

قطــر تسـتحــق الأفضــل Qatar Deserves The Best

Prepared for:

هيئة الأشغال العامة PUBLIC WORKS AUTHORITY

# **TECHNICAL BRIEFING NOTE**

## ITS Gantries Design Requirements 04 Nov 2015

Prepared by: Road Design Department



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### 1 OBJECTIVE

The objective of this technical memorandum is to provide interim, conceptual ITS gantry design examples. These design examples are intended to provide guidance for designers on how additional safety, maintainability, accessibility and constructability improvements may be achieved. It is expected that in line with these drawings formal standards will be updated in due course.

#### 2 BACKGROUND

The ITS program in Qatar is currently being implemented on over 30 expressways and some 200 additional local roads projects. The ability to inform the driving public about travel times, road conditions, speed limits and lane use, whilst they are using the road network requires the use of electronic signage.

Overhead installations (i.e. Gantries) are therefore a critical element in the ability to provide this level of driver information. Gantries therefore, through the provision of Dynamic Message Signs (DMS) and Lane Control Signs (LCS), are a critical infrastructure element required for the management of traffic incidents or events. The placement and type of Gantry has a direct impact on both message types and message view ability by drivers on the road network and therefore on choices that drivers make.

These gantry locations are therefore required to be carefully chosen to be able to disseminate information to drivers about current traffic conditions to allow them to make more informed decisions.

It is expected that LCS equipment will be installed at approximate 500 meter intervals on the main expressways (managed corridors), and each lane shall have a dedicated LCS. DMS will be installed on the nominated approaches and prior to main interchanges and intersections to advise of any issues ahead and to thereby assist the operators and motorists to re-route vehicles around any incidents.

The following list contains examples of ITS equipment that can be deployed on a gantry, (reducing the number of gantries is recommended to help reduce operation and maintenance complexity in the future):-

- DMS
- LCS
- License Plate Readers (LPR)
- Close Circuit Television (CCTV) (if agreed within the design review process)
- Vehicle Detection Equipment
- Other as agreed within the design review process

Due to spacing limitations it is expected to have static signs collocated on ITS gantries in key locations as agreed within the design review process, to only those locations where there is an approval to do so to deliver a final solution due to visual and spacing limitations. Any such approval shall be based on static sign approvals with Ashghal Signage department and joint reviews with ITS designers and contractors.

The following are some primary functional and non-functional requirements that need to be considered when including gantries as part of a wider design process:

- 1. Safety
  - a. Safety for the technicians and engineers;



- b. Improved safety and protection for the general public from (i.e. falling objects) and a reduction in accidents caused during temporary traffic management situations;
- c. Reduction across the entire roadway network in the use of MEWPS (Mobile Elevated Work Platform)/Hiabs/Attenuator Vehicles, etc., because of use of the man accessible structures.
- 2. Maintainability
  - a. Increased ease of access for maintenance activities;
  - b. Less time restraints for access to equipment given that the gantries will be man accessible, therefore leading to a more effective remediation of faults and or pro-active maintenance;
  - c. Minimal, if any requirement for additional Mobile Elevating Work Platform (MEWP)/Hiabs/attenuator vehicles, etc.;
  - d. Possibility of producing a more comprehensive proactive maintenance regimen, allowing more maintenance visits on a regular basis as no lane/road closures are required for this activity anymore (unless signs need replaced);
- 3. Network access and performance.
  - a. Significant reduction on road closures and associated road space bookings, and temporary traffic management, more importantly less disruption to drivers;
  - b. Minimal, if any requirement for additional MEWP/Hiabs/attenuator vehicles, etc.
- 4. Constructability
  - a. Dependent on the design approach agreed by Ashghal, these gantries can possibly accommodate the horizontal span in sections for ease of manufacturing and also potentially include a modular construction up to a maximum width of roadway. This will allow Ashghal to have a surplus stock of sections that just need to be bolted together after a gantry design has been prepared. Following this methodology will also allow the replacement of sections on a gantry that has at any point incurred an impact from an over height vehicle. The same principle can also be applied to the leg support uprights.
  - b. This type of gantry will allow the contractor to "fit out" the gantry off site, with the exception of ADS (Advanced Directional Sign) and top mounted SDMS (Small Dynamic Message Sign) & DMS. The advantage of this is that most of the equipment can be pretested prior to being transported to site. Once arriving on site the installation of the gantry and commissioning of ITS equipment would be significantly reduced. The ITS power and communication cabling and the equipment fit out would be complete on the gantry, therefore all that would be required is a final connection from the cable distribution boxes on the walkway to the GME (Ground Mounted Enclosure) and FP (Feeder Pillar).

