MINISTRY OF MUNICIPALITY AND ENVIRONMENT

INFRASTRUCTURE PLANNING DEPARTMENT

Guidelines for Utility Impact Assessment for Expressways

(MME 2012 Typical Cross-Sections)

April 2019

Table of Contents

Document Control

Document No.	**IPD-MME-UT-XW-01-R2**		
Prepared By	Mujtaba Hamidy & Abdul Al Muhuzin Khutan		
Checked By	Hassan Qasem		
	Maher Chabib		
	Saudha Backer		
Approved By	Ibrahim Abbas Hassan		
Revision	2	Date	

1.0 INTRODUCTION

1.1 Purpose

The purpose of this document, from the Infrastructure Planning Department of the Ministry of Municipality and Environment (IPD-MME), is to provide guidelines for the Utility Corridor allocation to achieve optimum use of the Right of Way for an Expressway Project.

The intended audiences for this document includes, without limitation, government agencies, service providers and private agencies involved in public services and infrastructure in the State of Qatar.

1.2 Document Control and Distribution

Updates and modifications to this document are controlled by IPD-MME. Users of this document should check that they have the most current version. Users are encouraged to provide feedback, which will be reviewed, assessed and possibly included in the next version.

1.3 Procedures for Submission

A written application shall be sent to the Director of Infrastructure Planning Department of the Ministry of Municipality and Environment. The Applicant shall provide drawings including location plan, site plan, proposed design, and any other relevant information to comply with MME's submission requirements in both electronic (CAD & PDF) and paper version.

1.4 Acronyms and Terminology

IPD:	Infrastructure Planning Department
MME:	Ministry of Municipality and Environment
PPD:	Public Parks Department
PWA:	Public Works Authority
ROW:	Right of Way
UPD:	Urban Planning Department

2.0 PROCEDURE FOR UTILITY ASSESSMENT

The designers for all Expressway Projects with respect to the Utility Corridor allocation must undertake the following steps:

a. Establish the extent of the road project's impact (which may extend beyond the limits of the project limit of work).
b. Collect data from all the relevant agencies including their proposed future projects. This data shall be updated at regular intervals throughout the development of the project.
c. A site investigation and survey (including a Ground Penetration Radar survey) to verify the position and levels of the agencies' underground as well as aboveground assets should be carried out.
d. Develop a Discrepancy Plans identifying all the discrepancies between the agency's As Built data against the surveyor's surveyed data. These plans shall be submitted to the responsible agency

for their information and use. The surveyed data should be considered accurate and used instead of the agency's As Built data, wherever applicable.

e. Develop the traffic requirements and finalize the road layout including, but not limited, all the junction configuration, bus stops, parking bays, taxi ranks, services roads and access points.
f. Identify the road project's underground structures such as ramps, troughs and tunnels, or surface assets such as light poles, street signs, traffic signals, barriers, pedestrian railings and landscaping features including tree planters.
g. Superimpose the proposed road layout plan and hard structures on top of the existing and proposed utilities identifying and assessing the impact of the proposed road project on the existing and known proposed utilities.
h. Superimpose the proposed road layout plan and hard structures with MME's generic (MME's 2012 Typical Cross Sections) corridor sections layout for that particular ROW width.
i. Carry out an Utility Impact Assessment, where the engineer shall decide for each of the existing utilities whether to :
    i keep the utility in its current location without treatment,
    ii protect the utility
    iii divert/relocate the utility or adjust its depth to comply with agency's requirements.
    iv excavate and remove the existing utility completely or abandon it in place with appropriate treatment.
j. A value engineering exercise needs to be carried out. MME supports proposals that keeps utilities in their existing location as much as possible by adjusting or providing provisions within the road design such as:
    i Road geometry (appropriate grade, alignment, widening on one side, ramp positioning)
    ii Highway drainage (alignments and locations of Ditches/Culverts/Inlets/Curbs)
    iii Retaining walls (appropriate design selection)
    iv Batters/Slopes/Barriers Bridges and abutment arrangements (maintaining corridors)
    v Protection above water pipes (AK)
    vi Concrete protection above electric cables and other ductwork
    vii Departures from standard design specifications
    viii Road carriageway or lane width reduction to avoid utilities.
    ix Consider signal standard changes
    x Increased signal mast arm lengths
    xi Signal and sign locations
k. The above considerations should be given in order to minimize the impact on any existing subsurface utilities, especially with respect to transmission cables or pipes.
l. MME's 2012 or 2014 typical cross sections, as appropriate, should be used as guideline only and adjustment must be carried out to reconfigure the corridor allocation to suit the location of the existing utilities, proposed utilities and the road configuration.
m. In areas of road widening where the existing utilities fall inside the proposed wider carriageway, the design engineer shall propose engineering solutions that either keep the affected utility in its current location, or relocate it outside the carriageway in a more desirable location if space is available. The design engineer should consider the items listed below (as per MME –IPD's checklist, item 4) and liaise with the utility agencies in order to determine the most appropriate engineered solution for their respective assets.
    i The material of utility e.g. VC/Asbestos or AC/ DI pipes or Oil Filled vs. XLPE cables
    ii The size and purpose of the utility (distribution or transmission)

iii The age and condition of the utility and assessment of any upgrade plans in coordination with the asset owner
iv The size and frequency of access chambers should be determined
v The schedule for periodic maintenance access (if any) of the asset should be established
vi The proposed location of the utility within the carriageway and the impact on traffic i.e. lane closures during maintenance, breakage or upgrade should be assessed.
vii The hierarchy comparative cost of relocating utilities, i.e. cost of relocating a smaller cable/pipe vs. bigger cable/pipe
viii Identification of any Substations, Pump Stations, etc. along the route that will need additional corridor provision for future expansion
ix Risk assessment in case of emergencies i.e. pressure mains bursting, electrical cable failure or telecommunication duct damage should be carried out.

n. In the majority of the cases, where road widening schemes or major structural elements are proposed, the allocated utility corridor widths as per MME's 2012 or 2014 typical cross-section will not be achieved, the design engineer should therefore consider the following:
   i Corridors should only be provided for existing and known future utilities.
   ii The placement of utilities under carriageway with deeper utilities towards the inner lane of the carriageway. It is preferred to place transmission cables or pipes at these locations. Generally, the installation of LV cables, telecommunication ducts and small distribution pipes or any other utilities required for house connections should not be installed within the carriageway.
   iii Further space saving can be achieved (subject to authority approval) if the utilities are placed in the following manner
   iv Shared Trenches/Common Trench for compatible utilities e.g. gas and water
   v Stacking of Utilities over short stretches e.g. transmission cables & large diameter pressure mains below distribution cables & smaller diameter pressure mains
   vi Telecommunication ducts above pressure mains or transmission cables where concrete slab is placed between the two for protection
   vii Easement, instead of acquiring land - utility easement can be created to allow utilities to traverse at pinch points.
   viii Rerouting of the utilities within secondary minor roads parallel to main traffic routes, this option should be especially considered at junctions.
   ix Consideration should be made for Power Galleries or Utility Tunnels in lieu of land acquisition and when other options are exhausted and Value Engineering has identified these as the optimal solution in any given case.

2.1 Utility Gallery Positioning – General Guidelines

a. The use of a gallery should only be envisaged if locating the utilities in accordance to the generic corridor sections layout, modified as per the guidelines above, is either prohibitive or overly disruptive.
b. If a gallery is deemed to be required, only one side of the road, the side that will least impact the existing utilities should be chosen.
c. Generally the configuration/arrangement/convention provided in MME typical cross-section should be followed e.g. water and foul sewer (rising main) or water and TSE should not be next to each other within the Gallery.

d. In areas where a gallery is used, it is recommended that non-gravity dependent utilities, such as electricity, water, and telecommunication should be located above the gallery while gravity dependent utilities should be located outside the gallery, where it is possible to do so.

e. The gallery should, as much as possible, limited only for the main transmission lines, while the distribution utilities should be located outside the gallery.

f. In areas where there are existing utilities and a gallery has been proposed, it is recommended that all the existing utilities be maintained in their location and that the utility corridors are adjusted to fit the existing situation.

g. In area where the existing non-gravity dependent utilities occupies the area outside the gallery and there is no space for gravity driven utilities, then it is recommended that a space be allocated for the gravity driven utilities below the existing utilities. Hence no exclusive corridor should be allocated for gravity dependent utilities, and no galley be used.

h. Stormwater corridor should be outside the proposed gallery and no corridor should be allocated for gullies.

3.0 ABOVE GROUND FEATURES

Currently, MME does not allocate corridors for above ground features. However, following are some guidelines to be followed for the major above ground features within the ROW.

3.1 Street Lighting Columns

a. Street Lighting is generally placed within the verge and median of the roadway. Its location is governed by a number of factors which include:
   - i Lux model
   - ii Must be placed at a safe distance from the edge of the carriageway
   - iii The movement of the pedestrian/cyclist shall not be hindered wherever possible
   - iv Space availability at verges
   - v Existing and proposed utilities
   - vi Road classification and alignment
   - vii ROW width
   - viii Light pole height
   - ix Light pole frequency
   - x Foundation type and dimensions
   - xi The location shall also meet the relevant authorities requirement in regards to its general maintenance e.g. in case a luminaire needs to be changed.

b. Generally the foundation of light poles should be positioned within allocated corridors defined in MME's typical cross section as L + ITS (Street Lighting & Intelligent Traffic System), which is required for all the streets in Qatar. If lighting poles cannot be located directly on, top its designated corridor e.g. due to the corridor being inside the carriageway or parking area, light poles shall be installed in other agencies corridors without an allocation of a special corridor. Therefore, the encroachment of the lighting pole on another agency's corridor (entirely or partially) is acceptable to MME. In such cases the designer is required to follow the below selection criteria for light pole positioning with (a) being the most preferred.

   i On top of gravity foul sewer or stormwater pipes that are allocated in the verges of the roadway (subject to availability of space).

ii On the electrical distribution, telecommunication, security ducts or similar corridors. The cables/ducts should be slewed around the base of the pole or taken under the pole's base. A typical detail of such arrangement should be produced to demonstrate it is feasible, constructible and meets the concerned agency's requirements.

iii On the distribution pressured mains corridors (water, rising main or TSE pipes less than 200mm diameter). It must be demonstrated that pressure mains can be realigned around the pole's base and that the pipe joint deflections are within the manufacture's specification and that the adjacent utilities are not impacted.

iv Within the electrical transmission corridor, with existing cables either slewed around the side of the foundation or below the foundation (subject to the availability of cable slack). It must be demonstrated that the bending radii of the cables meets Kahramaa Electricity's requirements. This is usually applicable in the central median.

v Foundations can be placed on top of pressurized transmission mains (water, TSE or Foul Sewer rising main). Light pole foundation shall be designed in such a way to ensure static loading on pipes below does not exceed pipe design criteria.

vi A special street lighting corridor wider than what has been prescribed in MMUP typical cross-section (L + ST = 0.5m) can be considered if it is shared with stormwater gullies, trees and other surface appurtenances such as signs, gantries, street furniture etc…

vii In certain special cases, if the separation of street light poles is less than 15m, a wider corridor can be considered to allow for the width of the light pole base.

Note: In all the cases designer must carry an in-depth clash analysis to satisfy the viability of the proposed light pole position. It is recommended in cases where the foundations are proposed on top of the transmission cable/pipe corridor, that a shallower and wider base be considered to allow the transmission cables/pipes to traverse under it. In case the foundation is proposed on top of a distribution corridor, a thinner base should be considered to allow the distribution cables/pipes to be slewed around it. A nominal diameter ducts/sleeves, extending at least 1 m on either side of the foundation should be provided, if the cables/pipes are to run below the foundation to permit the future use of the corridor.

3.2 Stormwater Gullies

a. It is desirable to locate Gullies above the gravity stormwater drainage pipes wherever possible. Where this may not be possible, the design engineer should make allowance for, and specify, deep corridors for utilities under the gullies (as in the case of transmission pipes/cables). It must be technically proven however, that the performance of the cables/pipes is not hindered by such localization, i.e. consideration should be given to electrical de-rating and hydraulic performance of the pipe. In case of distribution cables/pipes, allowances should be given for slewing and realigning of these smaller cables/pipes to get around fixtures such as gullies. In both instance the agency responsible for the corridor will have the right to take out the gully if access is required to their asset for maintenance, emergency repairs or upgrade purposes. Therefore, an agreement will be developed between PWA, MME and the relevant agency for such undertaking. See below for further guidelines.

b. Stormwater Gullies are generally placed along the kerb (either as side entry or top entry) at the edge of carriageway, service road or edge of the median (where there is super-elevation) and their location and frequency is primarily governed by the road design, which include the below factors:
    i Road Geometry
    ii Road catchment (width of RoW)
    iii Cross-fall & Profile of the road
    iv Road classification
    v Existing and proposed utilities

c. Currently there is no designated corridor in MME's 2012 typical cross-section for Stormwater Gullies. However, MME's 2014 typical cross section (for undeveloped areas) does provide a location to the Stormwater Gully, that is to be placed on top of the proposed Stormwater corridor given that the Stormwater pipes are deep and therefore there is available space above the pipe. Therefore, it is encouraged to locate the stormwater pipes along the kerb-line of the road, where the surface water can be collected by the Gullies and directed to the conveyance system below it. In cases where Gullies cannot be placed on top of the stomwater corridor, the Gullies can be installed in other agencies corridors without been provided a dedicated Gully corridor. The placement of the Stormwater Gullies on other agency's corridor (entirely or partially) is acceptable to MME. In such cases the designer should consider the following;

    i When installed in the electrical distribution, telecommunication, security ducts or similar corridors – the cables/ducts shall be slewed around the Gully. A typical detail of such arrangement should be produced to demonstrate it is feasible, constructible and meets the concerned agency's requirements.

    ii When installed in the distribution pressured mains corridors (water, rising main or TSE pipes with their diameter less than 200mm) – it must be demonstrated that the pressure mains can be realigned around the Gully and that the pipe joint deflections are within the manufacture's specification and that the adjacent utilities are not impacted.

    iii When installed in the electrical transmission corridor – the electrical transmission cables should be installed below the Gully. It must be demonstrated that the bending radii of the cables meets Kahramaa Electricity's requirements and that the clearance (between the base of the gully and the cable) is in compliant with Kahramaa's and the cable manufacture's specifications.

    iv When installed in a pressurized transmission mains corridor (Water, TSE or Foul Sewer rising main), gullies shall be installed on top of these mains with the static loading on the pipes below not exceeding the pipe's design criteria. Also the pipe joint deflections are within the manufacture's specifications and that the adjacent utilities are not impacted.

Note:

- In each of the above four cases, a typical detail of the proposed arrangement must be produced and should demonstrate that the proposed arrangement is feasible, constructible and meets the affected agencies' requirements.
- A wider corridor for street lighting and stormwater gullies are acceptable if it is shared with trees and other surface appurtenances such as road signs, gantries and street furniture. In addition, the installation of deep sewers would be permissible in this corridor.
- In all cases the designer must carry an in-depth clashes analysis to ensure that all clashes have been dealt with.

- A nominal diameter ducts/sleeves, extending at least 1m on either side of the gully should be provided, if the cables/pipes are to be installed below the gully for the future use.

3.3 Trees

If there are open spaces available on the verges or in the medians, trees can be installed in such places. However, given that, in the expressway program, the Right of Ways are extremely constricted, the design engineer is encouraged to utilize tree barriers and should consider placement of such trees above the gravity sewers where possible. Alternatively, if the landscape design requires the frequency of trees to be at regular intervals of 10 meters and less, consideration could be given to placing such trees above transmission pipes/cables with the understanding that these cables/pipes have to be constructed deeper than their usual depth. Similarly it must be proven that there is no adverse impact on the performance of these utilities. In addition, an undertaking that in case access is required to the assets, the agency can take out trees and reinstate them to MME's Public Parks Department's specifications. It is important that the landscape design of the road projects be carried out in conjunction and in coordination with the highway and utilities design and should not be considered as an "add on" or an afterthought to be accommodated by the utilities designers at a later stage of the design process.

3.4 Gantries, Traffic Lights, Signage and Street Furniture

Gantries, traffic lights, signage and street furniture are elements of the roadway that do not have any designated corridors. Therefore; the foundations and pole positions of these elements should be properly coordinated with the subsurface assets to ensure there are no clashes and that they do not obstruct the installation of future utilities directly above their foundations or at least minimize such effect.

Note: Encroachment of chambers/manholes, stormwater gullies as well as the foundations for street lighting poles or other features are likely to extend to adjoining corridors. The design engineer must demonstrate that these encroachments will not adversely impact the adjoining utilities.

4.0 APPROVAL PROCESS

The approval process involves the MME-IPD, Ashghal and Utility agencies. Overall there are four stages as indicated in Figure 1.

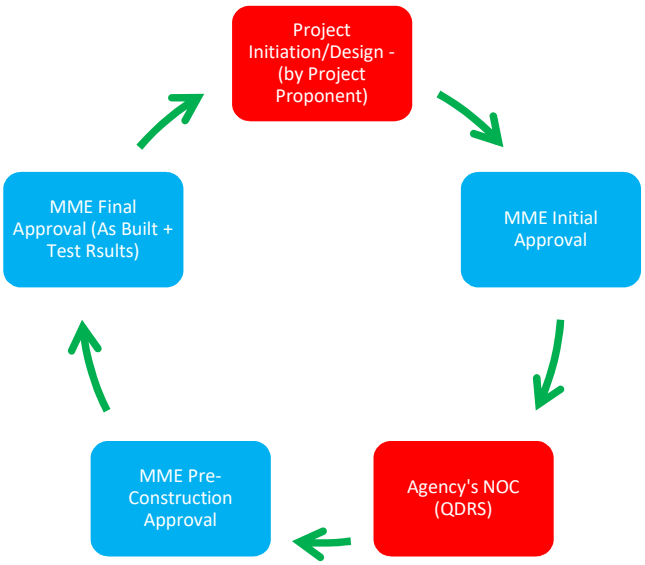


Figure 1

4.1 IPD-MME's Initial Approval

Design of utility corridor distribution shall be prepared by the applicant as per MME's guidelines, specified in this document for all utility network, then shall be submitted to MME-IPD for review and initial approval.

4.2 No Objection Certificates from Utility Providers

After obtaining the Initial Approval from MME-IPD, the applicant shall seek NOCs from utility providers, through the application of QDRS or similar. The project proponent is also required to meet agency's conditions. Any disagreement or point of contingency between the project proponent and a utility agency should be raised to MME for resolution.

4.3 IPD-MME's Pre-Construction Approval

Prior to the execution of the project the applicant shall submit the below documents to MME-IPD, in addition if there are any changes in comparison to MME's initial approval it must be highlighted and documents must be provided to fully justifying the proposed changes.

i. Written approvals from all the relevant agencies, including Ashghal's Drainage Department, Ashghal's Street Lighting Department, Kahramaa Water, Kahramaa Electricity, Qatar Petroleum, CRA, QAF, SSD and MoTC.

ii. A latest version of AutoCAD drawings of all the drawings.

iii. A SHP file of Rainbow drawings.

iv. IPD-MME's Final Approval

4.4 IPD-MME's Final Approval

The final approval will be granted to the applicant when the work is completed and a copy of the "As Built" in soft and hard copies as well as testing certification from the relevant agencies. The As Built drawing will be checked against the Pre-Construction approved documents and in case of any discrepancy between the two submittals, the applicant is required to provide clarification and justification. If accepted by MME-IPD the final version of the As Built drawings will be incorporated in the GIS system as true document. Accordingly MME-IPD will issue a final approval which will allow the applicant to request final completion certificate from the concern Municipality.

5.0 DISCLAIMER

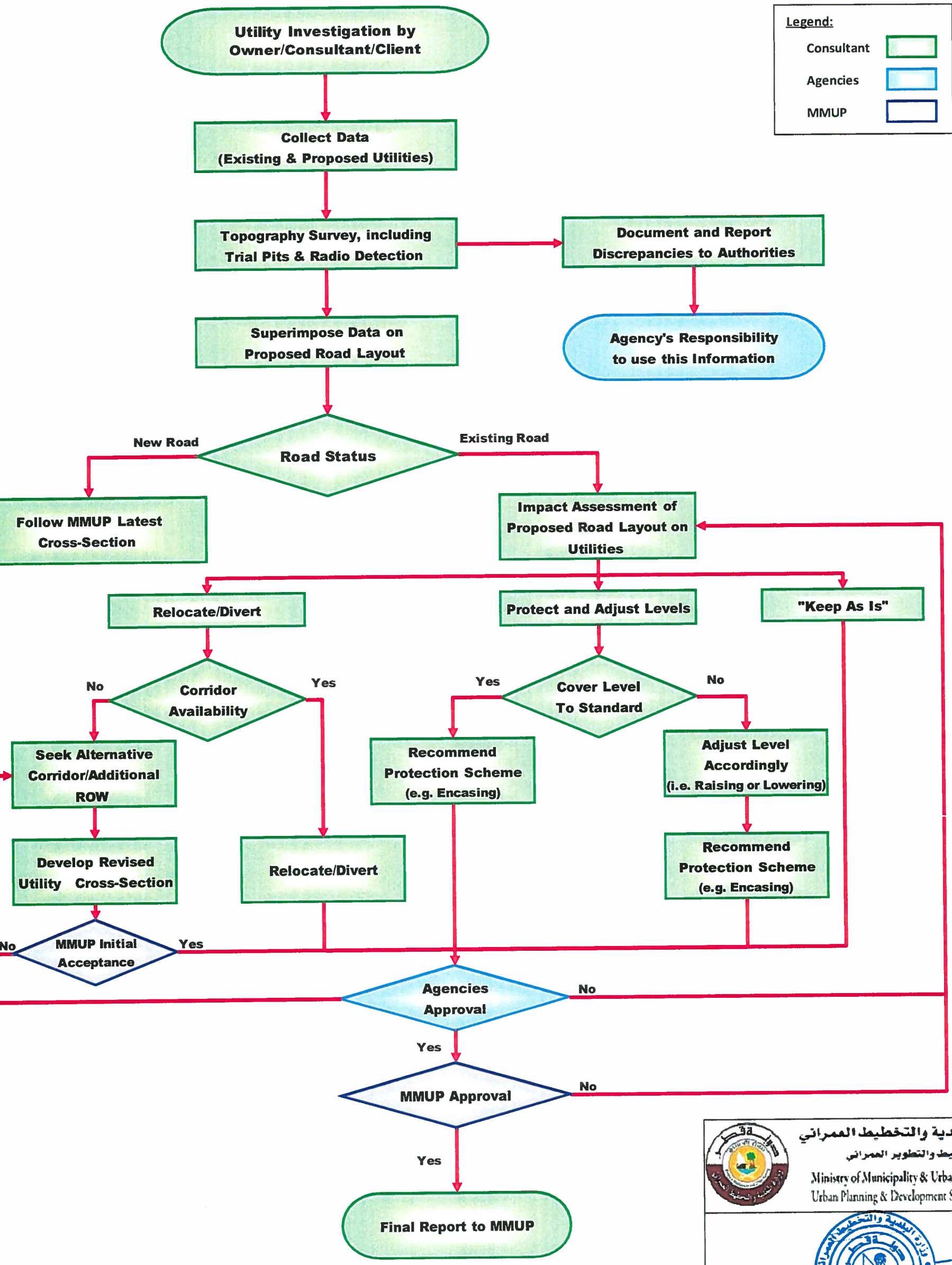
This document is intended to be used only in its entirety. IPD-MME should be contacted if the Applicant requires additional information or has questions regarding the content or completeness of this document.

Under no circumstances does IPD - MME warrant or certify the requesting agency's analysis to be free of errors or deficiencies of any kind. The use of IPD - MME's approval for any work, does not relieve the requesting agency (or anyone who acts on its behalf) from its responsibilities, nor does it entitle the requesting agency (or anyone who acts on its behalf) to claim any kind of compensation for damages or losses during construction or thereafter.

6.0 APPENDICES

APPENDIX A: MME Utility Investigation Approval Procedure

MMUP Utility Investigation Approval Procedure for Road Projects



NOTE:
THE PROPOSED FLOW CHART IS ONLY A GUIDE TO ASSESS THE CONSULTANT DEVELOPING A UTILITY INVESTIGATION REPORT. THE TOR OF EACH CONTRACT SHOULD BE STRICTLY FOLLOWED.

وزارة البلدية والتخطيط العمراني
قطاع التخطيط والتطوير العمراني
Ministry of Municipality & Urban Planning
Urban Planning & Development Sector

Authorised by:
Mohamed Abdah
Director of Transportation And Infrastructure Planning Department

Checked by:
Abdullah Jassim Al-Muraikhi
Section Head

Designed By:
Mujtaba Hamidy & Hassan Qasem

Date: October 2012

Doc No: MMUP/INF/002

APPENDIX B: MME Project Documentation Submission

Project Documentation Submission:

LOCAL ROAD AND DRAINAGE

1. COVER PAGE
2. GENERAL NOTES
3. LEGENDS AND ABBREVIATIONS
4. CUT AREAS LAYOUT PLAN – IMPACT ASSESSMENT ON EXISTING UTILITY
5. DISCREPANCY DRAWINGS
6. ROAD PAVEMENT LAYOUT PLAN AND DETAILS
7. PROPOSED UTILITY CORRIDOR – COMBINED LAYOUT PLAN
8. CROSS SECTIONS
9. UTILITY CHECKLIST
10. STANDARD CADD LAYERING

NOTES:

- All drawing entities should be by layer.
- CADD CTB (Pen Assignment) to be develop for clarity and to be included in the submission.
- Drawing layout and cross section should be as per approved scale.
- A3 size of drawings in hardcopy to be provided along with the softcopies both PDF and CAD format.

Prepared by: Muhsin Kuhutan
Checked by: Mujtaba Hamidy
Approved by: Hassan Qasem

DETAILED DESIGN
ROAD INFRASTRUCTURE - SUBDIVISIONS
(PROJECT LOCATION)

REV. NO.	DATE	DESCRIPTION	APPR.

State of Qatar
Ministry of Municipality & Urban Planning

TRANSPORTATION & INFRASTRUCTURE
PLANNING DEPARTMENT

CLIENT

PROJECT CODE

PROJECT

DESIGN CONSULTANT

TITLE

DESIGNED		STATUS	
CHECKED		UPDA APPROVAL	
DATE		SCALE	@ A1 = @ A3 =
DWG. NO.	PROJECT COVER PAGE		REV. NO.

GENERAL NOTES

REV. NO.	DATE	DESCRIPTION	APPR.

State of Qatar
Ministry of Municipality & Urban Planning

TRANSPORTATION & INFRASTRUCTURE PLANNING DEPARTMENT

CLIENT

PROJECT CODE

PROJECT

DESIGN CONSULTANT

TITLE

DESIGNED	STATUS
CHECKED	UPDA APPROVAL
DATE	SCALE @ A1 = @ A3 =
DWG. NO. GENERAL NOTES	REV. NO.

DRAWING LEGENDS AND ABBREVIATION

REV. NO.	DATE	DESCRIPTION	APPR.

State of Qatar
Ministry of Municipality & Urban Planning

TRANSPORTATION & INFRASTRUCTURE PLANNING DEPARTMENT

CLIENT

PROJECT CODE

PROJECT

DESIGN CONSULTANT

TITLE

DESIGNED	STATUS
CHECKED	UPDA APPROVAL
DATE	SCALE @ A1 = @ A3 =
DWG. NO. LEGENDS & ABBREVIATIONS	REV. NO.

FOR CONTINUATION REFER TO SHEET No: 9

FOR CONTINUATION REFER TO SHEET No: 1

FOR CONTINUATION REFER TO SHEET No: 3

NOT INCLUDED IN CONTRACT

ALIGNMENT P8H24

ALIGNMENT P8E10

ALIGNMENT P8G8

ALIGNMENT P8G7

ALIGNMENT P8G2

L = ± 158.0m Ø300mm PVC W1

L = ± 90.0m Ø300mm PVC W1

L = ± 35.0m Ø100mm PVC W1

L = ± 43.0m 4C300XLPE E1

L = ± 72.0m Ø100mm PVC W1

300mm

100mm

150mm

LEGEND FOR RELOCATIONS:

ELECTRICAL CABLES:

APPROX. LENGTH OF RELOCATED CABLE

L = ± 54.0m 4C300XLPE — E1 — DESCRIPTION OF RELOCATION TO BE CARRIED OUT (SEE BELOW)

TYPE OF CABLE TO BE RELOCATED

POTABLE WATER PIPES:

APPROX. LENGTH OF RELOCATED PIPE

L = ± 61.0m Ø100mm PVC — W1 — DESCRIPTION OF RELOCATION TO BE CARRIED OUT (SEE BELOW)

SIZE AND MATERIAL OF PIPE TO BE RELOCATED

RELOCATION TYPES:

E1 EXISTING ELECTRICAL CABLE TO BE DEEPENED TO SATISFY STANDARD COVER DEPTHS. DEEPENED CABLE TO BE INSTALLED ALONG PREVIOUS ALIGNMENT.

E2 EXISTING ELECTRICAL CABLE TO BE DEEPENED TO SATISFY STANDARD COVER DEPTHS AND INSTALLED ALONG ALLOCATED UTILITY CORRIDOR.

W1 EXISTING WATER PIPE TO BE DEEPENED TO SATISFY STANDARD COVER DEPTHS. DEEPENED CABLE TO BE INSTALLED ALONG PREVIOUS ALIGNMENT.

W2 EXISTING WATER PIPE TO BE DEEPENED TO SATISFY STANDARD COVER DEPTHS AND INSTALLED ALONG ALLOCATED UTILITY CORRIDOR.

LEGEND:

- AREA IN CUT, DEPTH = 0.00 TO 0.20m
- AREA IN CUT, DEPTH = 0.20 TO 0.40m
- AREA IN CUT, DEPTH = 0.40 TO 0.60m
- AREA IN CUT, DEPTH = 0.60 TO 0.80m
- AREA IN CUT, DEPTH = 0.80 TO 1.00m
- AREA IN CUT, DEPTH = 1.00m AND DEEPER
- EXISTING POTABLE WATER PIPE
- RELOCATED POTABLE WATER PIPE
- EXISTING KAHRAMAA MEDIUM VOLTAGE (MV) ELECTRICAL CABLE
- EXISTING KAHRAMAA LOW VOLTAGE (LV) ELECTRICAL CABLE
- RELOCATED ELECTRICAL CABLE
- REMOVED PIPE/CABLE
- EXISTING DUCT
- EXISTING SUBSTATION

LIMIT OF SHEETS

0 5 10 15 20 25 m

SCALE 1:500

KEY PLAN

NOTES:

1. THE LOCATIONS OF ALL EXISTING AND PROPOSED KAHRAMAA SERVICES HAVE BEEN OBTAINED FROM PUBLIC UTILITY RECORDS (REF. QCS CLAUSE 1-1.37).
2. PRIOR TO EXECUTING THE WORKS THE CONTRACTOR SHALL LIAISE WITH THE SERVICES DEPARTMENT AND COMPLY WITH ALL THE WORK REQUIREMENT OF THE DEPARTMENTS.
3. COVER DEPTHS FOR RELOCATED SERVICES SHOULD BE OBSERVED. REFER TO KAHRAMAA STANDARDS.
4. RELOCATIONS OF ALL SERVICES TO INCLUDE ATTACHED APPURTENANCES INCLUDING VALVES, HYDRANTS, SERVICE CONNECTIONS, ETC.
5. THESE DRAWINGS ARE NOT INTENDED TO BE USED FOR EARTHWORKS.
6. AREAS OF CUT SHOWN ARE BASED ON PROPOSED FINISH SURFACE LEVELS.
7. DESIGNER ASSUMED THAT EXISTING UTILITY SERVICES ARE LOCATED AT MINIMUM SERVICE COVER DEPTHS SPECIFIED BY CONCERNED SERVICE AUTHORITY.
8. THE IMPACT ON THE EXISTING UTILITY SERVICES UNDER AREAS IN CUT WITH DEPTHS FROM 0.0m TO 0.20m SHOULD BE ASSESSED BY CONTRACTOR AT SITE AND ENSURE THAT THE CONCERNED SERVICE AUTHORITY REQUIREMENTS ARE MET.

Rev.	Date	Revision Details	Drawn	Chkd.	Appd.

