



مشروع تعزيز المرونة المؤسسية والإقتصادية في اليمن
Strengthening Institutional & Economic Resilience in Yemen
(SIERY)

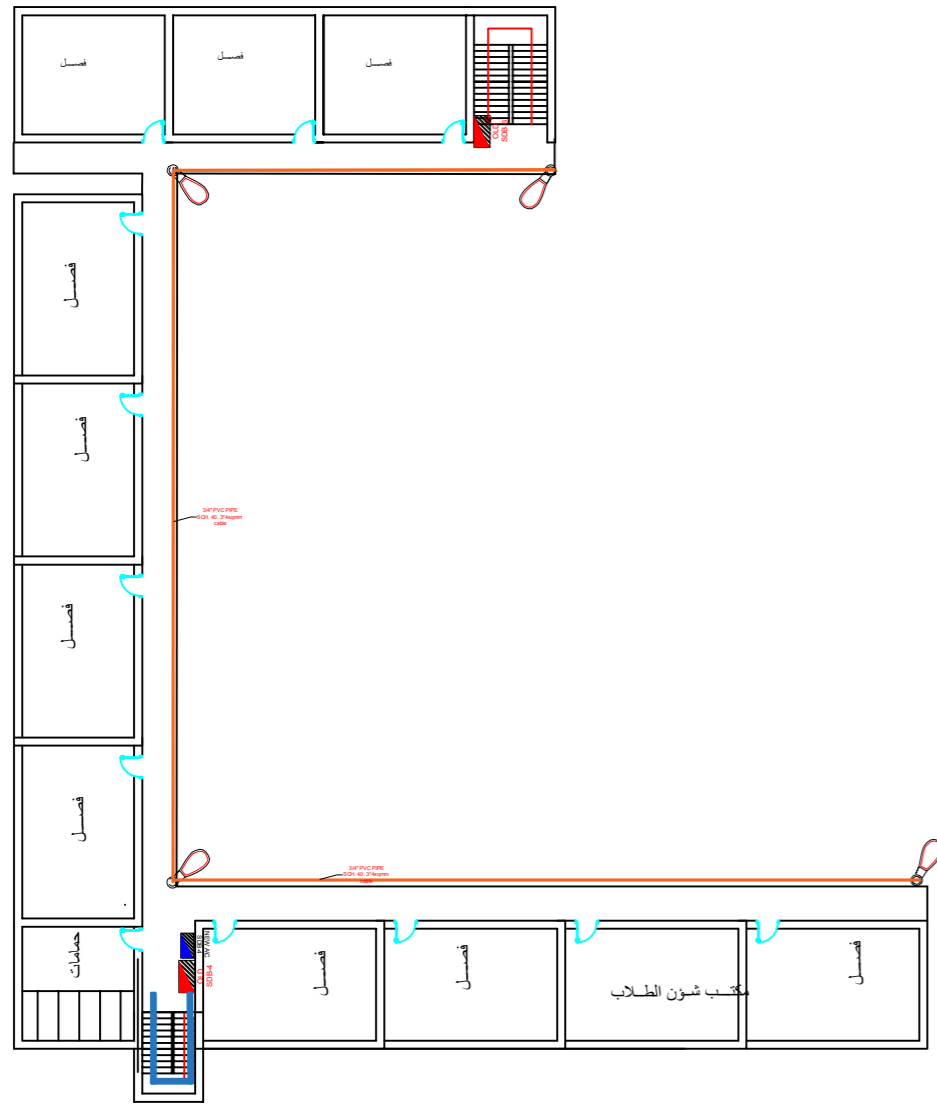
توريد وتركيب منظومات طاقة شمسية لمدارس في عدن

Supply & Install Solar System for Schools in Aden

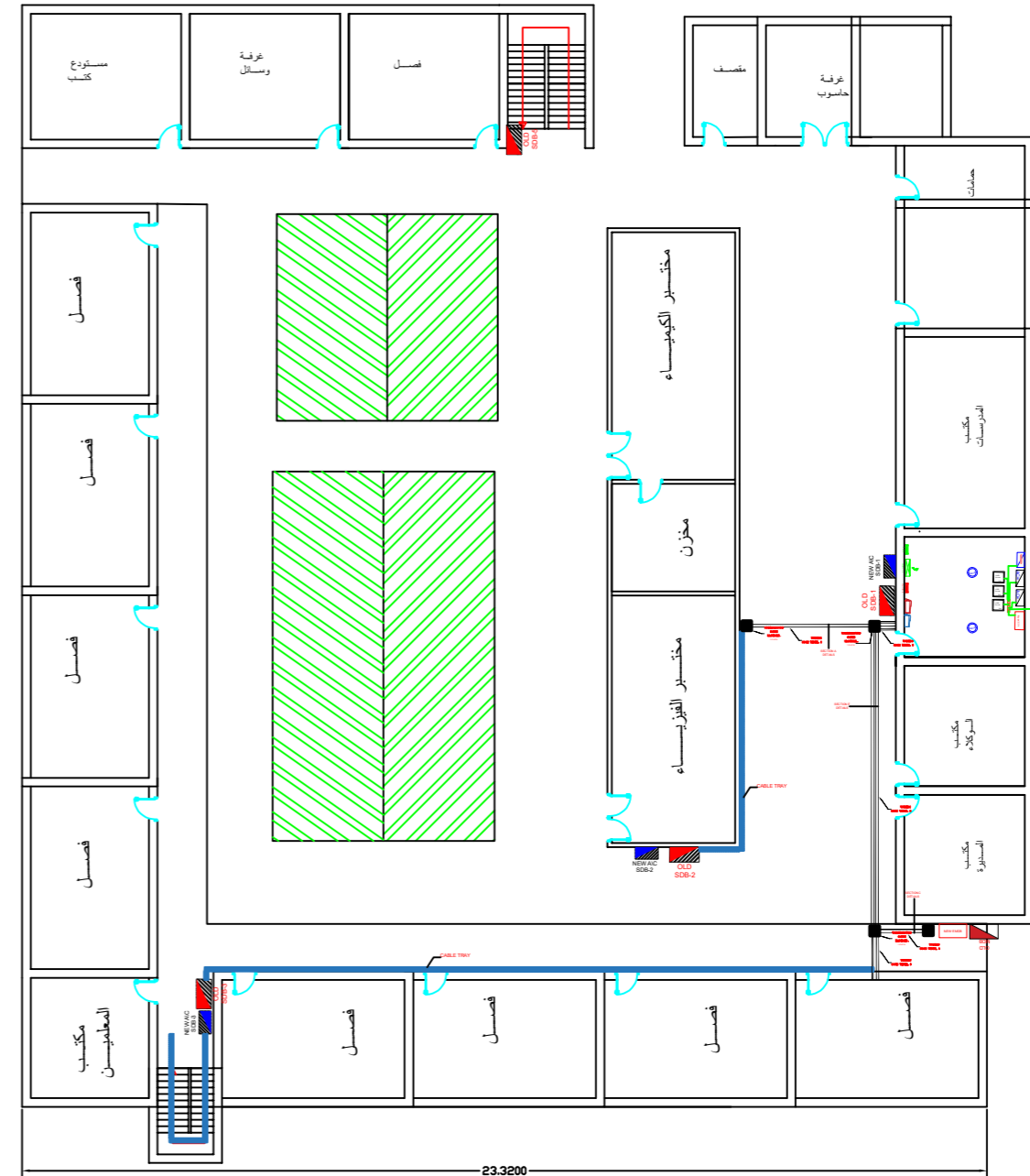
ELECTRICAL DRAWINGS

DRAWING LIST:-

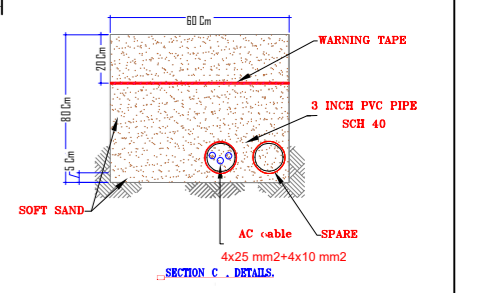
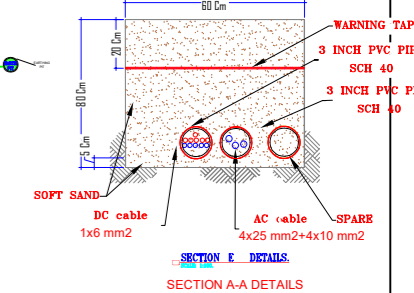
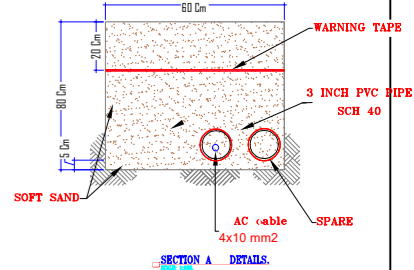
| NO | DRAWING TITLE |
|---------|---|
| S1 - 01 | Floors Layout |
| S1 - 02 | Batteries Room |
| S1 - 03 | PV Distribution |
| S1 - 04 | Lightening&grounding Protection Layout |
| S1 - 05 | Lightening&grounding Protection Details |
| S1 - 06 | New E MDB Single line Diagram |
| S1 - 07 | New A\C Sub Single line Diagram |
| S1 - 08 | Existed MDB Layout |
| S1 - 09 | PV System Single Line Diagram |



