Fort Bend County
Engineering Department
301 Jackson Suite 401
Richmond, Texas 77469
281.633.7500
Permits@fortbendcountytx.gov

REVIEW BY FORT BEND COUNTY COMMISSIONERS COURT

[X] Right of Way Permit
[ ] Commercial Driveway Permit

Permit No: 2018-24237

Applicant: Crown Castle NG Central LLC/CobbFendley

Job Location Site: 22502 Oak Mist Lane, Katy, TX 77494

Bond No. [redacted] **Date of Bond:** 5/12/2014 **Amount:** $50,000.00

The above applicant came to make use of certain Fort Bend County property subject to, "The Order Regulating the Laying, Construction, Maintenance, and Repair of Buried Cables, Conduits, and Pole Lines, In, Under, Across or Along Roads, Streets, Highways, and Drainage Ditches in Fort Bend County, Texas, Under the Jurisdiction of the Commissioners Court of Fort Bend County, Texas," as passed by the Commissioners Court of Fort Bend County, Texas, of the Minutes of the Commissioners Court of Fort Bend County, Texas, to the extent that such order is not inconsistant with Chapter 181, Vernon's Texas Statutes and Codes Annoted.

Notes:

1. Evidence of review by the Commissioners Court must be kept on the job site and failure to do so constitutes grounds for job shutdown.
2. Written notices are required:
   a. 48 hours in advance of construction start up, and
   b. When construction is completed and ready for final inspection, submit notification to Permit Administrator thru MyGovernmentOnline.org portal.
3. This permit expires one (1) year from date of permit if construction has not commenced.
4. This permit applies to work performed within right-of-ways owned and maintained by Fort Bend County only, and it is the responsibility of the applicant to acquire all other necessary permits.

On this 13th day of November, 2018, Upon Motion of Commissioner Meyers, seconded by Commissioner Morales, duly put and carried, it is ORDERED, ADJUDGED AND DECREED that said notice of said above purpose is hereby acknowledged by the Commissioners Court of Fort Bend County, Texas, and that said notice be placed on record according to the regulation order thereof.

Signature

By: _____
County Engineer

By: N/A
Drainage District Engineer/Manager

Presented to Commissioners Court and approved.

Date Recorded 11-16-2018 Comm. Court No. 14F

Clerk of Commissioners Court

By: _____
Deputy

11/16/2018 Original sent to Sean Eglinton, Engineering dept.

Fort Bend County
Engineering Department
301 Jackson Suite 401
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PERMIT APPLICATION REVIEW FORM FOR CABLE, CONDUIT, AND POLE LINE ACTIVITY IN FORT BEND COUNTY

[X] Right of Way Permit

[ ] Commercial Driveway Permit

Permit No: 2018-24237

The following "Notice of Proposed Cable, Conduit, and/or Pole Line activity in Fort Bend County" and accompanying attachments have been reviewed and the notice conforms to appropriate regulations set by Commissioner's Court of Fort Bend County, Texas.

(1) COMPLETE APPLICATION FORM:

- [X] a. Name of road, street, and/or drainage ditch affected.
- [X] b. Vicinity map showing course of directions
- [X] c. Plans and specifications

(2) BOND:

- [ ] County Attorney, approval when applicable.
- [X] Perpetual bond currently posted. Bond No: [redacted] Amount: $50,000.00
- [ ] Performance bond submitted. Bond No: Amount:
- [ ] Cashier's Check Check No: Amount:

(3) DRAINAGE DISTRICT APPROVAL (WHEN APPLICABLE):

Drainage District Approval _____ Date _____

We have reviewed this project and agree it meets minimum requirements.

Permit Administrator _____ 11/6/2018
Date

CROWN CASTLE | FIBER

SPRINT CO LOCATION ON EXISTING CROWN CASTLE NODES FORT BEND, TX

DRAWING INDEX:	
SHEET	DESCRIPTION
1	COVER SHEET
2-3	GENERAL CONSTRUCTION NOTES & DETAILS
4	NODE LOCATION MAP
5-13	PLAN AND PROFILE
14-16	CONSTRUCTION DETAILS

NO.	SHEET NO.	CC NODE I.D.	SCU NO.	SPRINT NODE I.D.	LATITTUDE	LONGTITUDE	NEAREST ADDRESS	ZIP CODE
1	5	VZW Cinco Ranch DAS/Node12	409941	HO90XSS62	29.728380	-95.789440	Cinco Ranch Blvd & Heritage Grand Ln	77494
2	5	VZW Cinco Ranch DAS/Node2	409931	HO90XSU00	29.722200	-95.767760	22502 Oak Mist Ln	77494
3	6	VZW Cinco Ranch DAS/Node1	409930	HO90XST99	29.718967	-95.763267	Spring Walk Dr & Ivy Terrace Cir	77450
4	6	VZW Cinco Ranch DAS/Node4	409933	HO90XSU01	29.714380	-95.766700	22319 Bridgehaven Dr	77494
5	7	VZW Cinco Ranch DAS/Node15	409944	HO90XST35	29.728929	-95.812045	Evening Canyon Ln & Blackwood Bridge Ln	77494
6	7	VZW Cinco Ranch DAS/Node17	409946	HO90XST36	29.727290	-95.806960	Evening Canyon Ln & Willow Colony Ln	77494
7	8	CCR-016	409945	HO90XST21	29.725420	-95.817400	Spring Green Blvd & Briarlilly Ln	77494
8	8	VZW Cinco Ranch DAS/Node13	409942	HO90XST34	29.724680	-95.812980	BlackWood Bridge Ln & Shady Walk Ln	77494
9	9	VZW Cinco Ranch DAS/Node20	409949	HO90XST38	29.722980	-95.807810	4903 Slate River Ln	77494
10	9	VZW Cinco Ranch DAS/Node14	409943	HO90XSS56	29.721719	-95.813370	26827 Sandy Arbor Ln	77494
11	10	VZW Cinco Ranch DAS/Node19	409948	HO90XSS44	29.720922	-95.806294	4910 Cadencrest Ct	77494
12	10	VZW Cinco Ranch DAS/Node18	409947	HO90XST37	29.719860	-95.799640	Gaston Rd. & Pointer Ridge Ln	77494
13	11	VZW Cinco Ranch DAS/Node11	409940	HO90XSS45	29.718380	-95.809560	26900 Cinco Ranch Blvd	77494
14	11	VZW Cinco Ranch DAS/Node8	409937	HO90XSO50	29.715860	-95.776210	6920 S Fry Rd	77494
15	12	VZW Cinco Ranch DAS/Node3	409932	HO90XST39	29.712240	-95.805409	8951 S Fry Rd	77494
16	12	VZW Cinco Ranch DAS/Node10	409939	HO90XST33	29.711960	-95.775470	23103 Tranquil Spring Ln	77494
17	13	VZW Cinco Ranch DAS/Node7	409936	HO90XST40	29.711070	-95.796460	6010 Dillon Creek	77494