Currently mono-tube non-man accessible gantries have been installed in Qatar for static signs and existing ITS systems. During maintenance it is required to partially/fully close off the road and this can be undertaken at off peak times and hence minimize disruption to traffic flow. Engineers and technicians must use MEWP/Hiabs/attenuator vehicles to access the equipment for maintenance. The gantries provide minimal safety considerations for engineers, technicians or general public.



It is not envisaged that non-man accessible gantries should be eliminated from being deployed in Qatar, but for the purpose of ITS deployment the man accessible gantries should be used where ever possible.

There are two main gantry categories man accessible and non-man accessible, the following is a comparison table between both types based on gantry design aspects stated earlier:

	Non-Man Accessible Gantry	Man Accessible Gantry
Safety	<ul> <li>Minimum safety provided for engineers, technicians and the general public;</li> <li>Lane(s) closure is required.</li> </ul>	<ul> <li>Safer for engineers, technicians and the general public;</li> <li>No lane(s) closure is required.</li> </ul>
Maintainability	<ul> <li>Lane(s) closure required;</li> <li>Additional MEWP/Hiabs/attenuator vehicles required.</li> </ul>	<ul> <li>Easier to access equipment;</li> <li>No lane(s) closure required;</li> <li>Reduce cost and time for regular Maintenance.</li> </ul>
Network access and Performance	<ul> <li>Lane(s) closure required;</li> <li>Additional MEWP/Hiabs/attenuator vehicles required.</li> </ul>	<ul> <li>Minimum lane(s) closure required.</li> </ul>
Constructability	<ul> <li>Testing is possible only after full gantry installation.</li> </ul>	<ul> <li>Allow for fitting equipment and test connections off-site</li> </ul>

#### 3 **RECOMMENDATIONS**

For the purpose of mounting safety supported electronic ITS equipment above the roadway, you are advised to follow the proposed man-accessible gantry structures as indicated in Appendix A.



### 4 APPENDIX A

#### CONCEPT GANTRY LAYOUTS

Drawing Number	Drawing Title	Rev.
01 of 10	MIDSPAN GANTRY LAYOUT - TYPE A	1.0
02 of 10	SUPERSPAN GANTRY LAYOUT - TYPE A	1.0
03 of 10	MIDSPAN GANTRY LAYOUT - TYPE B	1.0
04 of 10	SUPERSPAN GANTRY LAYOUT - TYPE B	1.0
05 of 10	MIDSPAN GANTRY LAYOUT - TYPE C	1.0
06 of 10	SUPERSPAN GANTRY LAYOUT - TYPE C	1.0
07 of 10	MIDSPAN GANTRY LAYOUT - TYPE D	1.0
08 of 10	SUPERSPAN GANTRY LAYOUT - TYPE D	1.0
09 of 10	MIDSPAN GANTRY LAYOUT - TYPE E	1.0
10 of 10	SUPERSPAN GANTRY LAYOUT - TYPE E	1.0



