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APPROVED MASTER PLAN
SEPARATE BUILDING PERMIT(S) REQUIRED

550312

Master Plan Project No.

This set of plans and specifications, together with separate approved building permits for each structure, shall be kept on file at all times during which work authorized by these plans is in progress. These plans shall be made available to City officials upon request. It is unlawful to change, modify or alter the approved plans and specifications without written authorization of the Building Official. The stamping of these plans and specifications SHALL NOT be held to permit nor approve the violation of City, County, State or Federal laws nor restrictions.

Issued by

THIS IS NOT A CONSTRUCTION PERMIT

APPROVED

004-07-2017

LAND DEVELOPMENT REVIEW
ENGR-BUILDING/STORMWATER

Barrie Delin



Jerry L. Michael
DATE 03-31-18

MOBILITIE INTELLIGENT INFRASTRUCTURE

MASTER STRUCTURAL PLANS

PTS #550312

SCOPE OF WORK: TO ATTACH MICRO-CELLULAR ANTENNAS AND ASSOCIATED EQUIPMENT TO EXISTING AND NEW TYPE 15, TYPE 15D AND TYPE 21 STREET LIGHT POLES WITHIN THE CITY OF SAN DIEGO RIGHT-OF-WAY.

DESIGN CODE REFERENCES:

1. 2015 IBC
2. 2016 CBC
3. ASCE MINIMUM DESIGN LOADS - 7-10
4. 2010 & 2015 CALTRANS STANDARD PLAN RSP ES-6A + ES-6D
5. AISC, STEEL CONSTRUCTION MANUAL, 14th ADDITION, 2010
6. SAN DIEGO STANDARD DRAWING SDE-101
7. DWG B6 MONOTUBE OCTAGONAL LIGHT POLE SPECIFICATIONS SHEET

STRUCTURAL STAMP ON
SHEET 3

ENGINEER OF RECORD JERRY L. MICHAEL 2488 ROCK VIEW GLEN ESCONDIDO, CA 92026 PHONE/FAX (760) 764-8034 TAX ID: 548-704732	
Coastal Communications Telecommunications Engineering 3441 EDISON PLACE, STE. 110 CARLSBAD, CA 92008 P: (760) 928-8918 F: (760) 928-8936	
Sprint	
SITE ADDRESS: _____	
TITLE: MASTER STRUCTURAL PLANS	
PTS NO: 550312	SHEET
DRAWING NO: TBD	1
DATE: 11/23/16	
SCALE: P.T.S.	

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MASTER STRUCTURAL PLANS FOR NEW STREET LIGHT POLES

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Jerry L. Michael
JERRY L. MICHAEL
DATE 03-31-18

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MOBILITIE INTELLIGENT INFRASTRUCTURE Master Structural Schematic

SITE ADDRESS:	
TITLE: SHEET INDEX	
PTS NO. 550312	SHEET
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SCALED: N.T.S.	

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550312
 BUILDING DEVELOPMENT REVIEW
 DIVISION-STRUCTURAL
 B. VISWANATH BASAVARAJA Date 6/5/2017

MASTER PLAN
 COURTESY REVIEW ONLY
 NO FUTURE BUILDING PERMIT



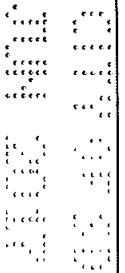
Gary L. Michel
 Gary L. Michel
 03-31-18 DATE

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MOBILITIE INTELLIGENT INFRASTRUCTURE Master Structural Schematic

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TITLE: SHEET INDEX	
PTS NO. 550312	SHEET
DRAWING NO. TBD	3
DATE: 1/23/18	
SCALED: N.T.S.	

MASTER STRUCTURAL PLANS FOR EXISTING STREET LIGHT POLES

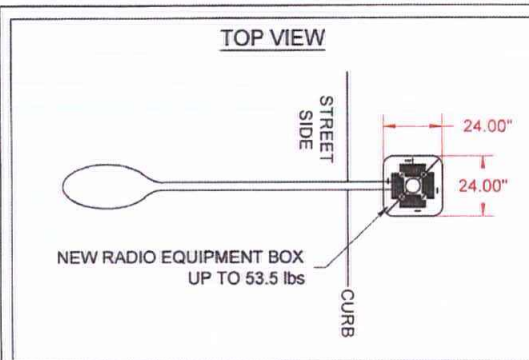


Jerry F. Michel 6-7-17
 JERRY F. MICHEL No. 042280 Exp. 12-31-18 DATE

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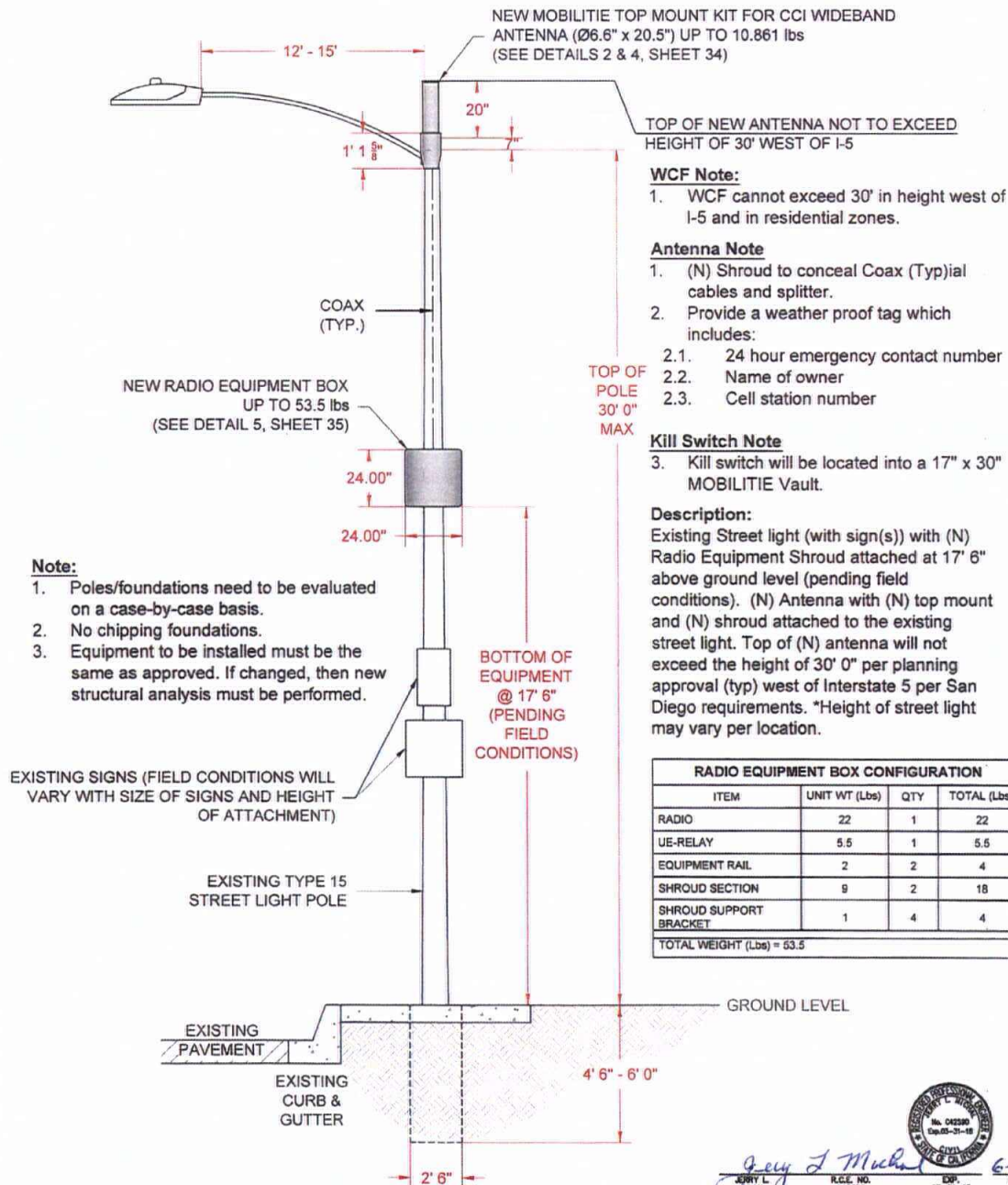
MOBILITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 EXISTING TYPE 15 STREET LIGHT POLE (WITH SIGN(S))
 WITH ANTENNA MOUNT AND RADIO EQUIPMENT BOX

SITE ADDRESS:		Values
TITLE:		EXISTING TYPE 15 STREET LIGHT POLE (WITH SIGN(S)) WITH ANTENNA MOUNT AND RADIO EQUIPMENT BOX
PTS NO.	660312	SHEET 4
DRAWING NO.	TBD	
DATE:	11/23/18	
SCALED	N.T.S.	



- Existing connections between type 15 street light poles and their foundations shall be field verified for their type (plate size, number/size of bolts) and current structural conditions which meets the requirements specified on the Master Structural.
- "As a California licensed Architect/Engineer, I have classified the undisturbed native soils to be silty sands, sandy silts and per Table 1806.2 of the 2013 CBC, I have assigned a foundation pressure of 1500 psf. and Lateral Bearing Pressure of 100 psf/ft., for the design of foundations related to this project".

Gregory J. Michel Signature of Licensed Architect/Engineer



RADIO EQUIPMENT BOX CONFIGURATION			
ITEM	UNIT WT (Lbs)	QTY	TOTAL (Lbs)
RADIO	22	1	22
UE-RELAY	5.5	1	5.5
EQUIPMENT RAIL	2	2	4
SHROUD SECTION	9	2	18
SHROUD SUPPORT BRACKET	1	4	4
TOTAL WEIGHT (Lbs) = 53.5			

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MOBILITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
EXISTING TYPE 15 STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

Gregory J. Michel R.C.E. NO. 042590 EXP. 03-31-18 DATE 6-3-17

DATE ADDRESS: Varies

TITLE: EXISTING TYPE 15 STREET LIGHT POLE (WITH SIGN(S)) WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

PTS NO. 550312 **SHEET** 5

DRAWING NO. TBD

DATE: 11/23/16

SCALE: N.T.S.

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO. Antenna Installation CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITIE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 30' Ave. Pole Dia. = As Noted, Steel Strength = 60,000 psi (per manufacturer)
 Footing by Design: Dia. = 2.5' dia. x 4.5' deep. Antenna wt. = 10.861 lbs Equipment Wt. = 53.5 lbs
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7-10
 2. 2016 CBC 4. 2010 Caltrans Standard Plan RSP ES-6A
 5. San Diego Standard Drawing SDE-101

30-FOOT round Type 15 steel light pole with top mount antenna, radio and signs.

1. Wind Loading:

Wind Zone: (Fig. 3-2.3) V = 110 mph (3 sec. Gust)

Coefficients: $K_z(16) = 0.87$ $K_z(32) = 0.94$
 $I_r = 0.87$ $G = 1.142$

Wind Pressures: $P_z(16) = (0.00256) K_z(16) G V^2 I_r = 22$ psf
 $P_z(35.0) = (0.00256) K_z(30.0) G V^2 I_r = 23.8$ psf



2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16) = 9.75 in. $A_m = (16) (9.75/12) = 13.0$ sq. ft.
 Ave. Dia. (16-30) = 7.88 in. $A_m = (14.0) (7.88/12) = 9.19$ sq. ft.

Area of antenna: $A = (7.18/12) (24/12) = 1.20$ sq. ft.

Area of equipment unit: $A = (2) (2) = 4.00$ sq. ft.

Area of light arm: $A = (0.25) (8) + (0.5) (2) = 3.00$ sq. ft.

Area of sign: $A = (1.25) (1.25) = 1.56$ sq. ft.

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3. FORCE ON POLE

Force on pole: $F = P_m A + P_{m,m} A = 504.7$ pounds

Force on Antenna: $F = P_m A_m = 28.6$ pounds

Force on equipment: $F = P_m A_m = 95.2$ pounds

Force on light arm: $F = (3.0) (23.8) = 71.4$ pounds

Force on Sign: $F = (22.0) (1.56) = 34.3$ pounds

Total wind load = 734.2 pounds

Depth Requirement: Typical Standard Depth is 4.5 feet per (SDE-101)

$D = 0.5A \{1 + [1 + (4.36h / A)]^2\}$

Where $A = (2.34 P/S, b) = \{ (2.34) (734.2 / (2200) (2.5)) \} = 0.31$

Therefore $D_m = 3.34$ ft. < 4.50 feet ok

4. Bearing Capacity

Gross pole wt: 1405 pounds (for pole + equipment)

$Q_m = 1500$ psf (Street light at 4.5 foot embedment)

Pole fig dia. = 2.5 ft. Footing area = 4.90 sq. ft.

$Q = 1500$ psf > $Q = (1405) / (4.90) = 286.7$ psf OK

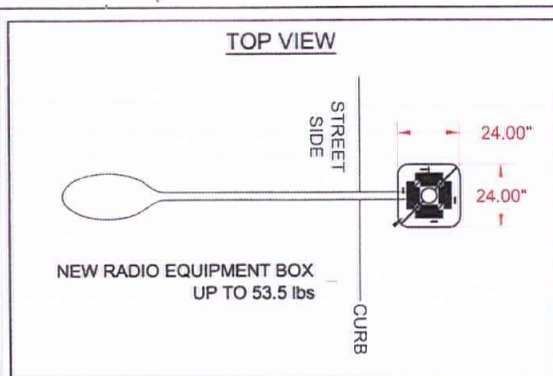
Page 2 of 2

SITE ADDRESS	Notes
TITLE	EXISTING TYPE 15 STREET LIGHT POLE WITH ANTENNA, RADIO EQUIPMENT BOX AND SIGN
DATE	6-01-2017
DESIGNED BY	JLM
CHECKED BY	JLM
SCALE	N.T.S.
SHEET	6

MOBILITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 EXISTING TYPE 15 STREET LIGHT POLE WITH SIGN(S)
 WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT-BOX

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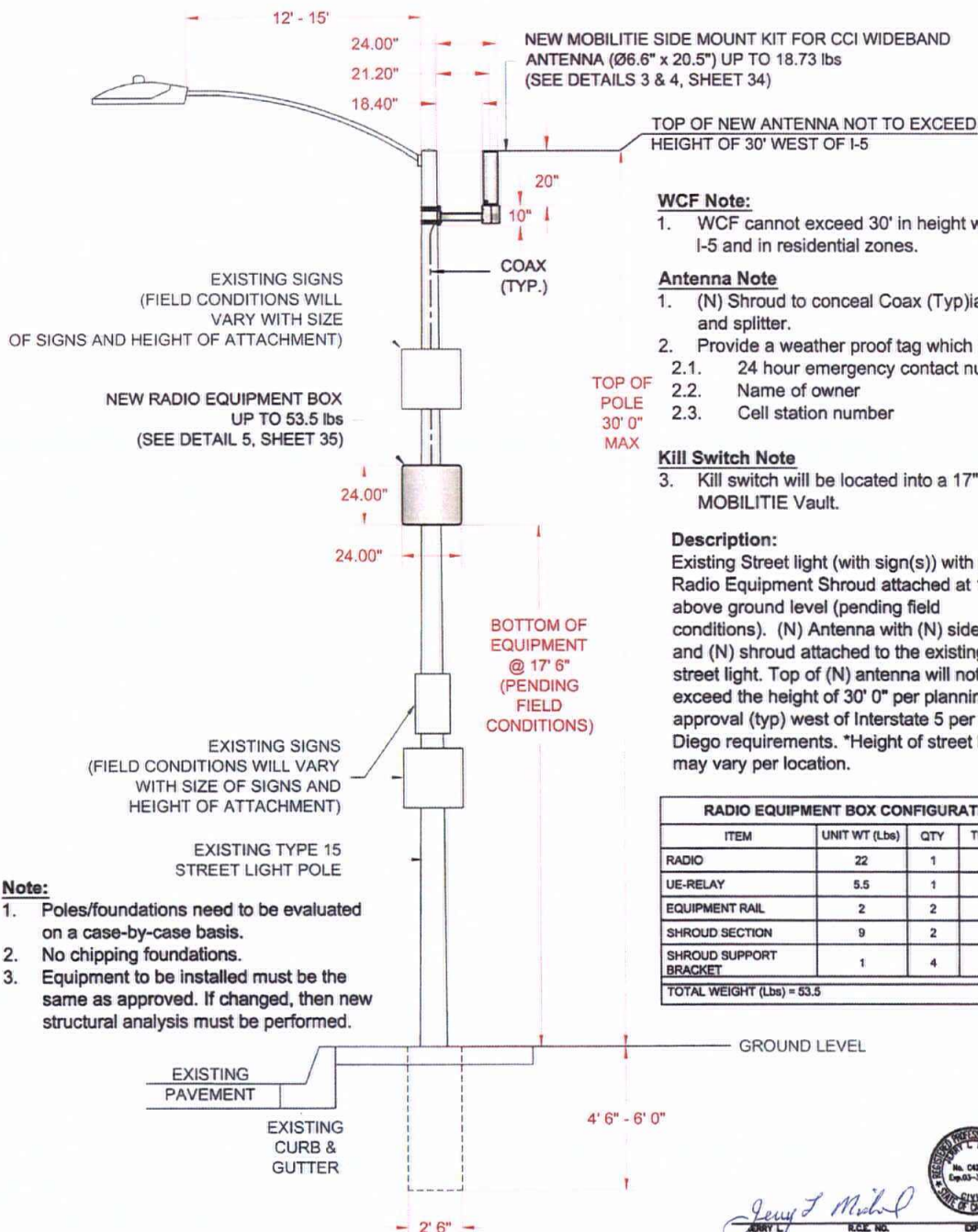
Jerry L. Michael
 JERRY L. MICHAEL
 CIVIL ENGINEER
 03-31-18
 DATE 6-3-17



- Existing connections between type 15 street light poles and their foundations shall be field verified for their type (plate size, number/size of bolts) and current structural conditions which meets the requirements specified on the Master Structural.
- "As a California licensed Architect/Engineer, I have classified the undisturbed native soils to be silty sands, sandy silts and per Table 1806.2 of the 2013 CBC, I have assigned a foundation pressure of 1500 psf. and Lateral Bearing Pressure of 100 psf/ft., for the design of foundations related to this project".

Jerry L. Michal

Signature of Licensed Architect/Engineer



WCF Note:

- WCF cannot exceed 30' in height west of I-5 and in residential zones.

Antenna Note

- (N) Shroud to conceal Coax (Typ) cables and splitter.
- Provide a weather proof tag which includes:
 - 24 hour emergency contact number
 - Name of owner
 - Cell station number

Kill Switch Note

- Kill switch will be located into a 17" x 30" MOBILITIE Vault.

Description:

Existing Street light (with sign(s)) with (N) Radio Equipment Shroud attached at 17' 6" above ground level (pending field conditions). (N) Antenna with (N) side mount and (N) shroud attached to the existing street light. Top of (N) antenna will not exceed the height of 30' 0" per planning approval (typ) west of Interstate 5 per San Diego requirements. *Height of street light may vary per location.

RADIO EQUIPMENT BOX CONFIGURATION			
ITEM	UNIT WT (Lbs)	QTY	TOTAL (Lbs)
RADIO	22	1	22
UE-RELAY	5.5	1	5.5
EQUIPMENT RAIL	2	2	4
SHROUD SECTION	9	2	18
SHROUD SUPPORT BRACKET	1	4	4
TOTAL WEIGHT (Lbs) = 53.5			

Note:

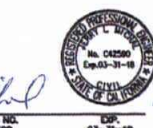
- Poles/foundations need to be evaluated on a case-by-case basis.
- No chipping foundations.
- Equipment to be installed must be the same as approved. If changed, then new structural analysis must be performed.

