1. GENERAL NOTES

1a ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS AND COORDINATES ARE IN METERS UNLESS NOTED OTHERWISE.

1b IN CASE OF CONFLICT BETWEEN THIS DRAWING AND ANY SPECIFIC DESIGN DRAWING, DESIGN DRAWING SHALL GOVERN.

1c THE FABRICATION & ERECTION HAVE TO BE EXECUTED ACCORDING TO EN 1090-2. EXECUTION CLASS FOR MAIN FRAMES, COLUMNS, BEAMS & BASE PLATES SHALL BE EXC3. & FOR ALL OTHER SECONDARY MEMBERS EXECUTION CLASS SHALL BE MINIMUM EXC2.

1d THE STEEL USED FOR CONSTRUCTION SHALL BE OF WELDABLE QUALITY.

2. MATERIAL

2a ALL STRUCTURAL STEEL SHALL CONFORM TO MINIMUM GRADE S235JR & S355J2. AS PER EN 10025 OR EQUIVALENT & MEET THE FOLLOWING REQUIREMENTS:

STEEL GRADE		THICKNESS t (mm)	MIN. YIELD STRENGTH fy (N/mm^2)	TENSILE STRENGTH fu (N/mm^2)
EN 10025	S 235	$t \le 16$	235	360
		$16 < t \le 40$	225	
		$40 < t \le 100$	215	
	S 275	$t \le 16$	275	410
		$16 < t \le 40$	265	
		$40 < t \le 63$	255	
		$63 < t \le 80$	245	
	S 355	$t \le 16$	355	470
		$16 < t \le 40$	345	
		$40 < t \le 100$	335	

FINAL STEEL QUALITY SHALL BE FIXED ACCORDING TO EN 1993-1-10 (TABLE 2.1), DEPENDING ON THE MINIMUM TEMPERATURE THE STRUCTURE SHALL EXPERIENCE TO AVOID BRITTLE FRACTURE.

2b ALL SECTIONS, DIMENSIONS AS PER EURO NORM 53-62 AND/OR EURO NORM 19-57 RESPECTIVELY. HOLLOW SECTIONS SHALL BE AS PER EN 10210-2 (HOT FABRICATED).

2c STRUCTURAL BOLTS SHALL BE HIGH STRENGTH BOLTS OF MINIMUM GRADE 8.8 (MINIMUM YIELD STRENGTH 640N/mm^2) WITH CORRESPONDING NUTS & WASHERS.
FOR SECONDARY STEEL (LIKE STAIRS, WALKWAY, RUNNERS, PURLINS ETC) MINIMUM BOLT GRADE SHALL BE 4.6 OR EQUIVALENT.

2d ALL ANCHOR BOLTS SHALL BE MINIMUM GRADE 8.8 (MINIMUM YIELD STRENGTH 640N/mm^2) AS MENTIONED IN CORRESPONDING DESIGN DRG. WITH CORRESPONDING NUTS AND WASHERS.

2e COLUMNS OF MINOR STRUCTURES SHALL BE FIXED WITH HILTI OR EQUIVALENT ANCHOR FASTNERS AS SPECIFIED IN RELEVANT DRAWINGS. ALL ANCHORS IN CONCRETE AND MASONARY SHALL BE HEAVY DUTY ANCHORS AND SHALL COMPLY WITH THE MANUFACTURERS WRITTEN RECOMMENDATIONS.

2f ALL CHEQUERED PLATE , BOLTS, NUTS & WASHERS SHALL BE HOT DIP GALVANISED. EXPOSED PARTS OF ANCHOR BOLTS SHALL BE TEMPORARILY PROTECTED AGAINST CORROSION BY SUITABLE MEANS.

3. CONNECTIONS

3a ALL FABRICATION SHALL BE DONE IN ACCORDANCE WITH EN1993-1-8:2005.

3b ALL SHOP CONNECTIONS SHALL BE WELDED CONNECTIONS AND ALL SITE CONNECTIONS SHALL BE BOLTED UNO.

3c ALL SHOP SPLICING SHALL BE DONE WITH FULL STRENGTH BUTT WELD.

3d MINIMUM TWO BOLTS OF M16 SHALL BE USED FOR ALL BEAM END CONNECTIONS. EXCEPT WHERE SPECIFIED IN CONNECTION FORCES REPORT.