هيئة الأشغال العامة
Public Works Authority

P.O.Box: 22188
Tel.: 00974 44950000
Fax: 00974 44950999

IA INFRASTRUCTURE AFFAIRS

قطر تستحق الأفضل
Qatar Deserves The Best
www.ashghal.gov.qa

Project Management Consultant :
Qatar Local Roads & Drainage
PARSONS BRINCKERHOFF
5th Floor, Faisal Tower #2
West Bay
PO Box 23103 Doha, Qatar
+974 4495 1601 (Project)
+974 4435 1612 (Main office)

Design Consultant :

Project Name:

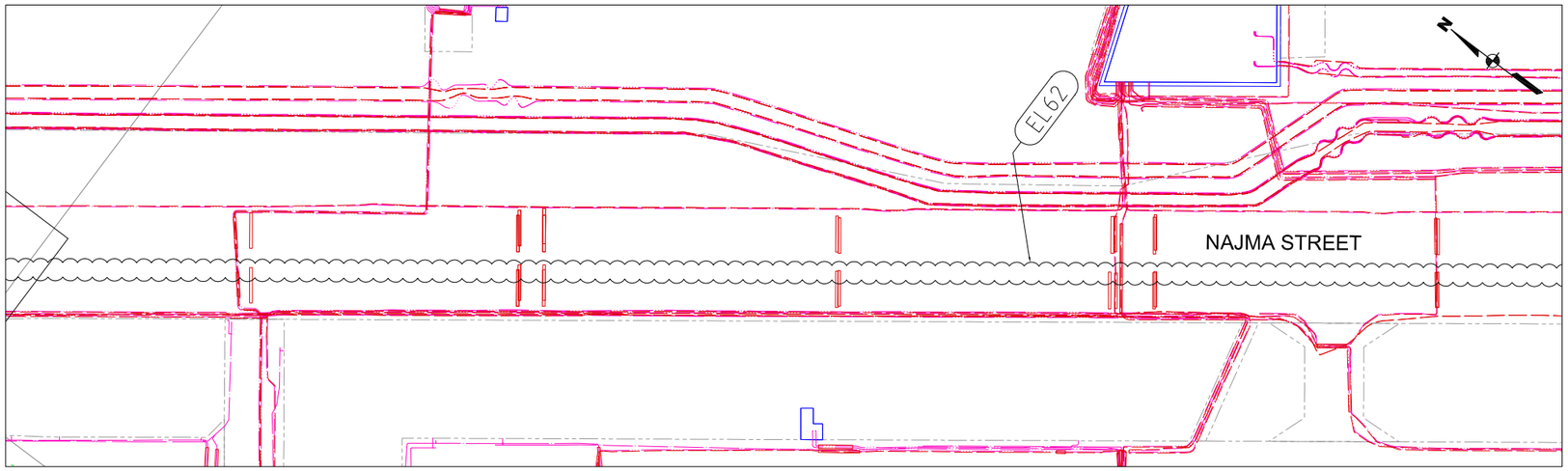
Project Code:

Status: DETATILED DESIGN APPROVAL

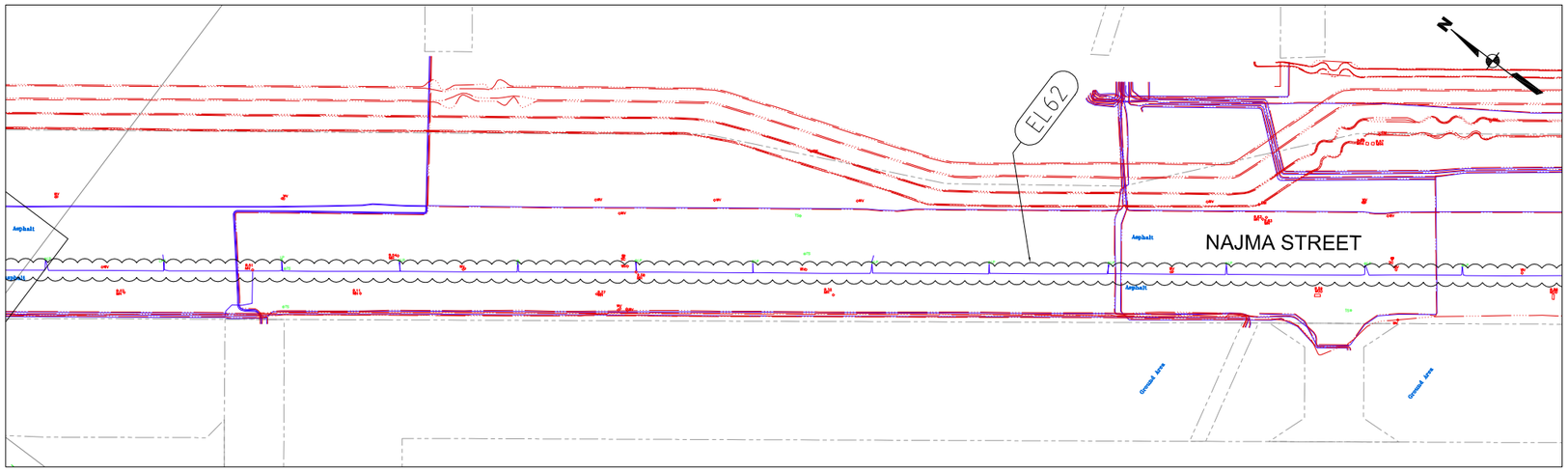
Drawing Title:

CUT AREAS LAYOUT PLAN
IMPACT ASSESSMENT
ON EXISTING UTILITY
SHEET 01 OF XX

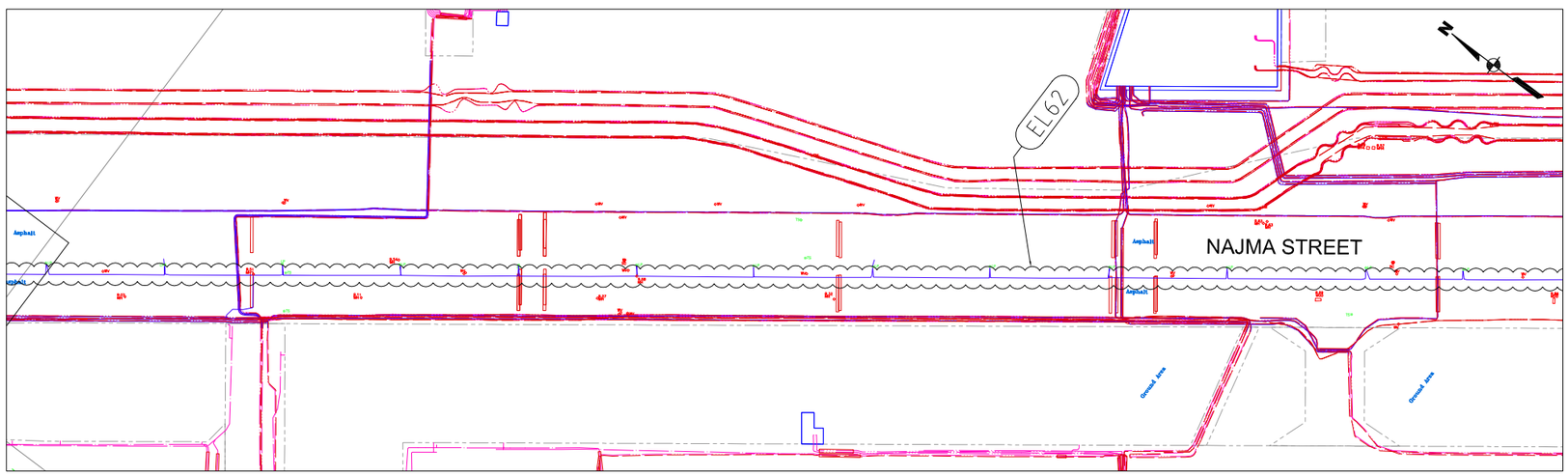
Drawn:	Checked:
Designed:	Approved:
Date:	Scale: 1:500 on A1
Drawing Number:	Revision:



AUTHORITY (ASHGHAL)



GPR SURVEY (CONCORD)



AUTHORITY & GPR SURVEY

KEYPLAN

COORDINATE SYSTEM : QATAR NATION GRID
UNITS OF MEASUREMENT: METERS
ORIGIN: 51 13' E 200,000 E
24 27' E 300,000 N
PROJECTION: TRANSVERSE MERCATOR
SPHEROID: INTERNATIONAL HAYFORD

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL COORDINATES ARE RELATED TO QATAR NATIONAL GRID.
3. EXISTING UTILITY INFORMATION HAS BEEN RECEIVED FROM RELEVANT AUTHORITIES.

LEGEND:

AUTHORITY (KAHRAMAA)
- ELECTRICITY HV/EHV CABLE + PILOT
- ELECTRICITY HV CABLE PROPOSED BY KAHRAMAA
- ELECTRICITY EHV CABLES PROPOSED BY KAHRAMAA
- ELECTRICITY MV CABLE + PILOT
- ELECTRICITY MV CABLE PROPOSED BY KAHRAMAA
- ELECTRICITY LV CABLE
- STREET LIGHTING

GPR SURVEY (CONCORD)
- ELECTRICITY HV CABLE
- ELECTRICITY MV CABLE
- ELECTRICITY LV CABLE
- UNKNOWN ELECTRICITY CABLE

REV	DATE	DESCRIPTION	DWN	APPD

وزارة البلدية والتخطيط العمراني
Ministry of Municipality & Urban Planning

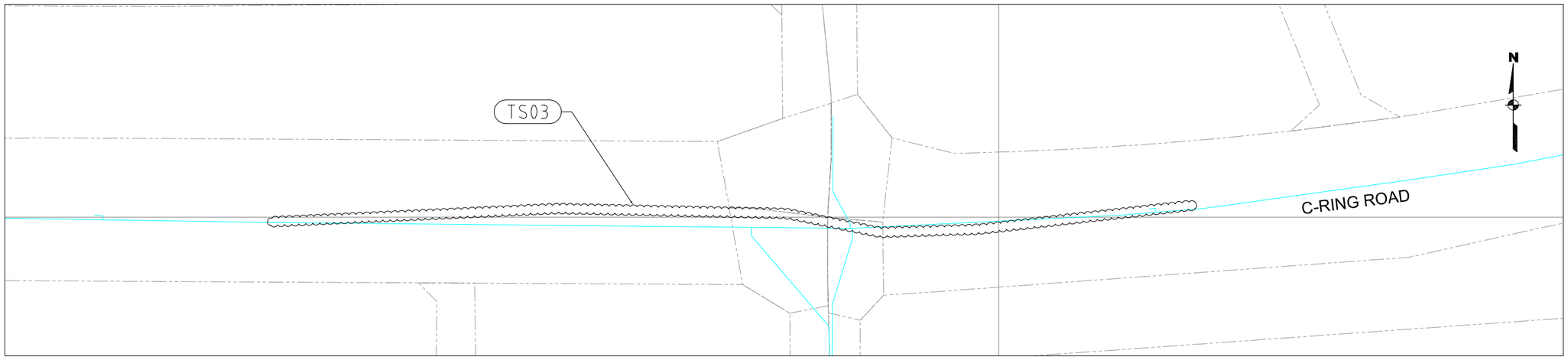
PROJECT:
LRDP
QN000

PROJECT CODE:

TITLE:
ELECTRICAL SERVICES
DISCREPANCY ASSESSMENT DRAWING
(Sheet 001 Cont. on END)

DESIGNED	STATUS
CHECKED	APPROVED
DATE	SCALE (A1) 1:1000
DRG No. REFERENCE DRAWING NUMBER	REVISION 0

AUTHORITY (ASHGHAL)



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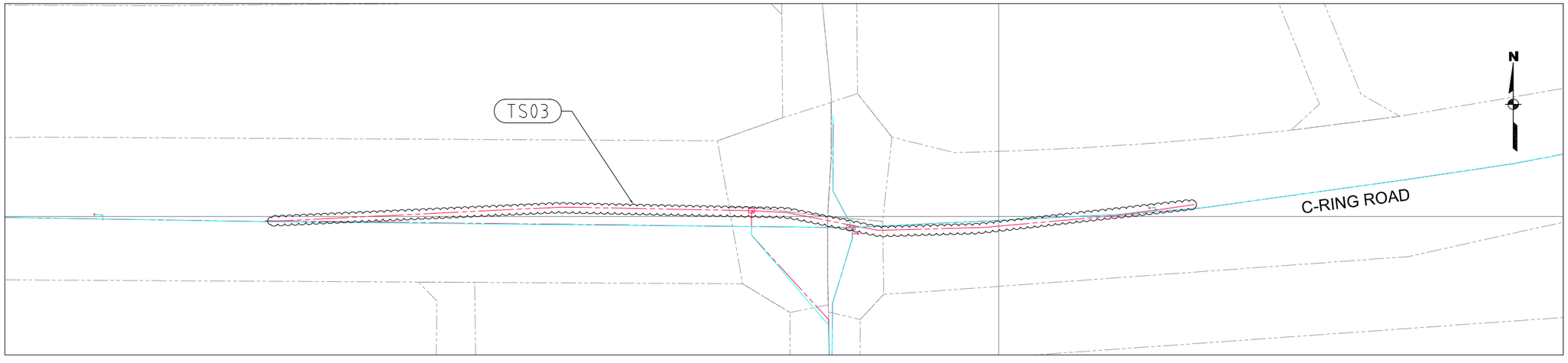


AUTHORITY & GPR SURVEY

KEYPLAN

COORDINATE SYSTEM : QATAR NATION GRID
UNITS OF MEASUREMENT: METERS
ORIGIN: 51 13' E 200,000 E
24 27' E 300,000 N
PROJECTION: TRANSVERSE MERCATOR
SPHEROID: INTERNATIONAL HAYFORD

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL COORDINATES ARE RELATED TO QATAR NATIONAL GRID.
3. EXISTING UTILITY INFORMATION HAS BEEN RECEIVED FROM RELEVANT AUTHORITIES.

LEGEND:

AUTHORITY (ASHGHAL)

TSE PIPELINE

GPR SURVEY (CONCORD)

TSE PIPELINE

REV	DATE	DESCRIPTION	DWN	APPD

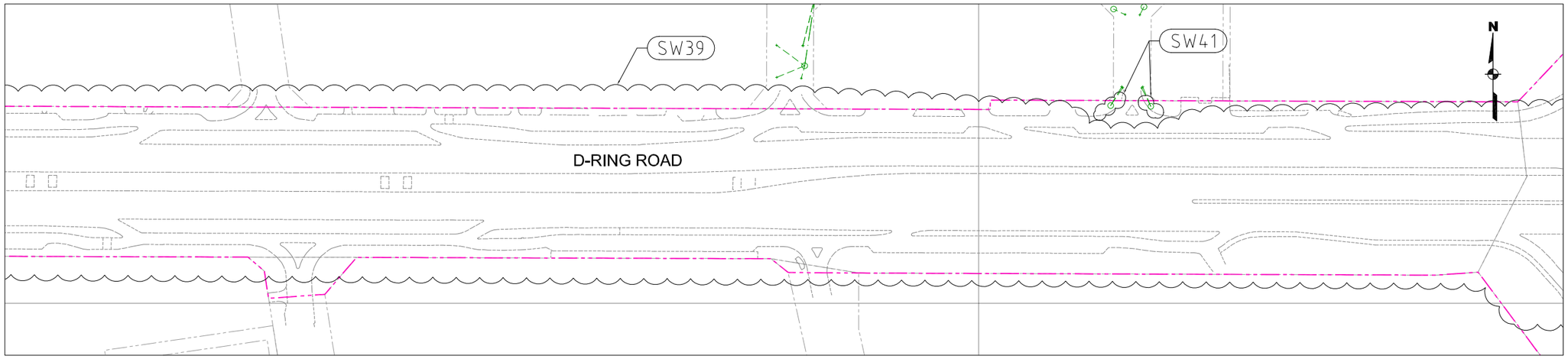
وزارة البلدية والتخطيط العمراني
Ministry of Municipality & Urban Planning

PROJECT:
LRDP
QN000

PROJECT CODE:

TITLE:
TSE SERVICES
DISCREPANCY ASSESSMENT DRAWING
(Sheet 001 Cont. on END)

DESIGNED	STATUS
CHECKED	APPROVED
DATE	SCALE (A1) 1:2500
DRG No. REFERENCE DRAWING NUMBER	REVISION 0



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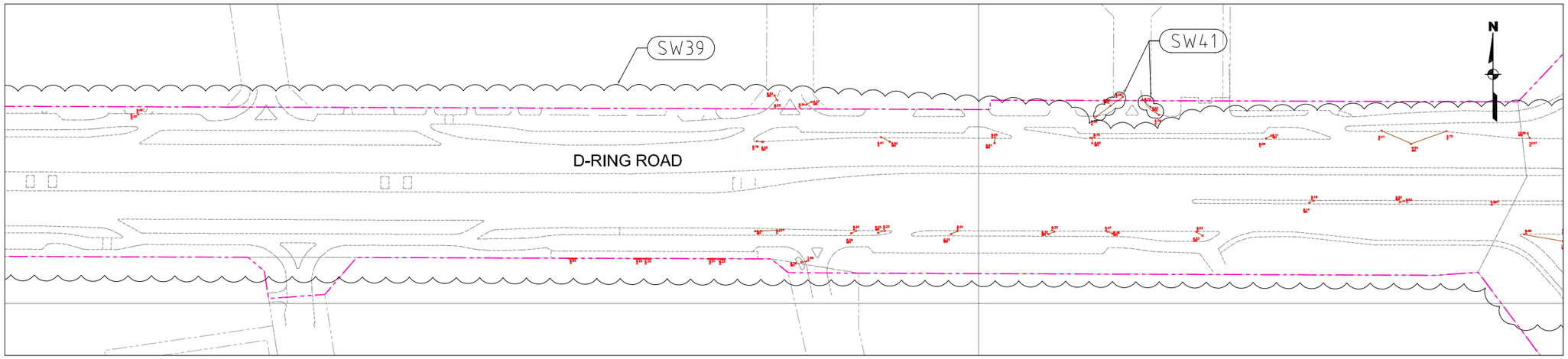

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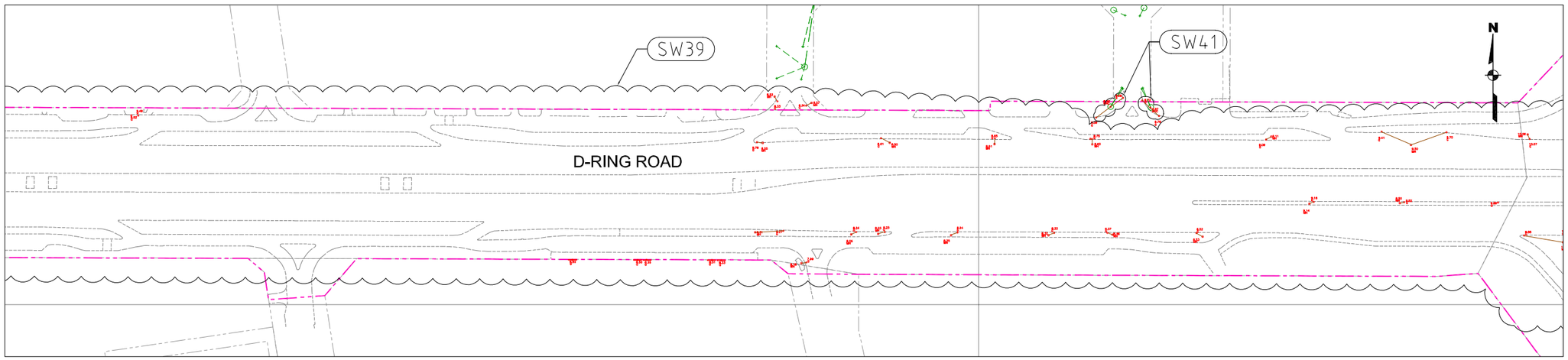

AUTHORITY & GPR SURVEY

KEYPLAN

COORDINATE SYSTEM : QATAR NATION GRID
UNITS OF MEASUREMENT: METERS
ORIGIN: 51 13' E 200,000 E
24 27' E 300,000 N
PROJECTION: TRANSVERSE MERCATOR
SPHEROID: INTERNATIONAL HAYFORD

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL COORDINATES ARE RELATED TO QATAR NATIONAL GRID.
3. EXISTING UTILITY INFORMATION HAS BEEN RECEIVED FROM RELEVANT AUTHORITIES.

LEGEND:

AUTHORITY (ASHGHAL)
- SURFACE WATER PIPELINE
- SURFACE WATER RISING MAIN

GPR SURVEY (CONCORD)
- SURFACE WATER PIPELINE
- SURVEY BOUNDARY

REV	DATE	DESCRIPTION	DWN	APPD

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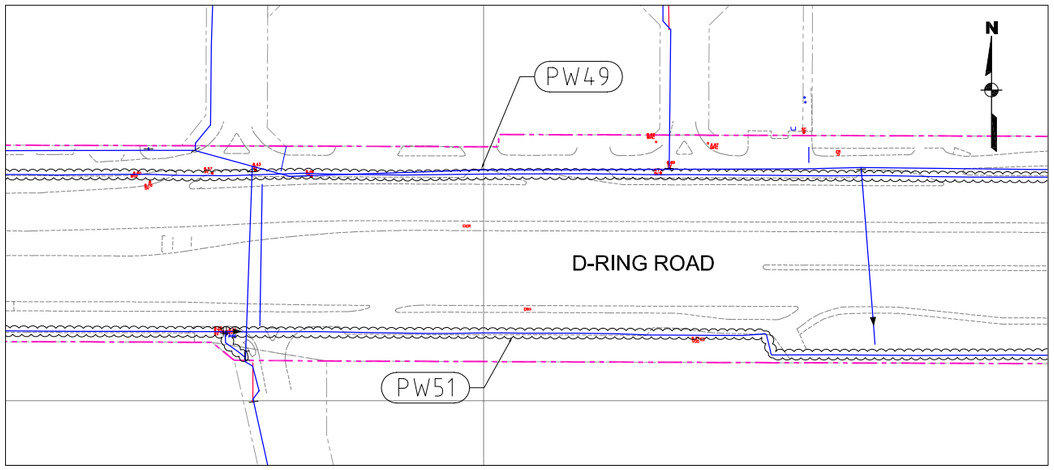
Ministry of Municipality & Urban Planning

PROJECT:
LRDP
QN000

PROJECT CODE:

TITLE:
SW SERVICES
DISCREPANCY ASSESSMENT DRAWING
(Sheet 001 Cont. on END)

DESIGNED	STATUS
CHECKED	APPROVED
DATE	SCALE (A1) 1:1000
DRG No. REFERENCE DRAWING NUMBER	REVISION 0



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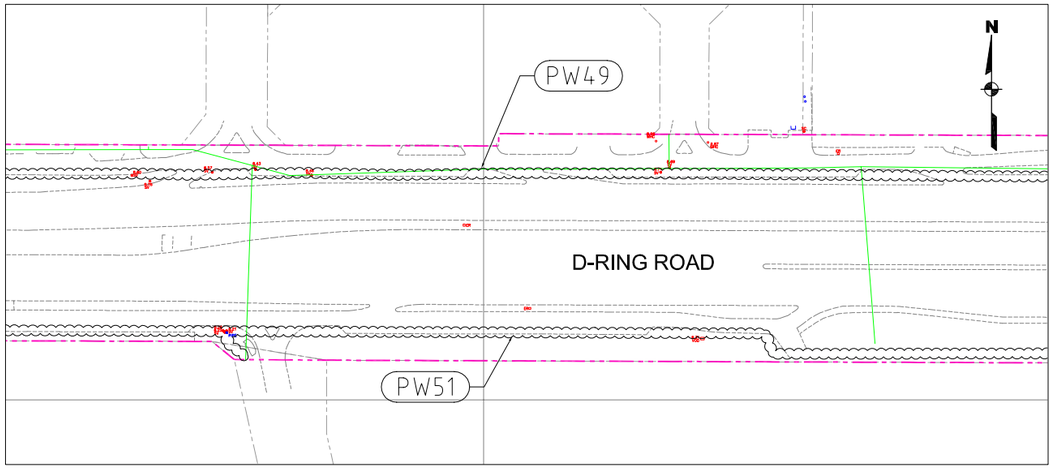
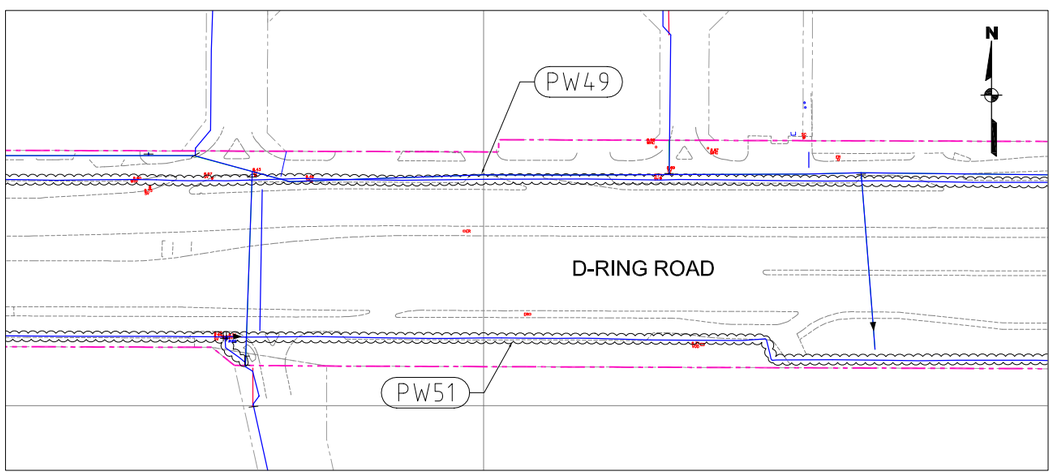


GPR SURVEY (CONCORD)



AUTHORITY & GPR SURVEY

KEYPLAN

N
W E
S

COORDINATE SYSTEM : QATAR NATION GRID
UNITS OF MEASUREMENT: METERS
ORIGIN: 51 13' E 200,000 E
24 27' E 300,000 N
PROJECTION: TRANSVERSE MERCATOR
SPHEROID: INTERNATIONAL HAYFORD

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL COORDINATES ARE RELATED TO QATAR NATIONAL GRID.
3. EXISTING UTILITY INFORMATION HAS BEEN RECEIVED FROM RELEVANT AUTHORITIES.

LEGEND:

AUTHORITY (ASHGHAL)
- POTABLE WATER PIPELINE
- POTABLE WATER PIPELINE TO BE CANCELLED BY KAHRAMAA
- ABANDONED POTABLE WATER

GPR SURVEY (CONCORD)
- POTABLE WATER PIPELINE
- SURVEY BOUNDARY

REV	DATE	DESCRIPTION	DWN	APPD

وزارة البلدية والتخطيط العمراني
Ministry of Municipality & Urban Planning

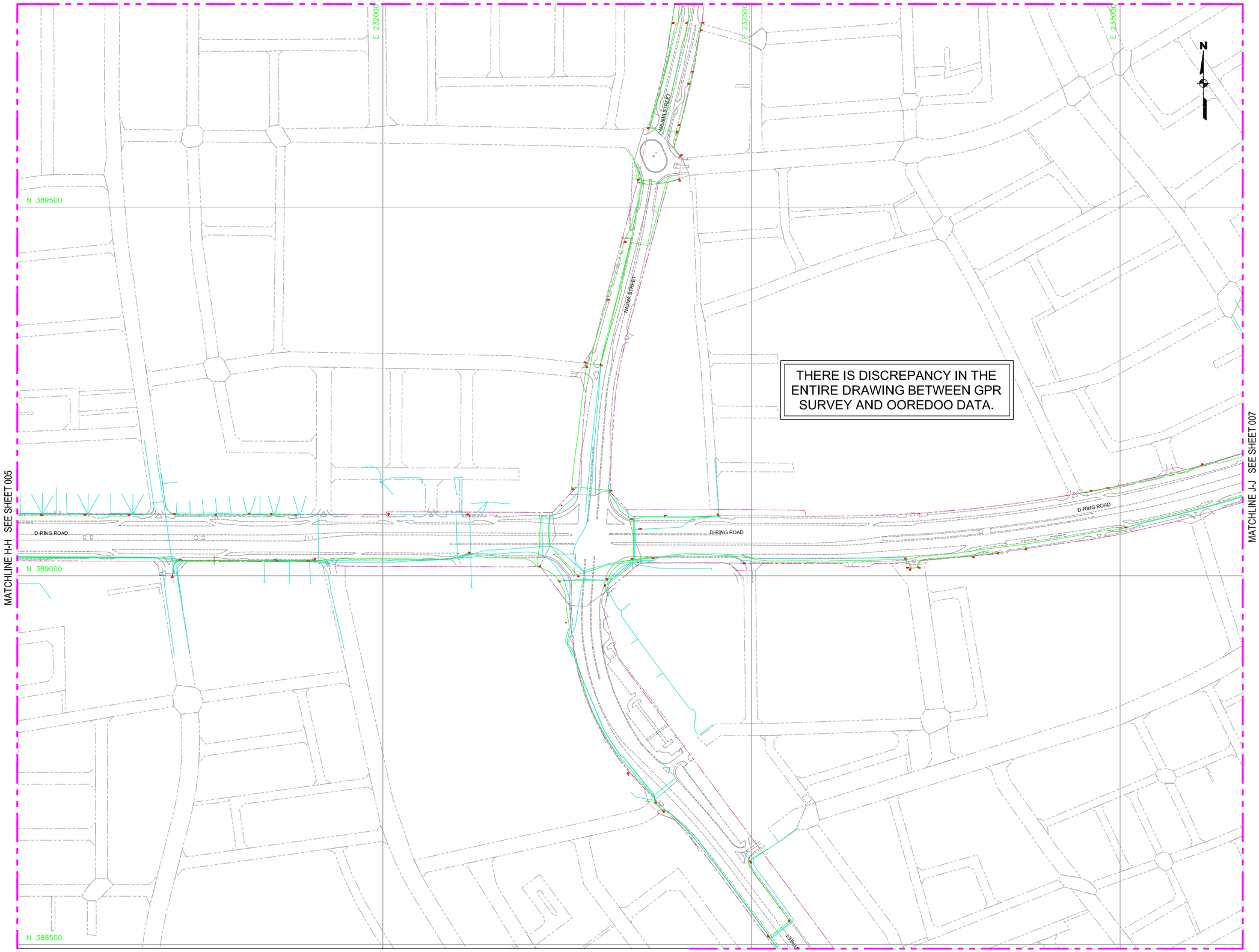
PROJECT:
LRDP
QN000

PROJECT CODE:

TITLE:
POTABLE WATER SERVICES
DISCREPANCY ASSESSMENT DRAWING
(Sheet 001 Cont. on END)

DESIGNED	STATUS
CHECKED	APPROVED
DATE	SCALE (A1) 1:1000
DRG No. REFERENCE DRAWING NUMBER	REVISION 0

MATCHLINE F-F SEE SHEET 003



MATCHLINE H-H SEE SHEET 005

MATCHLINE J-J SEE SHEET 007

MATCHLINE K-K SEE SHEET 008

PLAN
SCALE 1:2500

6
-

KEYPLAN

COORDINATE SYSTEM : QATAR NATION GRID
UNITS OF MEASUREMENT: METERS
ORIGIN: 51 13' E 200,000 E
24 27' E 300,000 N
PROJECTION: TRANSVERSE MERCATOR
SPHEROID: INTERNATIONAL HAYFORD

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL COORDINATES ARE RELATED TO QATAR NATIONAL GRID.
3. EXISTING UTILITY INFORMATION HAS BEEN RECEIVED FROM RELEVANT AUTHORITIES.