الدور الأول



الدور الأرضي



Supply & Install Solar System for Schools in Aden

توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

مساقط الأدوار
Floors Layout

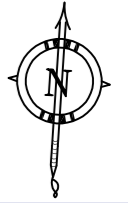
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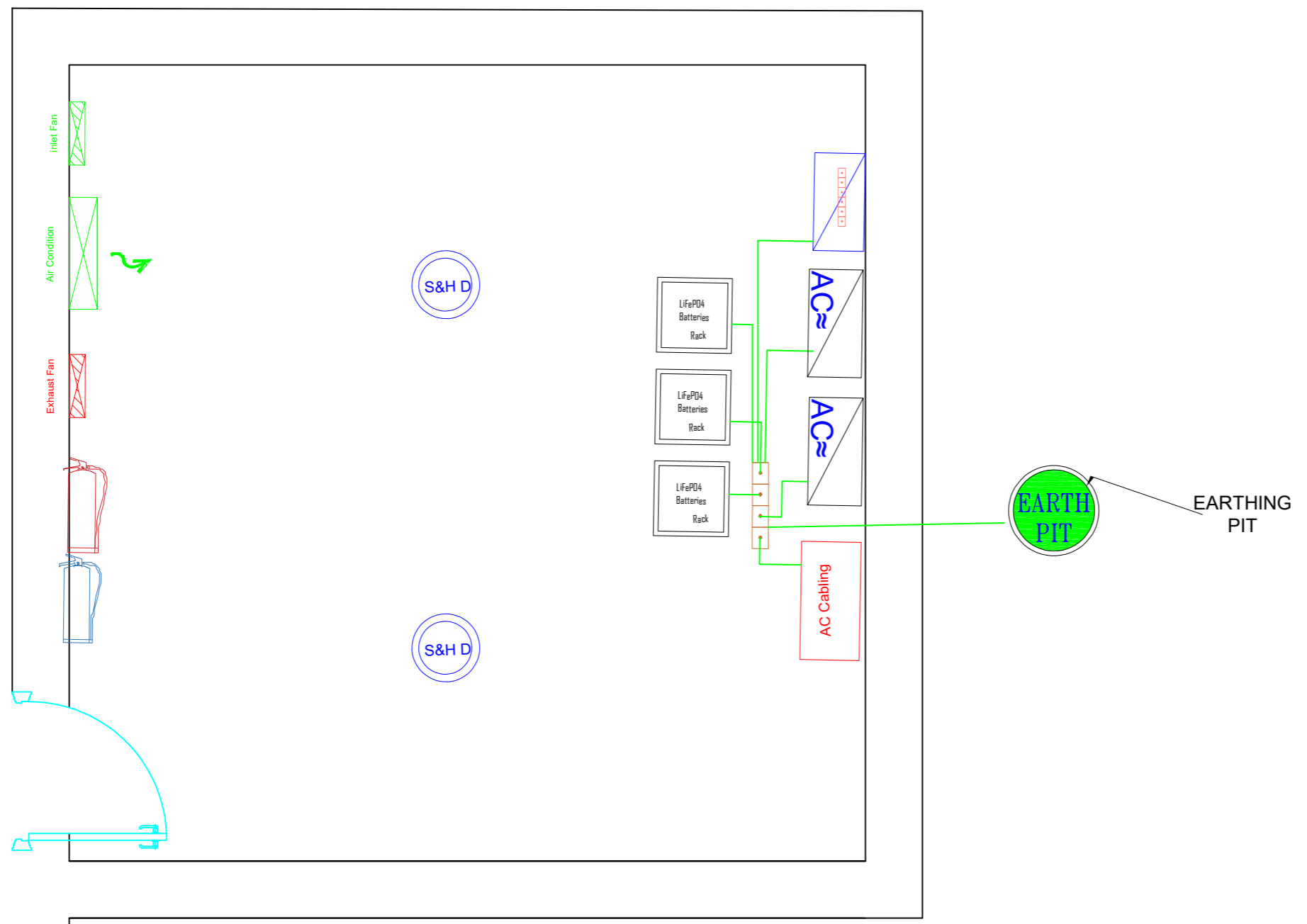
مسقط افقي

S1 - 01

sheet
اسم اللوحة

Sheet No
رقم اللوحة





| SYMBOL | DESCRIPTION |
|--------|---|
| | CONNECTION BOX BETWEEN CHARGE CONTROLLER AND BATTERY RACK |
| | HYBRID INVERTER |
| | MPPT BATTERY CHARGER |
| | BATTERY RACK. |
| | AC COUPLING PANEL |
| | INLET FAN |
| | EXHAUST FAN |
| | SMOKE & HEAT DETECTOR |
| | FIRE EXTINGUISHER POWDER |
| | FIRE EXTINGUISHER CO2 |
| | Air Condition |



Supply & Install Solar System for Schools in Aden
 توريد وتركيب منظومات طاقة شمسية
 لمدارس في عدن

غرفة البطاريات
 Batteries Room

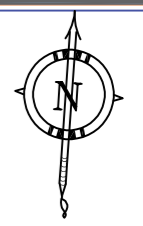
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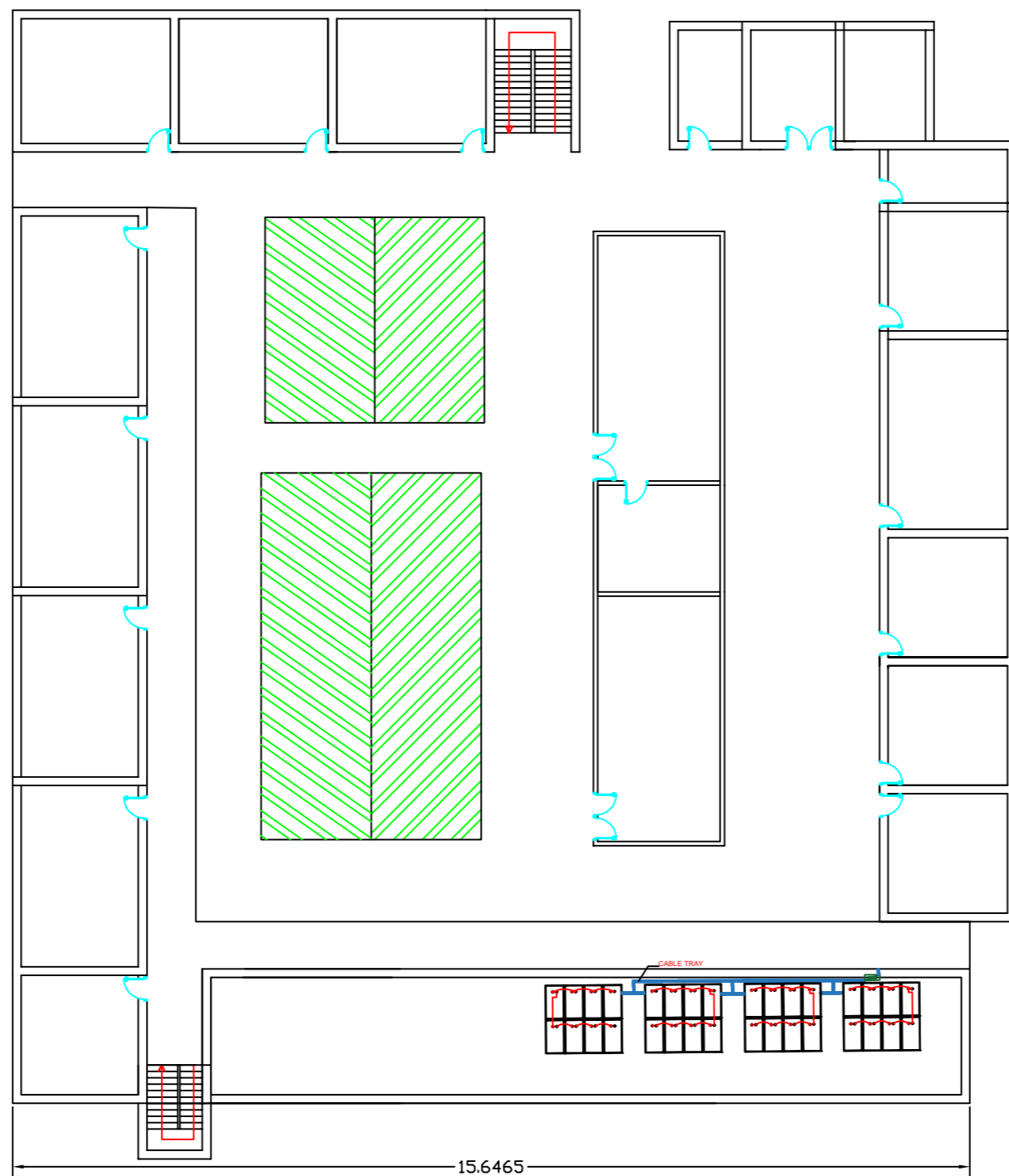
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اسم اللوحة

S1 - 02

رقم اللوحة





Supply & Install Solar System for
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توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

توزيع الألواح الشمسية
PV DISTRIBUTION

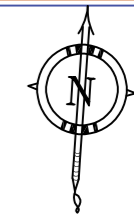
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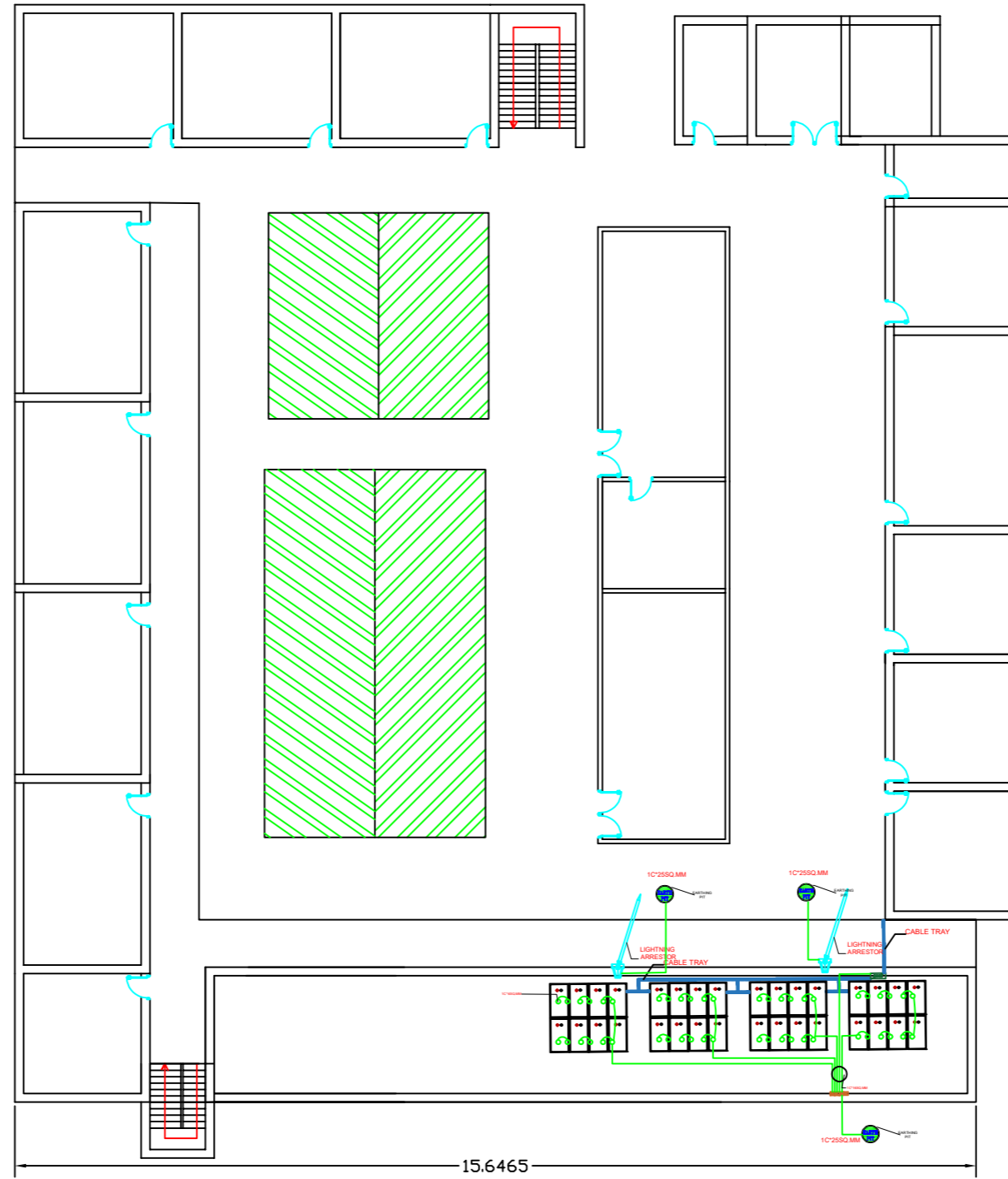
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اسم اللوحة