3e ALL GUSSETS AND CONNECTING ANGLES SHALL BE MINIMUM 8MM THK.

3f ALL CONNECTIONS FOR MAIN MEMBERS SHALL BE DESIGNED SLIP CRITICAL. FOR SECONDARY STEEL BEARING TYPE CONNECTIONS MAY BE USED.

3g FOR OUTDOOR STEEL (EXPOSED TO ENVIRONMENT) IF THE BEAM ORIENTATION IS SUCH THAT THERE IS A RISK OF WATER ACCUMULATION WITHIN THE BEAM, SUITABLE DRAIN HOLES SHALL BE PROVIDED IN BEAM. DETAILS OF SUCH HOLES (MINIMUM DIAMETER: 30MM) TO BE DECIDED BY CONTRACTOR.

3h IN ALL CASES UNTHREADED PORTION OF BOLTS SHOULD BEAR ON MEMBERS CONNECTED. MINIMUM ONE THREAD SHOULD BE PROJECTING OUT OF NUT AFTER INSTALLATION UNO.

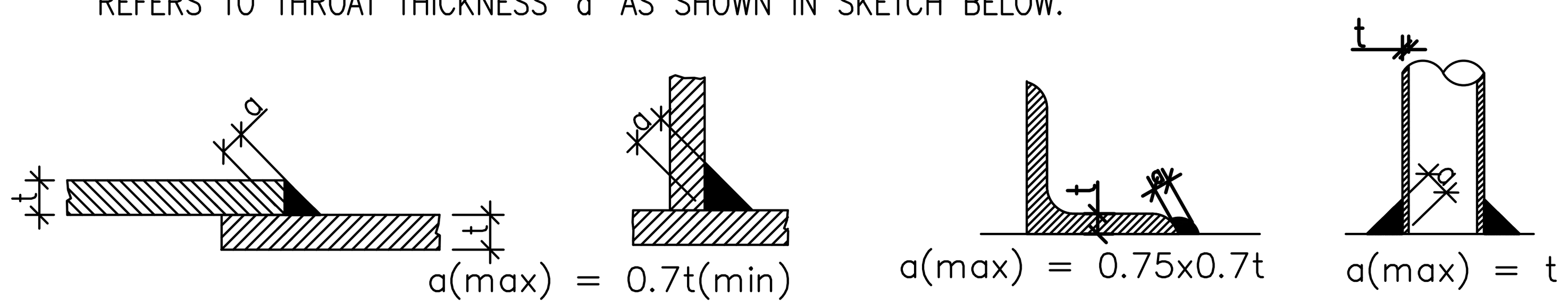
3i BOLTS OF GRADE 8.8 OR HIGHER INCLUDING ANCHOR BOLTS MUST NOT BE WELDED.

4. WELDING

ALL WELD SYMBOLS SHALL BE AS PER EN 2553 OR EQUIVALENT.

4a MINIMUM SIZE OF FILLET WELD SHALL BE a = 4mm UNO. SIZE OF WELD

4b REFERS TO THROAT THICKNESS 'a' AS SHOWN IN SKETCH BELOW.



ALL FILLET WELDS SHALL BE CONTINUOUS UNLESS NOTED OTHERWISE.

4c WHERE WELDED PROFILES ARE NECESSARY, ALL WELDS CONNECTING WEB

4d WITH FLANGE SHALL BE CONTINUOUS.

4e THE SPECIFIED YIELD STRENGTH, ULTIMATE TENSILE STRENGTH, ELONGATION AT FAILURE AND MINIMUM CHARPY V-NOTCH ENERGY VALUE OF THE FILLER METAL, SHOULD BE EQUIVALENT TO, OR BETTER THAN THAT SPECIFIED FOR THE PARENT MATERIAL.

4f THE WELD QUALITY CONTROL AND TESTING PROCEDURE (ULTRASONIC, RADIOGRAPHIC, MAGNETIC OR VISUAL) SHALL BE AS PER EN ISO 25817. FOR FATIGUE LOADED STRUCTURES (eg. CRANE GIRDER) QUALITY LEVEL OF WELDS SHALL BE AS PER EN1993-1-9 AND EN1090-2.

