

TOWN OF MARANA TRAFFIC SIGNAL DESIGN STANDARDS



SEPTEMBER 2005

APPROVED FOR DISTRIBUTION:


 Keith E. Brann, P.E.,
 Acting Town Engineer

9/9/2005
 Date



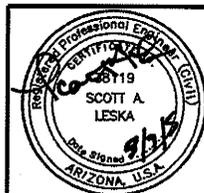
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TRAFFIC SIGNAL STANDARDS		730
DATE: 9/9/05	REVISED:	SHEET 1 OF 1

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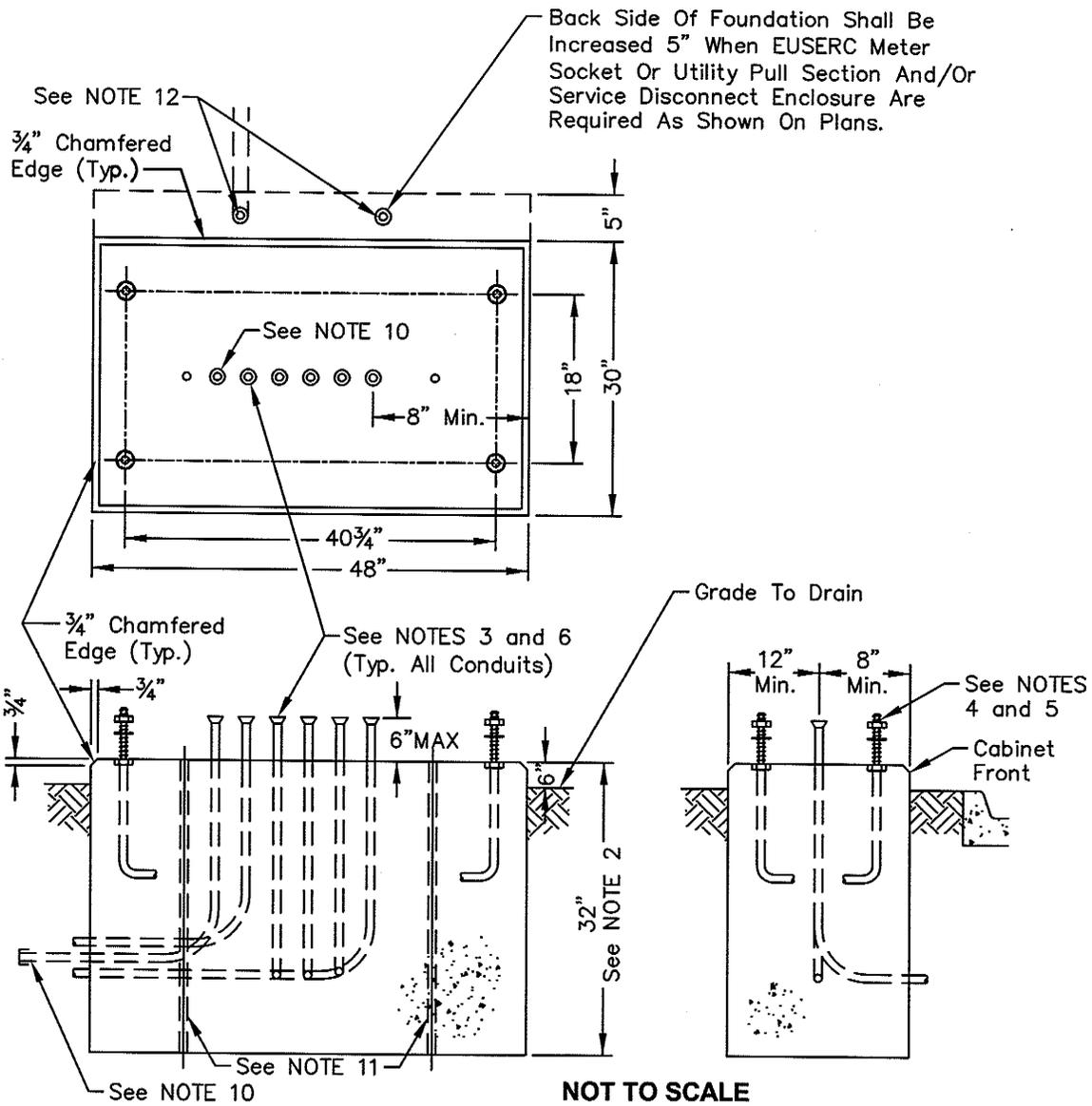
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STANDARD DETAIL		DETAIL NO:
INDEX OF SHEETS		730-00
DATE: 7/16/05	REVISED:	SHEET 1 OF 1



NOT TO SCALE

NOTES:

1. All materials and construction shall conform to the requirements of the Special Provisions and Standard Specifications.
2. Unstable soil may require deeper foundations. See Special Provisions and Standard Specifications.
3. For conduit size, location, and quantity, see Project Plans.
4. Anchor bolts shall be galvanized 3/4" x 12" x 4" complete with nuts and washers.
5. Anchor bolt's projection above foundation shall be 2" min. 2 1/2" max.
6. Conduit projection above foundation shall be 2 1/2" min. 4" max.
7. Use an approved silicon sealer RTV type gray in color or clear, between cabinet and foundation.
8. In unpaved areas a raised concrete pad foundation (36" x width of cabinet foundation x 4" thick) shall be installed in front of the cabinet (door side). Pad shall be set 2" below the foundation elevation. Slope pad away from cabinet at a 50:1 slope.
9. All cabinet foundations shall have two (2) 3/4" diameter x 10' long bonded copper ground rod with clamp.
10. Install 1-4" conduit for future use, stubbed and capped 24" past the edge of the foundation as directed by the Town Engineer or His/Her Designee.
11. 1" sleeve (for each ground rod) shall be inserted when foundation is poured. Install one (1) 3/4" diameter x 10' long bonded copper ground rod in each sleeve.
12. 4" sleeves for service conduits if an Electrical Utility Service Entrance Requirement Committee (EUSERC) meter socket or EUSERC utility pull section and/or service disconnect enclosure are required.
13. Prior to pouring concrete foundation, final approval of conduit placement from Town Engineer or His/Her Designee shall be obtained.
14. Contractor is responsible to make sure cabinet fits on bolt pattern.

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STANDARD DETAIL		DETAIL NO:
FOUNDATION FOR TYPE IV, V CONTROLLER CABINETS		730-210
DATE: 9/9/05	REVISED:	SHEET 1 OF 1

GENERAL TRAFFIC SIGNAL RESPONSIBILITIES:

1. Materials installed as part of this Project shall be furnished and installed in accordance with the requirements of the following table:

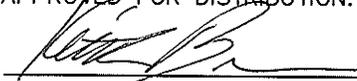
	Contractor Furnished	Contractor Installed/ Constructed	Town Furnished	Town Installed
Traffic Signal Poles and Mast Arms	X	X		
Steel Poles and Anchor Bolts (With Nuts and Washers)	X	X		
Concrete Pole Foundation	X	X		
Type IV Traffic Signal Controller Cabinet(s) With Controller(s) and All Auxiliary/Incidental Equipment			X	X
Controller Cabinet Concrete Foundation with Anchor Bolts	X	X		
Electrical Service Pedestal			X	X
Electrical Service Pedestal Concrete Foundation	X	X		
All Wiring and Cabling (Including Bare Bond Wire and Pull Ropes)	X	X		
Concrete Pull Boxes	X	X		
Electrical Conduit	X	X		
Ground Rods and Connectors	X	X		
Traffic Signals and Mounting Assemblies	X	X		
Pedestrian Signals and Mounting Assemblies	X	X		
Pedestrian Push Button Stations with Signs	X	X		
Luminaires and Photocells	X	X		
Vehicle Detection Loops	X	X		
Emergency Vehicle Preemption Equipment		X	X	
Emergency Vehicle Preemption Wiring	X	X		
Video Detection System Equipment		X	X	
Video Detection System Wire and Cable		X	X	
Pan/Tilt/Zoom Color-B/W Video Equipment		X	X	
Pan/Tilt/Zoom Color-B/W Cable & Wire		X	X	
Internally Illuminated Street Name Sign(s) or Street Name Sign(s)	X	X		
Regulatory Signing	X	X		
All other appurtenances necessary for the operation of the traffic signal installation(s), except as modified on the Project Plans or as provided in the Special Provisions.	X	X		

GENERAL TRAFFIC SIGNAL RESPONSIBILITIES (CONTINUED):

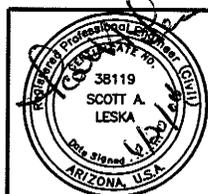
- The Contractor shall contact the Town of Marana Traffic Signal Maintenance and Operations Supervisor at (520)382-2500 a minimum of two (2) weeks prior to the scheduled installation of the cabinet(s). The Town of Marana will deliver the cabinet(s) to the Project Site on the day scheduled for installation.
- The Town of Marana will place the cabinet(s) onto the foundation(s). The Contractor shall be responsible for ensuring that the anchor bolts are positioned such that the cabinet(s) will align properly onto the foundation(s). Contractor shall secure cabinet(s) to the foundation.
- The Contractor shall be responsible for routing all conductors into the cabinet, and shall identify routing and connections of all cables and conductors as required in the 1994 Pima County/City of Tucson "Standard Specifications for Public Improvements". The Town of Marana staff will terminate the conductors in the cabinet(s).
- The Contractor shall carefully disassemble and salvage all existing traffic signal and street lighting equipment that is not to remain or be relocated as shown on the Project Plans or as provided in the Special Provisions. All of the salvaged equipment shall be returned to the Town of Marana Operations Center (MOC), 5100 West Ina Road, Tucson AZ, 85743. The salvaged equipment shall be unloaded by the Contractor, as directed by the Town. Contact the Town of Marana Traffic Signal Maintenance and Operations Supervisor at (520) 382-2500 a minimum of two (2) working days (excluding weekends and Town recognized holidays) prior to delivering the equipment.
- Existing traffic signal operations shall be maintained throughout the duration of the Project as shown on the Project Plans or as called for in the Special Provisions unless approved by the Town Engineer or His/Her Designee.
- The Contractor shall obtain all required permits and shall be responsible for all traffic control related to the Project and the construction zone. The Contractor shall strictly conform and adhere to the approved Project Traffic Control Plan at all times.
- The Contractor shall install/construct all items associated with the Project as called for on the Project Plans or in the Special Provisions.
- The Contractor shall load, transport and unload all items specified on the Project plans supplied by both the Contractor and the Town to the job site, unless specified otherwise by the Engineer. The Contractor shall notify the Town of Marana and its representatives a minimum of two (2) working days (excluding weekends and Town recognized holidays) in advance. Contact the Traffic Signal Maintenance of Operations Supervisor at (520) 382-2500.

Note: It is intended that the Notes herein of the Traffic Signal Standard Responsibilities shall be considered part of the Construction Contract Documents. If the Project Plans differ from the notes herein (Town of Marana Standard Detail 730-400) the Project Plans shall note the change on the Project Plan's General Note Sheet and be edited where appropriate to fit the Project.

APPROVED FOR DISTRIBUTION:


 Keith E. Brann, P.E., Date
 Town Engineer

6/20/2006



STANDARD DETAIL		DETAIL NO:
GENERAL TRAFFIC SIGNAL RESPONSIBILITIES		730-400
DATE: 9/9/05	REVISED: 06/20/06	SHEET 1 OF 1

GENERAL TRAFFIC SIGNAL NOTES (CONTINUED):

- 34. The Contractor shall coordinate with the telephone utility public improvement coordinator to verify the location of the telephone connection at each intersection.
- 35. The Contractor shall "pothole" or hand dig all foundations prior to the placement of all cabinets, and traffic signal and/or street light poles.
- 36. The Contractor shall not make or begin any excavation, digging or any work associated with moving any earth or ground within any public Town rights-of-way, utility easements, and/or any expressed or implied private property without first determining whether any underground facilities (shown and not shown on the Project Plans) will be encountered, and if so where they are located from each and every public utility, municipal corporation or other entity having the right to bury such underground facility within the public right-of-way, private property or easement within the Project limits. The Contractor shall take all necessary measures for the location and control of such facilities in a careful and prudent manner.
- 37. Any equipment and/or utilities within the project (shown or not shown on the plans) that is damaged or destroyed by the contractor shall be repaired or replaced at the sole expense of the Contractor.
- 38. The Contractor shall immediately report all conflicts regarding the overhead utilities and the Project signal equipment that is to be installed as indicated on the Project Plans to the Town Engineer and the utility of jurisdiction. If required, the Contractor shall coordinate all utility and/or traffic signal equipment relocation as required with the Town, the Engineer of Record and the Utility Company.
- 39. The Contractor shall pothole all utilities (shown and not shown on the Project plans) prior to boring, trenching, or directional drilling to verify depths and locations.

- 40. The Design Speed for _____ is _____ mph. The Posted Speed for _____ is _____ mph.
- 41. The Contractor is advised of the utility contacts as indicated in the following table:

Utility	Contact	Phone No.
Tucson Electric Power Co	Gary Goulin	
QWEST	Steve Johnson	
AT&T Communications	Mike O'Neill	
Comcast Cable Communications	Mike Gin	
Pima County Wastewater Management	Bob Decker	
Southwest Gas Corporation	Robert Daniels	
Sprint Communications	Colin Sword	
Marana Water Department	Brad DeSpain	
Tucson Water Department	Tony Tineo	
Trico Electric Cooperative	Chuck Wilcox	

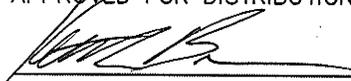
(The designer shall coordinate, verify, and list all utility companies and contacts within the Project limits, and provide the correct information in the table above.)

Note:

It is intended that Notes 1-39 of this Traffic Signal Standard shall be considered as part of the Construction Contract Documents. If the Project Plans differ from the notes herein (Town of Marana Standard Detail 730-401) the Project Plans shall note the change on the Project Plan's General Note Sheet and be edited where appropriate to fit the Project.

It is intended that Notes 40-41 of this Traffic Signal Standard be placed on the Project Plans in their entirety and edited where appropriate to fit the Project.

APPROVED FOR DISTRIBUTION:


 Keith E. Brann, P.E.,
 Town Engineer

07/14/2006
 Date



STANDARD DETAIL		DETAIL NO:
GENERAL TRAFFIC SIGNAL NOTES		730-401a
DATE: 9/9/05	REVISED: 07/14/2006	SHEET 3 OF 3

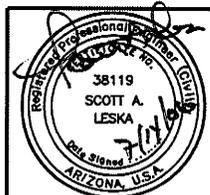
GENERAL TRAFFIC SIGNAL NOTES (CONTINUED):

17. IMSA 19-1, 16-conductor solid wire cable shall be installed continuous and unspliced from the controller cabinet to the Type "A" or Type "G" pole on each corner. At locations where there are no Type "A" or Type "G" poles, the 16-conductor cable shall be installed to the No. 7 pull box on that corner for future use with a minimum of 30' slack. See Town of Marana's Traffic Signal Cable Schematic Standard Detail and Traffic Signal Wiring Schematic Standard Detail for details.
18. See Town of Marana Typical Traffic Signal Wiring Schematic for wiring details for Vehicular Signal Heads, Pedestrian Signal Heads, Pedestrian Pushbuttons, and EVPE installations.
19. All vehicle detection loop wire shall be #14 AWG, IMSA 51-5-1985 cable. Detector lead-in cables shall be #14 AWG, IMSA 50-2-1984 cable. The detector lead-in cable shall be continuous and unspliced between the controller cabinet and the pull box adjacent to loop. Provide a minimum of five (5) feet of slack as measured from the lip of the pull box opening in the pull box adjacent to the loop detector.
20. All telephone interconnect cable, and detector lead-in cable shall be continuous and unspliced.
21. The video detection cable shall be installed, continuous and unspliced, from the video camera mounting (attached to the luminaire mast arm) to the controller cabinet.
22. The emergency vehicle preemption sensor cable shall be 3M-Opticom Detector Cable Model No. 138 or approved equal as specified by the Town Engineer or His/Her Designee.
23. The conductors for the emergency vehicle preemption sensor and beacon shall be routed to the traffic signal head at the mast arm tip or as specified on the Project Plans, Special Provisions and/or the Town Engineer or His/Her Designee. Provide lengths as required by the Town Engineer or His/Her Designee.
24. The location of preemption sensors shall be in accordance with Standard Details 730-410 thru 730-417 or as approved by the Town Engineer prior to the installation of the sensors. All vehicle detection loops shall be centered within the pavement of the travel lane or as approved by the Town Engineer.
25. Vehicle Detection Loops shall be installed prior to the final lift of pavement. For loops installed after the final lift, detection loop sawcuts shall be flushed with water under pressure and then dried with air under pressure prior to applying loop sealant.
26. All side by side 6' X 6' loops shall have a separate Detector Loop Lead-in Cable.
27. All signal housings shall be polycarbonate and black. All visors shall be painted black and material approved by the Town Engineer or His/Her Designee prior to ordering and installation.
28. All vehicular signal faces shall be 12 inch and all lenses shall be polycarbonate. All signal indications shall be LED, except the yellow ball and yellow arrow indications mounted overhead on a mast arm, which shall be incandescent. All yellow indications (yellow ball and yellow arrow) within a vehicular signal face, not mounted on an overhead mastarm, shall be LED. All Pedestrian signal faces shall be LED Countdown Style Pedestrian Signal Heads as provided in the MUTCD 2003 ed. (Section 4E.07)
29. There shall be a minimum of two circuits (each with a separate electrical phase) for the intersection safety lighting and Internally Illuminated Street Name Sign (IISNS) circuit. There shall be a minimum of two circuits provided to each pole's hand hole with solid No. 10 AWG THHW conductors. The luminaires shall be wired such that circuit No. 1 luminaires are on its diagonally opposite counterpart. The other diagonally opposing luminaires shall be wired on circuit No. 2. The IISNS shall be wired using the opposite circuit from the luminaire, on the same pole, that the luminaires are wired. All IISNS shall be installed and wired from the pull box to the IISNS unspliced.
30. Three (3) No. 10 AWG-THHW Conductors shall be installed from each luminaire to the pole's adjacent pull box that the luminaire is mounted on and shall be unspliced, leaving a minimum of five (5) feet of slack as measured from the pull box lip opening. Install a 15-amp in-line fuse for each luminaire in the associated #7 pull box.
31. For each luminaire circuit, three (3) conductors, THHW No. 10 AWG, shall be pulled from the power service cabinet to the poles adjacent pull box unspliced.
32. Prior to construction of pole foundations, grade slope to ensure that top of foundations are not exposed more than 6" above final grade. Grade all pole foundations, cabinet foundations, pull boxes and the ilk such that drainage of water flows away from the equipment being constructed and/or installed.
33. The Contractor shall contact the electrical utility public improvement coordinator to verify the service connection requirements and the location of the electric service connection for the traffic signal at each intersection. The Contractor shall be responsible for excavating and backfilling the trench and installing any necessary sleeves under sidewalks or driveways. The Contractor is responsible for installing the required conduit infrastructure between the service point and the UPS/meter pedestal according to the utility electrical service provider's requirements. The electrical utility will install the electrical cable in the conduit between these two locations or as provided on the Project Plans.

APPROVED FOR DISTRIBUTION:


 Keith E. Brann, P.E.,
 Town Engineer

07/14/2006
 Date



STANDARD DETAIL		DETAIL NO:
GENERAL TRAFFIC SIGNAL NOTES		730-401a
DATE: 9/9/05	REVISED: 07/14/2006	SHEET 2 OF 3

GENERAL TRAFFIC SIGNAL NOTES:

1. All equipment/materials and construction shall comply with the requirements contained in the Town of Marana Standard Details (latest edition), the Project's Supplemental Specifications, the Special Provisions, the Project Plans, the 2003 Pima County/City of Tucson "Standard Specifications for Public Improvements", and the Pima County/City of Tucson "Standard Details for Public Improvements".
2. All pedestrian push button assemblies shall comply with current ADA requirements. The pedestrian pushbutton signs shall be the R10-3e as identified in the Manual on Uniform Traffic Control Devices (MUTCD), latest edition.
3. Internally Illuminated Street Name Signs (IISNS) shall be installed such that the sign is mounted directly to the vertical shaft of the pole, located above the signal mast arm and positioned such that the sign is side mounted on the street side of the pole. The Contractor shall submit a sign detail and mounting detail to the Town for review a minimum of three (3) weeks prior to the estimated installation date for Town's approval.
4. The exact location of each new pole foundation, pull box, controller cabinet foundation, and UPS/electric service pedestal foundation shall be approved by the Town Engineer or His/Her Designee prior to final placement, installation, and/or construction.
5. The top of the pole foundation shall be level and six (6) inches above the finished grade. Provide extended bolts for all pole foundations to allow for future elevation adjustments.
6. All Conduit, Cable, Wire, Poles, Posts, Signs, Equipment, Materials and Appurtenances supplied for the Project shall be furnished and purchased new and unused. The new equipment, materials and appurtenances shall be ordered and delivered for this specific Project only. The Contractor shall provide a submittal list of all proposed materials along with the material specifications to the Town for all materials to be incorporated in the Project to the Town Engineer for review and approval prior to construction. The Town Engineer shall inspect and approve the said requested equipment, material and/or appurtenances prior to use and/or installation. The said material in no way shall be used without written consent from the Town Engineer. The Town reserves the right to refuse to allow the installation of any and all equipment the Contractor submits for approval if it chooses without cause, justification and/or recourse. If Contractor installs the materials without prior written consent from the Engineer, the Contractor shall remove and replace the equipment with acceptable new equipment and/or material(s) at his/her sole expense.
7. All new conduit as shown on the Project Plans shall be installed a minimum of 30 inches below finished grade. Conduit installed under roadways, driveways, or any open areas subject to vehicles, or conduits with conductors that have voltages over 250 volts, shall be installed a
 7. minimum of 36 inches below finished grade unless stated otherwise on (Cont.) the Project Plans or in the Special Provisions.
 8. Any conduit installed shallower than 30 inches below finished grade shall be encased in concrete per Pima County/City of Tucson "Standard Specifications for Public Improvements", 2003 edition, Subsection 732-3.01 (G).
 9. Prior to the Town's acceptance and prior to pulling conductor, cable, wire and/or fiber optic cables, all conduit(s) (new and existing) to be incorporated into the new system as provided for on the Project Plans shall be cleaned and blown out with compressed air in the presence of the Town's inspector. A properly sized conduit piston or mandrel shall be pulled through the entire conduit system in the presence of the Town's inspector prior to conductor, cable or wire installation to ensure that no obstructions or debris exist in the conduit. No water or moisture shall remain in conduit(s) prior to installing conductors.
 10. Conduit installed under existing paved driveway(s), sidewalk(s), and pavement that are not scheduled to be reconstructed as part of the Project shall be installed by means of boring or directional drilling.
 11. Pull boxes shall not be installed within concrete curb access ramp(s) or sidewalk(s). Any pull boxes installed behind curb(s) shall be installed between the curb and the proposed/future sidewalk or beyond the proposed/future sidewalk in accordance with the Project Plans and Special Provisions. An exception to this requirement is permitted for pull boxes installed within a median or as otherwise called for on the Project Plans, Special Provisions, or by the Town Engineer or His/Her Designee.
 12. Any pull boxes installed along an uncurbed roadway shall be installed adjacent to, but not within, the shoulder.
 13. A 3/4" diameter x 10' long ground rod (copper) shall be installed in all #7 pull boxes used for the High Voltage conductors. A 3/4" diameter x 10' long ground rod (copper) shall be installed in the home run pull box (No. 7 with extension) adjacent to the controller cabinet. Two ground rod clamps shall be furnished for grounding the ground wire on each ground rod.
 14. Two (2) 3/4" diameter x 10' long ground rods (copper) shall be installed in the controller cabinet foundation a minimum of 8 feet apart. See Town of Marana's Controller Cabinet Foundation Standard Detail (730-210) for details.
 15. The high voltage cables and conductors shall be separated from the low voltage cables and conductors, and shall be installed/constructed in separate conduit.
 16. IMSA 19-1 20-conductor solid wire cable shall be installed continuous and unspliced from the controller cabinet through the No. 7 pull box on each corner to the poles traffic signal head wire splicing compartment.

