

- 13. Luminaire arms shall be oriented in the same vertical plane as the mast arm unless otherwise indicated in the plans.
- 14. Turn-on of the traffic signal system, shall be in accordance with City turn-on procedures. 15. All construction of the traffic signal that will result in taking the existing traffic signal out of operation shall be performed on Sunday between 9:00 a.m. and 6:00 p.m. and completed that same day, unless otherwise directed by the Engineer. The City of Overland Park Police Department shall provide officer control of the intersection when the signal is out of operation. The contractor shall notify the police department and the City Traffic Services division at least 72 hours in advance. The Traffic Signal Inspector and the Traffic Signal Specialist shall be present during this time (unless otherwise directed by
- the Engineer). 16. The traffic signal contractor shall notify the City of Overland Park Department of Public Works, (913) 895-6027, of the exact construction schedule so that inspection of the traffic signal installation can be made of all phases, including conduit installations.

Traffic Signal Turn-on

- and hardware is installed.

- 5. Actual activation shall consist of the following steps:
- is turned on.
- - after one week of operation.

The following is a list of traffic signal equipment which shall be salvaged and stored on site for pickup by the City of Overland Park, unless otherwise instructed by the inspector. All salvaged equipment shall be carefully disassembled and stored. The condition at the time of City pickup shall be the same as prior to removal. The contractor shall notify the City of Overland Park Department of Public Works Inventory Control Specialist (913) 327-6603 to arrange for the City pickup of the salvaged equipment. Provide 48-hours advance notice.

The following is a list of traffic signal equipment which shall be salvaged and returned to the City of Overland Park, unless otherwise instructed by the inspector. The condition at the time of delivery shall be the same as prior to removal. Disassembly of equipment shall be done prior to to returning the equipment. All equipment, excluding signal poles and mast arms, shall be delivered to the Blue Valley Public Works Maintenance Facility (Traffic Services Maintenance Office and Shop) 6869 W. 153rd Street. Signal poles and mast arms shall be returned to offsite facility near 53rd Street and Renner Road (West of I-435). The contractor shall notify the City of Overland Park Department of Public Works Inventory Control Specialist (913) 327-6603 to arrange for the City pickup of the salvaged equipment. Provide 48-hours advance notice.

The City maintains the first right of refusal of any equipment listed. The project inspector will make an on-site assessment to determine if the equipment should be salvaged or disposed. Any equipment that will not be salvaged shall become the property of the contractor.

- and returned.
- and pedestrian signal heads.
- equipment.
- controller cabinet and returned.
- instead of cut off.

Existing Equipment Removal Summary Description of Item Quantity Location

17. The contractor shall be responsible for any damage incurred to any existing underground sprinkler system during construction. All affected pipes or fittings shall be restored to their original condition and location and new materials used shall be similar to those of the existing system. All restoration work shall be acceptable to the Engineer and owner thereof.

18. The contractor shall be required to submit catalog cuts or shop drawings for all equipment to be installed on this project. All materials shall be from the City of Overland Park pre-approved materials list available at

19. All signal cable shall be positively identified at the controller and each pole with phase numbers and colored electrical tape as follows:

Vehicle Phases φ6 - Purple φ2 - Blue

- φ 8 Yellow
- φ4 Red

grade.

 ϕ 6 - Purple and Orange φ 2 - Blue and Orange φ 8 - Yellow and Orange

Pedestrian Phases

 ϕ 4 - Red and Orange

20. The contractor shall leave slack cable in poles, service boxes, junction boxes and control center according to

- provide 6' min. slack for all cable in service boxes

- provide 10' min. slack for all cable in the controller cabinet
- provide 3' slack for loop cable in the junction box - provide 3' slack for loop lead-in cable in the junction box

- provide 1' min. slack on each side of the cable splice and for CCTV and EVP and #10 AWG ground

21. Within the traffic signal cabinet, the contractor shall use plastic tie-wrap identification tags with permanent marker to identify all of the vehicular and pedestrian heads that are served by each cable. The numbering of the signal heads shall conform to the plan sheets.

