS) Tension Line Wire	4 Rows - 3.55/4.75mm Dia PVC coated (BS) line wire
E	Strrup Wire	2.7/3.8mm Dia PVC coated (BS) Strrup wire
F	Tie Wire	1.8/2.6mm Dia PVC Coated (BS) Tie wire
G	Stretcher Bar	25 x 5mm THK MS flat - Stretcher bar

NOTES:

- All dimensions are in millimeters unless noted otherwise.
- All Wires & Fence shall be PVC Coated (BS).
- All metals shall be Hot Dip Galvanized to BS EN ISO 1461 & Polyester Powder Coated in Green colour (RAL-6005).
- All foundations shall be Bitumen coated, Post shall be Bitumen coated minimum 300mm above foundation.

Rev.	Date	Revision Description	Drawn	Checked	Approved
2	24.08.23	Revised as detailed	BV	SK	NB
1	04.08.13	Issued for Construction	BV	RSK	NB
0	12.03.07	Issued for Review/ Tender	BV	RSK	NB

Dubai Supply Authority

STANDARD DRAWING
PIPELINE CORRIDOR CHAIN LINK MESH FENCE
DETAILS (SHEET 1 OF 2)

CAD File Name	Size	Scale	Area Code	Doc Code	Serial No.	Sheet of	Sheets	Rev. No.
DP-OPSON-0188-01 - CHAIN LINK MESH FENCE DETAILS SHEET 1 OF 2	A3	NTS	9 0 0	0 8	0 1 7	0 0 1	0 0 2	2

ATTACHMENT 2: GATE DETAILS

ELEVATION OF GATE

DETAIL OF HINGE

DETAIL OF DROP BOLT

DETAIL OF PADLOCK

GATE HARD SURFACE LIMIT (NOTE 5)

SR. NO.	ITEM	SPECIFICATION
1.	A	3.55/4.75 mm DIA PVC COATED (BS) (GREEN) CHAIN LINK FENCE MESH 50 x 50mm
2.	B	166.0mm OD (CLASS B) MS PIPE. GATE POST
3.	C	60.0mm OD MS PIPE (2.6mm THK) FRAME
4.	D	48.0mm OD MS PIPE (2.6mm THK) BRACING

NOTES:

- All dimensions are in millimeters unless noted otherwise.
- All Wires & Fence shall be PVC Coated (BS).
- All metals shall be Hot Dip Galvanized to BS EN ISO 1461 & Polyester Powder Coated in Green colour (RAL-6003).
- All foundations shall be Bitumen coated. Post shall be Bitumen coated minimum 300mm above foundation.
- Access gate shall be surfaced with 300mm thick compacted road base or similar approved erosion protection material, and shall extend minimum 6 m from the end of the gate (either side). Sloped access to the gate shall be at a gradient of 1:6 or less.

				dusup Dubai Supply Authority		STANDARD DRAWING PIPELINE CORRIDOR CHAIN LINK MESH FENCE DETAILS (SHEET 2 OF 2)								
2	24.08.23	Revised as detailed	BV	SK	NB	CAD File Name	Size	Scale	Area Code	Doc Code	Serial No.	Sheet of	Sheets	Rev. No.
1	04.08.13	Issued for Construction	BV	RSK	NB				9	0	0	8	0	1
0	12.03.07	Issued for Review/ Tender	BV	RSK	NB				0	8	0	1	7	0
Rev.	Date	Revision Description	Drawn	Checked	Approved	10-06-411-062-03 - CHAIN LINK MESH FENCE DETAILS SHEET 2 OF 2	A3	NTS	9	0	0	8	0	1