*NO WATER, WASTEWATER, OR DRAINAGE PROPOSED IN THIS PLAN SET

CALL BEFORE YOU DIG !
TEXAS ONE CALL PARTICIPANTS REQUEST 48 HOURS NOTICE BEFORE YOU DIG, DRILL, OR BLAST - STOP CALL
Texas One Call System
1-800-344-8377

APP.		REVISIONS	DATE
3			
2			
1			

CobbFendley
Texas Registration No. 274
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262 | www.cobfen.com

INTERIM REVIEW
Not intended for construction, bidding or permit purposes.
Engineer: DIANA C. WARD
P.E. Serial No.: 83014
Date: OCTOBER 2018

FORT BEND COUNTY

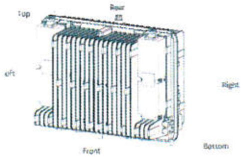
TELECOMMUNICATION DATE

CITY ENGINEER DATE

SHEET NO 1 OF 16 SHEETS

Radio Specifications (FWHT)

Description	Specification
Size/dimensions (HxWxD)	9.68 x 12.83 6.3 inch (246 x 326 x 160 mm)
Weight/mass & volume	26.45 lbs. (12 kg) & 10 L
Operational temperature range	-40°F - +131 °F (humidity: 5% to 95%)
Storage temperature range	-40°F - +158 °F
Cooling fans	None
Cold start capable	Yes
Ingress Protection Rating	IP65 (Outdoor rated)
AC input voltage range	90 - 264 V (47/63 Hz)
Power consumption, max	360W (including 25.5W for PoE)
FCC & UL approved	Yes
TD-LTE operating frequencies (Band 41)	Full band unit - UL/DL: 2496-2690 MHz Low band unit - UL/DL: 2496-2593 MHz High band unit - UL/DL: 2593-2690 MHz
# of supported LTE carriers	2
LTE Tx/Rx ports & type	2 x 4.1/9.5 Mini-DIN (f) - 2T2R / MIMO
LTE RF Tx output power	1 - 20W (each port)
Synchronization required	Integrated GPS using FAWD or ToP IEEE 1588v2
Backhaul method	1 Gigabit Ethernet, copper, RJ45, or 1 Gigabit Ethernet, fiber, SFP (various)
Power over Ethernet (PoE) port	Yes - IEEE 802.3at
Installation mounting method	Pole or wall (using Nokia mounting bracket, FMWA)
Seismic	Zone-4
Unit color	Telegray 4 (RAL7047)
Paintable	Yes (follow guidance)



BTS side	Minimum clearances	Recommended clearances
Front	50 mm (1.97 in)	500 mm (19.68 in)
Rear	35 mm (1.38 in)[1]	35 mm (1.38 in)[1]
Top	100 mm (3.94 in)	Height of the unit + 10 mm (0.39 in)
Bottom	100 mm (3.94 in)	300 mm (11.81 in)
Left	10 mm (0.39 in)[2]	10 mm (0.39 in)[2]
Right	10 mm (0.39 in)	10-110 mm (0.39/4.33 in)[3]

[1] For wall and pole installations.

[2] For horizontal pole installations the clearance must be at least 20 mm (0.78 in).

[3] Depends on the screwdriver length.

Nokia GPS Antenna (FMWD)

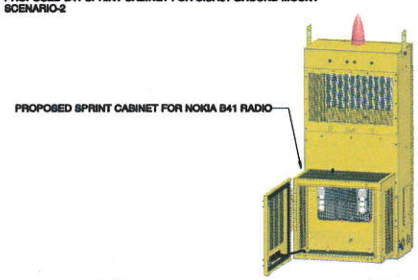
Description	Specification
Operating frequency	1575.42 MHz
Antenna gain	26 dBi
Polarization	Right hand circular
Horizontal beamwidth	360°
Antenna port	N-type (m)
Weight	0.31 lbs (0.14 kg)

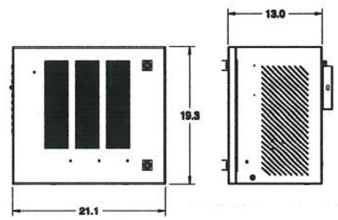
Nokia Wall and Pole Mounting Bracket (FMWA)

The width of the band straps should be less than ¾" to properly fit into the slots of the Nokia mounting bracket.

