



दि. मध्यप्रदेश स्टेट एगो इण्डस्ट्रीज डेवलपमेंट कार्पोरेशन लिमिटेड

(मध्यप्रदेश शासन का उपक्रम)

मुख्यालय : पंचानन भवन, तृतीय तल, मालवीय नगर, भोपाल - 462003

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मुख्या/मार्केटिंग/यात्री प्रति./2019-20/3542

दिनांक : 15.10.2019

प्रति,

क्षेत्रीय प्रबंधक (समस्त)

जिला प्रबंधक (समस्त)

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Mail से

विषय : PRE-FABRICATED STEEL STRUCTURE (YATRI-PRITIKSHALAYA & SWAGAT DWAR) के प्रदाय हेतु कय-टिकय दरों का प्रसारण ।

संदर्भ : निगम द्वारा जारी आर.सी.ओ. दिनांक 17.09.2019

निगम द्वारा वर्ष 2019-20 के लिए PRE-FABRICATED STEEL STRUCTURE (YATRI-PRITIKSHALAYA & SWAGAT DWAR) के प्रदाय हेतु दिनांक 17.09.2019 को आनलाइन दरें आमंत्रित की गयी थी। उक्त पत्र के साथ तकनीकी मापदण्ड एवं डिजाइन, ड्राईंग इस पत्र के साथ संलग्न कर भेजी जा रही है।

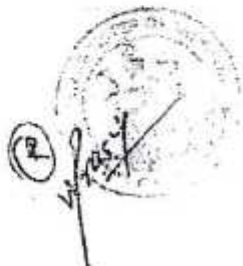
कृपया उक्तानुसार कार्यवाही सुनिश्चित करें।

उप महाप्रबंधक (विपणन)

Model-1

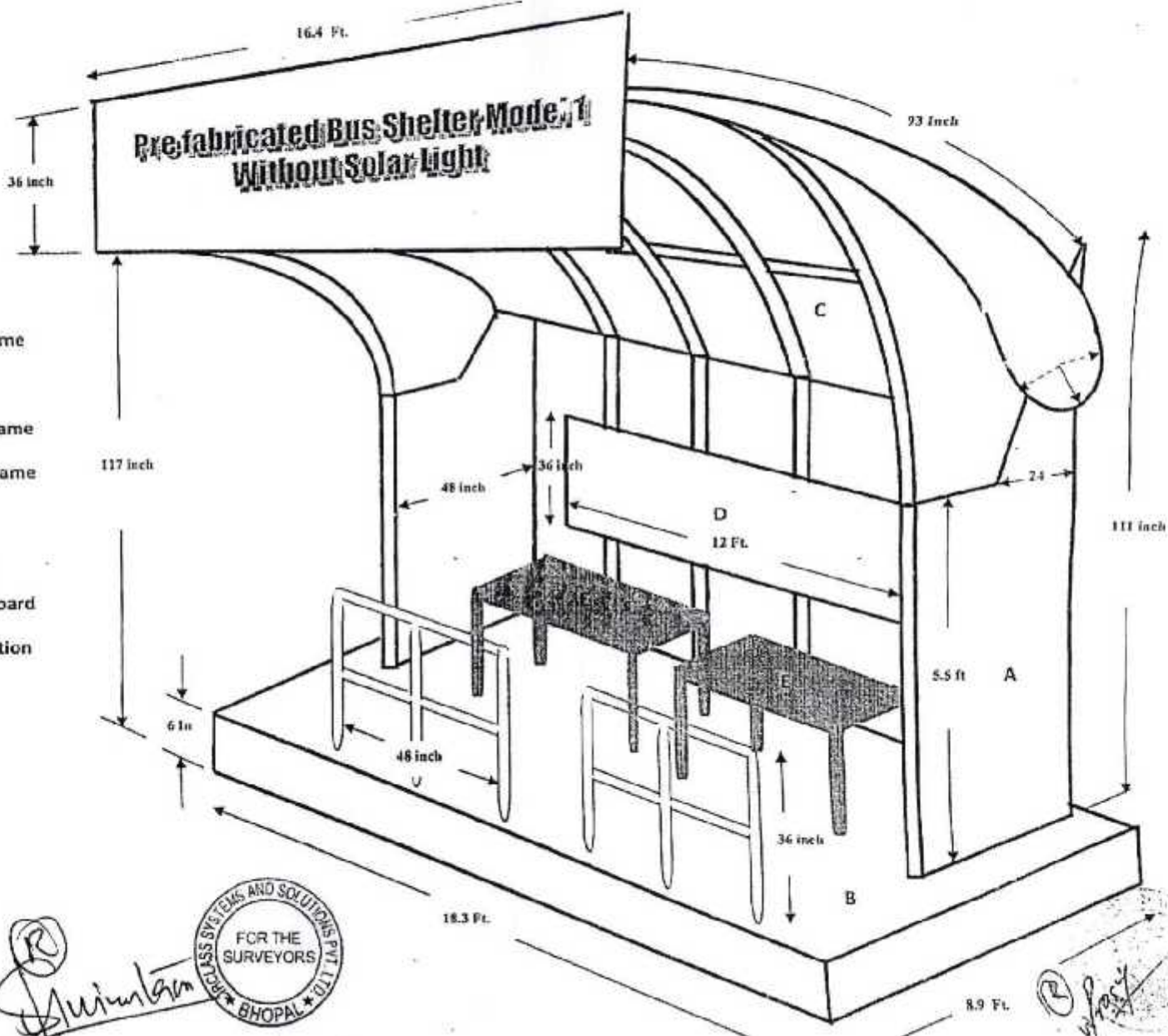
## PRE FABRICATED BUS SHELTER MODEL 1 WITHOUT SOLAR RIGHT

1. **A Side Frame** :- Side frame shall be made of 65 x 65 mm x 3 mm. square hollow section and 20 Swg. G.I. sheet with two coat enamel painting fixed by welding or riveting on the both side of the frame as per standard practice size as shown in the drawing attached.
2. **B Floor** :- Floor of the shelter shall be made of 10 inches Brick lining masonry or steel shuttering filled with base of concrete followed by Concrete pavers or concrete base as per consignee instruction.
3. **Roof Frame** :- Roof frame shall be made of 50 x 50 mm. square M.S. section followed by 1 mm. thick G.I. sheet is fitted for roof with two coat enamel coating/painting as per consignee instructions.
4. **D Back frame** :- Back frame shall be made of Square pipe 50 x 50 x 3 mm. over it 1.0 mm. G.I. sheet is fitted and fastened with back frame pipe made of 50 x 50 mm, x 3 mm. hollow square M.S. pipe.
5. **E Chair** :- Chair 2 No. as per requirement is fixed in concrete base shall be made of 50 mm. round G.I. pipe of standard practice with G.I. sheet fixed over it with two coat of enamel colour over it as per consignee instructions as shown in drawing attached.
6. **F Railing** :- 2 No. of railing shall be made of 40 mm. diameter G.I. pipe without colour with two coat of enamel colour over it as per consignee instructions as shown in drawing attached.
7. **G Front Sign Board** :- Front sign board shall be made of Rectangular pipe pipe 50 x 25 x 3 mm. and 20 Swg. Sheet fitted over it or board fully made of 20 swg. Sheet with collar bend to entire boundary for strength. this board is placed over the top of the shade.
8. **H Foundation** :- Foundation of the Whole shade rest on the coloumn footing/ Foundation bolt as per standard practice .

A handwritten signature in black ink is written over a circular blue stamp. The stamp contains some illegible text and a star symbol.

A handwritten signature in black ink is written over a circular blue stamp. The stamp contains the text 'SYSTEMS AND SOLUTIONS PVT. LTD.' and 'BHOPAL' around the perimeter, with 'THE SURVEYORS' in the center.

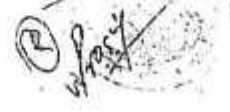
A handwritten signature in black ink is written over a circular blue stamp. The stamp contains the text 'SYSTEMS AND SOLUTIONS PVT. LTD.' and 'BHOPAL' around the perimeter, with 'THE SURVEYORS' in the center.