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	2. ALL LEVELS ARE IN METERS AND RELATED TO SITE DATUM
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	3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE
	SPELIFICATION AND ALL RELEVANT OVERSEEING ORGANIZATION'S DRAWINGS.
	4. ALL DIMENSIONS SHOWN ON THIS DRAFT SPECIMEN DRAWING ARE
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	5. SIGN SIZES, OVERHANGS AND FIXING DETAILS ARE TO BE CONFIDENT BY THE SIGN SUPPLIES PRIOR TO FARPLY ATIONS OF
	THE GANTRY.
	6. ALL EQUIPMENT INSTALLED ON THE STRUCTURE MUST BE EASILY
	ACCESSIBLE FROM THE CENTER WALKWAY.
	7. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR DESIGNING A
	RETRACTABLE FRAME MECHANISM THAT SHALL HAVE THE LCS AND LPR EQUIPMENT MOUNTED ON. THE FRAME MECHANISM SHALL
	ALLOW THE SIGN EQUIPMENT TO BE RETRACTED INTO THE STRUCTURE WALKWAY SO THAT THE FRONT DISPLAY CAN BE
	CLEANED AND MAINTAINED. THIS MECHANISM SHOULD
	INCORPORATE AN AUTOMATIC MECHANICAL MOVEMENT TO ENSURE THAT CORRECT CLOSURES ARE MAINTAINED.
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	9. THE WALKWAYS AND SIDE WALLS SHOULD BE OF THE SOLID
	DECKING OR OPEN MESH TYPE WHICH WILL PREVENT THE PASSING OF A BALL OF Smm IN DIAMETER
	10. THE STRUCTURAL ENGINEER SHALL DESIGN A LOCKABLE, SAFE ACCESS POINT TO ALLOW ANY ENGINEERS OR TECHNICIANS TO
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	ACCESS POINT TO ALLOW GAIN ACCESS TO THE LIFT WINCH. THIS ACCESS POIN STRUCTURES THAT HAVE THAT REQUIRE CATWALK	ANY ENGINEERS OR TECHNICIANS T ING MAST AND MANUALLY OPERAT T SHALL ALSO BE USED FOR ANY FRONT FASCIA MOUNTED STATIC S ACCESS FOR MAINTENANCE.	O C ED IGNS
	11. THE STRUCTURAL ENGINE THE MINIMUM CLEARANCE HARD-SHOULDER OR SHY, AND CABINETS IS ADHFRF	ER IS RESPONSIBLE FOR ENSURING DISTANCE FROM THE CARRIAGEWA , TO THE PROPOSED ITS STRUCTUR D TO AND DUE CONSIDERATION SHO	THAT Y, ES IULD
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	12. THE STRUCTURAL ENGINE THE LOCKABLE ACCESS L/ 500mm FROM THE FINISHEI	ER SHALL ENSURE THAT THE BASE ADDER SHALL NOT BE HIGHER THAN ) GROUND LEVEL.	OF D
	13. THE STRUCTURAL SUPPOR MAINTENANCE ACCESS TO AND HORIZONTAL BOX SE	RT FRAME MUST ALLOW FOR FULL THE REAR OF THE SIGN. THE VERT CTIONS MUST AT NO POINT IMPEDE	ICAL THE
	ACCESS REQUIREMENTS.		
	14. THE STRUCTURAL ENGINE INCLINATION ANGLES FOR	ER IS RESPONSIBLE FOR PROVIDING ALL SIGNAGE BASED ON ROAD PRO	FILE
	AND HIGHWAY ALIGNMENT STRUCTURAL SUPPORTS	FOR OPTIMUM VIEWABILITY. THE FOR ALL SIGNAGE MUST BE DESIGN	ED SO
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	4. ALL DIMENSIONS SHOWN ON T INDICATIVE AND EXACT DETAIL PROVIDED BY THE STRUCTUR DESIGN PROCESS. THE CONTRA DIMENSION FABRICATION FOR A	HIS DRAFT SPECIMEN DRAWING ARE LED DIMENSIONS SHOULD BE AL DESIGN ENGINEER DURING THE ACTOR IS TO PROVIDE FULL APPROVAL PRIOR TO ERECTION.				