S1 - 03

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رقم اللوحة

Sheet No
رقم اللوحة





Supply & Install Solar System for
Schools in Aden

توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

نظام الحماية من الصواعق
والتأريض
Lightning & grounding
Protection Layout

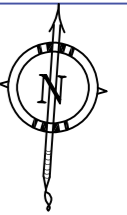
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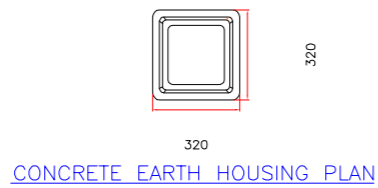
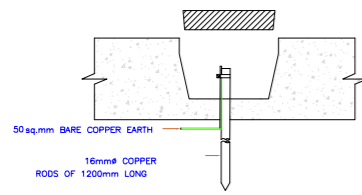
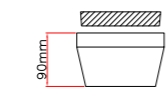
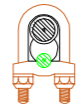
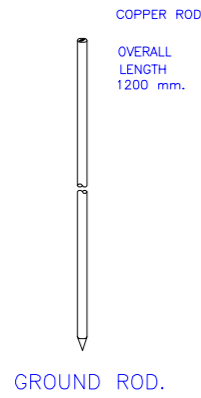
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S1 - 04

Sheet No
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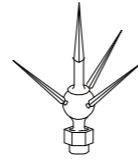
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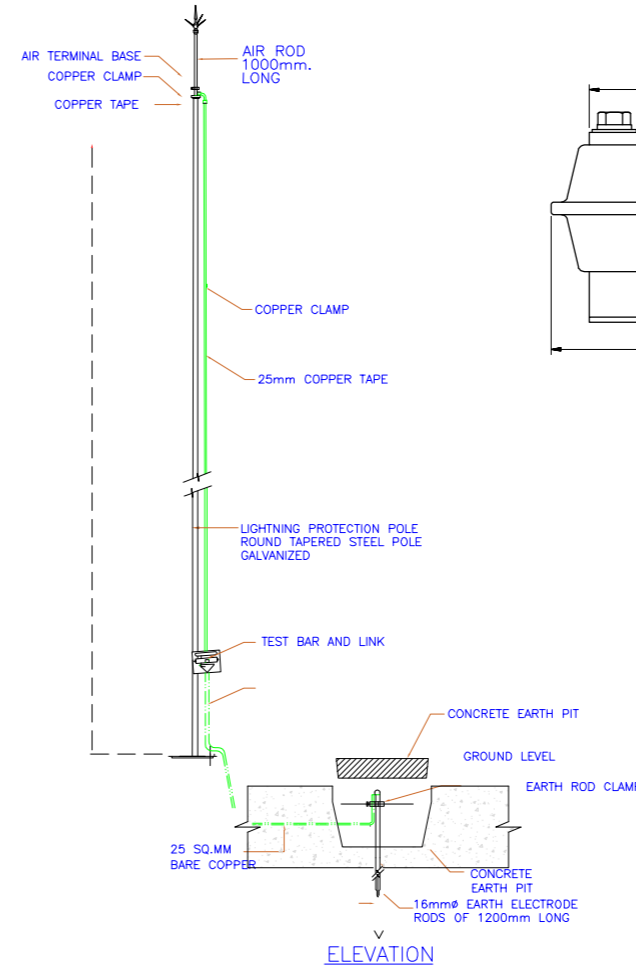
EARTHING PIT DETAILS

AIR TERMINAL TIP

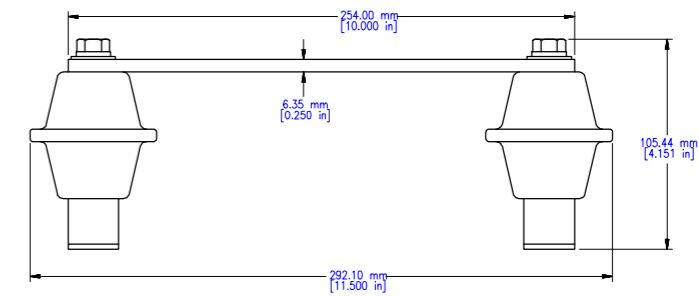
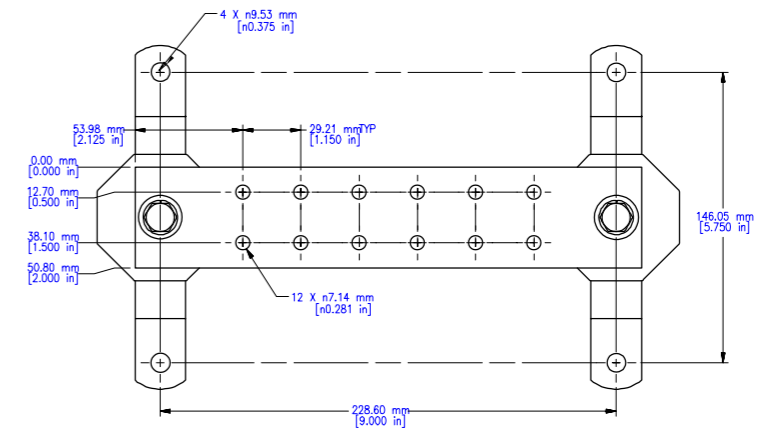


AIR TERMINAL

AIR TERMINAL SADDLE



LIGHTNING PROTECTION SYSTEM



EARTHING BUSBAR



Supply & Install Solar System for Schools in Aden

توريد وتركيب منظومات طاقة شمسية لمدارس في عدن

تفاصيل نظام الحماية من الصواعق والتأريض
Lightning & grounding Protection Details

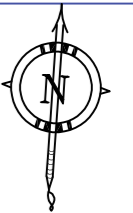
ثانوية عبد الباري قاسم للبنات

Sheet Name

sheet اسم اللوحة

S1 - 05

Sheet No رقم اللوحة



Utility grid



| SYMBOL | DESCRIPTION |
|--------|----------------------------|
| | AUTOMATIC TRANSFER SWITCH |
| | SURGE ARRESTER |
| | CIRCUIT BREAKER (MCCB/MCB) |
| | CIRCUIT BREAKER (RCB) |
| | AC FUSE |



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توريد وتركيب منظومات طاقة شمسية لمدارس في عدن

مخطط لوحة التوزيع الجديد
NEW EMDB SINGLE LINE DIAGRAM

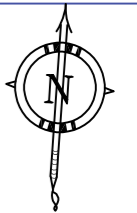
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




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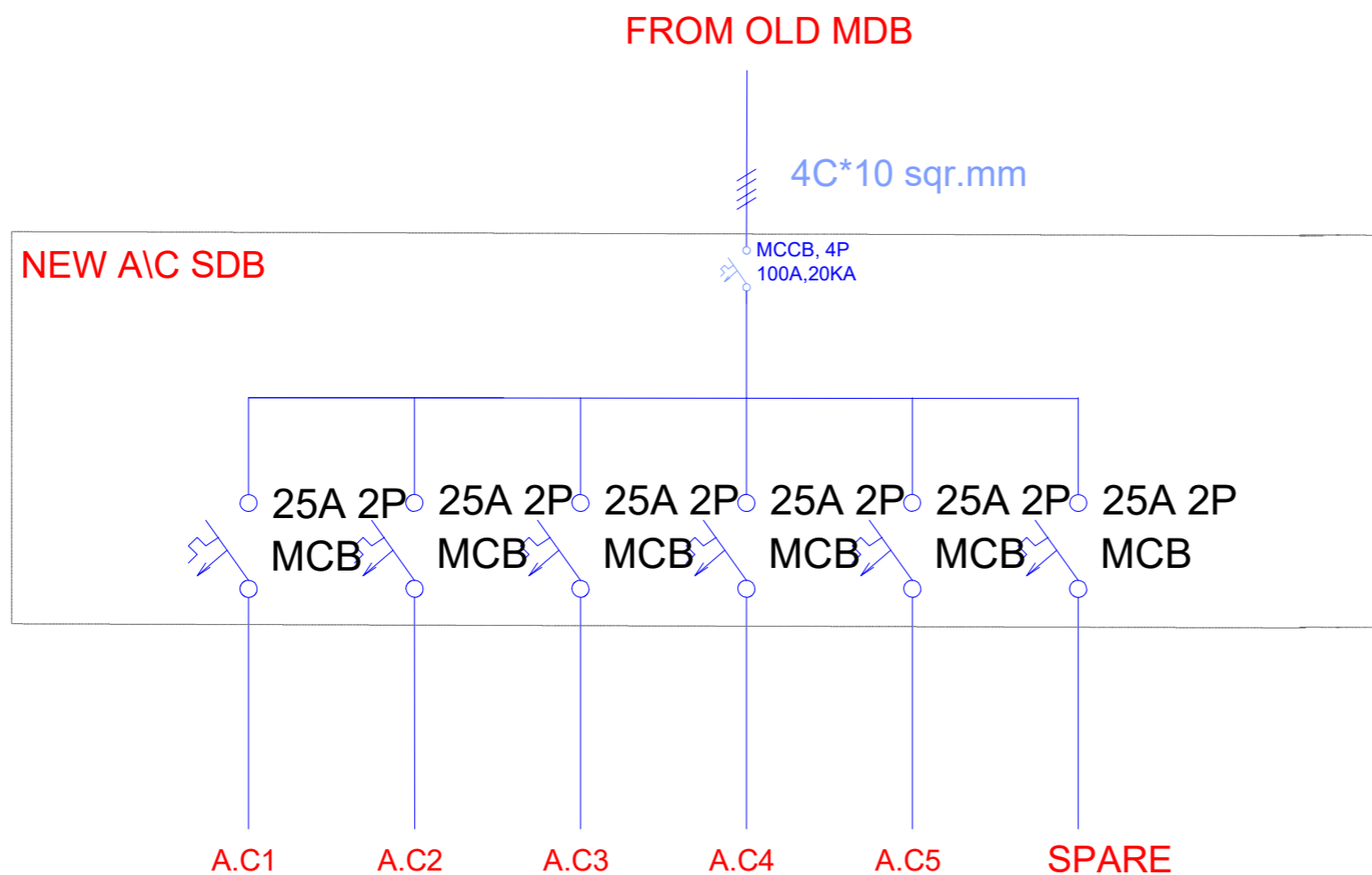
اسم اللوحة