AC Power Cable, 32' (10m), 18AWG (FPWO)

PROPOSED B41 SPRINT CABINET FOR CISH51 GROUND MOUNT SCENARIO-2





Amphenol ANTENNA SOLUTIONS (2x) 696-896 / (2x) 1695-2180 / (4x) 1695-2700 / (2x) 3550-3700 / (2x) 5150-5925 MHz

2C6U4MT360X12Fwxys0

MULTI-BAND | OMNI | CANISTER ANTENNA | X-POL | FIXED TILT | 1219 MM (48.0 IN)

Features

- Omni configuration with 24 connectors
- Ideal for Small Cell / DAS applications
- Available with 4.3-10 connectors
- [illegible]
- Available for order with a grey, brown or black radome

Connector Description

The antenna has 24 connectors located at the bottom

Low Band #1	R1	696-896	(2x) 4.3-10 Female	Mid Band #5	Y3	1695-2700	(2x) 4.3-10 Female
Low Band #2	R2	696-896	(2x) 4.3-10 Female	Mid Band #6	Y4	1695-2700	(2x) 4.3-10 Female
Mid Band #1	B1	1695-2180	(2x) 4.3-10 Female	High Band #1	Y5	3550-3700	(2x) 4.3-10 Female
Mid Band #2	B2	1695-2180	(2x) 4.3-10 Female	High Band #2	Y6	3550-3700	(2x) 4.3-10 Female
Mid Band #3	Y1	1695-2700	(2x) 4.3-10 Female	High Band #3	V1	5150-5925	(2x) 4.3-10 Female
Mid Band #4	Y2	1695-2700	(2x) 4.3-10 Female	High Band #4	V2	5150-5925	(2x) 4.3-10 Female

Electrical Characteristics

Electrical Characteristics	R1 R2		B1 B2			Y1 Y2 Y3 Y4				Y5 Y6	V1 V2
Frequency Bands (MHz)	(2x) 696-896		(2x) 1695-2180			(4x) 1695-2700				(2x) 3550-3700	(2x) 5150-5925
	696-806	806-896	1695-1880	1850-1990	1920-2180	1695-1880	1850-1990	1920-2200	2300-2700		
Polarization	(2x) ±45°		(2x) ±45°			(4x) ±45°				(2x) ±45°	(2x) ±45°
Horizontal Beamwidth	360°	360°	360°	360°	360°	360°	360°	360°	360°	360°	360°
Vertical Beamwidth	37.3°±4.2°	32.9°±5.2°	25.5°±7.7°	21.4°±1.6°	21.0°±1.9°	20.3°±4.4°	16.8°±3°	17.9°±2.1°	15°±2.9°	28°±9.9	24.2°±5.1°
Gain (dBi)	6.2 ± 0.7	6.9 ± 0.5	7.3 ± 1.4	8.4 ± 1	8 ± 1.2	9.4 ± 0.8	9.8 ± 0.8	9.8 ± 0.7	9.6 ± 1	4.3 ± 0.6	3.7 ± 0.7
Electrical Downtilt (°)	(w) 0		(x) 2, 4, 6			(x) 2, 4, 6				(y) 0	(y) 0
Impedance	50Ω		50Ω			50Ω				50Ω	50Ω
VSWR	≤ 1.5:1		≤ 1.5:1			≤ 1.5:1				≤ 1.5:1	≤ 1.5:1
Upper Sidelobe Suppression	> 12 dB		> 11 dB			> 12 dB				> 14 dB	N/A
Isolation – Intraband	22 dB		25 dB			25 dB				25 dB	25 dB
Isolation – Interband	> 30 dB		> 30 dB			> 30 dB				> 30 dB	> 30 dB
IM3 (2x20W carrier)	< -153 dBc		< -153 dBc			< -153 dBc				N/A	N/A
Input Power	(4x) 500 W		(4x) 300 W			(8x) 300 W				(4x) 300 W	(4x) 300 W
Sector Configuration	Omni										
Lightning Protection	Direct Ground										

Mechanical Characteristics

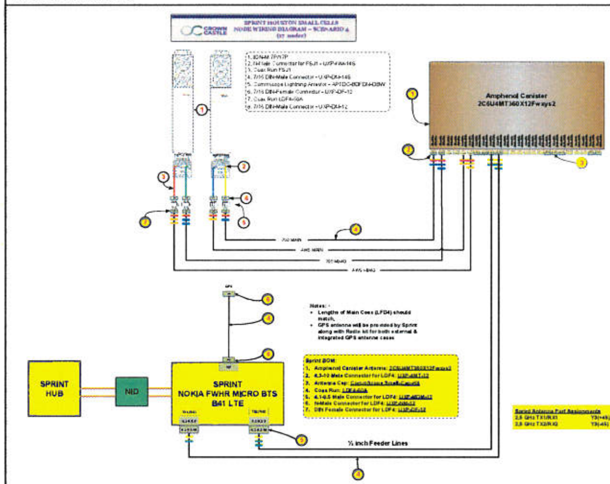
Antenna Dimensions (Height x Diam)	1219 x 457	mm	48.0 x 18.0	in
Weight without Mounting Bracket Kit	25.4	kg	56	lbs
Antenna Volume	0.20	m³	7.1	ft³
Survival Wind Speed	241	km/hr	150	mph
Wind Area	0.56	m²	6.0	ft²
Wind Load (160 km/hr or 100 mph)	466	N	106	lbf

[illegible]

REV06-318NA www.amphenol-antennas.com 1 of 4

ANTENNA SPECIFICATIONS

RADIO SPECIFICATIONS



CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

CobbFendley
Texas Registration No. 274
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262 | www.cobbfendley.com

GENERAL CONSTRUCTION NOTES & DETAILS

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

HORZ :
VERT :

SHEET No: 2 OF 16

EXECUTION

A. Provide (1) main ground from the antenna mounting bracket at the top of the pole, to the main ground bus bar (TMGB) (location defined below). Main vertical ground shall consist of # # 2 solid bare copper cable. Said ground shall be protected by a PVC U-Guard to the top of the pole and stapled every 24" with corrosion resistant (dipped galvanized) staples.

B. #2 solid bare copper cable is highly susceptible to theft and may be a bit excessive to run to top of pole. #2 tin coated is recommended by Ops. As it's cheaper and less likely to be stolen. Buss Bars may also be tin coated to make them less susceptible to theft.