4g ALL BUTT WELDS SHOWN IN DRAWING SHALL BE FULL STRENGTH BUTT WELDS (CJP). WELD SURFACE PREPARTION SHALL BE AS PER EN ISO 9692 TO ACHIEVE FULL STRENGTH.

5. GRATING

5a ALL GRATINGS SHALL BE MIN 40mm THICK & HOT DIP GALVANIZED UNO UNLESS NOTED OTHERWISE ON DRAWINGS.

5b 100mm HIGH KICK PLATE (8mmTHK) ABOVE GRATING SHALL BE PROVIDED ADJACENT TO HANDRAIL AND AT ALL EDGES OF GRATING INCLUDING AROUND CUTOUTS AND AT ALL EDGES WHERE HANDRAIL IS NOT SHOWN IN PLAN AND UNDER THE FIRST STEP OF AN OPEN RISER STAIR STARTING FROM AN ELEVATED POSITION.

5c FLOOR GRATING SHOULD BE CUT & NEATLY FITTED AROUND COLUMNS AND OTHER PENETRATIONS. HOWEVER CUTTING OF GRATING BY MEANS OF OXYACETYLENE BURNERS IS NOT ALLOWED.

5d GRATING SPAN SHALL BE MAXIMUM 1500MM. GRATING SHALL BE SELECTED SO THAT MAX DEFLECTION DOES NOT EXCEED SPAN/200 OR 4 MM UNDER DESIGN VALUE OF UNIFORMLY DISTRIBUTED LOAD OF 5 kN/m2 OR UNDER A CONCENTRATED LOAD OF 1.5 kN SPREAD OVER AN AREA OF 200 x 200mm.

5e THICKNESS & SPACING OF BEARING BARS MAY BE DECIDED BY FULLFILLING THE REQUIREMENT OF SENTENCE ABOVE . HOWEVER FOR CORROSIVE CONDITION BEARING BAR THICKNESS SHOULD BE 4MM (MIN)

5f FOR SAFETY PURPOSE ALL OPENING FOR PIPING, CABLE TRAYS, DUCTS OR EQUIPMENT SHALL BE PROTECTED WITH TEMPORARY GRATING OR HANDRAIL. CONTRACTOR MUST COORDINATE THESE OPENINGS WITH SITE MANAGEMENT.

5g FOR GRATING WITH ONE END CANTILEVER, THE ADJOINING SIMPLY SUPPORTED SPAN OF GRATING PANEL TO BE SECURED WITH SPECIAL CLAMPS WITH LOCKING DEVICES TO PREVENT RISK OF UPLIFT.

5h GRATING WHEREVER MARKED 'REMOVABLE' IN RELEVANT DRAWING SHALL BE DEATILED IN SUCH A WAY SO THAT WEIGHT OF EACH REMOVABLE PANEL DOES NOT EXCEED 40 Kg.

5i GRATINGS SHALL BE FORGED WELDED FOR INDOOR & PRESSED-LOCKED NARROW PITCH FOR OUTDOOR APPLICATIONS. GRATING SHALL BE HOT-DIP GALVANIZED AND ALL DAMAGED HOT-DIP GALVANIZING AND FIELD-CUT PORTIONS OF GRATING SHALL BE REPAIRED OR TOUCHED UP IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

5j MINIMUM FLANGE WIDTH OF SUPPORT BEAM FOR DOUBLE SIDE GRATING IS 90mm.

5k STEEL GRATING BEARING BARS AND DISTRIBUTION BARS SHALL BE SERRATED BARS OF WELDABLE QUALITY MILD STEEL CONFORMING TO INTERNATIONAL STANDARDS

5l GRATING SHALL BE INSTALLED WITH FASTENING CLAMPS/BOLTS AT ALL FOUR CORNERS OF GRATING PANEL (MINIMUM).

6. ERECTION

6a BRACED BAYS SHALL BE ERECTED FIRST. ADEQUATE BRACING AND TEMPORARY SUPPORTS TO BE DESIGNED AND FORESEEN FOR CONSTRUCTION STAGE.

6b ALL STRUCTURAL STEEL SHALL BE PAINTED ACCORDING TO COLOUR SCHEDULE.

6c ALL ERECTION SHALL BE DONE AS PER ERECTION DRAWINGS AND METHOD STATEMENTS PREPARED BY THE CONTRACTOR.