- TERMS :-
- A :- Side Frame
  - B :- Floor
  - C :- Roof Frame
  - D :- Back Frame
  - E :- Chair
  - F :- Railing
  - G :- Front Board
  - H :- Foundation



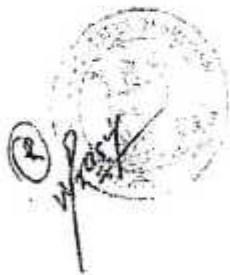
Model-1



Model-2

## SPECIFICATION OF PRE FABRICATED BUS SHELTER MODEL 2, WITH Two 16 WATT LED SOLAR LIGHT

1. **A Side Frame** :- Side frame shall be made of 50 x 50 mm. square hollow section and 20 Swg. G.I. sheet without colour or M.S. sheet with two coat enamel painting fixed by welding or riveting on the both side of the frame as per standard practice size as shown in the drawing attached.
2. **B Floor** :- Floor of the shelter shall be made of 10 inches Brick lining masonry filled with lean base of concrete followed by Concrete pavers or concrete base as per consignee instruction.
3. **Roof Frame** :- Roof frame shall be made of 50 x 50 mm. square M.S. section followed by .5 mm. thick G.I. sheet is fitted for roof with two coat enamel coating/painting as per consignee instructions.
4. **D Back frame** :- Back frame shall be made of I.S.A. 25 x 25 x 3 mm. over it 20 swg. G.I. sheet is fitted and fastened with back frame pipe made of 50 x 59 mm. hollow square M.S. pipe.
5. **E Chair** :- Chair 2 No. as per requirement is fixed in concrete base shall be made of 30 mm. round M.S. pipe of standard practice with G.I. sheet fixed over it like bench without colour or M.S. sheet with two coat of enamel colour over it as per consignee instructions as shown in drawing attached.
6. **F Railing** :- 2 No. of railing shall be made of 40 mm. diameter S.S./G.I. pipe without colour or M.S. pipe with two coat of enamel colour over it as per consignee instructions as shown in drawing attached.
7. **G Front Sign Board** :- Front sign board shall be made of frame I.S.A. 25 x 25 x 3 mm. and 20 Swg. Sheet fitted over it or board fully made of 20 swg. Sheet with collar bend to entire boundary for strength. this board is placed over the top of the shade.
8. **H Foundation** :- Foundation of the Whole shade rest on the column footing/ Foundation bolt as per standard practice .



Model 2

## 16 Watt Solar Light & Structure

White Light Emitting Diode (W-LED) is a solid state device which emits light when forward electric current passes through it. A LED based solar street lighting system consists of a PV Module, control electronics, battery, and W-LED based Luminaries, all suitably mounted on a Pole. The battery is charged by electricity generated through the PV module during day time and the luminary provides light from dusk to dawn.

Light Source	White Light Emitting Diode (W-LED) LED
Light Out put	White colour (colour temperature 55000 -65000 K) minimum 15 LUX when measured at the periphery of 4 meter diameter from a height up to 2 to 4 meter. The illumination should be uniform without dark bands or abrupt variations, and soothing to the eye. Higher light output will be preferred.
Mounting of light	2 to 4 metre mounted
PV Module	1. 40 Wp under STC, measured at 16.4 V at load. Module Voc minimum of 21V- (For 16W Model)
Battery	12 V- 40 AH @ C/10, Max DoD 75%. Tubular OR 12 V- 40 AH @ C/10, Max DoD 75%. Tubular Lead Acid Floated (For 16W Model) OR 12 V- 60 AH @ C/10, Max DoD 75%. Tubular OR 12 V- 60 AH @ C/10, Max DoD 75%. Tubular Lead Acid Floated
Electronics Efficiency	Min 85% total
Duty Cycle	Dusk to dawn
Autonomy	3 days or Minimum 42 operating hours per permissible discharge

### OTHER DETAILS

#### DUTY CYCLE


The W-LED solar street lighting system should be designed to operate from dusk to dawn, under average daily insolation of 5.5 kWh/sq.m. on a horizontal surface.

#### LIGHT SOURCE

1. The light source will be a white LED type.
2. The colour temperature of white LED used in the system should be in the range of 55000 K-65000
3. W-LEDs should not emit ultraviolet light. K.
4. The light output from the white LED light source should be constant throughout the duty cycle.
5. The lamps should be housed in an assembly suitable for outdoor use.
6. The temperature of heat sink should not increase more than 20°C above ambient temperature during the dusk to dawn operation.

#### BATTERY

1. 12V, 45Ah and 12V, 60Ah lead Acid, Tubular Positive Plate flooded electrolyte.
2. The battery will have a minimum rating of 12V, 45Ah and 12V 60Ah at C/10 discharge rate. 75 % of the rated capacity of the battery should be between fully charged and load cut off conditions.
3. Battery should conform to the standard make.


**ELECTRONICS**

1. The total electronic efficiency should be at least 85%.
2. Electronics should operate at 12 V and should have temperature compensation for proper charging of the battery throughout the year.
3. No load current consumption should be less than 20 mA.
4. The PV module itself should be used to sense the ambient light level for switching ON and OFF the lamp.
5. The PCB containing the electronics should be capable of solder free installation and replacement.
6. Necessary lengths of wires/cables, switches suitable for DC use and fuses should be provided.

**PV MODULE**

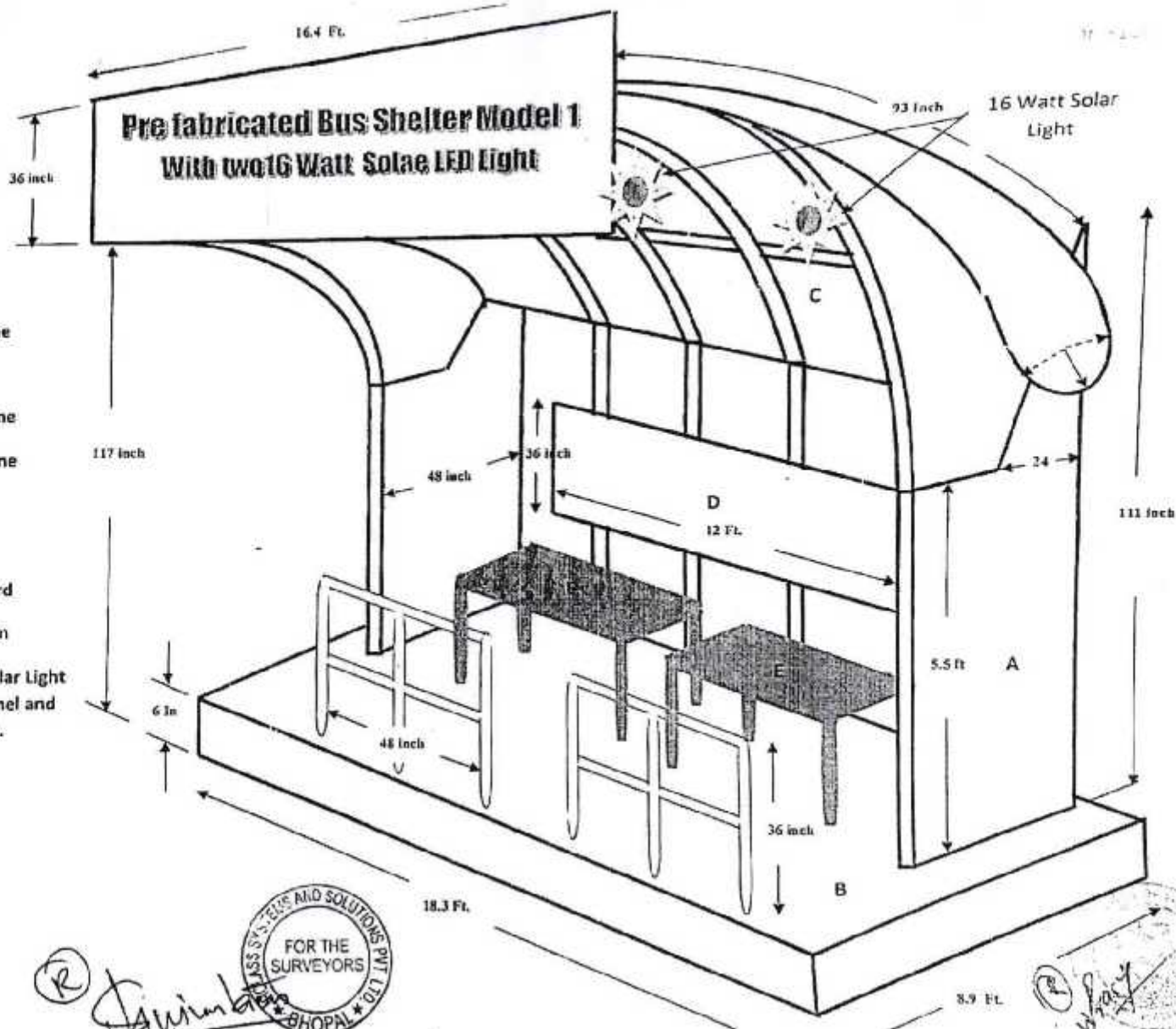
1. Indigenously manufactured PV module should be used.
2. The PV module should have crystalline silicon solar cells.
3. The power output of the module(s) under STC should be a minimum of 40 Wp at a load voltage\* of  $16.4 \pm 0.2$  V.
4. Open circuit voltage\* of the PV modules under STC should be at least 21.0 Volts.
5. The module efficiency should not be less than 12 %.
6. The terminal box on the module should have a provision for opening for replacing the cable, if required.
7. Identification and Traceability Each PV module used in any solar power project must use a RF identification tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.)
  1. Name of the Manufacturer of PV module
  2. Name of the manufacturer of Solar Cells.
  3. Month and year of the manufacture (separately for solar cells and module).
  4. Country of origin (separately for solar cells and module).