LEGEND:

AUTHORITY (OOREDOO)
OOREDOO DUCT

GPR SURVEY (CONCORD)
OOREDOO DUCT
SURVEY BOUNDARY

REV	DATE	DESCRIPTION	DWN	APPD

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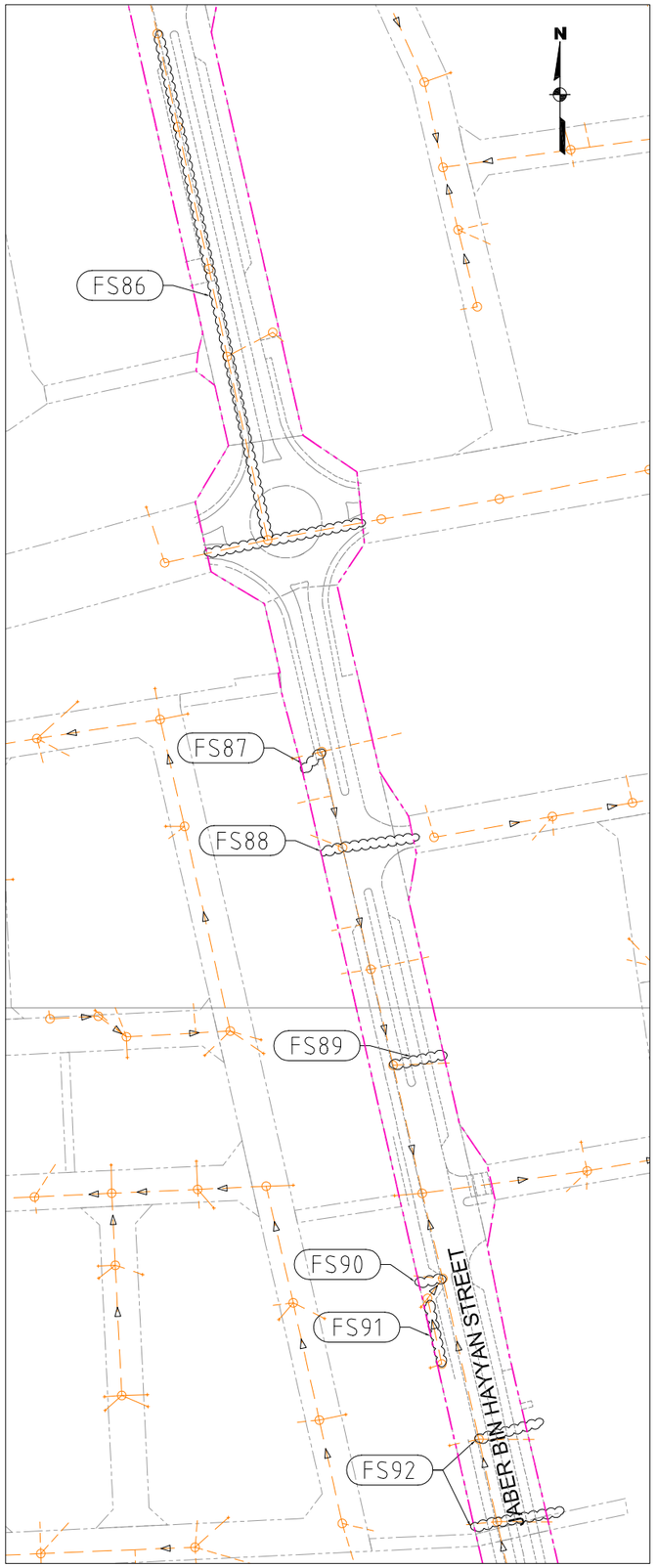
Ministry of Municipality & Urban Planning

PROJECT:
LRDP
QN000

PROJECT CODE:

TITLE:
OOREDOO SERVICES
DISCREPANCY ASSESSMENT DRAWING
(Sheet 001 Cont. on END)

DESIGNED	STATUS
CHECKED	APPROVED
DATE	SCALE (A1) 1:2500
DRG No. REFERENCE DRAWING NUMBER	REVISION 0



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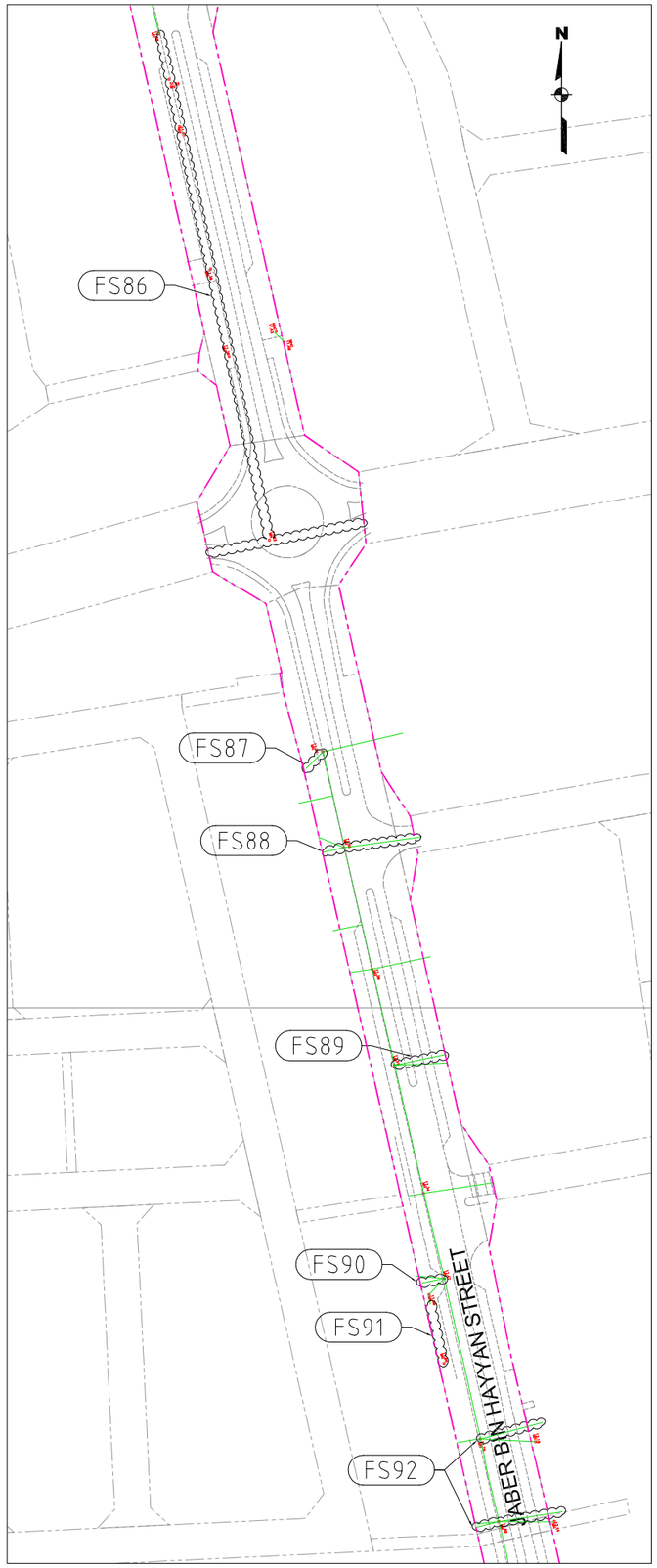
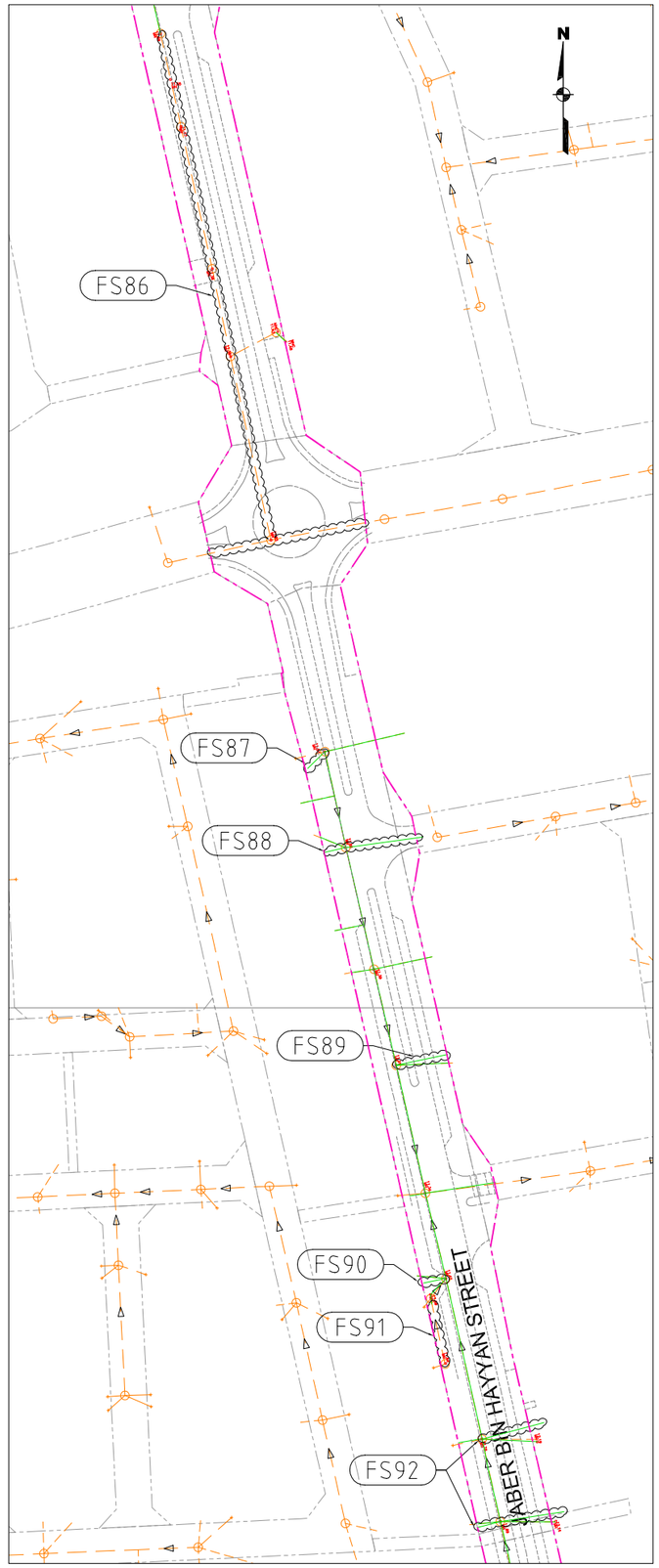


GPR SURVEY (CONCORD)



AUTHORITY & GPR SURVEY

KEYPLAN

COORDINATE SYSTEM : QATAR NATION GRID
UNITS OF MEASUREMENT: METERS
ORIGIN: 51 13' E 200,000 E
24 27' E 300,000 N
PROJECTION: TRANSVERSE MERCATOR
SPHEROID: INTERNATIONAL HAYFORD

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL COORDINATES ARE RELATED TO QATAR NATIONAL GRID.
3. EXISTING UTILITY INFORMATION HAS BEEN RECEIVED FROM RELEVANT AUTHORITIES.

LEGEND:

AUTHORITY (ASHGHAL)
- FOUL SEWER PIPELINE
- FOUL SEWER RISING MAIN

GPR SURVEY (CONCORD)
- FOUL SEWER PIPELINE
- SURVEY BOUNDARY

REV	DATE	DESCRIPTION	DWN	APPD

وزارة البلدية والتخطيط العمراني
Ministry of Municipality & Urban Planning

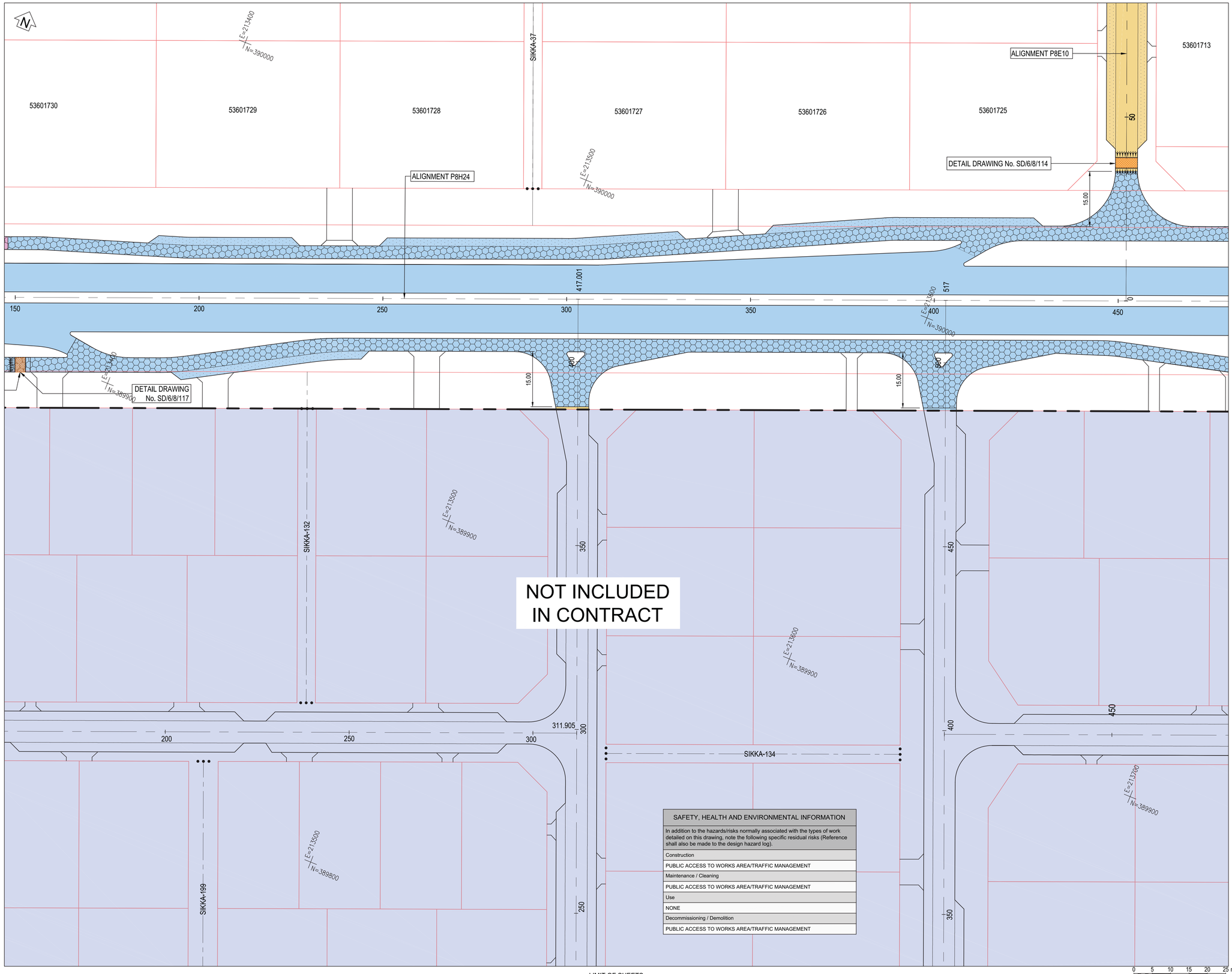
PROJECT:
LRDP
QN000

PROJECT CODE:

TITLE:
FOUL SEWER SERVICES
DISCREPANCY ASSESSMENT DRAWING
(Sheet 001 Cont. on END)

DESIGNED	STATUS
CHECKED	APPROVED
DATE	SCALE (A1) 1:1000
DRG No. REFERENCE DRAWING NUMBER	REVISION 0

FOR CONTINUATION REFER TO SHEET No: 9



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following specific residual risks (Reference shall also be made to the design hazard log).
Construction
PUBLIC ACCESS TO WORKS AREA/TRAFFIC MANAGEMENT
Maintenance / Cleaning
PUBLIC ACCESS TO WORKS AREA/TRAFFIC MANAGEMENT
Use
NONE
Decommissioning / Demolition
PUBLIC ACCESS TO WORKS AREA/TRAFFIC MANAGEMENT

KEY PLAN

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. ALL COORDINATES & LEVELS ARE RELATED TO QATAR NATIONAL GRID AND QATAR NATIONAL HEIGHT DATUM, RESPECTIVELY.
3. REFER TO PAVEMENT SCHEDULES IN SECTION E OF TENDER DOCUMENTS FOR BLOCK PAVING (BP) AND FULLY FLEXIBLE (FF) PAVEMENT OPTIONS. SUFFIX 'B' REPRESENTS BUFF, 'C' CHARCOAL & 'R' RED COLOUR.
4. SEE TYPICAL TIE IN DETAIL DRAWINGS FOR PAVEMENT TIE IN DETAILS.
5. SEE LANDSCAPE DRAWINGS FOR OTHER PAVED AREAS, e.g. FOOTPATH, CYCLE LANE, SIKKA. SPLITTER ISLAND.
6. ROAD MARKINGS SHOWN ARE INDICATIVE ONLY.

LEGEND:

Corridor	Carriageway	Parking Bay
16m	BP2-B *	BP2-C
	FF3 #	BP2-C
20/24m	FF3	BP2-C
32m	FF5	FF5-R
40m	FF5	
64m	FF5	

* CORE COMMUNITY ROADS
\# OTHER ROADS

Corridor	Service Road	Parking Bay & Bus Layby (Collector Roads)
40m	FF5	FF5-R
64m	FF5	FF5-R
Bus Layby at Local Roads	BP2-R	Roundabout Overrun Area BP2-C

SIK-216 SIKKA NUMBER
RAISED JUNCTION
SPEED TABLE
CUL DE SAC TURNING HEAD

Rev.	Date	Revision Details	Drawn	Chkd.	Appd.

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Public Works Authority

P.O.Box: 22188
Tel.: 00974 44950000
Fax: 00974 44950999
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Project Management Consultant :

Qatar Local Roads & Drainage
ASHGHAL PROGRAMME DELIVERY

PARSONS BRINCKERHOFF
5th Floor, Faisal Tower #2
West Bay
PO Box 23103 Doha, Qatar
+974 4495 1601 (Project)
+974 4435 1612 (Main office)

Design Consultant :

Project Name:

Project Code:

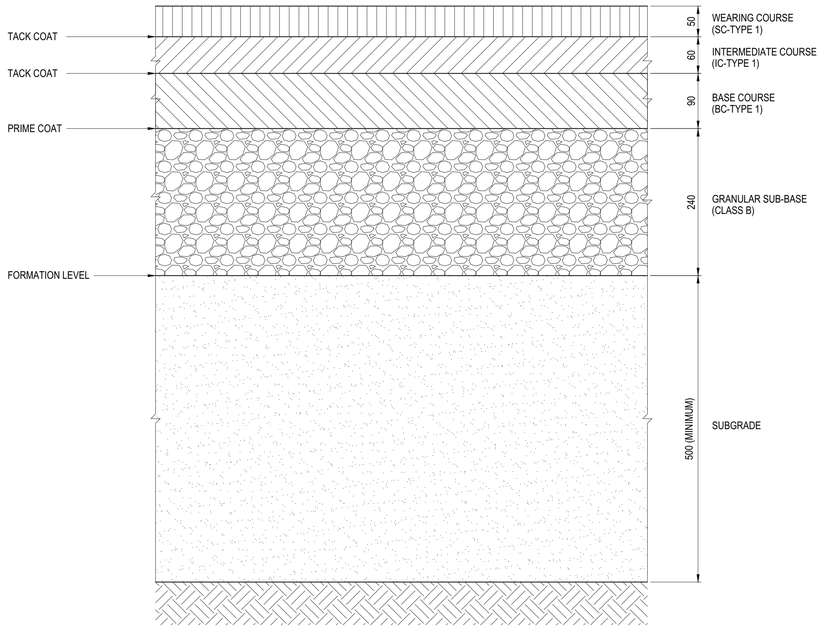
Status: DETAILED DESIGN

Drawing Title:

ROAD PAVEMENT
LAYOUT PLAN
SHEET 01 OF XX

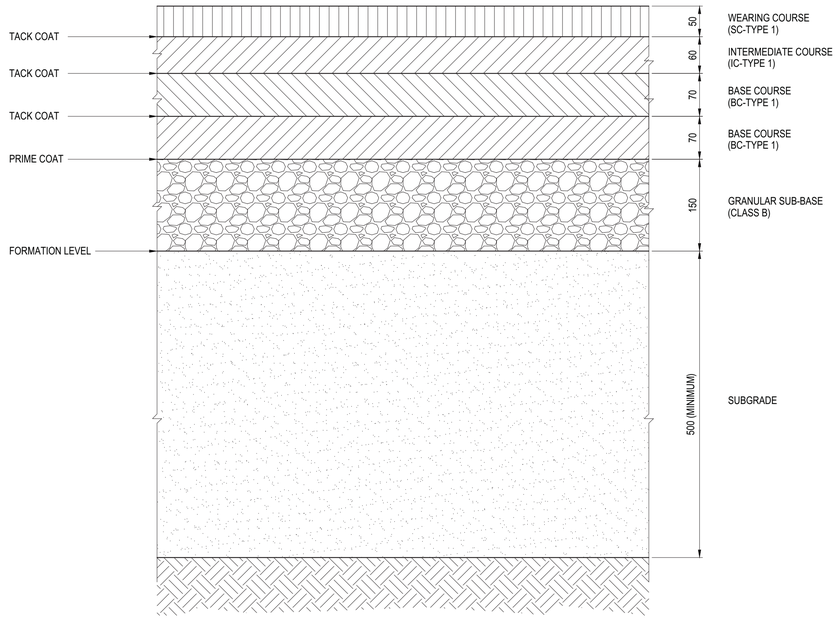
Drawn:	Checked:
Designed:	Approved:
Date:	Scale: 1:500 on A1
Drawing Number:	Revision:

FULLY FLEXIBLE
OPTION FF3



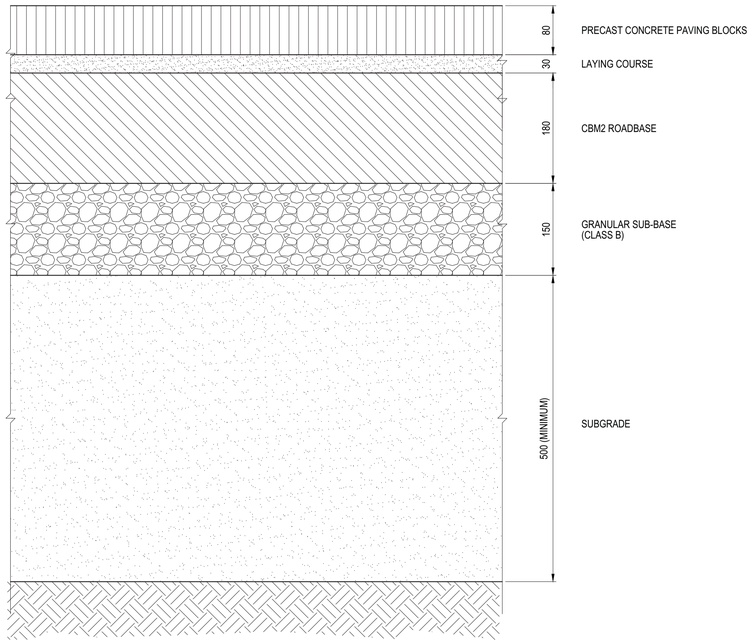
1 DETAILS 1
SCALE 1:5

FULLY FLEXIBLE
OPTION FF5



2 DETAILS 2
SCALE 1:5

BLOCK PAVEMENT
OPTION BP2



3 DETAILS 3
SCALE 1:5

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. REFER TO PAVEMENT SCHEDULE FOR DETAILS OF PAVEMENT MATERIALS.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following specific residual risks (Reference shall also be made to the design hazard log).

Construction

Maintenance / Cleaning

Use

Decommissioning / Demolition

Rev.	Date	Revision Details	Drawn	Chkd.	Appd.

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PARSONS BRINCKERHOFF
5th Floor, Faisal Tower #2
West Bay
PO Box 23103 Doha, Qatar
+974 4495 1601 (Project)
+974 4435 1612 (Main office)
Design Consultant :

Project Name:

Project Code:

Status: DETAILED DESIGN APPROVAL

Drawing Title:

HIGHWAYS STANDARD DETAIL PAVEMENT CONSTRUCTION DETAILS

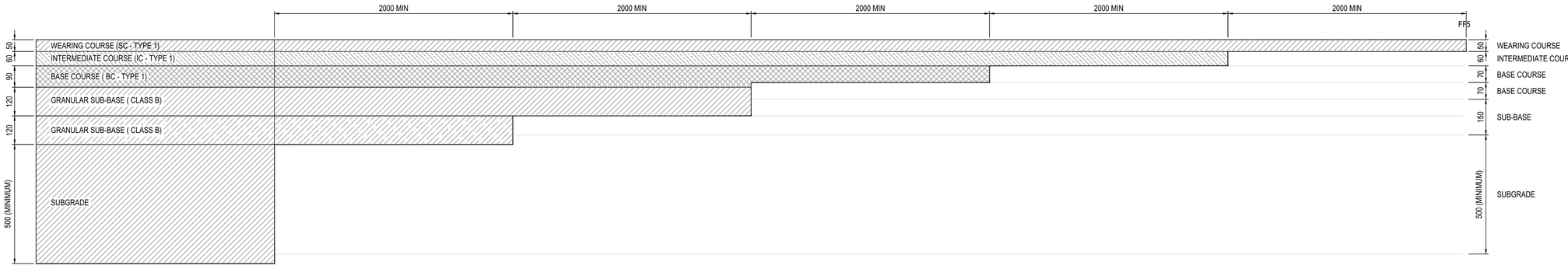
Drawn:	Checked:
Designed:	Approved:
Date:	Scale: 1:5 on A1
Drawing Number:	Revision:

0 50 100 150 200 250 mm
SCALE 1:5

OPTION FF3

LONGITUDINAL TIE-IN BETWEEN FF3 AND FF5

OPTION FF5



1 DETAIL 1

SCALE N.T.S

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. REFER TO QCS 2010 SECTION 6 PART 5 CLAUSES 5.9.2.10 AND 5.9.4.1 to 5.9.4.3 REGARDING TRANSVERSE JOINTS.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following specific residual risks (Reference shall also be made to the design hazard log).

Construction

Maintenance / Cleaning

Use

Decommissioning / Demolition

Rev.	Date	Revision Details	Drawn	Chkd.	Appd.

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+974 4495 1601 (Project)
+974 4435 1612 (Main office)

Design Consultant :

Project Name:

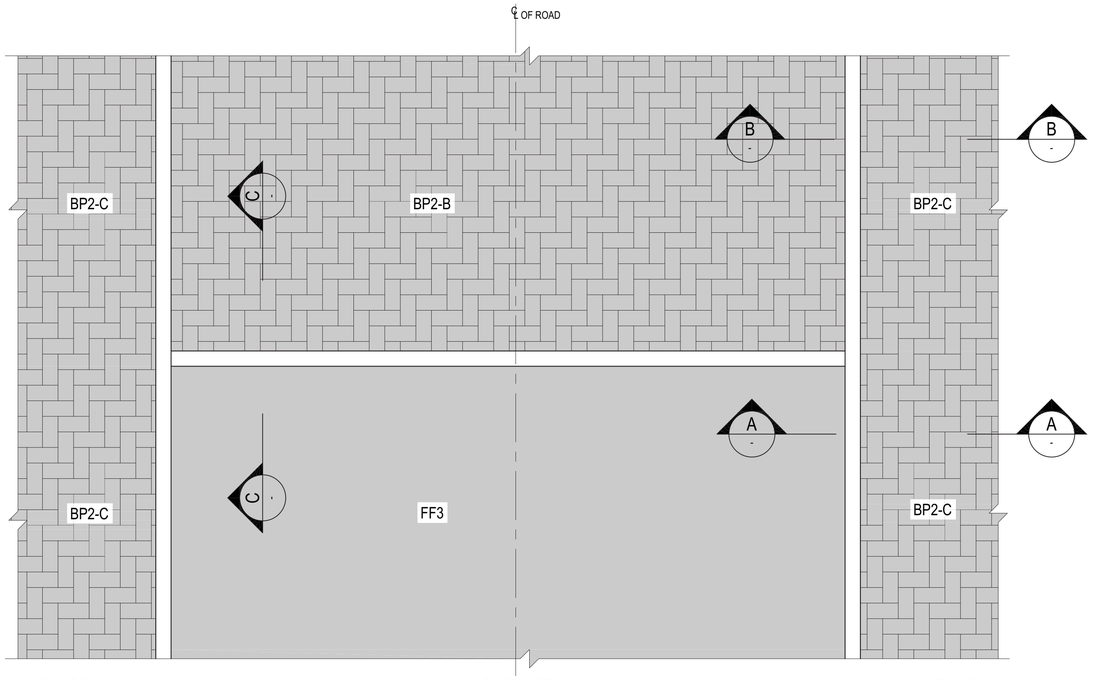
Project Code:

Status: DETAILED DESIGN APPROVAL

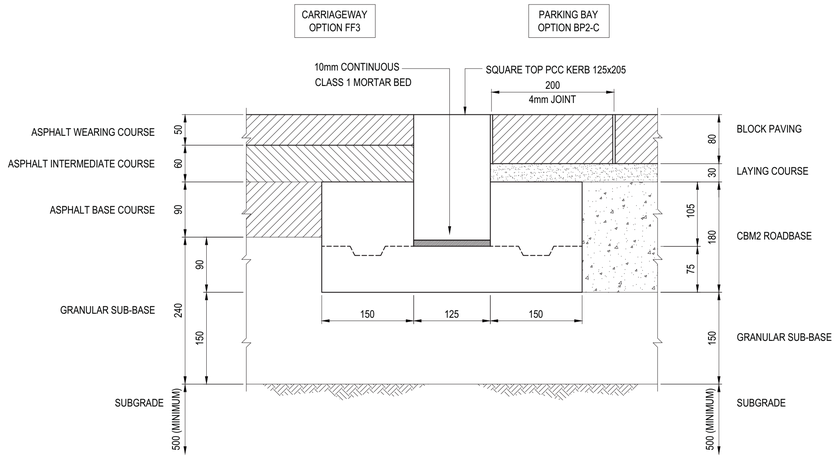
Drawing Title:

HIGHWAYS STANDARD DETAIL PAVEMENT LONGITUDINAL TIE-IN DETAILS

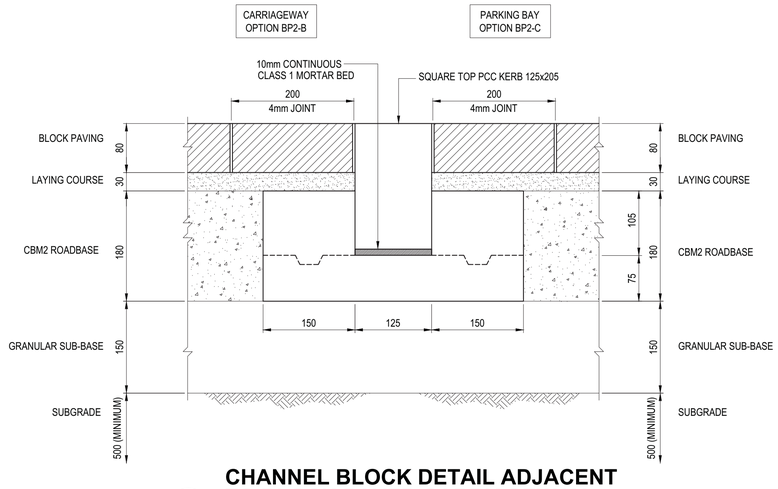
Drawn:	Checked:
Designed:	Approved:
Date:	Scale: N.T.S
Drawing Number:	Revision:



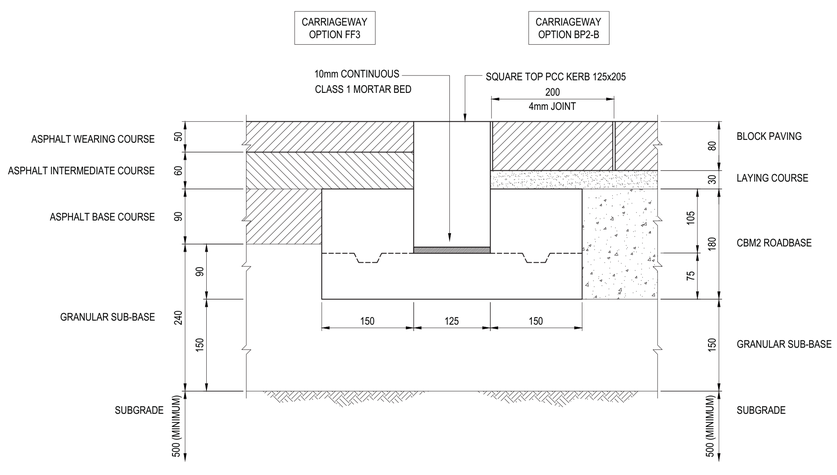
1 PLAN VIEW
N.T.S.



A LONGITUDINAL CHANNEL BLOCK DETAIL ADJACENT TO ASPHALT CARRIAGEWAY
SCALE 1:5



B CHANNEL BLOCK DETAIL ADJACENT TO BLOCK PAVED CARRIAGEWAY
SCALE 1:5



C TRANSVERSE JOINT BETWEEN CHANNEL BLOCK AND ASPHALT CARRIAGEWAY
SCALE 1:5

0 50 100 150 200 250 mm
SCALE 1:5

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. WHERE KERB CONCRETE FOUNDATION LEVEL IS BELOW SUB-BASE LEVEL PLACE 75mm THICK CONCRETE BLINDING LAYER BELOW FOUNDATION.
3. JOINTS BETWEEN KERBS SHALL HAVE A WIDTH OF 4mm EXCEPT AT MOVEMENT JOINTS.
4. AT EVERY 10m INTERVAL A MOVEMENT JOINT 20mm WIDE SHALL BE FORMED THROUGH THE CONCRETE FOUNDATION AND BACKING. THE JOINT FILLER SHALL BE BITUMEN IMPREGNATED CORK BOARD.
5. WHERE THE CROSS FALL OF ROAD SURFACE IS TOWARDS THE KERB THE SUB-BASE SHOULD BE CARRIED THROUGH TO EDGE OF THE EMBANKMENT OR TO THE FILTER DRAIN.
6. KERB UNIT SHALL BE LAID ON 1:3 CEMENT SAND MORTAR NOT LESS THAN 10mm THICK AND NOT MORE THAN 40mm THICK.
7. EDGE RESTRAINT IS REQUIRED AT ALL EDGES OF BLOCK PAVING, INCLUDING INTERFACE BETWEEN BLOCK AND ASPHALT PAVEMENTS.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following specific residual risks (Reference shall also be made to the design hazard log).

Construction

Maintenance / Cleaning

Use

Decommissioning / Demolition

Rev.	Date	Revision Details	Drawn	Chkd.	Appd.