6d PERMISSIBLE TOLERANCES FOR CRANE RAIL ALIGNMENT AS PER ONE OF FOLLOWING STANDARDS : DIN 4132, VDI 3576, BS 466 EN 1993-6 OR LOCAL CODE.

7. EARTHING

7a TYPICAL EARTHING DETAIL TO STEEL COLUMN SHALL BE WELDED AT SITE COLD ZINC COATING SHALL BE APPLIED AFTER WELDING TO BOTH COLUMN & PLATE.

8. SCOPE

8a CONNECTION DESIGN FOR COMPLETE STEEL STRUCTURE IS IN CIVIL SUPPLIER SCOPE & DESIGN SHALL BE ACCORDING TO EN 1993-1-8.

8b COMPLETE STRUCTURAL STEEL MATERIAL SUPPLY, FABRICATION & ERECTION AT SITE, INCLUDING STEEL SECTIONS, HANDRAILS, GRATINGS, CHEQUERED PLATES, CATLADDERS, CRANE RAIL (INCLUDING FIXING CLIPS) ETC. IS IN CIVIL SUPPLIER SCOPE.

8c GENERAL STRUCTURAL STEELWORKS DRAWINGS (GUIDE DRAWINGS) WILL BE SUPPLIED. DETAIL DRAWINGS (WORKSHOP DRAWINGS) ARE IN CIVIL SUPPLIER SCOPE.

9. LADDERS

9a LADDER SUPPORTED ON CONCRETE IS TO BE FIXED ON CONCRETE PEDESTALS RESP WALLS BY ADEQUATE ANCHOR FASTENERS.

9b SELF CLOSING SAFETY GATES ACCORDING TO INTERNATIONAL STANDARDS (EN 14122) AND REGULATIONS TO BE INSTALLED AT ALL LADDER EXIT LOCATIONS.

9c THE TOP LADDER RUNG SHALL BE ADJUSTED SUCH THAT IT IS AT GRATING / CONCRETE TOP LEVEL.

9d LADDERS FOR HEIGHTS OVER 3,0M TO BE EQUIPPED WITH SAFETY CAGE. WALKING HEIGHT BELOW SAFETY CAGE TO BE MIN 2,2M.

9e LADDERS FOR HEIGHTS OVER 10,0M TO BE EQUIPPED WITH INTERMEDIATE PEDESTALS ACCORDING RELEVANT INTERNATIONAL CODES (EN 14122).

10. STAIRWAYS

10a STAIRWAY TREADS ARE TO BE DETAILED BASED ON THE SPACING IN RELEVANT GUIDE DRAWINGS.

10b TREADS ARE TO BE DESIGNED FOR A LOAD OF 3.0 kN/m^2

10c TYPICAL DETAILS OF STEEL STAIRWAYS ARE GIVEN ON RELEVANT GUIDE DRAWINGS.

10d ANTI SLIP NOSING SHALL BE INCORPORATED IN ALL STAIR TREADS AND ON EDGES OF PLATFORMS AT TOP OF STAIRS.

11. HANDRAILS

11a HANDRAIL SHALL PREFERRABLY BE PLACED ON BEAM FLANGE.

11b HANDRAIL CONNECTION OVER CONCRETE SURFACE SHOULD BE BY ANCHOR FASTENERS DEPENDING ON THE POST LOCATION.

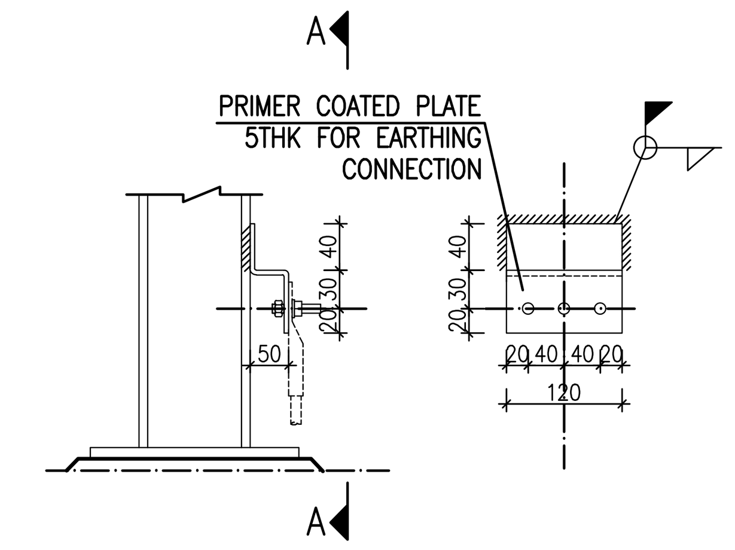
11c HANDRAIL SHALL BE PAINTED ACCORDING TO COLOUR SCHEDULE.