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 Town Engineer

07/14/2006
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STANDARD DETAIL		DETAIL NO:
GENERAL TRAFFIC SIGNAL NOTES		730-401a
DATE: 9/9/05	REVISED: 07/14/2006	SHEET 1 OF 3

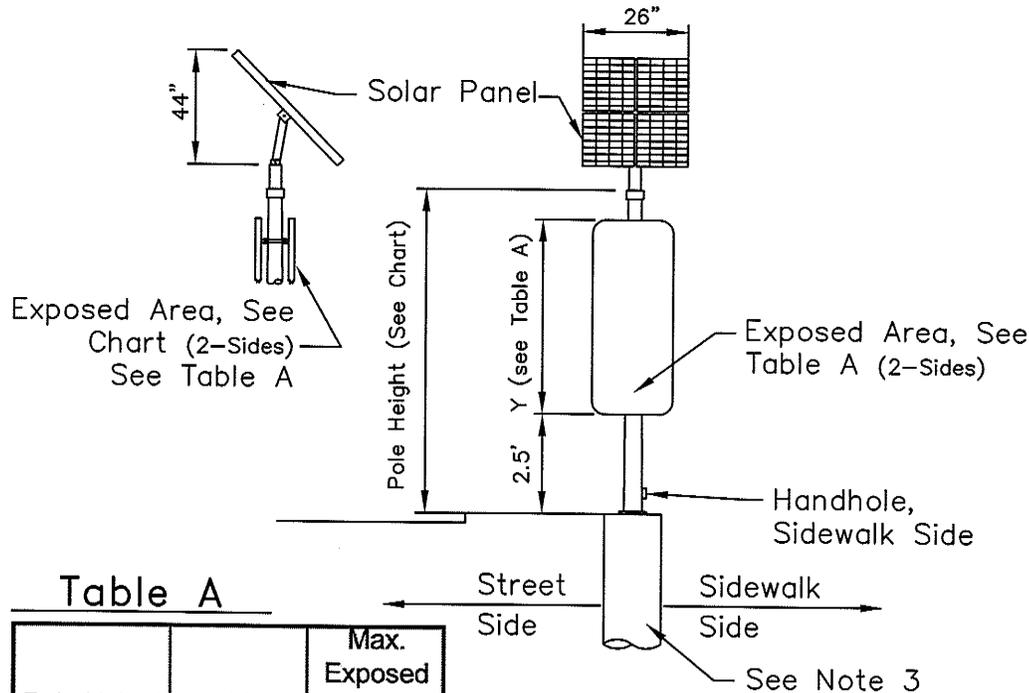
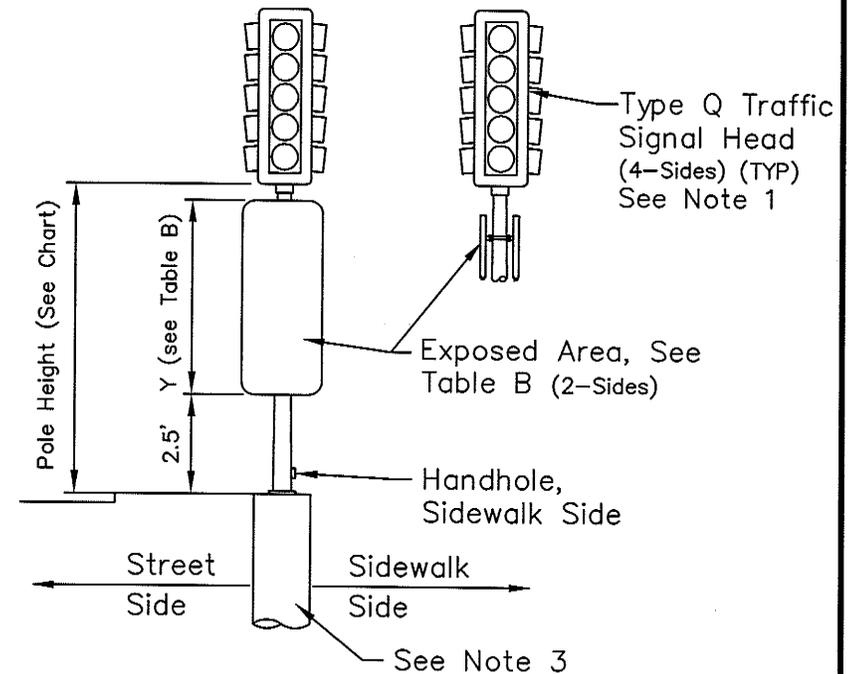


Table A

Pole Height	Y	Max. Exposed Area
7'	4.5'	45 sq. ft.
10'	7.5'	40 sq. ft.
12'	9.5'	35 sq. ft.
15'	12.5'	30 sq. ft.

Table B

Pole Height	Y	Max. Exposed Area
7'	4.5'	30 sq. ft.
10'	7.5'	25 sq. ft.
12'	9.5'	20 sq. ft.
15'	12.5'	15 sq. ft.



Type A Pole With Signal Head

Not To Scale

NOTES:

1. A maximum of one (1) four-sided signal head (4-Q) shall be installed on the pole as shown.
2. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.
3. Foundation shall be a minimum of 6' in depth as measured from the top of finished grade and a minimum of 3' in diameter. All other foundation requirements shall adhere to Pima County/City of Tucson's Standard Details for Public Improvements, 2003 Ed.
4. The total exposed area shall be measured by the largest exposed area of a single installed item. Items may include signs, traffic signal heads, controller cabinets, etc.

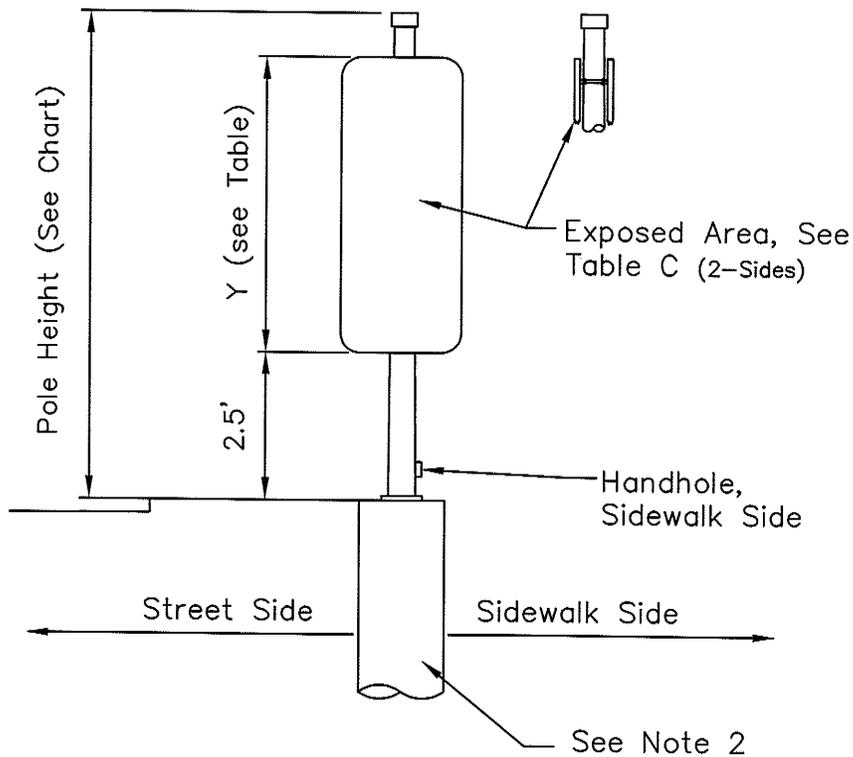
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Keith E. Brann
 Keith E. Brann, P.E.,
 Town Engineer

4/14/2006
 Date



STANDARD DETAIL		DETAIL NO:
POLE LOADING DETAIL TYPE A POLE		730-408
DATE: 4/14/06	REVISED:	SHEET 1 OF 2



Type A Pole

Not To Scale

NOTES:

1. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.
2. Foundation shall have a minimum depth as shown in Table C, and shall be measured from the top of finished grade. The foundation shall have a minimum diameter of 3'. All other foundation requirements shall adhere to Pima County/City of Tucson's Standard Details for Public Improvements, 2003 Ed.
3. The total exposed area shall be measured by the largest exposed area of a single installed item. Items may include signs, traffic signal heads, controller cabinets, etc.

Table C

Pole Height	Y	6ft Drilled Shaft	
		Max. Exposed Area	Max. Exposed Area
7'	4.5'	60 sq. ft.	35 sq. ft.
10'	7.5'	55 sq. ft.	30 sq. ft.
12'	9.5'	50 sq. ft.	25 sq. ft.
15'	12.5'	45 sq. ft.	20 sq. ft.

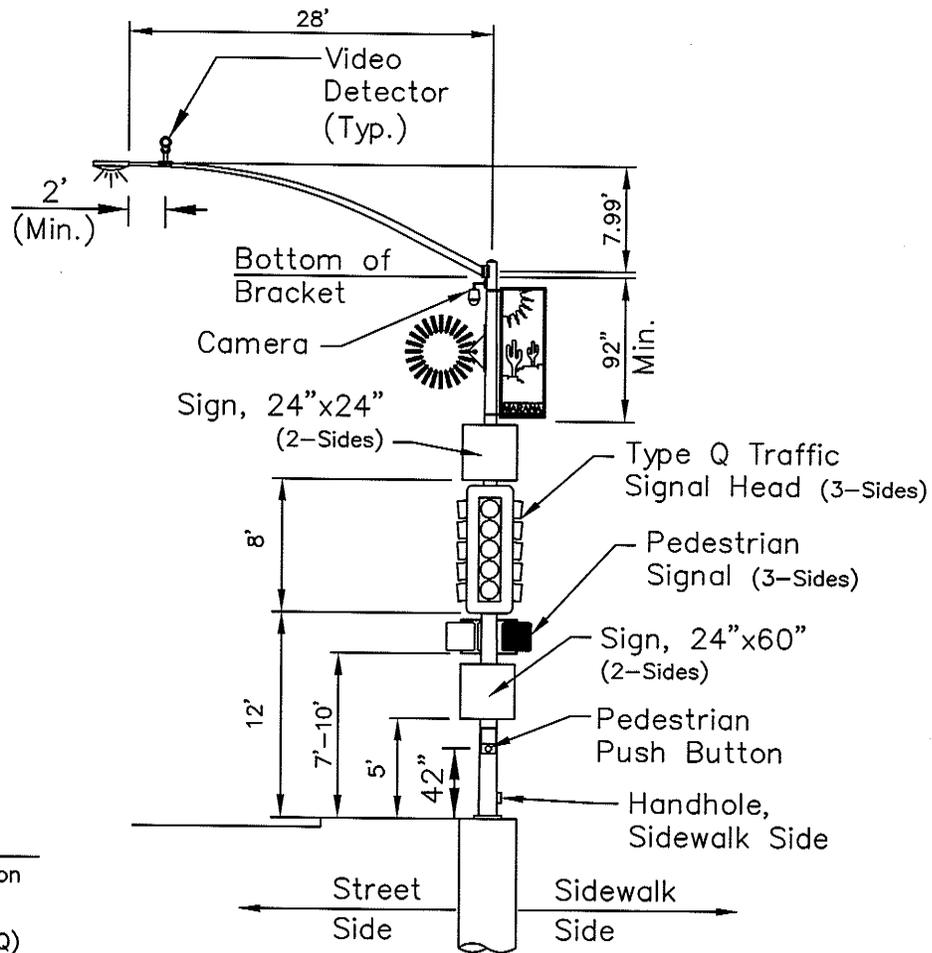
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Keith E. Brann
 Keith E. Brann, P.E.,
 Town Engineer

4/14/2006
 Date



STANDARD DETAIL		DETAIL NO:
POLE LOADING DETAIL TYPE A POLE		730-408
DATE: 4/14/06	REVISED:	SHEET 2 OF 2



NOTES:

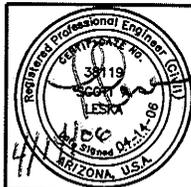
1. A maximum 20' length mast arm shall be installed on the Type G pole standard.
2. A maximum of one (1) three-sided signal head (3-Q) and one (1) three-sided pedestrian signal head shall be installed on the pole as shown.
3. Mast arm dimensions are measured from bracket connection point of upright to tip of mast arm.
4. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.

APPROVED FOR DISTRIBUTION:

Keith E. Brann, P.E.,
Town Engineer

4/14/2006

Date



STANDARD DETAIL

POLE AND MAST ARM LOADING DETAIL
TYPE G POLE WITH 20 FT. MAST ARM

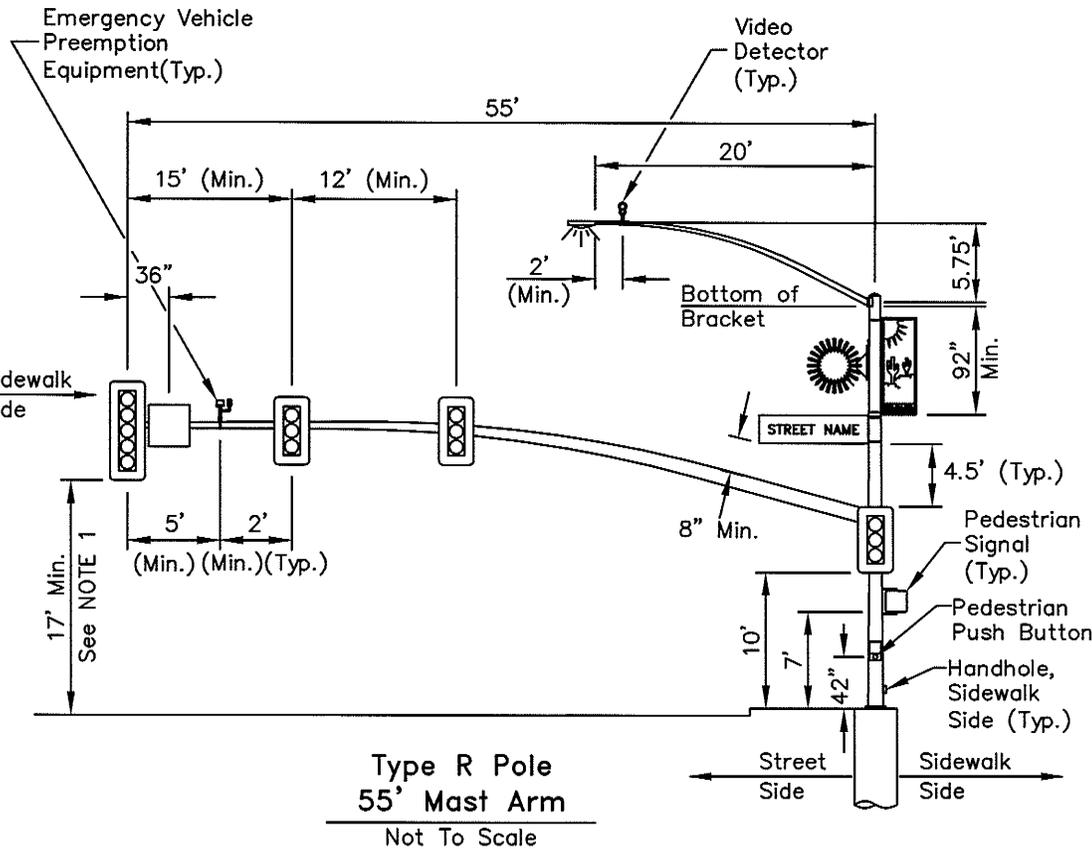
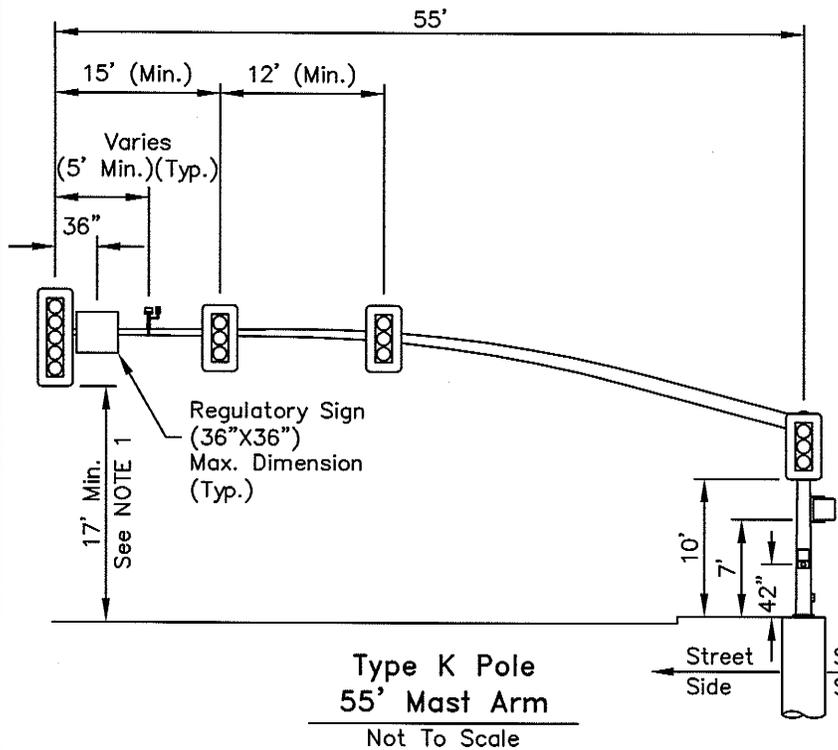
DATE: 4/14/06

REVISED:

DETAIL NO:

730-409

SHEET 1 OF 1



NOTES:

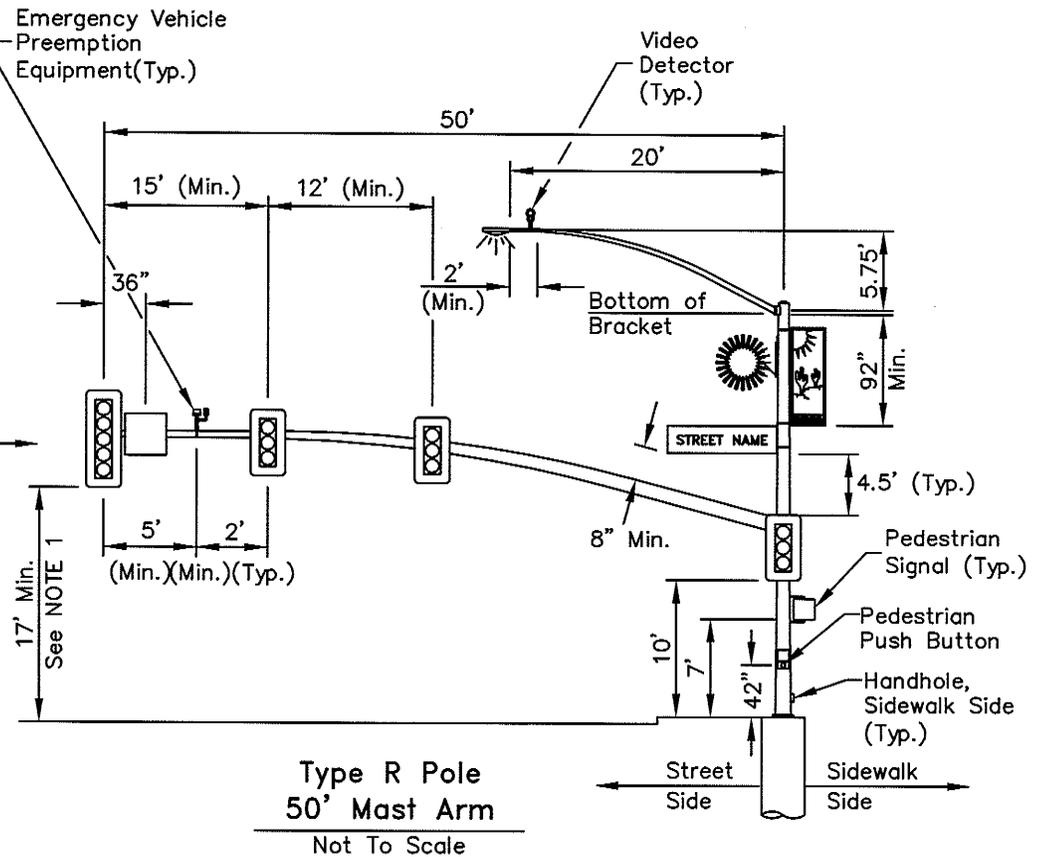
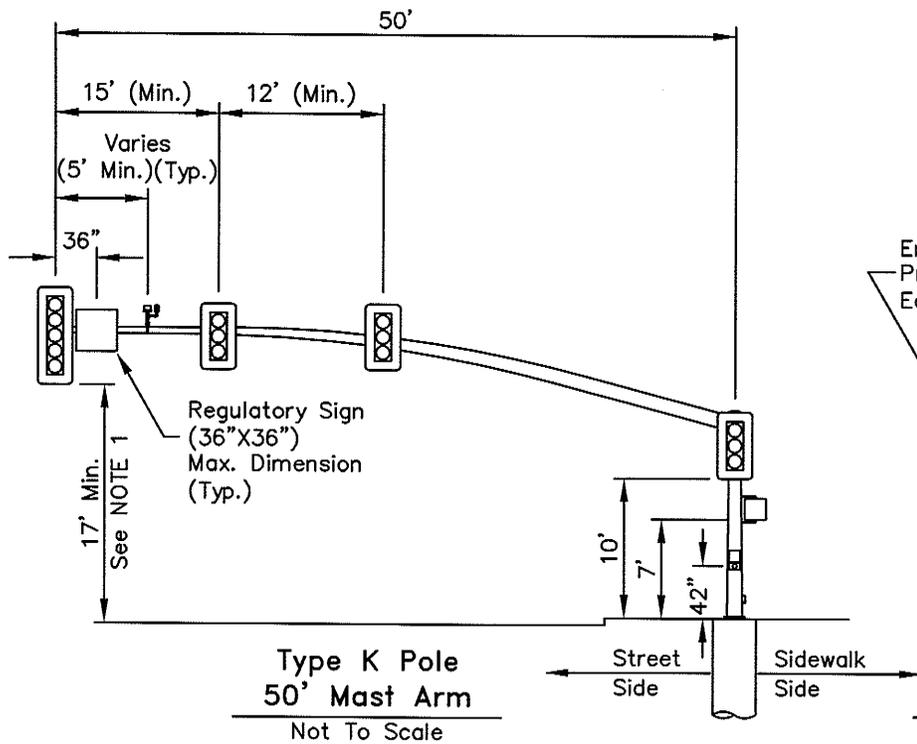
1. There shall be a minimum of 17' clearance between the surface of the pavement and the bottom of each signal head back plate mounted on the mast arm.
2. A maximum of 3 signal heads (1-Q, 2-F) may be installed on the 55' mast arm as shown.
3. Mast arm dimension measured from center of upright to tip of mast arm.
4. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.