S1 - 06

رقم اللوحة



| SYMBOL | DESCRIPTION |
|---|----------------------------|
|  | MANUAL TRANSFER SWITCH |
|  | SURGE ARRESTER |
|  | CIRCUIT BREAKER (MCCB/MCB) |
|  | CIRCUIT BREAKER (RCB) |
|  | AC FUSE |



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توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

ثانوية عبد الباري قاسم للبنات
الجديده الفرعية
NEW A/C SUB SINGLE
LINE DIAGRAM

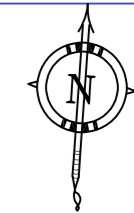
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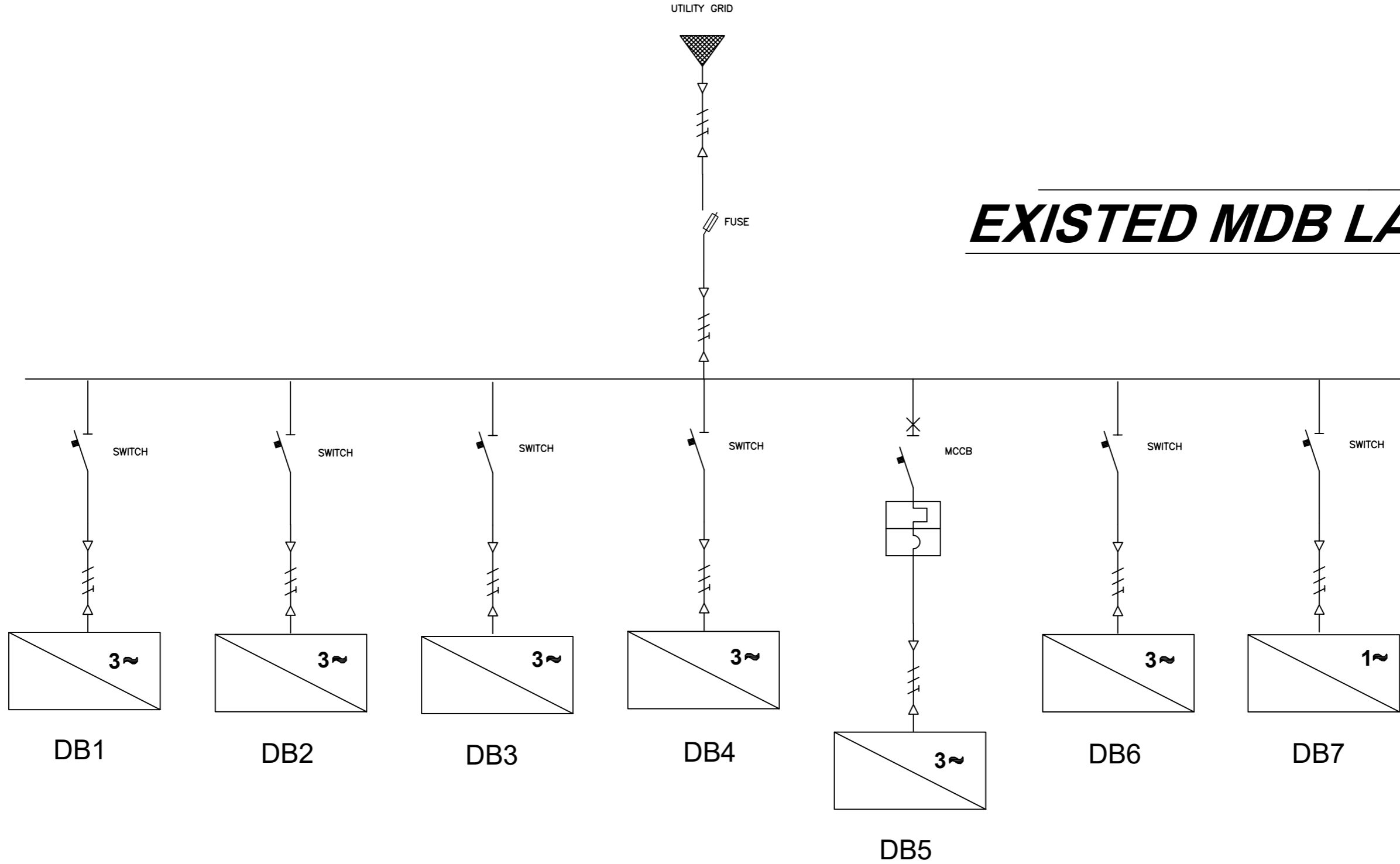
S1 - 07

رقم اللوحة



UTILITY GRID

EXISTED MDB LAYOUT



Supply & Install Solar System for
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توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

مخطط لوحة توزيع الحالية

Existed MDB Layout

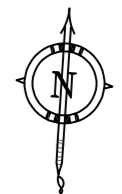
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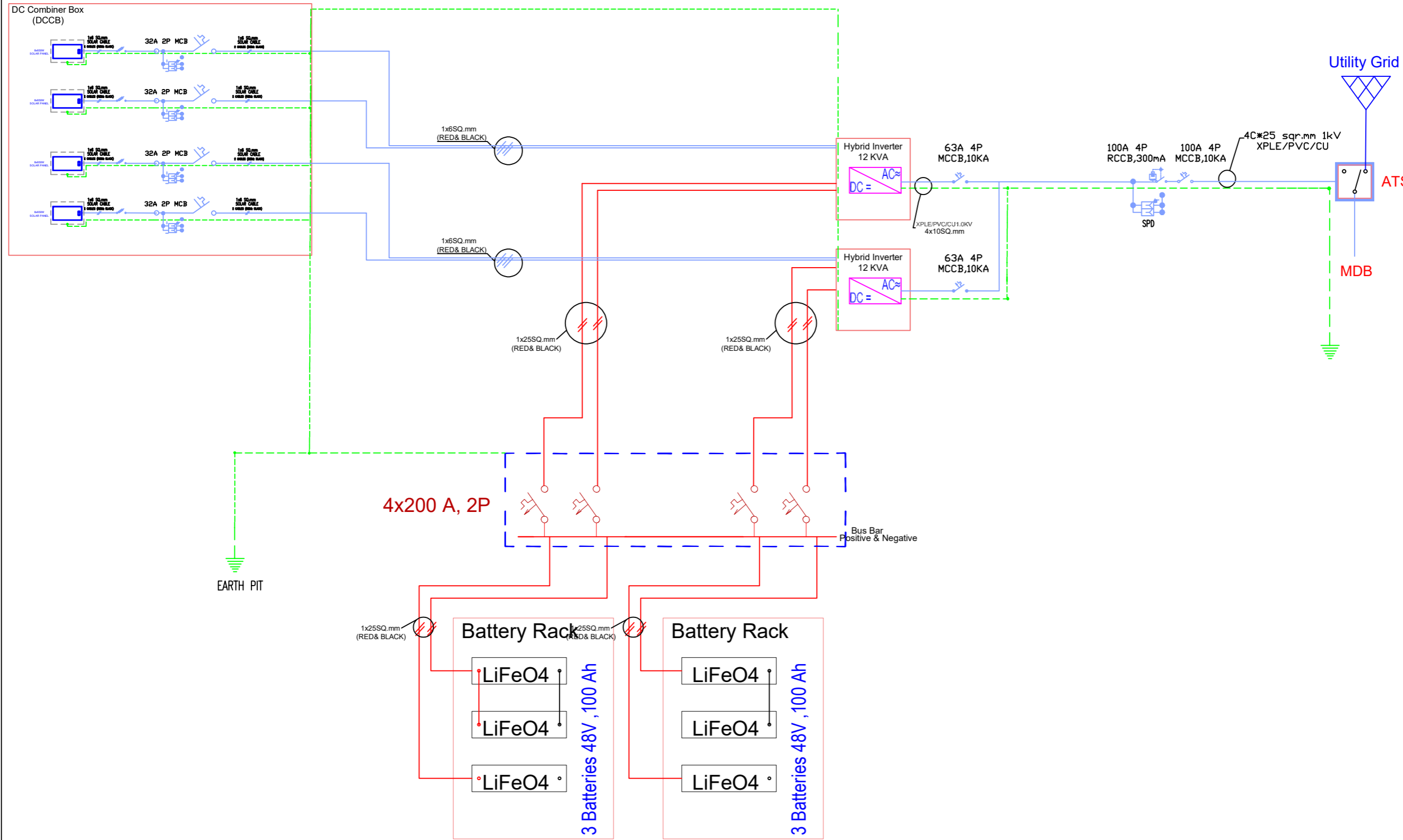
Sheet Name

sheet
اسم اللوحة

S1 - 08

Sheet No
رقم اللوحة





| SYMBOL | DESCRIPTION |
|--------|------------------------|
| | PHOTOVOLTAIC MODULE |
| | HYBRID INVERTER |
| | ATUO TRANSFER SWICH |
| | SURGE ARRESTER |
| | CIRCUIT BREAKER (MCB) |
| | CIRCUIT BREAKER (MCCB) |
| | CIRCUIT BREAKER (RCCB) |
| | DC FUSE |



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توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

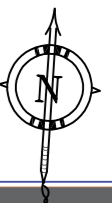
مخطط النظام الشمسي
PV Sysetm Single Line
Diagram

ثانوية عبد الباري قاسم للبنات

S1 - 09

sheet
اسم اللوحة

Sheet No
رقم اللوحة



STRUCTURE DRAWINGS

DRAWING LIST:-

| NO | DRAWING TITLE |
|---------|---|
| S2 - 01 | Main Notes |
| S2 - 02 | 8 PANELS 3D SCHEME. |
| S2 - 03 | MOUNTING STRUCTURE SIDE VIEW. |
| S2 - 04 | COLUMN BASE PLATE |
| S2 - 05 | BEAMS PLAN DETAILS. |
| S2 - 06 | CONCRETE, CONNECTION AND BASE PLATES DETAILS A. |
| S2 - 07 | CONCRETE, CONNECTION AND BASE PLATES DETAILS B. |

GENERAL

G .1THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL , ELECTRICAL ,MECHANICAL ,OTHER CONTRACT DRAWINGS ,SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT . ANY DISCREPANCY SHALL BE REFERRED TO THE SUPERINTENDENT FOR DECISION BEFORE PROCEEDING WITH THE WORK .