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MOBILITIE INTELLIGENT INFRASTRUCTURE

Master Structural Schematic

EXISTING TYPE 15 STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX



Jerry L. Michal
JERRY L. MICHAL
E.C.L. NO.
C42590

EXP.
03-31-18

DATE
6-5-17

SITE ADDRESS:	Varies
TITLE:	EXISTING TYPE 15 STREET LIGHT POLE (WITH SIGN(S)) WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX
PTS. NO.	550312
DRAWING NO.	TBD
DATE:	11/23/16
SCALED:	N.T.S.
SHEET	7

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO. Antenna Installation CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITIE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 30' Ave. Pole Dia. = As Noted, Steel Strength = 60,000 psi (per manufacturer)
 Footing by Design: Dia. = 2.5' dia. x 4.5' deep.
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7-10
 2. 2016 CBC 4. 2010 Caltrans Standard Plan RSP ES-6A
 5. San Diego Standard Drawing SDE-101

30-FOOT type 15 steel pole with side mount antenna, radio and signs.

1. Wind Loading:

Wind Zone: (Fig. 3-2.3) V = 110 mph (3 sec. Gust)
 Coefficients: Kz (16) = 0.87 Kz (32) = 0.94
 Ir = 0.87 G = 1.142
 Wind Pressures: Pz (16) = (0.00256) Kz (16) GVIR = 22 psf
 Pz (35.0) = (0.00256) Kz (30.0) GVIR = 23.8 psf

2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16') = 9.75 in. A_u = (16) (9.75/12) = 13.0 sq. ft.
 Ave. Dia. (16-30') = 7.88 in. A_m = (14.0) (7.88/12) = 9.91 sq. ft.

Area of light arm: A = (0.25)(8) + (0.5)(2) = 3.0 sq. ft.

Area of antenna: A = (7.18/12)(24/12) = 3.3 sq. ft.

Area of equipment unit: A = (2.0)(2.0) = 4.0 sq. ft.

Area of Sign: A = (1.5)(1.5) = 2.25 sq. ft.



Page 1 of 2

3. FORCE ON POLE

Force on pole: F = P_w + P_uA = 521.9 pounds
 Force on Antenna: F = P_wA_u = 78.5 pounds
 Force on equipment: F = P_wA_m = 88.0 pounds
 Force on light arm: F = (3.0)(23.8) = 71.4 pounds
 Force on Signs (2): F = (2)(2.25)(23.8) = 102.6 pounds

Total wind load = 862.4 pounds

Depth Requirement: Typical Standard Depth is 4.5 feet (per design SDE-101)

$$D = 0.5A(1 + [1 + (4.36h/A)]^2)$$

$$\text{Where } A = (2.34 P/S, b) = [(2.34)(862.4)/(2200)(2.5)] = 0.37$$

$$\text{Therefore } D_u = 3.66\text{ft.} < 4.50\text{ feet ok}$$

4. Bearing Capacity

Gross pole wt: 1405 pounds (for pole + equipment)
 Q_u = 1500 psf (Street light at 4.5 foot embedment)
 Pole ftg dia. = 2.5 ft. Footing area = 4.91 sq. ft.
 Q = 1500 psf > Q = (1405)/(4.91) = 203.3 psf OK

5. Antenna Attachment Calculations:

Moment on Attachment Bolts

$$\text{From Wind: } P1 = (2)(48.1) = 96.2\text{ ft-lbs From Wt.: } P2 = (1)(53.5) = 53.5\text{ ft-lbs}$$

Worst Case - Diagonal Bolts

$$M_{\text{max}} = ((96.2)^2 + (53.5)^2)^{1/2} = 110.1\text{ ft-lbs}$$

$$T = C = (12)(110.1)/(4.24) = 311.5\text{ lbs}$$

5/8" Bolt Capacity = 1000 lbs (per manufacturer) Therefore bolts are adequate.

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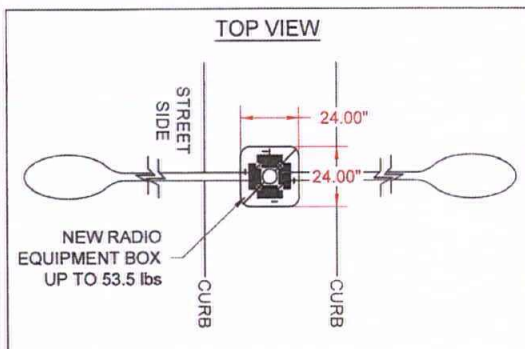
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PROJECT NO.	0000	DATE	11/22/18
DRAWING NO.	0000	SCALE	AS SHOWN
SHEET		8	

MOBILITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 EXISTING TYPE 15 STREET LIGHT POLE WITH SIGN(S)
 WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX

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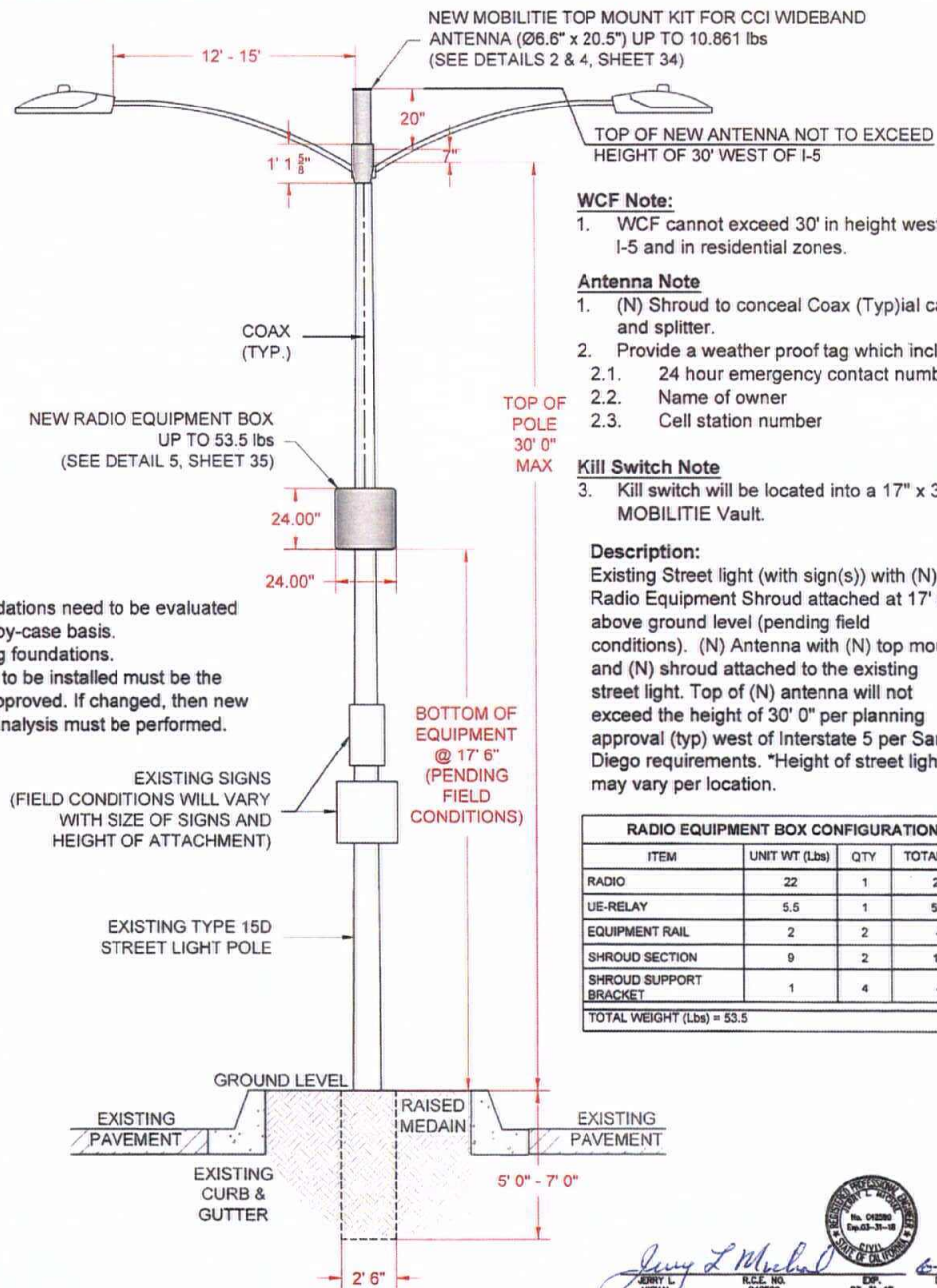


Jerry L. Michels 6-3-17
 DATE



- Existing connections between type 15D street light poles and their foundations shall be field verified for their type (plate size, number/size of bolts) and current structural conditions which meets the requirements specified on the Master Structural.
- "As a California licensed Architect/Engineer, I have classified the undisturbed native soils to be silty sands, sandy silts and per Table 1806.2 of the 2013 CBC, I have assigned a foundation pressure of 1500 psf. and Lateral Bearing Pressure of 100 psf/ft., for the design of foundations related to this project".

Jerry L. Michael Signature of Licensed Architect/Engineer



Note:

- Poles/foundations need to be evaluated on a case-by-case basis.
- No chipping foundations.
- Equipment to be installed must be the same as approved. If changed, then new structural analysis must be performed.

RADIO EQUIPMENT BOX CONFIGURATION			
ITEM	UNIT WT (Lbs)	QTY	TOTAL (Lbs)
RADIO	22	1	22
UE-RELAY	5.5	1	5.5
EQUIPMENT RAIL	2	2	4
SHROUD SECTION	9	2	18
SHROUD SUPPORT BRACKET	1	4	4
TOTAL WEIGHT (Lbs) = 53.5			

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MOBILITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
EXISTING TYPE 15D STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

SITE ADDRESS		Variations
TITLE: EXISTING TYPE 15D STREET LIGHT POLE WITH SIGN(S) WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX		
PTS NO.	550312	SHEET
DRAWING NO.	TBD	
DATE:	11/23/16	
SCALE:	N.T.S.	
		9

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO. Antenna Installation CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITIE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 30' Ave. Pole Dia. = as noted, Steel Strength = 60,000 psi (per manufacturer)
 Footing by Design: Dia.=2.5' dia. x 5.0'deep. Equip. Wt. = 53.5 lbs Antenna Wt. = 18.3 lbs
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7-10
 2. 2016 CBC 4. 2010 Caltrans Standard Plan RSP ES-6D

30-FOOT type 15D round steel pole with top mount antenna, radio 2 light arms and signs.

1. Wind Loading:

Wind Zone: (Fig. 3-2.3) V= 110 mph (3 sec. Gust)
 Coefficients: Kz (16) = 0.87 Kz(32) = 0.94
 Ir= 0.87 G = 1.142

Wind Pressures: Pz(16) = (0.00256) Kz(16)GV²IR = 22 psf
 Pz(35.0) = (0.00256) Kz(30.0)GV²IR = 23.8 psf

2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16') = 7.11 in. A_p = (16) (7.11/12) = 9.48 sq.ft.
 Ave. Dia. (16-30') = 5.48 in. A_m = (14.0) (5.48/12) = 6.39 sq.ft.

Area of light arms(2): A = (2) (0.25)(8) + (0.5)(2) = 6.0 sq. ft.

Area of antenna: A = (7.18/12)(24/12) = 3.3 sq.ft

Area of equipment unit: A = (2.0)(2.0) = 4.00 sq.ft

Area of Pedestrian Sign: A = (1.25)(1.25) + (1)(1.5) = 3.06 sq.ft



Page 1 of 2

3. FORCE ON POLE

Force on pole: F = P_wA + P_{eq}A = 541.8 pounds

Force on Antenna: F = P_wA_m = 78.5 pounds

Force on equipment: F = P_wA_{eq} = 88.0 pounds

Force on light arms(2): F = (2)(3.0)(23.8) = 142.8 pounds

Force on Signs (2): F = (22.0)(3.06) = 67.3 pounds

Total wind load = 918.4 pounds

Depth Requirement: Typical Standard Depth is 5.0 feet (per RSP ES-6D)

D = 0.5A (1 + [1 + (4.36h / A)]²)

Where A = (2.34 P/S.b) = [(2.34) (918.4) (2200) (2.5)] = 0.39

Therefore D_m = 3.77ft. < 5.00 feet OK

4. Bearing Capacity

Gross pole wt: 1100 pounds (for pole + equipment)
 Q_a = 1500 psf (Street light at 5.0 foot embedment)

Pole ftg dia. = 2.5 ft. Footing area = 4.91 sq. ft.

Q = 1500 psf > Q = (1100)/(4.91) = 224.0 psf OK

Page 2 of 2

TITLE: <u>MOBILITIE INTELLIGENT INFRASTRUCTURE</u>	
SUBJECT: <u>VARIOUS AREAS</u>	
EQUIPMENT BOX	
PTS NO. <u>580312</u>	SHEET
DRAWING NO. <u>15D</u>	10
DATE: <u>11/22/16</u>	
SCALE: <u>N.T.S.</u>	

MOBILITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 EXISTING TYPE 15D STREET LIGHT POLE WITH SIGN(S)
 WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

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 2345 RED HILL AVE. SUITE 200
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 (949) 261-3883
 E: www.mobilitie.com

Jerry L. Michael
 JERRY L. MICHAEL
 P.E. NO. 42390
 Exp. 3-31-18
 DATE: 6-5-17

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO. Antenna Installation CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 30' Ave. Pole Dia. = 6.0 in. Steel Strength = 60,000 psi (per manufacturer)
 Footing by Design: Dia. = 2.5' dia. x 5.0' deep. Equip. Wt. = 53.5 lbs Antenna Wt. = 18.73 lbs
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7-10
 2. 2016 CBC 4. 2010 Caltrans Standard Plan RSP ES-6D

30-FOOT type 15D round steel pole with side mount antenna, radio, 2 light arms and signs.

1. Wind Loading:

Wind Zone: (Fig. 3-2.3) V = 110 mph (3 sec. Gust)
 Coefficients: $K_z(16) = 0.87$ $K_z(32) = 0.94$
 $I_r = 0.87$ $G = 1.142$

Wind Pressures: $P_z(16) = (0.00256) K_z(16) G V^4 I_r = 22 \text{ psf}$
 $P_z(35.0) = (0.00256) K_z(30.0) G V^4 I_r = 23.8 \text{ psf}$

2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16') = 6.00 in. $A_{16} = (16) (6.00/12) = 8.00 \text{ sq. ft.}$
 Ave. Dia. (16-30') = 6.00 in. $A_{30} = (14.0) (6.00/12) = 7.00 \text{ sq. ft.}$

Area of light arms(2): $A = (2) (0.25)(8) + (0.5)(2) = 6.0 \text{ sq. ft.}$

Area of antenna: $A = (7.18/12)(24/12) = 3.3 \text{ sq. ft.}$

Area of equipment unit: $A = (2.0)(2.0) = 4.00 \text{ sq. ft.}$

Area of Signs: $A = (1.0)(2.0) + (2) (1.25)(1.25) = 5.06 \text{ sq. ft.}$



Page 1 of 2

3. FORCE ON POLE

Force on pole: $F = P_{ws} A + P_{em} A = 342.6 \text{ pounds}$
 Force on Antenna: $F = P_{ws} A_{em} = 78.5 \text{ pounds}$
 Force on equipment: $F = P_{ws} A_{eq} = 88.0 \text{ pounds}$
 Force on light arms(2): $F = (2)(3.0)(23.8) = 142.8 \text{ pounds}$
 Force on Signs (2): $F = (22.0)(3.06) = 67.3 \text{ pounds}$

Total wind load = 719.2 pounds

Depth Requirement: Typical Standard Depth is 5.0 feet (per RSP ES-6D)

$$D = 0.5A \{ 1 + [1 + (4.36h / A)]^2 \}$$

$$\text{Where } A = (2.34 P/S, b) = [(2.34) (719.2) / (2200) (2.5)] = 0.31$$

$$\text{Therefore } D_{req} = 3.34 \text{ ft.} < 5.00 \text{ feet OK}$$

4. Bearing Capacity

Gross pole wt: 1100 pounds (for pole + equipment)
 $Q_u = 1500 \text{ psf}$ (Street light at 5.0 foot embedment)

Pole ftg dia. = 2.5 ft. Footing area = 4.91 sq. ft.

$$Q = 1500 \text{ psf} > Q_u = (1100) / (4.91) = 224.0 \text{ psf OK}$$

5. Antenna Attachment Calculations:

Moment on Attachment Bolts

$$\text{From Wind: } P_1 = (2)(48.1) = 96.2 \text{ ft-lbs From Wt: } P_2 = (1)(53.5) = 53.5 \text{ ft-lbs}$$

Worst Case - Diagonal Bolts

$$M_{max} = ((96.2) + (53.5)) / 2 = 110.1 \text{ ft-lbs}$$

$$T = C = (12)(110.1) / (4.24) = 311.5 \text{ lbs}$$

5/8" Bolt Capacity = 1000 lbs (per manufacturer) Therefore bolts are adequate.

Page 2 of 2

DATE	12
TIME	
DATE	
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DATE	
TIME	
DATE	
TIME	

MOBILITE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 EXISTING TYPE 15D STREET LIGHT POLE WITH SIGN(S)
 WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX

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 (949) 261-3883
 E: www.mobilitie.com



1. WCF cannot exceed 30' in height west of I-5 and in residential zones.

Antenna Note

1. (N) Shroud to conceal Coax (Typ)ial cables and splitter.
2. Provide a weather proof tag which includes:
 - 2.1. 24 hour emergency contact number
 - 2.2. Name of owner
 - 2.3. Cell station number

Kill Switch Note

3. Kill switch will be located into a 17" x 30" MOBILITIE Vault.

Description:

Existing octagonal street light (with sign(s)) with (N) Radio Equipment Shroud attached at 17' 6" above ground level (pending field conditions). (N) Antenna with (N) side mount and (N) shroud attached to the existing street light. Top of (N) antenna will not exceed the height of 30' 0" per planning approval (typ) west of Interstate 5 per San Diego requirements. *Height of street light may vary per location.

RADIO EQUIPMENT BOX CONFIGURATION			
ITEM	UNIT WT (Lbs)	QTY	TOTAL (Lbs)
RADIO	22	1	22
UE-RELAY	5.5	1	5.5
EQUIPMENT RAIL	2	2	4
SHROUD SECTION	9	2	18
SHROUD SUPPORT BRACKET	1	4	4
TOTAL WEIGHT (Lbs) = 53.5			



Jerry L. Michael *6-3-18*
JERRY L. MICHAEL R.C.E. NO. 042590 EXP. 03-31-18 DATE

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MOBILITE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic

EXISTING TYPE 15 OCTAGONAL STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX

SITE ADDRESS:		Varies	
TITLE: EXISTING TYPE 15 OCTAGONAL STREET LIGHT POLE (WITH SIGNS) WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX			
PTS. NO.	550312	SHEET	
DRAWING NO.	TBD		
DATE:	11/23/16	13	
SCALED:	N.T.S.		