22. The contractor, or their supplier, shall, at the contractor's expense, submit a concrete mix design for approval by the Kansas City Metro Materials Board (KCMMB) prior to placement of any concrete. Additional information regarding KCMMB approved concrete mix designs is available on the following website:

23. All non-functioning traffic signal and pedestrian signal heads shall be covered with approved opaque coverings specifically manufactured for traffic signal heads. The color of the coverings shall be as follows:

- orange at locations of new traffic signals, where no previous signal existed.

- black at locations of signal modifications such that the coverings do not detract from the functioning signal heads.

24. All existing traffic signals shall remain in operation and be used in place until the permanent traffic signal installation is complete and in operation. Refer to the traffic control plans for additional requirements. The contractor shall coordinate the disconnection of service with Evergy for the existing signal system. 25. All temporary traffic signals installed by the contractor shall be equipped with a 2070 or ASC3 Rackmount controller provided by the contractor for compatibility with the City's signal system.

26. Contractor shall use a polymer lubricating agent to facilitate conduit bores under paved streets. Failure to do so will result in a denial to retrieve bore head by excavation methods, in the case of loss, under any paved

27. The ends of all conduit in the controller cabinet shall be plugged with duct seal. 28. All existing concrete foundations, shown to be removed, shall be removed a minimum of 24" below final

29. The contractor shall be required to install inventory stickers on the back of all signs installed on signal poles, or mast arms on the project, and record each respective bar code number on the plan sheet adjacent to the corresponding sign, for delivery to the project inspector. Inventory stickers will be provided by the City. 30. If the final combination signal/streetlight pole is less than ten (10) feet away from the nearest overhead power line, the contractor shall contact Evergy and request them to sleeve their line prior to pole installation, drilling of foundation, or any other associated work. All associated costs shall be the responsibility of the contractor.

31. The contractor shall be required to have all tree branches that obstruct CCTV cameras, radar detection sensors or traffic signal heads trimmed by a licensed arborist.

32. Any equipment the City pre-ordered prior to the contract shall be picked up at the applicable City Maintenance facility at the contractor's expense. All the items must be picked up at one time.

1	<u>Procedure</u>	

1. Turn-on should not be scheduled until power is actually available at the service pedestal and all other equipment

2. At least two working days prior to scheduled signal activation, all testing should be completed and successful, all defects and deficiencies correct, all indications operational and properly aimed, cables tagged, controller fully operational performing all timing functions required, all other items of work associated with the signal completed, and all signs and pavement markings properly installed unless otherwise approved by the engineer. 3. The City Inspector and Signal Technician will conduct a full inspection of the signal system within these same two

days. Upon satisfactory conditions of the signal system, the turn-on schedule will be confirmed. Any deficiencies found during the final inspection shall result in the rescheduling of the activation.

4. If the traffic signal is a new installation where previously none existed, the contractor shall install "SIGNAL AHEAD" (W3-3) and "NEW" (W16-15p) warning signs with orange background and yellow type B flashing beacons

advising the motorists of the signal activation. Signs may be installed prior to putting the signal into operation and covered until such time as the signal is placed into full operation. Signs are subsidiary to other items.

*** installation of all required equipment in the controller cabinet

* testing of installed equipment

* unbagging of all signal heads and signs if applicable

* activation of the signal with the contractor's flagger stopping all traffic momentarily as the signal

* minor re-aiming of signal heads, if necessary

* uncover the signal ahead sign and turn on flashing beacon

6. Activation of the traffic signal shall not be scheduled for weekends, Fridays or days right before public holidays. Activation shall take place in the morning hours only after 9:00 a.m.

7. The contractor shall remove the "Signal Ahead" (W3-3) and "NEW" (W16-15p) warning signs and flashing beacons

8. Assumption of maintenance operations related to equipment or signal timings within the traffic signal cabinet will be the responsibility of the City of Overland Park and shall occur after successful turn-on to full operation. This applies to temporary traffic signal installations, traffic signal modifications and new traffic signal installations and applies to normal maintenance operations or emergency callouts to take corrective action to return the signal back to full operating condition. Final acceptance by the City is conditional until the contractor has corrected all defects and punch list items. If a traffic signal malfunction occurs between successful turn-on and final acceptance and the signal malfunction is due to faulty work by the contractor, the City of Overland Park Maintenance Division will take corrective action and has the discretion to bill the contractor for all related expense, including overhead.