C. Provide (1) main ground from the main ground bus bar (TMGB) (location defined below) to a ground rod at the pole base. Main ground vertical shall consist of a # 2 solid bare copper cable. Said ground shall be protected by a PVC U-Guard to the bottom of the pole and stapled every 24" with corrosion resistant (dipped galvanized) staples.

D. Ground rod shall be 8' in depth minimum and copper clad.

E. Ground rod shall be placed per NEC code with regards to depth and distance from wood pole.

F. Ground rod shall be buried minimum of 8' below grade.

G. # 2 ground shall be attached directly to the ground rod via Cad Weld.

H. Main ground vertical shall be attached directly to a ground bus bar (TMGB) mounted to the face of the utility pole. Method of contact shall be 2 hole plated lug (Brown) to the main ground bus (TMGB) on the left or top slot depending on the orientation of the TMGB.

I. Main ground vertical to the Antenna mounting bracket shall be attached directly to the Antenna Bracket via a self-tapping bolt or screw. A washer must be added to the thru bolt or screw to avoid damage to the lug while maintaining a secure bond.

J. TMGB shall be mounted above the Charles cabinet below the RRH standoff, directly to the wood pole structure.

K. All pole mounted devices, including but not limited to: (antenna mounts and antennas, mounting brackets, cabinets) shall be connected to the TMGB with a #6 copper braided cable UV coated and green in color.

L. All pole mounted devices, including but not limited to: (antenna mounts and antennas, mounting brackets, cabinets) shall be connected to this TMGB using compression type, 2 hole connector lugs.
   1. Connector lugs must attach to the bus bar with two holes facing up and out with the bolt heads are on the back side of the bus bar.
   2. Stacking of connector lugs is prohibited.
   3. Placement of connector lugs on front and rear face of grounding bar is permitted.
   4. Any modifications to the connector lugs is prohibited, including but not limited to grinding, cutting or bending.
   5. Connector lugs must be placed with even spacing and must not come in contact with another connector lug.
   6. Slotted side of the connector lug should be placed on the slotted side of the bus bar.
   7. All connector lugs shall have two (2) compressions per lug.
   8. All connector lugs must have NO-OX applied to any label which contact another metal to retard oxidation including and especially the conductor in the compression end.
   9. All connector lugs must be properly sealed from weather with heat shrink.
   10. All connector lugs must be attached using 3/8" hardware x 2" per each lug and in the following manner:
      a. Flat Washer on the backside of the lug
      b. Bolt thru the lug hole facing outward.
      c. Flat Washer on the front side of the lug
      d. Lock Washer on the front side of the flat washer.
      e. Nut on the bolt, turned to 1/2 threads showing at maximum torque
      f. All nuts on connector bolts must be tightened so that the lock washers are completely compressed.

M. No mechanical connections are acceptable except in the event of mechanical fittings being a integral part of the product from the factory. ie: Charles cabinet # 6 ground lugs on each side of the cabinet.

N. Exposed welds on GadWelds must be ground off to a safe taper.

O. All cad welds must be coated with Zinc-it or like product to prevent oxidation.

P. All exposed metallic surfaces must be sprayed with a protective coating such as Zinc-It.

Q. All fittings exposed to environment must be sealed with shrink wrap.

1. Exposed "shiners" conductors are prohibited if in excess of 1-16th of an inch.

TESTING

A. 5 Ohms to ground is required for acceptance. If 5 Ohms cannot be met with above requirements, additional ground rods will be added to the field until 5 Ohms is achieved.

DOCUMENTATION

A. Photos of the tests are required as well as test results in formal document format. Submit result of test to GC Construction Manager prior to final walkthrough. Submit all photos and tests with closeout package per Section 01700 - Closeout Procedures and Required Documents.

GROUNDING SPECIFICATIONS

1. FORT BEND COUNTY MUST BE INVITED TO THE PRE-CONSTRUCTION MEETING.
2. CONTRACTOR SHALL NOTIFY FORT BEND COUNTY ENGINEERING DEPARTMENT 48 HOURS PRIOR TO COMMENCING CONSTRUCTION AND 48 HOUR NOTICE TO ANY CONSTRUCTION ACTIVITY WITHIN THE LIMITS OF THE PAVING AT CONSTRUCTION@FORTBENDCOUNTYTX.GOV
3. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FROM FORT BEND COUNTY PRIOR TO COMMENCING CONSTRUCTION OF ANY IMPROVEMENTS WITHIN COUNTY ROAD RIGHT OF WAYS.
4. ALL PAVING IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH FORT BEND COUNTY "RULES, REGULATIONS AND REQUIREMENTS" RELATING TO THE APPROVAL AND ACCEPTANCE OF IMPROVEMENTS IN SUBDIVISIONS AS CURRENTLY AMENDED.
5. ALL ROAD WIDTHS, CURB RADII AND CURB ALIGNMENT SHOWN INDICATES BACK OF CURB.
6. A CONTINUOUS LONGITUDINAL REINFORCING BAR SHALL BE USED IN THE CURBS.
7. ALL CONCRETE PAVEMENT SHALL BE 5 ½ BACK CEMENT WITH A MINIMUM COMPRESSIVE STRENGTH OF 3500 PSI AT 28 DAYS. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT EACH CURB RETURN AND AT A MAXIMUM SPACING OF 60 FEET.
8. ALL WEATHER ACCESS TO ALL EXISTING STREETS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
9. 4"X 12" REINFORCED CONCRETE CURB SHALL BE PLACED IN FRONT OF SINGLE FAMILY LOTS ONLY. ALL OTHER AREAS SHALL BE 6" REINFORCED CONCRETE CURB.
10. AT ALL INTERSECTION LOCATIONS, TYPE 7 RAMPS SHALL BE PLACE IN ACCORDANCE WITH TXDOT RED-12A STANDARD DETAIL SHEET. A.D.A. - HANDICAP RAMPS SHALL BE INSTALLED WITH STREET PAVING AT ALL INTERSECTIONS AND COMPLY WITH CURRENT A.D.A. REGULATIONS.
11. CURB HEADERS ARE REQUIRED AT CURB CONNECTIONS TO HANDICAP RAMPS, WITH NO CONSTRUCTION JOINT WITHIN 5' OF RAMPS.
12. ALL INTERSECTIONS UTILIZING TRAFFIC CONTROL MEASURES SHALL HAVE A.D.A. WHEEL CHAIR RAMPS INSTALLED.
13. GUIDELINES ARE SET FORTH IN THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED, SHALL BE OBSERVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE FLAGMEN, SIGNING, STRIPING AND WARNING DEVICES, ETC., DURING CONSTRUCTION - BOTH DAY AND NIGHT.
14. ALL R1- I STOP SIGNS SHALL BE 30"X30" WITH DIAMOND GRADE SHEETING PER TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
15. STREET NAME SIGNAGE SHALL BE ON A 9" HIGH SIGN FLAT BLADE W/REFLECTIVE GREEN BACKGROUND. STREET NAMES SHALL BE UPPER AND LOWERCASE LETTERING WITH UPPERCASE LETTERS OF 6" MINIMUM AND LOWERCASE LETTERS OF 4.5" MINIMUM. THE LETTERS SHALL BE REFLECTIVE WHITE. STREET NAME SIGNS SHALL BE MOUNTED ON STOP SIGN POST.
16. A BLUE DOUBLE REFLECTORIZED BUTTON SHALL BE PLACED AT ALL FIRE HYDRANT LOCATIONS. THE BUTTON SHALL BE PLACED 12 INCHES OFF OF THE CENTERLINE OF THE STREET ON THE SAME SIDE AS THE HYDRANT.