12. CORROSION PROTECTION

12a CORROSION PROTECTION MEASURE TO BE TAKEN ACCORDINGLY AS SPECIFIED IN TABLE BELOW.

Sl. NO.	ITEMS	ENVIRONMENTAL CONDITION			
		INSIDE BUILDING	OUTSIDE BUILDING	RAL	COLOUR
1	GRATINGS	HOT DIP GALVANIZED	HOT DIP GALVANIZED	GALVANIZED	
2	HANDRAILS	GALVANIZED + PAINTED FINAL	GALVANIZED + PAINTED FINAL		AS DEFINED BY OWNER
3	EDGE ANGLE	GALVANIZED	GALVANIZED	GALVANIZED	–
4	INSERT PLATES	GALVANIZED	GALVANIZED	GALVANIZED	–
5	CHEQUERED PLATE	GALVANIZED	GALVANIZED	GALVANIZED	–
6	LADDERS	GALVANIZED + PAINTED FINAL	GALVANIZED + PAINTED FINAL		AS DEFINED BY OWNER
7	MAIN STRUCTURES	HOT DIP GALVANIZED	HOT DIP GALVANIZED	GALVANIZED	–
8	ROAD BRIDGE STRUCTURE	SPECIAL COATING SYSTEM AS GIVEN BELOW			

12b SPECIAL COATING SYSTEM FOR ROAD BRIDGE STRUCTURE:
a HOT WATER BLASTING OF STEEL SURFACE
b PRIMER: 2-COMPONENT EPOXY-COATING 70mü
c UNDERCOAT: 2-COMPONENT EPOXY-COATING 70mü
d FINISH COAT: 2-COMPONENT POLYURETHAN-COATING 80mü



TYPICAL EARTHING DETAIL VIEW A-A

REFERENCE DRAWINGS მითითებული ნახაზები	
DRAWING NO. ნახაზის ნომერი	TITLE ნახაზის სათაური

NOTES : შენიშვნა :

1. ALL DIMENSIONS ARE IN MILLITIMETRES UNLESS NOTED OTHERWISE.
"ზომები მოცემულია მილიმეტრიანი, გარდა შემთხვევისა თუ სხვაგვარად არ არის აღნიშნული"

2. ALL LEVELS ARE IN METRES AND RELATE TO SEA LEVEL.
2. დონეები მოცემულია მეტრებში და დაკავშირებულია ზღვის დონესთან

3. ALL DIMENSIONS ARE TO FACE OF CONCRETE, MASONRY (WITHOUT PLASTERING) OR FINISHED FACE OF STUD PARTITION.
3. ყველა ზომა ეთანხმება/ემთხვევა ბეტონის, აგურის/ქვის წყობის (ბათქაშის გარეშე) ზედაპირს ან ტიხრების დასრულებულ ზედაპირს

STEELWORK GUIDE DRAWING ლითონის სამუშაოები ნახაზი

KEY PLAN: ძირითადი გეგმა:
not in scale მასშტაბის გარეშე

Revision ცვლილება	Details of revision თემა	Date თარიღი	Drawn დახაზულია	Checked შემოწმებულია
03	-	-	-	-
02	-	-	-	-
01	Earthing Detail added - Ready for Construction	26.07.2017	Mardetko	Edegger
00	Ready for Construction	27.04.2017	Edegger	Uzunoglu

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PROJECT: პროექტი :
HPP Mestiachala 1 & 2
Detail Design

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CONTENT OF DRAWING: ნახაზის შემადგენლობა/სარჩევი :
HPP MESTIACHALA 1 & 2
GENERAL NOTES FOR STEELWORK DRAWINGS

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