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO. Antenna Installation CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITIE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 30' Ave. Pole Dia. = As Noted, Steel Strength = 50,000 psi (per manufacturer)
 Footing by Design: Dia. = 2.5' dia. x 4.5' deep. Equip. Wt. = 53.5 Lbs Antenna Wt. = 10.861 lbs
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7 - 10
 2. 2016 CBC 4. Dwg B8 Monotube Octagonal light pole Specification sheet.

30-FOOT type 15 Octagonal steel pole with side mount antenna, radio and signs.

1. Wind Loading:

Wind Zone: (Fig. 3-2.3) V = 110 mph (3 sec. Gust)
 Coefficients: Kz (16) = 0.87 Kz(32) = 0.94
 I = 0.87 G = 1.142
 Wind Pressures: Pz(16) = (0.00256) Kz(16)GV²IR = 22 psf
 Pz(35.0) = (0.00256) Kz(30.0)GV²IR = 23.8 psf

2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16) = 6.88 in. A_u = (16) (6.88/12) = 9.17 sq.ft.
 Ave. Dia. (16-30) = 4.78 in. A_u = (14.0) (4.78/12) = 6.37 sq.ft.
 Area of light arm: A = (0.25)(8) + (0.5)(2) = 3.0 sq.ft.
 Area of antenna: A = (7.18/12)(24/12) = 1.2 sq.ft.
 Area of equipment unit: A = (2.0)(2.0) = 4.00 sq.ft.
 Area of Signs (2): A = (1.5)(1.5) + (1.5)(1) = 3.75 sq.ft.



Page 1 of 2

3. FORCE ON POLE

Force on pole: $F = P_u + P_{u,w}A = 353.4$ pounds
 Force on Antenna: $F = P_u A_u = 78.5$ pounds
 Force on equipment: $F = P_u A_u = 95.2$ pounds
 Force on light arm: $F = (3.0)(23.8) = 71.4$ pounds
 Force on Signs (2): $F = (3.75)(22.0) = 82.5$ pounds

Total wind load = 681.0 pounds

Depth Requirement: Typical Standard Depth is 4.5 feet (per design sheet)

$$D = 0.5A (1 + [1 + (4.36h / A)]^2)$$

$$\text{Where } A = (2.34 P/S, b) = [(2.34) (681) / (2200) (2.5)] = 0.29$$

$$\text{Therefore } D_u = 3.23 \text{ ft.} < 4.50 \text{ feet ok}$$

4. Bearing Capacity

Gross pole wt: 1405 pounds (for pole + equipment)
 Q_u = 1500 psf (Street light at 4.5 foot embedment)
 Pole ftg dia. = 2.5 ft. Footing area = 4.91 sq. ft.
 Q = 1500 psf > Q = (1405)/(4.91) = 286.3 psf OK

5. Antenna Attachment Calculations:

Moment on Attachment Bolts

$$\text{From Wind: } P1 = (2)(48.1) = 96.2 \text{ ft-lbs From Wt.: } P2 = (1)(53.5) = 53.5 \text{ ft-lbs}$$

Worst Case - Diagonal Bolts

$$M_{max} = (96.2) + (53.5) = 149.7 \text{ ft-lbs}$$

$$T = C = (12)(110.1)(4.24) = 311.5 \text{ lbs}$$

5/8" Bolt Capacity = 1000 lbs (per manufacturer) Therefore bolts are adequate.

Page 2 of 2

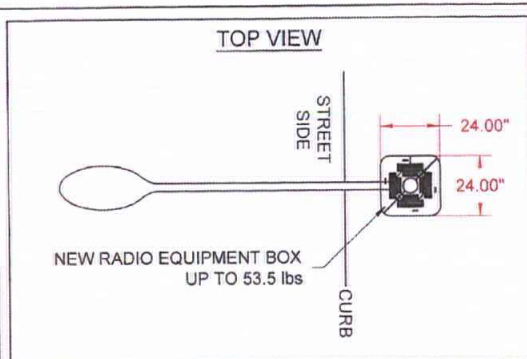
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TITLE: EXISTING TYPE 15 OCTAGONAL STREET LIGHT POLE WITH ANTENNA, RADIO EQUIPMENT BOX	SHEET
PROJECT NO. 10012	14
DRAWING NO. 100	
DATE: 1/20/18	
SCALE: N.T.S.	

MOBILITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 EXISTING TYPE 15 OCTAGONAL STREET LIGHT POLE (WITH SIGN(S))
 WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX

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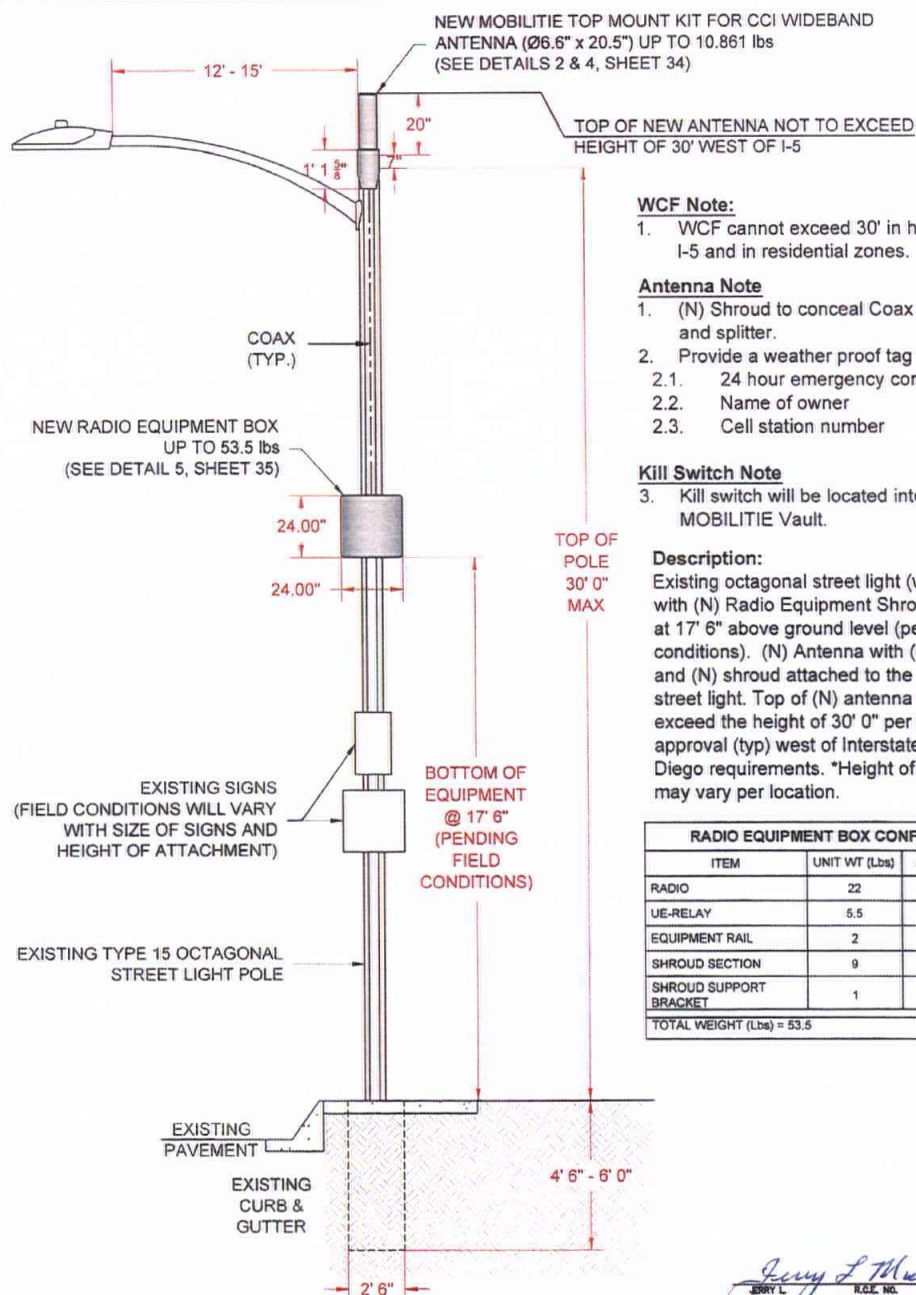


Jerry L. Michal
 JERRY L. MICHAL
 CIVIL
 03-25-18
 DATE 6-3-17



- Existing connections between type 15 octagonal street light poles and their foundations shall be field verified for their type (plate size, number/size of bolts) and current structural conditions which meets the requirements specified on the Master Structural.
- "As a California licensed Architect/Engineer, I have classified the undisturbed native soils to be silty sands, sandy silts and per Table 1806.2 of the 2013 CBC, I have assigned a foundation pressure of 1500 psf. and Lateral Bearing Pressure of 100 psf/ft., for the design of foundations related to this project".

Jerry L Michel Signature of Licensed Architect/Engineer



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MOBILITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
EXISTING TYPE 15 OCTAGONAL STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

DATE: 03-31-18
SHEET: 15
TITLE: EXISTING TYPE 15 OCTAGONAL STREET LIGHT POLE (WITH SIGN(S)) WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX
PTS NO: 550312
DRAWING NO: TBD
DATE: 11/23/16
SCALE: N.T.S.

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO: TYPICAL ANTENNA / RADIO INSTALLATION CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 30' Ave. Pole Dia. = As Noted, Steel Strength = 60,000 psi (per manufacturer)
 Footing by Design: Dia. = 2.5' dia. x 4.5' deep Equip. wt. = 53.5 Lbs Antenna wt. = 10.861 Lbs
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7 - 10
 2. 2016 CBC 4. Dwg B6 Monotube Octagonal light pole Specification sheet.

30-FOOT type 15 Octagonal steel pole with top mount antenna, radio and signs.

1. Wind Loading:

Wind Zone: (Fig. 3-2.3) V = 110 mph (3 sec. Gust)
 Coefficients: $K_z(16) = 0.87$ $K_z(32) = 0.94$
 $I_r = 0.87$ $G = 1.142$

Wind Pressures: $P_z(16) = (0.00256) K_z(16) G V^2 I_r = 22$ psf
 $P_z(32.0) = (0.00256) K_z(32.0) G V^2 I_r = 23.8$ psf

2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16') = 6.88 in. $A_{16} = (16) (6.88/12) = 9.17$ sq.ft.
 Ave. Dia. (16-30') = 4.78 in. $A_{30} = (14.0) (4.78/12) = 6.37$ sq.ft.

Area of light arm: $A = (0.25)(8) + (0.5)(2) = 3.0$ sq. ft.

Area of antenna: $A = (7.18/12)(24/12) = 3.3$ sq.ft

Area of equipment unit: $A = (2.0)(2.0) = 4.00$ sq.ft

Area of Sign: $A = (1.5)(1.5) = 2.25$ sq.ft



Page 1 of 2

3. FORCE ON POLE

Force on pole: $F = P_{16} A_{16} = 353.3$ pounds
 Force on Antenna: $F = P_{30} A_{30} = 78.5$ pounds
 Force on equipment: $F = P_{30} A_{eq} = 95.2$ pounds
 Force on light arm: $F = (3.0)(23.8) = 71.4$ pounds
 Force on Signs (2): $F = (2)(2.25)(23.8) = 102.6$ pounds
 Total wind load = 701.0 pounds

Depth Requirement: Typical Standard Depth is 4.5 feet (per design B6)

$$D = 0.5A \{ 1 + [(4.36h / A)]^2 \}$$

$$\text{Where } A = (2.34 P/S, b) = [(2.34) (701.0) / (2200) (2.5)] = 0.30$$

$$\text{Therefore } D_{req} = 3.29 \text{ ft.} < 4.50 \text{ feet ok}$$

4. Bearing Capacity

Gross pole wt: 1347 pounds (for pole + equipment)

$Q_u = 1500$ psf (Street light at 4.5 foot embedment)

Pole ftg dia. = 2.5 ft. Footing area = 4.91 sq. ft.

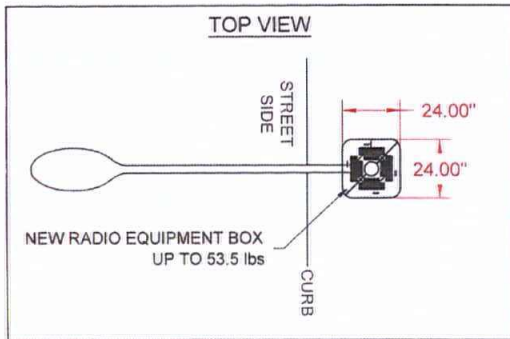
$Q = 1500 \text{ psf} > Q = (1347) / (4.91) = 274.3$ psf OK

Page 2 of 2

DATE	BY	CHKD	APPD
11/02/18	JLM		
11/02/18	JLM		
11/02/18	JLM		
11/02/18	JLM		

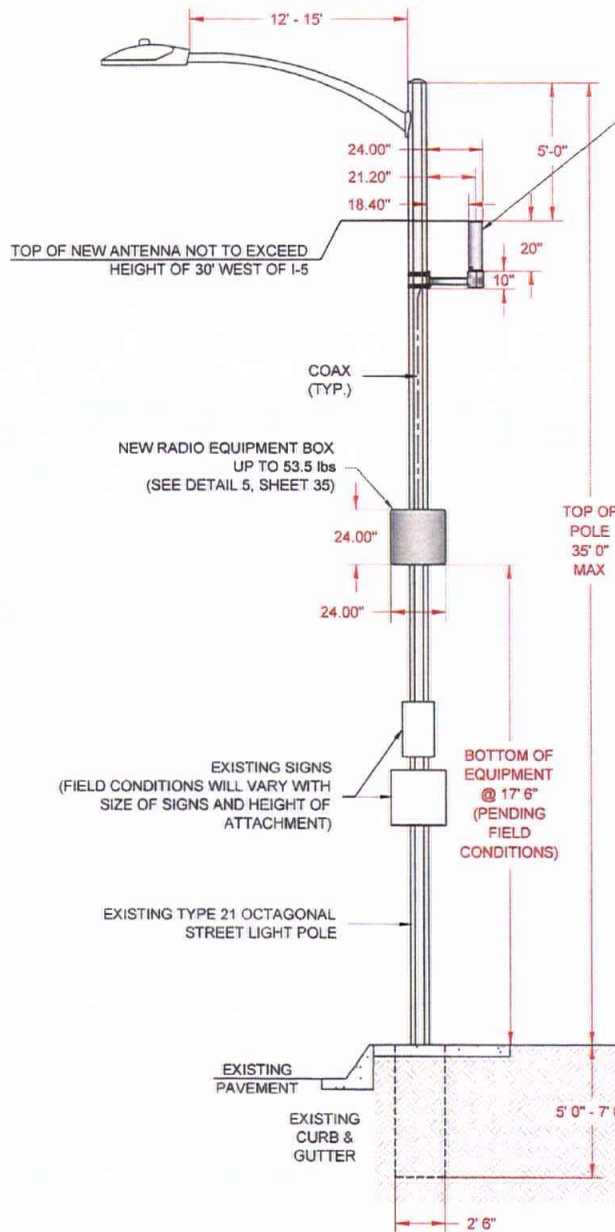
MOBILITE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 EXISTING TYPE 15 OCTAGONAL STREET LIGHT POLE WITH SIGN(S)
 WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

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- Existing connections between type 21 octagonal street light poles and their foundations shall be field verified for their type (plate size, number/size of bolts) and current structural conditions which meets the requirements specified on the Master Structural.
- "As a California licensed Architect/Engineer, I have classified the undisturbed native soils to be silty sands, sandy silts and per Table 1806.2 of the 2013 CBC, I have assigned a foundation pressure of 1500 psf. and Lateral Bearing Pressure of 100 psf/ft., for the design of foundations related to this project".

Jerry L. Michal Signature of Licensed Architect/Engineer



NEW MOBILITIE SIDE MOUNT KIT FOR CCI WIDEBAND ANTENNA (Ø6.6\" x 20.5\") UP TO 18.73 lbs (SEE DETAILS 3 & 4, SHEET 34)

WCF Note:

- WCF cannot exceed 30' in height west of I-5 and in residential zones.

Antenna Note

- (N) Shroud to conceal Coax (Typ)ial cables and splitter.
- Provide a weather proof tag which includes:
 - 24 hour emergency contact number
 - Name of owner
 - Cell station number

Kill Switch Note

- Kill switch will be located into a 17\" x 30\" MOBILITIE Vault.

Description:

Existing octagonal street light (with sign(s)) attached to pole with (N) Radio Equipment Shroud attached at 17' 6\" above ground level (pending field conditions). (N) Antenna with (N) side mount and (N) shroud attached to the existing street light. Top of (N) antenna will not exceed the height of 30' 0\" per planning approval (typ) west of Interstate 5 per San Diego requirements. *Height of street light may vary per location.

RADIO EQUIPMENT BOX CONFIGURATION			
ITEM	UNIT WT (Lbs)	QTY	TOTAL (Lbs)
RADIO	22	1	22
UE-RELAY	5.5	1	5.5
EQUIPMENT RAIL	2	2	4
SHROUD SECTION	9	2	18
SHROUD SUPPORT BRACKET	1	4	4
TOTAL WEIGHT (Lbs) = 53.5			

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MOBILITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
EXISTING TYPE 21 OCTAGONAL STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX.

Jerry L. Michal 6-5-17

DATE: 03-31-18

SITE ADDRESS: Varies

TITLE: EXISTING TYPE 21 OCTAGONAL STREET LIGHT POLE (WITH SIGN(S)) WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX

PTS NO: 550312

DRAWING NO: TBD

DATE: 11/23/18

SCALE: N.T.S.

SHEET 17

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO.: TYPICAL ANTENNA / RADIO INSTALLATION CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITIE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 35' Ave. Pole Dia. = As Noted, Steel Strength = 60,000 psi (per manufacturer)
 Footing by Design: Dia. = 2.5' dia. x 5'deep. Antenna Wt. = 18.73 lbs Equipment Wt. = 53.5 lbs
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7 - 10
 2. 2016 CBC 4. Dwg B6 Monotube Octagonal light pole Specification sheet.

35-foot type 21 steel light pole with side mount, radio and signs.