Instructions for Disassembly and Return of Salvaged Traffic Signal Equipment

For Use on Federal Funded Projects

DELETE WHICHEVER NOTE DOES NOT APPLY TO THIS PROJECT

For Use on Non-Federally Funded Projects

1. Emergency Vehicle Pre-emption (EVP) detector units, Video Detection Cameras, Radar Detectors, CCTV cameras, pedestrian pushbuttons and any other equipment must be removed from the mast arms or poles

2. All vehicular traffic signal heads and pedestrian signal heads shall be removed from the mast arms or poles and be returned. All LED indications must be removed from the vehicular signal and or pedestrian signal heads and boxed prior to returning. Lamps, visors and backplates should remain attached to the vehicular

3. Mounting brackets and signal head mounting arms should be removed from the signal heads. Mounting bracket cables shall not be cut for removal, unless they are cracked or damaged.

4. All signal poles, pedestal poles, mast arms and luminaire arms shall be returned. Anchor bolt covers and pole caps must be boxed and or bagged and returned with the equipment. Mast arms and luminaire arms shall be removed from poles prior to delivery. The contractor shall be required to remove and discard all included cable except wiring harnesses for radar detection and RWIS sensors which shall be returned with the

5. Secondary service pedestal enclosures or battery backup enclosures shall be removed from the traffic signal

6. Traffic signal controller cabinet and all internal components shall be returned. Any traffic signal controller cabinet hardware that is not attached to the cabinet must be boxed and or bagged and returned with the equipment. Field wire connections on returned signal controller cabinets shall be unscrewed at the terminals

7. All compressed natural gas generator assembly units shall be returned.

8. Remove and return all junction box and service box covers. Boxes will not be salvaged.

9. Disassembly of any streetlight equipment that is attached to the traffic signal equipment shall follow the guidelines as stated in the "instructions for disassembly and return of salvaged streetlighting equipment".

10. Disassembly of any traffic sign equipment attached to the traffic signal equipment shall follow the guidelines as stated in the "instructions for disassembly and return of salvaged traffic sign equipment".

	CITY OF OVERLAND PARK	DEPARTMENT OF PUBLIC WORKS	
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Signal Faces





Phase2468Phase Minimum Green111Phase Walk1111Phase Pedestrian Clear1111Phase Passage1111Phase Passage 21111Phase Maximum 11111Phase Maximum 21111Phase Yellow Change1111Phase Red Clear1111	Phase Timings Plan				
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Phase Maximum 1 Image Phase Maximum 2 Image Phase Yellow Change Image Phase Red Clear Image	Phase Passage 2				
Phase Maximum 2 Image Phase Yellow Change Image Phase Red Clear Image	Phase Maximum 1				
Phase Yellow Change	Phase Maximum 2				
Phase Red Clear	Phase Yellow Change				
	Phase Red Clear				

Flashing Operations	
Vehicle Heads	Dark
Pedestrian Heads	Dark





Ped. Pushbutton Detail

 $\frac{Construction Notes}{1}$



	CITY OF OVERLAND PARK	DEPARTMENT OF PUBLIC WORKS	
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<u>Wiring Diagram</u>