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Project Management Consultant :
Qatar Local Roads & Drainage ASHGHAL PROGRAMME DELIVERY
PARSONS BRINCKERHOFF
5th Floor, Faisal Tower #2
West Bay
PO Box 23103 Doha, Qatar
+974 4495 1601 (Project)
+974 4435 1612 (Main office)

Design Consultant :

Project Name:

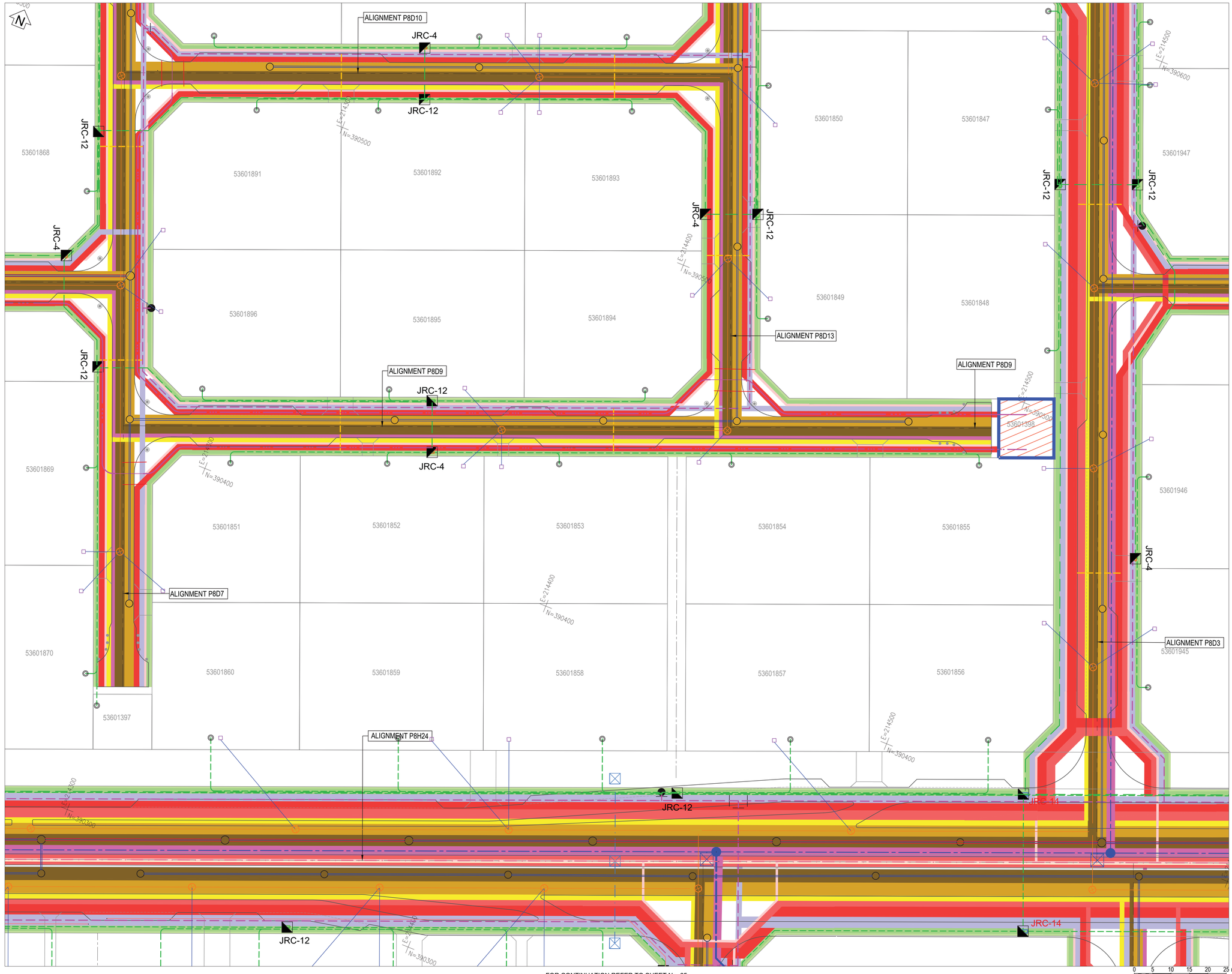
Project Code:

Status: DETAILED DESIGN APPROVAL

Drawing Title:
HIGHWAYS
CHANNEL BLOCK DETAILS
AT PARKING BAYS

Drawn:	Checked:
Designed:	Approved:
Date:	Scale: AS SHOWN
Drawing Number:	Revision:

FOR CONTINUATION REFER TO SHEET No: 83



FOR CONTINUATION REFER TO SHEET No: 73

FOR CONTINUATION REFER TO SHEET No: 75

FOR CONTINUATION REFER TO SHEET No: 65

KEY PLAN

NOTES:

1. FOR UTILITIES LEGENDS,

LEGEND:

- ELECTRICITY (TRANSMISSION)
- ELECTRICITY (DISTRIBUTION)
- ELECTRICITY (LIGHTING + ITS)
- TELECOMMUNICATIONS (QAF)
- TELECOMMUNICATIONS
- SEWERAGE
- SURFACE WATER
- TREATED SEWERAGE EFFLUENT
- WATER
- CHILLED WATER
- DOHA SURVEILLANCE SECURITY SYSTEM
- GAS

Rev.	Date	Revision Details	Drawn	Chkd.	Appd.

Project Management Consultant :

Qatar Local Roads & Drainage ASHGHAL PROGRAMME DELIVERY

PARSONS BRINCKERHOFF
5th Floor, Faisal Tower #2
West Bay
PO Box 23103 Doha, Qatar
+974 4435 1601 (main office)

Design Consultant :

Client :

Public Works Authority
P.O. Box 22188
Tel.: (0974) 4950000
Fax.: (0974) 4950999

I A INFRASTRUCTURE AFFAIRS

ASHGHAL أشغال
قطر تستحق الأفضل Qatar Deserves The Best

Project Name:

Project Code:

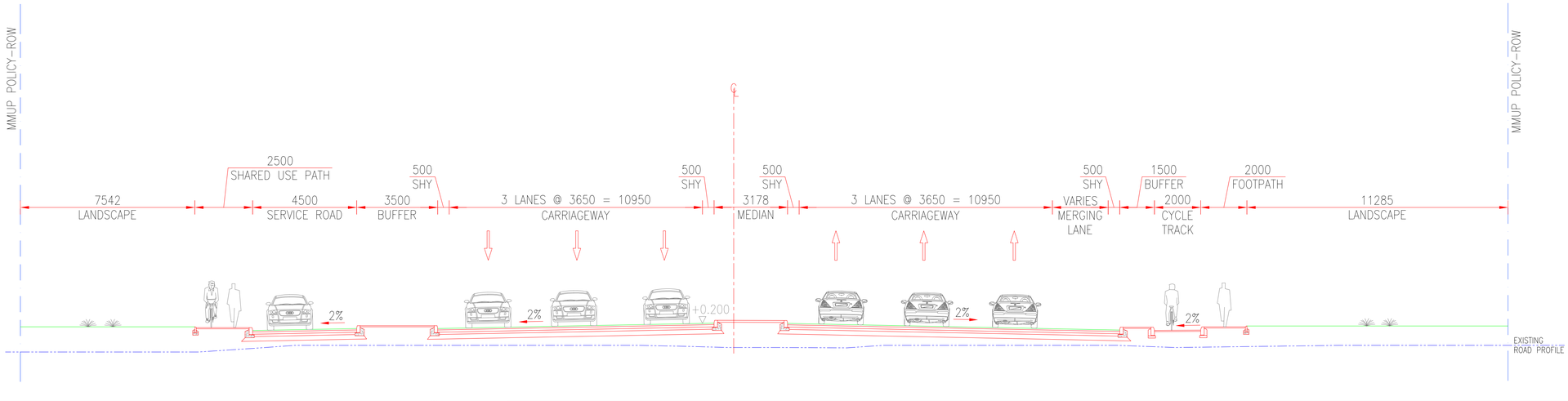
Status: DETAILED DESIGN APPROVAL

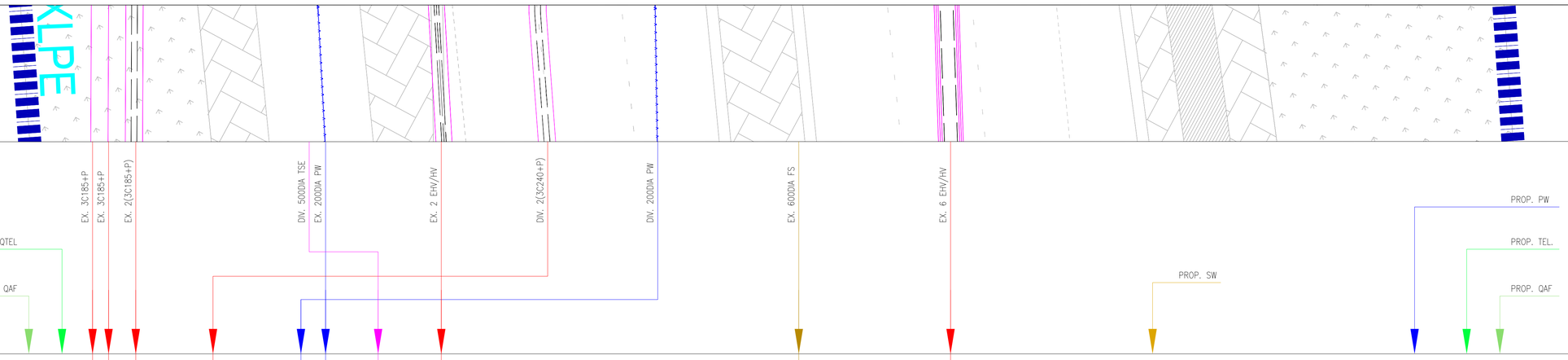
Drawing Title:

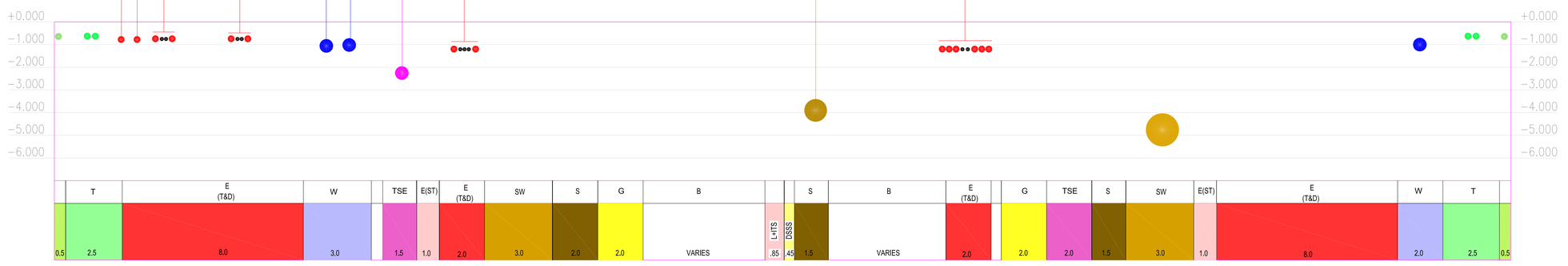
PROPOSED UTILITY CORRIDOR
COMBINED LAYOUT PLAN
(EXISTING AND PROPOSED UTILITY)

SHEET 01 OF XX

Drawn:	Checked:
Designed:	Approved:
Date:	Scale: 1:500 @ A1
Drawing Number:	Revision:

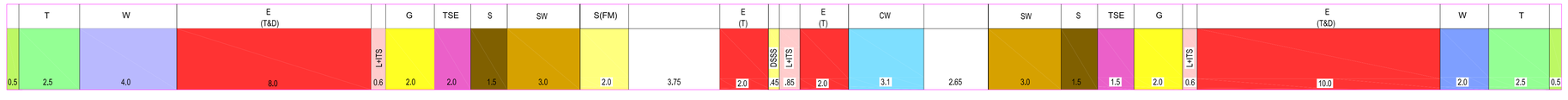






PROPOSED UTILITY CROSS SECTION - 64.3M

Scale 1:100



MMUP TYPICAL CROSS SECTION CORRIDOR - 64M

Scale 1:100

Prepared by: Muhsin Kuhutan
Checked by: Mujtaba Hamidy
Approved by: Hassan Qasem

NOTE:

REFER TO DRAWING XXX.XXX.XXX FOR GENERAL NOTES

LEGEND:

COLOR CODING

E(T)	ELECTRICITY (TRANSMISSION)
E(D)	ELECTRICITY (DISTRIBUTION)
	ELECTRICAL GALLERY
E(ST)	STREET LIGHTING
T	TELECOMMUNICATION
T(QAF)	TELECOMMUNICATION QATAR ARMED FORCE (QAF)
SFM	SEWERAGE FORCE MAIN
TSE	TREATED SEWERAGE EFFLUENT
S	SEWERAGE GRAVITY
W	WATER
CW	CHILLED WATER
G	GAS
SW	SURFACE WATER
B	BUFFER

ABBREVIATIONS:

E(T)	ELECTRICITY TRANSMISSION
E(D)	ELECTRICITY DISTRIBUTION
E(ST)	ELECTRICITY STREET LIGHTING
T	TELEPHONE
(QAF)	QATAR ARMED FORCE (QAF)
SFM	SEWERAGE FORCE MAIN
TSE	TREATED SEWERAGE EFFLUENT
S	SEWERAGE GRAVITY
W	WATER
CW	CHILLED WATER
G	GAS
SW	SURFACE WATER
B	BUFFER
PROP	PROPOSED
EXIST	EXISTING
MIN	MINIMUM
K.V	KILO VOLT

REV. NO.	DATE	DESCRIPTION	APPR.
0	DD/MM/YY	ISSUED FOR APPROVAL	XXXX

State of Qatar
Ministry of Municipality & Urban Planning

TRANSPORTATION AND INFRASTRUCTURE PLANNING DEPARTMENT

DESIGN CONSULTANT DETAILS & LOGO

PROJECT CODE: XXXXXXXXX

PROJECT: CONCEPT DESIGN OF ROADS/INFRASTRUCTURE

PROJECT NAME - PACKAGE XX

TITLE: PROPOSED CROSS SECTION SECTION Z (SHEET 01 OF XX)

DESIGNED	XXXX	STATUS	CONCEPT DESIGN
CHECKED	XXXX	TIPD APPROVAL	
DATE	DD.MM.YY	SCALE	@ A1 = 1:150, @ A3 = 1:300
DWG. NO.	MMUP DRAFT	REV. NO.	0.0

MMUP UTILITY IMPACT ASSESSMENT CHECKLIST
LOCAL ROADS AND DRAINAGE PROGRAM
(For MMUP's Initial Acceptance)

Item	Description	Yes	No	Comments
1.0	**Data Collection**			
1.1	Data collected of all the existing and proposed utilities from utility agencies? Information must be current (not older than 4 months.) The agencies are:			
	a. MMUP			
	b. Ashghal (Drainage, TSE and Foul Sewer)			
	c. Ashghal – Road Projects			
	d. Qatar Petroleum			
	e. Kahramaa Electricity			
	f. Kahramaa Water			
	g. ictQatar			
	h. Qtel			
	i. Vodafone			
	j. QNBN			
	k. DSSS			
	l. Qatar Cool			
	m. District Cooling – Kahramaa			
	n. Qatar Arm Forces (QAF)			
	o. Qatar Rail Company (QRail)			
	p. Others (Specify)			
	Attributes of utilities should also be requested i.e. size, type, age, material, class and any other relevant information such as voltage, operating pressure etc…			
1.2	Coordinated with adjacent as well as Large Projects?			
	a. Mega Reservoirs			
	b. IDRIS			
	c. Metro			
	d. Q2022			
	e. QIDMP			
	f. Local Road & Drainage Program			
	g. Others			
1.3	Coordination with Utility agencies regarding existing and future abandonments as well possible upgrades within the vicinity of the project corridor?			
1.4	Conducted topographic survey and geophysics survey (GPR, Radio detection & Trial Pits)?			
1.5	Assessed all the discrepancies between the survey and the 'As Built' and forwarded to relevant agencies?			

MMUP UTILITY IMPACT ASSESSMENT CHECKLIST
LOCAL ROADS AND DRAINAGE PROGRAM
(For MMUP's Initial Acceptance)

Item	Description	Yes	No	Comments
2.0	**Study of the Roads and Surrounding Area**			
2.1	Identified the location of the project?			
	a. Rural			
	b. Urban			
	c. Inner Urban			
2.2	Type of Roads			
	a. Arterial			
	b. Local Urban Collector			
	c. Local Urban Access			
	d. Others (please specify)			
2.3	Studied the Land Use Plan, future adjacent developments (shopping centers, industries, hospitals, institutions etc…) and major utilities along the corridor e.g. substation, pump stations, water tanks etc.?			
3.0	**Road Design and Layout**			
3.1	Road and layout including all the Junctions, Access, Landscape, street furniture etc. design has been developed.			
3.2	Proposed Land acquisition required for road design has been developed?			
4.0	**Assessment of each impacted existing utility**			
4.1	Impact of the proposed road configuration on the existing utility			
	including; a. The effect of the proposed profile has been assessed.			
	b. The effect of the proposed landscape (hard & soft) been checked.			
	c. The effect of surface as well as sub-surface appurtenances and features e.g. light poles, structural foundations etc… has been checked.			
4.2	Consideration of measures/changes that can be adopted to minimize the impact on existing utilities?			
	a. Geometric (profile and alignment)			
	b. Road Drainage & Curb			
	c. Slope/Retaining Walls/Barriers			
	d. Structure/Bridges/Footing			
	e. Other design changes for maintaining the existing utilities at their current location please specify.....			
4.3	Decision hierarchy for utility adjustment with **A** being the most preferred?			
	A. Keep As Is			
	B. Protect (to utility providers requirements)			
	C. Relocate			

MMUP UTILITY IMPACT ASSESSMENT CHECKLIST
LOCAL ROADS AND DRAINAGE PROGRAM
(For MMUP's Initial Acceptance)

Item	Description	Yes	No	Comments
	D. Install in a duct bank system			
	E. Install in shared trench			
	F. Reroute			
	G. Install in Gallery			
	H. Land Acquisition, with (i) being the easiest to acquire.			
	i. Government unallocated			
	ii. Government allocated			
	iii. Private Undeveloped (no structures)			
	iv. Private Developed- old			
	v. Private Developed- new			
	vi. Protected Environment			
	vii. Protected Sensitive (PEO)			
	viii. *Protected Heritage*			
4.4	Consideration should be given to the following factors when adjusting the affected existing utilities?			
	a. The type of utility e.g. VC/Asbestos or AC/ DICL or Oil Fill vs. XLPE			
	b. The size of the utility (distribution or transmission)			
	c. The Age of the utility and assessment for potential upgrade.			
	d. The size and frequencies of the chambers			
	e. The frequency of maintenance			
	f. The proposed location of the utility within the carriageway and the impact on traffic i.e. Lane Closures during maintenance or breakage.			
	g. The hierarchy cost of relocating utilities, i.e. cost of relocating a smaller cable/pipe vs. bigger cable/pipe			
	h. Identification of Primary Substations, Pump Stations etc.			
	i. Potential risks in case of breakage			
5.0	**Conflict Analysis**			
5.1	Assessment been carried out for the utility conflicts arising from; a. Road configuration?			
	b. Between different utilities?			
	c. Major projects e.g. Metro?			
	d. Adjacent projects?			
6.0	**Documentation & Submittals**			
6.1	The following documents should be provided for the full length of the Road project in readable scale (not less than 1:500 @ A1 size):			
	a. Presentation of change in the road levels i.e. existing vs. proposed in profile and cross-section.			
	b. Presentation of the road layout including other projects within the corridor e.g. Metro, IDRIS etc.			
	c. Presentation of existing and proposed utilities, where the			

MMUP UTILITY IMPACT ASSESSMENT CHECKLIST
LOCAL ROADS AND DRAINAGE PROGRAM
(For MMUP's Initial Acceptance)

Item	Description	Yes	No	Comments
	utilities shown to be "protected", "abandoned", "removed", "kept as is", "relocated" and proposed new utilities.			
	d. Presentation of Utility Corridor in plan and cross-section. These corridors should be based on: i. MMUP typical cross-section ii. Existing utility to be maintained at their current location (i.e. "Keep As Is" or "Protect") iii. Planned future utilities (provided by utility provider) iv. Estimation of future utility needs considering the sensitivity of corridor as per item 2.3.			
	e. Presentation of Cross-sections showing MMUP allocated utility corridors, proposed utility corridors as well as the existing and proposed utilities.			
	f. Presentation of Layout Plan indicating the Land to be acquired for Utility purposes.			
6.2	It is encouraged to separate the "dry" utilities from "wet" utilities in the layout plans for ease of documentation.			

Project Management Consultant (PMC) Responsible

Review Engineer _____ Signature _____ Name

Engineer Approve (Project Director) _____ Signature _____ Name

MMUP - UTILITY CORRIDORS STANDARD CADD LAYERING

LAYER NAME	COLOR TYPE	ABBREVIATION
DRY UTILITIES:		
QATAR ARMED FORCES	189,248,100	QAF
TELECOMMUNICATION	148,255,148	TEL
DOHA SURVEILLANCE SECURITY SYSTEM	255,255,209	DSSS
INTELLIGENT TRAFFIC SYSTEM	76,199,15	ITS
STREET LIGHTING	255,168,168	ST
STREET LIGHTING + ITS	255,204,204	L+ITS
ELECTRICAL DISTRIBUTION	255,51,51	E(D)
ELECTRICAL (TRANSMISSION)	255,51,51	E(T)
WET UTILITIES:		
POTABLE WATER	185,185,254	PW(D)
POTABLE WATER (MAIN)	185,185,254	PW(T)
GAS PIPELINE	255,255,36	G
CHILLED WATERLINE	199,255,255	CW
TREATED SEWERAGE EFFLUENT	235,96,201	TSE
SEWERAGE	128,96,0	S
SURFACE WATER	214,161,0	SW
GROUND WATER	214,161,0	GW
SEWERAGE FORCE MAIN	255,232,163	S(FM)

APPENDIX C: Kahramaa/Ashghal Memorandum of Understanding (MOU)

Memorandum of Understanding (MOU)

Between

Public Works Authority (PWA)

And

Qatar General Electricity & Water Corporation (Kahramaa)

July 2017

Approved by:

Date:

H.E. Dr. Saad Bin Ahmad Al Muhannadi

PWA President

H.E. Essa Hilal Al Kuwari

Kahramaa President

Table of Contents

MoU between PWA & Kahramaa Electricity (KME)

Memorandum of Understanding (MOU)

Agreement between the following Members of the Utility Coordination Committee (UCC)

PUBLIC WORKS AUTHORITY Infrastructure Affairs Department (PWA)

And

KAHRAMAA Electricity Network Affairs Department

And witnessed by

Ministry of Municipality and Environment, Infrastructure Planning Department

Ministry of Interior, Traffic Safety and Engineering Administration

Ministry of Municipality and Environment (Environmental Assessment Department EAD)

Contents

Introduction

Generally, it is evident that the distribution and allocation of the utility corridors for the Public Works Authority (PWA) projects, especially for those located within Inner Doha, is becoming a challenge to the designers. This could be due to various factors such as limitation of the available Right of Way (RoW), higher traffic volumes and higher demands on utility services. The complicated road configuration (e.g. underpasses, tunnels and overpasses) to accommodate the current and projected traffic volumes is further aggravating this issue.

To address such challenges and to meet the future demands on utilities, the Infrastructure Planning Department (IDP) of MME published Road Cross Sections. This was carried out in consultation with all utility providers, in which the utility corridors were redistributed and some other corridors like, GAS, District Cooling, Utility Gallery etc. were added. To facilitate and guide the implementation of the new road cross section and utility redistributed for enhanced corridors, MME has prepared specific requirements and issued an Implementation Guidelines as well. However, MME acknowledges that large portions if not all PWA Projects will deviate from the typical standard corridors primarily due to lack of available RoW. Therefore, as a result of this constraint, a new set of guidance needs to be developed to aid the consultant designing these road projects.

Currently MME is in the process of finalizing the Qatar National Master Plan under the Urban Planning Department (UPD). This Master Plan will be used by all agencies to carry the future planning of their utilities. However, in the absence of such strategic land use plan, the UPD have assigned Interim Land Use Plans as well as RoW to serve the current development in the country. Therefore, IPD's role is to determine the width of the RoW, how the width of the RoW is distributed among each utility provider to ensure all the necessary utilities have the access to fully service the current development, and provisions made to serve future development.

IPD's position is that any land required for a project must be fully justified and it is not preferred to demolish existing buildings or acquire land to meet the prescribed utility corridor allocation as per MME's Typical Cross-Sections. Although it may achieve the necessary approvals from the relevant agencies, IPD does not consider such approach to be best practice and will hesitate to approve schemes that are based on unnecessary land take.

Background

The Government has directed that land acquisition and the demolition of properties are to be limited and appropriate design solutions must be put in place to ensure compliance.

MME has directed that in order to limit land acquisition utility corridors should be restricted to existing and known future services only. Corridors for future unknown services would be considered when the need arises.

The Utilities Coordination Committee (UCC) has considered proposals to achieve land acquisition reductions specifically associated with the allocation of electrical corridors and the agreements reached are recorded below.

Parties to the MOU

This MOU is between the following parties:

- Public Works Authority (PWA) represented by the Infrastructure Affairs Department and the Assets Affairs Department.

- Kahramaa Electricity (KME) represented by the Electricity Network Affairs Department.

Witnessed and agreed by:

- Ministry of Municipality and Environment (MME) represented by the Infrastructure Planning Department (IPD).

Objective

This MOU puts into effect an agreement on the items listed below, reached between PWA and KME at the UCC meetings held in June 2015. The MOU is witnessed and agreed by MME. The contents shall be implemented by PWA, KME and MME.

Agreements Reached at the UCC Meetings held in June 2015 and other UCC Meetings:

Item 1: Corridor Width Allocation

1.1 Provide for Existing and Known Future cable services only.

1.2 MME shall provide corridors for Unknown Future requirements, at the time they are confirmed and required.

Item 2: Cables Under The Carriageway

2.1 New or diversions of HV/EHV Cables under the carriageway to be only considered and reviewed when the PWA design consultant has discounted all

options to place cables in the verge. The PWA design consultant will be required to justify to MME and Kahramaa why cables need to be placed under the carriageway. In order to be accessible at all times, joint link boxes to be kept on the verge.

2.2 Subject to 2.1 above new HV/EHV Cables may be placed under the carriageway in the following order of priority:

- Service Roads.
- Slip Roads.
- Collector/Distributor Roads.
- Hard shoulders.
- Slow lanes in multi-lane roads.
- Intersections (to be reviewed by KME on case by case basis).

2.3 Existing cables (other than LV/MV cables - refer to item 2.12) can be left under carriageway provided they are adequately protected against damage. Impacted Existing LV/M cables inside the carriageway to be diverted to the appropriate Corridor.

2.4 Maximum length of HV/EHV cables allowed under carriageways is 500m. Cable lengths greater than 500m will be considered as special cases and will require higher management approval.

2.5 PWA accepts to provide unhindered access to KME for emergencies and essential maintenance of cables. PWA confirms that KME will be allowed to excavate in the carriageway for cable fault repair works/emergency cable maintenance works. KME Contractor shall follow Emergency RO Process and shall comply with PWA "Amendment to the Code of Practice and Specification for Road Openings in Highway, dated December 2014" and with QCS 2014 Specifications for Backfilling and Reinstatement.

2.6 PWA design consultant to consider Traffic Management for accessing cables.

2.7 HV/EHV cables can be laid under asphalt-paving; interlocking-paving tiles are not required.

2.8 KME is to comply with the PWA "Amendment to the Code of Practice and Specification for Road Openings in the Highway" dated December 2014. (Refer to Appendix 2 for protocol of works).

2.9 PWA is to implement an inspection regime during construction to ensure that the backfilling sections of the Code of Practice (refer to item 2.8) are fully complied with.

2.10 For projects KME works falling under PWA Construction Projects, KME is to follow the attached protocol of work (refer to Appendix 2). PWA Protocol of Works is not applicable for KahraMaa Emergency Works.

Kahramaa contractors carrying out the Reinstatement works may not be PWA approved contractors. However, KME Contractor shall comply with PWA "Amendment to the Code of Practice and Specification for Road Openings in Highway, dated December 2014" and QCS 2014 Specifications for Backfilling and Reinstatement.

2.11 Oil filled HV/EHV cables that need to be relocated shall be upgraded to XLPE type Cable from substation to substation.

2.12 Existing LV/MV cables in the main or service roads, before or after PWA new road layout, will be left under the carriageway in order to avoid the high cost of relocating these utilities to their respective corridors. However, a corridor should be provided in the verge (out of the carriageway) to accommodate the known future electrical networks.

In case there are no corridors available outside the carriageway for the future electrical networks due to the congestion of existing utilities, PWA has to submit a land acquisition request to accommodate the future networks (in specific for the Expressways). In case there is no available land to be acquired or rejected by MME-IPD, a letter confirming the same has to be received from MME-IPD and presented to KM.

In addition, the following conditions should be considered:

- PWA shall allow KAHRAMAA to carry future works in the carriageway for connections, operations and maintenance, and any other emergency works wherever required.
- PWA shall protect the existing utilities during construction phase of PWA projects as per KAHRAMAA's specifications.
- PWA shall bear the cost of reinstatement upon completion of the maintenance/emergency works by KAHRAMAA if it was found out that the cable fault is due to PWA's design or method of implementation while providing the required concrete protection.

2.13 Only shallow planting will be allowed inside the electrical corridor above the cable. Only after assessing other options, such shallow planting over the cable route maybe allowed.

MV/LV cable routes having shallow planting, unhindered access to be provided to KME for emergency and essential maintenance and special arrangements for cables under shallow planting will be agreed on case by case to maintain access

2.14 Existing LV/MV cables, underneath Parking bays, Pedestrian Path, Cycle Path, Verge (or others), falling in other utilities' corridors will be kept in place in order to avoid the high cost of their relocations to their respective corridors. However, a corridor should be provided in the verge (out of the carriageway) to accommodate the future electrical networks. Please refer to clause2.13 above for requirements in case no corridors are available.

Item 3: Cable Joint Bays under the Carriageway

3.1 It is permissible to place HV/EHV cable joint bays under the carriageway subject to clause 2.1 above and the following conditions:

- Link boxes shall be placed under the verge and must be accessible at all times.
- PWA accepts to provide unhindered access to KME for emergency and essential Proactive & Corrective maintenance of EHV/HV joint Bays.
- PWA design consultant to prepare outline traffic management scheme for accessing cables joint boxes.
- PWA and KME accept the cable joint box detail attached as Appendix 1.

Item 4: Reduced Spacing of Cables

4.1 KME to permit reduced optimized cable spacing based on calculations prepared by the PWA design consultant or their specialized sub-consultant subject to the following conditions:

PWA design consultant to discuss and agree with KME the following:

- Design Criteria and Method of calculation.
- Allowable parameters.
- Allowable thermal resistivity for specialized backfill.
- Absolute minimum spacing.
- Maintain Cable Current carrying capacity specified by KM.

Item 5: Splitting of corridors and/or Intermittent Structures within Electrical Corridors

5.1 It is acceptable to allow splitting of corridors and/or intermittent structures such as street lighting poles and foundations, trees and road gullies to be constructed within the electrical corridors. Wherever possible, splitting of electrical corridors or re-routing around obstacles is accepted when it benefits

the project and relocation of utilities is minimized. PWA design consultants to set parameters on how the structures to be constructed and electrical cables protected from these structures and at the same time provide easy access.

5.2 For splitting of corridors it is critical to ensure that widths allocated due to splitting is usable by KME, and should be assessed on case-by-case basis, for the benefit of the State.

Item 6: Vertical Stacking/ Duct Banks (Single User/Authority)

6.1 Vertical stacking and duct banks are agreed in principle for a single User/Authority only, based on calculations prepared by the PWA design consultant and subject to the following:

Design Consultants to discuss and agree with KME:

- Design criteria and the method of calculation.
- Acceptable rating values, depending on the application and actual forecasted load.
- Chamber spacing to be proposed by the PWA Design Consultant based on pulling calculations and other criteria.

6.2 Vertical Stacking to be proposed only if other options are not feasible.

6.3 Duct banks option will be discouraged by KME.

6.4 After conditions in 6.1 are fulfilled, if the proposed vertical stacking design is approved by KME, KM HSE approval to be mandatory in view of safety operations and Maintenance Personal.

6.5 Civil Defense approval (if required) to be obtained for all underground structures and Substation after KME and KM HSE approvals.

Item 7: Rerouting of cables

7.1 Where there is a limitation of availability of electrical corridor, re-routing of electrical cables to an adjacent relatively minor road is acceptable.

Item 8: Kahramaa Cable tunnel

8.1 The use of cable tunnels is permitted after all other options have been studied.

8.2 Cable Tunnel design guidance to be agreed within one month of the date of this agreement. The time for design review may vary and will be on a case-by-case basis.

8.3 Cable Tunnels will be handed over to KME for operation and maintenance.

Item 9: Allocation of Land for Substations

9.1 The area of land to be allocated for substations is to be based on the actual current design requirement and confirmed known future needs.

9.2 MME guideline documents "Electrical Distribution – Guidance for Location (Version 2 - July 2014)" is to be followed for sizing the areas required for the substations.

Item 10: Street Lighting

10.1 For Street Lighting Feeder Pillar (SLFP) that allocated more than 500m away from Substation, it is PWA responsibility to maintain the Voltage Drop from Substation to SLFP within 3%. In addition, it is PWA responsibility to maintain the Voltage Drop from Substation to the last Street Lighting Poles, of each circuit within, 5%.

10.2 PWA will undertake the responsibility to maintain the Voltage Drop for the Street Lighting Assets within the approved range.

Implementation of the Agreement

This MOU shall be implemented by:

- PMC's and Consultants/Contractors appointed by the PWA.
- Engineers and Technical staff appointed by Kahramaa Electricity to review and approve PWA design and drawing submissions.
- Engineers and Technical staff appointed by MME to review and approve PWA design and drawing submissions.

Changes to the Agreement

Changes or deviations to this MOU shall not be permitted without agreement by the UCC.