1. Wind Loading:

Wind Zone: (Fig. 3-2.3) V = 110 mph (3 sec. Gust)
 Coefficients: $K_z(16) = 0.87$ $K_z(32) = 0.94$
 $I_s = 0.87$ $G = 1.142$
 Wind Pressures: $P_z(16) = (0.00256) K_z(16) G V^2 I_s = 22 \text{ psf}$
 $P_z(35.0) = (0.00256) K_z(30.0) G V^2 I_s = 23.8 \text{ psf}$

2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16) = 7.28 in. $A_{16} = (16) (7.28/12) = 9.70 \text{ sq. ft.}$
 Ave. Dia. (16-35) = 4.87 in. $A_{35} = (19.0) (4.87/12) = 7.37 \text{ sq. ft.}$
 Area of light arm: $A = (0.25)(8) + (0.5)(2) = 3.0 \text{ sq. ft.}$
 Area of antenna: $A = (7.18/12)(24/12) = 3.3 \text{ sq. ft.}$
 Area of equipment unit: $A = (2.0)(2.0) = 4.00 \text{ sq. ft.}$
 Area of Sign: $A = (1.5)(1.5) = (1)(1.5) = 3.75 \text{ sq. ft.}$



Page 1 of 2

3. FORCE ON POLE

Force on pole: $F = P_u A + P_{16,27} A = 388.8 \text{ pounds}$
 Force on Antenna: $F = P_u A_{ant} = 78.5 \text{ pounds}$
 Force on equipment: $F = P_u A_{eq} = 95.2 \text{ pounds}$
 Force on light arm: $F = (3.0)(23.8) = 71.4 \text{ pounds}$
 Force on Signs (2): $F = (2)(2.25)(23.8) = 102.6 \text{ pounds}$

Total wind load = 736.5 pounds

Depth Requirement: Typical Standard Depth is 5 feet (per design B6)

$$D = 0.5A (1 + [1 + (4.36h / A)]^2)^{0.5}$$

$$\text{Where } A = (2.34 P/S, b) = \{ (2.34) (736.5 / (2200) (2.5)) \} = 0.31$$

$$\text{Therefore } D_{35} = 3.58 \text{ ft.} < 5 \text{ feet ok}$$

4. Bearing Capacity

Gross pole wt: 1455 pounds (for pole + equipment)
 $Q_u = 1500 \text{ psf}$ (Street light at 4.5 foot embedment)
 Pole ftg dia. = 2.5 ft. Footing area = 4.91 sq. ft.
 $Q = 1500 \text{ psf} > Q = (1455) / (4.91) = 296.3 \text{ psf OK}$

5. Antenna Attachment Calculations:

Moment on Attachment Bolts

From Wind: $P_1 = (2)(48.1) = 96.2 \text{ ft-lbs}$ From Wt.: $P_2 = (1)(53.5) = 53.5 \text{ ft-lbs}$

Worst Case - Diagonal Bolts

$$M_{max} = (96.2)^2 + (53.5)^2)^{0.5} = 110.1 \text{ ft-lbs}$$

$$T = C = (12)(110.1) / (4.24) = 311.5 \text{ lbs}$$

5/8" Bolt Capacity = 1000 lbs (per manufacturer) Therefore bolts are adequate.

Page 2 of 2

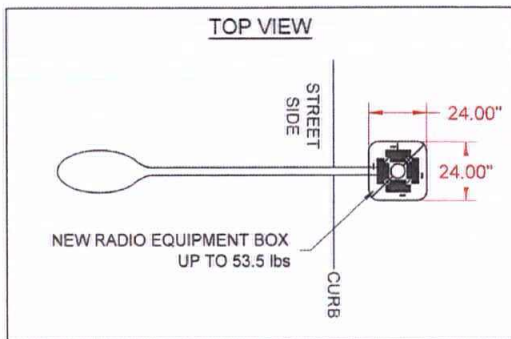
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TIME	11:23:18
SCALE	N.T.S.
PROJECT NO.	18
PROJECT NAME	MOBILITIE INTELLIGENT
PROJECT ADDRESS	VARIOUS AREAS
PROJECT CITY	SAN DIEGO, CALIFORNIA
PROJECT STATE	CALIFORNIA
PROJECT ZIP	92101
PROJECT PHONE	(619) 281-3883
PROJECT FAX	(619) 281-3883
PROJECT EMAIL	www.mobilitie.com

MOBILITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 EXISTING TYPE 21 OCTAGONAL STREET LIGHT POLE (WITH SIGNS)
 WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX

mobilitie
 intelligent infrastructure
 2148 RED HILL AVE. SUITE 200
 COSTA MESA, CA 92626
 (949) 281-3883
 E: www.mobilitie.com

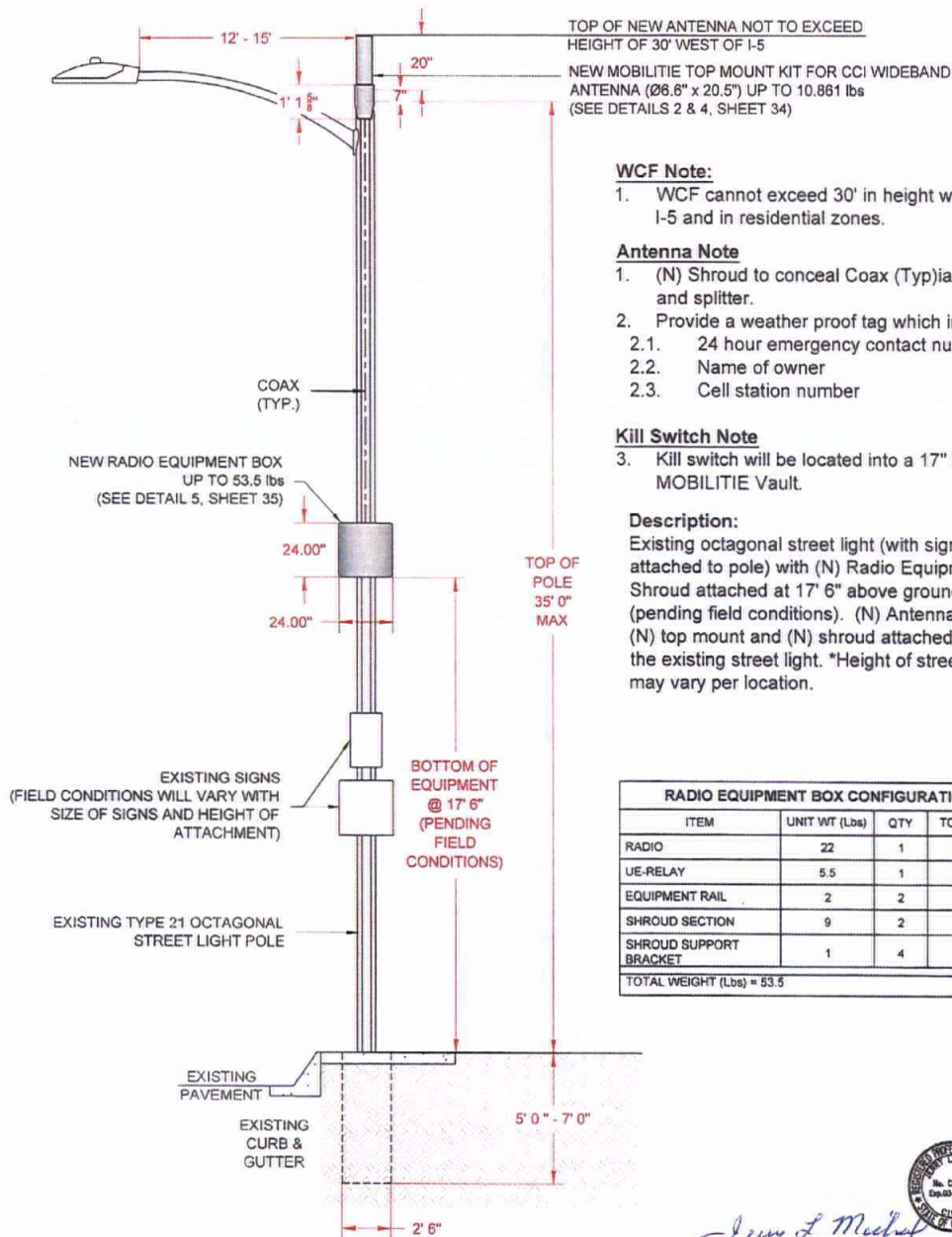


Jerry L Michel
 JLM
 03-31-18
 DATE



- Existing connections between type 21 octagonal street light poles and their foundations shall be field verified for their type (plate size, number/size of bolts) and current structural conditions which meets the requirements specified on the Master Structural.
- "As a California licensed Architect/Engineer, I have classified the undisturbed native soils to be silty sands, sandy silts and per Table 1806.2 of the 2013 CBC, I have assigned a foundation pressure of 1500 psf. and Lateral Bearing Pressure of 100 psf/ft., for the design of foundations related to this project".

Jerry L. Michael Signature of Licensed Architect/Engineer



WCF Note:

- WCF cannot exceed 30' in height west of I-5 and in residential zones.

Antenna Note

- (N) Shroud to conceal Coax (Typ)ial cables and splitter.
- Provide a weather proof tag which includes:
 - 24 hour emergency contact number
 - Name of owner
 - Cell station number

Kill Switch Note

- Kill switch will be located into a 17" x 30" MOBILITE Vault.

Description:

Existing octagonal street light (with sign(s)) attached to pole) with (N) Radio Equipment Shroud attached at 17' 6" above ground level (pending field conditions). (N) Antenna with (N) top mount and (N) shroud attached to the existing street light. *Height of street light may vary per location.

RADIO EQUIPMENT BOX CONFIGURATION			
ITEM	UNIT Wt (Lbs)	QTY	TOTAL (Lbs)
RADIO	22	1	22
UE-RELAY	5.5	1	5.5
EQUIPMENT RAIL	2	2	4
SHROUD SECTION	9	2	18
SHROUD SUPPORT BRACKET	1	4	4
TOTAL WEIGHT (Lbs) = 53.5			



Jerry L. Michael 6-3-17
R.C.E. NO. C42280 EXP. 03-31-18 DATE

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E: www.mobilitie.com

MOBITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
EXISTING TYPE 21 OCTAGONAL STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

SITE ADDRESS:	Varies
TITLE:	EXISTING TYPE 21 OCTAGONAL STREET LIGHT POLE (WITH SIGN(S)) WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX
PTS NO.	550312
DRAWING NO.	TBD
DATE:	11/23/16
SCALED:	N.T.S.
SHEET	19

PROJECT NO. TYPICAL ANTENNA / RADIO INSTALLATION CALCULATIONS BY: JLM
PROJECT NAME: MOBILITIE INTELIGENT DATE: 6-01-2017
PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psd/ft
Steel Pole Ht. = 35' Ave. Pole Dia. = As Noted, Steel Strength = 60,000 psi (per manufacturer)
Footings by Design: Dia.=2.5' dia. x 5'deep. Antenna Wt.=10.861lbs Equipment Wt.= 53.5 lbs

References:

1. 2015 IBC	3. ASCE MINIMUM DESIGN LOADS - 7 - 10
2. 2016 CBC	4. DWG B8 Monotube Octagonal light pole Specification sheet.

Area of Sign: $A = (1.5)(1.5) = (1)(1.5) = 3.75 \text{ sq.ft}$



Jerry L. Michal
JERRY L. MICHAL R.C.E. NO. 042590 EXP. 03-31-18 6-3-17
DATE

$$Q = 1500 \text{ psf} > Q = (1455)/(4.91) = 296.3 \text{ psf OK}$$

Page 2 of 2

SITE ADDRESS:	VIEWS	
	TITLE: EXISTING TYPE 21 OCTAGONAL STREET LIGHT POLE (WITH SIGNS) WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX	
	PT# NO.	850112
	DRAWING NO.	TBD
	DATE:	1/23/16
SCALE:	N.T.S.	
		SHEET
		20

MOBILITE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
EXISTING TYPE 21 OCTAGONAL STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

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MASTER STRUCTURAL PLANS NEW STREET LIGHT POLES TO REPLACE CONCRETE POLES

21

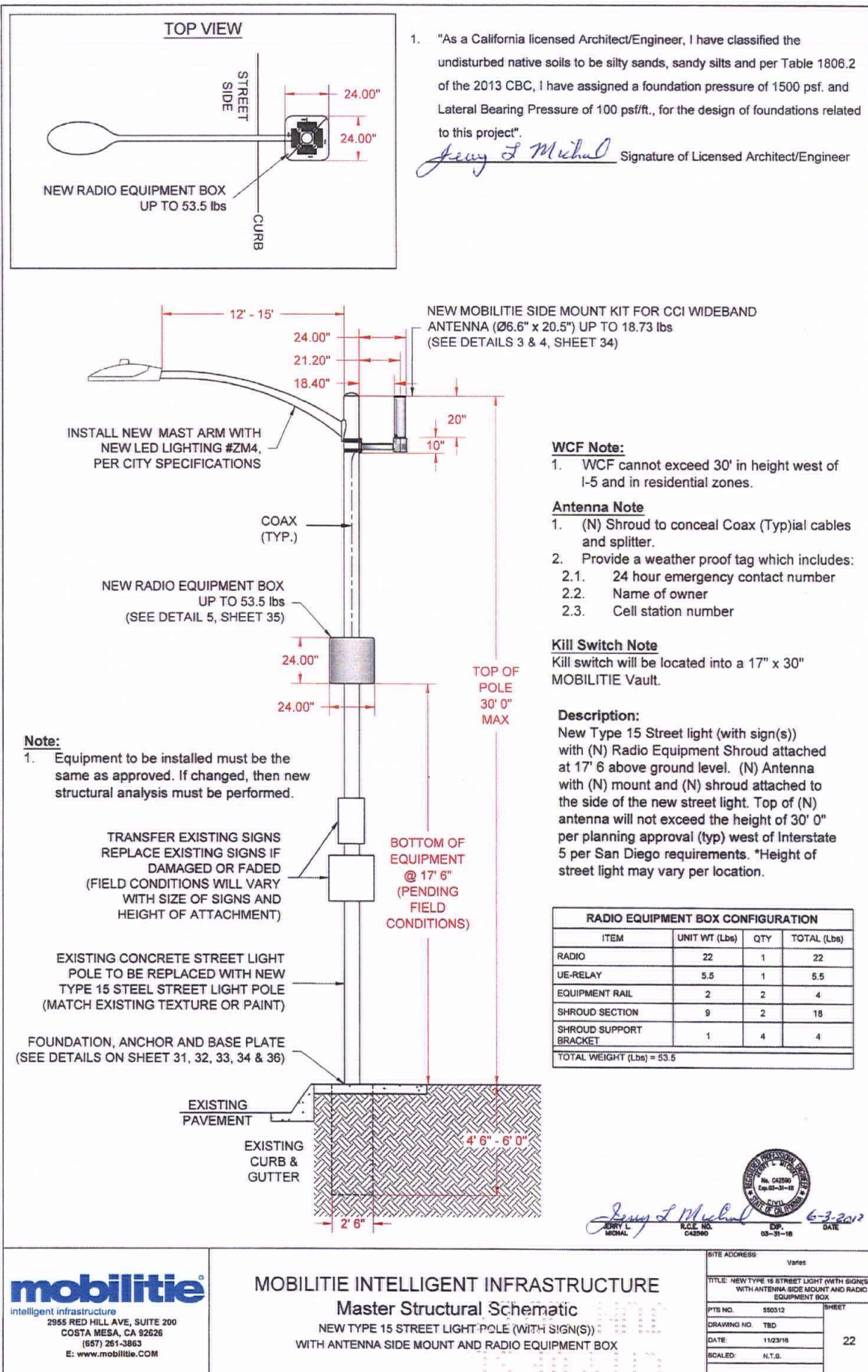
Greg L. Mohr
 6-3-17
 R.C.E. INC.
 02-31-18
 DATE



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MOBITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 NEW TYPE 15 & 21 STREET LIGHT POLES (WITH SIGN(S))
 WITH ANTENNA MOUNT AND RADIO EQUIPMENT BOX

SITE ADDRESS		Varies
TITLE:		NEW TYPE 15 & 21 STREET LIGHT POLES (WITH SIGN(S)) WITH ANTENNA MOUNT AND RADIO EQUIPMENT BOX
PTS NO	550312	21
DRAWING NO.	TBD	
DATE:	1/23/18	
SCALED:	N.T.S.	



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MOBILITIE INTELLIGENT INFRASTRUCTURE

Master Structural Schematic

NEW TYPE 15 STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX

DATE: 6-3-2012

EXP.: 03-31-18

SCALE: N.T.S.

SHEET: 22

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO. Antenna Installation CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITIE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 30' Ave. Pole Dia. = As Noted, Steel Strength = 60,000 psi (per manufacturer)
 Footing by Design: Dia. = 2.5' dia. x 4.5' deep, Antenna Wt. 18.73 lbs Equip. Wt. 53.5 lbs
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7-10
 2. 2016 CBC 4. 2010 Caltrans Standard Plan RSP ES-6A
 5. San Diego Standard Drawing SDE-101

30-FOOT type 15 round steel pole with side mount antenna, radio and signs.

1. Wind Loading:

Wind Zone: (Fig. 3-2.3) V = 110 mph (3 sec. Gust)

Coefficients: $K_z(16) = 0.87$ $K_z(32) = 0.94$
 $I_r = 0.87$ $G = 1.142$

Wind Pressures: $P_z(16) = (0.00256) K_z(16) G V^2 / R = 22 \text{ psf}$

$P_z(30.0) = (0.00256) K_z(30.0) G V^2 / R = 23.8 \text{ psf}$

2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16') = 7.13 in. $A_{u1} = (16) (7.13/12) = 9.51 \text{ sq. ft.}$
 Ave. Dia. (16-30') = 5.00 in. $A_{u2} = (14.0) (5.00/12) = 5.84 \text{ sq. ft.}$

Area of light arm: $A = (0.25)(8) + (0.5)(2) = 3.0 \text{ sq. ft.}$

Area of antenna: $A = (7.18/12)(24/12) = 3.3 \text{ sq. ft.}$

Area of equipment unit: $A = (2.0)(2.0) = 4.00 \text{ sq. ft.}$

Area of Sign: $A = (1.5)(1.5) = (1)(1.5) = 3.75 \text{ sq. ft.}$



Page 1 of 2

3. FORCE ON POLE

Force on pole: $F = P_u A + P_{u,eq} A = 366.2 \text{ pounds}$

Force on Antenna: $F = P_u A_{u1} = 78.5 \text{ pounds}$

Force on equipment: $F = P_u A_{u2} = 95.2 \text{ pounds}$

Force on light arm: $F = (3.0)(73.8) = 71.4 \text{ pounds}$

Force on Signs (2): $F = (3.75)(23.8) = 102.6 \text{ pounds}$

Total wind load = 703.9 pounds

Depth Requirement: Typical Standard Depth is 4.5 feet (per design SDE-101)

$D = 0.5A (1 + [1 + (4.36h / A)]^2)$

Where $A = (2.34 P/S, b) = [(2.34) (703.9) / (2200) (2.5)] = 0.30$

Therefore $D_{req} = 3.29 \text{ ft.} < 4.50 \text{ feet ok}$

4. Bearing Capacity

Gross pole wt: 1347 pounds (for pole + equipment)

$Q_u = 1500 \text{ psf}$

Pole ftg dia. = 2.5 ft. Footing area = 4.91 sq. ft.

$Q = 1500 \text{ psf} > Q_u = (1347) / (4.91) = 274.3 \text{ psf OK}$

5. Antenna Attachment Calculations:

Moment on Attachment Bolts

From Wind: $P_1 = (2)(48.1) = 96.2 \text{ ft-lbs}$ From Wt.: $P_2 = (1)(53.5) = 53.5 \text{ ft-lbs}$

Worst Case - Diagonal Bolts

$M_{max} = ((96.2)^2 + (53.5)^2)^{1/2} = 110.1 \text{ ft-lbs}$

$T = C = (12)(110.1) / (4.24) = 311.5 \text{ lbs}$

5/8" Bolt Capacity = 1000 lbs (per manufacturer) Therefore bolts are adequate.