	<ol> <li>SIGN SIZES, OVERHANGS AND CONFIRMED BY THE SIGN SUPP THE GANTRY.</li> </ol>	FIXING DETAILS ARE TO BE LIER PRIOR TO FABRICATIONS OF				
	6. ALL EQUIPMENT INSTALLED OF ACCESSIBLE FROM THE CENTER	N THE STRUCTURE MUST BE EASILY R WALKWAY.				
	7. THE STRUCTURAL ENGINEER IS RETRACTABLE FRAME MECHAN AND LOF EQUIPMENT HOUNTE! ALLOW THE SIGN EQUIPMENT STRUCTURE WALKWA'S OT H CLEANED AND MAINT AINED. TH INCORPORATE AN AUTOMATIC ENSURE THAT CORRECT CLOSS	RESPONSIBLE FOR DESIGNING A IISM THAT SHALL HAVE THE LCS 0 ON. THE FRAME MECHANDEN SHALL TO BE RETRACTED INTO THE AT THE FRONT DISPLAY CAN BE IIS MECHANDEN SHOULD MECHANICAL MOVEMENT TO NES ARE MANTAINED.				
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	11. THE STRUCTURAL ENGINEER IS THE MINIWU CLEARANCE DIST HARD-SHOULDER OR SHY, TO AND CABINETS IS ADHERED TO BE GIVEN TO INSTALLING A SA PROTECTION OF PROPOSED ITS PER QHDM.	RESPONSIBLE FOR ENSURING THAT ANCE FROM THE CARRIAGEWAY, THE PROPOSED ITS STRUCTURES AND DUE CONSIDERATION SHOULD FETY BARRIER SYSTEM FOR THE S STRUCTURES AND CABINETS AS				
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	NOTES:
	1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
	2. ALL LEVELS ARE IN METERS AND RELATED TO SITE DATUM UNLESS NOTED OTHERWISE.
	3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE
	SPECIFICATION AND ALL RELEVANT OVERSEEING ORGANIZATION'S DRAWINGS.
	4. ALL DIMENSIONS SHOWN ON THIS DRAFT SPECIMEN DRAWING ARE
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	DESIGN PROCESS. THE CONTRACTOR IS TO PROVIDE FULL DIMENSION FABRICATION FOR APPROVAL PRIOR TO FRECTION.
	5. SIGN SIZES, OVERHANGS AND FIXING DETAILS ARE TO BE
AND MANUALLY	CONFIRMED BY THE SIGN SUPPLIER PRIOR TO FABRICATIONS OF THE GANTRY.
CH	6. ALL EQUIPMENT INSTALLED ON THE STRUCTURE MUST BE EASILY
	ACCESSIBLE FROM THE CENTER WALKWAY.
	7. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR DESIGNING A
	AND LPR EQUIPMENT MOUNTED ON. THE FRAME MECHANISM SHALL
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	INCORPORATE AN AUTOMATIC MECHANICAL MOVEMENT TO
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	SUCH SUBMITTED VARIATION FROM THE CURRENT APPROVED
	OTHER SAMPLES) WILL REQUIRE DESIGNERS TO SEEK APPROVAL
	FUK SUCH VARIATION AS A DEPARTURE.
	9. THE WALKWAYS AND SIDE WALLS SHOULD BE OF THE SOLID DECKING OR OPEN MESH TYPE WHICH WILL PREVENT THE PASSING
	OF A BALL OF 5mm IN DIAMETER.
	10. THE STRUCTURAL ENGINEER SHALL DESIGN A LOCKABLE, SAFE ACCESS POINT TO ALLOW ANY ENGINEERS OR TECHNICIANS TO
	GAIN ACCESS TO THE LIFTING MAST AND MANUALLY OPERATED WINCH. THIS ACCESS POINT SHALL ALSO BE USED FOR ANY
	STRUCTURES THAT HAVE FRONT FASCIA MOUNTED STATIC SIGNS THAT REQUIRE CATWALK ACCESS FOR MAINTENANCE.
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	THE MINIMUM CLEARANCE DISTANCE FROM THE CARRIAGEWAY, HARD-SHOULDER OR SHY, TO THE PROPOSED ITS STRUCTURES