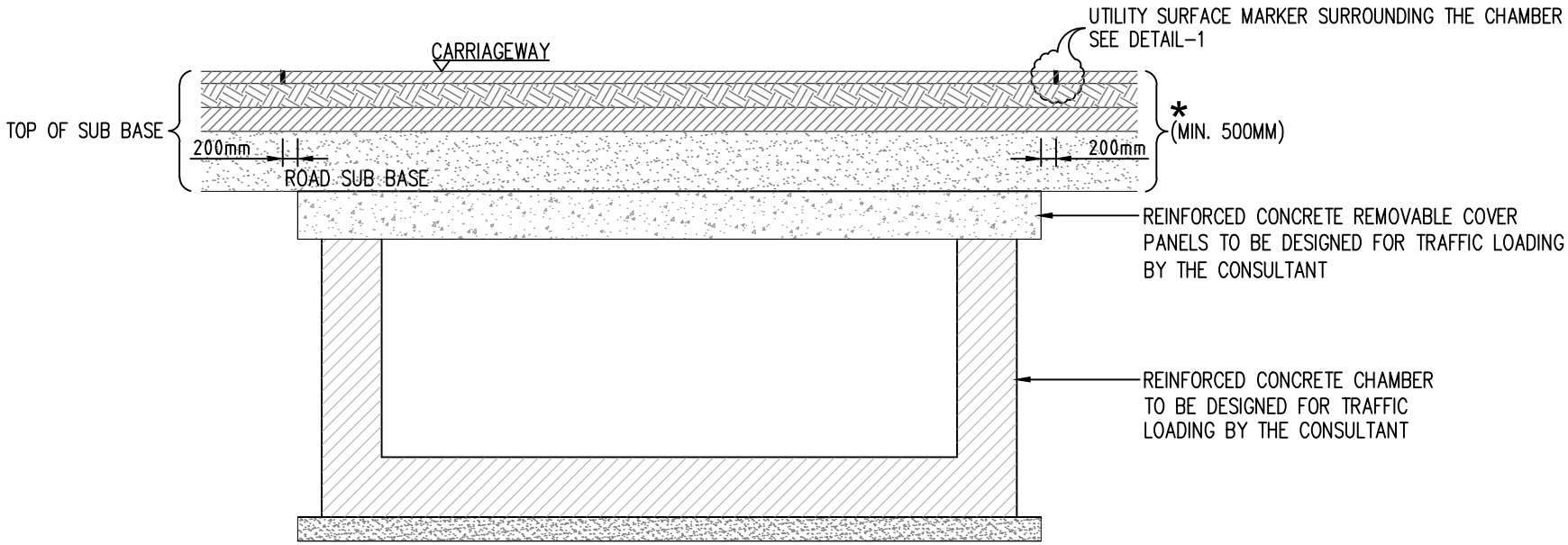
Applicable Laws and Dispute Resolution

Qatari Law shall govern this MOU. In the case of a dispute, the parties should seek to resolve it amicably within a 14-day period. In the event that a resolution is not reached then they should submit a joint report to the parties' Top Management for resolution within 7 days of receipt of the report.

Commencement Date

This MOU shall be effective from the date it is agreed and signed by the parties and shall not have a retrospective effect unless mutually agreed by the parties. This MOU shall remain in force until such time that the parties agree to terminate.

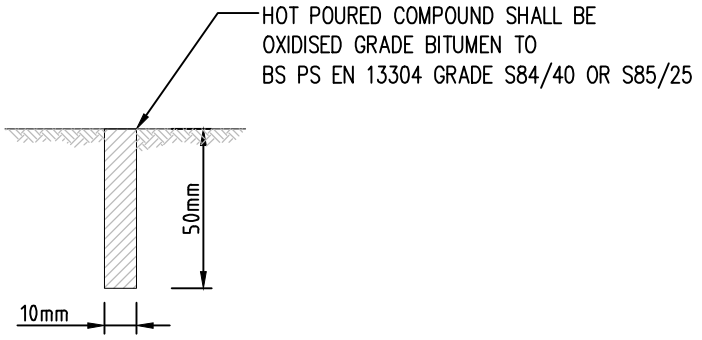
Appendix (1): TYPICAL JOINT BAY DETAILS WITHIN THE ROADWAY (KME)



TYPICAL JOINT BAY DETAILS WITHIN THE ROADWAY (KME)

SCALE: NTS

* IN CASE WHERE THE THICKNESS OF ROAD TOP SUB BASE IS LESS THEN 500mm, THE DEFICIT OF THIS THICKNESS ON TOP OF THE CHAMBER IS TO MADE UP BY ROAD BASE ALSO.



DETAIL - 1

NOTES:

- POSITION OF COVER SLAB TO BE SURVEYED BY THE CONTRACTOR FOR INSTATEMENT OF THE SURFACE MARKER AND SHALL BE INCLUDED ON THE AS BUILT DRAWINGS
- THIS SKETCH REFLECT THE ALLOCATION OF ELECTRICAL JOINT BAY DETAIL UNDER THE ROAD CARRIAGEWAY AND DO NOT SUPERSEDE KAHRAMAA RELEVANT TYPICAL DETAIL
- FOR CABLE INSTALLATION DETAILS, REFER TO KAHRAMAA TYPICAL STANDARD DETAIL FOR JOINT BAY

Rev.	Date	Revision Details	Chkd.	Appd
0	APRIL 15	ISSUED FOR INFROMATION		

هيئة الأشغال العامة
Public Works Authority
www.ashghal.gov.qa
I A INFRASTRUCTURE AFFAIRS
قطر تستحق الأفضل
Qatar Deserves The Best

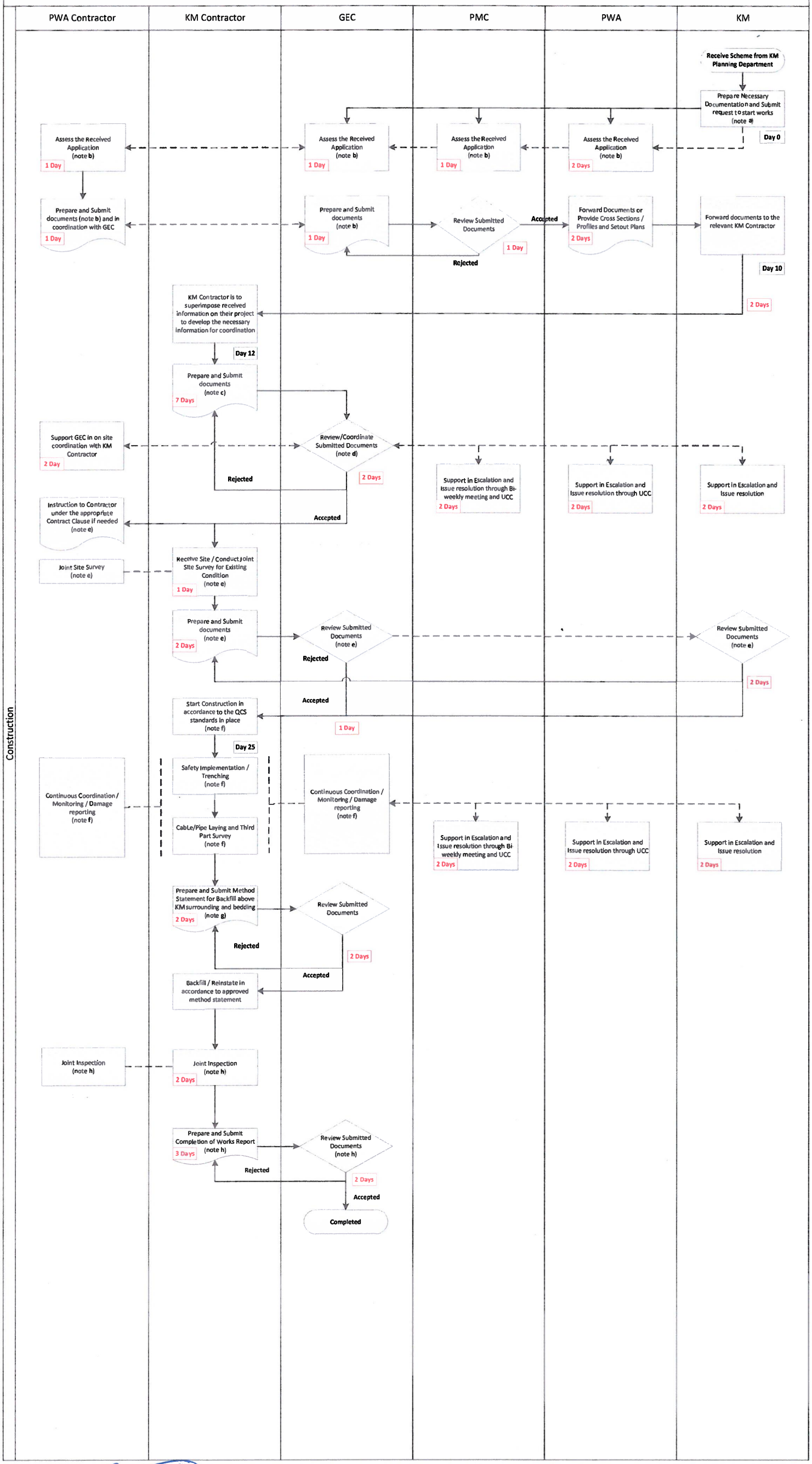
Project Code: EXPRESSWAY PROGRAMME

Drawing Title: TYPICAL ELECTRICAL HV JOINT BAY DETAILS WITHIN THE ROADWAY (KME)

Date:	Scale:	Revision:
APRIL 2015	NTS	0

Drawing Number: EXW-GENL-0000-PM-KBR-DG-80001-001

Appendix (2) - Protocol of Work for KM contractors Requesting to work Within PWA Projects**



Abdullah Hamad Al Attiyah — UCC Chairman

Saoud Al Tamimi — UCC Assistant Chairman

Abdullah Ali A Al-Theyab — UCC KM Electricity Representative

Fahad Yousef Tolefat — UCC KM Water Representative

Qatar Deserves The Best

Rev.05 July 2017

NOTES

Public Works Authority (PWA)
Kahramaa (KM)
Programme Management Consultant (PMC)
Utilities Coordination Committee (UCC)
General Engineering Consultant (GEC)
Days mean Working Days
Request for Information (RFI)

NOTES:

****This Protocol only applies when there are PWA Contractors and Consultants on site.**

In case there are no PWA contractors and Consultants, KM is responsible to ensure that KM contractors comply with QCS requirements in relation to Excavation, managing excavated material, backfilling operations and full site clearance and to PWA O&M requirements for reinstatement "Amendment to the Code of Practice and Specification for Road Openings in the Highway" dated December 2014 or its following updates. Moreover, KMW has to ensure that testing of backfilling elements shall be in accordance to appropriate Qatari Standards in Place.

a) Minor Schemes application is directly submitted to QPRO 2.0, Major Schemes are to be submitted as per QDRS Requirements. In exceptional cases start of works can be requested via official letter to PWA. All initial applications submitted is to clearly identify (CAD Format):

- Limits of Work
- Line Diagram of the Section of works to be constructed

Applications submitted through QPRO 2.0 will go to PWA first and assigned to PMC/GEC/PWA Contractor as needed

Applications submitted through QDRS will go to all auto assigned parties PWA/PMC/GEC

b) Once the application is received by the PWA and/or its delegated Consultants, the information is superimposed on the impacted project and the following information is provided

- Assessment and Conditions Form (includes conditions to be abided by KM contractor and all relevant points of contact)
- For PWA Projects In Concept Design KM is to Follow Cross-sections provided by KM Planning
- For PWA Projects that is past Concept Design Applicant to follow PWA Cross-sections (approved and stamped by KM planning department)
- Roads Profiles and Setout plans By PWA (CAD Format)
- Projects Safety plan for projects in Construction for Infrastructure Schemes
- The PWA to inform KM Construction of changes in projects stages/priorities

c) Once the information is received from PWA, KM is designate the relevant contractor to prepare the following and coordinate with the GEC/Contractor for approval and site handover

- In Un-Graded areas KM is to Coordinate directly with PWA for the best way forward
- In Graded Areas KM Contractor to Submit Shop drawings in accordance to the received PWA Cross sections, Road profiles and Setout plans (cables/pipes to be reflected in the right corridor and at the right level)
- Safety plan in accordance to QCS standards for projects in construction for Infrastructure Schemes
- General Method statement for Reinstatement / Backfilling
- Proposed Detailed Schedule of Works (P6 format)
- Excavated Material Management Plan
- Back fill Material Approval Requests (including source agreement)
- Testing of Back filling Elements shall be in accordance to appropriate Qatari Standards in Place

d) The GEC/Contractor is to coordinate the following

- Review and comment on submittal for All Projects
- Set up Kick off meeting for Projects in construction inviting all necessary parties
- Review and agree received Safety plan and General Method statement for Reinstatement / Backfilling in accordance to the PWA requirements for projects in construction
- Agree and finalize Proposed Schedule and Site handover for Areas of KM Works
- The GEC is to escalate necessary issues/concerns early to the PMC/PWA as needed
- After finalization of all the above and submittal is accepted the GEC is to Handover the Site to KM Contractor

e) The PWA or PWA Delegated Engineer to direct the PWA Contractor under the appropriate contract clause providing the following information: KM Contractors Name, Contact Details, Scope of Work and Duration

The KM Contractor is to follow the following upon receiving the site

- Conduct a Joint Survey with PWA Contactor
- Prepare and Submit an Existing Site Condition Report, which should include images and narrative, highlighting any issues or issues to be foreseen that might prevent the contractor from return the site to its existing condition
- The PWA or PWA Delegated Engineer is to Sign-off on Existing Site Condition Report upon confirmation

f) The KM Contractor is to follow

- To comply with QCS requirements in relation to HSE, Excavation, managing excavated material, backfilling operations and full site clearance or
- Lay Cables/Pipes in according to the Approved Shop Drawings (approved levels and location)
- Confirmation of cables/pipes location by Third Party Survey
- All reports to be Submitted to GEC/Contractor on Site
- Report any Property damages to KM, the PWA, the PWA Delegated Engineer, Property Owner and PWA Contractor. The Proposed remedial action will be subject to review and approval by the Property owner and the PWA Delegated Engineer before Implantation
- Provide full documentation related to the remedial action in accordance to QCS requirements for archiving with Final Dossier

g) The KM Contractor to prepare a method statement for backfilling / reinstatement specific to the area being complete ensuring

- To comply with QCS requirements in relation to HSE, Excavation, managing excavated material, backfilling operations and full site clearance or
- PWA O&M requirements for reinstatement
- Confirming that all materials used in backfilling and sub-base for works above KM bedding and surrounding to be in line with Qatari Specification and standards
- Surplus excavated materials to be taken off site by KM Contractor

h) Upon the Completion of KM Works and for Final Approval

- Conduct a Joint Inspection with PWA Contactor
- Provide a Confirmation to PWA in relation to all Works which have been put out of view at time of Inspection
- The KM Contractor to prepare a Completion of Works Report
- The PWA or PWA Delegated Engineer will confirm and sign that the Works have been undertaken to his complete satisfaction (reinstatement)

MOU Approval

This MOU shall enter into force upon its signing by the parties below.

Signed by:

Date:

H.E. Dr. Saad Bin Ahmad Al Muhannadi

PWA President

H.E. Essa Hilal Al Kuwari

Kahramaa President

Approved by:

Abdullah Hamad Al Attiyah

UCC Chairman / Assistant of PWA President

Abdullah Ali A Al-Theyab

UCC Kahramaa Electricity Representative

Witnessed by:

Fahad Yousef Tolefat

UCC Kahramaa Water Representative

Ibrahim Abbas

UCC MME Representative

Br. Mohamed Maarafiya

UCC MOI Representative

Youssef Ibrahim Al-Homr

UCC MME-EAD Representative

MoU between PWA & Kahramaa Water (KMW)

Memorandum of Understanding (MOU)

Agreement between the following Members of the Utility Coordination Committee (UCC)

Public Works Authority Infrastructure Affairs Department (PWA)

And

- KAHRAMAA-Water Network Affairs (KMW)

And witnessed by

Ministry of Municipality and Environment, Infrastructure Planning Department

Ministry of Interior, Traffic Safety and Engineering Administration

Ministry of Municipality and Environment (Environmental Assessment Department (EAD))

Contents

Appendix (1)

PWA commitment

Appendix (2)

Protocol of Work for KM Contractors Requesting to Work within LR&DP

Introduction

Generally, it is evident that the distribution and allocation of the utility corridors for the Public Works Authority (PWA) projects, especially for those located within Inner Doha, is becoming a challenge to the designers. This could be due to various factors such as limitation of the available Right of Way (RoW), higher traffic volumes and higher demands on utility services. The complicated road configuration (e.g. underpasses, tunnels and overpasses) to accommodate the current and projected traffic volumes is further aggravating this issue.

To address such challenges and to meet the future demands on utilities, the Infrastructure Planning Department (IDP) of MME published Road Cross Sections. This was carried out in consultation with all utility providers, in which the utility corridors were redistributed and some other corridors like, GAS, District Cooling, Utility Gallery etc. were added. To facilitate and guide the implementation of the new road cross section and utility redistributed for enhanced corridors, MME has prepared specific requirements and issued an Implementation Guidelines as well. However, MME acknowledges that large portions if not all PWA projects will deviate from the typical standard corridors primarily due to lack of available RoW. Therefore as a result of this constraint, a new set of guidance needs to be developed to aid the consultant designing these road projects.

Currently MME is in the process of finalizing the Qatar National Master Plan under the Urban Planning Department (UPD). This Master Plan will be used by all agencies to carry the future planning of their utilities. However, in the absence of such strategic land use plan, the UPD have assigned Interim Land Use plans as well as RoWs to service the current development in the country. Therefore one of IPD's roles is to determine the widths of the RoW and also how the width of the RoW is distributed among each utility provider to ensure all the necessary utilities have the access to fully service the current development and also provisions made to service future development.

IPD's position is that any land required for a project must be fully justified and it is not preferred to demolish existing buildings or acquire land to meet the prescribed utility corridor allocation as per MME's Typical Cross-Sections. Although it may achieve the necessary approvals from the relevant agencies, IPD does not consider such approach to be best practice and will hesitate to approve schemes that are based on unnecessary land take.

Background

The Government has directed that land acquisition and the demolition of properties are to be limited and appropriate design solutions must be put in place to ensure compliance.

MME has directed that in order to limit land acquisition utility corridors should be restricted to existing and known future services only. Corridors for future unknown services would be considered when the need arises.

The Utilities Coordination Committee (UCC) has considered proposals to achieve land acquisition reductions specifically associated with the allocation of Water corridors and the agreements reached are recorded below.

Parties to the MOU

This MOU is between the following parties:

- Public Works Authority (PWA) represented by the Infrastructure Affairs Department
- KMW Water (KMW) represented by the Water Network Affairs -Directorate

And witnessed and agreed by

- Ministry of Municipality and Environment (MME) represented by the Infrastructure Planning Department (IPD)

Objective

This MOU puts into effect an agreement on the items listed below, reached between PWA and KMW. The MOU is witnessed and agreed by MME. The contents shall be implemented by PWA, KMW and MME.

Agreements between PWA and KMW:

Item.01 Submittals

1.01 The Utility Cross Sections design drawings, Detailed Design drawings for all PWA projects related to KMW should be submitted through QDRS System for review and approval by KMW.

i. Shop drawings , As built drawings should be submitted via official letter to Water project Department , regarding Material approval shall be submitted to WP (material specification section)

ii. Once approved through QDRS application, PWA and/or its delegated consultant shall submit hard copy officially for stamp.

1.02 KMW is required to provide comments on new revision and/or approval of PWA submissions according to the following timeframe. PWA submittals are:

1.02.1 Utility Cross Sections design drawings (10 working days).

1.02.2 Detail Design drawings (20 working days).

1.02.3 Shop Drawings (10 working days).

1.02.4 PWA Design Consultant may submit Shop Drawings as part of Detail Design submission according to KMW requirements (20 working days).

1.03 Revalidation of KMW existing/proposed Networks is required after one year from the date of affixed approval on the drawings

1.04 Referring to clause 1.03 above and for renewing of RO request:

1.04.1 For PWA additional requirements, revalidation of KMW existing/proposed Networks is required

1.04.2 Revalidation of design approvals from KMW is not required for the RO renewal in case there are no changes from the approved drawings and no change in the scope of work and same project boundary

1.05 For KMW additional requirements during design submissions and/or revalidation (items 1.01, 1.02, & 1.03) or during renewal of RO (item 1.04):

- KMW should request PWA to add the additional requirements and shall provide budget for these requirements.
- KMW shall provide conditional approval for the submission while the additional requirements are in the process of being agreed between PWA and KMW.

- In parallel, PWA will study these requirements and provide cost estimate to KMW for formal approval prior to implementation.

Item.02 Water Corridor Allocation

2.01 PWA Design Consultant has to follow MME Typical Utility Cross Sections as Guidelines for the location and width of Water corridor, where appropriate.

In cases where the MME Typical Cross Sections cannot be applied due to , (1) road corridor width restrictions, (2) additional land cannot be acquired as confirmed by official MME writing , and/or (3) any other justified reason, then refer to item 03 below.

2.02 Referring to clause 2.01 above, PWA Design Consultant to undertake an assessment:
- To accommodate the existing and proposed Water Pipes within the allocated Water corridors
- To properly locate the related existing and proposed chambers along the vicinity of the allocated Water corridors, while considering constructability and accessibility of the proposed chambers (possibility of splitting corridors as per item 07).

2.03 New Allocated water corridors should be outside the carriageway, and free from any interfaces with others services where possible.

Item.03 Water Pipelines and its appurtenances under Carriageway

3.01 Existing Water Pipes Under the Main and Service Carriageways

(a) Existing Water pipes in the main or service roads, before or after PWA new road layout, will be left under the carriageway in order to avoid the high cost of relocating these utilities to their respective corridors. However, a corridor should be provided in the verge (out of the carriageway) to accommodate the known future Water networks free for any interfaces with other services as an optimum solution.

However, existing pipes constructed since 25 years or above or in poor condition should be relocated outside carriageway within Ashghal project.

(b) In case there are no corridors available outside the carriageway for the known future Water networks due to the congestion of existing utilities,

PWA has to submit a land acquisition request to accommodate the future networks outside carriageway. In case there is no available land to be acquired or rejected by MME-IPD, a letter confirming the same has to be received from MME-IPD and presented to KM.

In addition, the following conditions should be considered:

i. With reference to point 3.01 (b) above, and in case water corridors are available only under the carriageway:
   - KMW shall study the possibility to find another route for the future network to avoid placing the network under carriageway.
   - In case another route is not available, PWA shall allow KMW to carry out future works in the carriageway for connections, operations, maintenance and pipes laying, and any other emergency works wherever required.

ii. PWA shall protect the existing utilities during construction phase of PWA projects as per KMW's specifications.

iii. KMW shall carry out (Phase 1) of the Reinstatement for the works mentioned above in points (i), and according to PWA specifications and KMW shall bear the associated cost *(refer to Item. 05 Backfilling and Reinstatement below).*

iv. PWA shall carry out (Phase 2) of the Reinstatement for the works mentioned above in points (i) and (ii), and PWA shall bear the associated cost unless it was found that the repair or maintenance works are due to defect from manufacturer(s) already approved by KMW and/or by KMW's Contractors *(refer to Item. 05 Backfilling and Reinstatement below).*

v. The aforementioned provisions and requirements shall not apply to Strategic Waterlines and its appurtenances (chambers, fittings...) , which will cause significant damage to the State of Qatar if any defects found therein; KMW will review on a case-by-case basis.

(c) Valve Chambers should be located outside the carriageway, unless restrictions prevented allocating chambers outside the carriageways.

(d) To minimize costs and avoid delays during design and construction phases, KMW will accept retaining/constructing valve chambers under carriageways similar to the water pipelines.

3.02 Existing Water pipes, underneath Parking bays, Pedestrian Path, Cycle Path, Verge, (or others) whether surfaces are paved with asphalt or not

Existing Water pipes underneath Parking bays, Pedestrian Path, Cycle Path, Verge,(or others), whether surfaces are paved with asphalt or not, falling within other utilities' corridors or other utilities falling within the water corridor will be kept in place in order to avoid the high cost of their relocations to their respective corridors. However, a corridor should be provided in the verge (out of the carriageway) to accommodate the future known water networks. Please refer to clause 3.01 (b) above for the conditions in case no corridors are available. Items (i) to (vi) of 3.01 above shall remain applicable for item 3.02

Item.04 PWA Undertaking for KMW to carry out works under the Carriageway

4.01 To avoid any potential conflicts when submitting Road Opening (RO) requests by KMW via QPRO, or any misunderstanding during future excavations to connect, operate, maintain or construct underground water lines located under carriageways, car parking lanes, pedestrian walkways, and asphalt-paved cycle paths (or others), the PWA hereby undertake as follows:

4.01.1 To communicate this MOU to all relevant entities regarding RO requests, mainly: Roads Operation and Maintenance Department, Ashghal staff reviewing ROs via QPRO, Ministry of Interior's General Traffic Department, MME's Infrastructure Planning Department, and any other entity involved in road opening procedures which are supervised by PWA.

4.01.2 All future submitted drawings should contain an individual item in general note referring to this MOU and its application on site.

4.02. Pipelines beneath carriageway should be designed while taking into account future temporary road diversion to maintain these pipelines.

4.03 Transmission Water Pipelines may be placed under carriageway in the following order of priority:

- Service Roads.
- Slip Roads.
- Collector/Distributor Roads.
- Hard Shoulders.
- Slow Lanes in Multi-Lane Roads.

4.04 In case there is no available space within Water corridor in the verge/parking bays, keeping Distribution Water Pipelines under the carriageway will require satisfying the steps, rules and instructions reflected in item 3.01 (b).

For common interest, KMW might request PWA to provide advance service connections to vacant plots for distribution pipelines left under carriageway.

4.05 KMW is to comply with the PWA "Amendment to the Code of Practice and Specification for Road Openings – December 2014 version"; refer to Appendix 1.

4.06 PWA is to implement an inspection regime during construction to ensure that the backfilling sections of the Code of Practice (refer to Item. 4 Backfilling and Reinstatement below) are fully complied with.

4.07 PWA to nominate a Focal Point (Person/Section/Department) to be responsible for coordination purposes with KMW for notification cases of pipelines leakages or any maintenance works on the KMW Assets accommodated/retained under carriageway.

4.08 Any confined/congested location where KMW does not have any provision for dewatering; KMW shall seek PWA approval to proceed with the dewatering in PWA Drainage/Storm Water Manholes available in the nearby KMW maintenance location, if any. PWA will support the application in case the capacity of PWA's relevant manholes at the time of the request can accommodate additional dewatering by KMW. If it's not possible to accommodate KMW dewatering request, KMW shall find another dewatering solution.

4.09 PWA Design Consultant to consider Traffic Management as part of Detail Design for accessing Pipelines.

Item.05 Backfilling and Reinstatement

5.01 Phase-1 Reinstatement: KMW is to comply with the PWA "Amendment to the Code of Practice and Specification for Road Openings in the Highway" dated December 2014. (Refer to clause 5.03 below). The Public Works Authority shall bear the cost and execution of Phase-2 Reinstatement of road (main and service), and parking lanes/bays paved in asphalt, when KMW undertake future or emergency work (RO4) to connect, operate or repair the potential damage to existing KMW water pipelines under the asphalt roads. For the only exception on this point refer to clause 3.01 (iv).

KMW will undertake the reinstatement works on the Verge (outside the carriageways), including cycle lanes and sidewalks (paved in asphalt or others), and parking lanes/bays with interlock because there is no phase 1 and phase 2 requirements outside of the carriageway. KMW will assess the associated implementation cost of these reinstatement works and in case of high costs, a new agreement can be arranged with PWA and the MoU can be amended accordingly. In any case, KMW is to comply with the PWA "Amendment to the Code of Practice and Specification for Road Openings in the Highway" dated December 2014. (Refer to Appendix 2 for protocol of works and to clause 5.03 below).

5.02 PWA is to implement an inspection regime during construction to ensure that the backfilling sections of the Code of Practice (refer to clause 5.01 above) are fully complied with.

5.03 PWA will relax their Code of Practice (refer to clause 5.01 above) for trench reinstatements such that only Phase-1 reinstatement shall be carried out by KMW. Where such relaxation is permitted the temporary asphalt's wearing course shall be replaced with a 50mm permanent wearing course benched 300mm wider than the underlying base course. PWA shall carry out phase-2 reinstatement.

Meanwhile, PWA will assess the cost, resources, and logistics required to undertake the Reinstatement works by PWA within the pilot projects agreed between PWA & KM. In case a new agreement is reached between KM & PWA, based on the outcome of these pilot projects, the MoU can be amended accordingly

5.04 For KMW works that fall within PWA projects under construction PWA, KMW are to follow the attached protocol of work (refer to Appendix 2).

5.05 PWA Protocol of Works is not applicable for KMW Emergency Works; KM Contractor shall comply with PWA "Amendment to the Code of Practice and Specification for Road Openings in Highway, dated December 2014" and QCS 2014 Specifications for Backfilling and Reinstatement.

5.06 KMW contractors carrying out the Reinstatement works may not be PWA approved contractors.

Item.06 *Reduced Spacing between Water Utility and PWA Wet Utilities (Drainage/Sewerage)*

6.01 Minimum Horizontal Spacing (edge to edge) between Water pipelines and PWA Wet Utility pipelines (FS; Sewerage; TSE) shall be 3m if the MME Typical Utility Cross Sections Guidelines allows it.

6.02 In case that MME typical utility cross sections guidelines and/or the modified utility cross sections by PWA consultant (to accommodate both existing and known future network) does not allow the requested spacing as per item 6.01, this clearance could be revised downward without providing concrete encasement protection. This clearance shall not be less than 1 m

6.03 In case where the proposed minimum horizontal spacing is less than 1 m, PWA shall provide concrete encasement protection around its utilities along the part parallel to the water pipes.

6.04 Minimum vertical free spacing between water pipeline and wet utilities pipelines (FS; Sewerage; TSE) shall be 0.5 m. In case where the proposed vertical free spacing is less than 0.5 m, KMW will review such proposal on a case by case basis.

Item.07 *Splitting of Corridors and/or Intermittent Structures within Water Corridors and Overlapping Corridors*

7.01 It is acceptable to allow splitting of corridors in case that the consultant proposal is duly justified and already accepted by KMW to split upon written approval.

7.02 For splitting of corridors it is critical to ensure that widths allocated due to splitting is usable by KMW, and should be assessed on case-by-case basis, for the benefit of the State.

7.03 The staking of water corridors with other corridors is not allowed.

7.04 Encroachment of PWA intermittent structures such as street lighting foundations, road gullies etc... to the water corridor is allowed and will be assessed on a case-by-case basis. PWA will bear the cost for diversion and/or relocation of these structures by KMW on site to enable access to maintain KMW network, if required.

Implementation of the Agreement

This MOU shall be implemented by:

1. PMC's and Consultants/Contractors appointed by the PWA.
2. Consultants/Contractors appointed by KMW.
3. Engineers, Technical Staff and Consultants appointed by KMW Water to review and approve PWA design and drawing submissions.
4. Engineers and Technical staff appointed by MME to review and approve PWA design and drawing submissions.

Changes to the Agreement

Changes or deviations to this MOU shall not be permitted without consensus agreement by the UCC.

Applicable Laws and Dispute Resolution

This MOU shall be governed by Qatari law. In the case of a dispute the parties should seek to resolve it amicably within a 14 day period. In the event that a resolution is not reached then they should submit a joint report within 7 days to the parties top management for resolution within another 7 days of receipt of the report.

Commencement Date

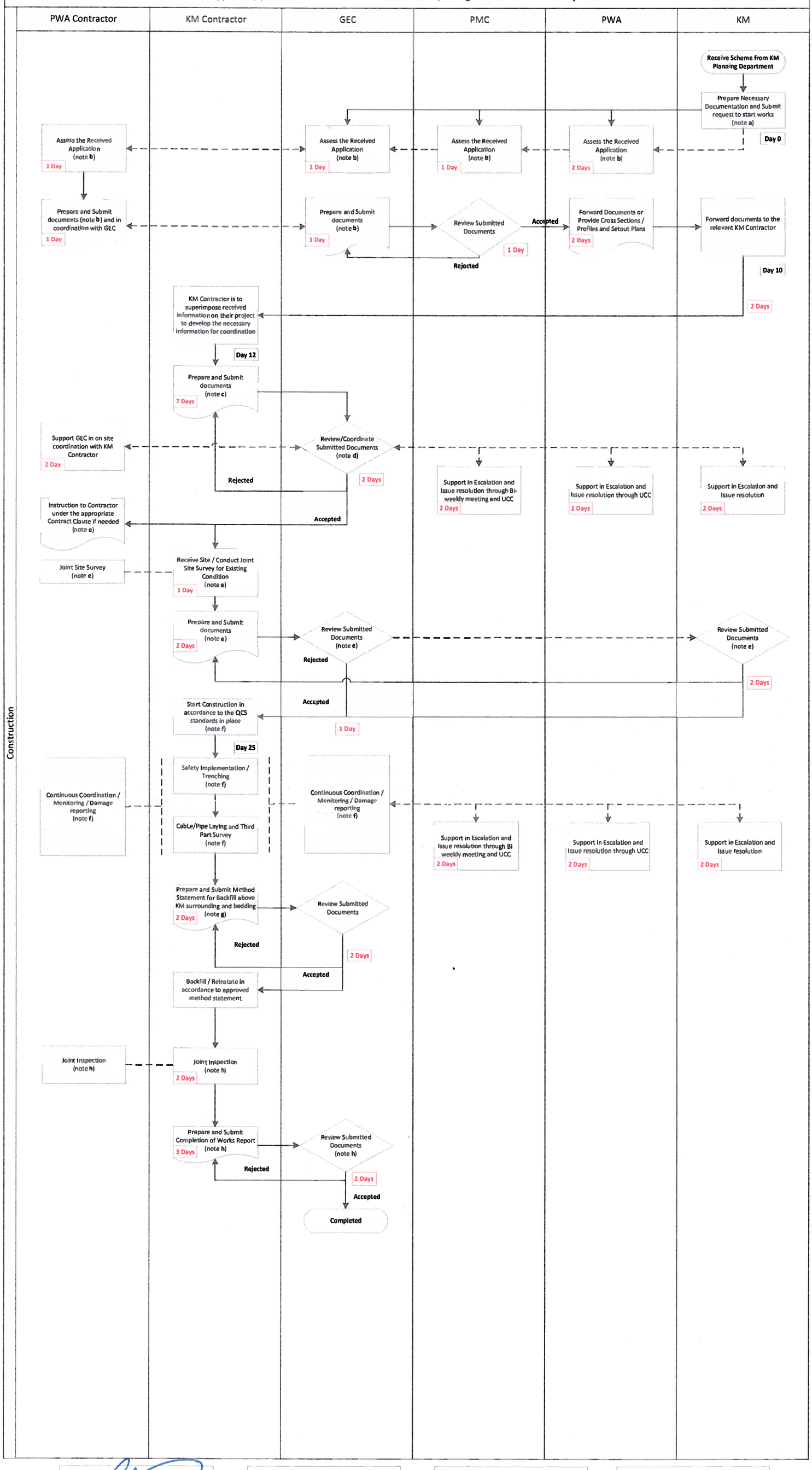
This MOU shall be effective from the date it is agreed and signed by the parties and shall not have a retrospective effect unless mutually agreed by the parties. This MOU shall remain in force until such time that the parties agree to terminate or modified, via consensus basis.