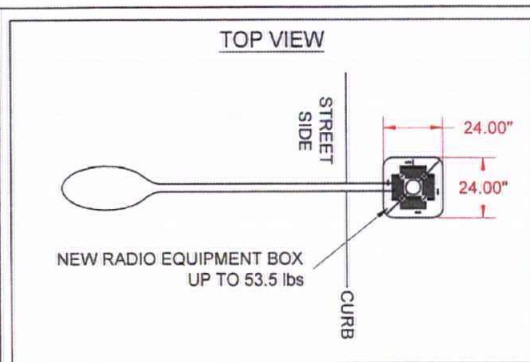
Page 2 of 2

DATE: 06-01-2017	SCALE: N.T.S.
DRAWING NO. 710	DATE: 11/20/16
PROJECT NO. 30011	SHEET 23
TITLE: NEW TYPE 15 STREET LIGHT POLE WITH ANTENNA, RADIO EQUIPMENT, BOX	

MOBILITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 NEW TYPE 15 STREET LIGHT POLE WITH SIGN(S)
 WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX

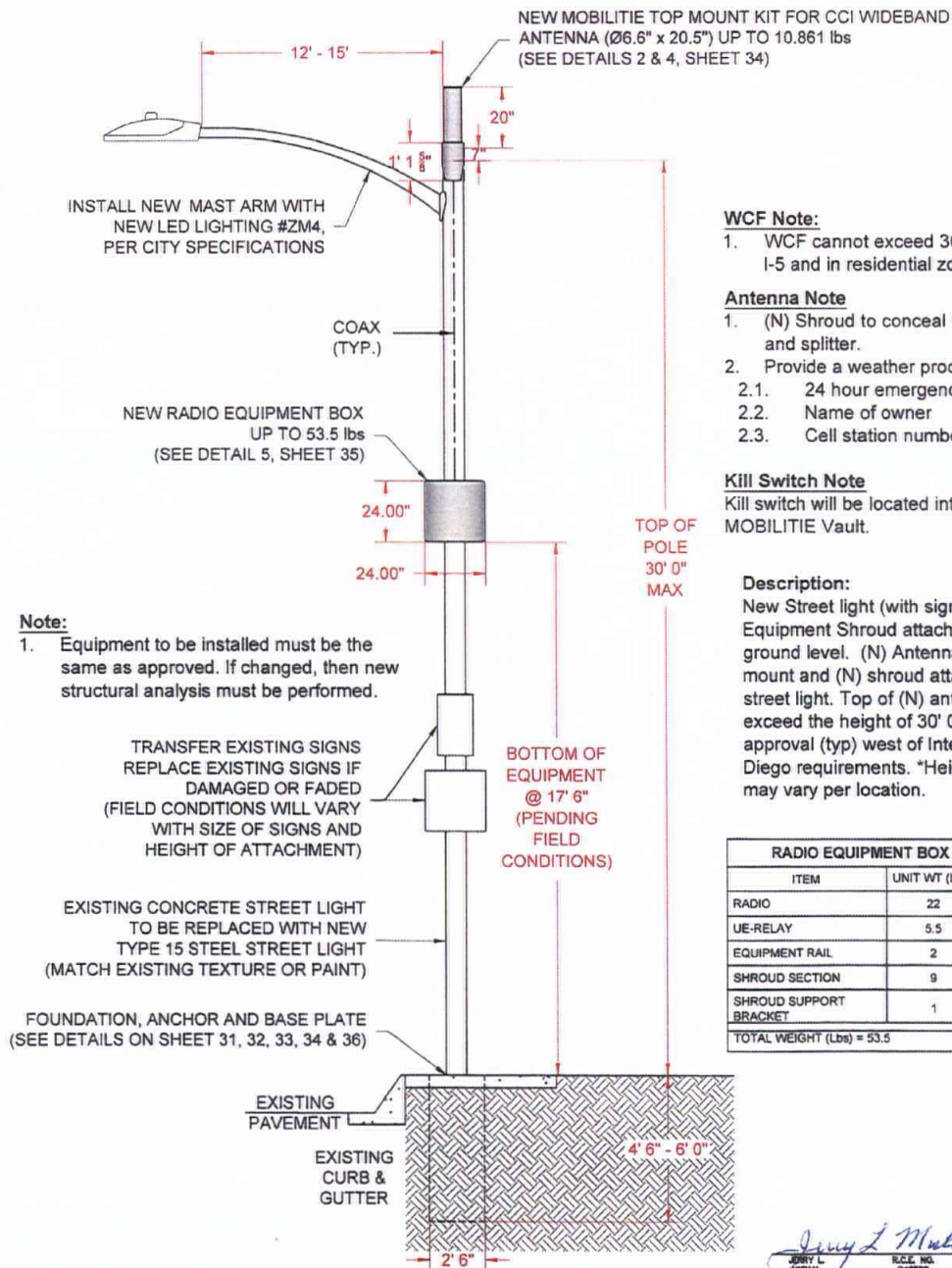
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 2885 ACEDIL AVENUE, SUITE 200
 SAN DIEGO, CA 92108
 (619) 581-3463
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Jerry F Mahal
 ESEY L. MAHAL
 R.E.L. NO. C42590
 EXP. 03-31-18
 DATE 6-3-17



1. "As a California licensed Architect/Engineer, I have classified the undisturbed native soils to be silty sands, sandy silts and per Table 1806.2 of the 2013 CBC, I have assigned a foundation pressure of 1500 psf. and Lateral Bearing Pressure of 100 psf/ft., for the design of foundations related to this project".

Jerry L. Michal Signature of Licensed Architect/Engineer



RADIO EQUIPMENT BOX CONFIGURATION			
ITEM	UNIT WT (Lbs)	QTY	TOTAL (Lbs)
RADIO	22	1	22
UE-RELAY	5.5	1	5.5
EQUIPMENT RAIL	2	2	4
SHROUD SECTION	9	2	18
SHROUD SUPPORT BRACKET	1	4	4
TOTAL WEIGHT (Lbs) = 53.5			

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MOBILITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
NEW TYPE 15 STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

SITE ADDRESS:	Varies
TITLE:	NEW TYPE 15 STREET LIGHT POLE (WITH SIGN(S)) WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX
PTS NO:	550312
DRAWING NO:	TBD
DATE:	11/23/16
SCALE:	N.T.S.
SHEET	24

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO. Antenna Installation CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITIE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 30' Ave. Pole Dia. = As Noted, Steel Strength = 60,000 psi (per manufacturer)
 Footing by Design: Dia.=2.5' dia. x 4.5'deep. Antenna Wt. 18.73 lbs Equip. Wt. 53.5 lbs
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7-10
 2. 2016 CBC 4. 2010 Caltrans Standard Plan RSP ES-6A
 5. San Diego Standard Drawing SDE-101

30-foot type 15 round steel pole with top mount antenna, radio and signs.

1. Wind Loading:

Wind Zone: (Fig. 3-2.3) V = 110 mph (3 sec. Gust)

Coefficients: Kz (16) = 0.87 Kz(32) = 0.94
 Ir = 0.87 G = 1.142

Wind Pressures: Pz(16) = (0.00256) Kz(16)GV²IR = 22 psf
 Pz(30.0) = (0.00256) Kz(30.0)GV²IR = 23.8 psf

2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16') = 7.13 in. A_p = (16) (7.13/12) = 9.51 sq. ft.
 Ave. Dia. (16-30') = 5.00 in. A_p = (14.0) (5.00/12) = 5.84 sq. ft.

Area of light arm: A = (0.25)(8) + (0.5)(2) = 3.0 sq. ft.

Area of antenna: A = (7.18/12)(24/12) = 3.3 sq. ft.

Area of equipment unit: A = (2.0)(2.0) = 4.00 sq. ft.

Area of Sign: A = (1.5)(1.5) = (1)(1.5) = 3.75 sq. ft.



Page 1 of 2

3. FORCE ON POLE

Force on pole: F = P_wA + P_{sw}A = 366.2 pounds

Force on Antenna: F = P_wA_{ant} = 78.5 pounds

Force on equipment: F = P_wA_{eq} = 95.2 pounds

Force on light arm: F = (3.0)(23.8) = 71.4 pounds

Force on Signs (2): F = (3.75)(23.8) = 102.6 pounds

Total wind load = 703.9 pounds

Depth Requirement: Typical Standard Depth is 4.5 feet (per design SDE-101)

$$D = 0.5A (1 + [1 + (4.36h / A)]^2)$$

$$\text{Where } A = (2.34 P/S, b) = [(2.34) (703.9) / (2200) (2.5)] = 0.30$$

$$\text{Therefore } D_{min} = 3.29 \text{ ft.} < 4.50 \text{ feet ok}$$

4. Bearing Capacity

Gross pole wt: 1347 pounds (for pole + equipment)
 Q_a = 1500 psf

Pole fig dia. = 2.5 ft. Footing area = 4.91 sq. ft.

$$Q = 1500 \text{ psf} > Q = (1347) / (4.91) = 274.3 \text{ psf OK}$$

5. Antenna Attachment Calculations:

Moment on Attachment Bolts

$$\text{From Wind: } P1 = (2)(48.1) = 96.2 \text{ ft-lbs From Wt.: } P2 = (1)(53.5) = 53.5 \text{ ft-lbs}$$

Worst Case - Diagonal Bolts

$$M_{max} = ((96.2)^2 + (53.5)^2)^{1/2} = 110.1 \text{ ft-lbs}$$

$$T = C = (12)(110.1) / (4.24) = 311.5 \text{ lbs}$$

5/8" Bolt Capacity = 1000 lbs (per manufacturer) Therefore bolts are adequate.

Page 2 of 2

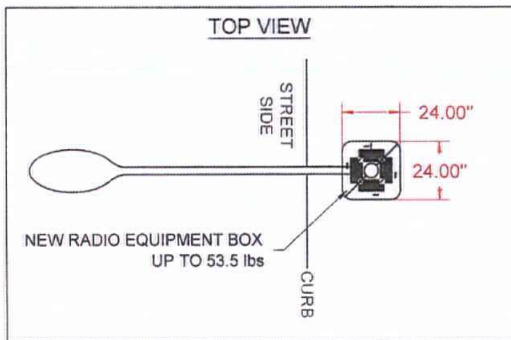
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TITLE	NEW TYPE 15 STREET LIGHT POLE WITH SIGN(S) WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX	DATE	25
PTS NO.	100012	DRAWING NO.	TBD
DATE	11/20/18	SCALE	N.T.S.

MOBILITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 NEW TYPE 15 STREET LIGHT POLE WITH SIGN(S)
 WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

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 COSTA MESA, CA 92625
 (949) 261-3843
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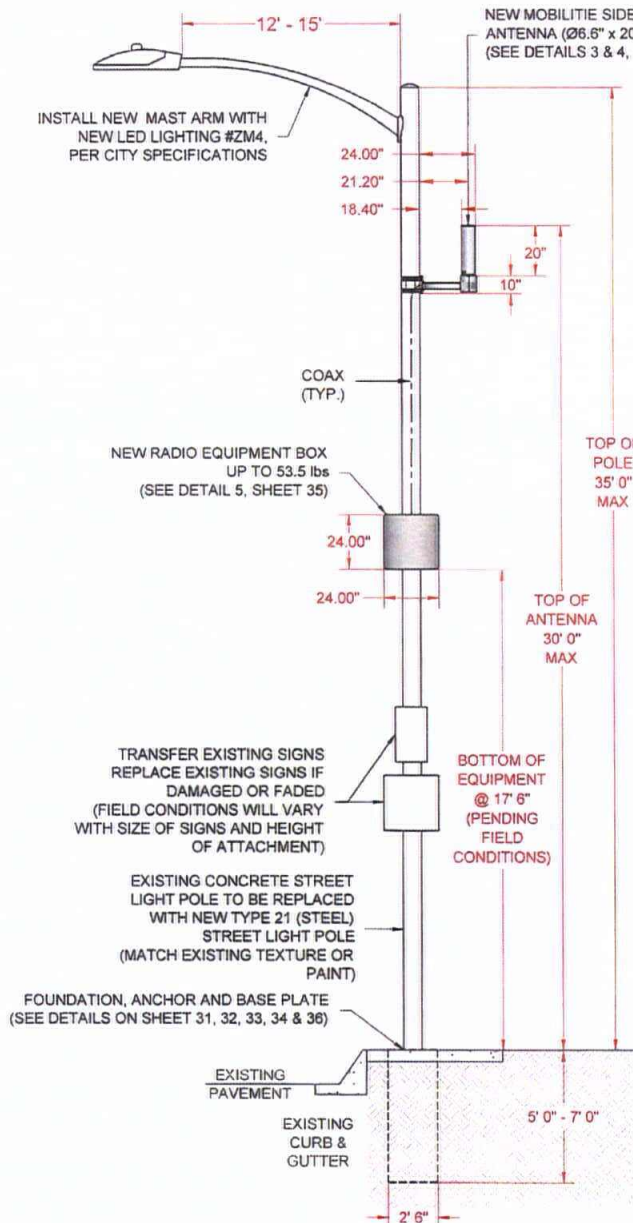


Jerry L. Mehal
 S.D.G. No. 42590
 Exp. 03-31-18
 DATE 6-3-2017



1. "As a California licensed Architect/Engineer, I have classified the undisturbed native soils to be silty sands, sandy silts and per Table 1806.2 of the 2013 CBC, I have assigned a foundation pressure of 1500 psf and Lateral Bearing Pressure of 100 psf/ft., for the design of foundations related to this project".

Jerry L. Michal Signature of Licensed Architect/Engineer



WCF Note:

1. WCF cannot exceed 30' in height west of I-5 and in residential zones.

Antenna Note

1. (N) Shroud to conceal Coax (Typ)ial cables and splitter.
2. Provide a weather proof tag which includes:
 - 2.1. 24 hour emergency contact number
 - 2.2. Name of owner
 - 2.3. Cell station number

Kill Switch Note

3. Kill switch will be located into a 17" x 30" MOBILITIE Vault.

Description:

New type 21 (steel) street light (with sign(s)) with (N) Radio Equipment Shroud attached at 17' 6" above ground level. (N) Antenna with (N) side mount and (N) shroud attached to the new street light. Top of (N) antenna will not exceed the height of 30' 0" per planning approval (typ) west of Interstate 5 per San Diego requirements. *Height of street light may vary per location.

RADIO EQUIPMENT BOX CONFIGURATION

ITEM	UNIT WT (Lbs)	QTY	TOTAL (Lbs)
RADIO	22	1	22
UE-RELAY	5.5	1	5.5
EQUIPMENT RAIL	2	2	4
SHROUD SECTION	9	2	18
SHROUD SUPPORT BRACKET	1	4	4
TOTAL WEIGHT (Lbs) = 53.5			



Jerry L. Michal 6-3-17
JERRY L. MICHAL R.C.E. NO. C42580 EXP. 03-31-18 DATE

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(657) 261-3863
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MOBILITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
NEW TYPE 21 STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX

SITE ADDRESS: Varies
TITLE: NEW TYPE 21 STREET LIGHT POLE (WITH SIGN(S)) WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX
PTS NO.: 560312
DRAWING NO.: TBD
DATE: 11/23/16
SCALE: N.T.S.
SHEET: 26

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO. Antenna Installation CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITIE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 35' Ave. Pole Dia. = As Noted, Steel Strength = 60,000 psi (per manufacturer)
 Footing by Design: Dia. = 2.5' dia. x 5' deep. Antenna Wt. 18.73 lbs Equip. Wt. 53.5 lbs
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7-10
 2. 2016 CBC 4. 2015 Caltrans Standard Plan RSP ES-6A

35-foot Type 21 round steel light pole with side mount antenna, radio and signs.

1. Wind Loadings:

Wind Zone: (Fig. 3-2.3) V = 110 mph (3 sec. Gust)
 Coefficients: Kz (16) = 0.87 Kz (32) = 0.94
 Ir = 0.87 G = 1.142
 Wind Pressures: Pz(16) = (0.00256) Kz(16)GVIR = 22 psf
 Pz(35.0) = (0.00256) Kz(35.0)GVIR = 23.8 psf

2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16) = 7.28 in. A_n = (16) (7.28/12) = 9.70 sq.ft.
 Ave. Dia. (16-35) = 4.87 in. A_m = (14.0) (4.87/12) = 7.37 sq.ft.
 Area of light arm: A = (0.25)(8) + (0.5)(2) = 3.0 sq. ft.
 Area of antenna: A = (7.18/12)(24/12) = 3.3 sq.ft.
 Area of equipment unit: A = (2.0)(2.0) = 4.00 sq.ft.
 Area of Sign: A = (1.5)(1.5) (1)(1.5) = 3.75 sq.ft.



Page 1 of 2

3. FORCE ON POLE

Force on pole: $F = P_w A + P_{sw} A = 388.8$ pounds
 Force on Antenna: $F = P_w A_m = 78.5$ pounds
 Force on equipment: $F = P_w A_{eq} = 95.2$ pounds
 Force on light arm: $F = (3.0)(23.8) = 71.4$ pounds
 Force on Signs (2): $F = (3.75)(22.0) = 82.5$ pounds

Total wind load = 716.4 pounds

Depth Requirement: Typical Standard Depth is 5 feet
 $D = 0.5A (1 + [1 + (4.36h / A)]^2)$

Where $A = (2.34 P/S, b) = [(2.34) (716.4) / (2200) (2.5)] = 0.30$

Therefore $D_m = 3.51$ ft. < 5 feet ok

4. Bearing Capacity

Gross pole wt: 1405 pounds (for pole + equipment)
 $Q_u = 1500$ psf
 Pole fig dia. = 2.5 ft. Footing area = 4.91 sq. ft.
 $Q = 1500$ psf > $Q = (1405) / (4.91) = 286.1$ psf OK

5. Antenna Attachment Calculations:

Moment on Attachment Bolts

From Wind: $P1 = (2)(48.1) = 96.2$ ft-lbs From Wt.: $P2 = (1)(53.5) = 53.5$ ft-lbs

Worst Case - Diagonal Bolts

$M_{max} = ((96.2) + (53.5)) \frac{1}{2} = 110.1$ ft-lbs

$T = C = (12)(110.1) / (4.24) = 311.5$ lbs

5/8" Bolt Capacity = 1000 lbs (per manufacturer) Therefore bolts are adequate.