NOTE: FORT BEND COUNTY NOTES SUPERSEDE ANY CONFLICTING NOTES.

INSPECTION. THE PROJECT AND ALL PARTS THEREOF SHALL BE SUBJECT TO INSPECTION FROM TIME TO TIME BY INSPECTORS DESIGNATED BY FORT BEND COUNTY. NO SUCH INSPECTIONS SHALL RELIEVE THE CONTRACTOR OF ANY OF ITS OBLIGATIONS HEREUNDER. NEITHER FAILURE TO INSPECT NOR FAILURE TO DISCOVER OR REJECT ANY OF THE WORK AS NOT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS, REQUIREMENTS AND SPECIFICATIONS OF FORT BEND COUNTY OR ANY PROVISION OF THIS PROJECT SHALL BE CONSTRUED TO IMPLY AN ACCEPTANCE OF SUCH WORK OR TO RELIEVE THE CONTRACTOR OF ANY OF ITS OBLIGATIONS HEREUNDER.

FORT BEND COUNTY CONSTRUCTION NOTES

1. RIGHT-OF-WAY USE PERMIT SHALL BE OBTAINED BY CONTRACTOR PRIOR TO COMMENCING WORK.
2. A UTILITY LOCATE IS REQUIRED FOR ALL PROJECTS.
3. CROSSING OF EXISTING UTILITIES SHALL BE COORDINATED BY CONTRACTOR.
4. ALL WORK TO BE CONDUCTED IN CITY RIGHT OF WAY, U.N.O.
5. ALL DISTURBED LANDSCAPING SHALL BE REPLACED TO SIMILAR EXISTING CONDITION.
6. ALL SURFACE REPAIR SHALL BE TO CITY SPECIFICATIONS.
7. ANY SIDEWALK CLOSURE SHALL BE COORDINATED WITH THE CITY AND PROPER SIGNAGE WILL BE PLACED.
8. TEMPORARY LIGHTING WILL BE COORDINATED WITH CITY AND PROVIDED WHENEVER EXISTING LIGHTING IS REMOVED OR UNAVAILABLE AS REQUIRED.
9. NO MATERIALS OR EQUIPMENT SHALL BE STORED ON PRIVATE PROPERTY OR BLOCK ACCESS TO PRIVATE PROPERTY.
10. OPEN EXCAVATIONS SHALL BE PROPERLY GUARDED AND SIGNED. NO OPEN EXCAVATIONS WILL BE LEFT ACCESSIBLE TO THE PUBLIC.
11. CLEANUP OF THE WORK AREA WILL BE COMPLETED EACH EVENING AND THE PROJECT AREA WILL BE RETURNED TO EXISTING CONDITION AT THE COMPLETION OF CONSTRUCTION AT EACH NODE LOCATION.
12. ALL WORK TO COMPLY WITH OSHA AND CITY GUIDELINES.
13. CONTRACTOR WILL BE RESPONSIBLE FOR LOCATING PRIVATE IRRIGATION PRIOR TO EXCAVATION. CONTRACTOR WILL REPAIR OR REROUTE IRRIGATION IN ROW AS NECESSARY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE AND REPLACE, AT THEIR COST, ANY AND ALL DAMAGED PAVEMENT, SIDEWALK, CURB AND GUTTER OUTSIDE THE PAY LIMIT, DAMAGE DUE TO THEIR ACTIVITIES ON THE PROJECT. THIS INCLUDES, BUT IS NOT LIMITED TO THE REMOVAL AND REPLACEMENT OF NEWLY CRACKED, THE REMOVAL AND REPLACEMENT OF EXISTING CRACKS WHERE THE CRACKS HAVE BEEN ENLARGED DUE TO THE CONTRACTORS OPERATIONS, THE REMOVAL AND REPLACEMENT OF DEFORMED PAVEMENT, CURB AND GUTTTER, SIDEWALK, ETC. ALL SAW CUTS USED FOR THE REMOVAL OF THESE ITEMS SHALL BE PERPENDICULAR AND PARALLEL TO THE CENTERLINE CONTROLLING THAT ITEM, OR AT THE DISCRETION OF THE CITY INSPECTOR.
15. THE VAULTS INSTALLED IN CONJUNCTION WITH THE INDIVIDUAL ANTENNA NODES SHALL BE FLUSH WITH THE GROUND.