APPROVED FOR DISTRIBUTION:

Keith E. Brann 9/9/2005
 Keith E. Brann, P.E.,
 Acting Town Engineer



STANDARD DETAIL		DETAIL NO:
MAST ARM LOADING DETAIL TYPE K AND R POLE WITH 55 FT. MAST ARM		730-410
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



NOTES:

1. There shall be a minimum of 17' clearance between the surface of the pavement and the bottom of each signal head back plate mounted on the mast arm.
2. A maximum of 3 signal heads (1-Q, 2-F) may be installed on the 50' mast arm as shown.
3. Mast arm dimension measured from center of upright to tip of mast arm.
4. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.

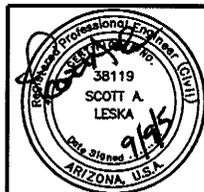
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9/9/2005

Keith E. Brann, P.E.,
Acting Town Engineer

Date



STANDARD DETAIL

DETAIL NO:

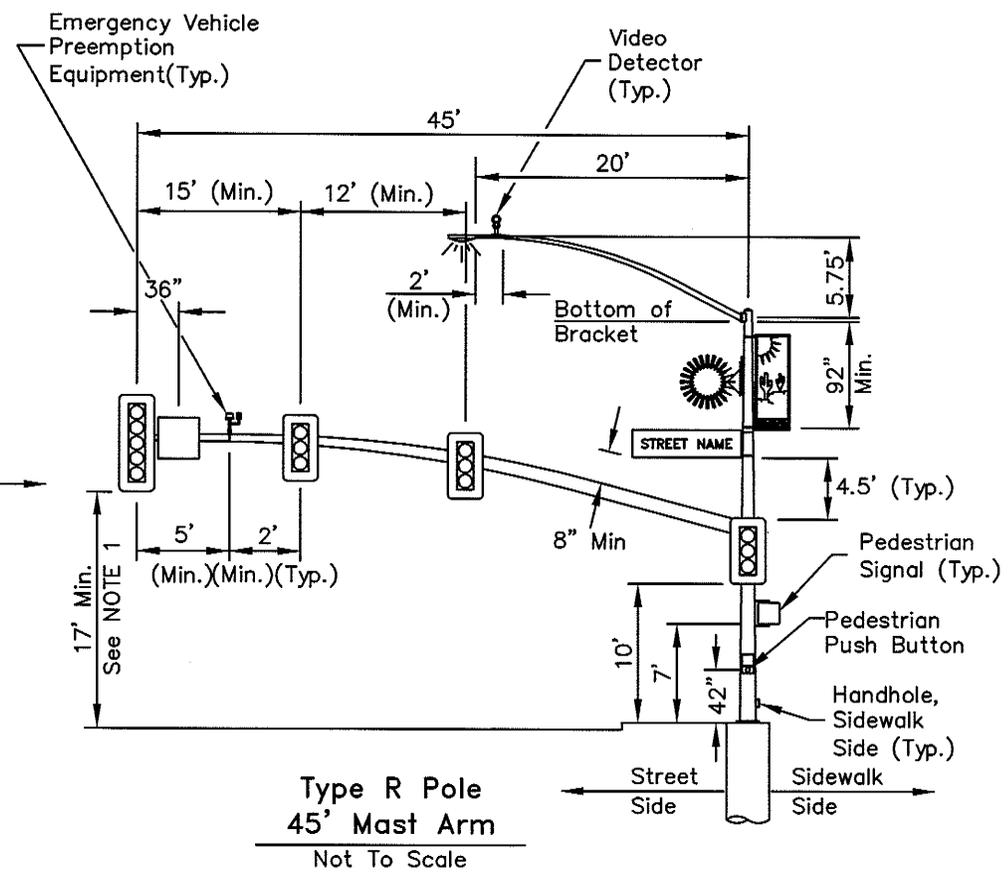
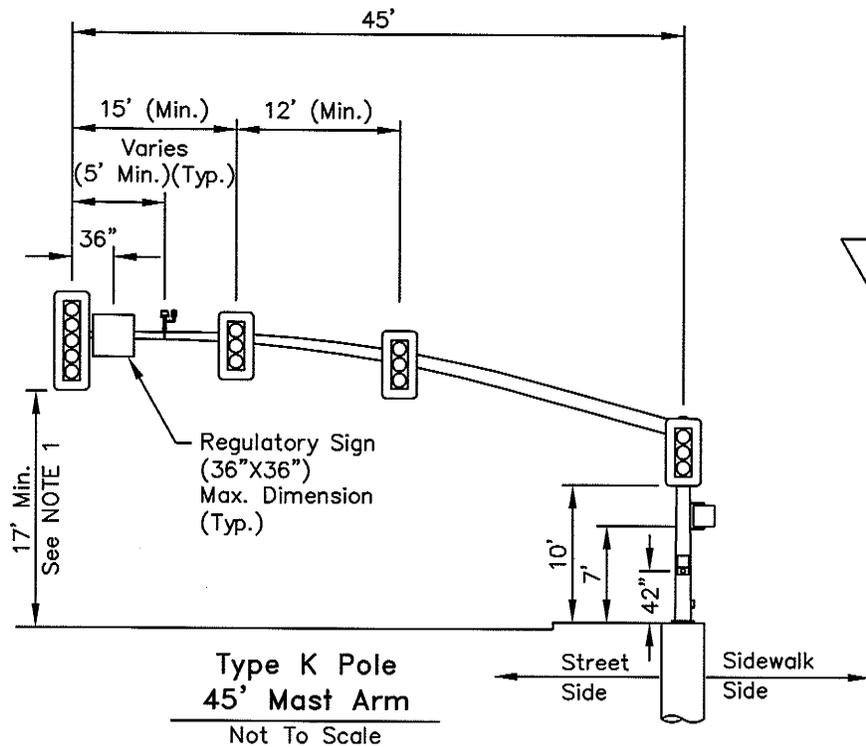
MAST ARM LOADING DETAIL
TYPE K AND R POLE WITH 50 FT. MAST ARM

730-411

DATE: 9/9/05

REVISED:

SHEET 1 OF 1



NOTES:

1. There shall be a minimum of 17' clearance between the surface of the pavement and the bottom of each signal head back plate mounted on the mast arm.
2. A maximum of 3 signal heads (1-Q, 2-F) may be installed on the 45' mast arm as shown.
3. Mast arm dimension measured from center of upright to tip of mast arm.
4. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.

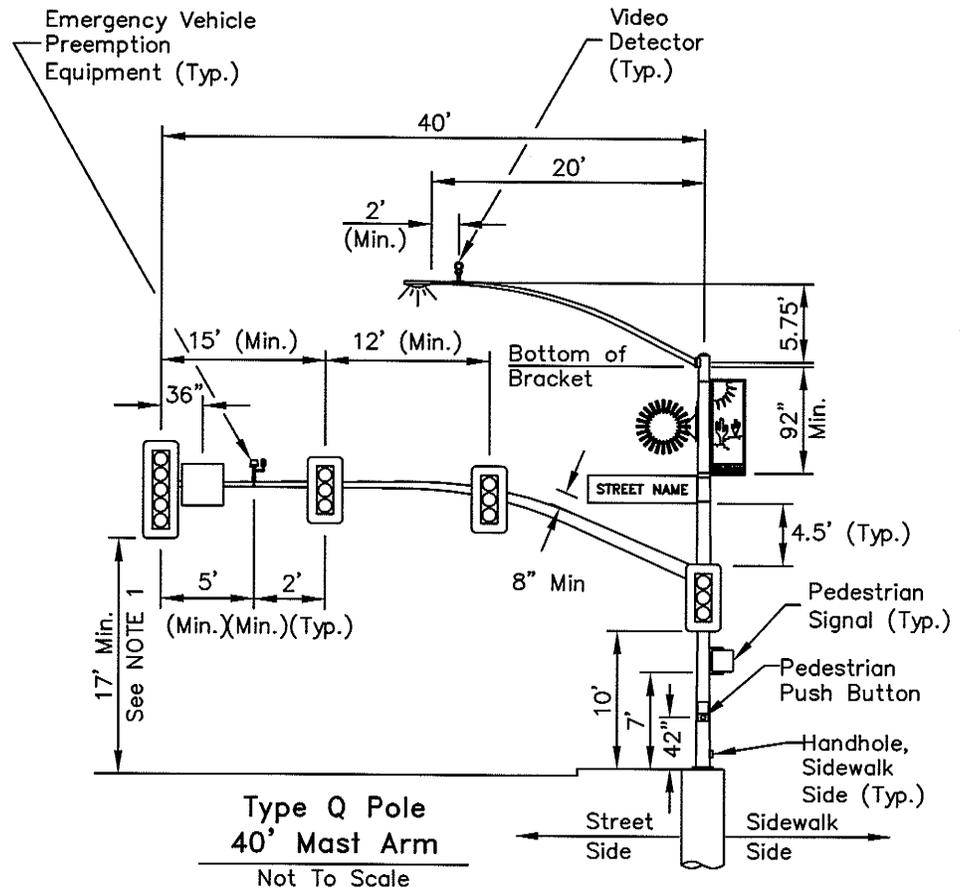
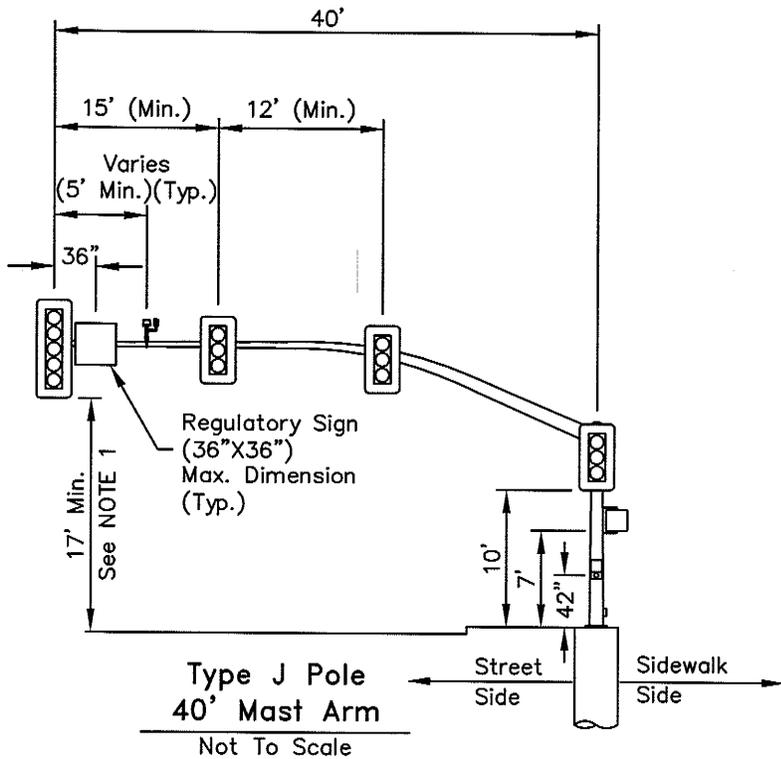
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 Keith E. Brann, P.E.,
 Acting Town Engineer

9/9/2005
 Date



STANDARD DETAIL		DETAIL NO:
MAST ARM LOADING DETAIL TYPE K AND R POLE WITH 45 FT. MAST ARM		730-412
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



NOTES:

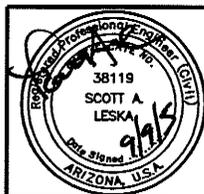
1. There shall be a minimum of 17' clearance between the surface of the pavement and the bottom of each signal head back plate mounted on the mast arm.
2. A maximum of 3 signal heads (1-Q, 2-F) may be installed on the 40' mast arm as shown.
3. Mast arm dimension measured from center of upright to tip of mast arm.
4. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.

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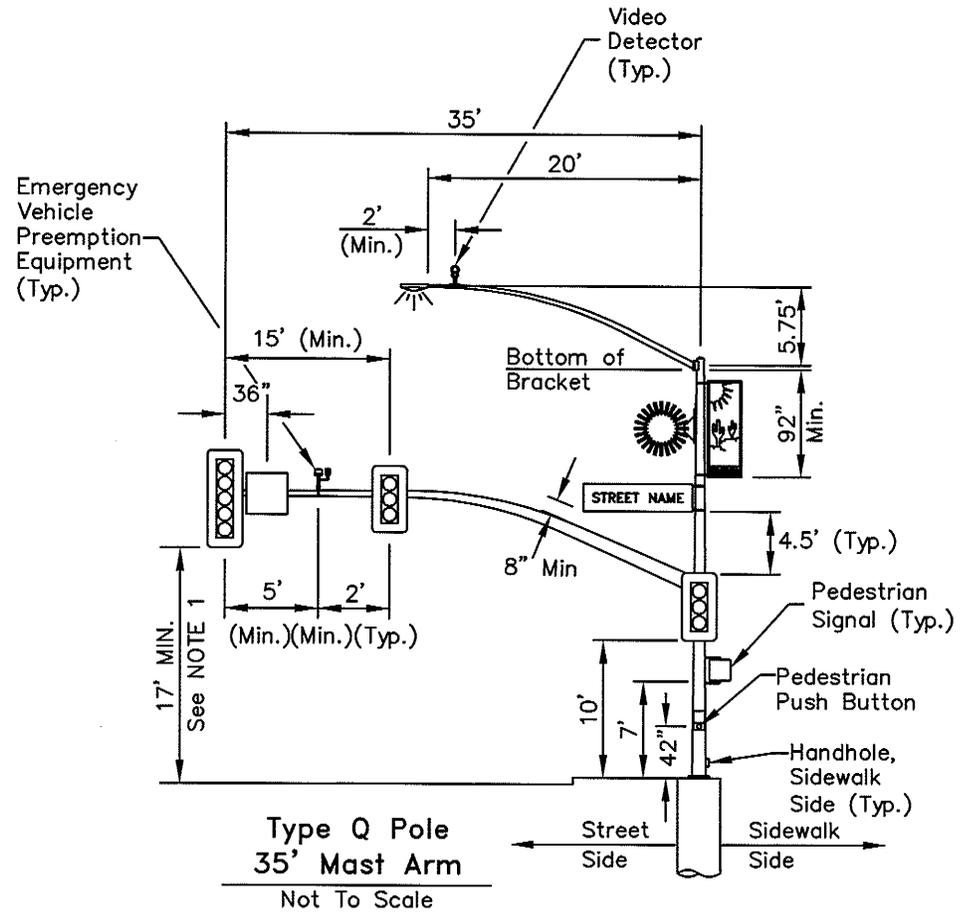
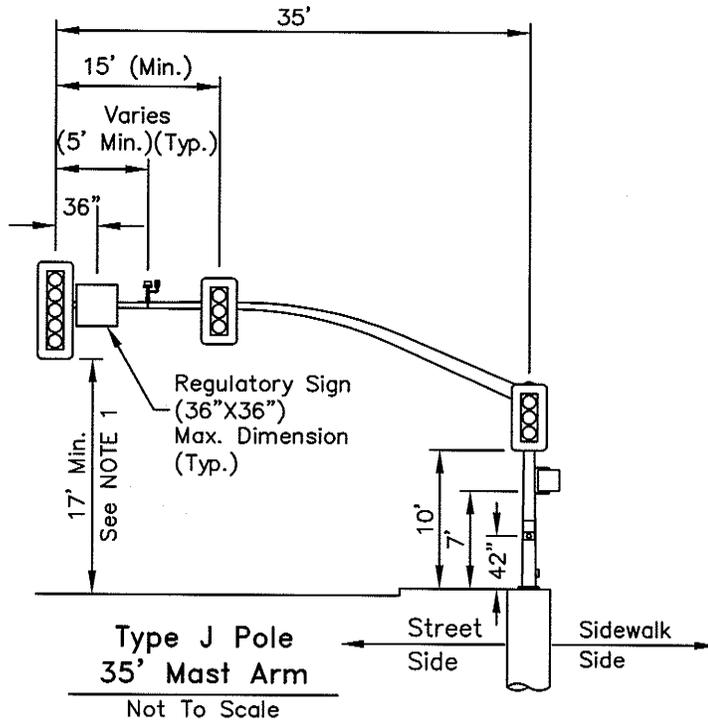
Keith E. Brann
 Keith E. Brann, P.E.,
 Acting Town Engineer

9/9/2005

Date



STANDARD DETAIL		DETAIL NO:
MAST ARM LOADING DETAIL TYPE J AND Q POLE WITH 40 FT. MAST ARM		730-413
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



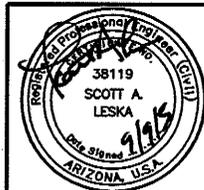
NOTES:

1. There shall be a minimum of 17' clearance between the surface of the pavement and the bottom of each signal head back plate mounted on the mast arm.
2. A maximum of 2 signal heads (1-Q, 1-F) may be installed on the 35' mast arm as shown.
3. Mast arm dimension measured from center of upright to tip of mast arm.
4. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.

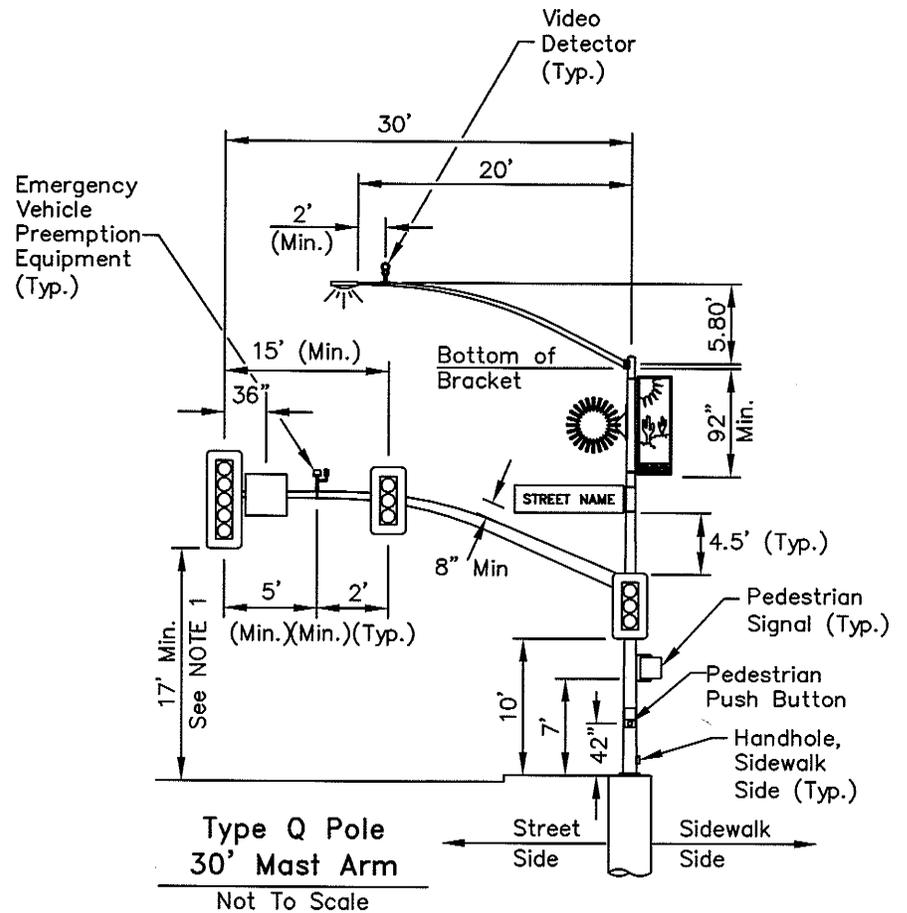
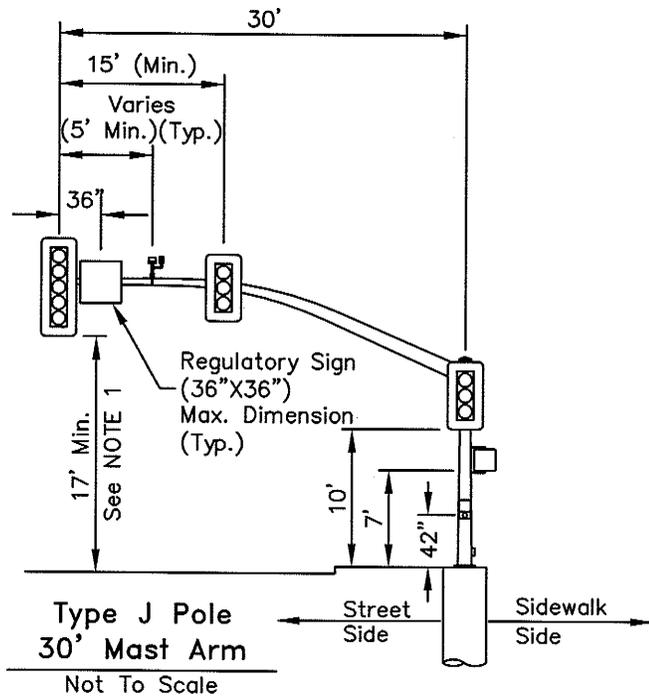
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 Keith E. Brann, P.E.,
 Acting Town Engineer

9/9/2005
 Date



STANDARD DETAIL		DETAIL NO:
MAST ARM LOADING DETAIL		730-414
TYPE J AND Q POLE WITH 35 FT. MAST ARM		
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



NOTES:

1. There shall be a minimum of 17' clearance between the surface of the pavement and the bottom of each signal head back plate mounted on the mast arm.
2. A maximum of 2 signal heads (1-Q, 1-F) may be installed on the 30' mast arm as shown.
3. Mast arm dimension measured from center of upright to tip of mast arm.
4. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.