Field Ter	m.	Indication	Signal Head No.	Notes	Field Ter	m.	Indication	Signal Head No.	Notes
	R1	Red				R1	Red		
	R2	Red				R2	Red		
CH1	Y1	Yellow			CH9	Y1	Yellow		
SBLT Ø1	Y2	Yellow			OL I	Y2	Yellow		
	G1	Green			SBFYLT	G1	Green (FYA)		
	G2	Green				G2	Green (FYA)		
	R1	Red				R1	Red		
	R2	Red				R2	Red		
CH2	Y1	Yellow			CH10	Y1	Yellow		
NB Ø2	Y2	Yellow			OL J	Y2	Yellow		
	G1	Green			EBFYLT	G1	Green (FYA)		
	G2	Green				G2	Green (FYA)		
	R1	Red				R1	Red		
	R2	Red				R2	Red		
СН3	Y1	Yellow			CH11	Y1	Yellow		
EBLT Ø3	Y2	Yellow			OL K	Y2	Yellow		
	G1	Green			NBFYLT	G1	Green (FYA)		
	G2	Green				G2	Green (FYA)		
	R1	Red				R1	Red		
	R2	Red				R2	Red		
CH4	Y1	Yellow			CH12	Y1	Yellow		
WB Ø4	Y2	Yellow			OL L	Y2	Yellow		
	G1	Green			WBFYLT	G1	Green (FYA)		
	G2	Green				G2	Green (FYA)		
	R1	Red				R1	DONT WALK		
	R2	Red				R2	DONT WALK		
CH5	Y1	Yellow			CH13	Y1			
NBLT Ø5	Y2	Yellow			NBP Ø2P	Y2			
	G1	Green				G1	WALK		
	G2	Green				G2	WALK		
	R1	Red				R1	DONT WALK		
	R2	Red				R2	DONT WALK		
CH6	Y1	Yellow			CH14	Y1			
SB Ø6	Y2	Yellow			WBP Ø4P	Y2			
	G1	Green				G1	WALK		
	G2	Green				G2	WALK		
	R1	Red				R1	DONT WALK		
	R2	Red				R2	DONT WALK		
CH7	Y1	Yellow			CH15	Y1			
WBLT Ø7	Y2	Yellow			SBP Ø6P	Y2			
	G1	Green				G1	WALK		
	G2	Green				G2	WALK		
	R1	Red				R1	DONT WALK		
	R2	Red				R2	DONT WALK		
CH8	Y1	Yellow			CH16	Y1			
EB Ø8	Y2	Yellow			EBP Ø8P	Y2			
	G1	Green				G1	WALK		
	G2	Green				G2	WALK		

- head No. _____ to terminals _____, ____ and _____ using red, black, and orange cables





LEGEND:

HDSP = High Density Switch Pack HDFTR = High Density Flash Transfer Relay FT = Field Terminal FPB = Flash Plug Block (R=Red, W=White)

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Miscellaneous			
Item	Unit	Quant.	
Install City-Supplied Traffic Signal Mast Arm	Each	-	Traffic Signal Ste
Remove/Relocate Existing Equipment	L.S.	-	Traffic Signal Alu
Evergy Service Pedestal & Ground Rod (Provided by Evergy and picked up by Contractor)	Each	-	Traffic Signal Alu
			Traffic Signal Alu
			Traffic Signal Ma
Traffic Signal Hoads			Luminaire Bracke
			Luminaire Bracke
Item	Unit	Quant.	
Pedestrian Signal Head (1 Section) (See Chart A)	Each	-	
Traffic Signal Head (See Chart A)	Each	-	
Backplate 5" (3 Section) Pedestrian Hybrid Beacon	Each	-	
Red Ball LED Kit	Each	-	
Yellow Ball LED Kit	Each	-	
Orange/White "Hand/Person" Countdown LED Kit	Each	-	Service Box Type
			Service Box Type
			Junction Box Typ
			Junction Box Typ
			Fiber Optic Servi
			Fiber Optic Servi
			Ground Rod & C

Signal Faces



	Chart A - Traff	fic Signal Head Summary	
No. Sections	Signal Face Arrangement	Bracket Type	Quantity
-	-	Mast Arm Bracket	-
-	-	Mast Arm Bracket	-
-	-	Mast Arm Bracket	-
-	-	Pole Bracket	-
-	-	Pole Bracket	-
-	-	Pole Bracket	-
-	-	Pole Bracket	-
-	-		-
-	-		-
-	-		-
-	-		-
-	-		-
-	-		-
-	-		-
-	-		-