**ELECTRONIC PROTECTIONS**

1. Adequate protection is to be incorporated under "No Load" conditions e.g. when the lamp is removed and the system is switched ON.
2. The system should have protection against battery overcharge and deep discharge conditions.
3. Fuse should be provided to protect against short circuit conditions.
4. Protection for reverse flow of current through the PV module(s) should be provided.
5. Electronics should have temperature compensation for proper charging of the battery throughout the year.
6. Adequate protection should be provided against battery reverse polarity. vii. Load reconnect should be provided at 80% of the battery capacity status.







- TERMS :-
- A :- Side Frame
  - B :- Floor
  - C :- Roof Frame
  - D :- Back Frame
  - E :- Chair
  - F :- Railing
  - G :- Front Board
  - H :- Foundation
  - I : 16 Watt Solar Light with solar panel and battery.

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*Signature*



Model-2



## Detail Specification of BUS STAND PRE FABRICATED STEEL STRUCTURE MODEL 3

S.No	ITEM NAME	DETAIL DESCRIPTION	Qty.
A.	Structure of Side Frame and Panels	<ol style="list-style-type: none"> <li>Structure of Frame :- 150 x 150 x 1.6 mm. square hollow M.S. Pipe.</li> <li>1.0 mm. thick Colour Coated Aluminum Composite Panel Sheet fixed with horizontal support of hollow square pipe 50 x 50 mm. as shown in the Drawing No. DRW- UPAGR-11</li> </ol>	2 No.
B.	Structure of Back Frame and Panels	<ol style="list-style-type: none"> <li>Structure of Frame :- 50 x 50 x 1 mm. square hollow M.S. Pipe.</li> <li>1.0 mm. thick Colour Coated Aluminum Composite Panel Sheet fixed with horizontal support of hollow square pipe 50 x 50 mm. as shown in the Drawing No. DRW- UPAGR-11</li> </ol>	1 No.
C.	Structure of Roof Frame and sheets.	<ol style="list-style-type: none"> <li>Structure of Frame :- 50 x 50 square hollow M.S. Pipe. And 25 x 25 mm. hollow square pipe in combination as a pulings.</li> <li>M.S. sheet having thickness .5 mm. shall have with structural frame in size by welding or riveting as shown in the Drawing No. DRW-UPAGR-11</li> </ol>	1 No.
D.	Seating Arrangement	<ol style="list-style-type: none"> <li>Seating arrangement for bus stop shade shall be made of .8 mm. M.S. hollow square Pipe having 50 x 25 mm. with combination of 25 x 25 mm. square hollow pipe throughout the width of the structure. as shown in the Drawing No. DRW-UPAGR-11</li> </ol>	2 No.
E.	Structure for Railing	<ol style="list-style-type: none"> <li>M.S. Railing shall be made of round M.S. Pipe 30 mm. diameter as per shown in the drawing DRW-UPAGR-11</li> </ol>	2 No.
F.	Display Board	<ol style="list-style-type: none"> <li>Display Board shall be made of .8 mm. thick M.S. pressed steel sheet, sides of the frame should be flanged to give strength on the corners, in size as shown in the Drawing No. DRW-UPAGR-11</li> </ol>	1 No.
G.	Foundation of Structure	<ol style="list-style-type: none"> <li>Main structure i.e. Side frame shall be fixed with Column footing / foundation bolts having at least 10 mm. Anchor bolt as per standard practice.</li> </ol>	4 No.
H.	Floor	<ol style="list-style-type: none"> <li>Excavation up to 2 ft then proper dressing &amp; compaction of the floor by hard moorum ( 15 x 20 ft.).</li> <li>Floor of the structure shall ne made of 203 mm. brick lining masonry or fixed permanent shuttering on the all side of the structure filled with lean base of concrete followed by concrete pavers / Vitrified tiles or solid concrete base as per 1:3:6 Cc M20 grade floor as per consignee instructions.</li> </ol>	160 q. ft.
9.	Solar Light 2 No. (Auto Cut off)	<ol style="list-style-type: none"> <li>Providing and fixing of 1 No. White-LED ( W-Led) based Solar street lighting system 16 Watt.</li> <li>Light Output White colour ( Colour temperature 55000 – 65000 K) minimum 15 LUX when measured at the periphery of 4 meter diameter.</li> <li>PV Module 40 Wp under STC, measured at 16.4 V at load. Module Voc minimum of 21 V.</li> <li>Battery 12 V- 40 AH @ C/10 Max DoD 75% Tubular or lithium. As per consignee instructions.</li> </ol>	



Model 3

## 16 Watt Solar Light & Structure

White Light Emitting Diode (W-LED) is a solid state device which emits light when forward electric current passes through it. A LED based solar street lighting system consists of a PV Module, control electronics, battery, and W-LED based Luminaries, all suitably mounted on a Pole. The battery is charged by electricity generated through the PV module during day time and the luminary provides light from dusk to dawn.

Light Source	White Light Emitting Diode (W-LED) LED
Light Out put	White colour (colour temperature 55000 -65000 K) minimum 15 LUX when measured at the periphery of 4 meter diameter from a height up to 2 to 4 meter. The illumination should be uniform without dark bands or abrupt variations, and soothing to the eye. Higher light output will be preferred.
Mounting of light	2 to 4 metre mounted
PV Module	1. 40 Wp under STC, measured at 16.4 V at load. Module Voc minimum of 21V- (For 16W Model)
Battery	12 V- 40 AH @ C/10, Max DoD 75%. Tubular OR 12 V- 40 AH @ C/10, Max DoD 75%. Tubular Lead Acid Floated (For 16W Model) OR 12 V- 60 AH @ C/10, Max DoD 75%. Tubular OR 12 V- 60 AH @ C/10, Max DoD 75%. Tubular Lead Acid Floated
Electronics Efficiency	Min 85% total
Duty Cycle	Dusk to dawn
Autonomy	3 days or Minimum 42 operating hours per permissible discharge

### OTHER DETAILS

#### DUTY CYCLE

The W-LED solar street lighting system should be designed to operate from dusk to dawn, under average daily insolation of 5.5 kWh /sq.m. on a horizontal surface.

#### LIGHT SOURCE

1. The light source will be a white LED type.
2. The colour temperature of white LED used in the system should be in the range of 55000 K-65000
3. W-LEDs should not emit ultraviolet light. K.
4. The light output from the white LED light source should be constant throughout the duty cycle.
5. The lamps should be housed in an assembly suitable for outdoor use.
6. The temperature of heat sink should not increase more than 20°C above ambient temperature during the dusk to dawn operation.