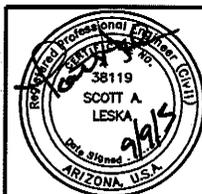
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Keith E. Brann

9/9/2005

Keith E. Brann, P.E.,
Acting Town Engineer

Date



STANDARD DETAIL

DETAIL NO:

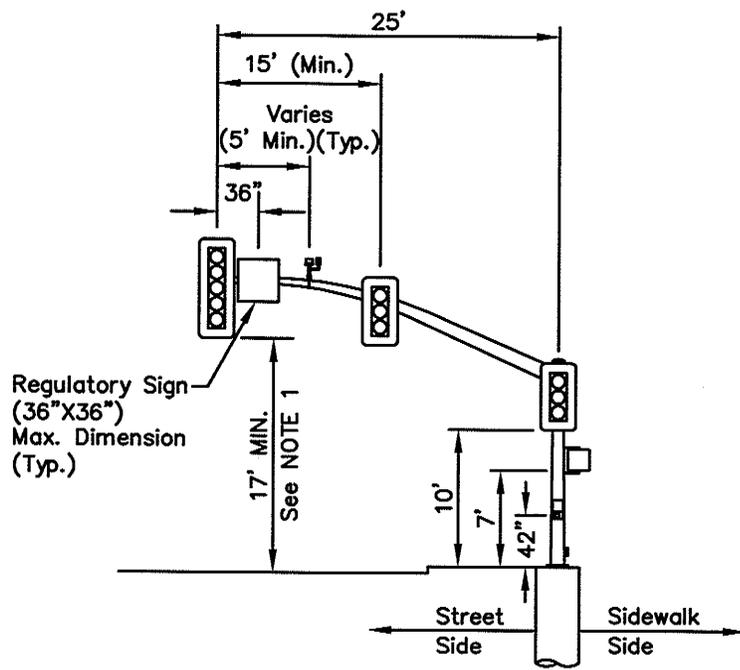
MAST ARM LOADING DETAIL
TYPE J AND Q POLE WITH 30 FT. MAST ARM

730-415

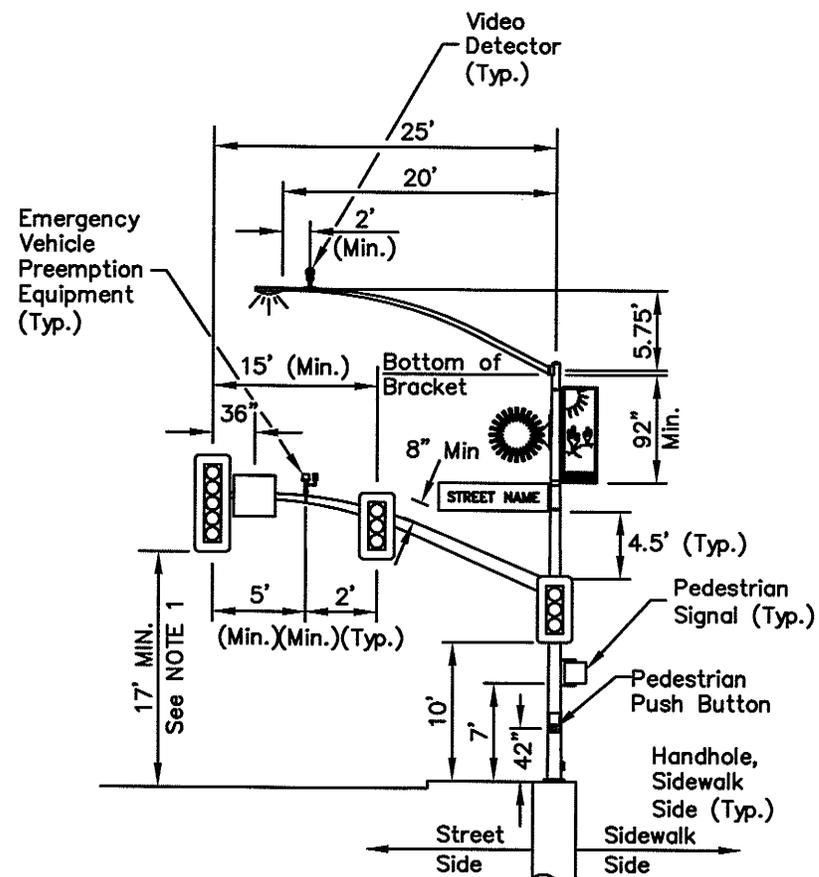
DATE: 9/9/05

REVISED:

SHEET 1 OF 1



Type J Pole
25' Mast Arm
 Not To Scale



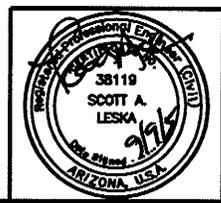
Type Q Pole
25' Mast Arm
 Not To Scale

NOTES:

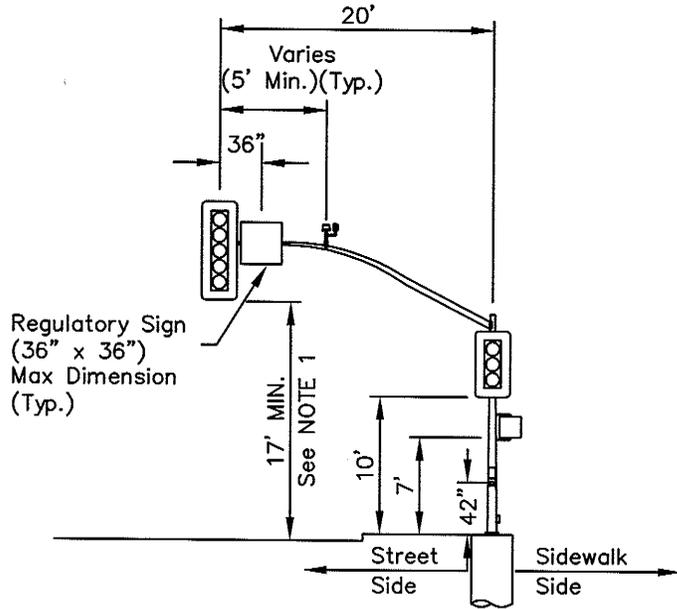
1. There shall be a minimum of 17' clearance between the surface of the pavement and the bottom of each signal head back plate mounted on the mast arm.
2. A maximum of 2 signal heads (1-Q, 1-F) may be installed on the 25' mast arm as shown.
3. Mast arm dimension measured from center of upright to tip of mast arm.
4. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.

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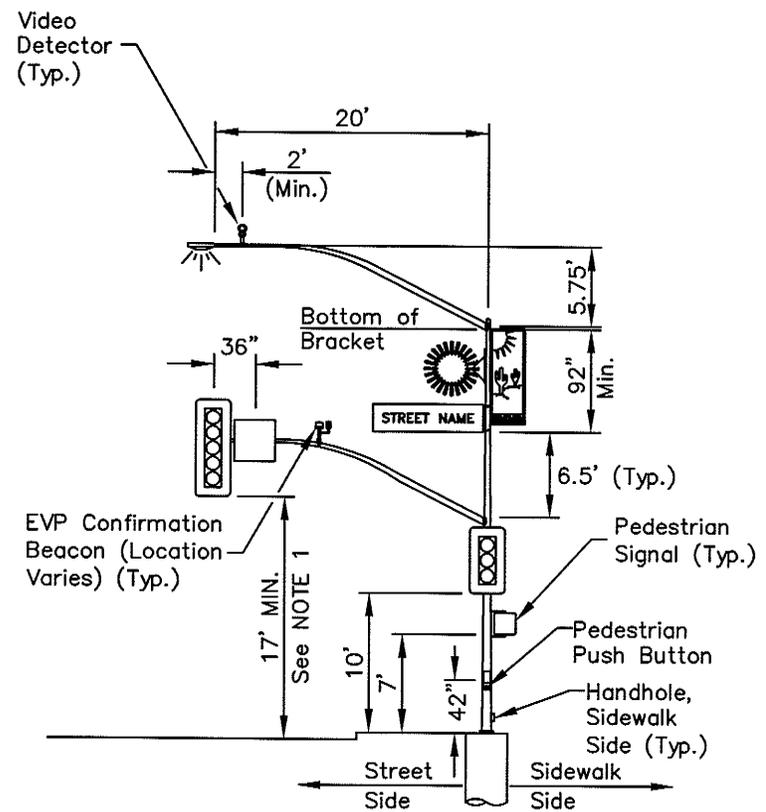
Keith E. Brann
 Keith E. Brann, P.E.,
 Acting Town Engineer
 Date 9/9/2005



STANDARD DETAIL		DETAIL NO:
MAST ARM LOADING DETAIL TYPE J AND Q POLE WITH 25 FT. MAST ARM		730-416
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



Type E Pole
20' Mast Arm
 Not To Scale



Type F Pole
20' Mast Arm
 Not To Scale

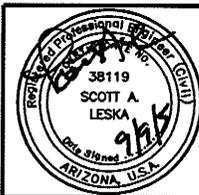
NOTES:

1. There shall be a minimum of 17' clearance between the surface of the pavement and the bottom of each signal head back plate mounted on the mast arm.
2. A maximum of 1 signal head (1-Q or 1-F) may be installed on the 20' mast arm as shown.
3. Mast arm dimension measured from center of upright to tip of mast arm.
4. The Designer shall provide additional structural analysis for any deviations from the dimensions shown which will result in increased structural loading.

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Keith E. Brann
 Keith E. Brann, P.E.,
 Acting Town Engineer

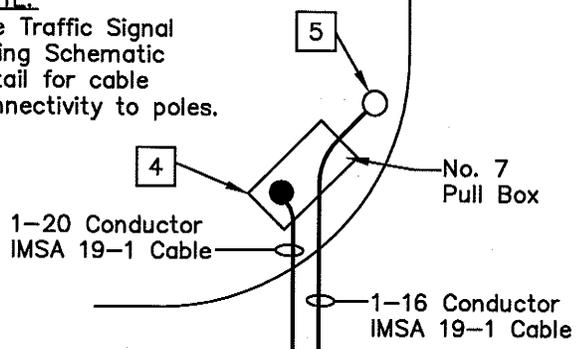
9/9/2005
 Date



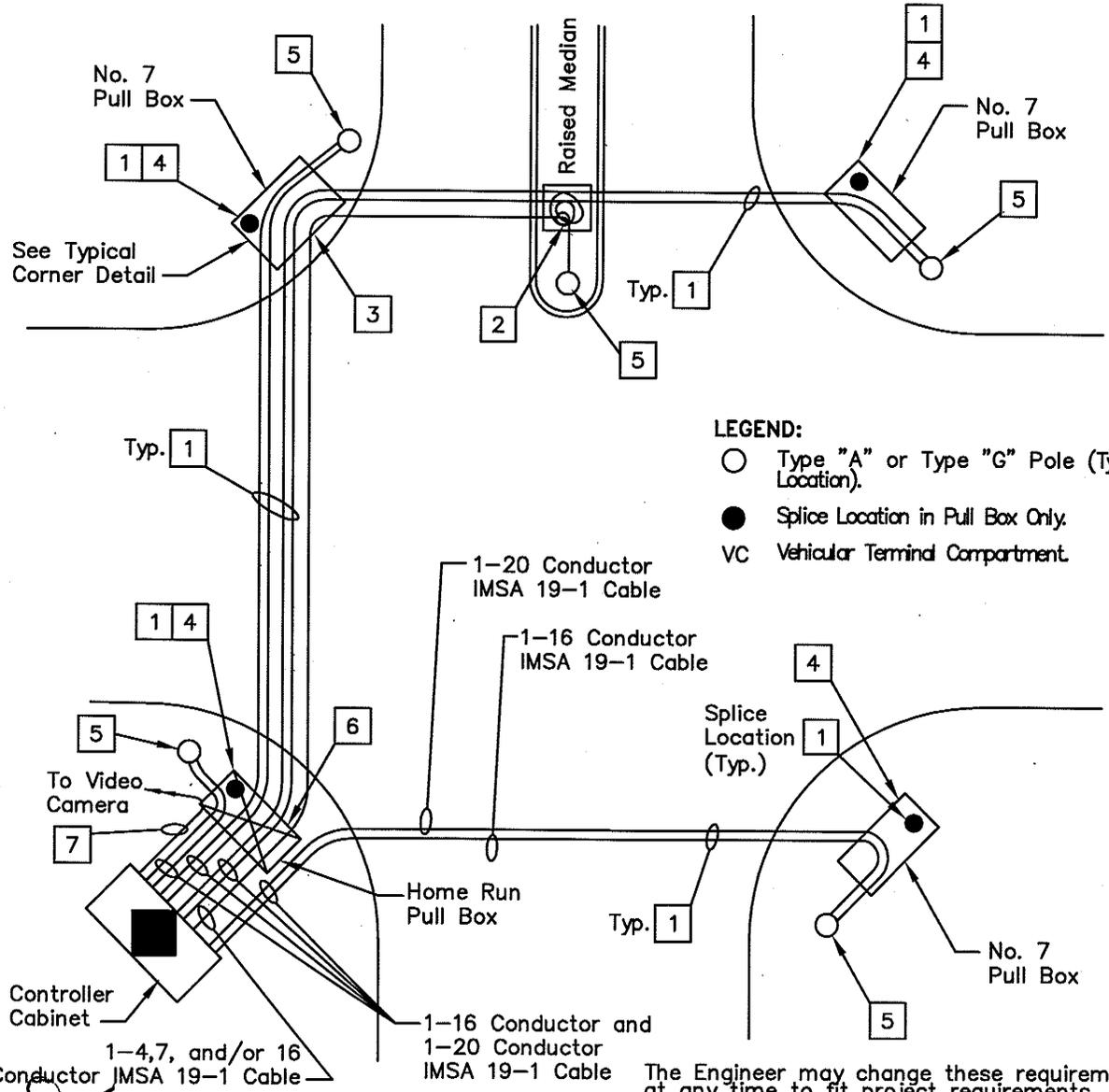
STANDARD DETAIL		DETAIL NO:
MAST ARM LOADING DETAIL TYPE E AND F POLE WITH 20 FT. MAST ARM		730-417
DATE: 9/9/05	REVISED:	SHEET 1 OF 1

NOT TO SCALE

NOTE:
See Traffic Signal Wiring Schematic Detail for cable connectivity to poles.



Typical Corner Detail



NOTES:

- 1 Splice permitted only at designated splice locations as shown on this plan. Each signal cable as shown shall be continuous and unspliced between the controller cabinet and the corner where it is terminated.
- 2 Provide 1 wrap of slack (5' min.) for each signal cable at intermediate median pull boxes. (Typ.)
- 3 Provide 2 wraps of slack (8' min.) for each signal cable passing through this pull box. (No splices permitted)
- 4 Provide 1 wrap of slack (5' min.) for all signal cables terminating in this pull box.
- 5 Terminate 4, 7, 16, and 20 Conductor IMSA 19-1 cable in VC on the Ped. Post, Type "A", Type "G", Type "Q", or Type "R" pole on corner. Provide 2 wraps of slack (8' min.) in adjacent pull box.
- 6 Provide 1 wrap of slack (5' min.) for each signal cable passing through the home run pull box (No. 7 with extension).
- 7 Terminate Video Cable (RG59 Cable, shielded), Data Cable (18AWG, Shielded), and Power Cable (3-12AWG CC) at Video Camera on pole designated by Project Plans or Town Engineer.

LEGEND:

- Type "A" or Type "G" Pole (Typ. Location).
- Splice Location in Pull Box Only
- VC Vehicular Terminal Compartment.

The Engineer may change these requirements at any time to fit project requirements.

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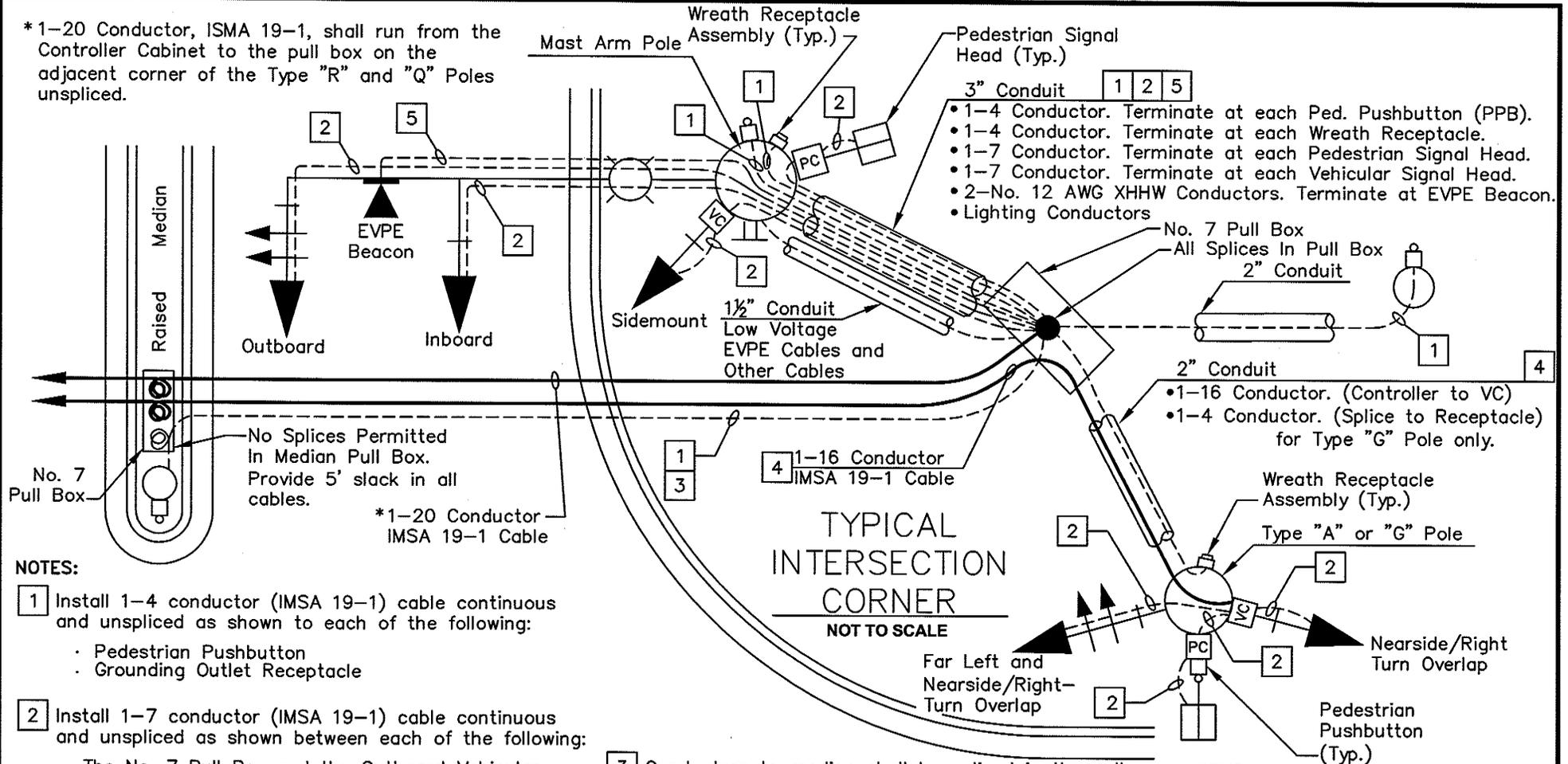
[Signature]
Keith E. Brann, P.E.,
Town Engineer

6/20/2006
Date



STANDARD DETAIL		DETAIL NO:
TYPICAL TRAFFIC SIGNAL CABLE SCHEMATIC		730-702
DATE: 9/9/05	REVISED: 06/20/06	SHEET 1 OF 1

*1-20 Conductor, ISMA 19-1, shall run from the Controller Cabinet to the pull box on the adjacent corner of the Type "R" and "Q" Poles unspliced.



- NOTES:**
- 1 Install 1-4 conductor (ISMA 19-1) cable continuous and unspliced as shown to each of the following:
 - Pedestrian Pushbutton
 - Grounding Outlet Receptacle
 - 2 Install 1-7 conductor (ISMA 19-1) cable continuous and unspliced as shown between each of the following:
 - The No. 7 Pull Box and the Outboard Vehicular Signal.
 - The No. 7 Pull Box and the Inboard Vehicular Signal.
 - The No. 7 Pull Box and the Sidemount Vehicular Signal.
 - The VC and the Far Left Mounted Vehicular Signal.
 - The VC and the Nearside/Right Turn Overlap Vehicular Signal.
 - The No. 7 Pull Box and the Pedestrian Signal Head.
 - The VC and the Pedestrian Signal Head/PPB.

- 3 Conductors to median shall be spliced in the pull box on the adjacent corner in the clockwise direction from the median.
- 4 Install 1-16 conductor (ISMA 19-1) cable continuous and unspliced as shown between VC (at type "A" or "G" pole) direct to controller.
- 5 2-No.12 AWG XHHW stranded white and blue conductors for EVPE beacon. Route beacon conductors direct to splice at No. 7 pull box.

- LEGEND:**
- VC Vehicular Terminal Compartment
 - PC Pedestrian Terminal Compartment
 - Splice Location in Pull Box

NOTE: Quantity of cables may vary based on actual field conditions or as directed by the Town Engineer.