GENERAL PROJECT NOTES

CREW MUST HAVE ONE ALU CERTIFIED PERSON - PERSONNEL.
WORKING/INSTALLING THE NODE CABINET MUST HAVE THE ALU METRO CELL CERTIFICATION. • ONLY CERTIFIED PERSONNEL MAY INSTALL ALU METRO CELLS. (I.E. NO TRAIN THE TRAINER OPTIONS PERMITTED) • A CERTIFIED INSTALLER MAY SUPERVISE ONE OR MORE NON-CERTIFIED "HELPERS" AS LONG THE CERTIFIED INSTALLER IS ON THE SAME SITE 100% OF THE TIME. (I.E. NO ROAMING SUPERVISORS!) • A CERTIFIED INSTALLER MAY NOT ACT AS A ROAMING QUALITY AUDITOR UNLESS THE ORIGINAL INSTALLATION IS COMPLETED BY A CERTIFIED INSTALLER AND THE QUALITY AUDIT IS ONLY USED TO ENSURE INTERNAL QUALITY. IN NO WAY WILL THIS AUDIT BE PORTRAYED AS AN ALCATEL-LUCENT AUDIT. • CERTIFIED PERSONNEL HAVE ACCESS TO REMOTE TECHNICAL SUPPORT FOR ISSUES RELATED TO METRO CELL INSTALLATION (866) 582-3688 / 866-LUCENTT • THE FOLLOWING PRODUCTS ARE COVERED: 9363 METRO CELL INDOOR, 9364 METRO CELL OUTDOOR, 9763 METRO CELL INDOOR, 9764 METRO CELL OUTDOOR, 9768 METRO RADIO OUTDOOR V1.0, AND THE 7310 CABINET.

ALU CERTIFIED TECH NOTE

AC	AIR CONDITIONING
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATELY
AWG	AMERICAN WIRE GAUGE
BCW	BARE COPPER WIRE
BLDG	BUILDING
BLK	BLOCK
BOB	BOTTOM OF BLOCK
B.S	BUILDING STANDARD
CLG	CEILING
CLR	CLEAR
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CO	COMPANY
DBL	DOUBLE
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DTL, DETL	DETAIL
DWG	DRAWING
E	EAST
EA	EACH
EL, ELEV	ELEVATION
ELECT	ELECTRICAL
EPB	ELECTRICAL PULL BOX
EQ	EQUAL
EQUIP	EQUIPMENT
EW	EACH WAY
EX	EXISTING
EXT	EXTERIOR
FIN	FINISH
FLUOR	FLUORESCENT
FLR	FLOOR
FT	FOOT, FEET
GA	GAUGE
GALV	GALVANIZE(D)
GC	GENERAL CONTRACTOR
GLB	GLUE LAMINATED BEAM
GRND	GROUND
GWB	GYPSUM WALL BOARD
HORIZ	HORIZONTAL
HR	HOUR
HT	HEIGHT
HVAC	HEATING, VENTING AND AIR CONDITIONING
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIA
IN	INCH
INFO	INFORMATION
INT	INTERIOR
LB(S)	POUND(S)
LF	LINEAR FEET
MAX	MAXIMUM
MECH	MECHANICAL
MTL	METAL
MFR	MANUFACTURER
MGR	MANAGER
MIN	MINIMUM
MISC	MISCELLANEOUS
N	NORTH
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPG	OPENING
OPP	OPPOSITE
PL	PROPERTY LINE
PLY	PLYWOOD
PR	PAIR
PROJ	PROJECT
PROP	PROPERTY
PT	PRESSURE TREATED
RCP	REFLECTED CEILING PLAN
REQD	REQUIRED
RM	ROOM
RO	ROUGH OPENING
ROW	RIGHT-OF-WAY
RX	RECEIVE SIGNAL
S	SOUTH
SCHED	SCHEDULE
SF	SQUARE FEET
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	SANITARY SEWER
STL	STEEL
STRUCT	STRUCTURAL
SUSP	SUSPENDED
SY	SQUARE YARD
THRU	THROUGH
TINND	TINNED
T.O.	TOP OF
TOB	TOP OF BLOCK
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TS	TUBE STEEL
TX	TRANSMIT SIGNAL
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LAB
URH	UNIVERSAL RADIO HEAD
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERIFY IN FIELD
VT	VINYL TILE
W	WEST
W	WITH
WDW	WINDOW
W/O	WITHOUT
WP	WORKING POINT
WTR	WATER

---- -- ---- -- ----	CENTER LINE
---------- -- -- ----------	PROPERTY LINE
---------- -- -- ----------	RIGHT-OF-WAY
-- -F- ---- -F- --	FIBER
-- -G- ---- -G- --	GAS
-- -P- ---- -P- --	POWER
-- -S- ---- -S- --	SANITARY SEWER
-- SD- ---- -SD --	STORM DRAIN
-- -W- ---- -W --	WATER
----P----P----	LIGHT CIRCUIT POWER
---OHE-------OHE---	OVERHEAD POWER LINE

ABBREVIATIONS AND SYMBOLS

REVISION

KEY NOTE

DETAIL REFERENCE

ELEVATION REFERENCE

SECTION REFERENCE

ELEVATION MARKER

PHOTOSIM REFERENCE

ANTENNA AZIMUTH

VIEW NUMBER / SHEET NUMBER / SHEET GROUP

EXISTING TREE

EXISTING BUSH / SHRUB

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

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13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3282 | www.cobbfendley.com