#### BATTERY

1. 12V, 45Ah and 12V, 60Ah lead Acid, Tubular Positive Plate flooded electrolyte.
2. The battery will have a minimum rating of 12V; 45Ah and 12V 60Ah at C/10 discharge rate. 75 % of the rated capacity of the battery should be between fully charged and load cut off conditions.
3. Battery should conform to the standard make.



**ELECTRONICS**

1. The total electronic efficiency should be at least 85%.
2. Electronics should operate at 12 V and should have temperature compensation for proper charging of the battery throughout the year.
3. No Load current consumption should be less than 20 mA.
4. The PV module itself should be used to sense the ambient light level for switching ON and OFF the lamp.
5. The PCB containing the electronics should be capable of solder free installation and replacement.
6. Necessary lengths of wires/cables, switches suitable for DC use and fuses should be provided.

**PV MODULE**

1. Indigenously manufactured PV module should be used.
2. The PV module should have crystalline silicon solar cells.
3. The power output of the module(s) under STC should be a minimum of 40 Wp at a load voltage\* of  $16.4 \pm 0.2$  V.
4. Open circuit voltage\* of the PV modules under STC should be at least 21.0 Volts.
5. The module efficiency should not be less than 12 %.
6. The terminal box on the module should have a provision for opening for replacing the cable, if required.
7. Identification and Traceability Each PV module used in any solar power project must use a RF Identification tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.)
  1. Name of the Manufacturer of PV module
  2. Name of the manufacturer of Solar Cells.
  3. Month and year of the manufacture (separately for solar cells and module).
  4. Country of origin (separately for solar cells and module).

**ELECTRONIC PROTECTIONS**

1. Adequate protection is to be incorporated under "No Load" conditions e.g. when the lamp is removed and the system is switched ON.
2. The system should have protection against battery overcharge and deep discharge conditions.
3. Fuse should be provided to protect against short circuit conditions.
4. Protection for reverse flow of current through the PV module(s) should be provided.
5. Electronics should have temperature compensation for proper charging of the battery throughout the year.
6. Adequate protection should be provided against battery reverse polarity. vii. Load reconnect should be provided at 80% of the battery capacity status.

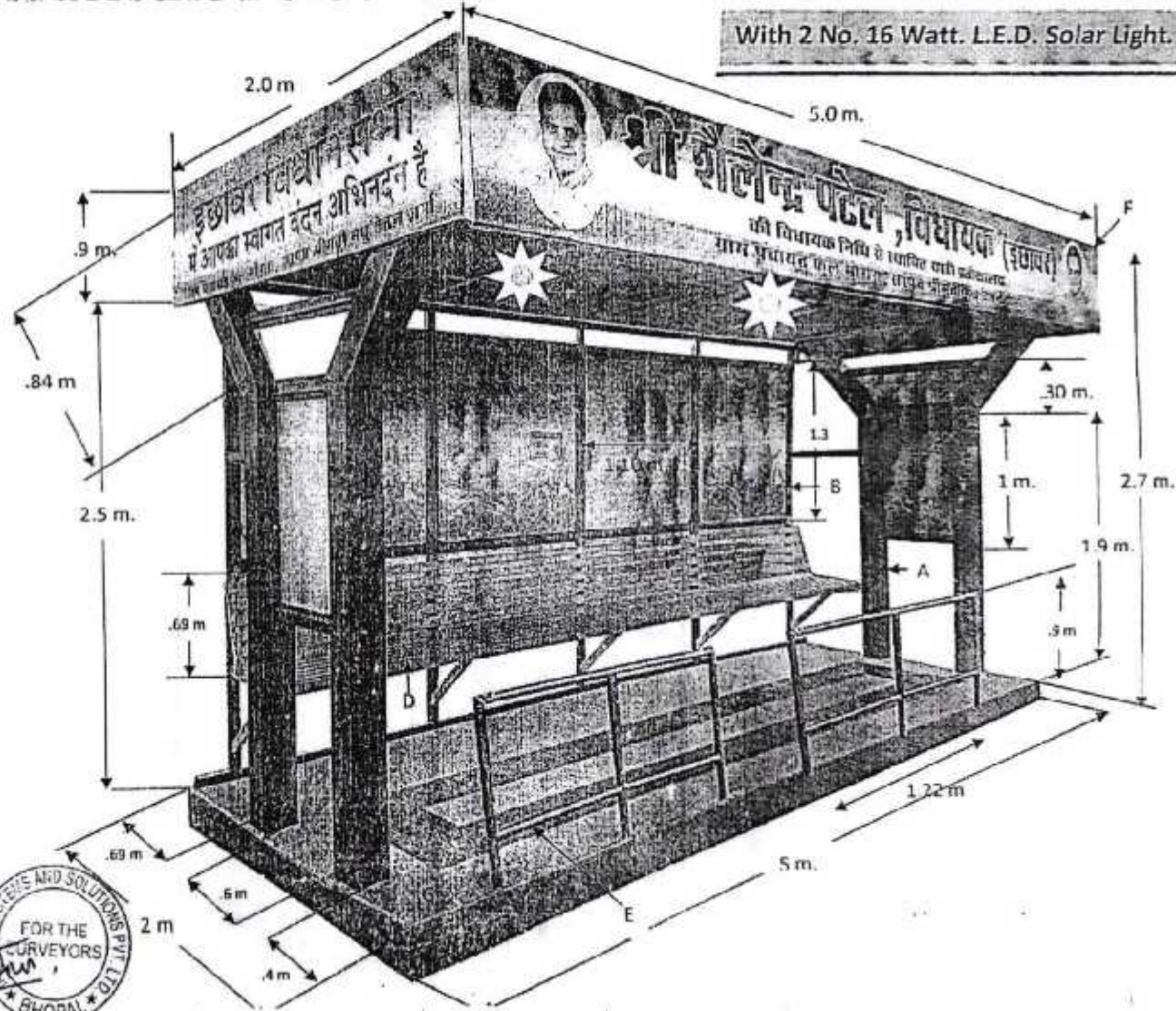
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BHOPAL

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BUSINESS SYSTEMS AND SOLUTIONS PVT. LTD.  
BHOPAL

# Prefabricated Steel Structure for Bus Stand Model 3

With 2 No. 16 Watt. L.E.D. Solar Light.

- A :- Structure of Side frame and Panels .
- B :- Structure of back frame and Panels
- C :- Structure of Roof frame and Panels
- D :- Seating Arrangement.
- E :- Structure of Railing.
- F :- Display Board.
- G :- Foundation Structure
- H :- Floor with side shuttering.
- I :- Solar Light 16 watt. LED Light.



Model-3

**SOLAR POWERED PREFABRICATED BUS SHELTER**  
**Technical Specification**

- **Side Frame:-** Side frame shall be made of 75x75x3mm round hollow section curved at 50 degree by pipe rolling machine and 1.25mm M.S. sheet with two coat colour enamel painting fixed by press moulding, welding or riveting on the both side of the frame as per standard practice size as shown in the drawing attached. 4x4 feet free space available for Information & communication of Govt. schemes with the help of flex/painting as per consignee instructions.
- **Foundation:-** Foundation shall be made up of M.S. sheet of 3 mm thickness around 4 sides of shade, size of panel shall be of 300x75x25 & moulding by hydraulic press.
- **Floor:-** Floor of the shelter shall be made of 10 inches Brick lining masonry filled with lean base of concrete followed by pavers or concrete base as per consignee instructions.
- **Roof Frame:-** Roof frame shall be made up of 50x25 mm square M.S. pipe section followed by 0.5mm G.I. profile sheet powered coated fitted for roof at 40 degree bending by hydraulic press.
- **Back Frame:-** Back frame shall be made up of I.S.A. 25x25x3 mm., 1.25 mm M.S. sheet fixed & fastened by moulding & welding into back frame supporting pipe of 75x3 mm round pipe. There is 36 Square feet free space available for Information & communication of Govt. Schemes with the help of Flex/ painting as per consignee instructions.
- **Chair:-** Sitting arrangement of at least 8 people should be made. Chairs of stainless steel mounting, grounding & fixing over the S.S. frame as shown in drawing.
- **Front Railing:-** Two nos. of stainless steel front railing shall be there to restrict entrance of stray animals inside shade. Size of each front railing shall be 1500 mm in length & 900 mm above the ground. Open Space of 600 mm between railings should be provided to enter in shade.
- **Side Railing:-** Two nos. of stainless steel side railing shall be there to restrict entrance of stray animals inside shade. Size of each side railing shall be 1200 mm in length & 900 mm above the ground.