UTHERS	AND CABINETS IS ADHERED TO AND DUE CONSIDERATION SHOULD BE GIVEN TO INSTALLING A SAFETY BARRIER SYSTEM FOR THE
	PROTECTION OF PROPOSED ITS STRUCTURES AND CABINETS AS PER OHDM
	12. THE STRUCTURAL ENGINEER SHALL ENSURE THAT THE BASE OF
	THE LOCKABLE ACCESS LADDER SHALL NOT BE HIGHER THAN 500mm EROM THE FINISHED GROUND LEVEL
	MAINTENANCE ACCESS TO THE REAR OF THE SIGN. THE VERTICAL
	ACCESS REQUIREMENTS.
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	AND HIGH WAY ALIGNMENT FOR OPTIMUM VIEWABILITY. THE
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ADDER	Design Consultant : GANNETT FLEMING WLL Project Name: INTELLIGENT TRANSPORTATION SYSTEM ITS DEVICE DETAILS Project Code: Status: DRAFT SPECIMEN Drawing Title: CONCEPT GANTRY LAYOUTS NOT TO BE USED FOR CONSTRUCTION
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	1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
	2. ALL LEVELS ARE IN METERS AND RELATED TO SITE DATUM UNLESS NOTED OTHERWISE.
	3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL RELEVANT OVERSEEING ORGANIZATION'S DRAWINGS.
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	6. ALL EQUIPMENT INSTALLED ON THE STRUCTURE MUST BE EASILY - ACCESSIBLE FROM THE CENTER WALKWAY.
	7. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR DESIGNING A RETRACTABLE FRAME MECHANISM THAT SHALL HAVE THE LCS AND LPR EQUIPMENT HONTED ON THE FRAME MECHANISM SHALL ALLOW THE SIGN EQUIPMENT TO BE RETRACTED INTO THE STRUCTURE WALKWAY SO THAT THE FRONT DISPLAY CAN BE CLEANED AND MAINTAINED. THIS MECHANISM SHOULD INCORPORATE AN AUTOMATIC MECHANICAL MOVEMENT TO ENSURE THAT CORRECT CLOSURES ARE MAINTAINED.
ST AND MANUALLY WINCH	8. THIS REPRESENTATIVE STRUCTURE LAYOUT IS INDICATIVE ONLY AND ILLUSTRATES CURRENCY IN STRUCTURE GANTRY DESIGN ATTRIBUTES, STRUCTURE DESIGNERS ARE ADVISED THAT ANY SUCH SUBMITTED VARIATION FROM THE CURRENT APROVED STANDARDS ON STRUCTURE DESIGN, INCLUDING THESE OR ANY OTHER SAMPLES] WILL REQUIRE DESIGNERS TO SEEK APPROVAL FOR SUCH VARIATION AS A DEPARTURE.
	9. THE WALKWAYS AND SIDE WALLS SHOULD BE OF THE SOLID DECKING OR OPEN MESH TYPE WHICH WILL PREVENT THE PASSING OF A BALL OF 5mm IN DIAMETER.
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THERS	12. THE STRUCTURAL ENGINEER SHALL ENSURE THAT THE BASE OF THE LOCKABLE ACCESS LADDER SHALL NOT BE HIGHER THAN 500mm FROM THE FINISHED GROUND LEVEL.
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	Design Consultant : GANNETT FLEMING WLL
<u>on</u>	Project Name: INTELLIGENT TRANSPORTATION SYSTEM ITS DEVICE DETAILS
	Project Code:
	Status: DRAFT SPECIMEN
	CONCEPT GANTRY LAYOUTS
	NOT TO BE USED FOR CONSTRUCTION
	SUPERSPAN GANTRY LAYOUT - TYPE C
	Drawn: JSG Checked: GRS Designed: N/A Approved: DD
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	DESIGN PROCESS. THE CONTRACTOR IS TO PROVIDE FULL