G .2DIMENSIONS ARE AS SHOWN . DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE STRUCTURAL DRAWINGS.

G .3SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR.

G .4DURING CONSTRUCTION THE STRUCTURE WILL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED .TEMPORARY BRACING SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED.

G .5ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATED CODES AND THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES.

G .6THE STRUCTURAL WORK SHOWN ON THESE DRAWINGS HAS BEEN DESIGNED

FOR THE FOLLOWING LOAD

- MINIMUM LIVE LOADS.
- WIND LOAD 0.777KN/m.2
- SELF WEIGHT.

G .7 REFER TO STRUCTURAL DRAWINGS FOR THE DIFFERENT CONSTRUCTION MATERIALS TO BE USED IN THE PROJECT.

STRUCTURE

S .1ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND FOLLOWING CODES

- AISC.13-
- ACI 318M .2014-
- ASCE 7-16.
- ASTM.

S2 .ALL MEMBERS OF GALVANIZED STEEL QUALITY - :THE A36FY 36MATERIAL WAS SELECTED FOR ALL COLUMNS ,BEAMS , PURLINS AND BRACING AND SECTIONS . MINIMUM YEILD STRENGTH (FY 240=MPA).

S3 .ESTABLISH ANY HOLES OR CUTTING WORK SHOULD BE BY USING POWER ELECTRICAL EQUIPMENT.

S .4 COATING PROTECTION SHALL BE

OF GALVANIZATION OF 60MICROMETER OR EQUIVALENT ,RECOMMENDED ALTERNATIVE 40MICRO ZINC GALVANIZATION WITH PRIMER ACRYLIC BINDER PAINT COATS OF 70MICROMETER AND ONE TOP COAT OF ACRYLIC BINDER PAINT OF 50MICROMETER WITH TOTAL 120MICROMETER BINDER OR EQUIVALENT AS PER ISO.12944

S5 .CONSTRUCTION JOINTS WHERE NOT SHOWN SHALL BE LOCATED TO THE APPROVAL OF THE ENGINEER .IF ANY.

S6 ALL BOLTS ARE A 325OR A 490HIGH STRENGTH BOLTS AS ASTM.

CONCRETE

C .1ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND AMERICAN CONCRETE CODE ACI318-M(2014-REINFORCED CONCRETE STRUCTURES).

C2 .CONCRETE QUALITY (CONCRETE WITH EPOXY GROUT -):MINIMUM CONCRETE CUBE STRENGTH (F'C 30=MPA)AFTER 28 DAYS

C .3CONCRETE WITH EPOXY GROUT MUST BE MIXED BY AN ELECTRIC DRILL.

C4 .CONCRETE BASES ARE SPRAYED FOR AT LEAST 5DAYS THREE TIMES A DAY



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توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

الملاحظات الرئيسية

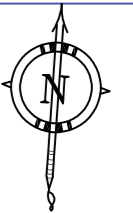
MAIN NOTES.

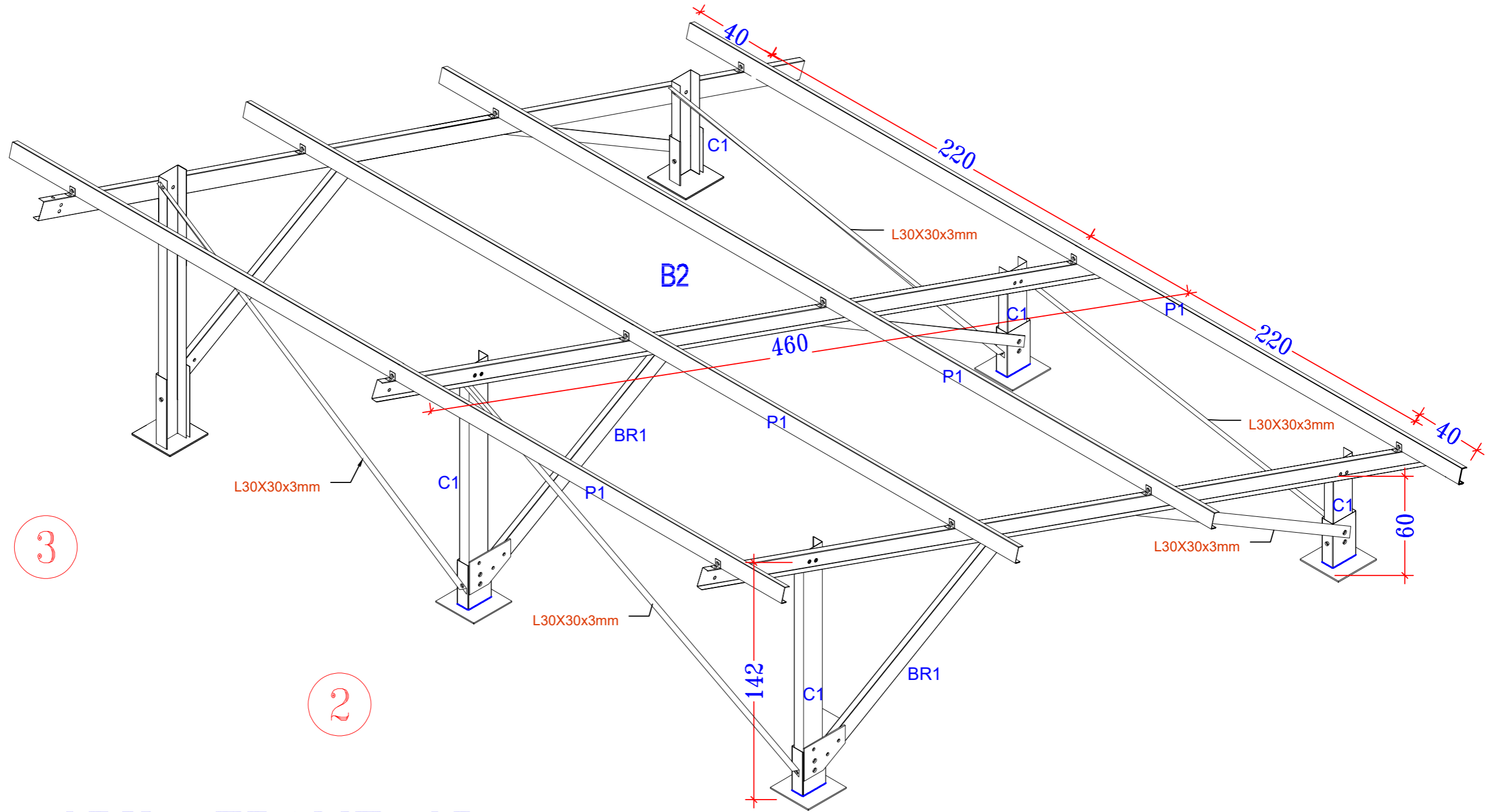
ثانوية عبد الباري قاسم للبنات

sheet
اسم اللوحة

S2 - 01

Sheet No
رقم اللوحة





8PVs FRAME 3D

GALVANIZED STEEL SECTIONS DETAILS.

| SECTION SHAPE | NO | MEMBER DIMENSIONS IN MM | | | | | REMARKS |
|---------------|--------|-------------------------|----|---|-------|---|---------|
| | | A | B | C | t | Ø | |
| C1, B1 | C1, B1 | 75 | 35 | 0 | 2.8-3 | - | |
| | P1 | 75 | 35 | 0 | 2.8-3 | - | |
| | BR1 | 75 | 35 | 0 | 2.8-3 | - | |