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Model-4

- **Front Sign Board:-** Front sign Board shall be made of frame I.S.A. 25×25×3 mm. M.S. pipe & 1.25 mm M.S. sheet fitted by bending hydraulic machine & fixed by welding. Board shall be of 12×2 feet for Information & communication of Govt. schemes.
- **Lighting Arrangement:-** Shelter should have proper lighting arrangement by Solar lamp of light output 6 watt with minimum lumen of 90 lumen/watt. Lithium Ion battery capacity should be of 3.6 volt/8amp & solar panel should be of 10 Wp.

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FOR THE SURVEYORS  
BHOVAL

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BHOVAL

## 16 Watt Solar Light & Structure

White Light Emitting Diode (W-LED) is a solid state device which emits light when forward electric current passes through it. A LED based solar street lighting system consists of a PV Module, control electronics, battery, and W-LED based Luminaries, all suitably mounted on a Pole. The battery is charged by electricity generated through the PV module during day time and the luminary provides light from dusk to dawn.

Light Source	White Light Emitting Diode (W-LED) LED
Light Out put	White colour (colour temperature 55000 -65000 K) minimum 15 LUX when measured at the periphery of 4 meter diameter from a height up to 2 to 4 meter. The illumination should be uniform without dark bands or abrupt variations, and soothing to the eye. Higher light output will be preferred.
Mounting of light	2 to 4 metre mounted
PV Module	1. 40 Wp under STC, measured at 16.4 V at load. Module Voc minimum of 21V- (For 16W Model)
Battery	12 V- 40 AH @ C/10, Max DoD 75%. Tubular OR 12 V- 40 AH @ C/10, Max DoD 75%. Tubular Lead Acid Floated (For 16W Model) 12 V- 60 AH @ C/10, Max DoD 75%. Tubular OR 12 V- 60 AH @ C/10, Max DoD 75%. Tubular Lead Acid Floated
Electronics Efficiency	Min 85% total
Duty Cycle	Dusk to dawn
Autonomy	3 days or Minimum 42 operating hours per permissible discharge

### OTHER DETAILS

#### DUTY CYCLE

The W-LED solar street lighting system should be designed to operate from dusk to dawn, under average daily insolation of 5.5 kWh/sq.m. on a horizontal surface.

#### LIGHT SOURCE

1. The light source will be a white LED type.
2. The colour temperature of white LED used in the system should be in the range of 55000 K-65000
3. W-LEDs should not emit ultraviolet light. K.
4. The light output from the white LED light source should be constant throughout the duty cycle.
5. The lamps should be housed in an assembly suitable for outdoor use.
6. The temperature of heat sink should not increase more than 20°C above ambient temperature during the dusk to dawn operation.

#### BATTERY

1. 12V, 45Ah and 12V, 60Ah lead Acid, Tubular Positive Plate flooded electrolyte.
2. The battery will have a minimum rating of 12V, 45Ah and 12V 60Ah at C/10 discharge rate. 75 % of the rated capacity of the battery should be between fully charged and load cut off conditions.
3. Battery should conform to the standard make.



**ELECTRONICS**

1. The total electronic efficiency should be at least 85%.
2. Electronics should operate at 12 V and should have temperature compensation for proper charging of the battery throughout the year.
3. No Load current consumption should be less than 20 mA.
4. The PV module itself should be used to sense the ambient light level for switching ON and OFF the lamp.
5. The PCB containing the electronics should be capable of solder free installation and replacement.
6. Necessary lengths of wires/cables, switches suitable for DC use and fuses should be provided.

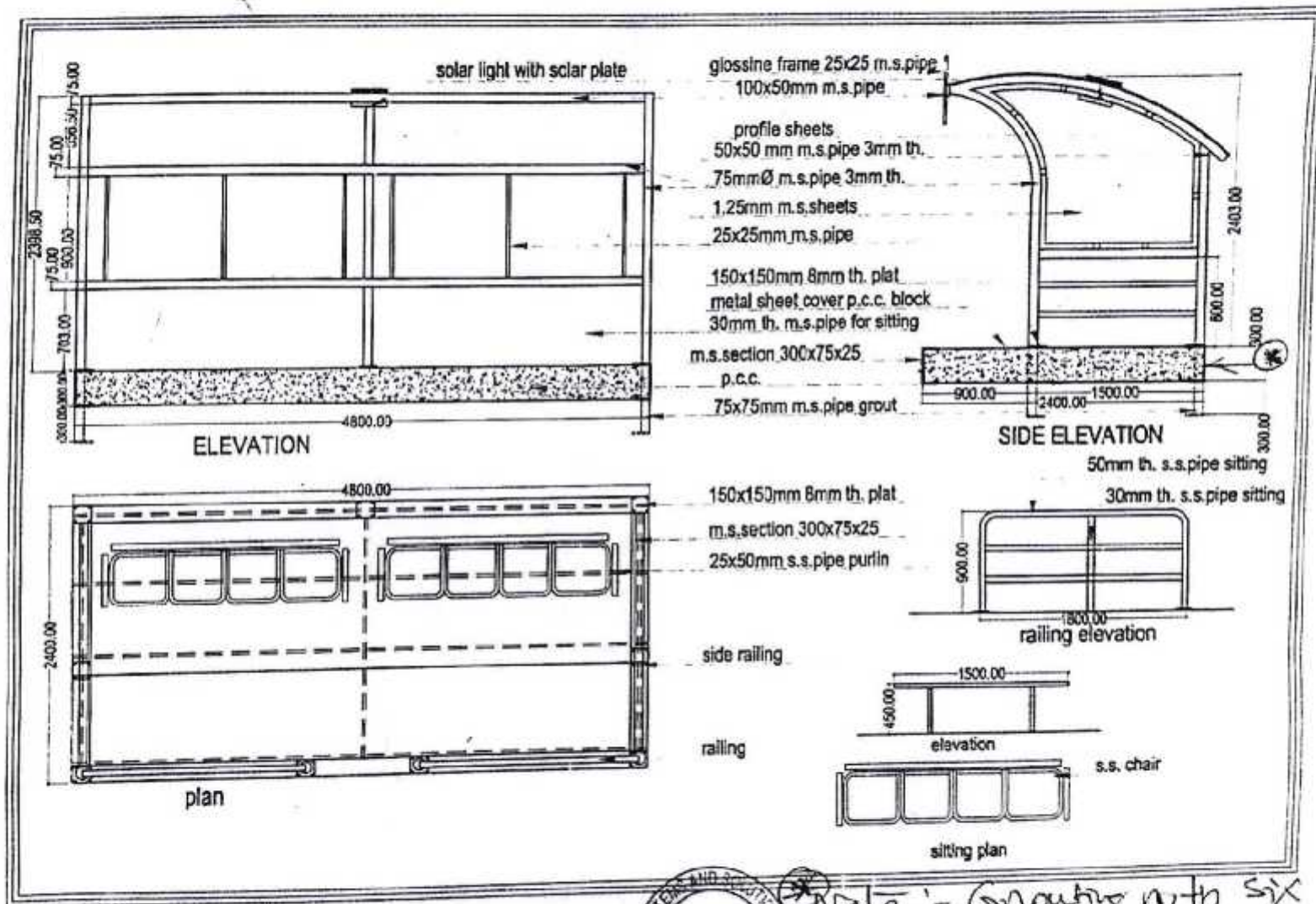
**PV MODULE**

1. Indigenously manufactured PV module should be used.
2. The PV module should have crystalline silicon solar cells.
3. The power output of the module(s) under STC should be a minimum of 40 Wp at a load voltage\* of  $16.4 \pm 0.2$  V.
4. Open circuit voltage\* of the PV modules under STC should be at least 21.0 Volts.
5. The module efficiency should not be less than 12 %.
6. The terminal box on the module should have a provision for opening for replacing the cable, if required.
7. Identification and Traceability Each PV module used in any solar power project must use a RF identification tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.)
  1. Name of the Manufacturer of PV module
  2. Name of the manufacturer of Solar Cells.
  3. Month and year of the manufacture (separately for solar cells and module).
  4. Country of origin (separately for solar cells and module).