	5. SIGN SIZES, OVERTANDS AND FIXING DETAILS ARE TO BE CONFIRMED BY THE SIGN SUPPLIER PRIOR TO FABRICATIONS OF
	<ol> <li>ALL EQUIPMENT INSTALLED ON THE STRUCTURE MUST BE EASILY – ACCESSIBLE FROM THE CENTER WALKWAY.</li> </ol>
	7. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR DESIGNING A
<b></b>	RETRACTABLE FRAME MECHANISM THAT SHALL HAVE THE LCS AND LPR EQUIPMENT MOUNTED ON. THE FRAME MECHANISM SHALL
U MANUALLY	ALLOW THE SIGN EQUIPMENT TO BE RETRACTED INTO THE STRUCTURE WALKWAY SO THAT THE FRONT DISPLAY CAN BE
	CLEANED AND MAINTAINED. THIS MECHANISM SHOULD
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	NOTES:		
	1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.		
	2. ALL LEVELS ARE IN METERS AND RELATED TO SITE DATUM		
	UNLESS NUTED OTHERWISE.		
	3. THIS UKAWING IS TO BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL RELEVANT OVERSEEING ORGANIZATION'S DDALINGS		
	4. ALL DIMENSIONS SHOWN ON THIS DRAFT SPECIMEN DRAWING ARE INDICATIVE AND EXACT DETAILED DIMENSIONS SHOULD BE	A	
WINCH	PROVIDED BY THE STRUCTURAL DESIGN ENGINEER DURING THE DESIGN PROCESS. THE CONTRACTOR IS TO PROVIDE FULL		
	DIMENSION FABRICATION FOR APPROVAL PRIOR TO ERECTION.		
	5. SIGN SIZES, OVERHANGS AND FIXING DETAILS ARE TO BE CONFIRMED BY THE SIGN SUPPLIER PRIOR TO FABRICATIONS OF		
	THE GANTRY.		
	<ol> <li>ALL EQUIPMENT INSTALLED ON THE STRUCTURE MUST BE EASILY ACCESSIBLE FROM THE CENTER WALKWAY.</li> </ol>		
	7. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR DESIGNING A		
	RETRACTABLE FRAME MECHANISM THAT SHALL HAVE THE LCS AND LPR EQUIPMENT MOUNTED ON. THE FRAME MECHANISM SHALL		
	ALLOW THE SIGN EQUIPMENT TO BE RETRACTED INTO THE STRUCTURE WALKWAY SO THAT THE FRONT DISPLAY CAN BE		
	CLEANED AND MAINTAINED. THIS MECHANISM SHOULD INCORPORATE AN AUTOMATIC MECHANICAL MOVEMENT TO	В	
	ENSURE THAT CORRECT CLOSURES ARE MAINTAINED.		
	8. THIS REPRESENTATIVE STRUCTURE LAYOUT IS INDICATIVE ONLY AND ILLUSTRATES CURRENCY IN STRUCTURE GANTRY DESIGN		
	ATTRIBUTES. STRUCTURE DESIGNERS ARE ADVISED THAT ANY SUCH SUBMITTED VARIATION FROM THE CURRENT APPROVED		
	STANDARDS ON STRUCTURE DESIGN, (INCLUDING THESE OR ANY OTHER SAMPLES) WILL REQUIRE DESIGNERS TO SEEK APPROVAL		
	FOR SUCH VARIATION AS A DEPARTURE.		
	9. THE WALKWAYS AND SIDE WALLS SHOULD BE OF THE SOLID DECKING OR OPEN MESH TYPE WHICH WILL PREVENT THE PASSING		
	OF A BALL OF 5mm IN DIAMETER.		
	10. THE STRUCTURAL ENGINEER SHALL DESIGN A LOCKABLE, SAFE ACCESS POINT TO ALLOW ANY ENGINEERS OR TECHNICIANS TO	С	
	GAIN ACCESS TO THE LIFTING MAST AND MANUALLY OPERATED WINCH. THIS ACCESS POINT SHALL ALSO BE USED FOR ANY		
BY OTHERS	STRUCTURES THAT HAVE FRONT FASCIA MOUNTED STATIC SIGNS THAT REQUIRE CATWALK ACCESS FOR MAINTFNANCE		
	11. THE STRUCTURAL ENGINEER IS RESPONSIBILE FOR ENGLIDING THAT		
	THE MINIMUM CLEARANCE DISTANCE FROM THE CARRIAGEWAY, HARD-SHOULDED OF SHY TO THE PROPOSED ITS STRUCTURES		