GENERAL CONSTRUCTION NOTES & DETAILS

NOTE: GC'S SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

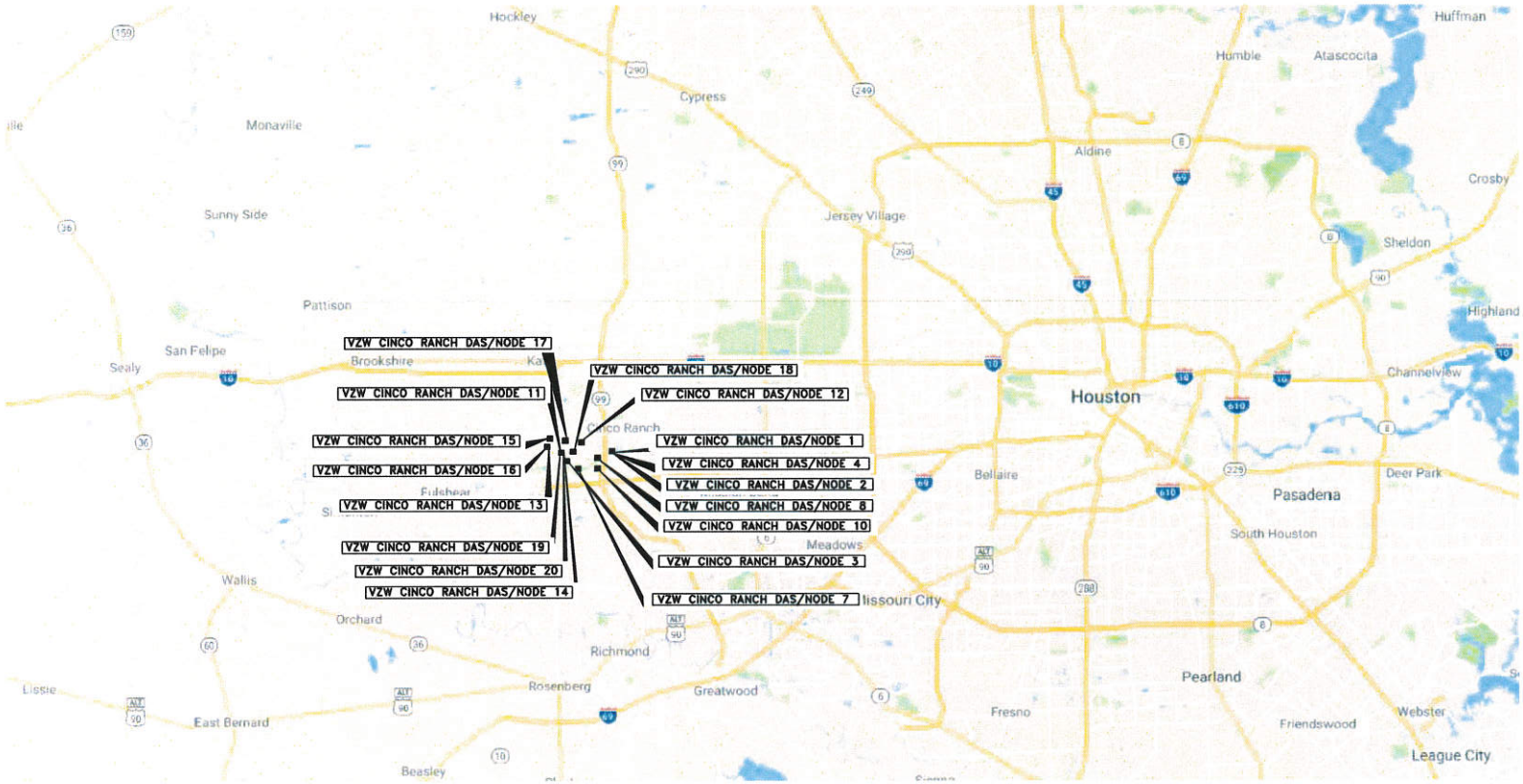
TELECOMMUNICATION | DATE

FILE NO:

DRAWING SCALE

HORZ :
VERT :

SHEET No: 3 OF 16



NODE LOCATION MAP
N.T.S.

CROWN CASTLE | FIBER

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713.462.3242 | fax 713.462.3262 | www.cobbfendley.com

GENERAL NODE LOCATION MAP

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

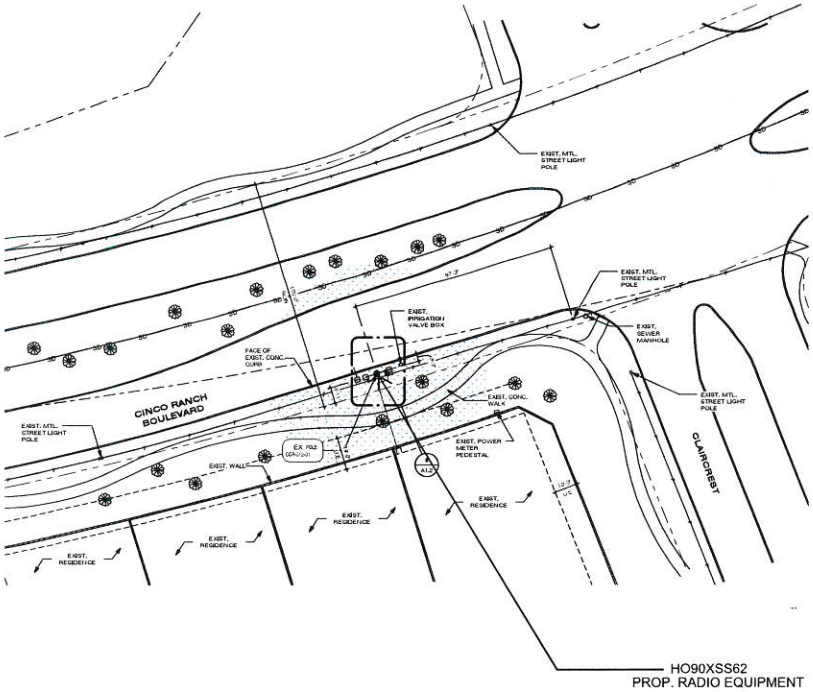
HORZ :
VERT :