Supply & Install Solar System for Schools in Aden

توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

مسقط ثلاثي الابعاد
8PANELS 3D SCHEME

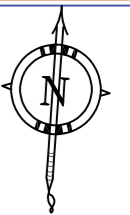
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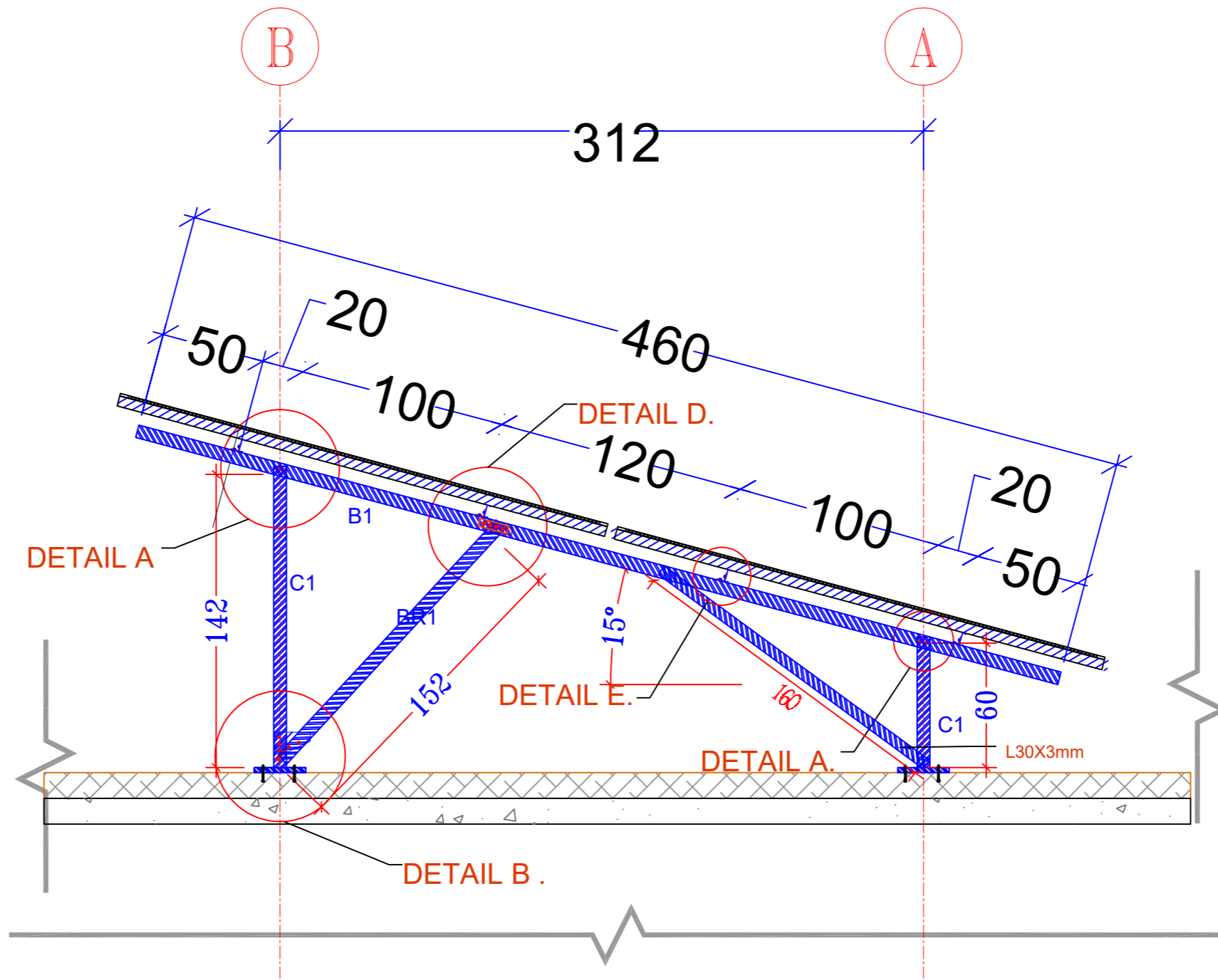
Sheet No

S2 - 02

اسم اللوحة

رقم اللوحة





FRAME ELEVATION DETAILS

GALVANIZED STEEL SECTIONS DETAILS.

| SECTION SHAPE | NO | MEMBER DIMENSIONS IN MM | | | | | REMARKS |
|---------------|--------|-------------------------|----|---|-------|---|---------|
| | | A | B | C | t | Ø | |
| C | C1, B1 | 75 | 35 | 0 | 2.8-3 | - | |
| | P1 | 75 | 35 | 0 | 2.8-3 | - | |
| | BR1 | 75 | 35 | 0 | 2.8-3 | - | |



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توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

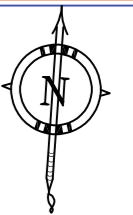
مسقط جانبي
MOUNTING
STRUCTURE SIDE
VIEW

ثانوية عبد الباري قاسم للبنات

S2 - 03

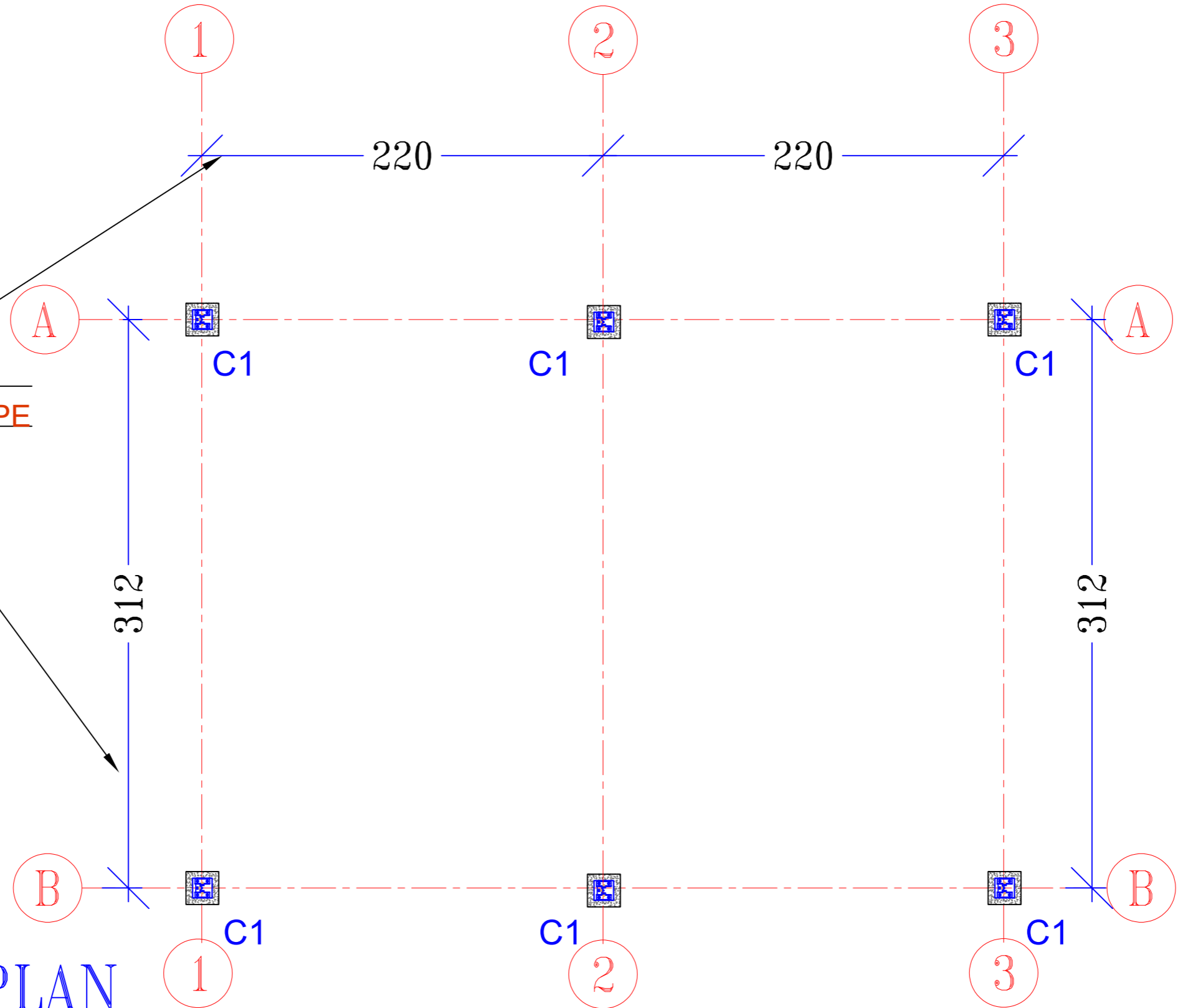
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Sheet No
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


DIMENSION ON SLOPE

COLUMN PLAN



GALVANIZED STEEL SECTIONS DETAILS.

| SECTION SHAPE | NO | MEMBER DIMENSIONS IN MM | | | | | REMARKS |
|---|--------|-------------------------|----|---|-------|---|---------|
| | | A | B | C | t | Ø | |
|  | C1, B1 | 75 | 35 | 0 | 2.8-3 | - | |
| | P1 | 75 | 35 | 0 | 2.8-3 | - | |
| | BR1 | 75 | 35 | 0 | 2.8-3 | - | |



Supply & Install Solar System for Schools in Aden

توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

تفاصيل الاعمدة

COLUMN BASE PLATE

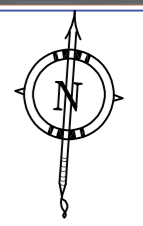
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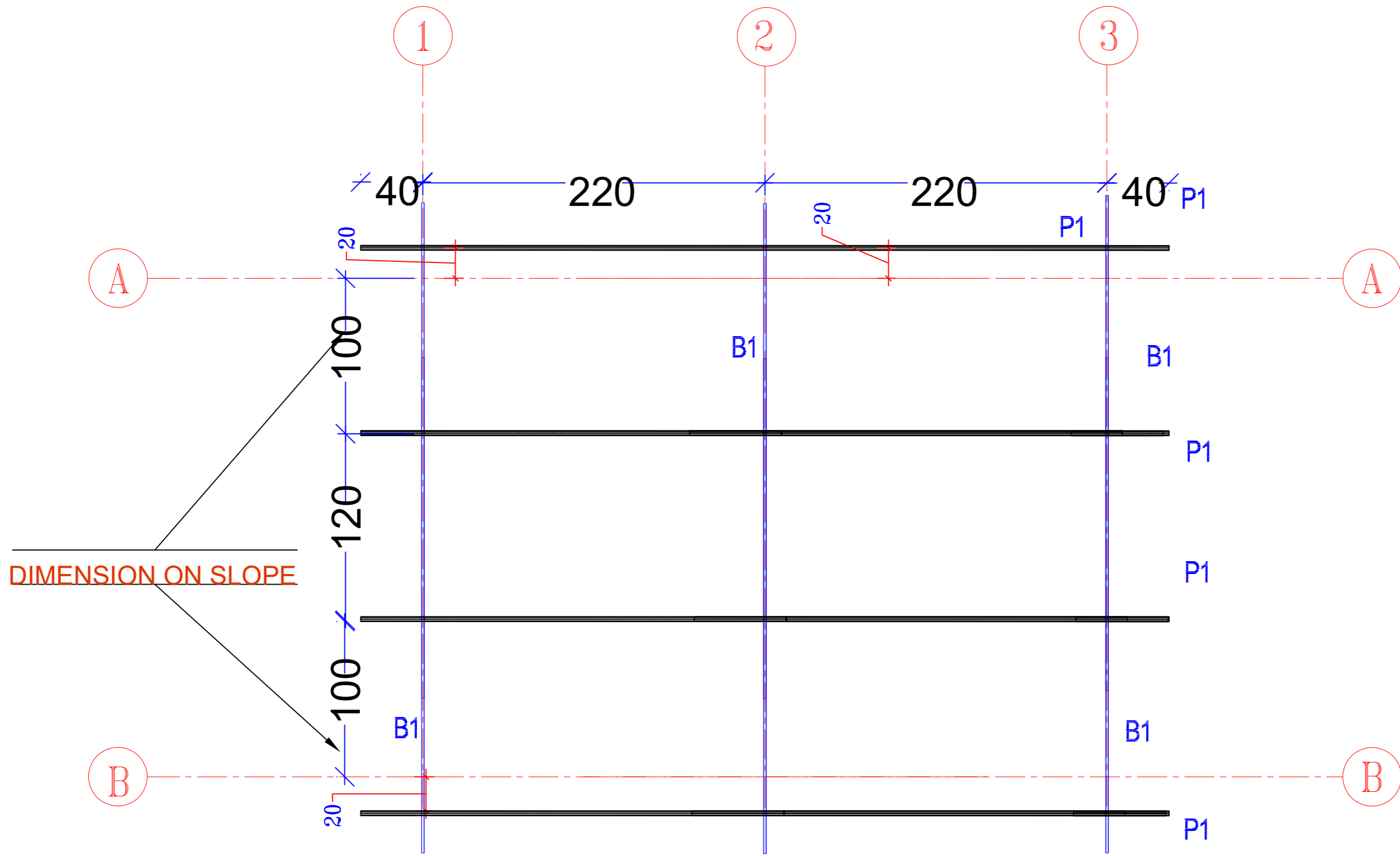
Sheet Name

اسم اللوحة

S2 - 04

Sheet No
رقم اللوحة





FRAME PLAN

GALVANIZED STEEL SECTIONS DETAILS.