Item Description ATC Controller Unit w/ D4 Firm Cabinet Monitor Unit (CMU) High Density Switch Pack High Density Flash Transfer R Surge Protector (Traffic Signal Utility Power Surge Protector (Serial Interface Unit (SIU) EVP Discriminator Module 2-0 EVP Discriminator Module 4-C Auxiliary Display Unit (ADU) RJ-45 Data Protector for CCT 242 DC Isolator Cabinet Alarm Panel

Bill of Materials Notes:

	Materiale Notes.
(1)	These approximate quantities
	all items required for the com

- necessary equipment.
- (5) All sign sheeting shall be micro-encapsulated prismatic sheeting (Type XI).



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	Pole De (See Traf	esignation fic Signal Str	uctures Detai	l Sheet)		No. of on Ma	Signals ist Arm					S (See Sigr	Signal Comp nal Compon	onent Spaci ent Spacing	ng Detail) (2)																
Pole	Mast Arm	Combo	Luminaire	Mast Arm Include	aire Mast Arm Include	ire Mast Arm Included	last Arm Included	Mast Arm Included	Mast Arm Included	Mast Arm Included	Mast Arm Included	Mast Arm Included	Mast Arm Included	Mast Arm Includeo	Mast Arm Included	t Arm Included	Mast	Mast			Mast A	rm No. 1						Mast A	rm No. 2		
No.	Length No. 1	Pole Type	Arms Arm Arm No. 1 No. 2	Length No. 2	Angle	Arm No. 1	Arm No. 2	A	В	С	D	E	EVP	CCTV	A	В	С	D	E	EVP	CCTV										
Cha	rt B Notes:					<u> </u>	<u> </u>		1	1				 Chai	l rt B Leaend	 :				1											

(5)

(1) Manufacturer shall certify that all poles conform to the 2013 edition of the AASHTO standard specifications for structural supports for highway signs, luminaires and traffic signals. (2) Engineer to confirm signal component spacing prior to arm drilling and head installation.

(3) When combination traffic signal/street light poles are specified to be supplied without the mast arms, The pole manufacturer shall be required to provide a steel or aluminum plate attachment to the mast arm plate with hardware to cover the cable entry hole.

Traffic Signal Poles		
Item	Unit	Quant.
Chart B)	Each	-
stal Pole (13') and Base	Each	-
stal Pole (9') and Base	Each	-
strian Push Button Pole	Each	-
Chart B)	Each	-
(See Also Chart B)	Each	-
See Also Chart B)	Each	-

Traffic Signal Boxes		
Item	Unit	Quant.
	Each	-
1	Each	-
2	Each	-
8') for Service Boxes	Each	-

Major Electronic Equipment Items

	Unit	Quant.
nware	Each	-
	Each	-
	Each	-
Pelay	Each	-
l Cabinet)	Each	-
(Secondary Service Enclosure)	Each	-
	Each	-
Channel	Each	-
Channel	Each	-
	Each	-
V Cameras	Each	-
	Each	-
	Each	-

es were prepared solely for the contractor's convenience. It is not guaranteed that this list of materials constitutes npletion of the work. Unless otherwise noted, the installation/modification shall be bid "lump sum" for all

(2) City to furnish equipment for contractor installation, if designated.

(3) Quantities for these items are included in the street lighting bill of materials.

(4) Quantities for these items are included in the fiber optic bill of materials.

(6) Quantities for these items are included in the overhead street name sign quantity table.

(7) A certified field service technician shall be on site at turn-on of CNG generators and battery backup systems.
 (8) See illuminated street name signs details for wiring diagrams, sizes and location.

(9) Supplier shall set up count zones for each intersection approach.

(10) All LED Cobra-Head luminaires shall have a minimum 10 year manufacturer's warranty.