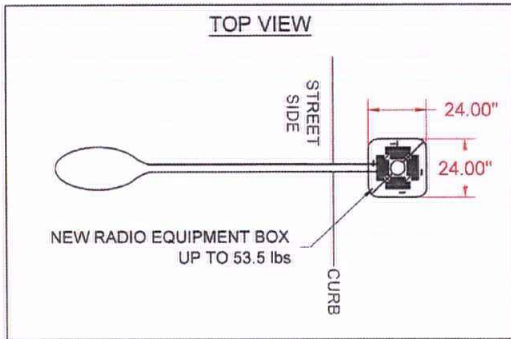
Page 2 of 2

SITE ADDRESS	VENUE
TITLE: NEW TYPE 21 STREET LIGHT POLE WITH SIDE MOUNT ANTENNA, RADIO EQUIPMENT AND SIGNS	PROJECT NO. 680012
DATE: 6-01-2017	DRAWING NO. TBD
SCALE: 1" = 10'-0"	DATE: 11/25/16
DESIGNED BY: JLM	CHECKED BY: JLM
APPROVED BY: JLM	DATE: 6-01-2017
SHEET	27

MOBILITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic:
 NEW TYPE 21 STREET LIGHT POLE (WITH SIGN(S))
 WITH ANTENNA SIDE MOUNT AND RADIO EQUIPMENT BOX

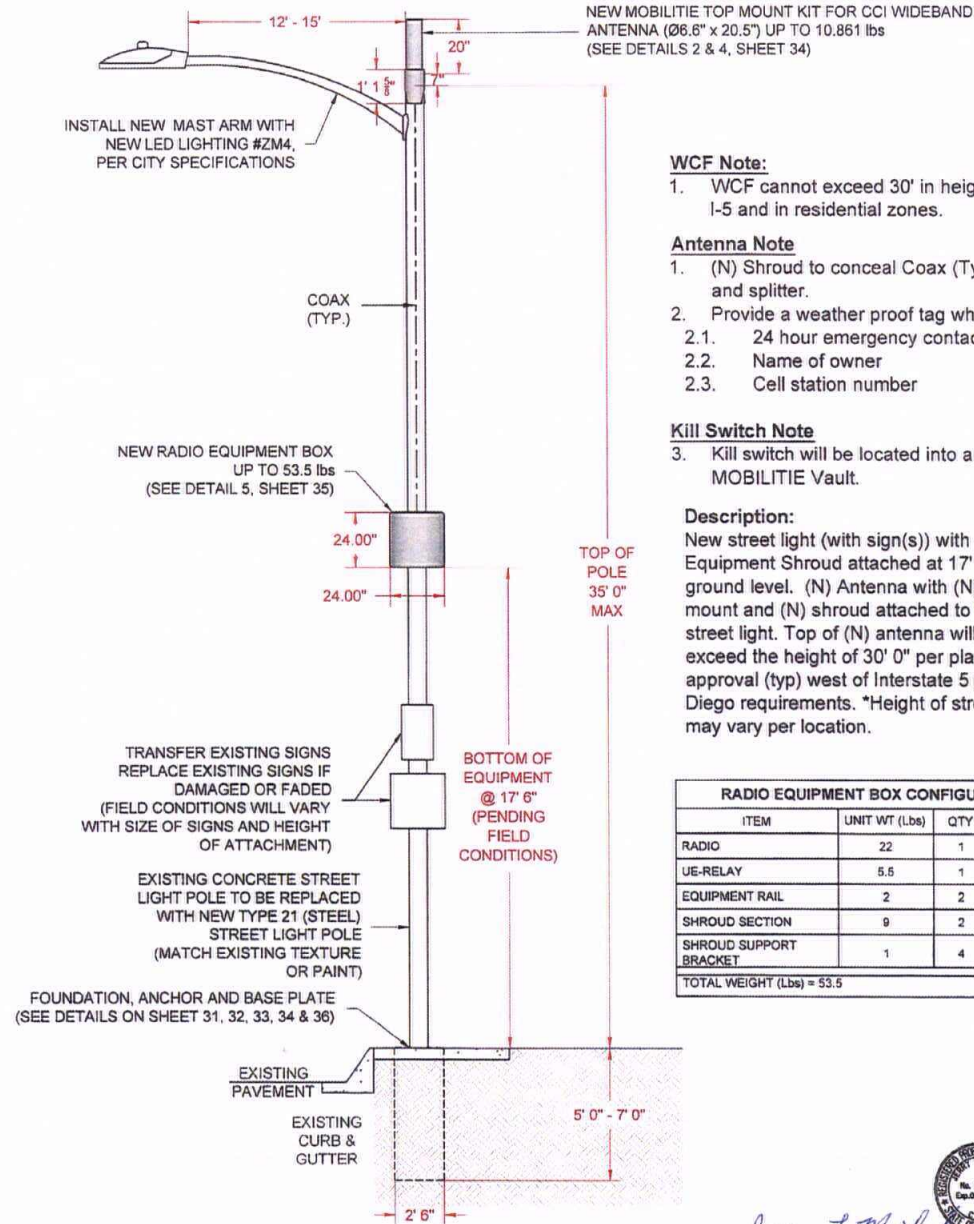
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 2350 COSTA MESA BLVD., SUITE 200
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 (949) 261-3863
 E: www.mobilitie.com

Jerry L. Michael
 JERRY L. MICHAEL
 REG. NO. 42590
 EXP. 3-31-18
 DATE 6-3-17



1. "As a California licensed Architect/Engineer, I have classified the undisturbed native soils to be silty sands, sandy silts and per Table 1806.2 of the 2013 CBC, I have assigned a foundation pressure of 1500 psf. and Lateral Bearing Pressure of 100 ps/ft., for the design of foundations related to this project".

Jerry L Michel Signature of Licensed Architect/Engineer



WCF Note:

1. WCF cannot exceed 30' in height west of I-5 and in residential zones.

Antenna Note

1. (N) Shroud to conceal Coax (Typ)ial cables and splitter.
2. Provide a weather proof tag which includes:
- 2.1. 24 hour emergency contact number
 - 2.2. Name of owner
 - 2.3. Cell station number

Kill Switch Note

3. Kill switch will be located into a 17" x 30" MOBILITIE Vault.

Description:

New street light (with sign(s)) with (N) Radio Equipment Shroud attached at 17' 6" above ground level. (N) Antenna with (N) side mount and (N) shroud attached to the new street light. Top of (N) antenna will not exceed the height of 30' 0" per planning approval (typ) west of Interstate 5 per San Diego requirements. "Height of street light may vary per location.

RADIO EQUIPMENT BOX CONFIGURATION

ITEM	UNIT WT (Lbs)	QTY	TOTAL (Lbs)
RADIO	22	1	22
UE-RELAY	5.5	1	5.5
EQUIPMENT RAIL	2	2	4
SHROUD SECTION	9	2	18
SHROUD SUPPORT BRACKET	1	4	4
TOTAL WEIGHT (Lbs) = 53.5			



Jerry L Michel 6-3-17
JERRY L. MICHEL R.C.E. NO. C42580 EXP. 03-31-18 DATE

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MOBILITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
NEW TYPE 21 STREET LIGHT POLE (WITH SIGN(S))
WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

SITE ADDRESS:		Varies
TITLE: NEW TYPE 21 STREET LIGHT POLE (WITH SIGN(S)) WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX		
PTS. NO.	550312	SHEET 28
DRAWING NO.	TBD	
DATE:	11/23/16	
SCALE:	N.T.S.	

STRUCTURAL DESIGN AND CALCULATIONS

PROJECT NO. Antenna Installation CALCULATIONS BY: JLM
 PROJECT NAME: MOBILITIE INTELLIGENT DATE: 6-01-2017
 PROJECT ADDRESS: VARIOUS AREAS
San Diego, California

DESIGN PARAMETERS

Bearing Capacity: 1500 psf (per CBC Table 1806.2) Allowable Lateral Pressure: 100 psf/ft
 Steel Pole Ht. = 35' Ave. Pole Dia. = As Noted. Steel Strength = 60,000 psi (per manufacturer)
 Footing by Design: Dia. = 2.5' dia. x 5' deep. Antenna Wt. 18.73 lbs Equip. Wt. 53.5 lbs
 References: 1. 2015 IBC 3. ASCE MINIMUM DESIGN LOADS - 7 - 10
 2. 2016 CBC 4. 2015 REVISED CALTRANS STANDARD PLAN RSA ES-6A

35-foot Type 21 steel light pole with top mount antenna, radio and signs.

1. Wind Loading:

Wind Zone: (Fig. 3-2.3) V = 110 mph (3 sec. Gust)
 Coefficients: $K_z(16) = 0.87$ $K_z(32) = 0.94$
 $I_r = 0.87$ $G = 1.142$
 Wind Pressures: $P_z(16) = (0.00256) K_z(16) G V^2 / R = 22$ psf
 $P_z(35.0) = (0.00256) K_z(35.0) G V^2 / R = 23.8$ psf

2. AREA CALCULATIONS

Area of pole: Ave. Dia. (0-16') = 7.28 in. $A_n = (16) (7.28/12) = 9.70$ sq. ft.
 Ave. Dia. (16-35') = 4.87 in. $A_n = (19.0) (4.87/12) = 7.71$ sq. ft.
 Area of light arm: $A = (0.25)(8) + (0.5)(2) = 3.0$ sq. ft.
 Area of antenna: $A = (7.18/12)(24/12) = 3.3$ sq. ft.
 Area of equipment unit: $A = (2.0)(2.0) = 4.00$ sq. ft.
 Area of Sign: $A = (1.5)(1.5) + (1)(1.5) = 3.75$ sq. ft.



Page 1 of 2

3. FORCE ON POLE

Force on pole: $F = P_w A + P_{sw} A = 388.8$ pounds
 Force on Antenna: $F = P_w A_n = 78.5$ pounds
 Force on equipment: $F = P_w A_n = 95.2$ pounds
 Force on light arm: $F = (3.0)(23.8) = 71.4$ pounds
 Force on Signs (2): $F = (3.75)(22.0) = 82.5$ pounds
 Total wind load = 716.4 pounds

Depth Requirement: Typical Standard Depth is 5' feet
 $D = 0.5A (1 + [1 + (4.36h / A)]^2)$

Where $A = (2.34 P/S, b) = [(2.34) (716.4) / (2200) (2.5)] = 0.30$

Therefore $D_n = 3.51$ ft. < 5 feet OK

4. Bearing Capacity

Gross pole wt: 1405 pounds (for pole + equipment)
 $Q_n = 1500$ psf
 Pole ftg dia. = 2.5 ft. Footing area = 4.91 sq. ft.
 $Q = 1500$ psf > $Q = (1405) / (4.91) = 286.1$ psf OK

5. Antenna Attachment Calculations:

Moment on Attachment Bolts

From Wind: $P_1 = (2)(48.1) = 96.2$ ft.-lbs From Wt.: $P_2 = (1)(53.5) = 53.5$ ft.-lbs

Worst Case - Diagonal Bolts

$M_{max} = (96.2) + (53.5) = 149.7$ ft.-lbs

$T = C = (12)(149.7) / (4.24) = 421.5$ lbs

5/8" Bolt Capacity = 1000 lbs (per manufacturer) Therefore bolts are adequate.

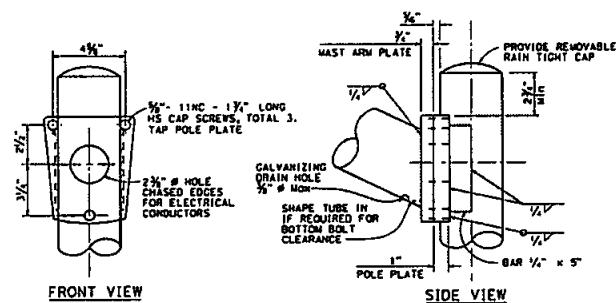
Page 2 of 2

DATE: 6-01-2017	BY: JLM
CHECKED: [Signature]	DATE: 6-01-2017
PROJECT NO. 520113	PROJECT NAME: MOBILITIE INTELLIGENT
DATE: 1/25/18	SCALE: N.T.S.
SHEET: 29	

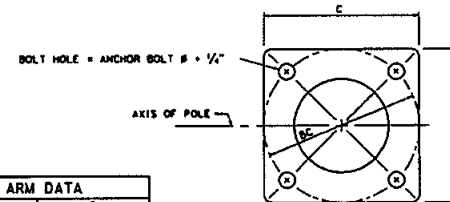
MOBILITIE INTELLIGENT INFRASTRUCTURE
 Master Structural Schematic
 NEW TYPE 21 STREET LIGHT POLE (WITH SIGN(S))
 WITH ANTENNA TOP MOUNT AND RADIO EQUIPMENT BOX

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James J. McDaniel
 JLM
 6-3-17
 DATE



LUMINAIRE MAST ARM CONNECTION
DETAIL R



BASE PLATE
DETAIL A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (LIGHTING STANDARD, TYPES 15 AND 21)

NO SCALE

RSP ES-6A DATED JULY 15, 2016 SUPERSEDES RSP ES-6A
DATED OCTOBER 30, 2015 AND STANDARD PLAN ES-6A DATED MAY 20, 2011 -
PAGE 452 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP ES-6A

TYPE 15 AND TYPE 21 BARRIER RAIL MOUNTED
ELEVATION B

POLE TYPE	POLE DATA				BASE PLATE DATA				C10H PILE FOUNDATION	
	HEIGHT	MIN OD		WALL THICKNESS	C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	Dia	DEPTH
15	30'-0"	8"	3 1/2"	0.1196"	1'-0"	1'-0"	1 1/2"	1" x 36"	2'-6"	6'-0"
21	33'-0"	8 3/4"	3 1/2"	0.1793"			2"	1 1/2" x 36"		7'-0"

* FOR BARRIER RAIL BOLTS, SEE REVISED STANDARD PLAN RSP ES-60.

M PROJECTED LENGTH	N RISE	W/O AT POLE	NOMINAL THICKNESS	P	
				TYPE 15	TYPE 2
6'-0"	2'-0"	3/4"	0.1196"	31'-6"	38'-4"
8'-0"	2'-6"	3/4"		32'-0"	37'-0"
10'-0"	3'-3"	3/4"		32'-6"	37'-9"
12'-0"	4'-3"	3/4"		33'-9"	38'-9"
15'-0"	4'-9"	4"		34'-9"	39'-3"

NOTES:

1. ☐ indicates mast arm length to be used unless otherwise noted on the plans.
2. For Type 15-SB, use Type 15 standard with Type 30 slip base plate details, see Revised Standard Plan RSP ES-6F.
3. Manhole shall be located on the downstream side of traffic.
4. For additional notes and details, see Revised Standard Plans R

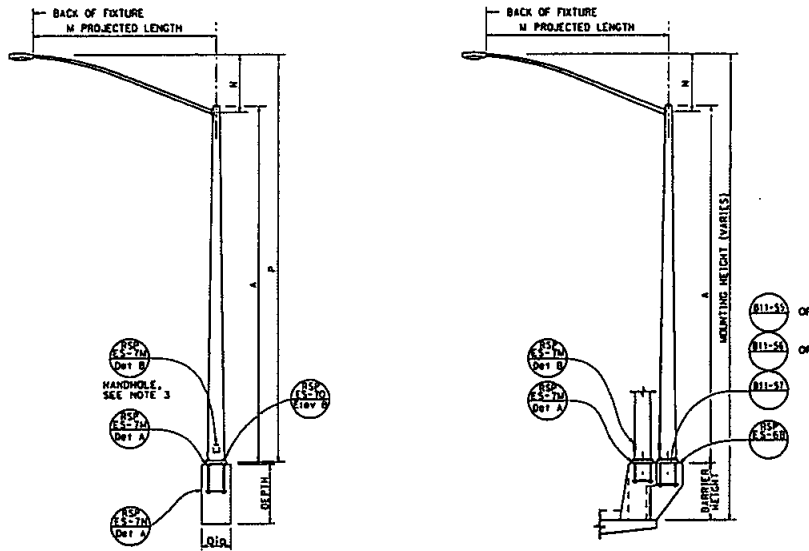


6-3-17
DATE

2010 REVISED STANDARD PLAN RSP ES-6A

MOBILITE INTELLIGENT INFRASTRUCTURE.
Master Structural Schematic.

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TYPE 15 AND TYPE 21
ELEVATION A

TYPE 15 AND TYPE 21 BARRIER RAIL MOUNTED
ELEVATION B

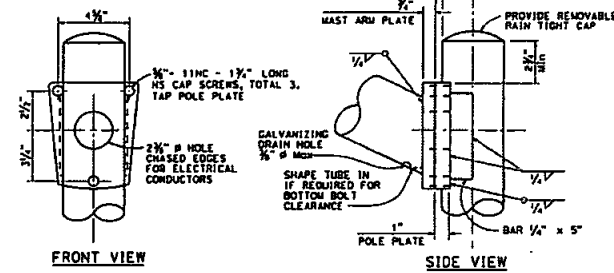
POLE TYPE	POLE DATA				BASE PLATE DATA				CIDH PILE FOUNDATION	
	A HEIGHT	MIN OD	BASE	TOP	WALL THICKNESS	C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	DIG DEPTH
15	30'-0"	8"	3/4"	3/4"	0.1196"	1'-0"	1'-0"	1 1/2"	1" x 36" x	6'-0"
21	35'-0"	8 1/2"	3/4"	3/4"	0.1193"	1'-0"	1'-0"	2"	1 1/2" x 36" x	7'-0"

* FOR BARRIER RAIL BOLTS, SEE REVISED STANDARD PLAN RSP ES-6D.

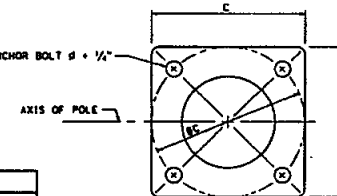
NOTES:

1. [] Indicates mast arm length to be used unless otherwise noted on the plans.
2. For Type 15-SB, use Type 15 standard with Type 3D slip base plate details, see Revised Standard Plan RSP ES-6F.
3. Manhole shall be located on the downstream side of traffic.
4. For additional notes and details, see Revised Standard Plans RSP ES-7H and RSP ES-7N.

LUMINAIRE MAST ARM DATA									
PROJECTED LENGTH	H	MIN OD AT POLE	MIN THICKNESS	TYPE 15	TYPE 21				
6'-0"	2'-0"	3/4"	0.1196"	31'-8"	36'-6"				
8'-0"	2'-6"	3/4"		32'-0"	37'-0"				
10'-0"	3'-0"	3/4"		32'-8"	37'-6"				
12'-0"	4'-0"	3/4"		33'-0"	38'-0"				
15'-0"	4'-6"	4/4"		34'-3"	39'-3"				



LUMINAIRE MAST ARM CONNECTION
DETAIL R



BASE PLATE
DETAIL A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
ELECTRICAL SYSTEMS
(LIGHTING STANDARD,
TYPES 15 AND 21)
NO SCALE

RSP ES-6A DATED JULY 15, 2016 SUPERSEDES STANDARD PLAN ES-6A
DATED OCTOBER 30, 2015 - PAGE 449 OF THE STANDARD PLANS BOOK DATED 2015.

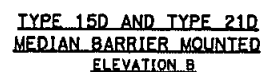
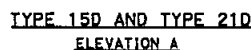
REVISED STANDARD PLAN RSP ES-6A

2015 REVISED STANDARD PLAN RSP ES-6A

NEW POLE DETAILS									
TITLE	DATE	BY	CHKD	APP'D	DATE	BY	CHKD	APP'D	DATE
NEW POLE DETAILS	1/2/2018	1/2/2018	1/2/2018	1/2/2018	1/2/2018	1/2/2018	1/2/2018	1/2/2018	1/2/2018
DATE	1/2/2018	DATE	1/2/2018	DATE	1/2/2018	DATE	1/2/2018	DATE	1/2/2018
SCALE	N/A	SCALE	N/A	SCALE	N/A	SCALE	N/A	SCALE	N/A

MOBILITE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
NEW POLE DETAILS

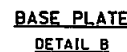
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(837) 261-3663
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LUMINAIRE MAST ARM DATA					
PROJECTED LENGTH	N RISE	MIN O' AT POLE	NOMINAL THICKNESS	P	
				TYPE 150	TYPE 210
6'-0"	2'-0"	3 1/2"	0.1196"	31'-6"	36'-6"
8'-0"	2'-6"	3 1/2"		32'-0"	37'-0"
10'-0"	3'-3"	3 3/4"		32'-9"	37'-9"
12'-0"	4'-3"			33'-0"	38'-0"

- NOTES:**

1. ☐ indicates most arm length to be used unless otherwise noted on the plans.
2. For additional notes and details, see Revised Standard Plans RSP ES-1 and RSP ES-2.
3. See Concrete Barrier Details Type 60E and 60SE.
4. For locations with one arm, plug unused cap screw holes with chase drill with galvanized cap screws and knockout plug.
5. Handhole shall be located perpendicular to the luminaire most arm and as directed by the Engineer.