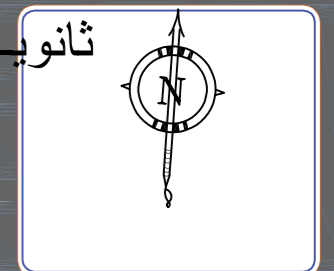
| SECTION SHAPE | NO | MEMBER DIMENSIONS IN MM | | | | | REMARKS |
|---------------|--------|-------------------------|----|---|-------|---|---------|
| | | A | B | C | t | ∅ | |
| C1, B1 | C1, B1 | 75 | 35 | 0 | 2.8-3 | - | |
| | P1 | 75 | 35 | 0 | 2.8-3 | - | |
| | BR1 | 75 | 35 | 0 | 2.8-3 | - | |

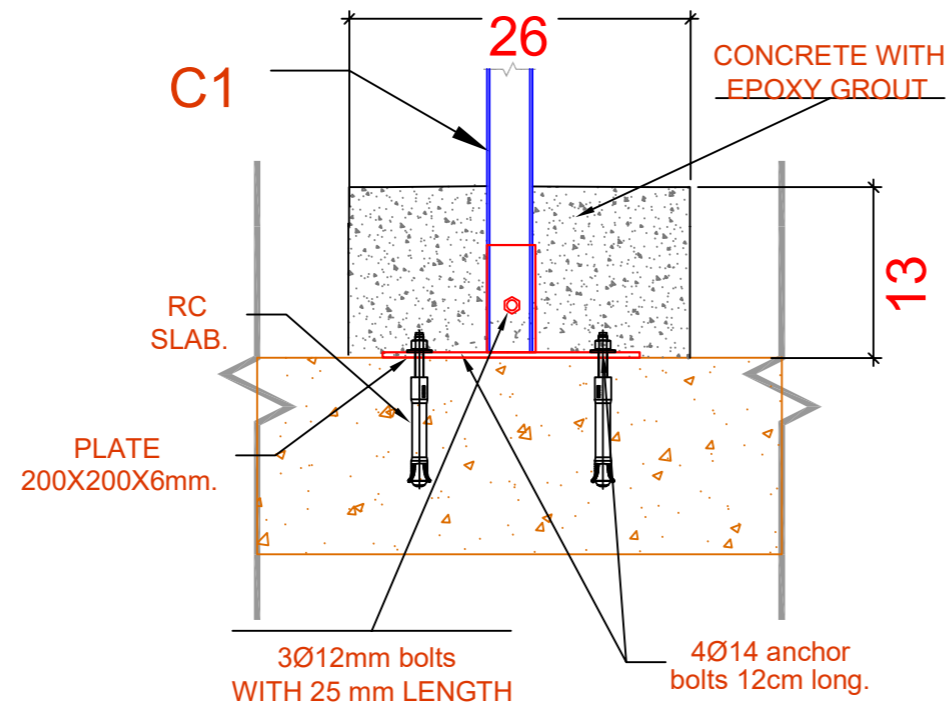


Supply & Install Solar System for Schools in Aden
 توريد وتركيب منظومات طاقة شمسية لمدارس في عدن

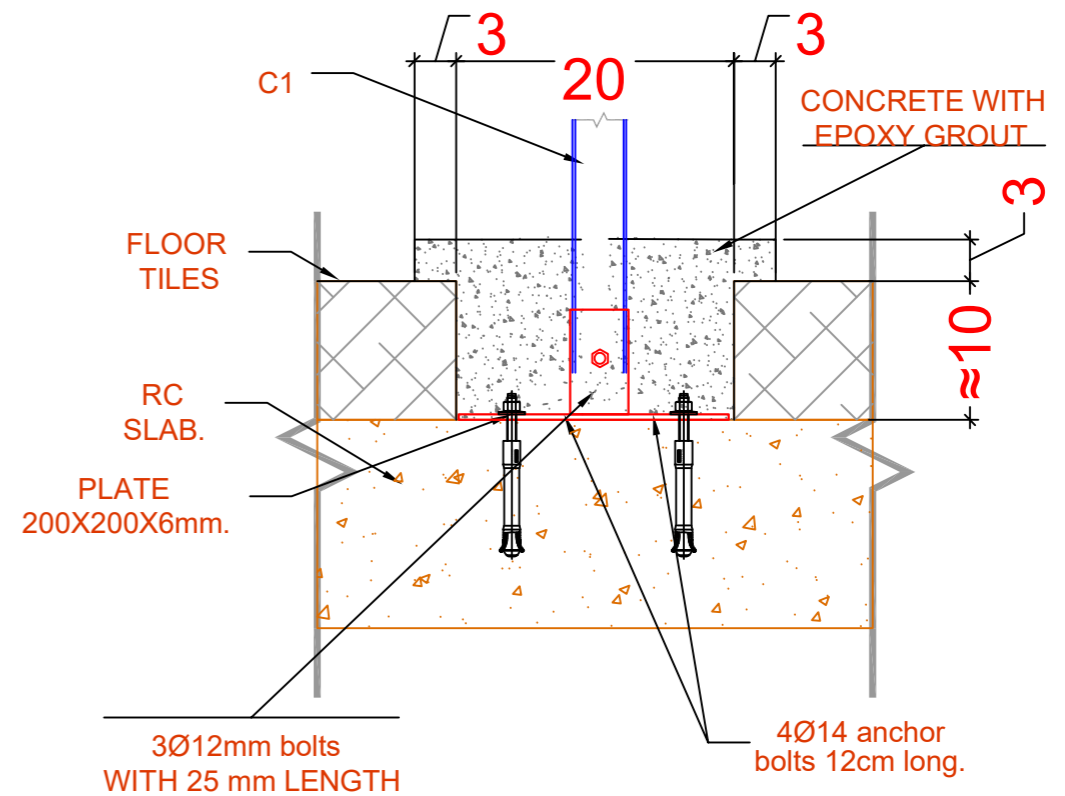
تفاصيل القواعد السقفية BEAMS PLAN DETAILS.

ثانوية عبد الباري قاسم للبنات
 sheet اسم اللوحة
 S2 - 05
 Sheet No رقم اللوحة

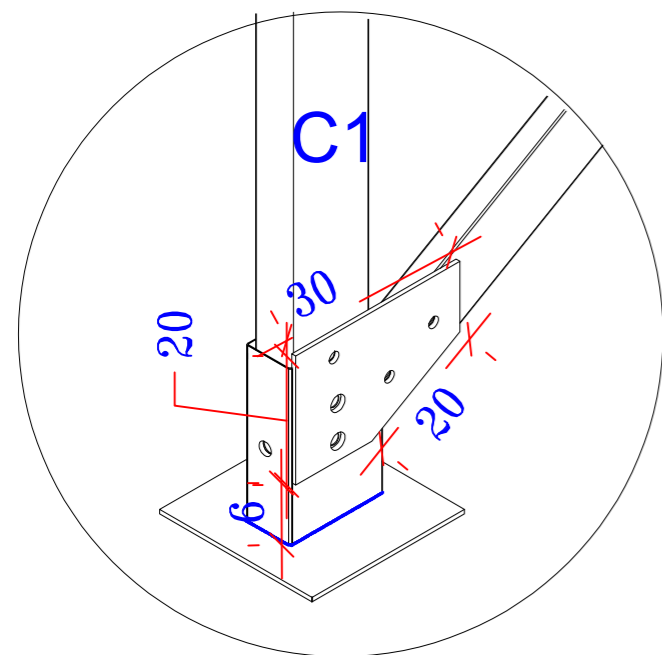




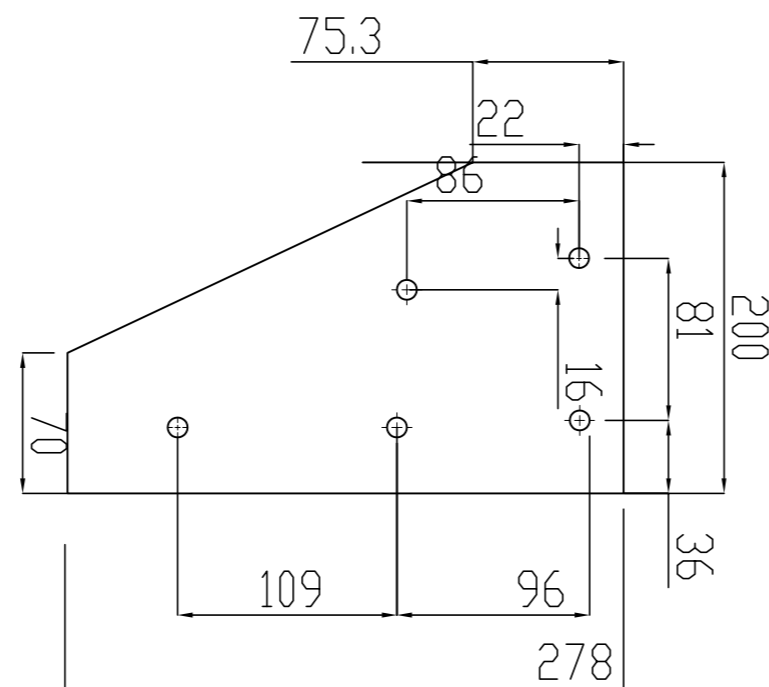
SLAB WITHOUT TILES



SLAB WITH TILES



DETAIL B.