**ELECTRONIC PROTECTIONS**

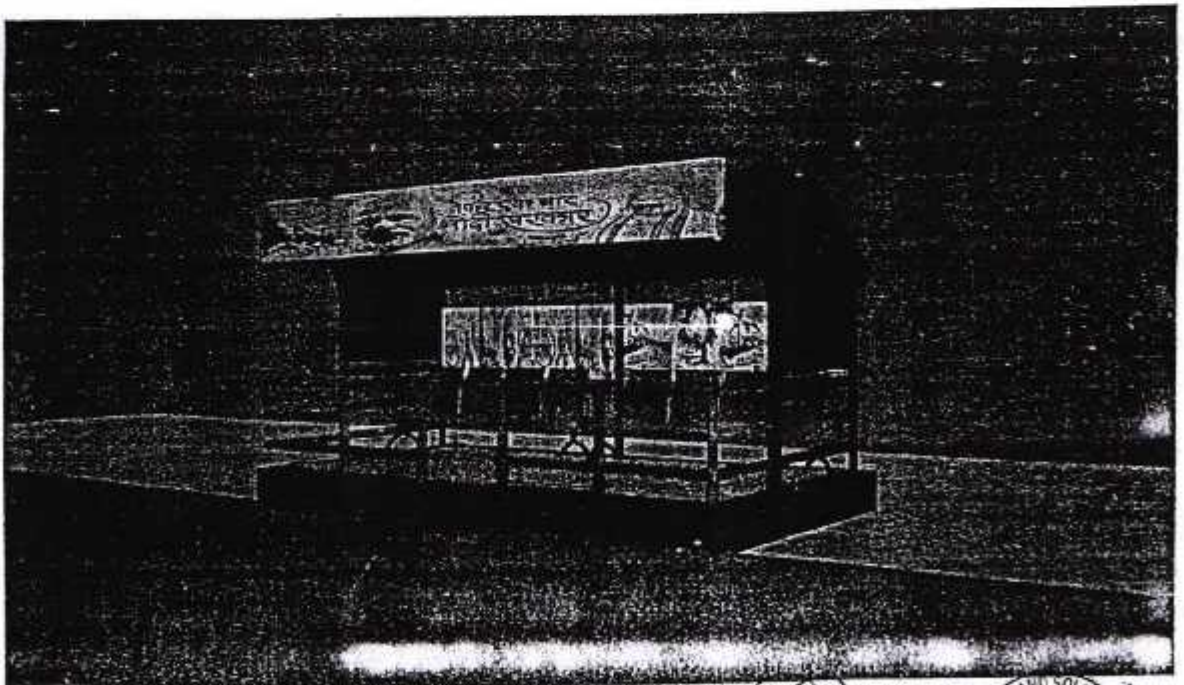
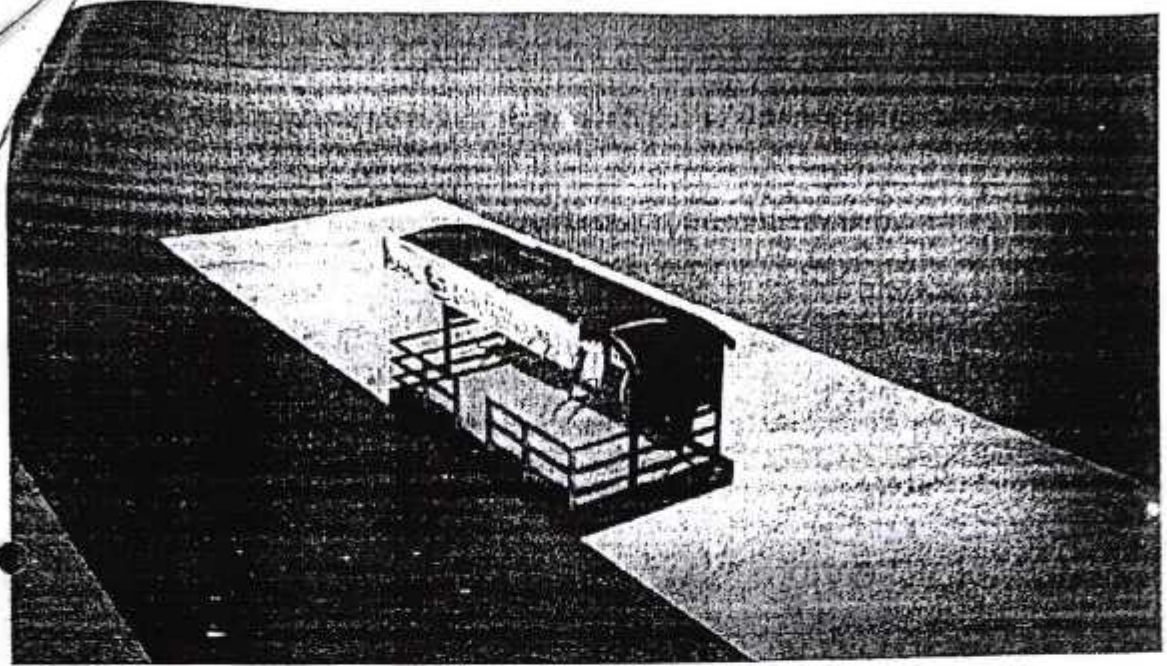
1. Adequate protection is to be incorporated under "No Load" conditions e.g. when the lamp is removed and the system is switched ON.
2. The system should have protection against battery overcharge and deep discharge conditions.
3. Fuse should be provided to protect against short circuit conditions.
4. Protection for reverse flow of current through the PV module(s) should be provided.
5. Electronics should have temperature compensation for proper charging of the battery throughout the year.
6. Adequate protection should be provided against battery reverse polarity. vii. Load reconnect should be provided at 80% of the battery capacity status.





Note:- Grouting with six anchors of 03 inch.  
*(Signature)*

Model-4



(R) *Sanjay*  
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BHO PAL

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ENGINEERS AND SOLUTIONS PVT. LTD.  
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BHO PAL

Model - 1

## Simply Supported Type Swagat Dwar Without Solar LED Light

### A. Sign Board with frame and bottom mounting plate

- 1). Horizontal frame members 75 mm dia and 1.5mm thickness MS pipe
- 2). Cross frame members 25mm dia and 1.5 mm thickness MS pipe
- 3). Board 1 mm thickness MS sheet
- 4). 600mm x 600mm x 25mm Mounting MS Plates-2 Nos

### B. Vertical column with top, bottom mounting plates & stiffner plates

- 1). 300mm dia and 4mm thickness pipe, 6175mm length
- 2). 600mm x 600mm x 25mm bottom Mounting MS Plate
- 3). 600mm x 600mm x 25mm top Mounting MS Plate
- 4). 25mm thick MS stiffner plates- 8 Nos

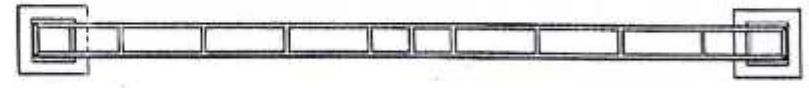
### C. Column foundation

- 1).  $\varnothing$ 25mm L- Shape MS bolts- 8 Nos
- 2).  $\varnothing$ 10 mm Circular stirrups - 8 Nos
- 3). 762mm x 762mm x 1320mm concrete column
- 4). 1220mm x 1220 mm x 100mm Concrete slab
- 4). 1220mm x 1220 mm x 100mm Concrete base