Appendix (1) -KAHRAMAA/ASHGHAL COMMITMENT LETTER

الصيغة النهائية للتعهد بين أشغال وكهرماء طبقا لما تم الأتفاق عليه خلال اجتماع اللجنة التنسيقية للخدمات والمرافق رقم (138) بتاريخ 14/6/2017

السيد المهندس / محمد ثاني المعاضيد المحترم
مـدير إدارة تخطيط شبكات المياه
المؤسسة العامة القطرية للكهرباء والماء (كهرماء)
ص،ب : 41
هاتف : 5989 /5988 4484
فاكس : 5496 4484
الـدوحـة ، قــطـر
المـشروع : مشاريع أشغال للطرق السريعة وتطوير الطرق المحلية والصرف الصحي
المـوضوع: تعهّد هيئة الأشغال العامة
بالإشارة إلى الموضوع أعلاه وفي إطار مراجعتكم لمخططات التصميمات المفصلة لشبكات المياه ، فإننا نحيطكم علما بما يلي :
نظرا لكون الدراسات التفصيلية لمخططات الطرق والبنية التحتية وخطوط الخدمات قد أفضت إلى ضرورة **مدّ/ استبقاء أجزاء من خطوط المياه القائمة/ المقترحة وغرف المحابس ذات الصلة** تحت **1) مسارات الطرق الأسفلتية Carriageway (الرئيسية والخدمية)** أو **2) تحت حارات مواقف السيارات وممرات المشاة ومسارات الدراجات الهوائية المعبدة بالأسفلت (أو غيرها)** وذلك نسبة للتكلفة المرتفعة لنقل الخدمات القائمة إلى المسار الخدمي الخاص بها أو لشدة اكتظاظ شبكات المرافق والخدمات تحت الأرض وعدم توفر المساحة الكافية بمخططات مسارات الخدمات النموذجية المعتمدة من طرف وزارة البلدية والبيئة، فقد تم الاتفاق بين أشغال وكهرماء في اجتماع اللجنة التنسيقية للخدمات والمرافق العامة رقم 123 بتاريخ 15/02/2017 على التالي:
أولاً: الخدمات القائمة فى مسار الطرق الأسفلتية (Carriageway) الرئيسية والخدمية: **أ.** في حالة وجود الخدمات القائمة (شبكات المياه) تحت مسار الطرق الأسفلتية (Carriageway) الرئيسية والخدمية قبل أو بعد التصميم الجديد للطريق من قبل أشغال: سيتم الإبقاء على الخدمات فى مواقعها تحت الطرق الأسفلتية الرئيسية والخدمية وذلك نظراً للتكلفة المرتفعة لنقلها إلى المسار الخدمي الخاص بها، على أن تتم دراسة كل حالة حسب وضع شبكة المياه المقترح استبقاؤها من طرف استشاري الهيئة ومع التأكيد على ضرورة توفير مسار خارج الطرق الرئيسية الأسفلتية لشبكات كهرماء المستقبلية خالى من الخدمات الأخرى كحل أساسي وفى حالة تعذر وجود ممر خال يتم الموافقة على وجود خدمات أخرى على النحو الموضح فى النقطة (ب) **ب.** فى حالة عدم توفر مسارات خارج الطرق الأسفلتية لشبكات المياه المستقبلية نتيجة لشدة اكتظاظ شبكات المرافق، يتعين على أشغال تقديم طلب للاستملاكات لتوفير تلك المسارات. وفى حال تعذر الاستملاك، يتم تقديم كتاب من قبل إدارة تخطيط البنية التحتية بوزارة البلدية والبيئة بما يفيد بذلك (مرفق طيه كتاب وزارة البلدية والبيئة ذو الصلة).
مع الأخذ في الاعتبار الإشتراطات التالية: **1.** بالنظر إلى النقطة (ب) وفي حالة توفر مسارات لخطوط المياه حصرياً تحت الطريق الأسفلتي، فإن لكهرماء الحق في استخدام المسارات لتمديد شبكات مياه جديدة أو أي استخدامات مرتبطة بالشبكة. **2.** إمكانية الصيانة والسماح لكهرماء بالقيام بأعمال الحفر المستقبلية بالطريق لتمديد وربط أو تشغيل أو إصلاح الأعطاب المحتملة أو الطارئة متى تطلب الأمر. **3.** قيام أشغال بحماية الخدمات القائمة حسب مواصفات المؤسسة العامة القطرية للكهرباء والماء خلال مرحلة تنفيذ البنية التحتية. **4.** تتحمّل كهرماء إعادة الأعمال المذكورة في النقطتين (1) و(2) أعلاه والمتعلقة بـ (phase 1) إلى وضعها الأصلي حسب مواصفات أشغال عند الانتهاء من الأعمال المذكورة سابقاً وتتحمّل التكاليف المترتّبة عن ذلك. **5.** تتحمّل أشغال إعادة الأعمال المذكورة في النقطتين (1) و(2) أعلاه والمتعلقة بـ (phase 2) إلى وضعها الأصلي ويستثنى من ذلك حالات الخلل الناتجة عن عيب تصنيعي في المواد التي تمّ اعتمادها من قبل كهرماء أو المقاول المعيّن من طرفها لمدّ الأنابيب. **6.** أما في حالة خطوط المياه الرئيسية التي ستتسبب في ضرر كبير على الدولة في حالة وجود أي عطل فيها ، تدرس كل حالة وتقدر بقدرها.
ثانياً: الخدمات القائمة تحت مواقف السيارات وممرات المشاة ومسارات الدراجات الهوائية المعبدة بالأسفلت (أو غيرها) وفى غير ممراتها المقترحة ضمن التصميم الجديد: تم الاتفاق على إبقاء الخدمات القائمة فى مواقعها نظرا للتكلفة المرتفعة لنقلها إلى المسار الخدمي الخاص بها مع الأخذ في الإعتبار الإشتراطات المذكورة أعلاه من النقطة 1 إلى 5.
تجنب أي تعارضات عند طلبات فتح الطريق المقدمة من طرف كهرماء بنظام "QPRO " أو أي سوء فهم أثناء أشغال الحفر المستقبلية لربط أو تشغيل أو صيانة خطوط المياه المطمورة تحت **مسار الطريق الأسفلتي او تحت حارات مواقف السيارات ومسالك المشاة ومسارات الدراجات الهوائية المعبدة بالأسفلت (أو غيرها)**، تتعهد هيئة الأشغال العامة أيضا بما يلي:
1. تعميم هذا الالتزام على جميع الأطراف المعنية بالموافقات على طلبات فتح الطريق والمتمثلة أساسا في إدارة تشغيل وصيانة الطرق، موظفي أشغال مراجعي طلبات فتح الطريق بنظام "QPRO " ، الإدارة العامة للمرور بوزارة الداخلية، إدارة البنية التحتية بوزارة البلدية والبيئة وأي جهات أخرى معنية لها علاقة بإجراءات فتح الطرق والتي تشرف عليها أشغال.
2. إضافة ملاحظة عامة بكل مخططات المشاريع في مختلف المراحل (التصميمات التفصيلية والرسومات التنفيذية ورسومات حسب التنفيذ) تنص على السماح لكهرماء بالقيام بأعمال الحفر المستقبلية لربط أو تشغيل أو صيانة خطوط المياه المطمورة تحت **مسار الطريق الأسفلتي او تحت حارات مواقف السيارات ومسالك المشاة ومسارات الدراجات الهوائية المعبدة بالأسفلت (أو غيرها)** متى طلبت كهرماء ذلك (مع ذكر مرجع التعهد وتاريخ صدوره). وستقوم كهرماء بتنفيذ وتحمل تكلفة إعادة الأعمال إلى وضعها الأصلى، حيث لا يوجد (Phase 1) و(Phase 2) بمسارات الدراجات الهوائية ومسالك المشاة وحارات مواقف المركبات المعبدة بالأسفلت. و تم الإتفاق على أن تقوم كهرماء (شؤون المياه) بتجربة ذلك لفترة زمنية ودراسة التكلفة المالية المترتبة على تلك الأعمال ورفعها إلى اللجنة التنسيقية للخدمات والمرافق العامة فى حالة الحاجة لذلك.
3. - بالنسبة للمسافات الأفقية والرأسية بين خطوط المياه و خدمات أشغال (FS, SW & TSE) ونظرا لحساسية الموضوع في حالات نفس المستوى حيث أنّه يتعلّق بحماية الصحة العامة، يجب أن توفر أشغال مسافة أفقية لا تقلّ عن ثلاثة أمتار (3 م) إذا كانت المقاطع العرضية النموذجية للخدمات الصادرة من وزارة البلدية والبيئة تسمح بذلك، مع مراعاة التالى: • في حالة ما إذا كانت المسافة الأفقية المتاحة تقل عن 3م، يتم السماح بتوفير مساحة أفقية أقل من 3 م طبقا لمقترح أشغال بعد دراسته على حدة وتقديره بقدره. • في حالة ما إذا كانت المسافة الأفقية المتاحة تقل عن 1م، يجب أن توفر هيئة الأشغال حماية خرسانية لخدماتها على طول الجزء الموازي لخطوط المياه نفس المستوى • يجب أن توفر أشغال مسافة عمودية عند تقاطع الخدمات مع خطوط المياه لا تقلّ عن نصف متر (0.5 م) و في حالة ما إذا كانت المسافة العمودية المتاحة تقل عن ذلك يتمّ دراسة كلّ اقتراح مقدم من طرف أشغال بهذا الخصوص على حدة و يقدّر بقدره.
في حال وجود أي استفسارات، يرجى الإتصال بالمهندس / (ذكر جهة التنسيق والخطة الوظيفية) على الهاتف (ذكر الرقم) أو عبر البريد الإلكتروني (ذكر العنوان)
وتـفضــلوا بـقبـول فـائق الإحــترام ،،،
إسم وصفة المُوقّع ممثل أشغال والمخول من طرفها لإصدار التعهد)
المرفقات: نسخة من كتاب وزارة البلدية والبيئة ذو الصلة

Appendix (2) - Protocol of Work for KM contractors Requesting to work Within PWA Projects**



Abdullah Hamad Al Attiyah
UCC Chairman

Saoud Al Tamimi
UCC Assistant Chairman

Abdullah Ali A Al-Theyab
UCC KM Electricity Representative

Fahad Yousef Tolefat
UCC KM Water Representative

قطر تستحق الأفضل
Qatar Deserves The Best

KAHRAMAA كهرماء

Rev.05 July 2017

NOTES

Public Works Authority (PWA)
Kahramaa (KM)
Programme Management Consultant (PMC)
Utilities Coordination Committee (UCC)
General Engineering Consultant (GEC)
Days mean Working Days
Request for Information (RFI)

NOTES:

****This Protocol only applies when there are PWA Contractors and Consultants on site.**

In case there are no PWA contractors and Consultants, KM is responsible to ensure that KM contractors comply with QCS requirements in relation to Excavation, managing excavated material, backfilling operations and full site clearance and to PWA O&M requirements for reinstatement "Amendment to the Code of Practice and Specification for Road Openings in the Highway" dated December 2014 or its following updates. Moreover, KMW has to ensure that testing of backfilling elements shall be in accordance to appropriate Qatari Standards in Place.

a) Minor Schemes application is directly submitted to QPRO 2.0, Major Schemes are to be submitted as per QDRS Requirements. In exceptional cases start of works can be requested via official letter to PWA. All initial applications submitted is to clearly identify (CAD Format):

- Limits of Work
- Line Diagram of the Section of works to be constructed

Applications submitted through QPRO 2.0 will go to PWA first and assigned to PMC/GEC/PWA Contractor as needed

Applications submitted through QDRS will go to all auto assigned parties PWA/PMC/GEC

b) Once the application is received by the PWA and/or its delegated Consultants, the information is superimposed on the impacted project and the following information is provided

- Assessment and Conditions Form (includes conditions to be abided by KM contractor and all relevant points of contact)
- For PWA Projects In Concept Design KM is to Follow Cross-sections provided by KM Planning
- For PWA Projects that is past Concept Design Applicant to follow PWA Cross-sections (approved and stamped by KM planning department)
- Roads Profiles and Setout plans By PWA (CAD Format)
- Projects Safety plan for projects in Construction for Infrastructure Schemes
- The PWA to inform KM Construction of changes in projects stages/priorities

c) Once the information is received from PWA, KM is designate the relevant contractor to prepare the following and coordinate with the GEC/Contractor for approval and site handover

- In Un-Graded areas KM is to Coordinate directly with PWA for the best way forward
- In Graded Areas KM Contractor to Submit Shop drawings in accordance to the received PWA Cross sections, Road profiles and Setout plans (cables/pipes to be reflected in the right corridor and at the right level)
- Safety plan in accordance to QCS standards for projects in construction for Infrastructure Schemes
- General Method statement for Reinstatement / Backfilling
- Proposed Detailed Schedule of Works (P6 format)
- Excavated Material Management Plan
- Back fill Material Approval Requests (including source agreement)
- Testing of Back filling Elements shall be in accordance to appropriate Qatari Standards in Place

d) The GEC/Contractor is to coordinate the following

- Review and comment on submittal for All Projects
- Set up Kick off meeting for Projects in construction inviting all necessary parties
- Review and agree received Safety plan and General Method statement for Reinstatement / Backfilling in accordance to the PWA requirements for projects in construction
- Agree and finalize Proposed Schedule and Site handover for Areas of KM Works
- The GEC is to escalate necessary issues/concerns early to the PMC/PWA as needed
- After finalization of all the above and submittal is accepted the GEC is to Handover the Site to KM Contractor

e) The PWA or PWA Delegated Engineer to direct the PWA Contractor under the appropriate contract clause providing the following information: KM Contractors Name, Contact Details, Scope of Work and Duration

The KM Contractor is to follow the following upon receiving the site

- Conduct a Joint Survey with PWA Contactor
- Prepare and Submit an Existing Site Condition Report, which should include images and narrative, highlighting any issues or issues to be foreseen that might prevent the contractor from return the site to its existing condition
- The PWA or PWA Delegated Engineer is to Sign-off on Existing Site Condition Report upon confirmation

f) The KM Contractor is to follow

- To comply with QCS requirements in relation to HSE, Excavation, managing excavated material, backfilling operations and full site clearance or
- Lay Cables/Pipes in according to the Approved Shop Drawings (approved levels and location)
- Confirmation of cables/pipes location by Third Party Survey
- All reports to be Submitted to GEC/Contractor on Site
- Report any Property damages to KM, the PWA, the PWA Delegated Engineer, Property Owner and PWA Contractor. The Proposed remedial action will be subject to review and approval by the Property owner and the PWA Delegated Engineer before Implantation
- Provide full documentation related to the remedial action in accordance to QCS requirements for archiving with Final Dossier

g) The KM Contractor to prepare a method statement for backfilling / reinstatement specific to the area being complete ensuring

- To comply with QCS requirements in relation to HSE, Excavation, managing excavated material, backfilling operations and full site clearance or
- PWA O&M requirements for reinstatement
- Confirming that all materials used in backfilling and sub-base for works above KM bedding and surrounding to be in line with Qatari Specification and standards
- Surplus excavated materials to be taken off site by KM Contractor

h) Upon the Completion of KM Works and for Final Approval

- Conduct a Joint Inspection with PWA Contactor
- Provide a Confirmation to PWA in relation to all Works which have been put out of view at time of inspection
- The KM Contractor to prepare a Completion of Works Report
- The PWA or PWA Delegated Engineer will confirm and sign that the Works have been undertaken to his complete satisfaction (reinstatement)

MOU Approval

This MOU shall enter into force upon its signing by the parties below.

Signed by: **Date:**

H.E. Dr. Saad Bin Ahmad Al Muhannadi
PWA President

H.E. Essa Hilal Al Kuwari
Kahramaa President

Approved by:

Abdullah Hamad Al Attiyah
UCC Chairman / Assistant of PWA President

Fahad Yousef Tolefat
UCC Kahramaa Water Representative

Witnessed by:

Abdullah Ali A Al-Theyab
UCC Kahramaa Electricity Representative

Ibrahim Abbas
UCC MME Representative

Br. Mohamed Maarafiya
UCC MOI Representative

Youssef Ibrahim Al-Homr
UCC MME-EAD Representative

APPENDIX D: MME Typical Road Cross-Sections and Utility Corridors 2012

Ministry of Municipality & Urban Planning
Urban Planning & Development Sector

وزارة البلدية والتخطيط العمراني
قطاع التخطيط والتطوير العمراني

Typical road cross-sections and utility corridors

January 2012

Consideration For Utility Detail Design

1. The utility relocations that have been proposed are in line with the authority's (Kahramaa Water, Kahramaa Electricity, ictQatar etc) general requirements and the necessary corridor has been allocated to satisfy these relocations. However, further investigation at the detail design and at construction stage of the project must be carried out to minimize the proposed relocations. MMUP strongly recommends that priority must be given for maintaining the existing utility in their current location.

2. Doha Street Surveillance System (DSSS) manhole shall be placed every 250m or as per the designed requirements. Reference should be made to DSSS-s documentations

3. All telecommunication cables including fiber optic cables, shall be accommodated within the designated telecommunication corridors. The corridors are marked with the letter "T" on the cross section,. The cables shall be accommodated in a duct bank. The distribution of the ducts among telecommunication providers as well as all technical details will be provided by ict QATAR. An independent corridor of 0.5m located at both sides of the roads is reserved for Qatar Armed Force (QAF). This corridor is assigned to QAF use only.

4. The identified standard Rights Of Way (R.O.W) (as per policy plan) were used for the allocation of the utility corridors. Ideally; most of utility services are accommodated within the given R.O.W outside the carriageways. In some cases the Width of corridors assigned for a specific utility cannot cater for all of the required utility services, Therefore some utility may corridors have to be located under the carriageways. Service providers shall provide an accepted technical solution for the alignment and construction methods. These cases shall be submitted to MMUP for consideration, coordination with other stakeholders and approval is also required.

5. Based on discussion with the technical team of Ashgahl (PWA), Drainage, Sewerage and Treated Sewerage Effluent (TSE) Corridors were grouped together to account for maximum flexibility in assigning the required width to the specific corridor. Sewer and drainage corridors are located under the carriageway. These services are normally laid deep under the road surface (micro tunnel) and most will not generally impact traffic, provided that proper construction methods are adopted.

6. Positive Drainage System, using pipes and culverts shall be constructed where possible under carriageways. Where Positive Drainage System are not feasible, retention areas should be set aside to retain surface water runoff until the water has soaked into the ground; these areas are known as infiltration basins. Public parks can be also used as infiltration basins or Emergency Flood Areas.

7. Soakaway are not recommended. They should only be used as a last. Soakaway shall be appropriately designed taking into consideration all other utilities.

8. All the future proposals for each utility provider shall be designed and aligned within their designated corridor/s. Exceptions will be considered in special cases where the designated utility corridor width does not fulfill a specific technical need, thus requiring additional corridor width. In such cases coordination shall be carried out with adjoining utility provider and their approval shall be sought. Also a request shall be submitted to MMUP for consideration and approval. This procedure shall follow the MMUP's flow chart for "Utility Impact Assessment"

9. The proposed cross-sections have been derived based on consultation with all the relevant stakeholders; however it is MMUP's understanding that not all the designated corridors will be utilized by the assigned services authorities. Therefore, upon coordination and mutual agreement between utility authorities, further refinement / modification of the cross-sections can be undertaken to ensure optimum and most cost effective utilization of the ROW is achieved

10. Connection points: The points connecting new utility services, aligned as per new proposed cross sections, and the existing utility services laid as per Qatar Highway Design Manual (QHDM). For each individual utility services, the connection points shall be studied and a technical solution to be develop and agreed upon.

11. Manuals: after acceptance and adoption of the new proposal, the road cross section shall replace the existing sections in all used manuals in the state of Qatar. The technical team will review and amend accordingly all related sections in all applicable technical manuals.

12. The proposed typical cross sections covers most of the road types as per the Transportation Master Plan of Qatar (TMPQ) and shall be directly applied to all new roads and to all roads within new subdivisions. All utility services under new roads shall be laid before any asphalt works are carried out. Coordination between Ashgahl and all relevant stakeholders are required during detail design stages and prior to the implementation.

13. For future improvements, that include maintenance, redesign of existing roads, relocation of any existing utilities, or etc...; the new cross sections detailing the utility corridors shall be compared against. Prior to any improvements a written request shall be submitted to the concerned utility provider and MMUP for approval. The cost associated with the improvements shall be the borne by the concerned authority.

14. The concept of a utility gallery was introduced for the 64m and 86m R.O.W and at major intersections dimensions and. Other details of the utility galleries are to be further studied. The galleries shall meet the utility demands and site Specific condition, including (but not limited) to gallery ventilation, lighting, utility allocation, emergency considerations (eg. fire, pipe bust etc), operation maintenance.

15. The concept of utility gallery should be used if all other options were found unfeasible and it shall be restricted to a short distance i.e. 100m to 500m. However, for sections longer than 500m, a special case study shall be prepared and submitted by the relevant stakeholder (applicant) to MMUP for approval.

16. Intelligent transportation system (ITS) service were added to the proposed cross sections. These cables of ITS service are to be laid in ducts within the electrical lighting (E) corridor in all types of road cross sections. Most of these cables will be located under the road verge or under the footpaths on both sides of the road. The dimension of the duct bank will be approx. 1m in width and about 0.6m in depth, and shall consist of two rows of 100mm diameter spare ducts. Its chambers shall be placed every 100m or as per the designed requirements and at intersections. Manhole and cross road ducts shall be placed every 500m and at Intersections.

17. Doha street surveillance system (DSSS) manhole shall be placed every 250m or as per the designed requirements. Reference should be made to DSSS-s documentations

18. All telecommunication cables, including fiber optic cables, will be accommodated within the designated telecommunication corridors. On the cross section, the corridors are marked with the letter "T". The cables will be accommodated in a duct bank. The distribution of the ducts among telecommunication providers as well as all technical details will be provided by ict QATAR. An independent corridor of 0.5m located at both sides of the roads is reserved for Qatar armed force (QAF). This corridor is assigned to QAF use only.

19. The identified standard rights of way (R.O.W) (as per policy plan) were used for the allocation of the utility corridors. Ideally; most of utility services are accommodated within the given R.O.W outside the carriageways. In some cases the Width of corridors assigned for a specific utility cannot cater for all of the required utility services, Therefore some utility corridors have to be located under the carriageways, such cases are limited. Service providers shall provide an accepted technical solution for the alignment and construction methods. These cases shall be submitted to MMUP for consideration, coordination with other stakeholders and approval.

20. Based on discussion with the technical team of Ashgahl (PWA), drainage, sewerage and treated sewerage effluent (TSE) Corridors were grouped together to account for maximum flexibility in assigning the required width to the specific corridor. Sewer and drainage corridors are located under the carriageway. These services will normally be laid deep under the road surface (micro tunnel) and mostly will not be affected by the traffic loads, provided that proper construction methods are adopted.

وزارة البلدية والتخطيط العمراني
قطاع التخطيط والتطوير العمراني
Ministry of Municipality & Urban Planning
Urban Planning & Development Sector

Mohamed Abdah
Director of Transportation And Infrastructure Planning Department

Designed: Hassan Qasem Mohamed Eldrisi
Mohab M. Zeki
Checked: Khalifa Buhazzaa
Approved by:
Date: January 2012
Dwg No: CS/GL-1
Sheet No: 1 of 1

21. Positive drainage system, using pipes and culverts shall be constructed where possible under carriageways. Where Positive drainage system are not feasible, retention areas should be set aside to store surface water runoff until the water has soaked into the ground; these areas are known as infiltration basins, Special land shall be designated as Infiltration basins. Public parks can be also used as infiltration basins or emergency flood areas.

22. Soakaway are not recommended. They should only be used as a last option to positive drainage system or retention areas (infiltration basins).Soakaway shall be appropriately designed taking into consideration all other utilities. This design shall be approved by PWA and MMUP.

23. For existing roads where the available R.O.W is insufficient to fulfill the utility requirements and the acquisition of additional land is not possible, then a utility gallery concept can be used to accommodate the utility services.

24. Most of the utility services can be accommodated inside the utility gallery; however utilities such as sewer and drainage that depends on gravity are excluded from the utility gallery.

25. Different options for utility galleries were provided. Agreement in principles of adopting utility galleries among all stakeholders was reached. However, all stakeholders are kindly requested to add any specific requirement which they may require.

26. All utility services within the R.O.W must be constructed, or appropriate and sufficient ducts and manholes / chambers be placed and accepted by MMUP and the relevant utility providers prior to the commencement of roads / carriageways construction. The appointed consultant/contractor for design and construction of the infrastructure projects shall produce a utility execution plan during the concept and detail design of the project. This plan shall be approved from all utility Providers, PWA and MMUP and they shall strictly adhere to it.

27. Utility services that are dependent on gravity such as drainage and sewer shall be designed in close coordination with the site grading and road level plans.

28. As a standard construction practice all deep services, such as sewer and drainage, shall be constructed prior to shallower services.

29. Details and method of execution procedures of each utility service shall be followed as per procedures set forth in relevant design and construction manuals in the state of Qatar.

30. Each utility provider is obligated to design and align their services within the designated utility corridor / corridors. Exceptions will be considered in special cases where the designated utility corridor width does not fulfill a specific technical need, thus requiring additional corridor width. In such cases coordination shall be carried out with adjoining utility provider and their approval shall be sought. Also a request shall be submitted to MMUP for consideration and approval.

31. The proposed cross-sections have been derived based on consultation with all relevant stakeholders; however it is MMUP's understanding that not all the designated corridors will be utilized by the assigned services authorities. Therefore, upon coordination and mutual agreement between utility authorities, further refinement / modification of the cross-sections can be undertaken to ensure optimum and most cost effective utilization of the row is achieved.

32. Connection points: The points connecting new utility services, aligned as per new proposed cross sections, and the existing utility services executed as per Qatar highway design manual (QHDM). For each individual utility services, the connection points shall be studied and a technical solution to be found and agreed upon.

33. Marker system: It is strongly recommended to use an electronic marker system for each individual utility which will enable field personnel to uniquely identify underground facilities in the field to correlate to plant maps or in the absence of maps. Such a system will reduce the amount of time and excavation required to locate and access specific underground facilities.

34. Detail design of the utility gallery: The gallery options shall be studied further. Technical limitation and safety issues shall be considered. Specific gallery cross section for specific situation to be prepared. The technical team to discuss each individual case and responsibility of each stakeholder to be determined and agreed upon. Maintenance of the utility gallery's civil structures shall be the responsibility of the PWA.

35. Manuals: after acceptance and adoption of the new proposal, the road cross section shall replace the existing sections in all used manuals in the state of Qatar. The technical team will review and amend accordingly all related sections in all applicable technical manuals.

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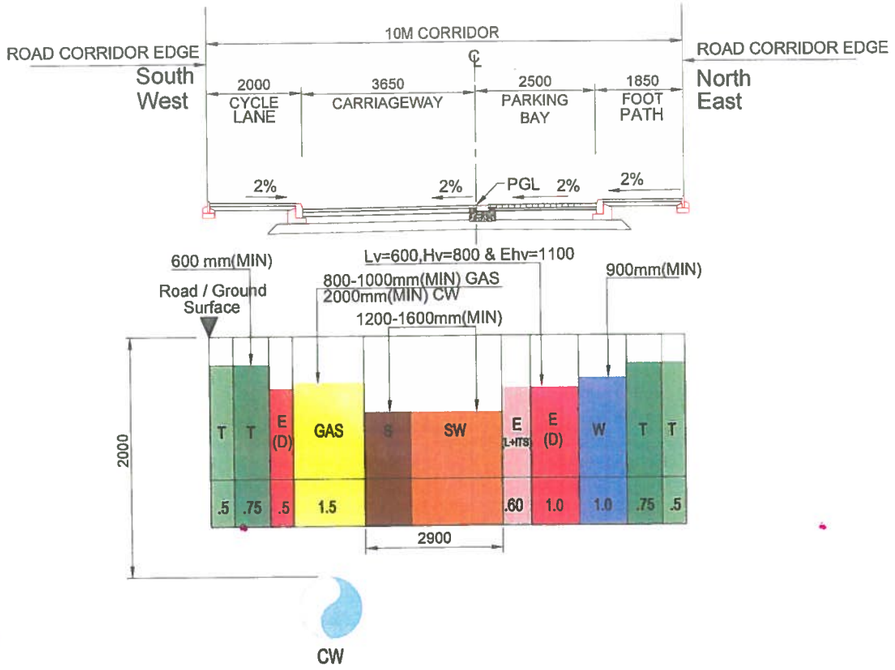
Ministry of Municipality & Urban Planning
Urban Planning & Development Sector

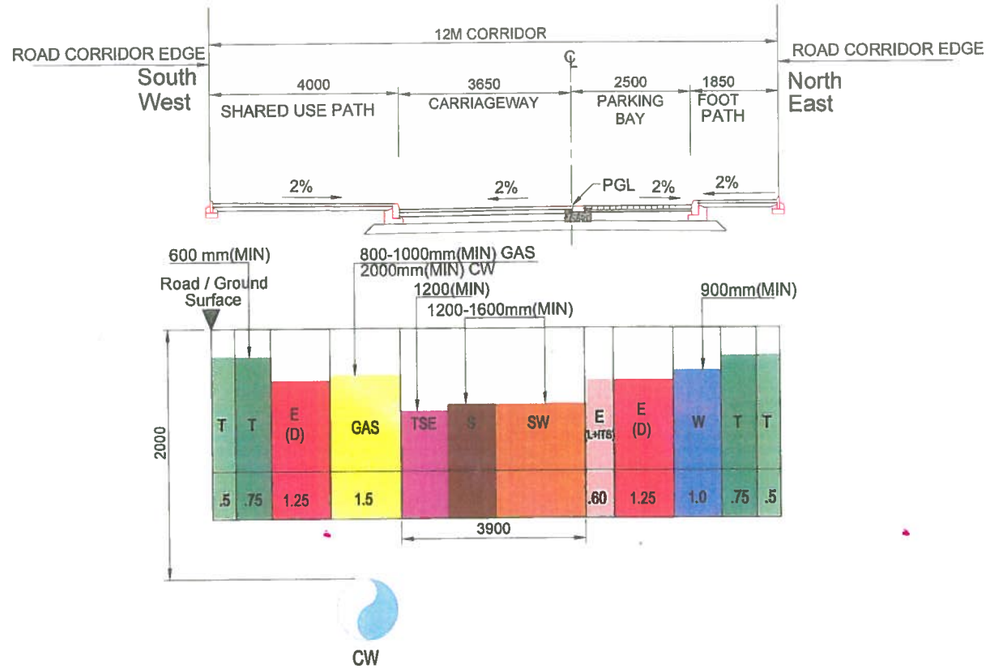
Mohamed Abdah
Director of Transportation And Infrastructure Planning Department

Designed	Hassan Qasem, Mohamed Elidrisi, Mohab M. Zaki
Checked	Khalifa Buhazzaa
Approved by	
Date	January 2012
Dwg No.	CS-02
Sheet No.	2 of 2

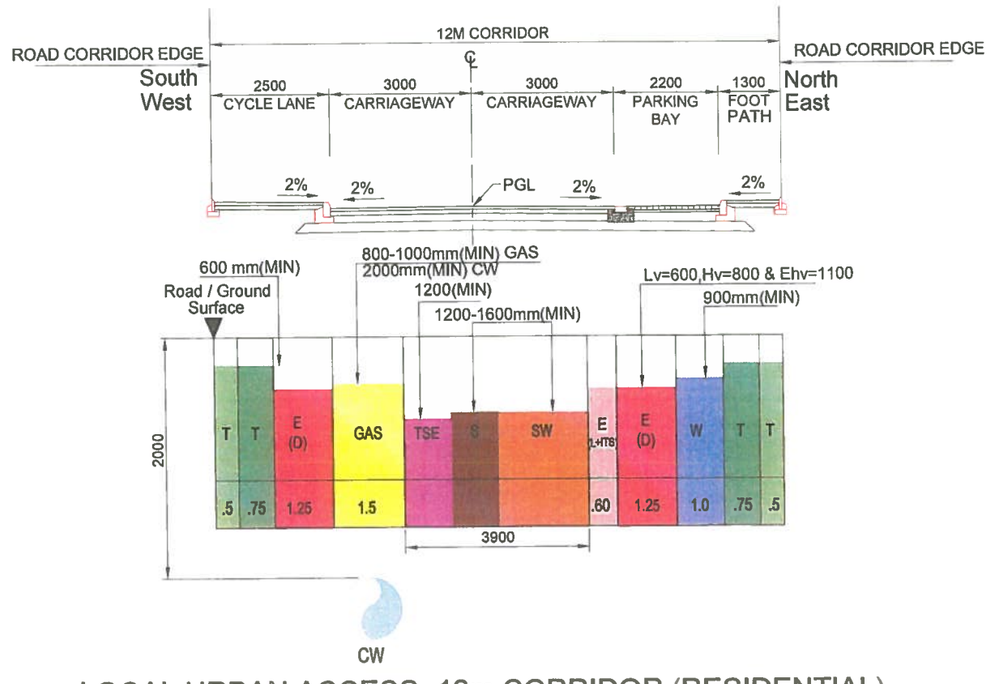
TYPICAL ROAD CROSS SECTION & UTILITY ALLOCATION FOR NEW URBAN ROADS



LOCAL URBAN ACCESS - 10m CORRIDOR (RESIDENTIAL), ONE WAY SYSTEM



LOCAL URBAN ACCESS - 12m CORRIDOR (RESIDENTIAL) ONE WAY SYSTEM



LOCAL URBAN ACCESS -12m CORRIDOR (RESIDENTIAL),

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL VERTICAL DIMENSIONS GIVEN ARE MINIMUM FROM GROUND/SURFACE IN MILLIMETERS.
3. ALL HORIZONTAL DIMENSIONS SHOWN FOR UTILITY RESERVATIONS ARE IN METERS.
4. CROSS SECTIONS SHOWN ARE ONLY TO BE USED AS GUIDELINES AND MAY BE SUBJECT TO MODIFICATIONS FOR INDIVIDUAL PROJECTS AS REQUIRED WITH ENGINEER'S APPROVAL
5. COORDINATION AND AGREEMENT IS REQUIRED WITH THE MINISTRY OF MUNICIPAL AND URBAN PLANNING PRIOR TO IMPLEMENTING THESE CROSS SECTIONS.
6. FOR THE UTILITIES PLACED UNDER THE CARRIAGEWAY THEIR ACCESS POINTS MUST BE PLACED AT THE CENTRE OF THE ROAD LANE.