	AND CABINETS IS ADHERED TO AND DUE CONSIDERATION SHOULD BE GIVEN TO INSTALLING A SAFETY BADDIED SYSTEM FOR THE		
	PROTECTION OF PROPOSED ITS STRUCTURES AND CABINETS AS		
	12. THE STRUCTURAL ENGINEER SHALL ENSURE THAT THE BASE OF THE LOCKABLE ACCESS LADDED SHALL NOT BE HIGHED THAN		
	THE EUCRADEE ACCESS EADDER SHALE NOT BE HIGHER THAN	D	
	500mm FROM THE FINISHED GROUND LEVEL.	D	
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	1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.	l
	2. ALL LEVELS ARE IN METERS AND RELATED TO SITE DATUM UNLESS NOTED OTHERWISE.	l
	3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL RELEVANT OVERSEEING ORGANIZATION'S DRAWINGS.	
	4. ALL DIMENSIONS SHOWN ON THIS DRAFT SPECIMEN DRAWING ARE INDICATIVE AND EXACT DETAILED DIMENSIONS SHOULD BE PROVIDED BY THE STRUCTURAL DESIGN ENGINEER DURING THE DESIGN PROCESS. THE CONTRACTOR IS TO PROVDE FULL DIMENSION FABRICATION FOR APPROVAL PRIOR TO ERECTION.	Δ
	5. SIGN SIZES, OVERHANGS AND FIXING DETAILS ARE TO BE CONFIRMED BY THE SIGN SUPPLIER PRIOR TO FABRICATIONS OF THE GANTRY.	
	6. ALL EQUIPMENT INSTALLED ON THE STRUCTURE MUST BE EASILY ACCESSIBLE FROM THE CENTER WALKWAY.	-
	7. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR DESIGNING A RETRACTABLE FRAME MECHANISM THAT SHALL HAVE THE LCS AND LPR EQUIPMENT MOUNTED ON. THE FRAME MECHANISM SHALL ALLOW THE SIGN EQUIPMENT TO BE RETRACTED INTO THE STRUCTURE WALKWAY SO THAT THE FRONT DISPLAY CAN BE CLEANED AND MAINTAINED. THIS MECHANISM SHOULD INCORPORATE AN AUTOMATIC MECHANICAL MOVEMENT TO	в
	ENSURE THAT CORRECT CLOSURES ARE MAINTAINED.	
LIFTING MAST AND MANUALLY OPERATED WINCH	8. THIS REPRESENT AT IVE STRUCT UNEL LATUUT IS INDICATIVE UNET AND ILLUSTRATES CURRENCY IN STRUCTURE GARTRY DESIGN ATTRIBUTES. STRUCTURE DESIGNERS ARE ADVISED THAT ANY SUCH SUBHITTED VARIATION FROM THE CURRENT APPROVED STANDARDS ON STRUCTURE DESIGN, (INCLUDING THESE OR ANY OTHER SAMPLES) WILL REQUIRE DESIGNERS TO SEEK APPROVAL FOR SUCH VARIATION AS A DEPARTURE.	_
	9. THE WALKWAYS AND SIDE WALLS SHOULD BE OF THE SOLID DECKING OR OPEN MESH TYPE WHICH WILL PREVENT THE PASSING OF A BALL OF 5mm IN DIAMETER.	
— WEALINER TIERU	10. THE STRUCTURAL ENGINEER SHALL DESIGN A LOCKABLE, SAFE ACCESS POINT TO ALLOW ANY ENGINEERS OR TECHNICIANS TO GAIN ACCESS TO THE LIFTING MAST AND MANUALLY OPERATED WINCH. THIS ACCESS POINT SHALL ALSO BE USED FOR ANY STRUCTURES THAT HAVE FRONT FASCIA MOUNTED STATIC SIGNS THAT REQUIRE CATWALK ACCESS FOR MAINTENANCE.	С
INDATION BY OTHERS	11. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR ENSURING THAT THE MINIMUM CLEARANCE DISTANCE FROM THE CARRIAGEWAY, HARD-SHOULDER OR SHY, TO THE PROPOSED ITS STRUCTURES AND CABINETS IS ADHERED TO AND DUE CONSIDERATION SHOULD BE GIVEN TO INSTALLING A SAFETY BARRIER SYSTEM FOR THE PROTECTION OF PROPOSED ITS STRUCTURES AND CABINETS AS PER QHDM.	_