EVP = Emergency Vehicle Pre-emption Detector

CCTV = Closed Circuit T.V. Camera

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- 1. Bolt covers, handhole cover, and mast arm & pole caps shall be shipped with the poles and be installed prior to final acceptance of the traffic signal system.
- 2. Install corresponding colors of signal heads at the same elevation adjust for mast arm rake.
- 3. Each vehicular signal head (mast arm and/or pole mounted) shall be covered with a black or orange (unless otherwise noted) signal head cover during construction until the system is made operational.
- 4. The side of pole signal head mounting heights shown are to the bottom of the housing and not to the brackets.
- 5. All R10-23 (Special) signs to be mounted on the traffic signal poles or mast arms shall be provided and installed by the contractor. All signs shall conform to the Manual on Uniform Traffic Control Devices, latest edition for color, size, letter and legend. (See sign details and specifications)
- 6. Contractor to provide and install overhead street name sign, if applicable. (See mounting detail and overhead street name sign detail.)
- 7. Emergency Vehicle Pre-emption (EVP) detector shall be mounted near the center of the through traffic lane(s) to the right or left of the sign.
- 8. All hardware not specifically shown in the details shall be in accordance with manufacturer's recommendation. Any deviations shall be submitted for approval.
- 9. Minor adjustments in the location of traffic signal poles or signal controller cabinet should be made in the field during construction in order to maintain a minimum 4'-0" clearance from the centerline of any fire hydrant to the face of pole or cabinet.
- 10. All traffic signal heads shall have two $\frac{1}{4}$ diameter drain holes drilled in the bottom housing .
- 11. Address Stencil shall have 2" high black EC film letters and numerals applied to a one piece Type XI retro-reflective sheeting with a black EC film border by the Contractor. Apply on 'street side' of pole facing the referenced street address.



DESCRIPTION		PROJ. AREA (FT²)	WEIGHT (LBS)		
12"-4 SEC. SIGNAL HEAD W/ BACK PLATES		12.00	54		→ 3'
12"-3 SEC. SIGNAL HEAD W/ BACK PLATES		10.00	42	THESE DIAGRAMS ARE] 1′ ─► └<
12"-4 SEC. SIGNAL HEAD W/ NO BACK PLATES		6.00	40		
16"x18"-1 SEC. PEDESTRIAN SIGNAL		3.00	20	AND SHOULD NOT BE	(H) (B) (L
36"x36" FLATSHEET ALUMINUM SIGN(MAX)		9.00	20	USED AS DETAILS FOR	
24"x96" ILLUMINATED STREET NAME SIGN(MAX)		16.00	120	CONTRUCTION PURPOSES	
ADVANCE RADAR DETECTOR		1.00	15		<u>o inki</u> Signai
PRESENCE RADAR DETECTOR		1.00	15		SIGNAL
CCTV CAMERA		1.00	15		
LUMINAIRE		1.00	30		
EMERGENCY VEHICLE PRE-EMPTION DETECTOR		0.50	5	3' -	
36"x36" FLATSHEET ALUMINUM SIGN(MAX)		9.00	20		'
rm traffic structures shown on this we been designed in accordance with and the allowable stress ts of the 2013 AASHTO "Standards ons for Structural Supports for gns, Luminaires and Traffic Signals," n, LTS-6. The wind loads were from a basic wind velocity of 90 MPH rrence interval of 25 years, and a egory of 2. The fatigue loads were	12' MAX.	12' MAX J 34' MAX.	40' MAX.	H A E B K <u>22'THRU 28'</u> <u>SIGNAL ARMS</u>	F
on the requirements of Section 11 of and the following design conditions. MA sed on the yearly mean wind velocity MPH. are not designed to resist g-induced cyclic loads. uced gust loads are excluded per the nents of the code.	AST ARM	18' MAX 13'-6" 8' MAX. MAX.		$\begin{array}{c} 12' -$	
	<u>TYPICAL</u> P LOADIN	<u>POST</u> G		<u>30°THRU 36°</u> SIGNAL ARMS	