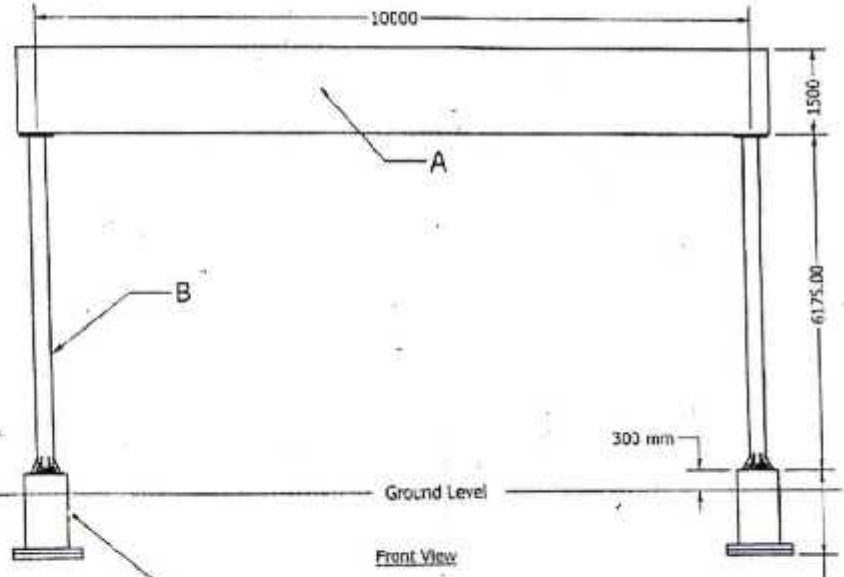




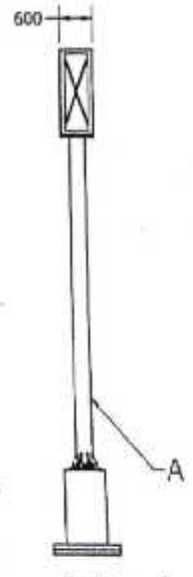
# Simply Supported Type Swagat Dwar Without Solar LED Light



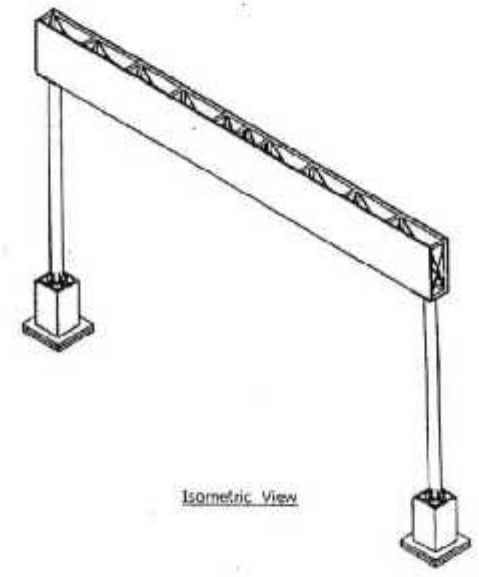
Top View



Front View



Side View



Isometric View

- A: Sign Board with frame and bottom mounting plate
- B: Vertical column with top, bottom mounting plates & stiffner plates
- C: Column foundation

Handwritten signature and initials.



Sheet-1

A

0.9 mm thick MS Sheet

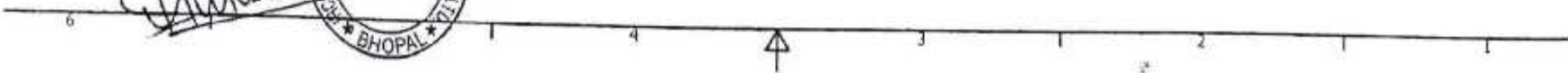
Isometric View

Ø75mm MS Pipe with 1.5mm thickness

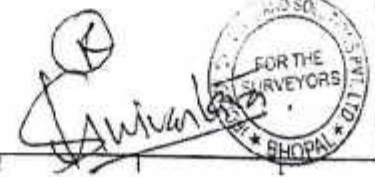
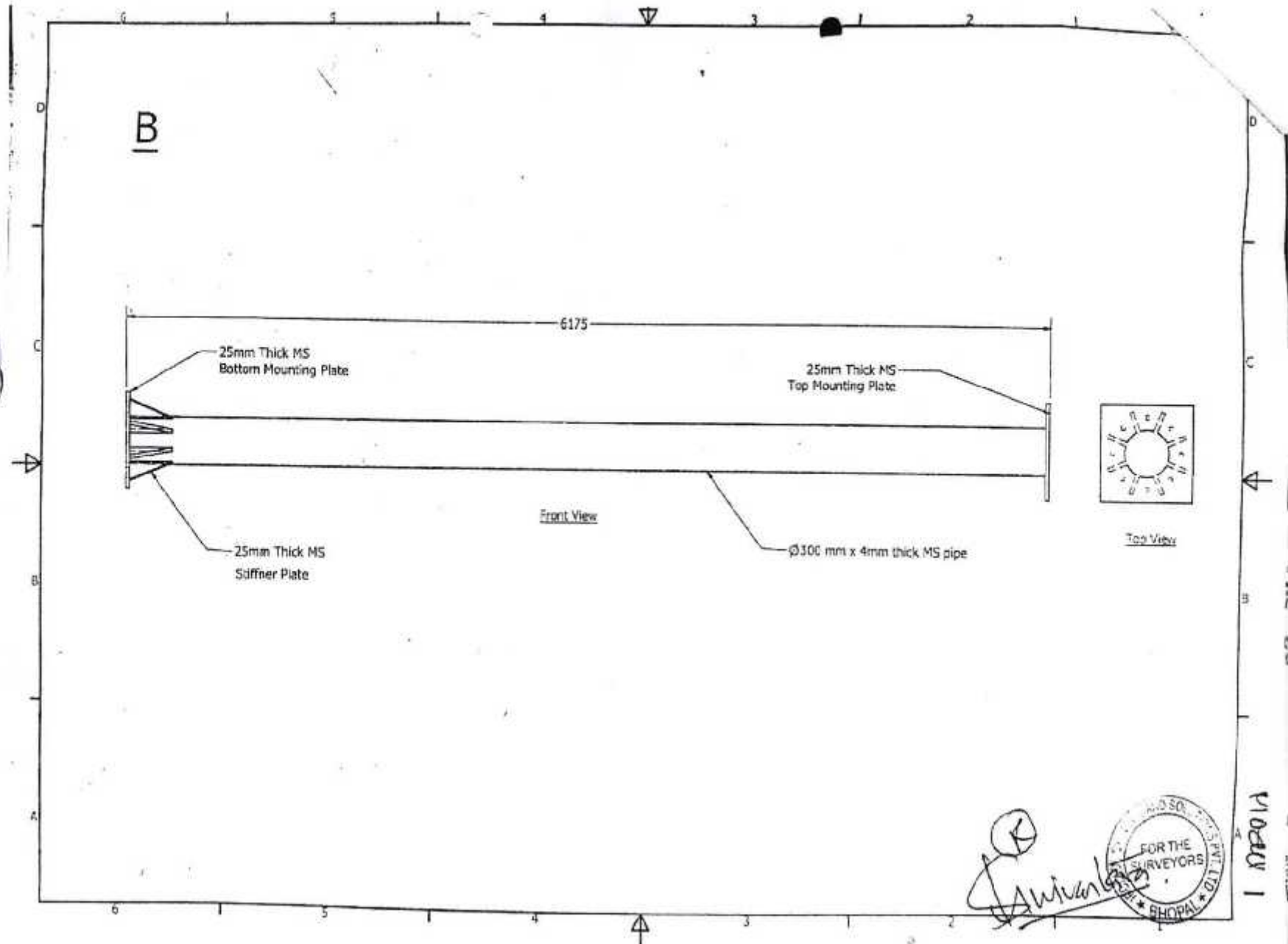
Ø25 mm MS Pipe with 1.5mm thickness