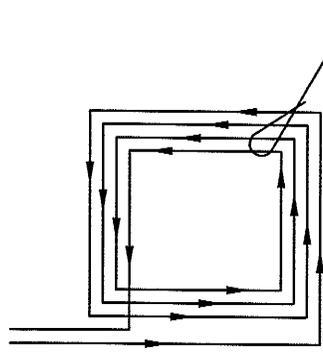
APPROVED FOR DISTRIBUTION:

Keith E. Brann
 Keith E. Brann, P.E.,
 Acting Town Engineer

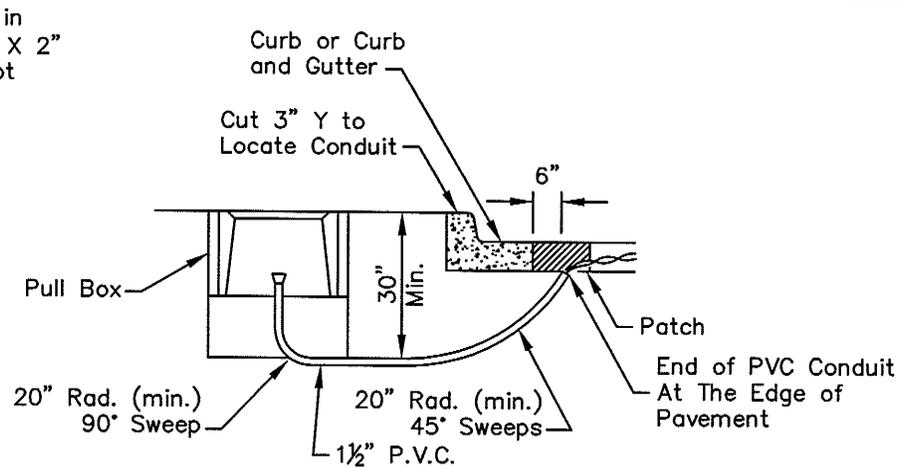
9/9/2005
 Date



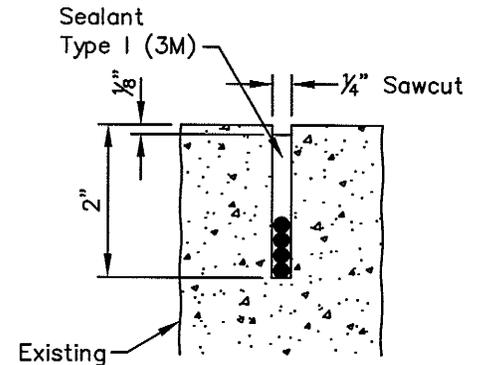
STANDARD DETAIL		DETAIL NO:
TOWN OF MARANA		730-703
TRAFFIC SIGNAL WIRING SCHEMATIC		
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



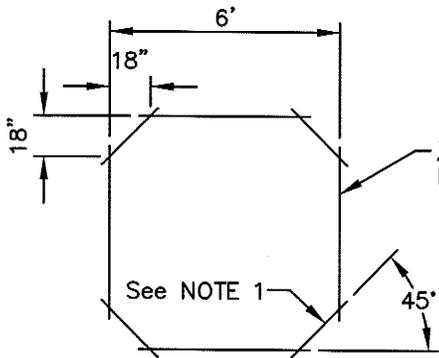
WIRE LAYOUT
Not To Scale



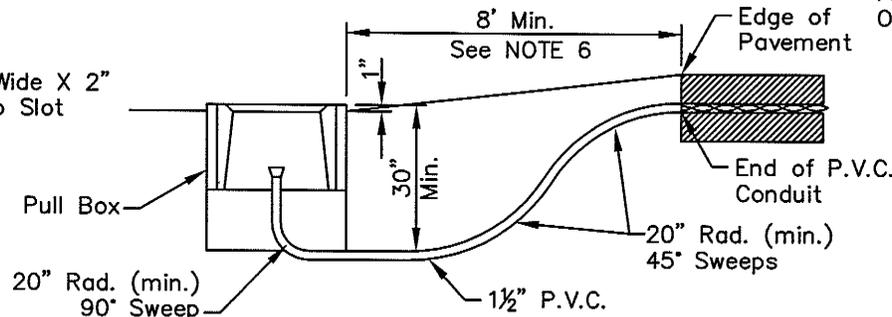
WITH CURB AND GUTTER
Not To Scale



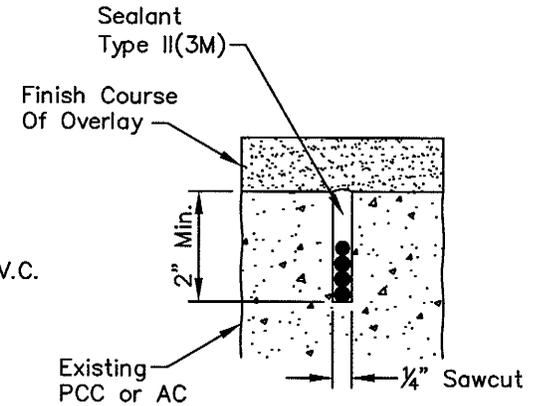
DETAIL 1
Not To Scale



SAWCUT LAYOUT
Not To Scale



WITHOUT CURB AND GUTTER
Not To Scale



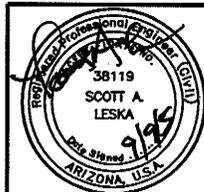
DETAIL 2
Not To Scale

NOTES:

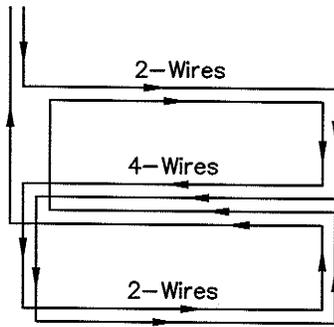
- Sawcut across corners at a 45° angle to minimize sharp angles in loop run.
- One loop detector shall be installed per lane and it shall be located in the center of the lane.
- Loops shall be installed in accordance with the requirements of Detail 1 when there is to be no additional surfacing.
- Loops shall be installed in accordance with the requirements of Detail 2 when an overlay or top course is installed/constructed.
- No splices permitted in loop wire.
- Any pull boxes installed along an uncurbed roadway shall be installed adjacent to, but not within, the shoulder.
- All pull boxes shall be located on the Project Plans with Station and Offset call-outs.

APPROVED FOR DISTRIBUTION:

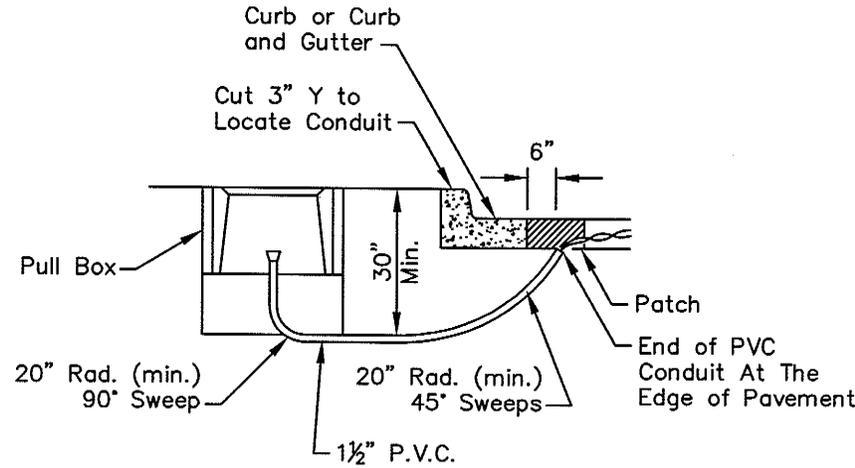
Keith E. Brann
Keith E. Brann, P.E.,
Acting Town Engineer
Date 9/9/2005



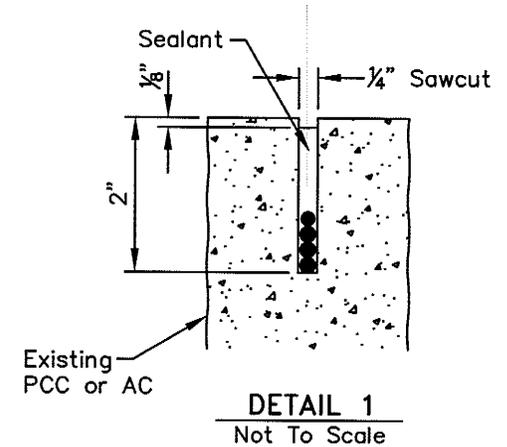
STANDARD DETAIL		DETAIL NO:
6' X 6' LOOP DETECTOR		730-710
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



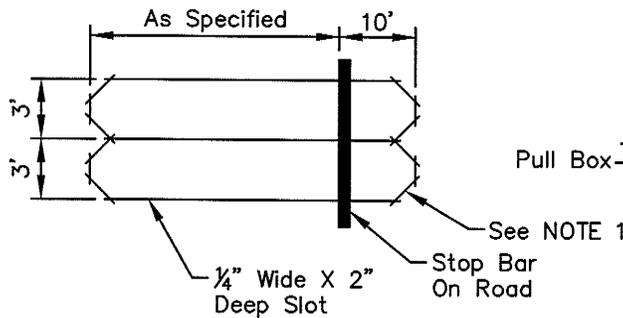
WIRE LAYOUT
Not To Scale



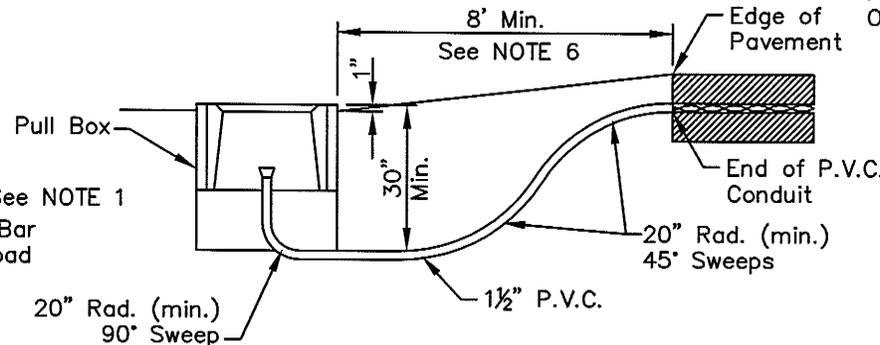
WITH CURB AND GUTTER
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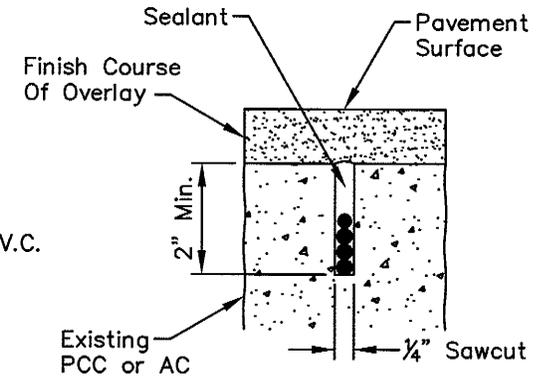
DETAIL 1
Not To Scale



SAWCUT LAYOUT
Not To Scale



WITHOUT CURB AND GUTTER
Not To Scale



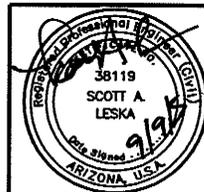
DETAIL 2
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NOTES:

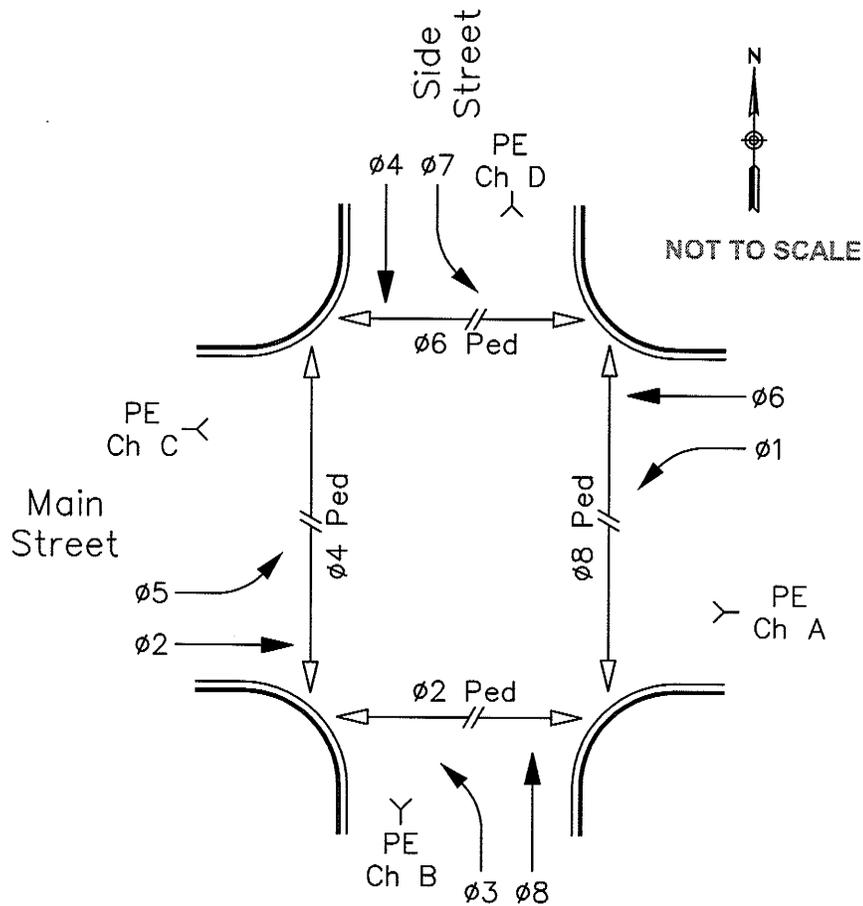
- Sawcut across corners at a 45° angle to minimize sharp angles in loop run.
- One loop detector shall be installed per lane and it shall be located in the center of the lane.
- Loops shall be installed in accordance with the requirements of Detail 1 when there is to be no additional surfacing.
- Loops shall be installed in accordance with the requirements of Detail 2 when an overlay or top course is installed/constructed.
- No splices permitted in loop wire.
- Any pull boxes installed along an uncurbed roadway shall be installed adjacent to, but not within, the shoulder.
- All pull boxes shall be located on the Project Plans with Station and Offset call-outs.

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 Keith E. Brann, P.E., Date
 Acting Town Engineer



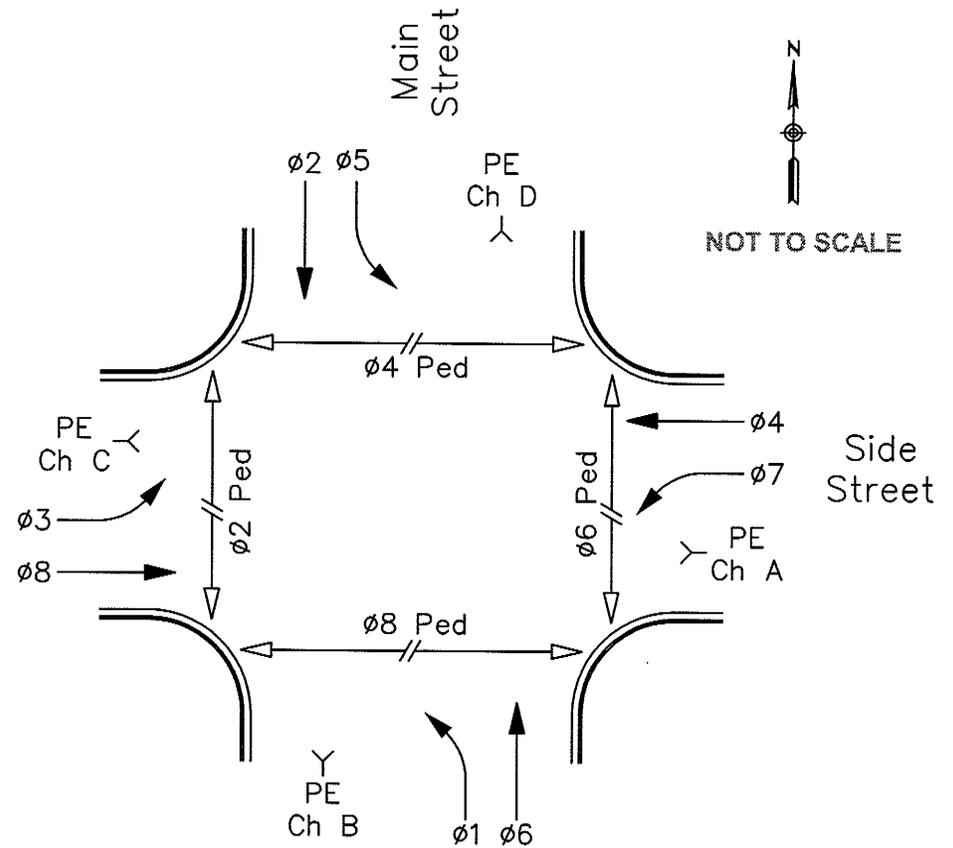
STANDARD DETAIL		DETAIL NO:
PRESENCE LOOP DETECTOR		730-712
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



EAST / WEST
MAIN STREET

PREEMPTION CHANNELS

- PE Channel A = EB Preemptor 1
- PE Channel B = SB Preemptor 2
- PE Channel C = WB Preemptor 3
- PE Channel D = NB Preemptor 4



NORTH / SOUTH
MAIN STREET

APPROVED FOR DISTRIBUTION:

Keith E. Brann
Keith E. Brann, P.E.,
Acting Town Engineer

10/14/2005

Date



STANDARD DETAIL

STANDARD TRAFFIC SIGNAL PHASING

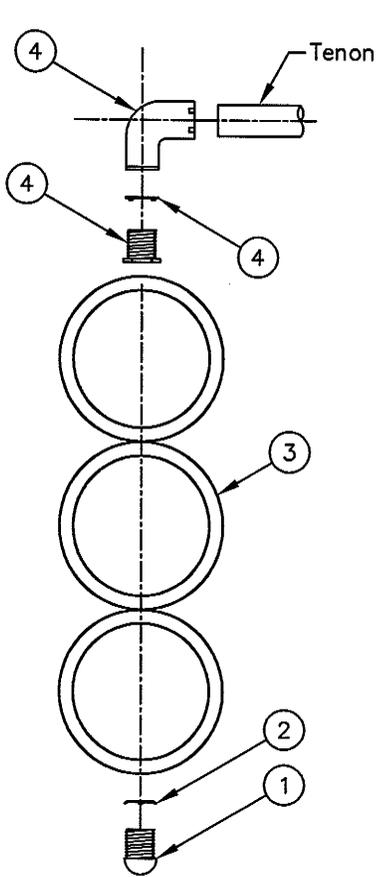
DATE: 9/9/05

REVISED: 10/14/2005

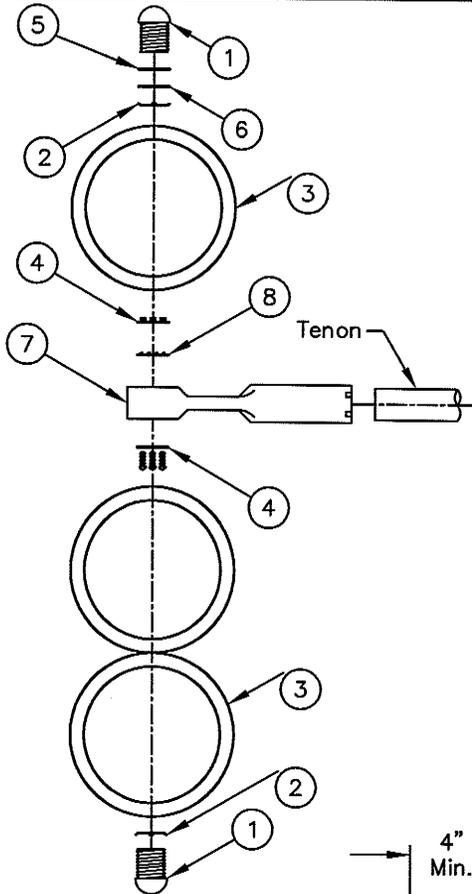
DETAIL NO:

730-800

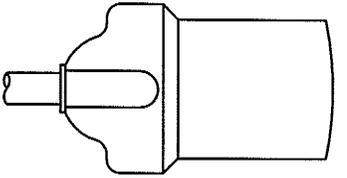
SHEET 1 OF 1



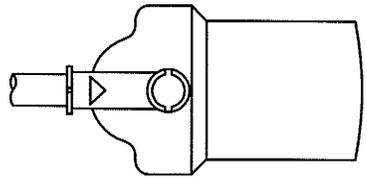
TYPE I MOUNT
Not To Scale



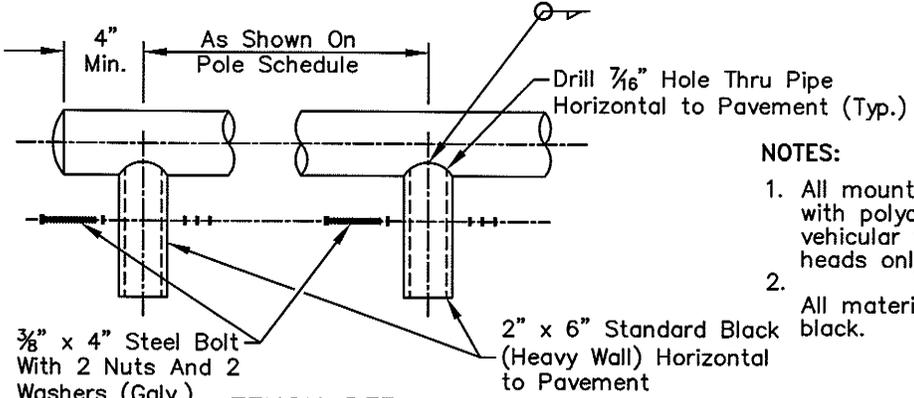
TYPE II MOUNT
Not To Scale



MOUNTING ORIENTATION PLAN
Not To Scale



MOUNTING ORIENTATION PLAN
Not To Scale



TENON DETAIL
Not To Scale

TYPE I MOUNT

LIST OF MATERIALS

Item	Qty.	Description
1	1	Mast Arm Plumbizer With Locking Device. (See T.S. 10-2)*
2	1	12" Signal Head. See Plans.
3	1	Conduit Lockout.
4	1	1 1/2" x 1 3/4" Lock Nipple.
5	1	Lock Ring. (See T.S. 10-1-4)*
6	1	Ornamental Cap. (See T.S. 10-1-6)*

TYPE II MOUNT

LIST OF MATERIALS

Item	Qty.	Description
1	2	Ornamental Cap. (See T.S. 10-1-6)*
2	2	Conduit Locknut.
3	1	12" Signal Head. See Plans.
4	2	Attaching Washers W/3-1/4-20 UNC x 3 1/2 Carriage Bolts and Nuts.
5	1	Flat Washer.
6	1	Neoprene Washer.
7	1	Elevator Plumbizer. (See T.S. 10-2)*
8	1	Lock Washer.