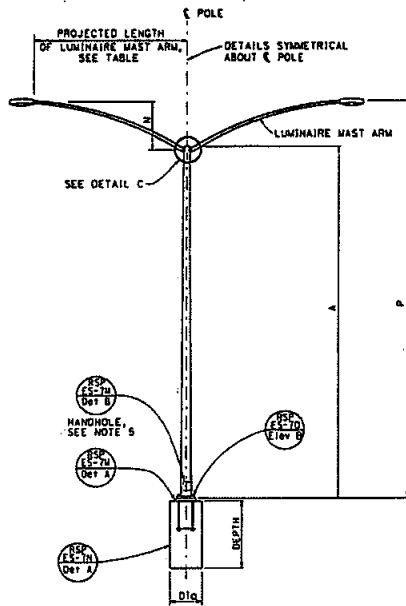
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS
(LIGHTING STANDARD,
TYPES 15D AND 21D,
DOUBLE LUMINAIRE MAST ARM)**

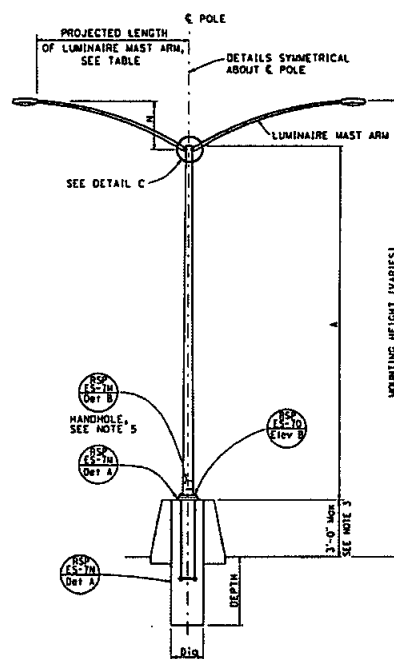
NO SCALE

RSP ES-60 DATED JULY 15, 2016 SUPERSEDES STANDARD PLAN ES-60
DATED OCTOBER 30, 2015 - PAGE 452 OF THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP ES-6D



TYPE 15D AND TYPE 21D
ELEVATION A



TYPE 15D AND TYPE 21D
MEDIAN BARRIER MOUNTED
ELEVATION B

POLE TYPE	POLE DATA				BASE PLATE DATA				CIDH PILE FOUNDATION	
	A	min OD	min	min	C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	DIA	DEPTH
15D	30'-0"	8"			1'-0"	1'-0"	1 1/2"	1 1/2" x 42"	2'-6"	7'-0"
21D	35'-0"	8 1/2"	3 1/2"	0.1193"	1'-0"	1'-0"	1 1/2"	1 1/2" x 42"	2'-6"	7'-0"

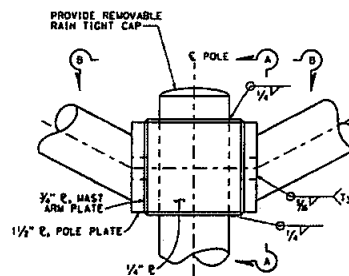
LUMINAIRE MAST ARM DATA					
PROJECTED LENGTH	N	min OD	NOMINAL THICKNESS	TYPE 15D	TYPE 21D
6'-0"	2'-0"	3 1/4"		31'-6"	36'-6"
8'-0"	2'-6"	3 1/2"	0.1196"	32'-0"	37'-0"
10'-0"	3'-3"	3 3/4"		32'-6"	37'-6"
12'-0"	4'-3"	3 1/2"		33'-0"	38'-0"

NOTES:

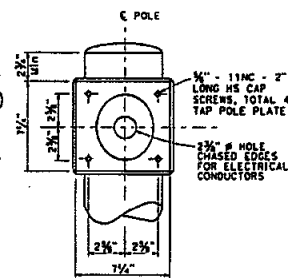
1. [] Indicates mast arm length to be used unless otherwise noted on the plans.
2. For additional notes and details, see Revised Standard Plans RSP ES-7M and RSP ES-7N.
3. See Concrete Barrier Details Type 60E and 60SE.
4. For locations with one arm, plug unused cap screw holes and chased outlet with galvanized cap screws and knockout plug.
5. Handhole shall be located perpendicular to the luminaire mast arm and as directed by the Engineer.

SHEET NO.	TOTAL SHEETS	DATE	SCALE
33	33	11/2/18	NTS

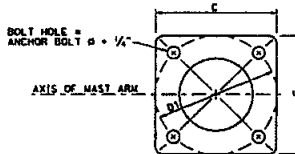
REGISTERED CIVIL ENGINEER
July 15, 2016
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA ON ITS OFFICIAL SEAL AND SEAL OF THE REGISTERED CIVIL ENGINEER
TO ACCOMPANY PLANS DATED



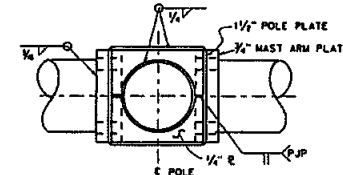
DETAIL C



SECTION A-A



BASE PLATE
DETAIL B



SECTION B-B

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
**ELECTRICAL SYSTEMS
(LIGHTING STANDARD,
TYPES 15D AND 21D,
DOUBLE LUMINAIRE MAST ARM)**
NO SCALE

RSP ES-6D DATED JULY 13, 2016 SUPERSEDES RSP ES-6D
DATED OCTOBER 30, 2015 AND STANDARD PLAN ES-6D DATED MAY 20, 2011.
PAGE 455 OF THE STANDARD PLANS BOOK DATED 2010.

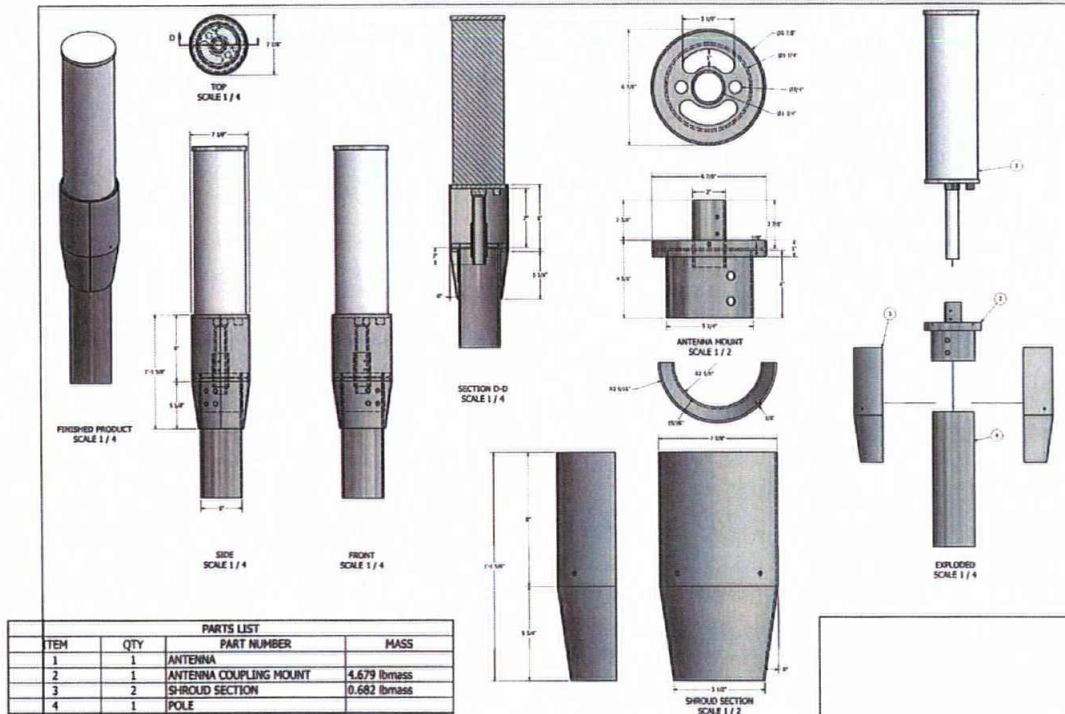
REVISED STANDARD PLAN RSP ES-6D

2010 REVISED STANDARD PLAN RSP ES-6D

MOBILITE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
NEW POLE DETAILS

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TEL: 714.441.1111
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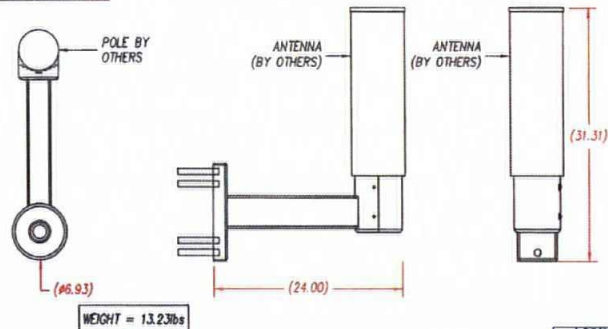
ANTENNA MOUNT TYPICAL SECTION: N.T.S.



2 SCALE N.T.S.

ITEM NO.	ITEM	DESCRIPTION
1	1	SIDE ARM, CCI ANTENNA, SAN DIEGO, WELDMENT
2	1	PLATE, U-BOLT BACKER, CCI W/ 1.5" PIPE
3	1	SHROUD HALF, CCI ANTENNA, SIDEARM SIDE
4	1	SHROUD HALF, CCI ANTENNA
5	2	HHCS, 3/8"-16 UNC X 1" LG, FT, HEX, 18-8 SS
6	4	WASHER, FLAT, 3/8", 18-8 SS
7	2	WASHER, SPLIT LOCK, 3/8", 18-8 SS
8	2	NUT, HEX, 3/8"-16 UNC, 18-8 SS
9	2	U BOLT, 1/4"-20 UNC, 18-8 SS
10	4	WASHER, FLAT, 1/4", 18-8 SS
11	4	WASHER, SPLIT LOCK, 1/4", 18-8 SS
12	4	NUT, HEX, 1/4"-20 UNC, 18-8 SS

ANTENNA SIDEARM MOUNT TYPICAL SECTION: N.T.S.



3 SCALE N.T.S.

CCI WIDE-BAND QUASI-OMNI ANTENNA (MODEL #SCA-03602-F2S) TYPICAL SECTION: N.T.S.

ELECTRICAL	
FREQUENCY RANGE:	1850-1895 MHz 2495-2690 MHz
GAIN:	7.8 dBi 7.8 dBi
ELEVATION BEAMWIDTH (-3dB):	12.7° 13.6°
ELECTRICAL DOWNWIND:	2" (1" AND 12" RLTS AVAILABLE)
FIRST UPPER SIDELOBS:	<-14 dB <-14 dB
CROSS-POLAR PORT-TO-PORT ISOLATION:	> 26 dB > 26 dB
VOLTAGE STANDING WAVE RATION (VSWR):	< 1.5:1 < 1.5:1
PASSIVE INTERMODULATION (X20dB):	< -150 dBc < -150 dBc
INPUT POWER CONTINUOUS WAVE (CW):	300 WATTS
POLARIZATION:	DUAL LINEAR 45°
INPUT IMPEDANCE:	50 ohms
LIGHTNING PROTECTOR:	DC GROUND
MECHANICAL	
DIMENSIONS (LxW):	20.5 x 6.6 in. (520 x 168 mm)
SURVIVAL WIND SPEED:	> 150 mph (>241 kph)
FRONT WIND LOAD:	17 lbs (7.4 N) @ 100 mph (161 kph)
EQUIVALENT FLAT PLATE AREA:	0.7 m² (0.1 m²)
WEIGHT:	5.5 lbs (2.5 kg)
CONNECTOR (RF):	2 x 4.1-9.5 FEMALE
CONNECTOR (GPS)(IF EQUIPPED):	1 x TYPE N-FEMALE
MOUNTING POLE:	1 TO 2.5 in. (25 TO 63 mm)



4 SCALE N.T.S.

Jerry L. Michel
JERRY L. MICHEL R.C.E. NO. 042090 EXP. 03-31-18 DATE 6-3-17

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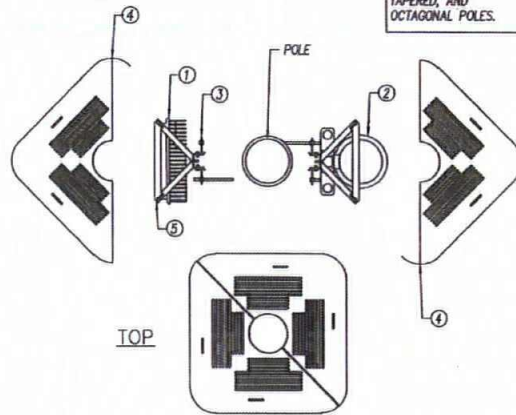
MOBILITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
ANTENNA DETAILS

BITE ADDRESS:	Vanes
TITLE:	ANTENNA DETAILS
PTS NO.	650312
DRAWING NO.	TBD
DATE:	11/23/16
SCALED:	N.T.S.
SHEET	34

EQUIPMENT CUBE
TYPICAL SECTION: N.T.S.

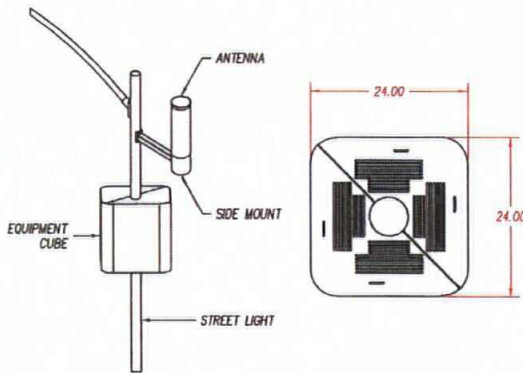
NOTE:
SUPPORT BRACKET WILL
MOUNT ON TO ROUND,
TAPERED, AND
OCTAGONAL POLES.

PARTS LIST			
ITEM NO.	ITEM	DESCRIPTION	ITEM APPROX. WEIGHT
1	1	RADIO	22 LBS
2	1	UE-RELAY	5.5 LBS
3	2	EQUIPMENT RAIL	2 LBS (4 LBS COMBINED)
4	2	SHROUD SECTION	9 LBS (18 LBS COMBINED)
5	4	SHROUD SUPPORT BRACKET	1 LB (4 LBS COMBINED)



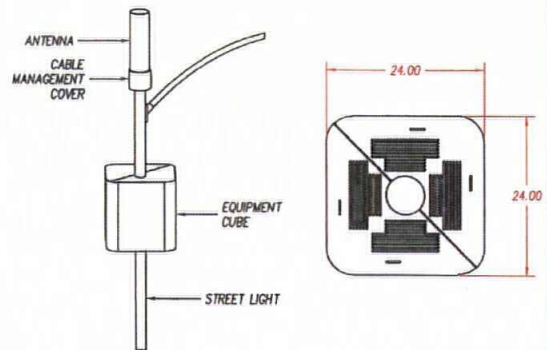
5 SCALE
N.T.S.

ANTENNA SIDE MOUNT &
EQUIPMENT CUBE ASSEMBLY
TYPICAL SECTION: N.T.S.



6 SCALE
N.T.S.

ANTENNA TOP MOUNT &
EQUIPMENT CUBE ASSEMBLY
TYPICAL SECTION: N.T.S.



7 SCALE
N.T.S.

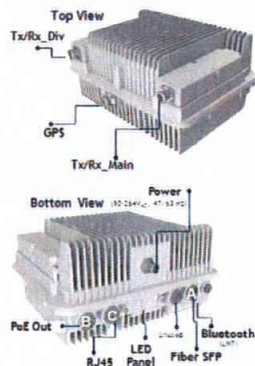
MOUNTED RADIO NOKIA B41 HP
(FWHR B41 HP - 47548A, 47560A, 47604A)
TYPICAL SECTION: N.T.S.

MANUFACTURER: NOKIA
MODEL: FWHR B41 HP
(OR APPROVED EQUAL)
HEIGHT: 9.7 IN
WIDTH: 12.8 IN
DEPTH: 6.3 IN
WEIGHT: 24.7 LBS

NOKIA



Front View



8 SCALE
N.T.S.

James L. Michel
JLM
R.E.E. NO. 042860
DATE 03-31-18
6-3-17



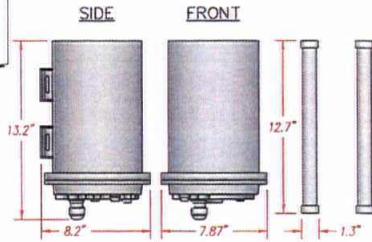
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(657) 261-3883
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MOBITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
EQUIPMENT DETAILS

SITE ADDRESS: Varies	
TITLE: EQUIPMENT DETAILS	
PTS NO. 500312	SHEET 35
DRAWING NO. TBD	
DATE: 11/23/16	
SCALED: N.T.S.	

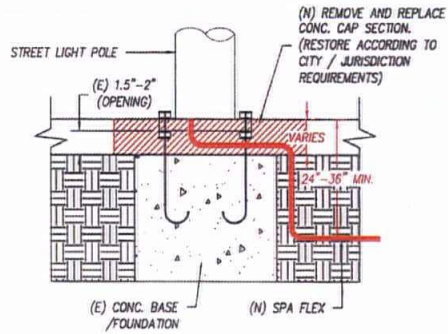
NOKIA/GEMTECK DE RELAY
MODEL # 473763A
TYPICAL SECTION: N.T.S.

MANUFACTURER:
NOKIA/GEMTECK
MODEL: 473763A
(OR APPROVED EQUAL)
HEIGHT: 24.62 IN
DIAMETER: 7.87 IN
WEIGHT: 5.5 LBS
NOKIA



9 SCALE
N.T.S.

CABLING DETAIL (POWER CABLING DETAIL)
TYPICAL SECTION: N.T.S.



NOTE:
CONCRETE SHALL CONTAIN CEMENT,
COARSE AGGREGATE, AND FINE
AGGREGATE WITH A MINIMUM OF 3,000
POUNDS COMPRESSIVE STRENGTH PER
SQUARE INCH IN 28 DAYS.

10 SCALE
N.T.S.

ANTENNA SIGNAGE
TYPICAL SECTION: N.T.S.

ANTENNA SIGNAGE:
ON METAL POLES - ADHESIVE
VINYL OR PLACARD STRAPPED
WITH SS TIES
SIGN PLACEMENT:
AFFIX TO THE STRUCTURE 3'-4'
BELOW THE COMMERCIAL RF
ANTENNA(S)
SIZE APPROX. 8" x 5"

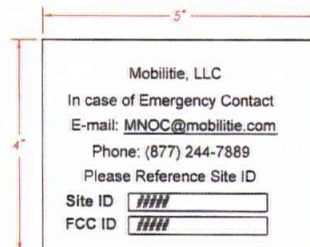


MOBILITIE, LLC

11 SCALE
N.T.S.

EMERGENCY CONTACT SIGN
TYPICAL SECTION: N.T.S.

OWNER / OPERATOR NOTE:
SITE ID LABEL TO BE AFFIXED
AT OR NEAR THE POINT OF
POWER CONNECTION WITH
T26S241 LABELING TAPE OR
EQUIVALENT BLACK ON WHITE
LABELING TAPE OF AT LEAST
18mm WIDTH WITH
EXTRA-STRENGTH ADHESIVE.
USE ANY COMPATIBLE P-TOUCH
LABEL MAKER. TEXT SHOULD BE
PRINTED IN ALL CAPS WITH A
MINIMUM HEIGHT OF 1/2".