NOTES

Roof pull out test should be carried out prior installation anchors pull out test should not be less than 7kN

GALVANIZED STEEL SECTIONS DETAILS.

| SECTION SHAPE | NO | MEMBER DIMENSIONS IN MM | | | | REMARKS |
|---------------|----|-------------------------|---|-------|---|---------|
| | | A | B | C | t | |
| C1, B1 | 75 | 35 | 0 | 2.8-3 | - | |
| P1 | 75 | 35 | 0 | 2.8-3 | - | |
| BR1 | 75 | 35 | 0 | 2.8-3 | - | |



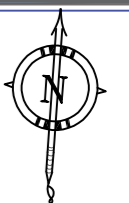
Supply & Install Solar System for Schools in Aden

توريد وتركيب منظومات طاقة شمسية لمدارس في عدن

تفاصيل القاعدة

CONCRETE ,CONNECTION AND BASE PLATES DETAILS A.

ثانوية عبد الباري قاسم للبنات

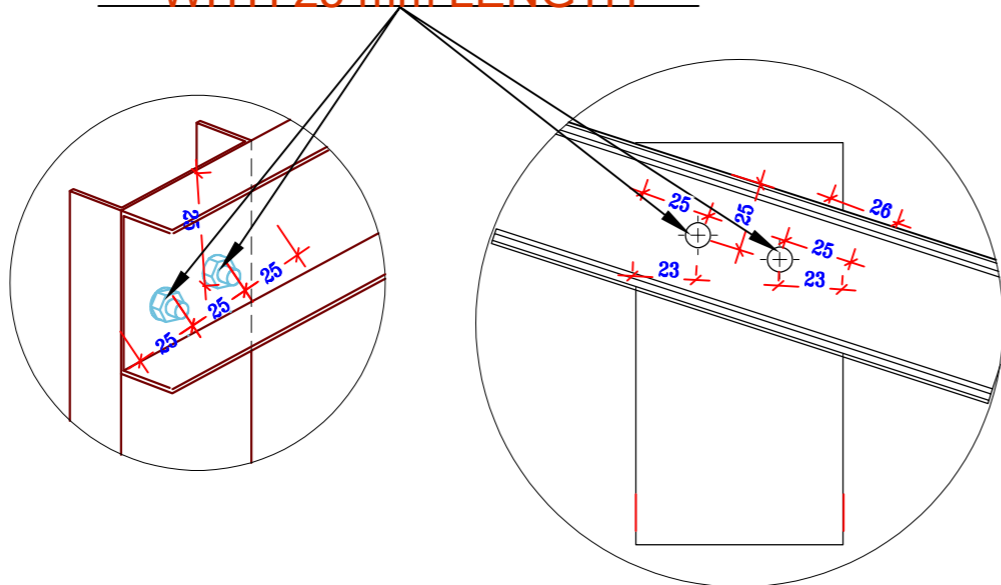


S2 - 06

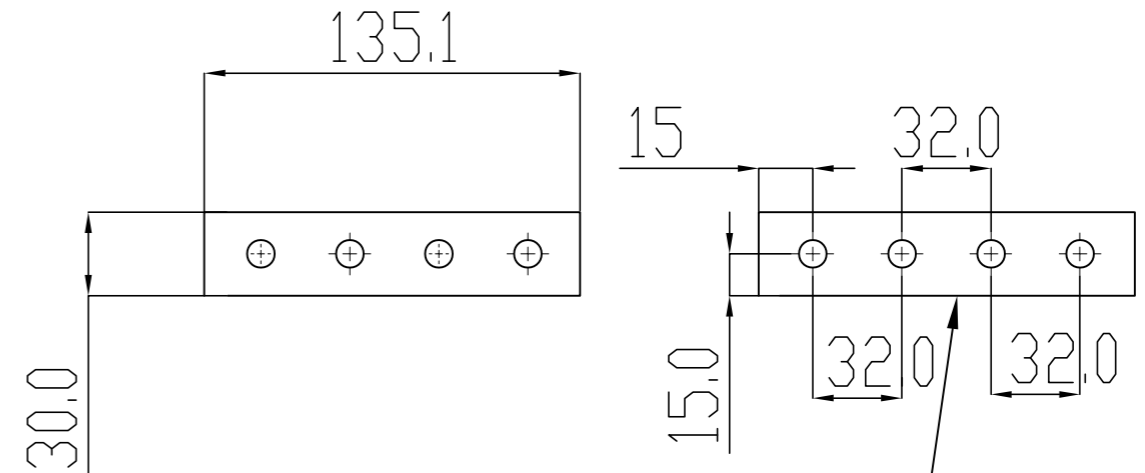
sheet اسم اللوحة

Sheet No رقم اللوحة

Ø12mm CONNECTION bolts
WITH 25 mm LENGTH



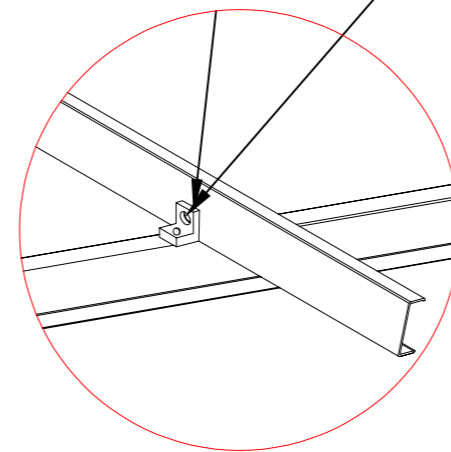
DETAIL A.



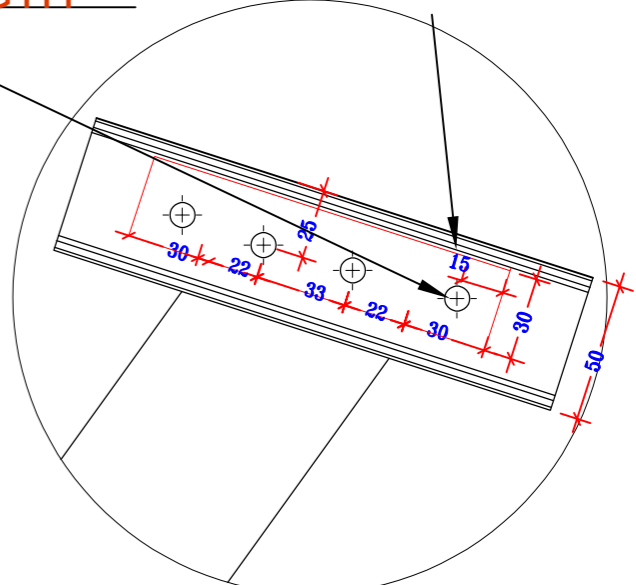
Ø12mm CONNECTION bolts
WITH 25 mm LENGTH

135x30x6mm PLATE

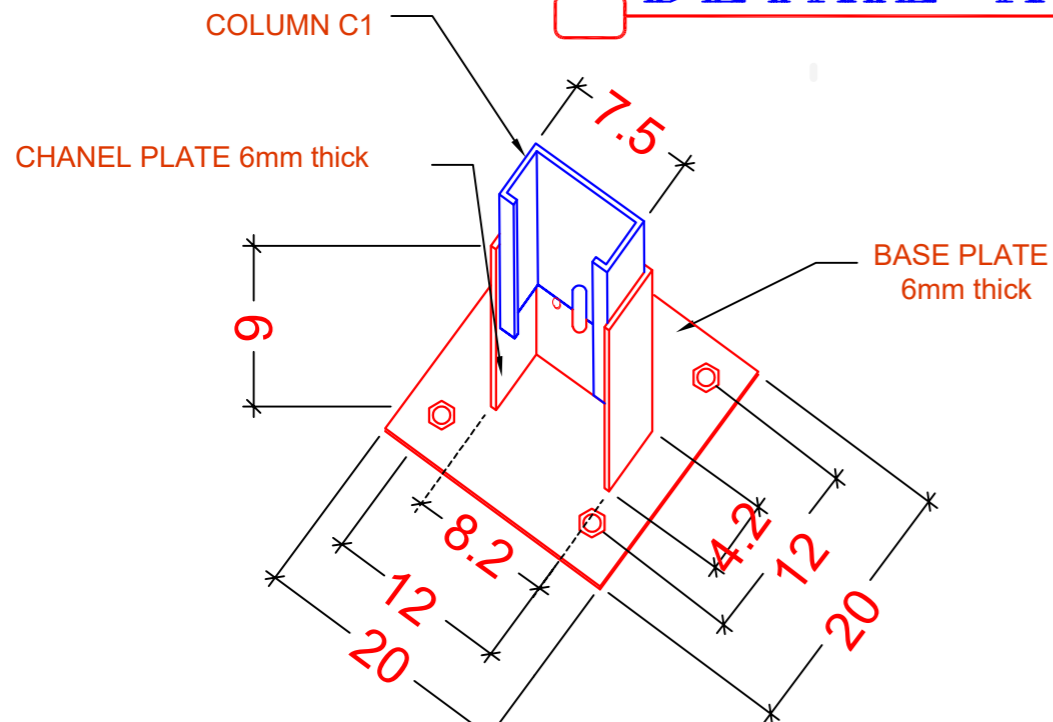
25x25x6mm LPLATE



DETAIL E



DETAIL D



BASE PLATE DETAIL

GALVANIZED STEEL SECTIONS DETAILS.

| SECTION SHAPE | NO | MEMBER DIMENSIONS IN MM | | | | REMARKS |
|---------------|-----|-------------------------|----|-------|-------|---------|
| | | A | B | C | t | |
| C1, B1 | 75 | 35 | 0 | 2.8~3 | - | |
| | P1 | 75 | 35 | 0 | 2.8~3 | - |
| | BR1 | 75 | 35 | 0 | 2.8~3 | - |



Supply & Install Solar System for
Schools in Aden

توريد وتركيب منظومات طاقة شمسية
لمدارس في عدن

تفاصيل القاعدة
CONCRETE ,CONNECTION AND BASE
PLATES DETAILS B.

ثانوية عبد الباري قاسم للبنات

sheet
اسم اللوحة

S2 - 07

Sheet No
رقم اللوحة