600x 600 x 25 mm MS Plate

Front View

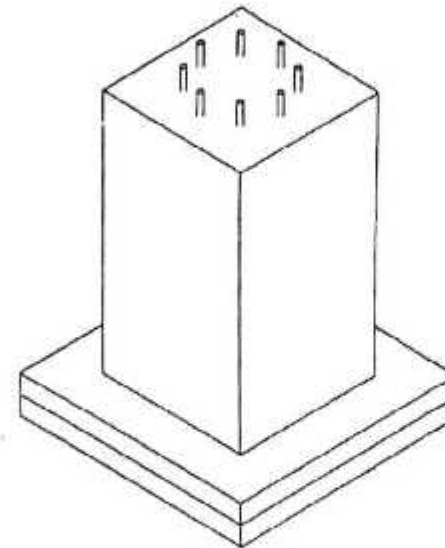
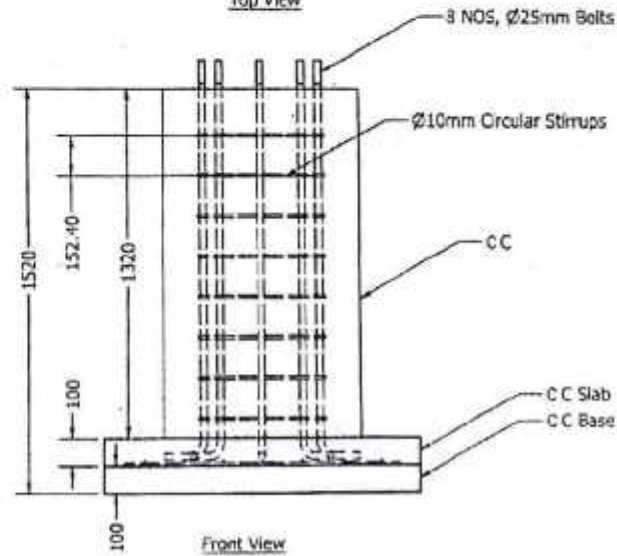
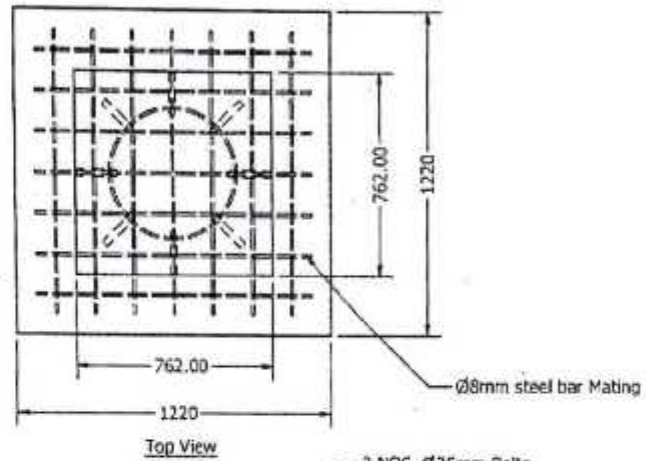


28



Model 1

CJ



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1 MPB/21

Model-2

**ACP SHEET FITTED SWAGAT DWAR**  
Technical Specification

**A. Colum Foundation:-**

- $\varnothing$ 20 mm L-Shape MS foundation Bolt, 8 Nos.
- $\varnothing$ 10 mm Circular stirrups, 8 Nos.
- 750mm $\times$ 750mm $\times$ 1000mm concrete Column
- 1200mm $\times$ 1200mm $\times$ 100mm concrete slab
- 1200mm $\times$ 1200mm $\times$ 100mm concrete base

**B. Vertical Column with top, bottom, mounting plate & stiffener plate**

- 600mm $\times$ 600mm vertical column length 5196mm
- 50mm $\times$ 50mm square M.S. vertical pipe, 4 nos.
- 35mm $\times$ 35mm square M.S. supporting pipe as per design
- 25mm $\times$ 25mm square M.S. truss cross pipe as per design
- 600mm $\times$ 600mm $\times$ 12mm top mounting M.S. plate
- 600mm $\times$ 600mm $\times$ 12mm bottom mounting M.S. plate
- 12mm thick stiffener plate, 8 nos.
- 136 square feet ACP sheet over the vertical columns front & rare side

**C. ACP Sign Board with Frame & bottom mounting Plate**

- Horizontal frame assembly 50mm $\times$ 50mm of 2 mm thickness M.S. pipe
- Cross frame assembly 25mm $\times$ 25mm of 2 mm thickness M.S. pipe
- 600mm $\times$ 600mm $\times$ 12mm mounting M.S. plate, 2 nos.
- 180 square feet ACP sheet fitted over the front & rare side of frame

REVIEWED / WITNESSED

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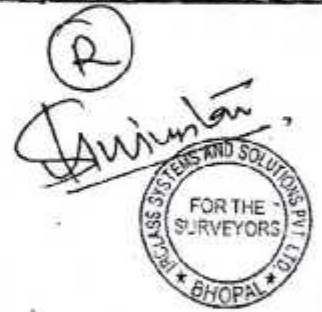
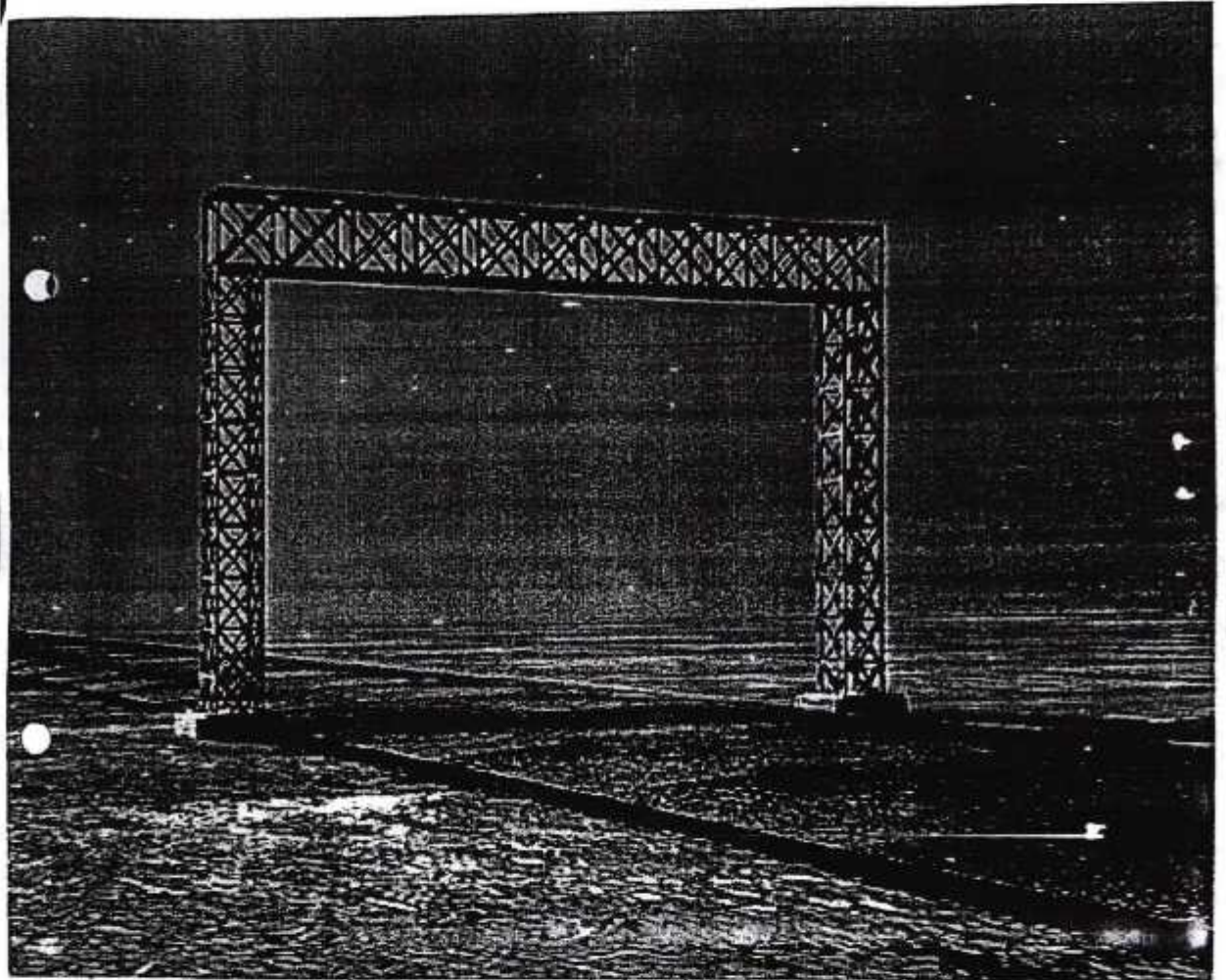
Reviewed

*[Signature]*  
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BHOPAL





Model-2



2012

Model-2



ए.सी.पी. शीट प्रवेश द्वार

*Handwritten signature*