/	12. THE STRUCTURAL ENGINEER SHALL ENSURE THAT THE BASE OF THE LOCKABLE ACCESS LADDER SHALL NOT BE HIGHER THAN 500mm FROM THE FINISHED GROUND LEVEL.	C
	13. THE STRUCTURAL SUPPORT FRAME MUST ALLOW FOR FULL MAINTENANCE ACCESS TO THE REAR OF THE SIGN. THE VERTICAL AND HORIZONTAL BOX SECTIONS MUST AT NO POINT IMPEDE THE ACCESS REQUIREMENTS.	
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SEE NOTE 10	14. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR PROVIDING THE INCLINATION ANGLES FOR ALL SIGNAGE BASED ON ROAD PROPILE AND HIGHWAY ALGMENT FOR OPTIMUM VIEWABLITY. THE STRUCTURAL SUPPORTS FOR ALL SIGNAGE MUST BE DESIGNED SO THAT THESE INCLINATION ANGLES CAN BE ACHIEVED.         LEGEND       VRS - VEHICLE RESTRAINT SYSTEM         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         1a       Date       Revision Details       Drawn       Chied Appl.         4	
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SEE NOTE 10	14. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR PROVIDING THE NICLINATION ANGLES FOR ALL SIGNAGE BASED ON ROAD PROPILE AND INGINAL SUPPORTS FOR ALL SIGNAGE MUST BE DESIGNED SO THAT THESE INCLINATION ANGLES CAN BE ACHIEVED.         LEGEND       VRS - VEHICLE RESTRAINT SYSTEM         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         1a       Date       Revision Details       Down       Cited Appd.       Appd.         1a       Date       Revision Details       Down       Cited Appd.         2	
SEE NOTE 10	14. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR PROVIDING THE INCLINATION ANGLES FOR ALL SIGNAGE BASED ON ROAD PROPILE AND HIGHWAY ALGOMENT FOR OPTIMUM VIEWABLITY. THE STRUCTURAL SUPPORTS FOR ALL SIGNAGE MUST BE DESIGNED SO THAT THESE INCLINATION ANGLES CAN BE ACHIEVED.         LEGEND       VRS - VEHICLE RESTRAINT SYSTEM         1a       OCT 2015       ISSUED FOR APPROVAL       JSG       GS       PR         vRS - VEHICLE RESTRAINT SYSTEM         1a       OCT 2015       Revision Details       Drawn       Clated       Apped.         aotall JLbill a Jgs       PROVIDENT FOR APPROVAL       JSG       GS       PR         Public Works Authority       Public Works Authority       Project Management Consultant :       Outer Deserves The Best         VO.BOX: 22188       Tel.: 00974 44950000       Fax: 00974 44950000       Vara Deserves The Best       Www.ashghal.gov.qa         Project Management Consultant :       GANNETT FLEMING WLL       Veriden Deserves The Best       Www.ashghal.gov.qa         INFRASTRUCTURE AFFAIRS       Project Mame:       INTELLIGENT TRANSPORTATION SYSTEM         ITS DEVICE DETAILS       Project Code:       Status:       DRAFT SPECIMEN         Drawing Title:       CONCEPT GANTRY LAYOUTS       NOT TO BE USED FOR CONSTRUCTION         Status:       DRAFT SPECIMEN       Drawing Title:         CONCEPT GANTRY LAYOUT - TYPE E	
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