* Standard Details for Public Improvements COT/PC 1994 edition

NOTES:

- All mounts shall be used with polycarbonate vehicular traffic signal heads only.
- All materials shall be black.

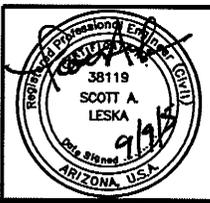
APPROVED FOR DISTRIBUTION:

Keith E. Brann

Keith E. Brann, P.E.,
Acting Town Engineer

9/9/2005

Date



STANDARD DETAIL

TYPE I AND II MOUNTING ASSEMBLIES

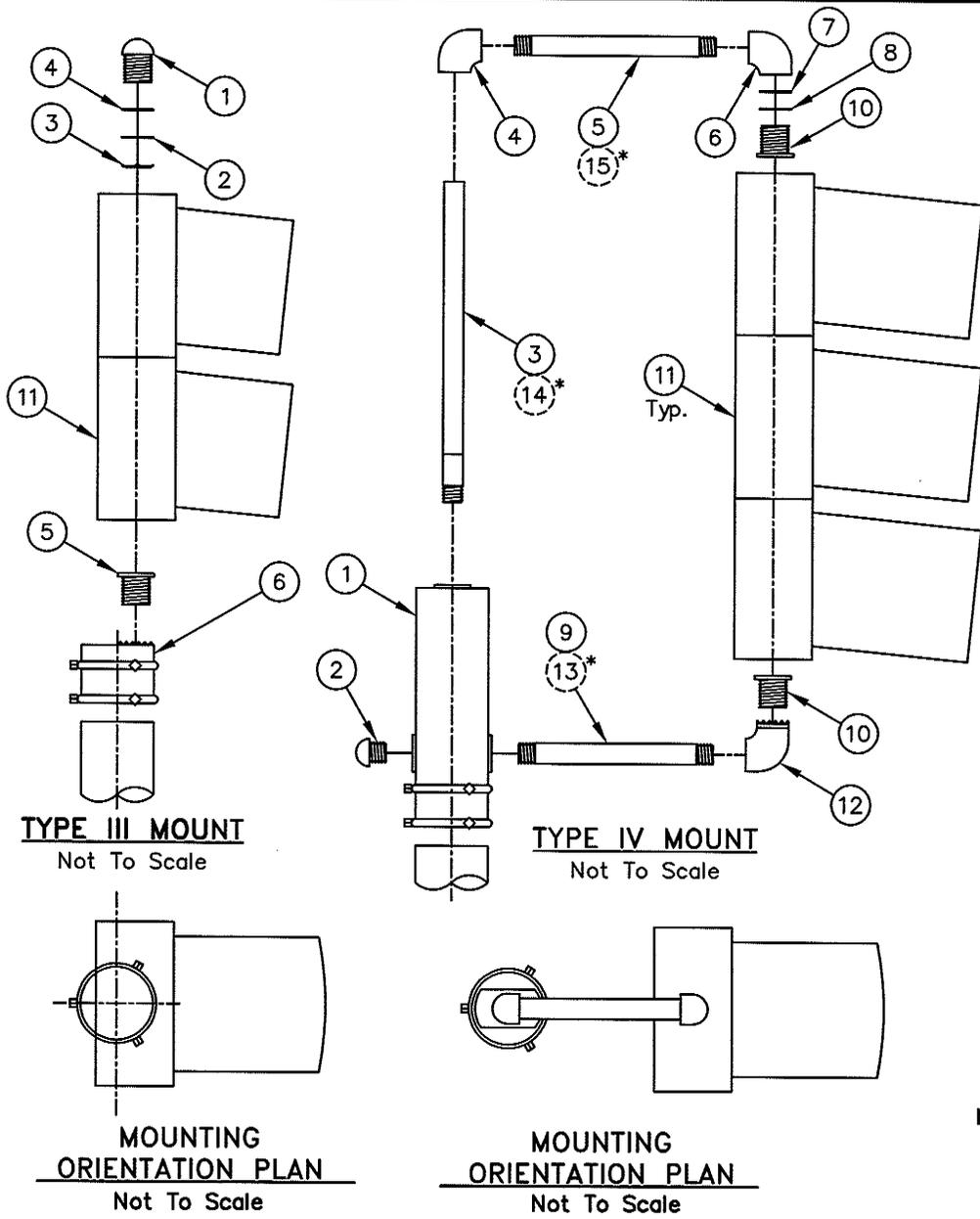
DATE: 9/9/05

REVISED:

DETAIL NO:

730-901

SHEET 1 OF 1



TYPE III MOUNT

LIST OF MATERIALS

ltn.	Qty.	Description
1	1	Ornamental Cap. (T.S. 10-1-6)**
2	1	Neoprene Washer.
3	1	Conduit Locknut.
4	1	Flat Washer.
5	1	1½" Lock Nipple 1⅛" Long.
6	1	Pole Top Offset Mount. (T.S. 10-1-3)**
7	1	Signal Head, See Plans.

TYPE IV MOUNT

LIST OF MATERIALS

ltn.	Qty.	Description
1	1	Pole Top Mounted Terminal Compartment. (T.S. 10-4-2)**
2	1	Ornamental Cap. (T.S. 10-1-6)**
3	1	1½" Center Pipe ***
4	1	90° Elbow, Drill & Tap for Setscrew.
5	1	1½" Pipe Nipple, 12½" Long For Pedestrian & Signal Heads.
6	1	90° Elbow.
7	1	Flat Washer.
8	1	Neoprene Washer.
9	1	1½" Pipe Nipple, 12" Long.
10	2	1½" Lock Nipple See Note 1.
11	1	12" Signal Head. See Plans.
12	1	90° Elbow With Locking Device. (TS 10-1-2)**
13*	1	1½" Pipe Nipple, 12" Long.
14*	1	1½" Pipe Nipple, 9 1/2" Long for Ped. Signal, For Illuminated Message Units Use 23⁵⁄₈" x 1½" Pipe.
15*	1	1½" Pipe Nipple, 12 1/2" Long.

** Standard Details for Public Improvements COT/PC 1994 edition.
 *** Nipple length shall be determined by Contractor to ensure a correct fit for the type of vehicular traffic signal head being installed.

NOTES:

1. Lock nipple length shall be 1¾" for 12" heads.
2. All materials shall be black.

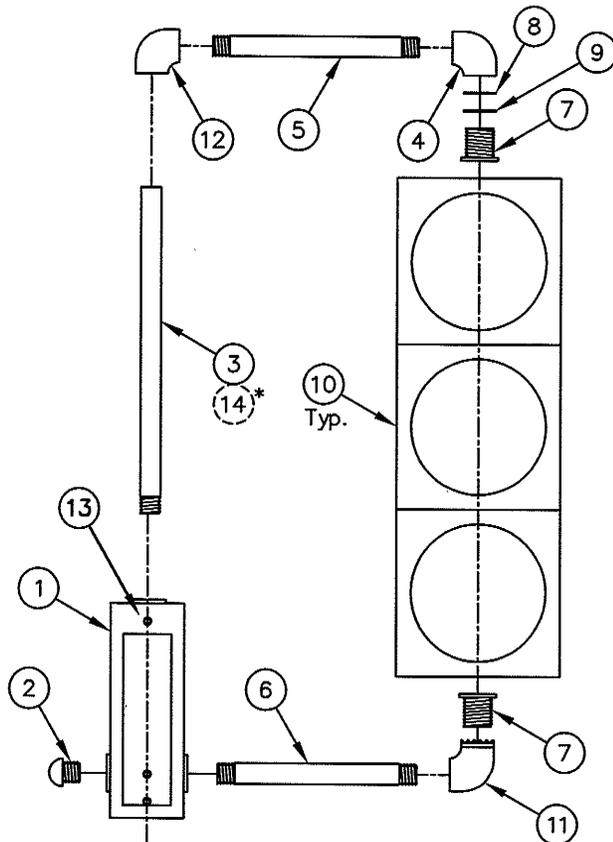
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 Acting Town Engineer

9/9/2005
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STANDARD DETAIL		DETAIL NO:
TYPE III AND IV MOUNTING ASSEMBLIES		730-902
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



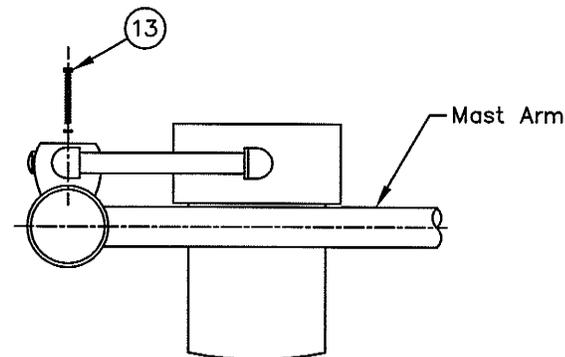
TYPE V MOUNT
Not To Scale

NOTES:

1. Lock nipple length shall be $1\frac{3}{4}$ " for 12" heads.
2. All materials shall be black.

LIST OF MATERIALS		
Itm.	Qty.	Description
1	1	Terminal Compartment For Side Mtg. (See T.S. 10-4-1)**
2	1	Ornamental Cap. (See T.S. 10-1-6)**
3	1	$1\frac{1}{2}$ " I.D. Pipe ***
4	1	$1\frac{1}{2}$ " I.D. Pipe, 90° Elbow.
5	1	$1\frac{1}{2}$ " I.D. Pipe Nipple, $24\frac{1}{2}$ " Long.
6	1	$1\frac{1}{2}$ " I.D. Pipe Nipple, 24" Long
7	1	$1\frac{1}{2}$ " Lock Nipple, See Note No. 1.
8	1	Flat Washer.
9	1	Neoprene Washer.
10	1	12" Signal Head. See Plans.
11	1	90° Ell With Locking Device. (T.S. 10-1-2)**
12	1	$1\frac{1}{2}$ " I.D. Pipe 90° Elbow, Drill & Tap For Setscrew.
13	2	$\frac{1}{2}$ " x 2" Galvanized Steel Bolt 13-UNC With Flat Washer and Lock Washer.
14*	1	$1\frac{1}{2}$ " Pipe Nipple $9\frac{1}{2}$ "-For Pedestrian Signal Units Only. (For Illuminated Message, Use $25\frac{3}{8}$ " Pipe)

** Standard Details for Public Improvements COT/PC 1994 edition.
 *** Nipple length shall be determined by Contractor to ensure a correct fit for the type of vehicular traffic signal head being installed.

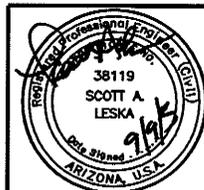


**MOUNTING
ORIENTATION PLAN**
Not To Scale

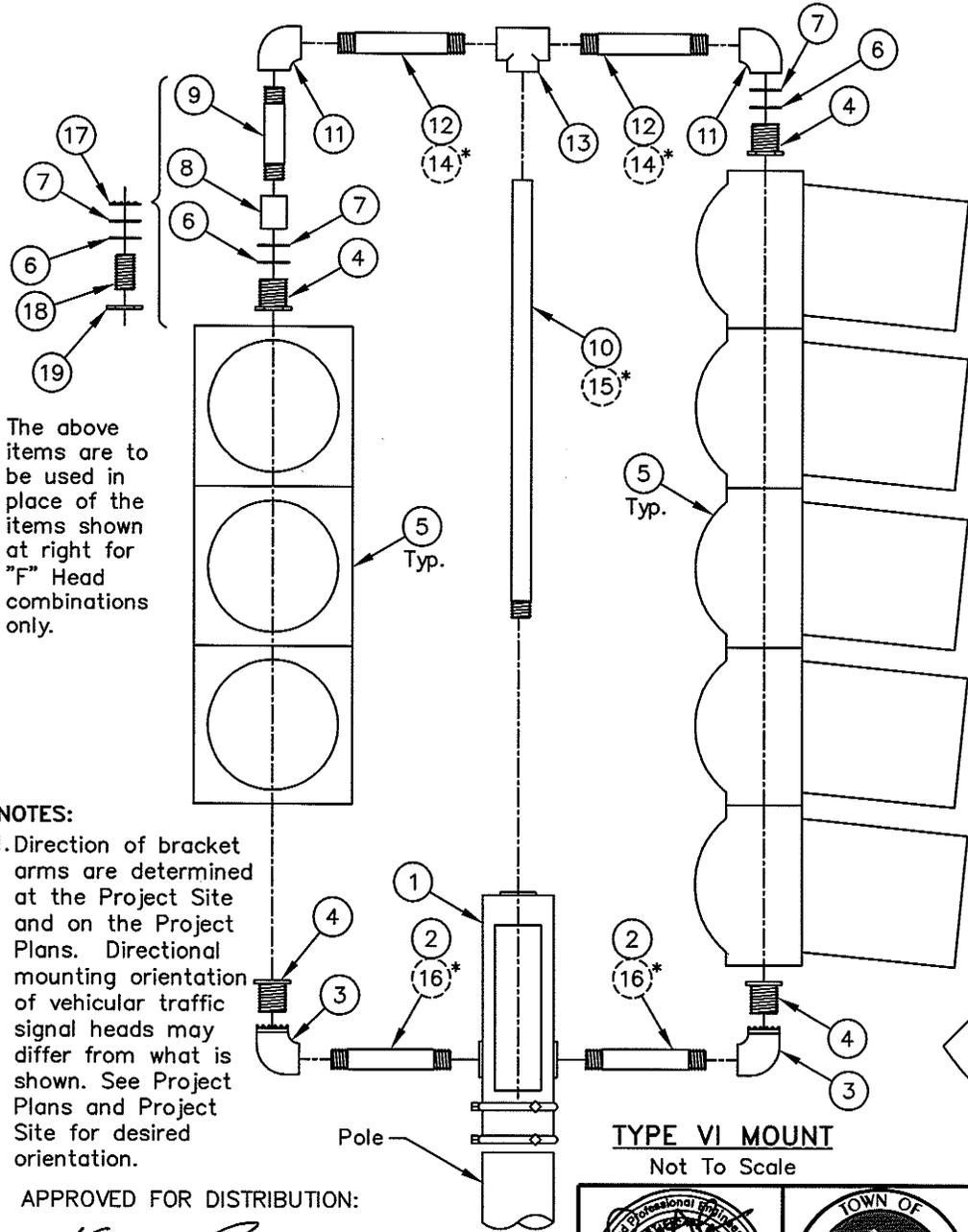
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STANDARD DETAIL		DETAIL NO:
TYPE V MOUNTING ASSEMBLY		730-903
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



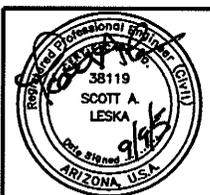
The above items are to be used in place of the items shown at right for "F" Head combinations only.

NOTES:
 1. Direction of bracket arms are determined at the Project Site and on the Project Plans. Directional mounting orientation of vehicular traffic signal heads may differ from what is shown. See Project Plans and Project Site for desired orientation.

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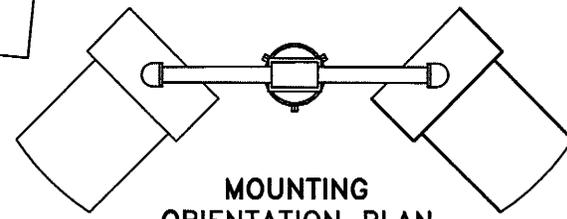


LIST OF MATERIALS		
Itm.	Qty.	Description
1	1	Terminal Compartment Pole Top Mtg. (See T.S. 10-4-1)**
2	2	1½" I.D. Pipe Nipple, 12" Long.
3	2	90° Ell With Locking Device. (See T.S. 10-1-2)**
4	4	1½" Lock Nipple, See NOTE No. 1.
5	2	12" Signal Head. See Plans.
6	2	Neoprene Washer.
7	2	Flat Washer.
8	1	1½" Pipe Coupling, As Required.
9	1	1½" Pipe Nipple ***
10	1	1½" Center Pipe ***
11	2	90° Elbow, 1½".
12	2	1½" Pipe Nipple, 12½" Long.
13	1	Pipe Tee, Drill & Tap for Setscrew.
14*	2	1½" Pipe Nipple, 12½" Long For Ped. Signal Heads.
15*	1	1½" Pipe Nipple, 9½" Long For Ped. Signal Heads.
16*	2	1½" Pipe Nipple, 12" Long For Ped. Signal Heads.
17	1	Conduit Lock Nut. (For 'F' & 'R' Combination Only)
18	1	1½" Pipe Nipple, 3" Long. (For 'F' & 'R' Combination Only)
19	1	Malleable Hex Nut. (For 'F' & 'R' Combination Only)

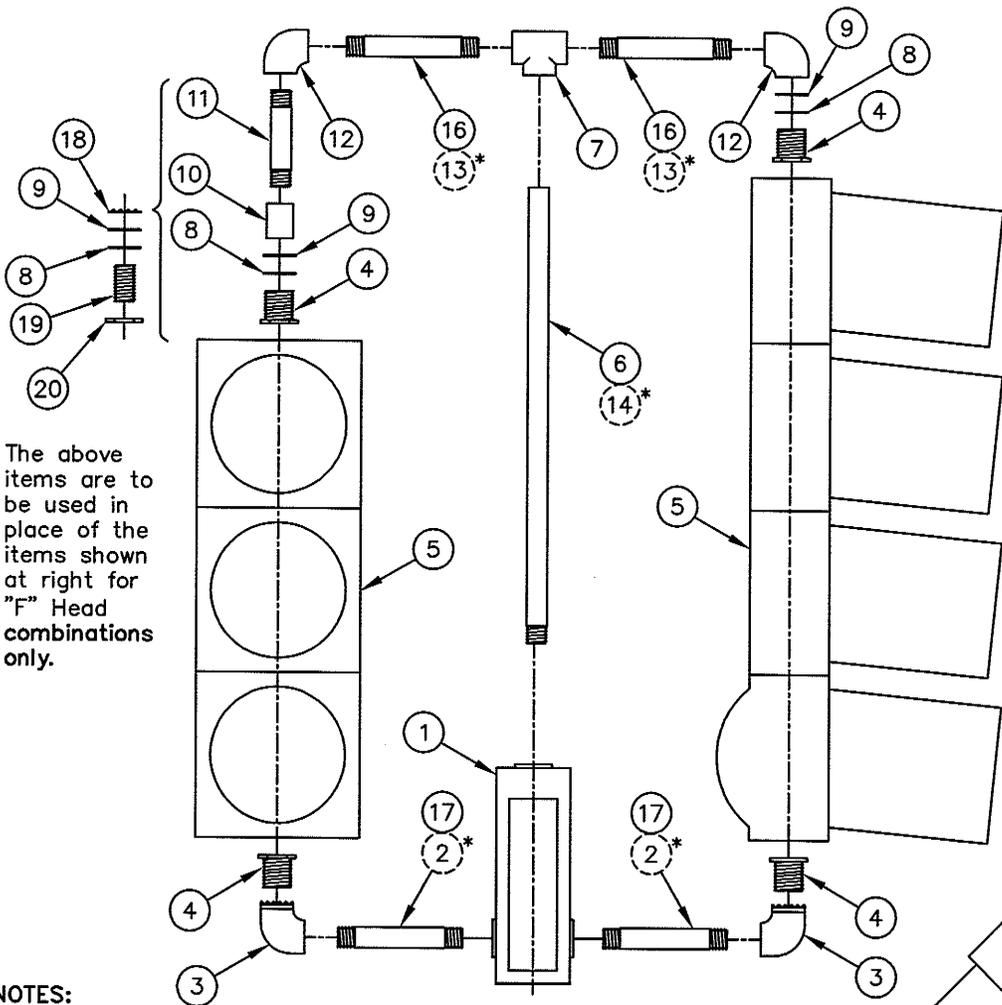
** Standard Details for Public Improvements COT/PC 1994 edition.
 *** Nipple length shall be determined by Contractor to ensure a correct fit for the type of vehicular traffic signal head being installed.

NOTES (Cont.):

- Lock nipple length shall be 1¾" for 12" heads.
- All materials shall be black.
- Mounting orientation may differ from what is shown. See Project Plans and Project Site for desired orientation.



STANDARD DETAIL		DETAIL NO:
TYPE VI MOUNTING ASSEMBLY		730-904
DATE: 9/9/05	REVISED:	SHEET 1 OF 1

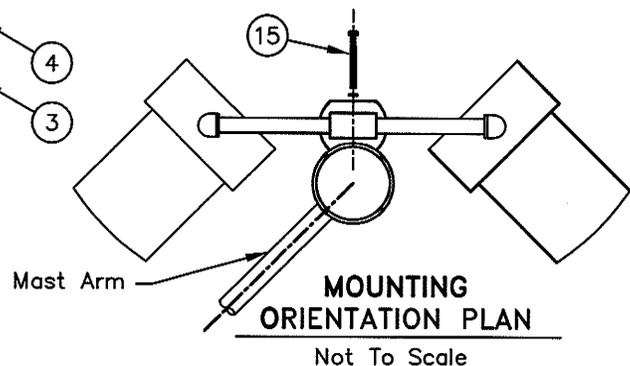


The above items are to be used in place of the items shown at right for "F" Head combinations only.

NOTES:

1. Direction of bracket arms are determined at the Project Site and on the Project Plans. Directional mounting orientation of vehicular traffic signal heads may differ from what is shown. See Project Plans and Project Site for desired orientation.