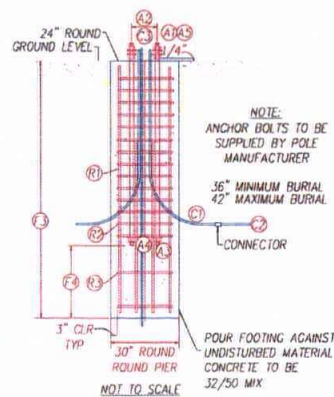


MOBILITIE, LLC

12 SCALE
N.T.S.

NEW POLE FOUNDATION
TYPICAL SECTION: N.T.S.

GROUND ROD:
G1 GROUND ROD SHALL BE MINIMUM
0.625 DIA. x 9' LONG COPPER CLAD.
G2 MINIMUM 3' EXPOSURE AT TOP OF
FOUNDATION WITHIN BOLT CIRCLE.



ANCHOR BOLTS:
A1 ANCHOR BOLTS SHALL BE 4-1" DIAMETER
AS GIVEN IN SPECIFICATIONS ASTM A449.
A2 BOLT CIRCLE DIAMETER TO MATCH POLE
BASEPLATE.
A3 ANCHOR BOLTS SHALL HAVE HEADS, OR
NUTS WITH THE THREADS STAKED AT TWO
PLACES BELOW THE NUT, EMBEDDED IN
FOUNDATION.
A4 ANCHOR BOLTS SHALL BE EMBEDDED 33"
MINIMUM BELOW STREET GRADE (63"
EMBEDMENT IN CONCRETE).
A5 BOLT PROJECTION AS RECOMMENDED
BY THE MANUFACTURER.

CONDUIT:
C1 CONDUIT SHALL BE RIGID STEEL,
GALVANIZED, INSIDE THE FOUNDATION,
WITH 6" MINIMUM STUB-OUT.
C2 SERVICE AND FEED CONDUITS SHALL
BE RGS OR SCH 80 PVC, AS REQUIRED.
C3 STUB UP TO WITHIN 4" FROM HAND
HOLE.

REINFORCEMENT:
R1 VERTICAL REBAR SHALL BE (7) #6 EQUALLY
SPACED INSIDE OF HOOPS.
R2 HOOPS SHALL BE #4 X 18" I.D., SPACED
4" O/C FROM TOP OF FOUNDATION TO
END OF ANCHOR BOLTS.
R3 HOOPS SHALL BE #4 X 18" I.D., SPACED
12" MIN FROM THE ANCHOR BOLTS TO
BOTTOM OF FOUNDATION.
R4 ALL REBAR SHALL HAVE 3" MINIMUM
COVERING.
F3 6" - 7" DEPTH PER SAN DIEGO STANDARD



Jerry L. Michel
JERRY L. MICHEL
REEL NO. 042800
DATE 6-3-17
COP. 03-31-18

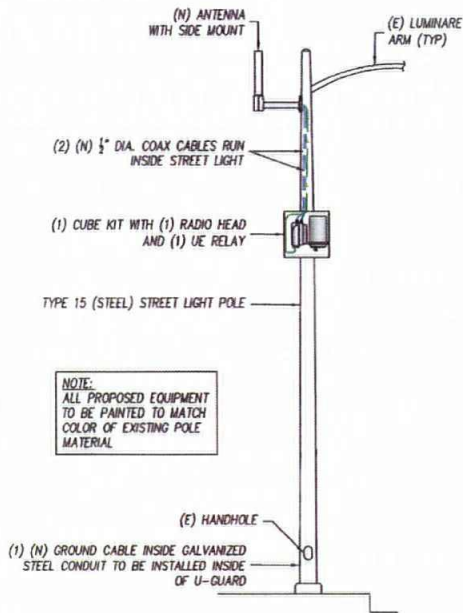
13 SCALE
N.T.S.

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MOBILITIE INTELLIGENT INFRASTRUCTURE
Master Structural Schematic
EQUIPMENT DETAILS

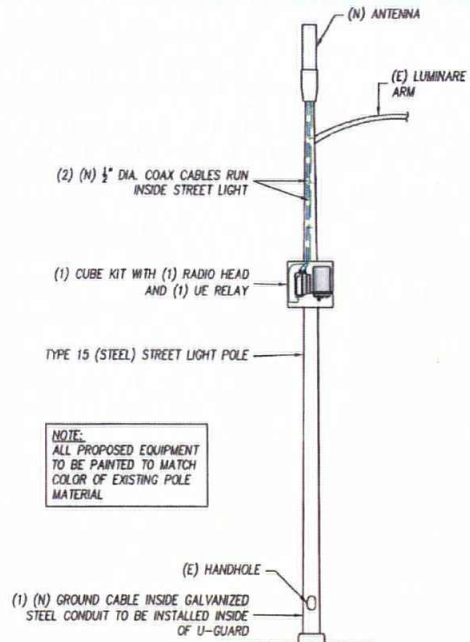
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TITLE: EQUIPMENT DETAILS	
PTS NO. 550312	SHEET 36
DRAWING NO. TBD	
DATE 1/12/16	
SCALED: N.T.S.	

PLUMBING DIAGRAM
TYPICAL SECTION: N.T.S.



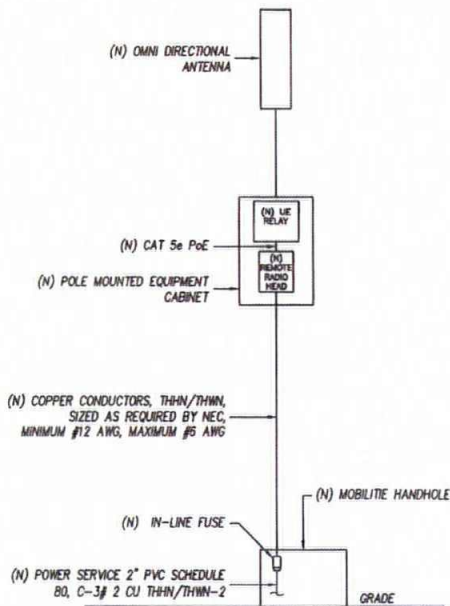
15 SCALE
N.T.S.

PLUMBING DIAGRAM
TYPICAL SECTION: N.T.S.



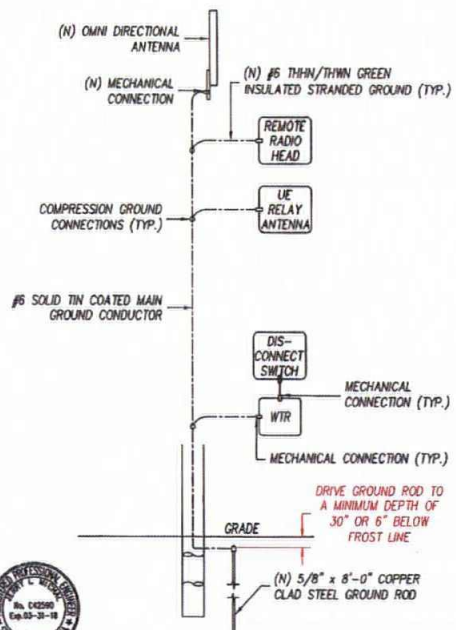
16 SCALE
N.T.S.

ONE LINE DIAGRAM
TYPICAL SECTION: N.T.S.



17 SCALE
N.T.S.

GROUNDING RISER DIAGRAM
TYPICAL SECTION: N.T.S.

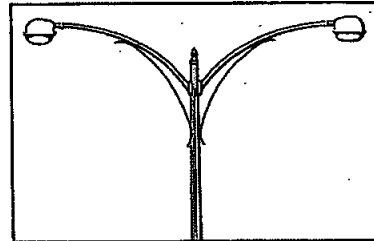
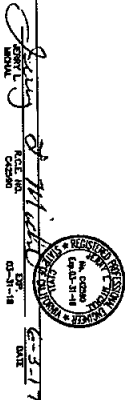


18 SCALE
N.T.S.

B6

MONOTUBE LIGHTING POLES

STEEL poles for mercury and filament luminaires.



	Nominal Mounting Height	CATALOG NUMBER			Pole Size
		4' 0" Bracket Spread	6' 0" Bracket Spread	8' 0" Bracket Spread	
DESIGN 401A (Coastalure) ANCHOR BASE TYPE	21' 0"	E-200-A2	E-200-B2	E-200-C2	6.5" x 3.7" x 20' 0"
	24' 6"	F-236-A2	F-236-B2	F-236-C2	7" x 3.7" x 23' 6"
	26' 0"	F-250-A2	F-250-B2	F-250-C2	7" x 3.5" x 25' 0"
	29' 8"	H-286-A2	H-286-B2	H-286-C2	8" x 4" x 28' 6"
	31' 0"	H-300-A2	H-300-B2	H-300-C2	8" x 3.8" x 30' 0"
DESIGN 403A (Coastalure) TRANSFORMER BASE TYPE	22' 8"	E-200-A2	E-200-B2	E-200-C2	6.5" x 3.7" x 20' 0"
	26' 2"	F-236-A2	F-236-B2	F-236-C2	7" x 3.7" x 23' 6"
	27' 8"	F-250-A2	F-250-B2	F-250-C2	7" x 3.5" x 25' 0"
	31' 2"	H-286-A2	H-286-B2	H-286-C2	8" x 4" x 28' 6"
	32' 8"	H-300-A2	H-300-B2	H-300-C2	8" x 3.8" x 30' 0"

MAXIMUM LUMINAIRE WT.

75 lbs.

57 lbs.

40 lbs.

MAXIMUM PROJECTED AREA OF LUMINAIRE

3.3 sq. ft.

3.3 sq. ft.

3.3 sq. ft.

NOTES:

1. Before ordering, see page B-167 for General Information.
2. Pole sizes are adequate for single or twin bracket application. Specify "twin" when required.
3. Maximum luminaire weight and maximum projected area of luminaire are determined from design criteria for poles as outlined in General Information on page B-167.
4. When ordering, specify both design and catalog numbers.

The Union Metal Manufacturing Company
Canton, Ohio
January 3, 1981

Catalog No. 100
Printed in U.S.A.

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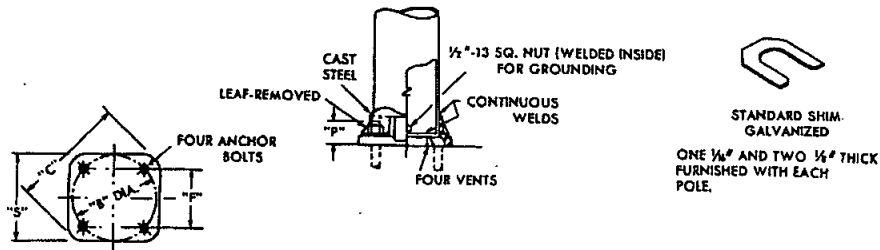
MOBITIE INTELLIGENT INFRASTRUCTURE
B6 MONOTUBE LIGHT POLES
STEEL POLES FOR MERCURY AND FILAMENT LUMINAIRES

SITE ADDRESS:		Varies
TITLE:		B6 MONOTUBE LIGHT POLES STEEL POLES FOR MERCURY AND FILAMENT LUMINAIRES
PTS NO.	580312	SHEET 38
DRAWING NO.	780	
DATE:	11/23/16	
SCALED:	N.T.S.	

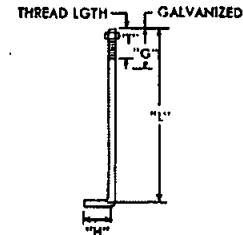
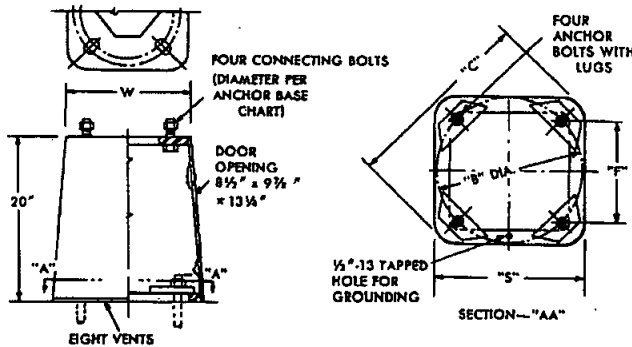
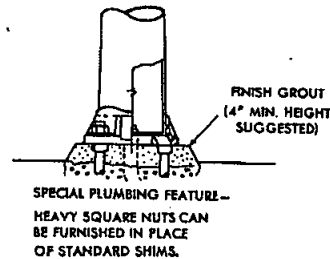
MONOTUBE LIGHTING POLES

B16

STEEL BASE AND ANCHOR BOLT DETAILS



POLE SIZE	ANCHOR BASES						ANCHOR BOLTS		
	"B" BOLT CIRCLE	"C"	"F"	"P" PROF.	"S" SQUARE		POLE GAUGE		
6.5"	9 1/4"	12 1/4"	8 1/4"	2 1/4"	10"		#11	#7	#3
7"	10"	13"	7 1/4"	2 1/4"	10 1/4"				
7.5"	10 1/4"	13 1/4"	7 1/4"	2 1/4"	11"				
8"	11"	14 1/4"	7 3/4"	2 3/4"	11 1/2"				
8.5"	11 1/4"	14 1/4"	8 1/4"	2 3/4"	12"				
9"	12 1/4"	15 1/4"	8 1/4"	3"	12 3/4"				
9.5"	13"	16 1/4"	9 1/4"	3 1/4"	13 1/2"				
10"	13 1/4"	17 1/4"	9 1/4"	3 3/4"	14 1/2"				



STANDARD ANCHOR BOLT				
BOLT SIZE	"L"	"H"	"T"	"G"
1" x 40"	36"	4"	6"	8"
1 1/4" x 48"	42"	6"	8"	10"
1 1/2" x 60"	54"	6"	9"	11"

DESIGN NO.			FABRICATED STEEL TRANSFORMER BASES						ANCHOR BOLTS		
#11 GA. POLES	#7 GA. POLES	#3 GA. POLES	POLE SIZE	"B" BOLT CIRCLE	"C"	"P"	"S" SQ.	"W"	#11 GA. POLES	#7 GA. POLES	#3 GA. POLES
1Y-82640-Y1	1Y-82640-Y3		6.5"								
	1Y-82640-Y4		7"								
1Y-82640-Y2	1Y-82640-Y5		7.5"								
	1Y-82840-Y4		8"								
1Y-82840-Y1	1Y-82840-Y2		8.5"								
			9"								
1Y-82840-Y2	1Y-82840-Y4		9.5"	17 1/4"	23 1/4"	12 1/4"	18"	15"			
			10"								
1Y-82840-Y3	1Y-82840-Y5										

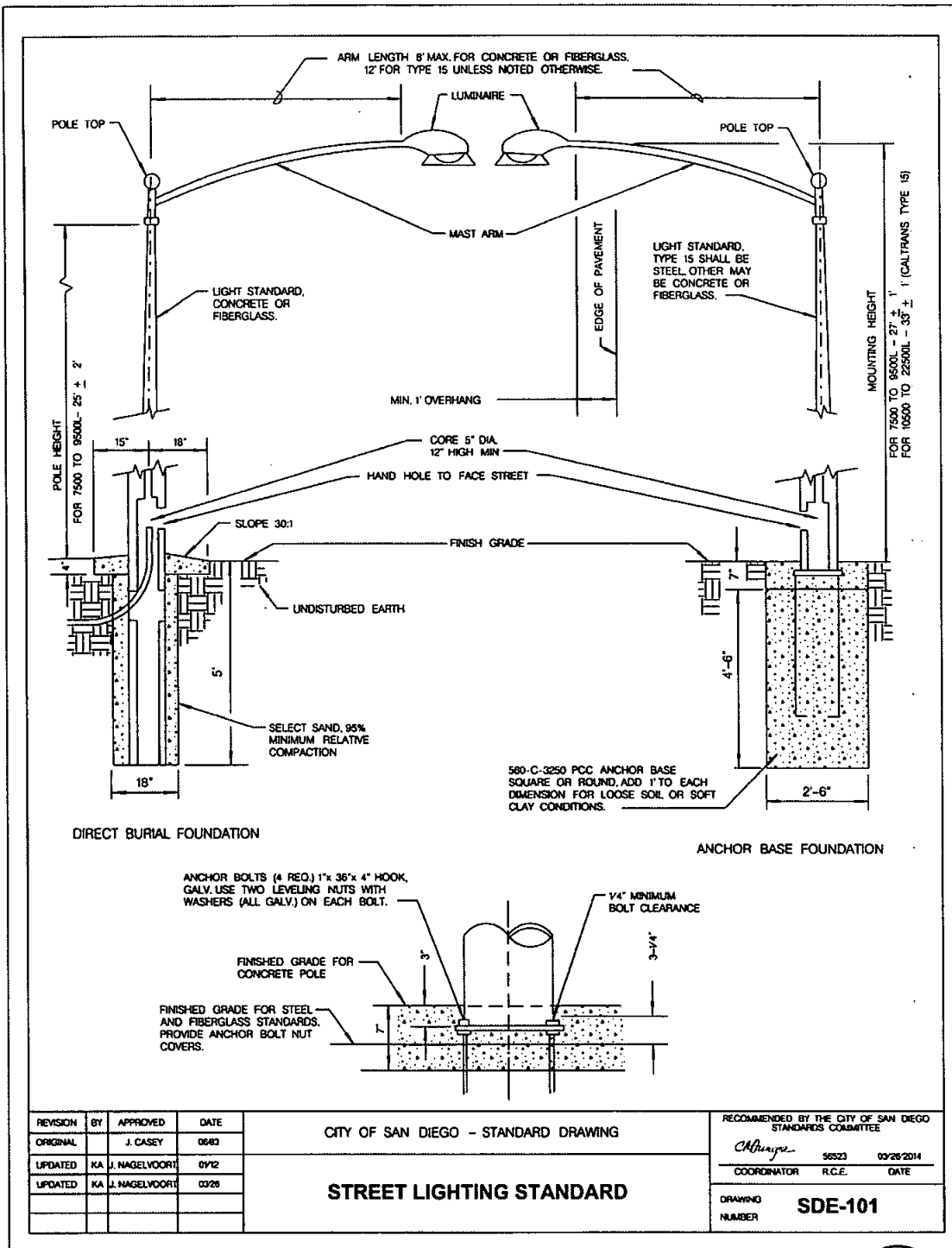
THIS DATA IS FOR GENERAL GUIDANCE ONLY. TEMPLATE PRINT, GIVING COMPLETE INFORMATION FOR SETTING ANCHOR BOLTS, IS FURNISHED WITH EACH ORDER.

The Union Metal Manufacturing Company
Canton 8, Ohio
January 3, 1961
Catalog No. 100
Printed in U.S.A.

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MOBILITIE INTELLIGENT INFRASTRUCTURE
B6 MONOTUBE LIGHT POLES
STEEL POLES FOR MERCURY AND FILAMENT LUMINAIRES

SITE ADDRESS:		Vares
TITLE:		B6 MONOTUBE LIGHT POLES STEEL POLES FOR MERCURY AND FILAMENT LUMINAIRES
PTS NO.	550312	SHEET
DRAWING NO.	TBO	
DATE	11/23/16	
SCALE	N.T.S.	



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MOBILITIE INTELLIGENT INFRASTRUCTURE
B6 MONOTUBE LIGHT POLES
STEEL POLES FOR MERCURY AND FILAMENT LUMINAIRES

July 2, 2014 6-3-12

DATE: 03-31-18

SITE ADDRESS: Vacant

TITLE: B6 MONOTUBE LIGHT POLES
STEEL POLES FOR MERCURY AND
FILAMENT LUMINAIRES

PTS NO. 593312

DRAWING NO. TBD

DATE: 1/23/16

SCALE: N.T.S.

SHEET 40