LEGEND:

COLOR CODING

E (T)	ELECTRICITY (TRANSMISSION)
E(D)	ELECTRICITY (DISTRIBUTION)
E (L+ITS)	ELECTRICITY (Street Lighting + Intelligent Traffic System)
T(QAF)	TELECOMMUNICATIONS (Qatar Armed Forces)
T	TELECOMMUNICATIONS
S	SEWERAGE
SW	SURFACE WATER
TSE	TREATED SEWERAGE EFFLUENT)
W	WATER
CW	CHILLED WATER
DSSS	DOHA SURVEILLANCE SECURITY SYSTEM
GAS	GAS

Water

1. MINIMUM COVER FROM TOP TO FINISHED GROUND LEVEL=900mm.
2. MINIMUM COVER FROM TOP OF SERVICE CONNECTION/SERVICE DUCTS TO FINISHED GROUND LEVEL=600mm (SERVICE CONNECTIONS WILL CROSS OTHER UTILITY RESERVES.

Electricity

3. MINIMUM COVER FROM TOP OF CABLE Lv=600mm, Hv=800mm & EHv=1100mm

MMUP TYPICAL CROSS SECTION WITH TYPICAL UTILITY CORRIDOR

وزارة البلدية والتخطيط العمراني
قطاع التخطيط والتطوير العمراني
Ministry of Municipality & Urban Planning
Urban Planning & Development Sector

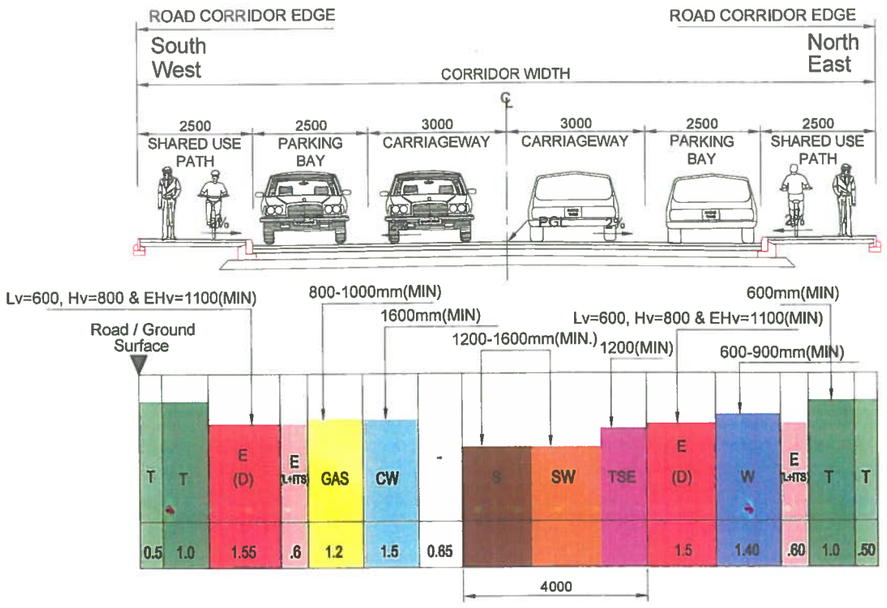
Mohamed Abdah
Director of Transportation And Infrastructure Planning Department

Designed:	Hassan Qasem, Mohamed Elidrisi, Mohab M. Zaki
Checked:	Khalifa Buhazzaa
Approved by:	
Date:	January 2012
Dwg No:	CS-U-10/12-002
Sheet No.	1 of 9

Ministry of Municipality & Urban Planning / Urban Planning & Development Sector /Hassan Qasem

CAD Ref: P:\11 Drafting Works\MMUP DATABASE\ARCHIVE\MMUP STANDARD CROSS SECTIONS\Standard cross-section.dwg

TYPICAL ROAD CROSS SECTION & UTILITY ALLOCATION FOR NEW URBAN ROADS



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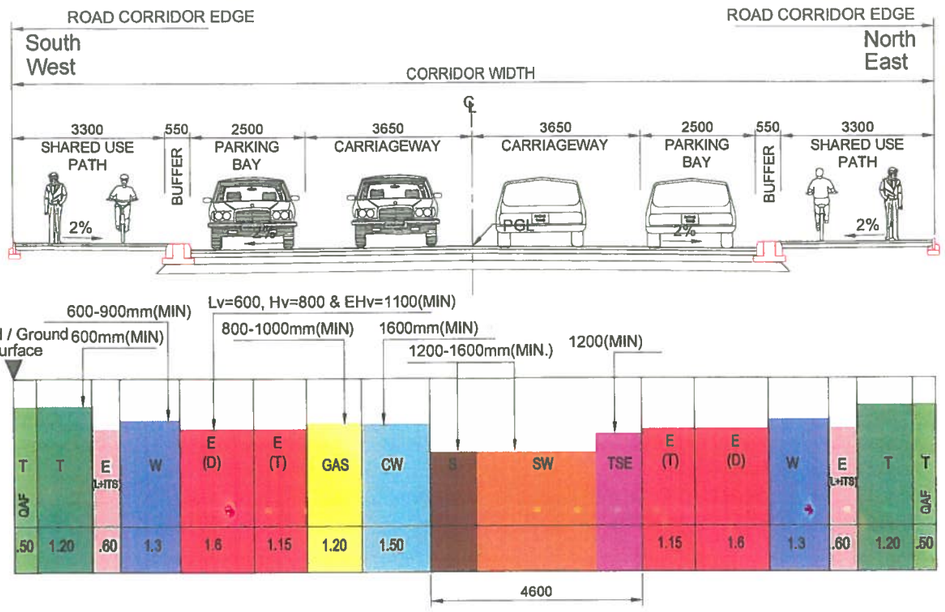
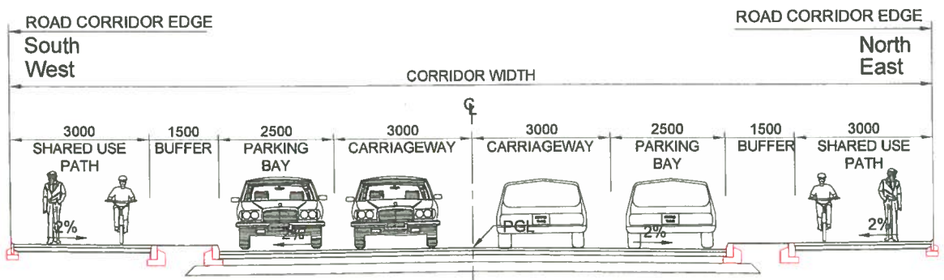
TYPICAL CROSS SECTION (SCALE 1:100)



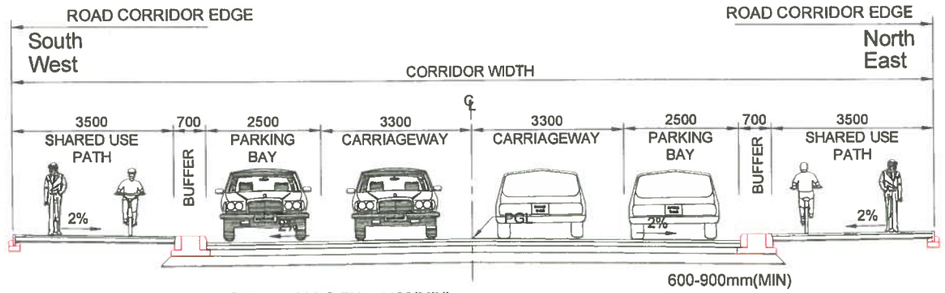
LOCAL URBAN ACCESS - 20m CORRIDOR (INDUSTRIAL)

TYPICAL CROSS SECTION (SCALE 1:100)



LOCAL URBAN ACCESS - 20m CORRIDOR (RESIDENTIAL)

TYPICAL CROSS SECTION (SCALE 1:100)



LOCAL URBAN ACCESS - 20m CORRIDOR (COMMERCIAL)

TYPICAL CROSS SECTION (SCALE 1:100)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL VERTICAL DIMENSIONS GIVEN ARE MINIMUM FROM GROUND/SURFACE IN MILLIMETERS.
3. ALL HORIZONTAL DIMENSIONS SHOWN FOR UTILITY RESERVATIONS ARE IN METERS.
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5. COORDINATION AND AGREEMENT IS REQUIRED WITH THE MINISTRY OF MUNICIPAL AND URBAN PLANNING PRIOR TO IMPLEMENTING THESE CROSS SECTIONS.
6. FOR THE UTILITIES PLACED UNDER THE CARRIAGEWAY THEIR ACCESS POINTS MUST BE PLACED AT THE CENTRE OF THE ROAD LANE.

LEGEND:

COLOR CODING

- E (T) — ELECTRICITY (TRANSMISSION)
- E(D) — ELECTRICITY (DISTRIBUTION)
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- W — WATER
- CW — CHILLED WATER
- DSSS — DOHA SURVEILLANCE SECURITY SYSTEM
- GAS — GAS

Water

1. MINIMUM COVER FROM TOP TO FINISHED GROUND LEVEL=900mm.
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Electricity

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MMUP TYPICAL CROSS SECTION WITH TYPICAL UTILITY CORRIDOR

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Ministry of Municipality & Urban Planning
Urban Planning & Development Sector

Mohamed Abdah
Director of Transportation And Infrastructure Planning Department

Hassan Qasem, Mohamed Elidrisi
Mohab M. Zaki

Khalifa Buhazzaa

Approved By:

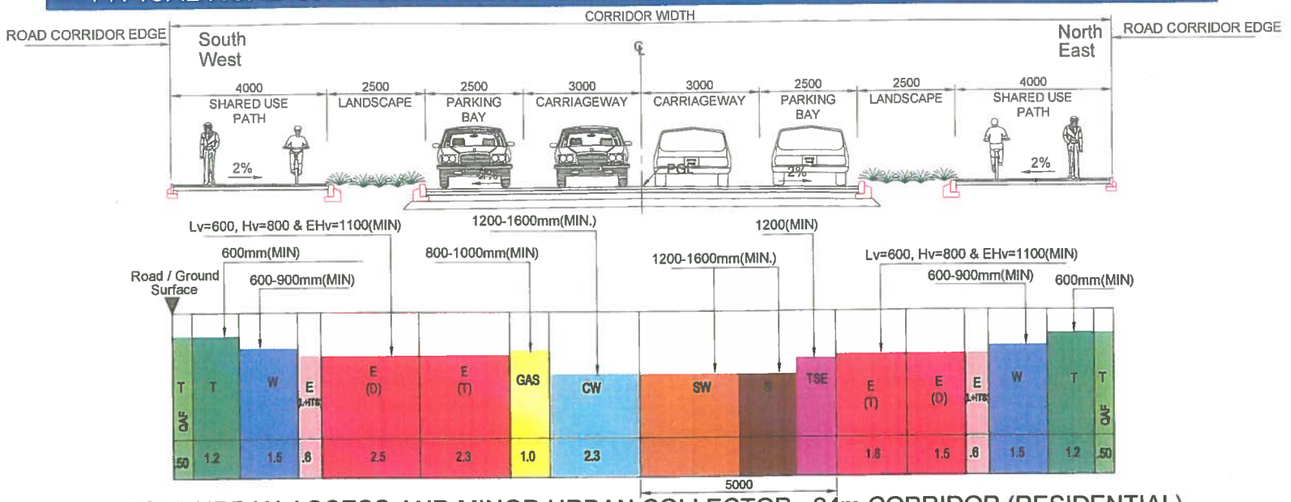
Date: January 2012

Drawing No.: CS-U-16/20-002

Sheet No.: 2 of 9

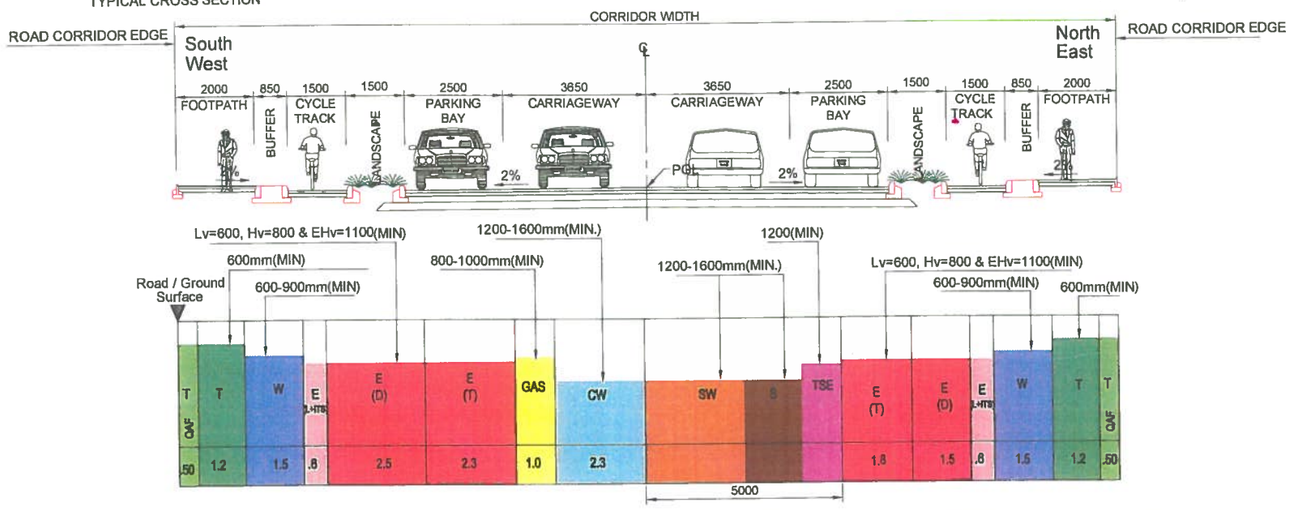
CAD Ref: P:\11 Drafting Works\MMUP DATABASE\ARCHIVE\MMUP STANDARD CROSS SECTIONS\Standard cross-section.dwg

TYPICAL ROAD CROSS SECTION & UTILITY ALLOCATION FOR NEW URBAN ROADS



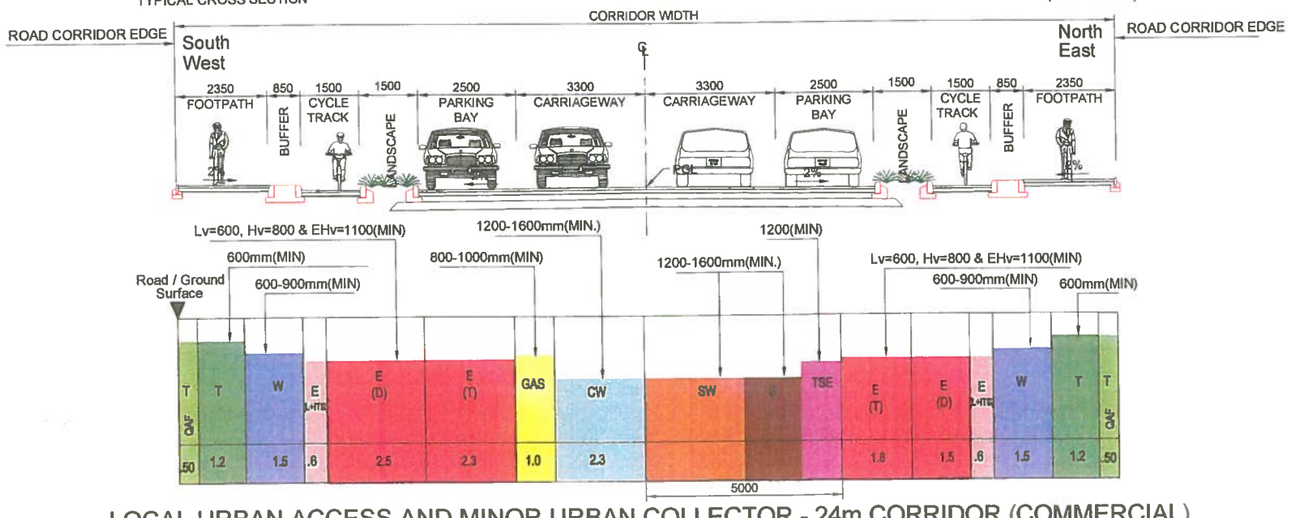
LOCAL URBAN ACCESS AND MINOR URBAN COLLECTOR - 24m CORRIDOR (RESIDENTIAL)

TYPICAL CROSS SECTION (SCALE 1:100)



LOCAL URBAN ACCESS AND MINOR URBAN COLLECTOR - 24m CORRIDOR (INDUSTRIAL)

TYPICAL CROSS SECTION (SCALE 1:100)



LOCAL URBAN ACCESS AND MINOR URBAN COLLECTOR - 24m CORRIDOR (COMMERCIAL)

TYPICAL CROSS SECTION (SCALE 1:100)

NOTES:

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LEGEND:

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Water

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MMUP TYPICAL CROSS SECTION WITH TYPICAL UTILITY CORRIDOR

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Urban Planning & Development Sector

Mohamed Abdah
Director of Transportation And Infrastructure Planning Department

Hassan Qasem, Mohamed Elidrisi
Mohab M. Zaki

Checked: Khalifa Buhazzaa

Approved by:

Date: January 2012

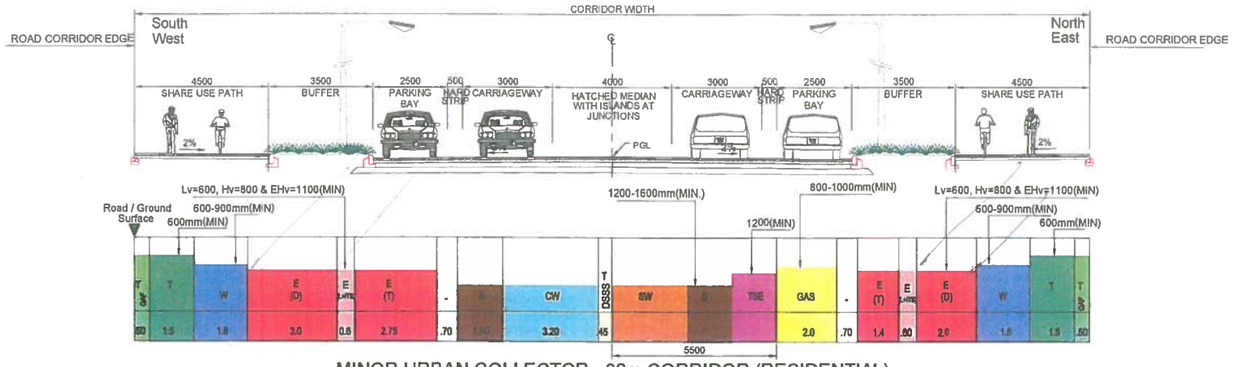
Dwg No: CS-U-24-002

Sheet No: 3 of 9

Ministry of Municipality & Urban Planning / Urban Planning & Development Sector /Hassan Qasem

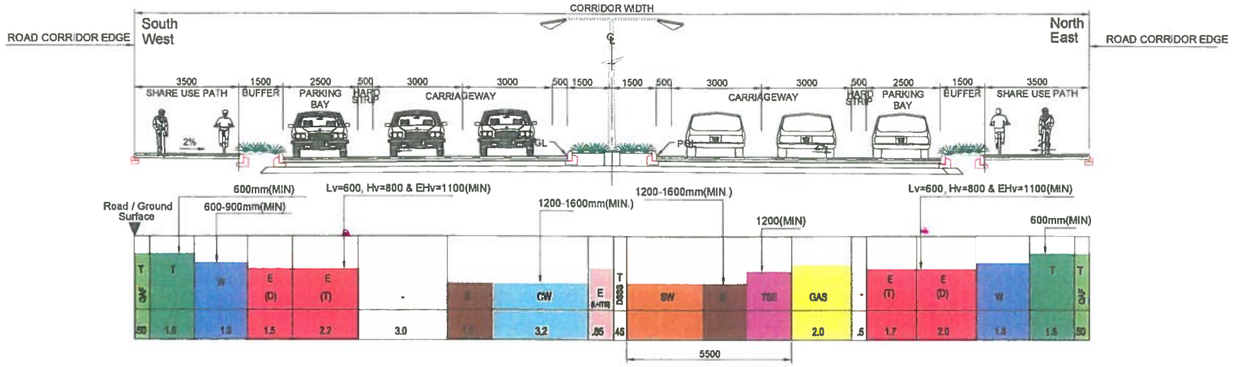
CAD Ref: P:\11 Drafting Works\MMUP DATABASE\ARCHIVE\MMUP STANDARD CROSS SECTIONS\Standard cross-section.dwg

TYPICAL ROAD CROSS SECTION & UTILITY ALLOCATION FOR NEW URBAN ROADS



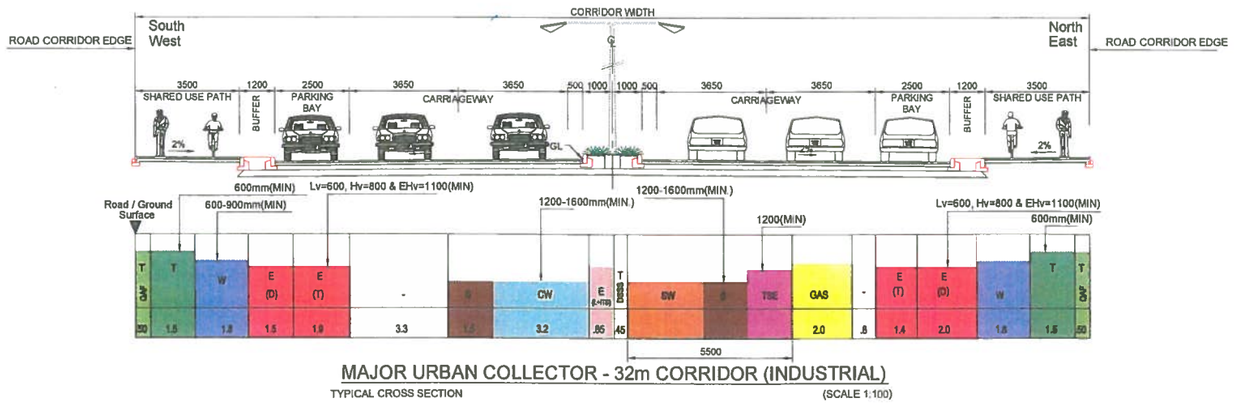
MINOR URBAN COLLECTOR - 32m CORRIDOR (RESIDENTIAL)

TYPICAL CROSS SECTION (SCALE 1:100)



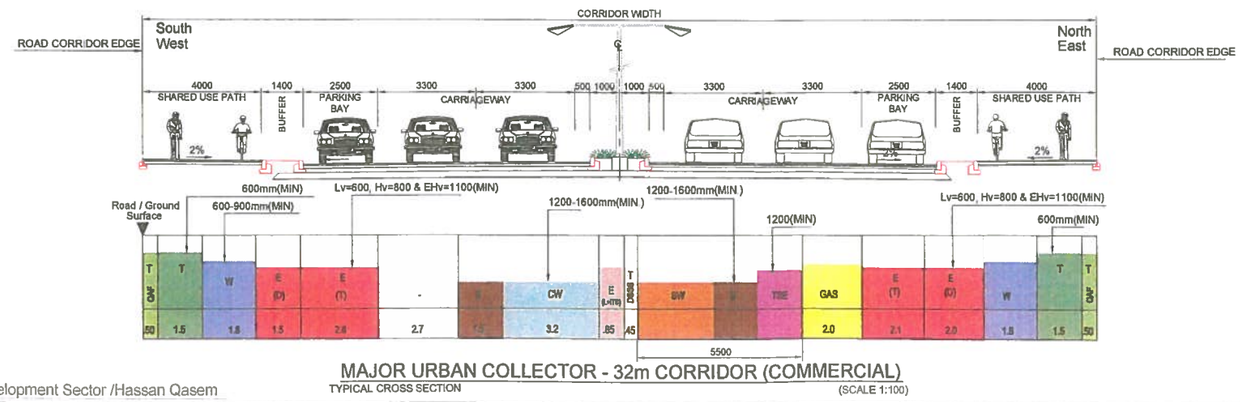
MAJOR URBAN COLLECTOR - 32m CORRIDOR (RESIDENTIAL)

TYPICAL CROSS SECTION (SCALE 1:100)



MAJOR URBAN COLLECTOR - 32m CORRIDOR (INDUSTRIAL)

TYPICAL CROSS SECTION (SCALE 1:100)



MAJOR URBAN COLLECTOR - 32m CORRIDOR (COMMERCIAL)

TYPICAL CROSS SECTION (SCALE 1:100)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
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LEGEND:

COLOR CODING

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Water

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Electricity

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MMUP TYPICAL CROSS SECTION WITH TYPICAL UTILITY CORRIDOR

وزارة البلدية والتخطيط العمراني
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Ministry of Municipality & Urban Planning
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Mohamed Abdah
Director of Transportation And Infrastructure Planning Department

Hassan Qasem, Mohamed Elidrisi
Mohab M. Zaki

Checked: Khalifa Buhazzaa

Approved by:

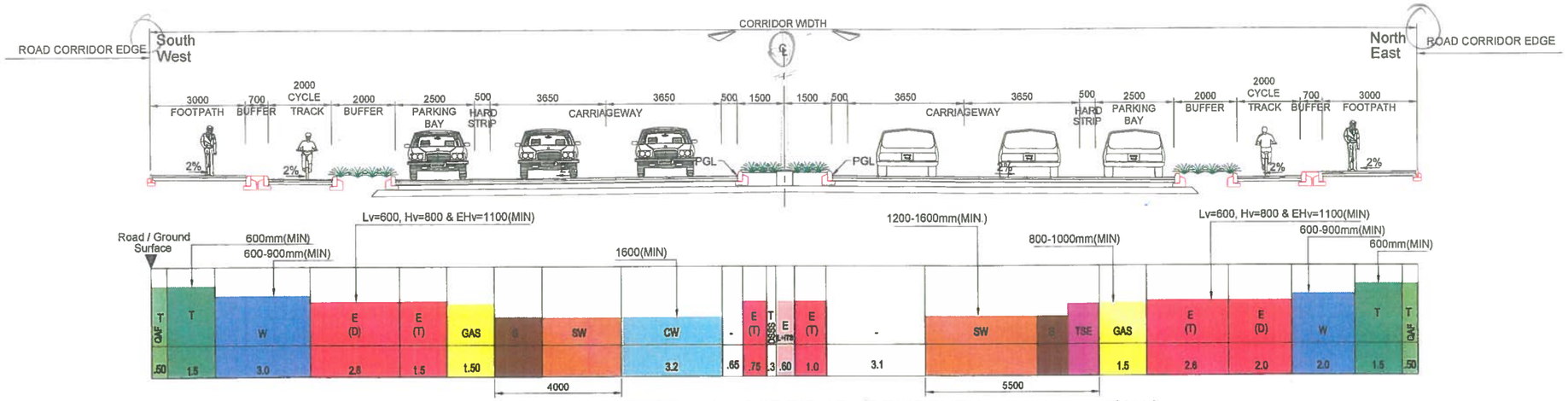
Date: January 2012

Dwg No: CS-U-32-002

Sheet No. 4 of 9

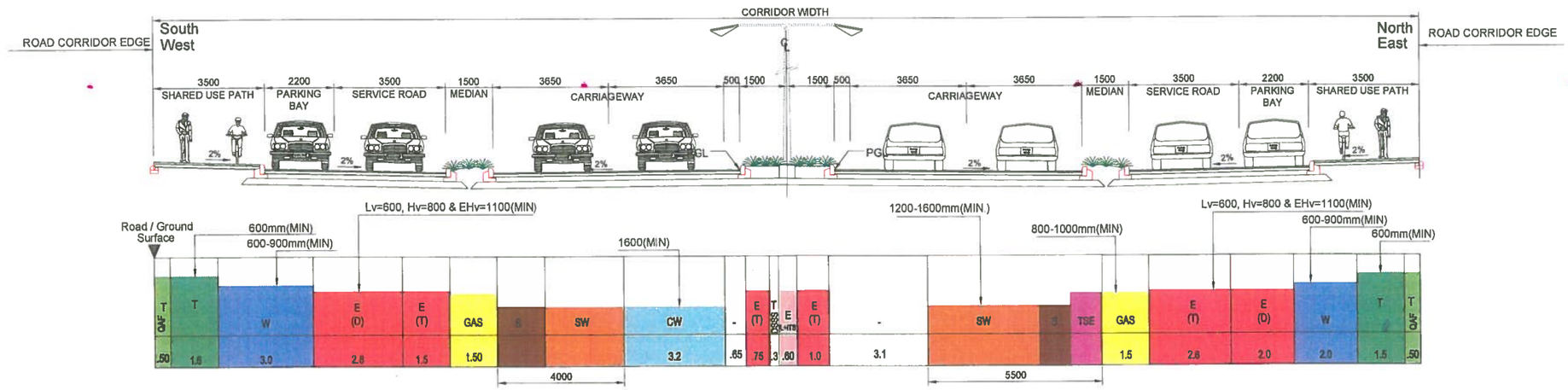
CAD Ref: P:\11 Drafting Work\MMUP DATABASE\ARCHIVE\MMUP STANDARD CROSS SECTIONS\Standard cross-section.dwg

TYPICAL ROAD CROSS SECTION & UTILITY ALLOCATION FOR NEW URBAN ROADS



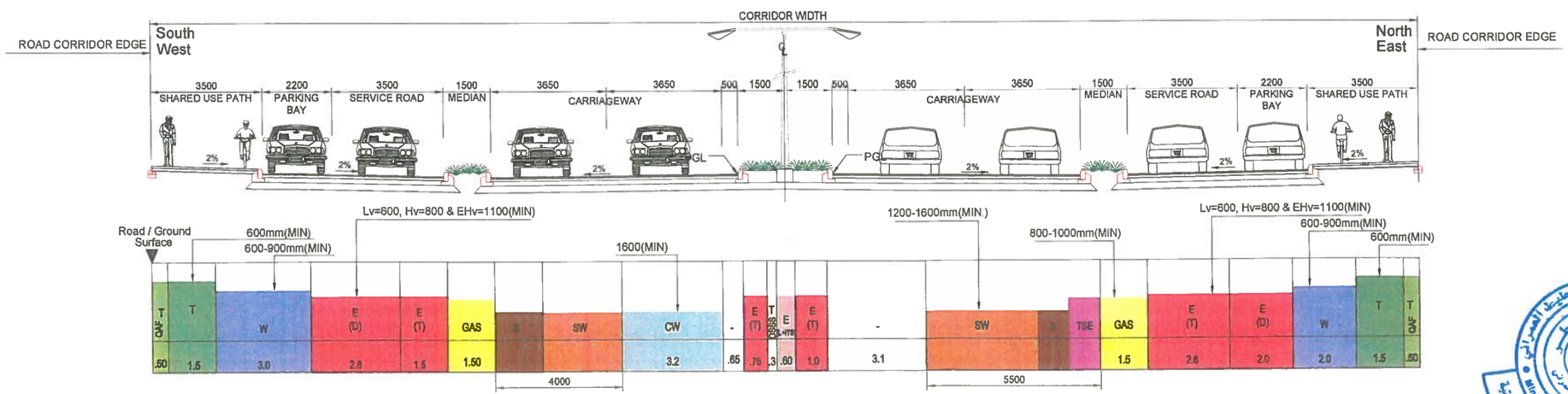
MAJOR URBAN COLLECTOR - 40m CORRIDOR (RESIDENTIAL & COMMERCIAL)