TABLE 1: POLE AND SIGNAL ARM DATA

LATE	DATA			ANCHO	R BOL	T DATA		S	SIGNAL	ARM DAT	A	S	IGNAL A	RM ATTACHN						
THK. "M" (IN)	CENTER HOLE "P" (IN)	BOLT HOLE "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "U" (IN)	BOLT QTY.	FIXED END DIA (IN)	FREE END DIA (IN)	GAUGE OF THK (IN)	SIGNAL ARM SPAN (FT)	SQUARE "A" (IN)	ТНК. "D" (IN)	BOLT SIZE "N" (IN)						
2.00	10.50	1.75	1.50	54.00	6.00	8.00	4	8.00	5.20	7	20.00	17.25	2.00	1.25 X 6.25						
								9.00	5.92	7	22.00	17.75	2.00	1.25 X 6.25						
0.00								9.00	5.64	7	24.00	17.75	2.00	1.25 X 6.25						
2.00	11.00	1.75	1.50	54.00	6.00	8.00	4	9.00	5.36	7	26.00	17.75	2.00	1.25 X 6.25						
								9.00	5.08	7	28.00	17.75	2.00	1.25 X 6.25						
						0 0 0 0		10.00	5.80	7	30.00	18.25	2.00	1.25 X 6.25						
2.00	11 50	2.00	1 75	94.00	6.00		0.00	0 00	0 00	8 00	1	10.50	6.02	7	32.00	18.25	2.00	1.25 X 6.25		
2.00	11.50	2.00	1.75	84.00	6.00	8.00	4	11.00	6.24	7	34.00	18.25	2.00	1.25 X 6.25						
								11.00	5.96	7	36.00	18.25	2.00	1.25 X 6.25						
						6.00 8.00						13.00	7.68	3	38.00	21.25	2.00	1.25 X 6.25		
										13.00	7.76	DET. 4	40.00	21.25	2.00	1.25 X 6.25				
								13.00	7.48	DET. 4	42.00	21.25	2.00	1.25 X 6.25						
2.25	14.00	2.00	1.75	84.00	6.00		8.00	8.00	8.00	8.00	8.00	8.00	8.00	4	13.00	7.20	DET. 4	44.00	21.25	2.00
								14.00	7.92	DET. 4	46.00	21.25	2.00	1.25 X 6.25						
										14.00	7.64	DET. 4	48.00	21.25	2.00	1.25 X 6.25				
								14.50	7.86	DET. 4	50.00	21.25	2.00	1.25 X 6.25						
								14.00	7.08	DET. 4	52.00	23.25	2.50	1.50 X 7.50						
2.25	14 75	2.25	2.00	84.00	6.00	10.00	1	15.00	7.80	DET. 4	54.00	23.25	2.50	1.50 X 7.50						
2.25	14.75	2.25	2.00	84.00	0.00	10.00	4	15.00	7.52	DET. 4	56.00	23.25	2.50	1.50 X 7.50						
								15.50	7.74	DET. 4	58.00	23.25	2.50	1.50 X 7.50						
								16.00	7.98	DET. 4	60.00	26.75	2.50	1.50 X 7.50						
								16.50	8.20	DET. 4	62.00	26.75	2.50	1.50 X 7.50						
2.25	14 25	2.25	2.00	84.00	6.00	10.00	Λ	17.00	8.42	DET. 4	64.00	26.75	2.50	1.50 X 7.50						
2.25	14.23	2.25	2.00	84.00	6.00	10.00	4	17.50	8.64	DET. 4	66.00	26.75	2.50	1.50 X 7.50						
								18.50	9.36	DET. 4	68.00	26.75	2.50	1.50 X 7.50						
								18.50	9.08	DET. 4	70.00	26.75	2.50	1.50 X 7.50						







Pole Foundation Notes:

- 1. Final pole, anchor bolt size, anchor bolt projection, and bolt circle shall be as per manufacturer's recommended practices (See Table 1). Rotate anchor bolt to maintain minimum clearance from edge of hole. All anchor bolt threads and nut surfaces shall be lubricated prior to tightening with stick wax or approved alternative.
- 2. All conduits and anchor bolts for all the new pole bases shall be rigidly installed before concrete is placed. Anchor bolts shall be spaced by means of a factory certified template or drawing, the center of which shall coincide with the center of the base.
- 3. All concrete used in this work shall meet the requirements of the Overland Park Municipal Code and shall be KCMMB5K concrete (f c = 5,000 psi) with a 7" slump. Poles shall not be erected until concrete has reached 3,500 psi.
- 4. Maintain 3" minimum clearance from reinforcing steel to edge of hole or form.
- 5. The drilled shaft foundation details presented herein are intended for installation into soil foundations. A special foundation investigation and design shall be conducted for residual soils with an "N" value of 4 or less or characterized as very soft to soft clay.
- 6. These standard designs assume a minimum compactive effort of 90% of Standard or Modified Proctor for cohesive fill material.
- 7. In the event excavation for the drilled shaft encounters sound limestone short of the required length shown in the table of dimensions, the shaft may be shortened to a minimum length of 8 feet with a minimum inclusive rock socket of 3 feet.
- 8. Shale foundation material will be considered as a stiff clay. Drilled shafts in shale must satisfy the dimensions on Table 2.
- 9. All concrete pole bases shall be consolidated by an internal type vibrator.
- 10. Final 6" of concrete foundation (pole cap) shall be formed square. The cap shall be formed and poured after the mast arm is erected and the pole plumb. Pole cap for pedestal pole shall be required at inspector discretion. Final top elevation shall match ADA sidewalk ramp.
- 11. PVC conduit elbows in concrete foundations shall be connected to HDPE conduit with PVC pipe nipple and approved PVC to HDPE couplings. All PVC pipe nipples, elbows, and couplings shall be considered subsidiary to the traffic signal pole base.
- 12. Bare No. 6 solid copper ground conductor shall be connected from internal pole grounding nut with a ring terminal to the clamp on the ground rod. Connect 1c#10 AWG system ground wire to separate ground rod clamp.
- 13. All reinforcing steel shall be ASTM A615 Grade 60 for KCMMB5K concrete.
- 14. All concrete surfaces should be brushed and sealed with curing compound.
- 15. Contractor shall use drill shaft wheels and rebar support boots to maintain 3" clearance to shaft wall and shaft bottom, respectively, for all mast arm foundations.
- 16. Contractor to provide ground rod(s) as required for maximum 25 ohms resistance to ground. Contractor shall be required to test with the inspector present.
- 17. Contractor shall be required to place concrete foundations within 48 hours after completion of drilling. Contractor shall maintain the integrity of the hole until concrete is placed.

Table 1 - Anchor Bolt Projection Dimensions				
Bolt Diameter	Plate Thickness "M"	Maximum Bolt Projection "P"		
0.75"	0.75"	2 ¼ "± ¼ "		
1.50"	2.00"	6 ¼ ₄ " ± ¼ ₄ "		
1.75"	2.00"	6 ³ / ₄ " ± ¹ / ₄ "		
1.75"	2.25"	7" ± ¼"		
2.00"	2.25"	7 ½" ± ¼"		



Hex Head Nut

Flat Washer

Pole Base Plate

Flat Washer

Square Leveling Nut



Rebar Cage Detail





Traffic Signal Pole Foundation

Snap shaft wheels around horizontal steel equally spaced around

Horizontal Rebar								
Pole Fnd. Dia.	Pole Fnd Depth	Rebar Cir. "D"	Spacing					
24"	30"	18"	12" MAX.					
36"	11'-13'	30"	12" MAX.					
42"	15'-21'	36"	12" MAX.					

Vertical Rebar							
Pole Fnd. Depth	Length "A"	No. of Spacers					
30"	2'-3"	4					
11'-0"	10'-6"	8					
12'-0"	11'-6"	8					
13'-0"	12'-6"	12					
15'-0"	14'-6"	12					
17'-0"	16'-6"	12					
21'-0"	20'-6"	16					

Table 2Signal Pole Foundations Drilled Shaft Dimensions						
Length of Mast Arm	"D" Diameter	"L" Length				
< 22'	36"	11'				
22' to 28'	36"	12'				
30' to 36'	36"	13'				
38' to 50'	42"	15'				
52' to 58'	42"	17'				
60' to 70'	42"	21'				
> 70'	Requires Spe	cial Design				

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