TYPE VII MOUNT
Not To Scale



LIST OF MATERIALS		
Itm.	Qty.	Description
1	1	Terminal Compartment Pole Top Mtg. (See T.S. 10-4-1)**
2*	2	1½" Pipe Nipple, 11½" Long. (For Ped. Signal Heads)
3	2	90° Elbow With Locking Device. (See T.S. 10-1-2)**
4	4	1½" Lock Nipple, See NOTE 1.
5	2	12" Signal Head. See Plans.
6	1	Center Pipe ***
7	1	Tee, Drill & Tap For Setscrew.
8	2	Neoprene Washer.
9	2	Flat Washer.
10	1	1½" Pipe Coupling, As Required.
11	1	1½" Pipe Nipple ***
12	2	90° Elbow.
13*	2	1½" Pipe Nipple, 12" Long. (For Ped. Signal Heads)
14*	1	1½" Pipe Nipple, 9½" Long. (For Ped. Signal Heads)
15	2	½"x2" Galvanized Steel Bolt 13 UNC With Flat Washer And Lock Washer.
16	2	1½" Pipe Nipple, 24½" Long.
17	2	1½" Pipe Nipple, 24" Long.
18	1	Conduit Lock Nut. (For 'F' & 'R' Combination Only)
19	1	1½" Pipe Nipple, 3" Long. (For 'F' & 'R' Combination Only)
20	1	Malleable Hex Nut. (For 'F' & 'R' Combination Only)

** Standard Details for Public Improvements COT/PC 1994 edition.
 *** Nipple length shall be determined by Contractor to ensure a correct fit for the type of vehicular traffic signal head being installed.

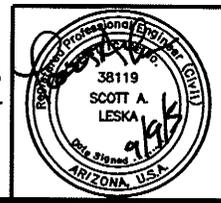
NOTES (Cont.):

2. Lock nipple length shall be and ¾" for 12" heads.
3. All materials shall be black.
4. Mounting orientation may differ from what is shown. See Project Plans and Project Site for desired orientation.

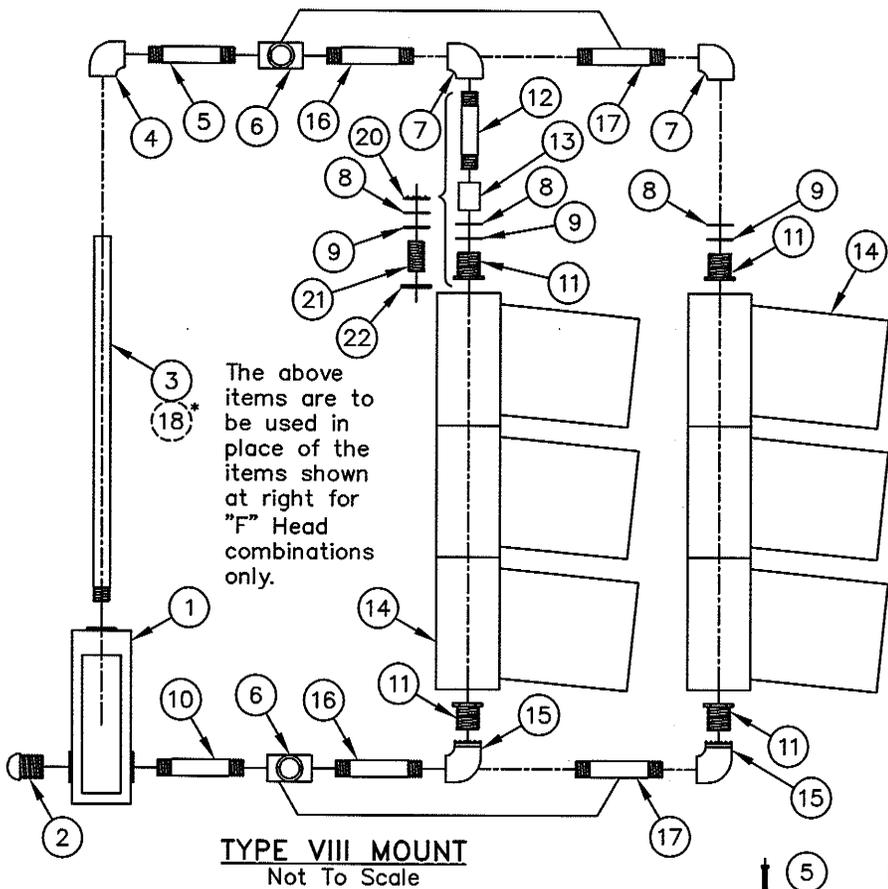
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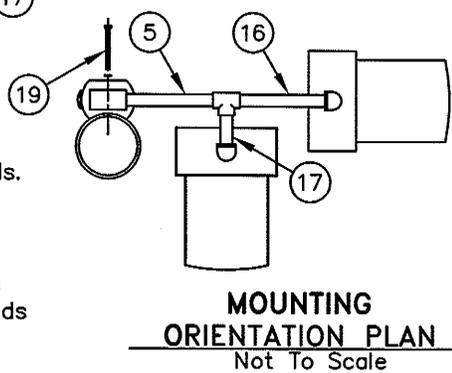


STANDARD DETAIL		DETAIL NO:
TYPE VII MOUNTING ASSEMBLY		730-905
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



LIST OF MATERIALS		
Item	Qty.	Description
1	1	Terminal Compartment Pole Top Mtg. (See T.S. 10-4-1)**
2	1	Ornamental Cap. (See T.S. 10-1-6)**
3	1	1 1/2" Pipe ***
4	1	1 1/2" 90° Elbow, Drill & Tap For Setscrew.
5	11	1 1/2" I.D. Pipe Nipple, 12 1/2" Long.
6	2	1 1/2" Pipe Tee.
7	2	90° Elbow.
8	2	Flat Washer.
9	1	Neoprene Washer.
10	4	1 1/2" I.D. Pipe Nipple, 12" Long.
11	1	1 1/2" Lock Nipple, See NOTE 1.
12	1	1 1/2" I.D. Pipe Nipple ***
13	2	1 1/2" Coupling, As Required.
14	2	12" Signal Head. See Plans.
15	2	90° Elbow With Locking Device. (See T.S. 10-1-2)**
16	2	1 1/2" I.D. Pipe Nipple, 12" Long.
17	1	1 1/2" I.D. Pipe Nipple, 12" Long.
18*	2	1 1/2" I.D. Pipe Nipple, 9 1/2" Long. For Ped Signal Only.
19	1	1/2" x 2" Galvanized Steel Bolt 13-UNC With Flat Washer And Lock Washer.
20	1	Conduit Lock Nut. (For 'F' & 'R' Combination Only)
21	1	1 1/2" I.D. Pipe Nipple, 3" Long. (For 'F' And 'R' Combination Only)
22	1	Malleable Hex Nut. (For 'F' & 'R' Combination Only)

- NOTES:**
1. Lock nipple length shall be and 1 3/4" for 12" heads.
 2. All materials shall be black.
 3. Direction of bracket arms are determined at the Project Site and on the Project Plans. Directional mounting orientation of vehicular traffic signal heads may differ from what is shown. See Project Plans and Project Site for desired orientation.

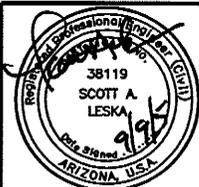


** Standard Details for Public Improvements COT/PC 1994 edition.
 *** Nipple length shall be determined by Contractor to ensure a correct fit for the type of vehicular traffic signal head being installed.

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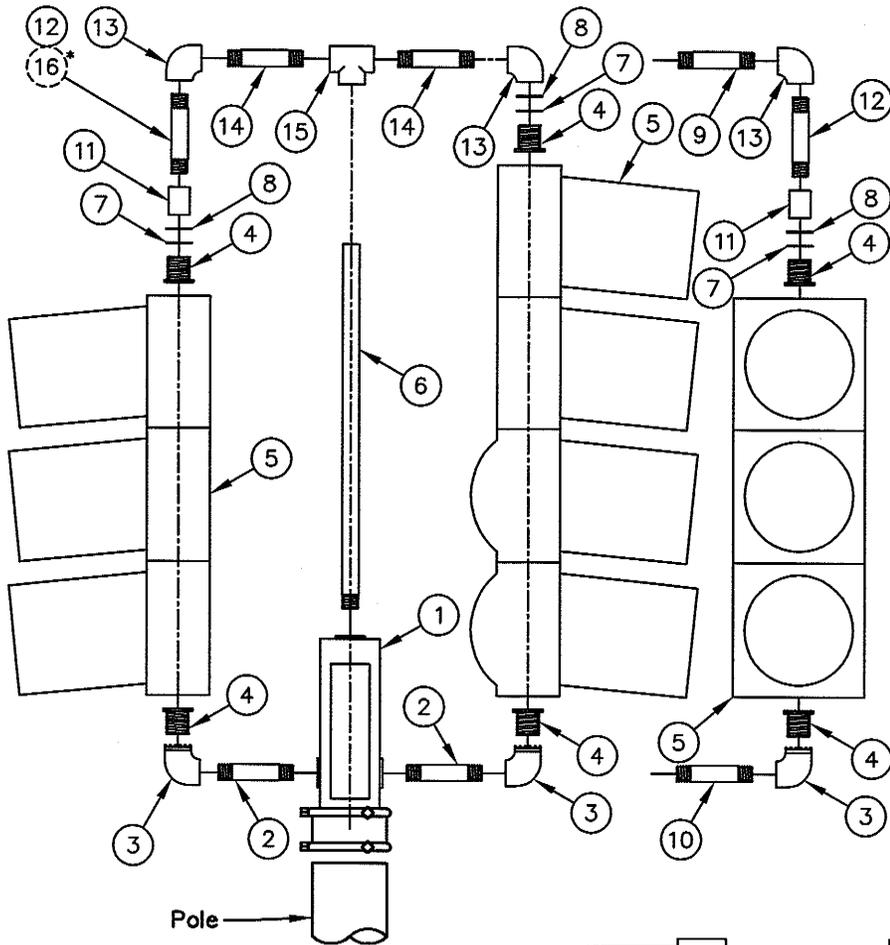


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LESKA
9/9/05
ARIZONA, U.S.A.

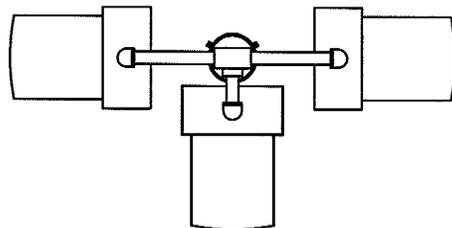


TOWN OF
MARANA
ARIZONA

STANDARD DETAIL		DETAIL NO:
TYPE VIII MOUNTING ASSEMBLY		730-906
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



TYPE IX MOUNT
Not To Scale



MOUNTING ORIENTATION PLAN
Not To Scale

LIST OF MATERIALS

Itm.	Qty.	Description
1	1	Pole Top Mtd. Terminal Compartment. (T.S. 10-4-2)**
2	2	1½" Pipe Nipple, 6" Long.
3	3	90° Elbow With Locking Device. (See T.S. 10-1-2)**
4	6	1½" Lock Nipple, See NOTES 1 & 3.
5	3	12" Signal Head. See Plans.
6	1	1½" Pipe ***
7	3	Neoprene Washer.
8	3	Flat Washer.
9	1	1½" Pipe Nipple, 12½" Long.
10	1	1½" Pipe Nipple, 12" Long.
11	2	1½" Coupling, As Required.
12	2	1½" Pipe Nipple ***
13	3	90° Elbow.
14	2	1½" Pipe Nipple, 6½" Long.
15	1	Tee With Side Outlet, Drill & Tap For Setscrew.
16	1	1½" I.D. Pipe Nipple, 49" Long For Pedestrian Signal.

** Standard Details for Public Improvements COT/PC 1994 edition.

*** Nipple length shall be determined by Contractor to ensure a correct fit for the type of vehicular traffic signal head being installed.

NOTES:

1. Lock nipple length shall be and 1¾" for 12" heads.
2. All materials shall be black.
3. Lock Nut is required in place of Lock Nipple when "F" face face or "R" face are hung on same frame.
4. Direction of bracket arms are determined at the Project Site and on the Project Plans. Directional mounting orientation of vehicular traffic signal heads may differ from what is shown. See Project Plans and Project Site for desired orientation.

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STANDARD DETAIL

DETAIL NO:

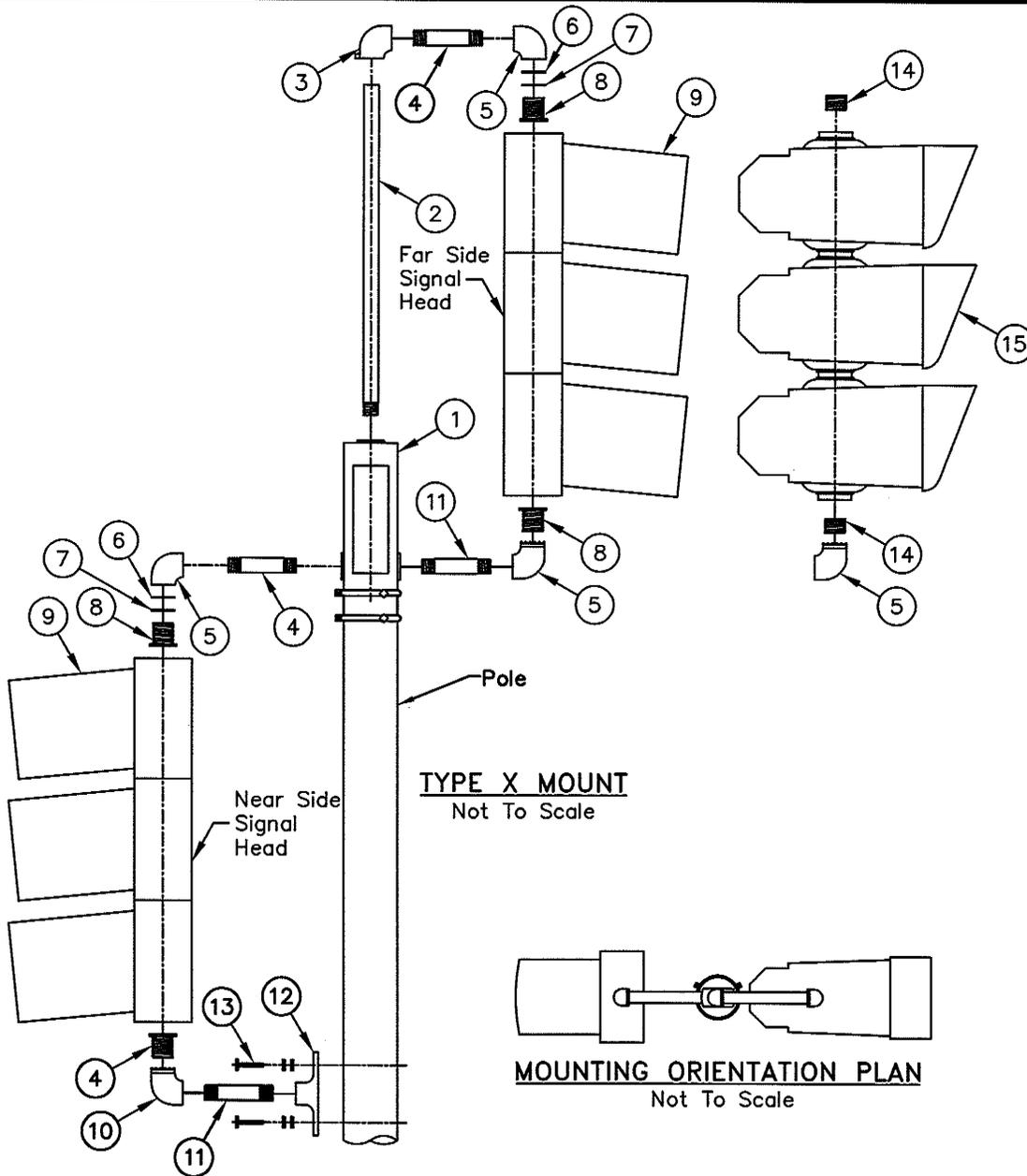
TYPE IX MOUNTING ASSEMBLY

730-907

DATE: 9/9/05

REVISED:

SHEET 1 OF 1



LIST OF MATERIALS		
Itm.	Qty.	Description
1	1	Pole Top Mtd. Terminal Compartment. (T.S. 10-4-2)*
2	1	1/2" Pipe ***
3	1	Elbow, 1 1/2", 90°, Reamed, Drilled, and Tapped For Screw.
4	2	Nipple, 1 1/2" x 1 1/2".
5	2	Elbow, 1 1/2", 90° (3 Required When Optical Signal is Used.)
6	2	Flat Washer.
7	2	Neoprene Washer.
8	4	1 1/2" Lock Nipple, See NOTE 1.
9	2	12" Signal Head. See Plans.
10	2	Elbow, 1 1/2", 90°, With Locking Device.
11	2	Nipple, 1 1/2" x 1 1/4"
12	1	Pole Plate. (T.S. 10-3-2)*
13	2	1/2" x 2" Galvanized Steel Bolt 13-UNC With Flat Washer and Lock Washer.
14	2	Close Nipple, 1 1/2" x 1 3/4".
15	1	Programmed Visibility Signal Assembly.

** Standard Details for Public Improvements COT/PC 1994 edition.

*** Pipe nipple length shall be determined by Contractor to ensure a correct fit for the type of vehicular traffic signal head being installed.

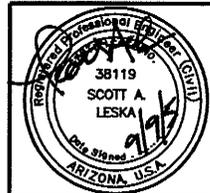
NOTES:

1. Lock nipple length shall be and 1 3/4" for 12" heads.
2. All materials shall be black.
3. Direction of Bracket arms are determined at the Project Site and on the Project Plans. Directional mounting orientation of vehicular traffic signal heads may differ from what is shown. See Project Plans and Project Site for desired orientation.

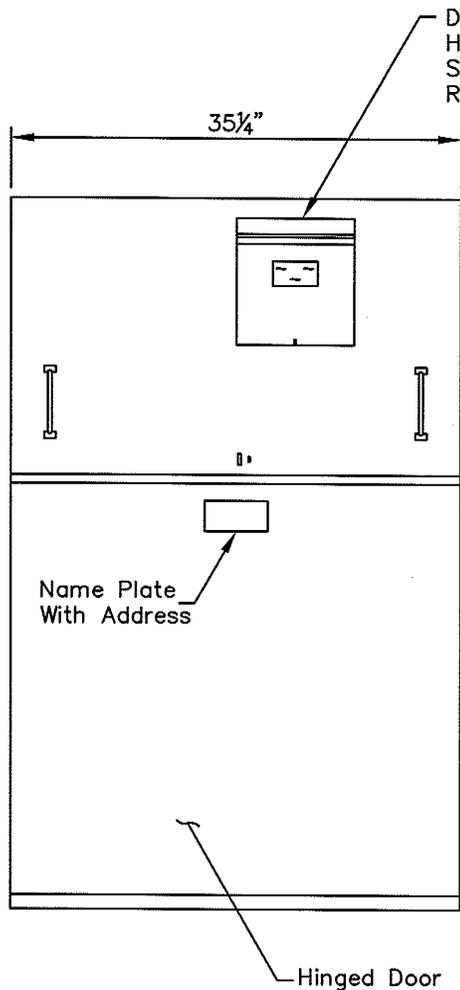
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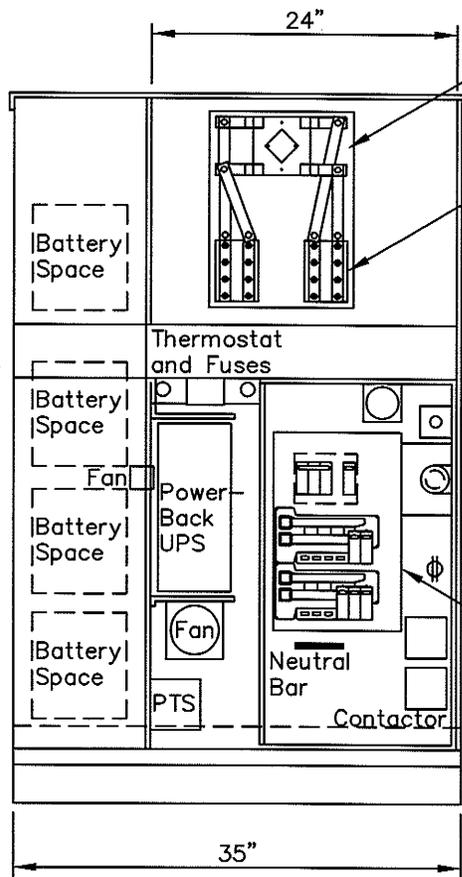


STANDARD DETAIL		DETAIL NO:
TYPE X MOUNTING ASSEMBLY		730-908
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



FRONT VIEW

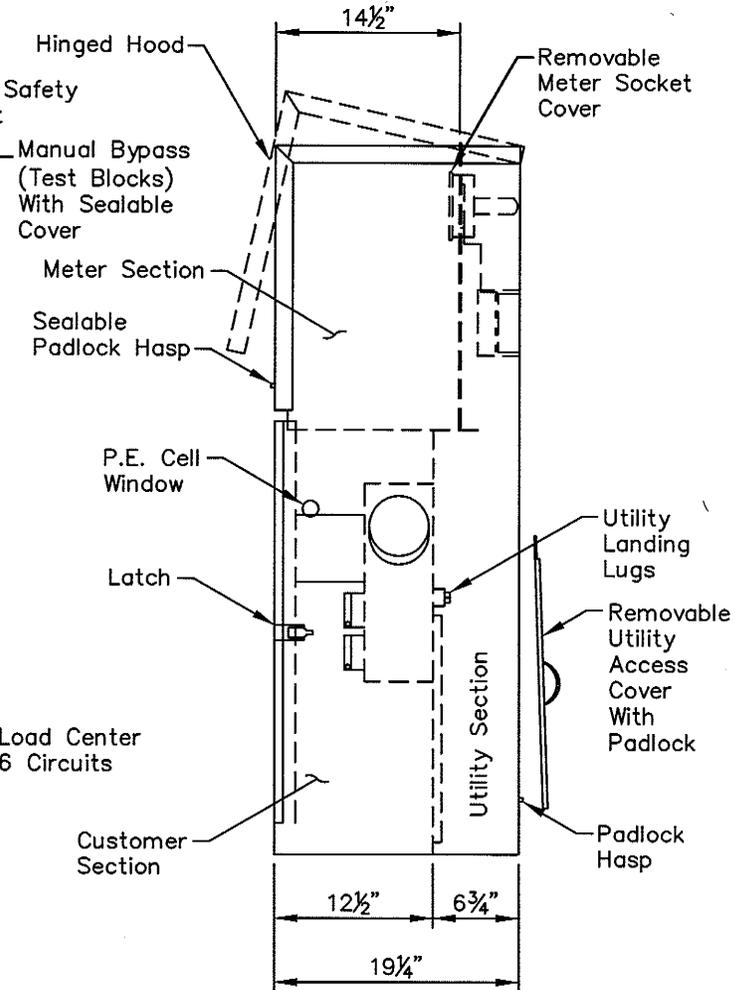
Not To Scale



FRONT VIEW

LESS DOOR, DEADFRONT, AND COVER

Not To Scale



SIDE VIEW

Not To Scale

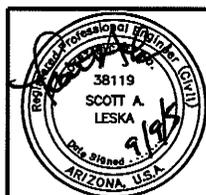
Note:

1. Load service calculations shall be provided and shown on the plans.
2. Single line electrical service diagrams to shall be shown on plans.