TYPICAL CROSS SECTION (SCALE 1:100)



MAJOR URBAN COLLECTOR - 40m CORRIDOR WITH SERVICE ROAD IF REQUIRED (RESIDENTIAL & COMMERCIAL)

TYPICAL CROSS SECTION (SCALE 1:100)



MAJOR URBAN COLLECTOR WITH SERVICE ROAD - 40m CORRIDOR (INDUSTRIAL)

TYPICAL CROSS SECTION (SCALE 1:100)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
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LEGEND:

COLOR CODING

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MMUP TYPICAL CROSS SECTION WITH TYPICAL UTILITY CORRIDOR

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Ministry of Municipality & Urban Planning
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Mohamed Abdah
Director of Transportation And Infrastructure Planning Department

Hassan Qasem, Mohamed Elidrisi
Mohab M. Zaki

Checked: Khalifa Buhazzaa

Approved by:

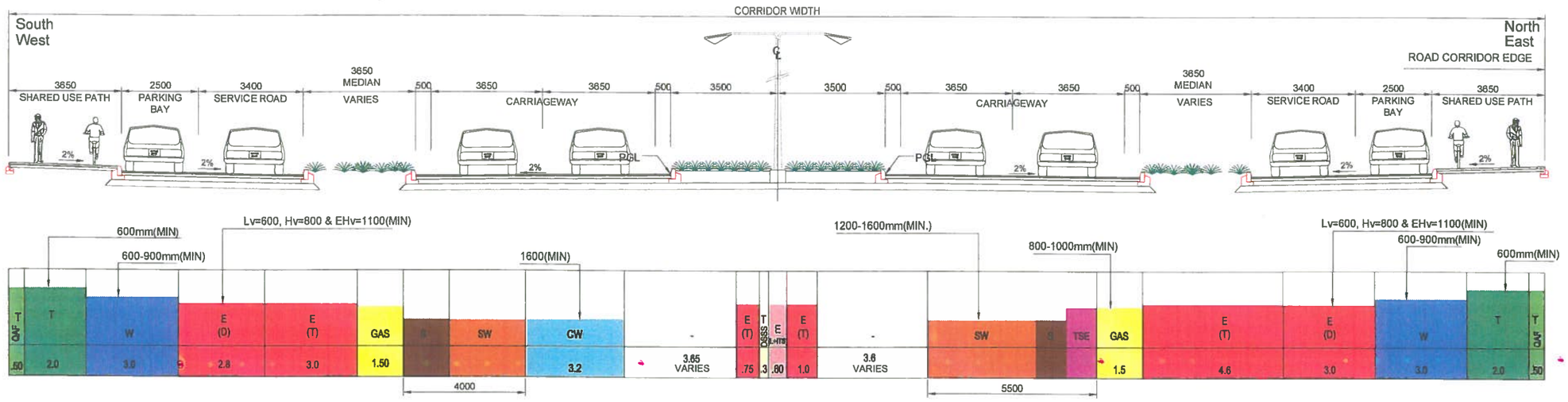
Date: January 2012

Dwg No. CS-U-40-002

Sheet No. 5 of 9

CAD Ref: P:\11 Drafting Works\MMUP DATABASE\ARCHIVE\MMUP STANDARD CROSS SECTIONS\Standard cross-section.dwg

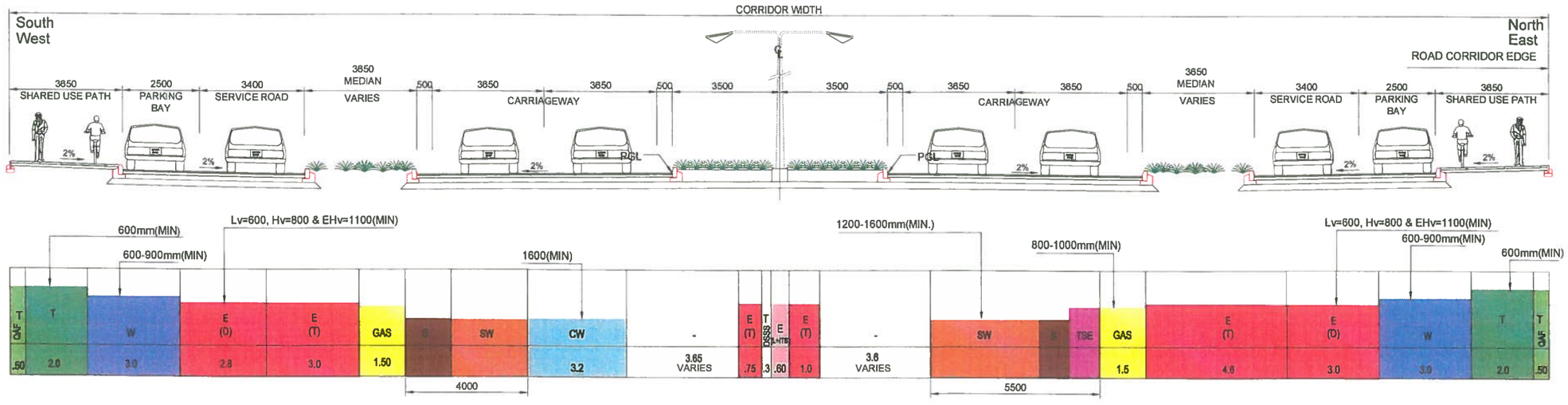
TYPICAL ROAD CROSS SECTION & UTILITY ALLOCATION FOR NEW URBAN ROADS



MAJOR URBAN COLLECTOR WITH SERVICE ROAD - 50m CORRIDOR (COMMERCIAL AND INDUSTRIAL)

TYPICAL CROSS SECTION

(SCALE 1:100)



MAJOR URBAN COLLECTOR WITH SERVICE ROAD - 50m CORRIDOR (RESIDENTIAL)

TYPICAL CROSS SECTION

(SCALE 1:100)

NOTES:

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LEGEND:

COLOR CODING

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Water

1. MINIMUM COVER FROM TOP TO FINISHED GROUND LEVEL=900mm.
2. MINIMUM COVER FROM TOP OF SERVICE CONNECTION/SERVICE DUCTS TO FINISHED GROUND LEVEL=600mm (SERVICE CONNECTIONS WILL CROSS OTHER UTILITY RESERVES.

Electricity

3. MINIMUM COVER FROM TOP OF CABLE Lv=600mm, Hv=800mm & EHv=1100mm

MMUP TYPICAL CROSS SECTION WITH TYPICAL UTILITY CORRIDOR

وزارة البلدية والتخطيط العمراني
قطاع التخطيط والتطوير العمراني
Ministry of Municipality & Urban Planning
Urban Planning & Development Sector

Mohamed Abdah
Director of Transportation And Infrastructure Planning Department

Hassan Qasem, Mohamed Elidrisi
Mohab M. Zaki

Checked: Khalifa Buhazzaa

Approved by:

Date: January 2012

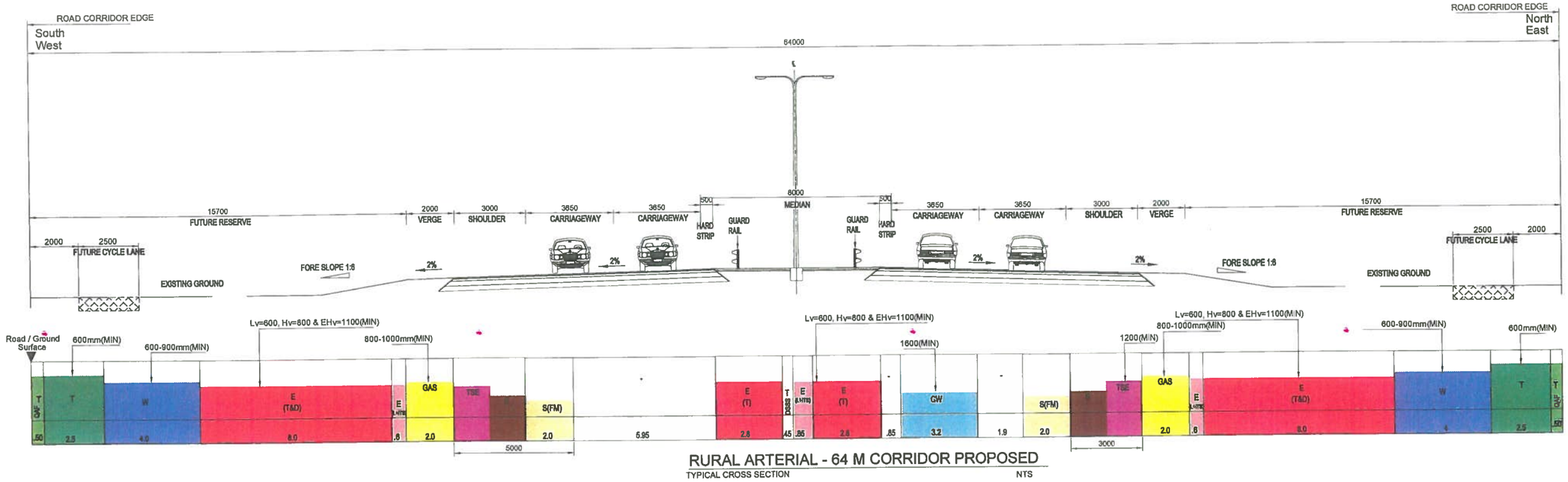
Dwg File: CS-U-50-002

Sheet No. 6 of 9

Ministry of Municipality & Urban Planning / Urban Planning & Development Sector /Hassan Qasem

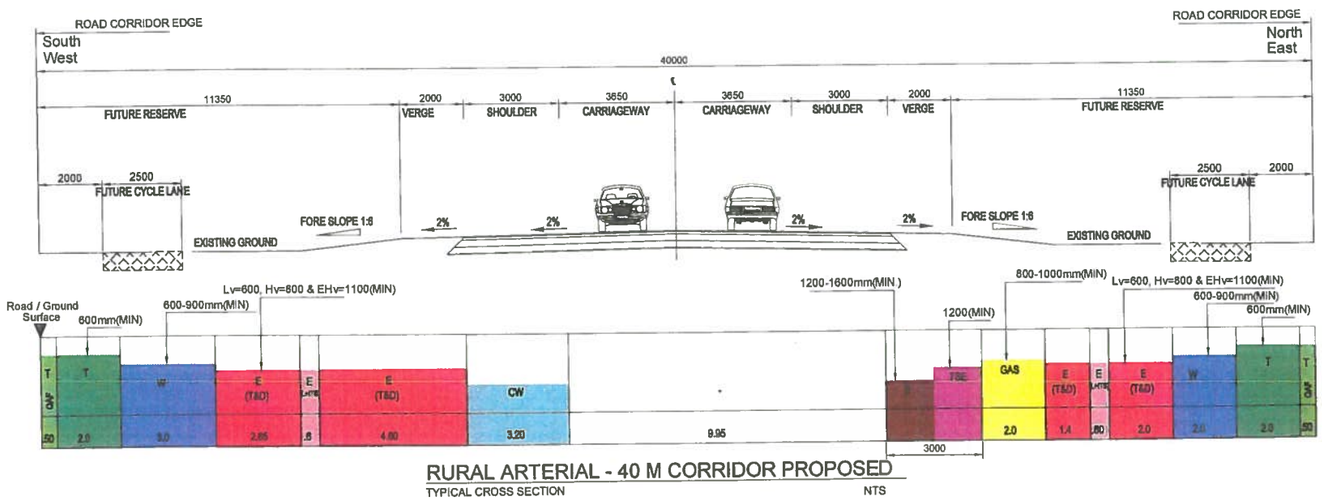
CAD Ref: P:\11 Drafting Works\MMUP DATABASE\ARCHIVE\MMUP STANDARD CROSS SECTIONS\Standard cross-section.dwg

TYPICAL ROAD CROSS SECTION & UTILITY ALLOCATION FOR NEW RURAL ROADS



RURAL ARTERIAL - 64 M CORRIDOR PROPOSED

TYPICAL CROSS SECTION NTS



RURAL ARTERIAL - 40 M CORRIDOR PROPOSED

TYPICAL CROSS SECTION NTS

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL VERTICAL DIMENSIONS GIVEN ARE MINIMUM FROM GROUND/SURFACE IN MILLIMETERS.
3. ALL HORIZONTAL DIMENSIONS SHOWN FOR UTILITY RESERVATIONS ARE IN METERS.
4. CROSS SECTIONS SHOWN ARE ONLY TO BE USED AS GUIDELINES AND MAY BE SUBJECT TO MODIFICATIONS FOR INDIVIDUAL PROJECTS AS REQUIRED WITH ENGINEER'S APPROVAL.
5. COORDINATION AND AGREEMENT IS REQUIRED WITH THE MINISTRY OF MUNICIPAL AND URBAN PLANNING PRIOR TO IMPLEMENTING THESE CROSS SECTIONS.

LEGEND:

COLOR CODING

- E (T) — ELECTRICITY (TRANSMISSION)
- E(D) — ELECTRICITY (DISTRIBUTION)
- E (L+ITS) — ELECTRICITY (Street Lighting + Intelligent Traffic System)
- T(QAF) — TELECOMMUNICATIONS (Qatar Armed Forces)
- T — TELECOMMUNICATIONS
- SEWERAGE
- SW — SURFACE WATER
- TSE — TREATED SEWERAGE EFFLUENT)
- W — WATER
- CW — CHILLED WATER
- DSSS — DOHA SURVEILLANCE SECURITY SYSTEM
- GAS — GAS
- S(FM) — SEWERAGE FORCE MAIN

Water

1. MINIMUM COVER FROM TOP TO FINISHED GROUND LEVEL=900mm.
2. MINIMUM COVER FROM TOP OF SERVICE CONNECTION/SERVICE DUCTS TO FINISHED GROUND LEVEL=600mm (SERVICE CONNECTIONS WILL CROSS OTHER UTILITY RESERVES.

Electricity

3. MINIMUM COVER FROM TOP OF CABLE Lv=600mm, Hv=800mm & EHv=1100mm

MMUP TYPICAL CROSS SECTION WITH TYPICAL UTILITY CORRIDOR

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Mohamed Abdah
Director of Transportation And Infrastructure Planning Department

Hassan Qasem, Mohamed Elidrisi
Mohab M. Zaki

Checked: Khalifa Buhazzaa

Approved by:

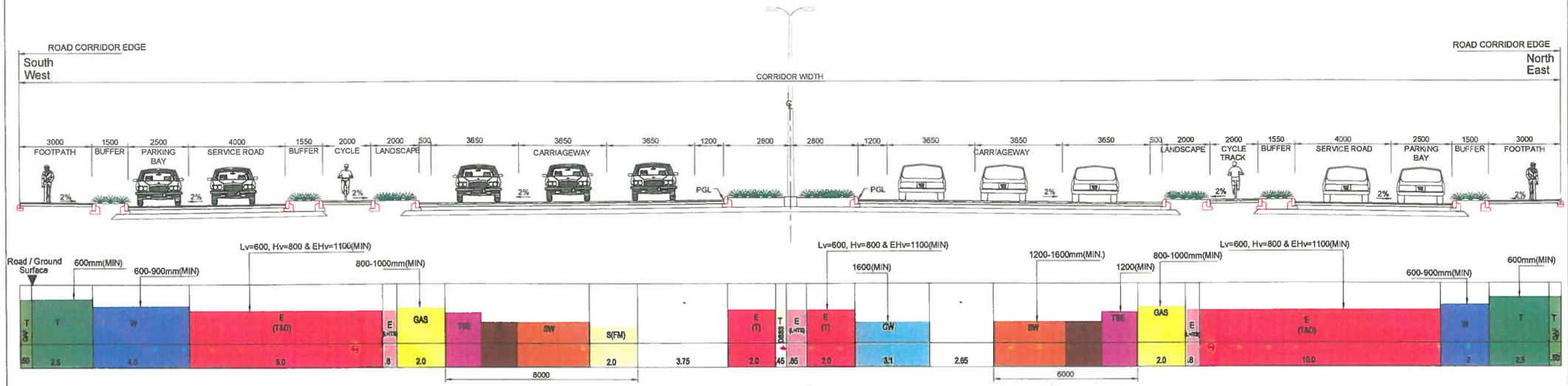
Date: January 2012

Dwg No: CS-R-40/64-002

Sheet No. 7 of 9

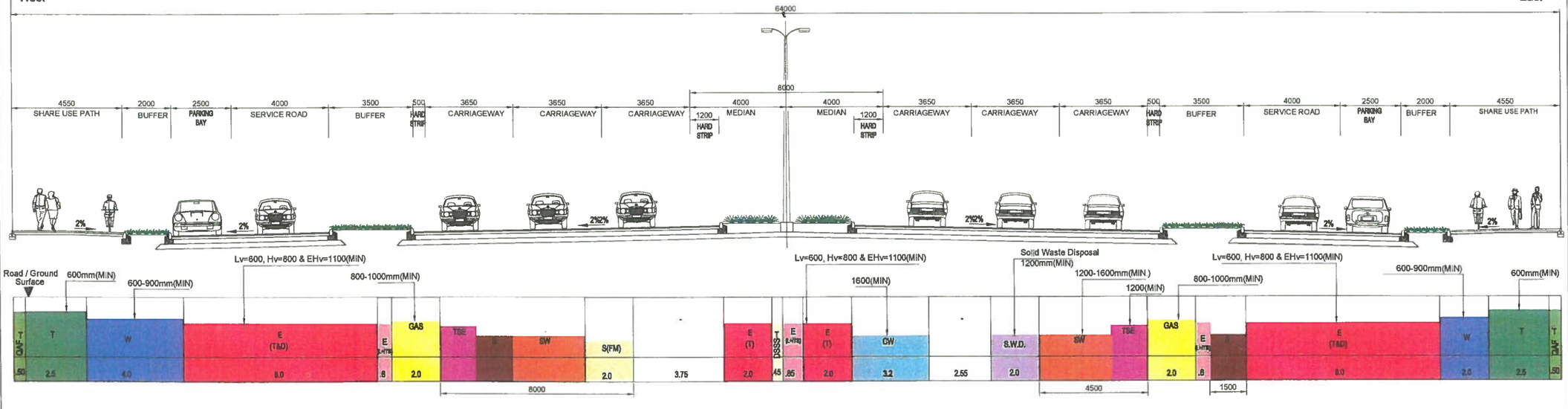
CAD Ref: P:\11 Drafting Works\MMUP DATABASE\ARCHIVE\MMUP STANDARD CROSS SECTIONS\Standard cross-section.dwg

TYPICAL ROAD CROSS SECTION & UTILITY ALLOCATION FOR NEW URBAN ROADS



URBAN ARTERIAL - 64m CORRIDOR (COMMERCIAL & INDUSTRIAL)

TYPICAL CROSS SECTION (SCALE 1:200)



URBAN ARTERIAL - 64m CORRIDOR (RESIDENTIAL)

TYPICAL CROSS SECTION (SCALE 1:200)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL VERTICAL DIMENSIONS GIVEN ARE MINIMUM FROM GROUND/SURFACE IN MILLIMETERS.
3. ALL HORIZONTAL DIMENSIONS SHOWN FOR UTILITY RESERVATIONS ARE IN METERS.
4. CROSS SECTIONS SHOWN ARE ONLY TO BE USED AS GUIDELINES AND MAY BE SUBJECT TO MODIFICATIONS FOR INDIVIDUAL PROJECTS AS REQUIRED WITH ENGINEER'S APPROVAL.
5. COORDINATION AND AGREEMENT IS REQUIRED WITH THE MINISTRY OF MUNICIPAL AND URBAN PLANNING PRIOR TO IMPLEMENTING THESE CROSS SECTIONS.

LEGEND:

COLOR CODING

- E (T) — ELECTRICITY (TRANSMISSION)
- E(D) — ELECTRICITY (DISTRIBUTION)
- E (L+ITS) — ELECTRICITY (Street Lighting + Intelligent Traffic System)
- T(QAF) — TELECOMMUNICATIONS (Qatar Armed Forces)
- T — TELECOMMUNICATIONS
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- TSE — TREATED SEWERAGE EFFLUENT)
- W — WATER
- CW — CHILLED WATER
- DSSS — DOHA SURVEILLANCE SECURITY SYSTEM
- GAS — GAS
- S(FM) — SEWERAGE FORCE MAIN

Water

1. MINIMUM COVER FROM TOP TO FINISHED GROUND LEVEL=900mm.
2. MINIMUM COVER FROM TOP OF SERVICE CONNECTION/SERVICE DUCTS TO FINISHED GROUND LEVEL=600mm (SERVICE CONNECTIONS WILL CROSS OTHER UTILITY RESERVES.

Electricity

3. MINIMUM COVER FROM TOP OF CABLE Lv=600mm, Hv=800mm & EHv=1100mm

MMUP TYPICAL CROSS SECTION WITH TYPICAL UTILITY CORRIDOR

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Mohab M. Zaki

Checked: Khalifa Buhazzaa

Approved by:

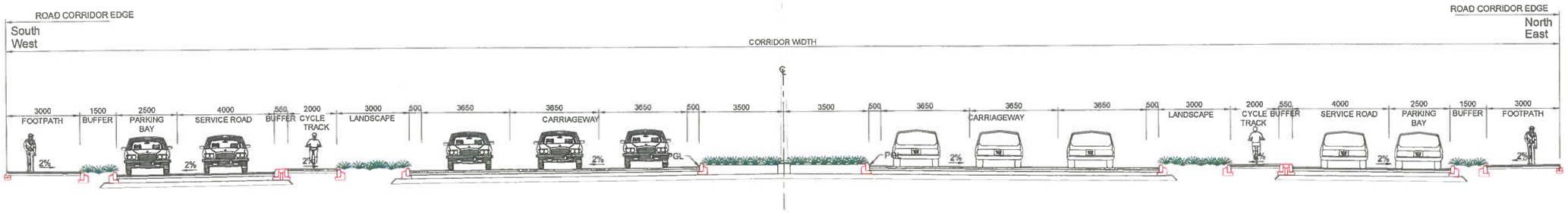
Date: January 2012

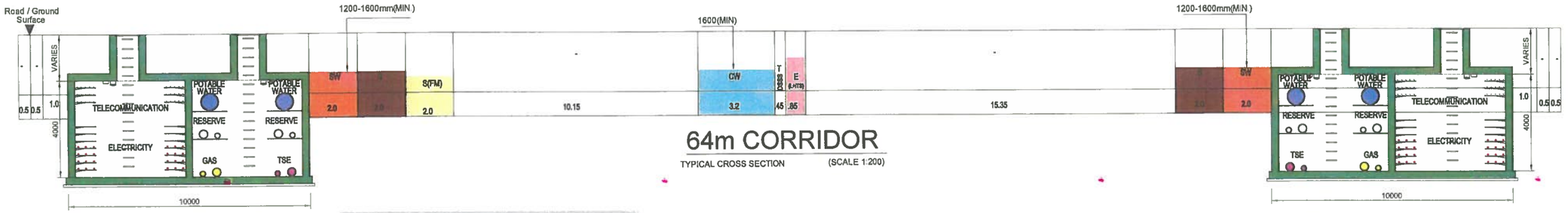
Dwg No: CS-U-64-003

Sheet No. 8 of 9

CAD Ref: P:\11 Drafting Works\MMUP DATABASE\ARCHIVE\MMUP STANDARD CROSS SECTIONS\Standard cross-section.dwg

TYPICAL ROAD CROSS SECTION & UTILITY ALLOCATION FOR NEW URBAN ROADS

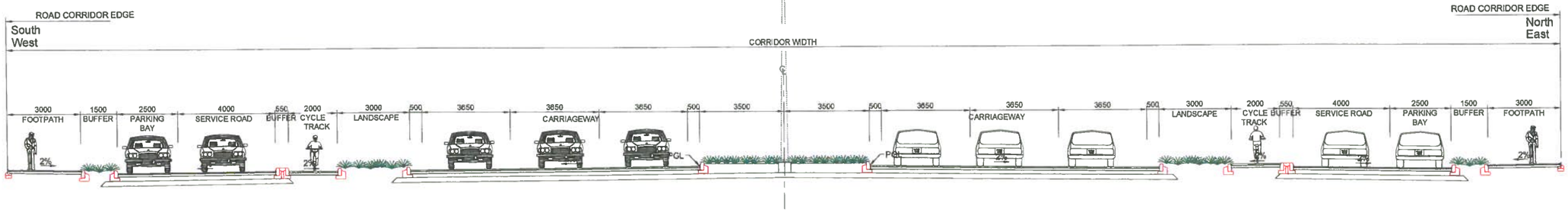


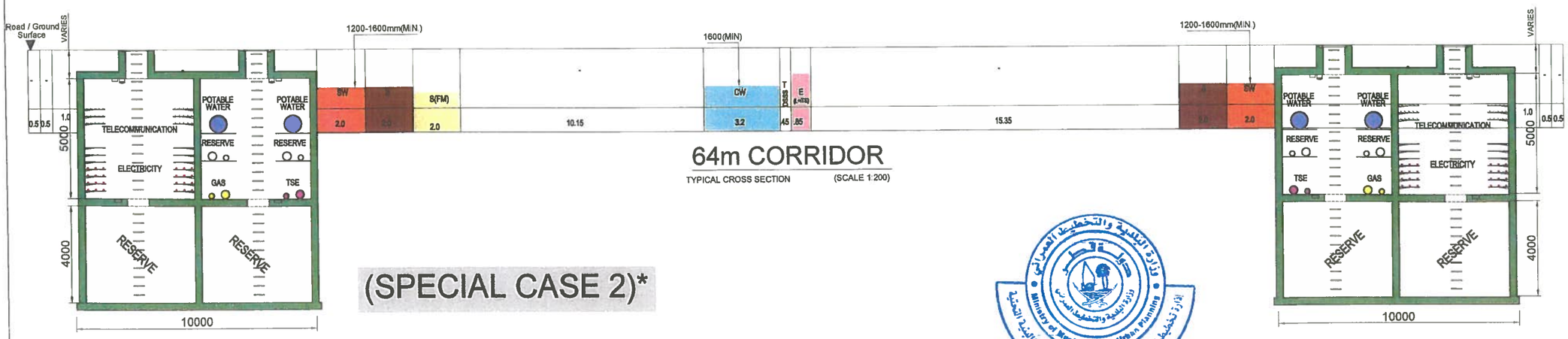


64m CORRIDOR

TYPICAL CROSS SECTION (SCALE 1:200)

(SPECIAL CASE 1)*





64m CORRIDOR

TYPICAL CROSS SECTION (SCALE 1:200)

(SPECIAL CASE 2)*

* GALLERY DIMENSIONS AND ARRANGEMENTS OF PIPES TO BE ADJUSTED AS REQUIRED

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NOTES:

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LEGEND:

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MMUP TYPICAL CROSS SECTION WITH TYPICAL UTILITY CORRIDOR

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Checked: Khalifa Buhazzaa

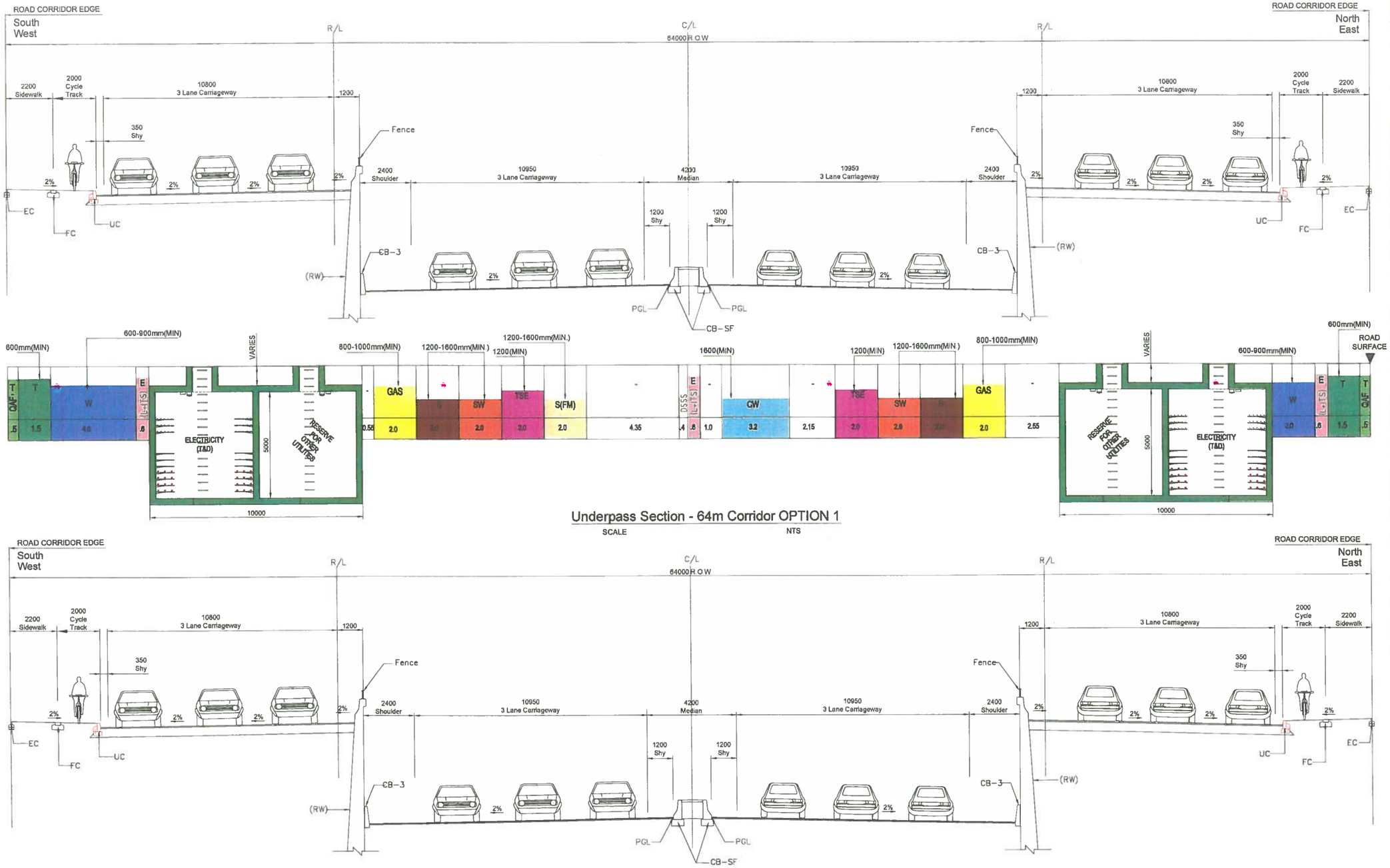
Approved by:

Date: January 2012

Dwg No: CS-U-64-003

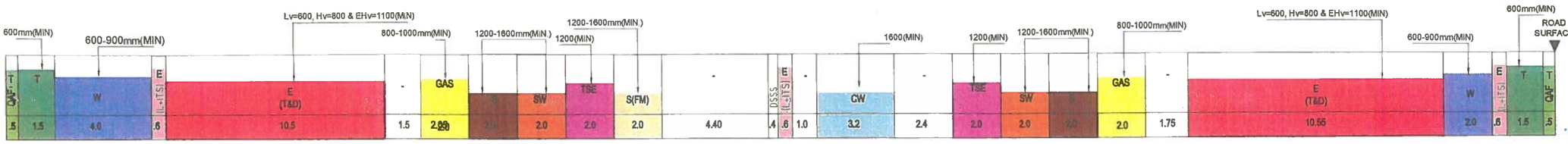
Sheet No. 9 of 9

SPECIAL CASE: 64m TYPICAL CROSS SECTION @ INTERSECTION



Underpass Section - 64m Corridor OPTION 1

SCALE NTS



Underpass Section - 64m Corridor OPTION 2

SCALE NTS

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NOTES:

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2. ALL VERTICAL DIMENSIONS GIVEN ARE MINIMUM FROM GROUND/SURFACE IN MILLIMETRES.

EXISITING ROAD:

FOR FUTURE IMPROVEMENTS, THAT INCLUDE MAINTENANCE, REDESIGN OF EXISTING ROADS, RELOCATION OF ANY EXISITING UTILITIES, OR ETC ..; THE NEW CROSS SECTIONS DETAILING THE UTILITY CORRIDORS SHALL BE COMPARED AGAINST. PRIOR TO ANY IMPROVEMENTS A WRITTEN REQUEST SHALL BE SUBMITTED TO THE CONCERNED UTILITY PROVIDER AND MMUP FOR APPROVAL. THE COST ASSOCIATED WITH THE IMPROVEMENTS WILL BE BURDEN OF THE CONCERNED AUTHORITY.

LEGEND:

COLOR CODING

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MMUP TYPICAL CROSS SECTION WITH TYPICAL UTILITY CORRIDOR

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Urban Planning & Development Sector

Mohamed Abdah
Director of Responsible and Infrastructure Planning Department
Hassan Qasem Mohamed Elidrisi
Checked: Khalifa Soumaya
January 2012
Drg No: USP-00-007
Sheet No. 1 of 3