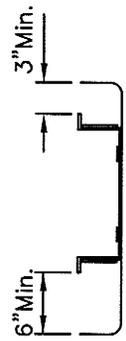
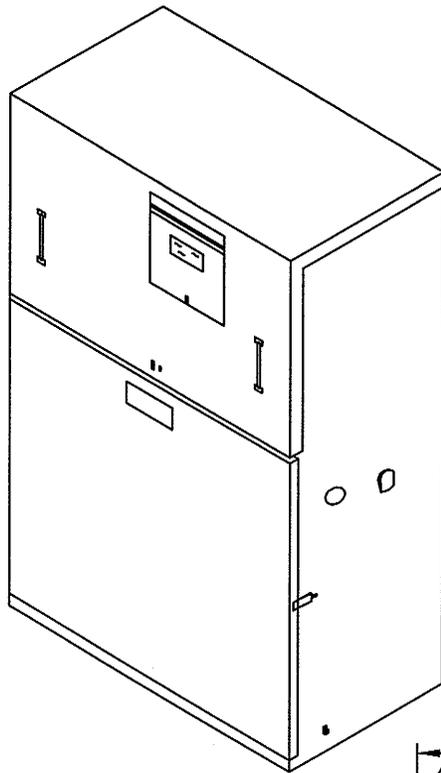
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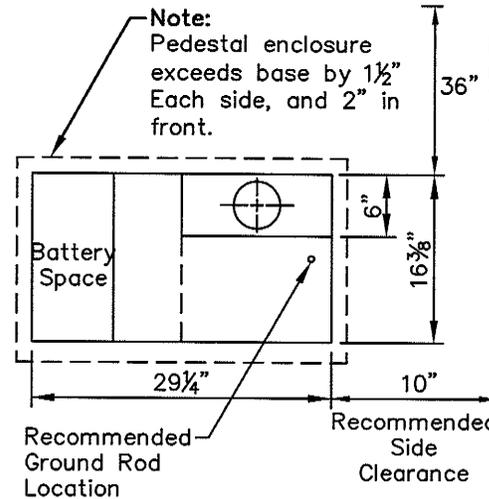
9/9/2005
 Date



STANDARD DETAIL		DETAIL NO:
UPS AND ELECTRIC SERVICE		730-1810
DATE: 9/9/05	REVISED:	SHEET 1 OF 2



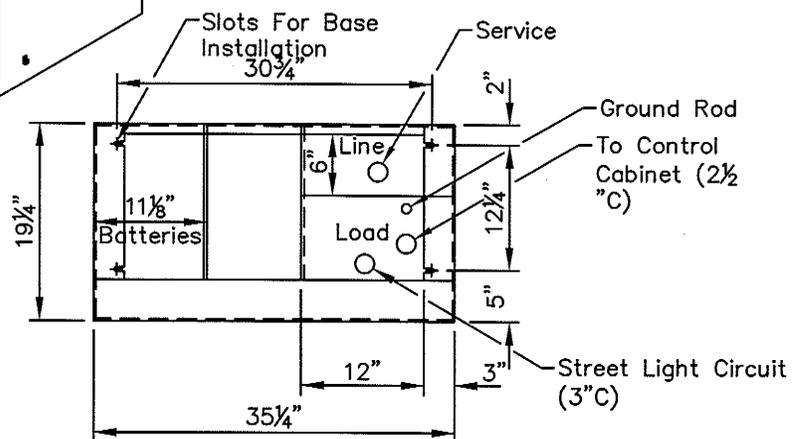
SIDE VIEW
Not To Scale



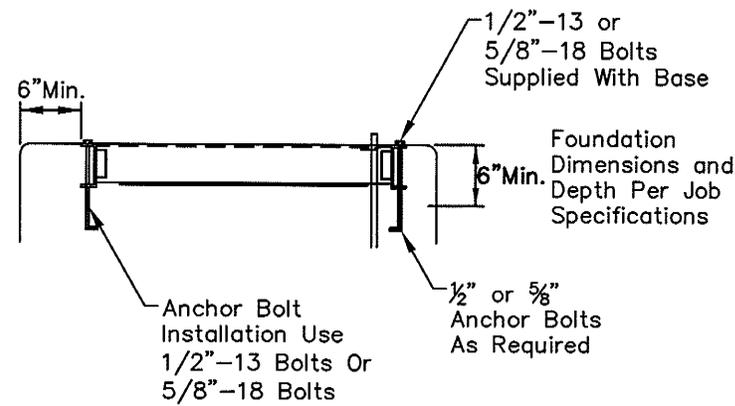
PLAN VIEW
Not To Scale

Minimum clearance reqd. per NEC 110-16, typical front and back.

Note: Pedestal enclosure exceeds base by 1 1/2" Each side, and 2" in front.



PEDESTAL PLAN VIEW MOUNTING SLOT DETAIL
Not To Scale



FRONT VIEW
Not To Scale

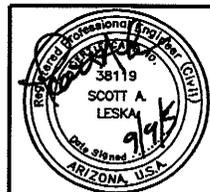
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STANDARD DETAIL

DETAIL NO:

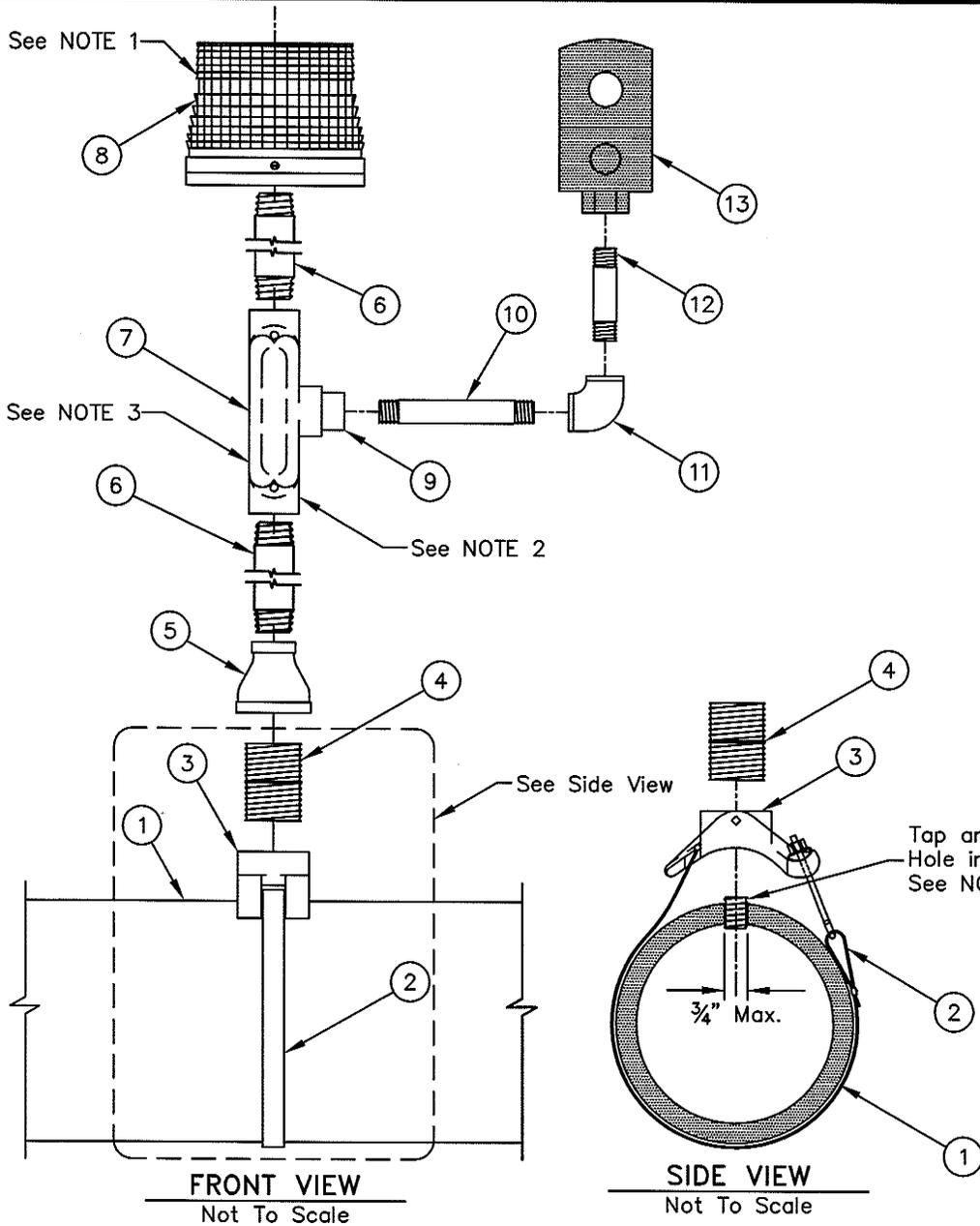
UPS AND ELECTRIC SERVICE

730-1810

DATE: 9/9/05

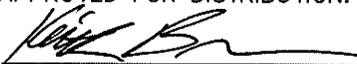
REVISED:

SHEET 2 OF 2

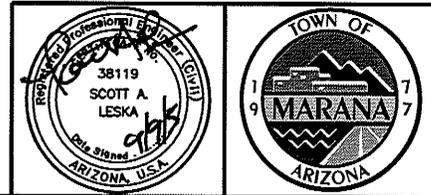


LIST OF MATERIALS		
Itm.	Qty.	Description
1	1	Signal Mast Arm (See Plans)
2	1	5/8" Banding
3	1	Pelco Astro Mini-Brac Band Mount AB-0121-42-NPT Or Approved Equal
4	1	1 1/2" Chase Nipple (Black Pipe)
5	1	1 1/2"-1" Reducer (Black Pipe, Painted Black)
6	2	12" Chase Nipple (Black Pipe)
7	1	1" Conduit Body C Style
8	1	Flashing Beacon, See Note 1
9	1	1"-3/4" Reducer
10	1	3/4" Pipe Nipple, 5" Long
11	1	3/4" 90° Elbow
12	1	3/4" Pipe Nipple, 3" Long
13	1	Optical Detector

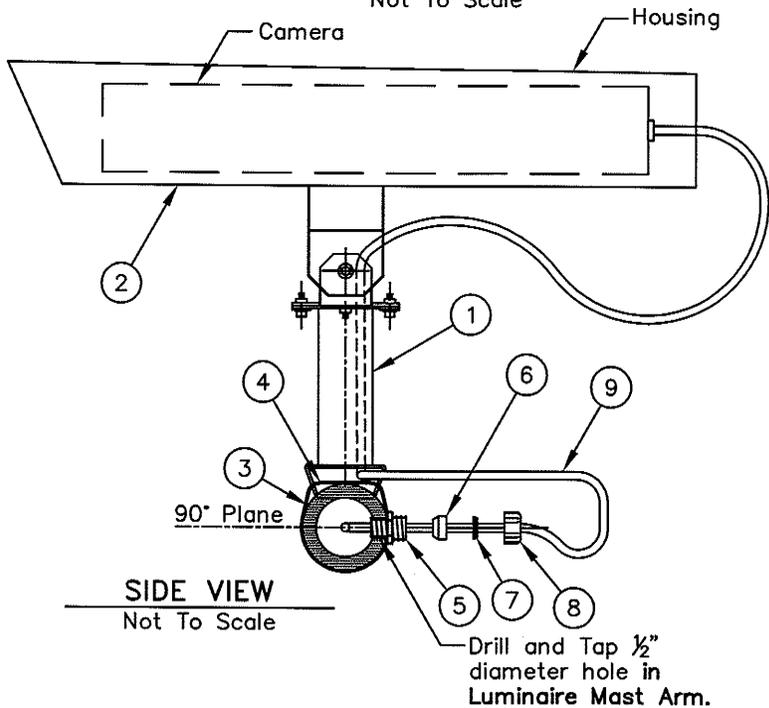
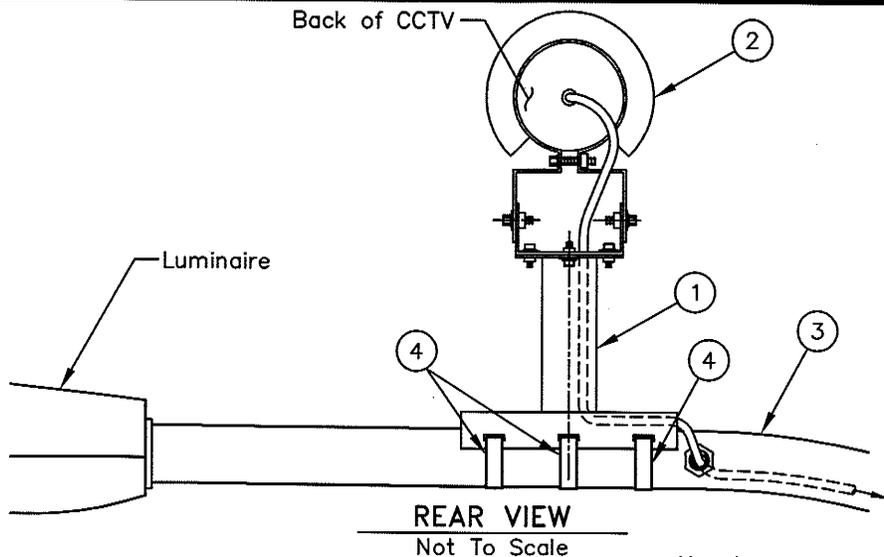
- NOTES:**
1. North/South pre-emption: Use clear beacon.
East/West pre-emption: Use blue beacon.
Whelen part No. IS32201 or approved equal.
 2. Face plate shall face away from approaching traffic.
 3. Conduit body shall be primed and then painted black.
 4. 2' minimum spacing from any other penetration into mast arm.

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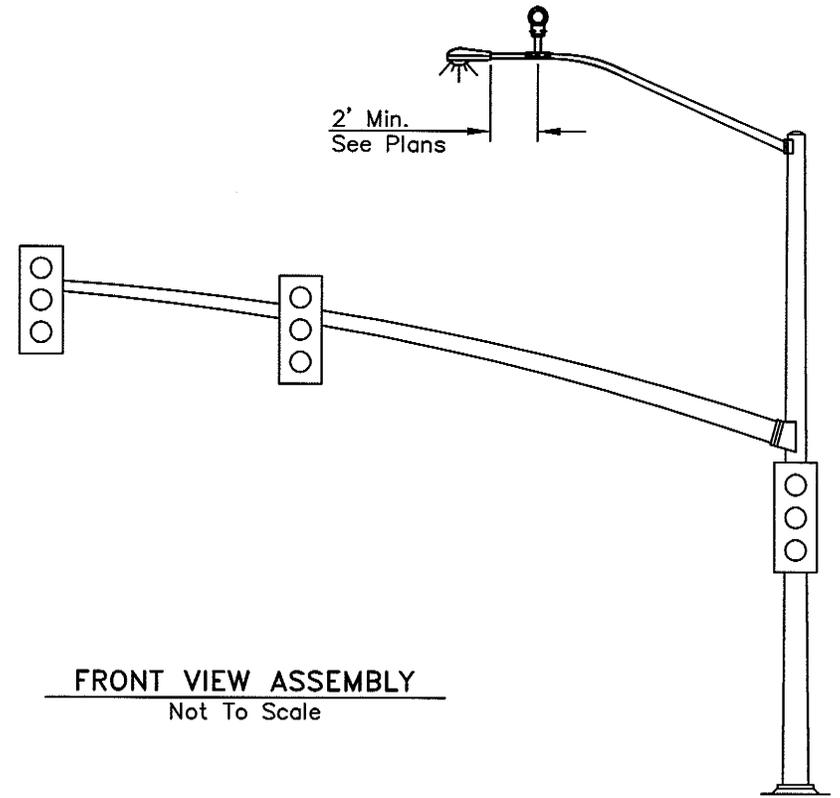
9/9/2005
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STANDARD DETAIL		DETAIL NO:
PRE-EMPTION MOUNTING DETAIL		730-1910
DATE: 9/9/05	REVISED:	SHEET 1 OF 1



LIST OF MATERIALS		
Itm.	Qty.	Description
1	1	Camera Mount
2	1	Camera
3	1	Luminaire Mast Arm
4	3	Banding
5	1	Chase Nipple (Black Pipe)
6	1	Gasket
7	1	Plastic Washer
8	1	Bolt
9	1	CCTV Cable Per Manufacturer Requirements



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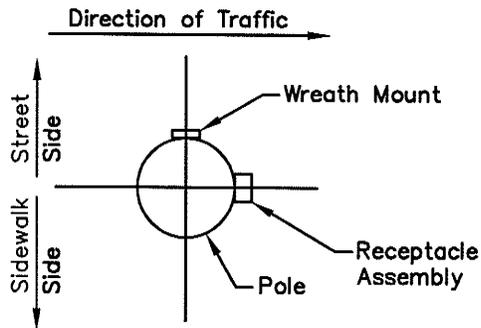
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 Keith E. Brann, P.E.,
 Acting Town Engineer

9/9/2005

Date

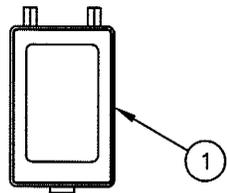


STANDARD DETAIL		DETAIL NO:
CAMERA AND MOUNT ASSEMBLY		730-1911
DATE: 9/9/05	REVISED:	SHEET 1 OF 1

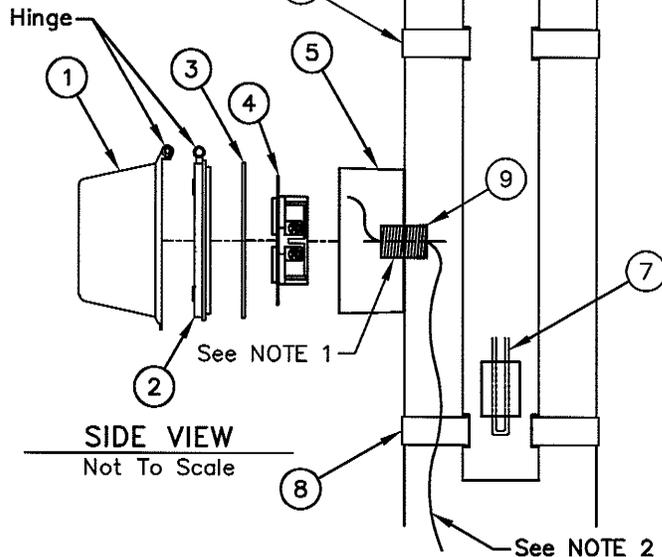


**PLAN VIEW
SCHEMATIC ORIENTATION**
Not To Scale

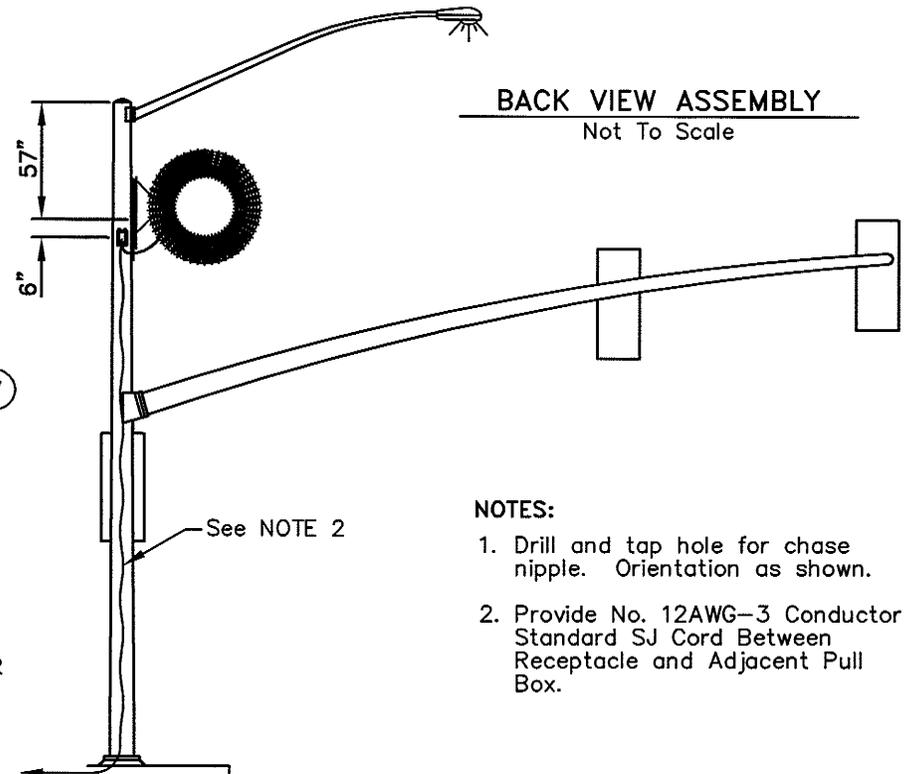
LIST OF MATERIALS		
Itm.	Qty.	Description
1	1	Steel Receptacle Cover
2	1	Steel Receptacle Base
3	1	Gasket
4	1	Grounding Outlet, 2-Pole, 3-Wire 15 Amp-125 Volt Rated Capacity
5	1	Outlet Box, Red Dot 14252 Or Approved Equal
6	1	Wreath Mount
7	1	Wreath
8	3	Banding
9	1	1" Chase Nipple (Black Pipe)
10	1	Pole (See Plans)



FRONT VIEW
Not To Scale



SIDE VIEW
Not To Scale



BACK VIEW ASSEMBLY
Not To Scale

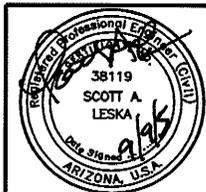
NOTES:

1. Drill and tap hole for chase nipple. Orientation as shown.
2. Provide No. 12AWG-3 Conductor Standard SJ Cord Between Receptacle and Adjacent Pull Box.

APPROVED FOR DISTRIBUTION:

Keith E. Brann
Keith E. Brann, P.E.,
Acting Town Engineer

9/9/2005
Date



STANDARD DETAIL

DETAIL NO:

RECEPTACLE AND WREATH MOUNT

730-1912

DATE: 9/9/05

REVISED:

SHEET 1 OF 1