SHEET No: 4 OF 16

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: CINCO RANCH BLVD. AND HERITAGE GRAND LN HOUSTON, TX 77494

LATITUDE:	29.728380
LONGITUDE:	-95.756440
POLE TYPE:	METAL SLIMLINE POLE
POLE ID #:	N/A

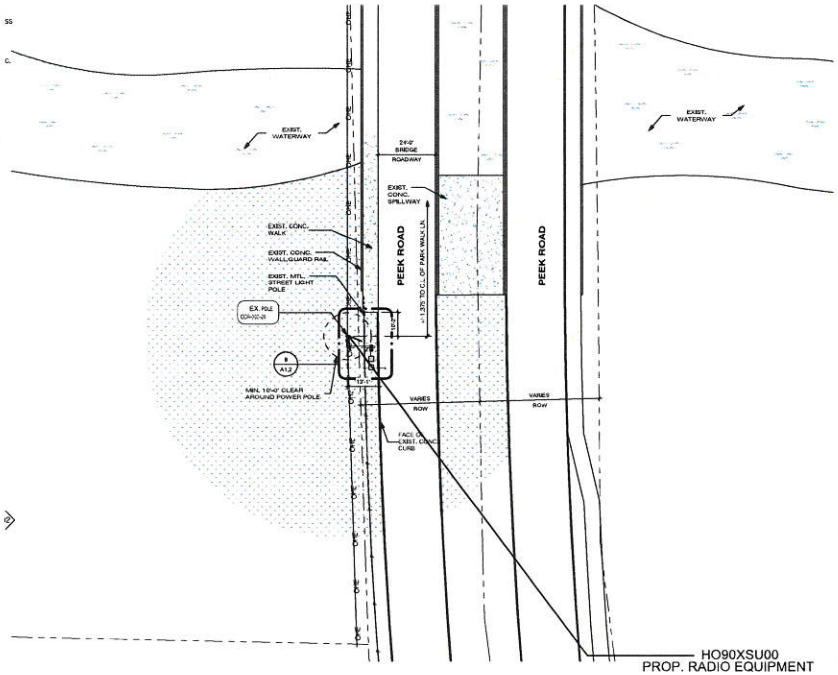


NODE ID: VZW CINCO RANCH DAS/NODE 12

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: 22502 OAK MIST LN., HOUSTON, TX 77494

LATITUDE:	29.722200
LONGITUDE:	-95.767780
POLE TYPE:	WOOD POWER POLE
POLE ID #:	N/A



NODE ID: VZW CINCO RANCH DAS/NODE 2

NOTES

1. CONTRACTOR SHALL RESTORE DISTURBED AREAS DURING CONSTRUCTION TO THE SAME OR BETTER CONDITION THAN FOUND PRIOR TO PROJECT COMMENCEMENT.
2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE IMMEDIATE VICINITY OF THE PROPOSED POLE LOCATION PRIOR TO COMMENCING CONSTRUCTION ON THIS PROJECT. IF A CONFLICT IS FOUND THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TREE NOTE

- NO EXCAVATION WITHIN FIFTEEN FEET OF TREES
- MINIMUM BORE DEPTH OF FOUR FEET UNDER TREES. NO OPEN CUT WITHIN TWELVE FEET OF TREES.

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

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PLAN AND PROFILE
HO90XSS62 AND HO90XSU00

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

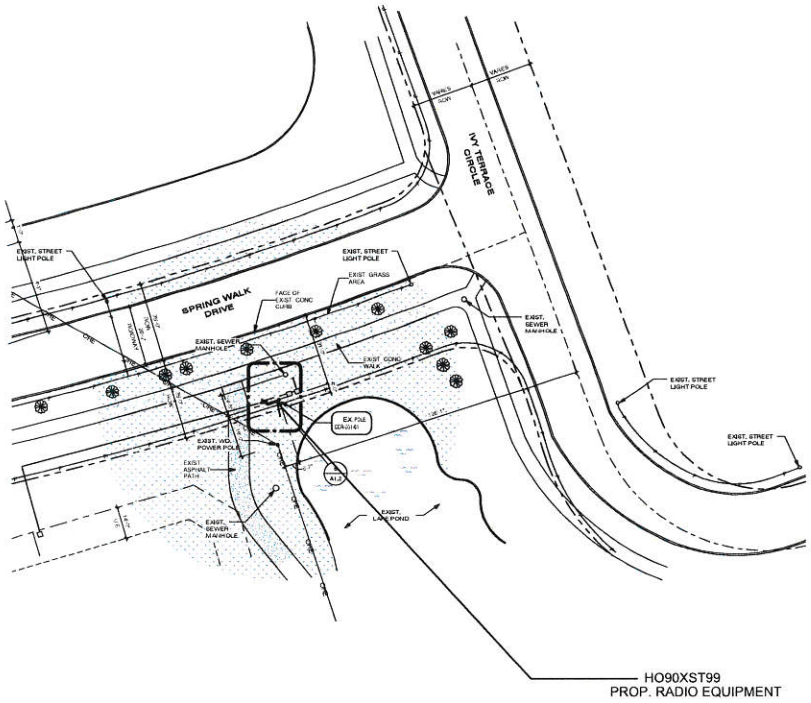
HORZ :
VERT :

SHEET No: 5 OF 16

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: SPRING WALK DR. AND IVY TERRACE CIRCLE HOUSTON, TX 77450

LATITUDE:	29.718967
LONGITUDE:	-95.763267
POLE TYPE:	WOOD POLE
POLE ID #:	N/A

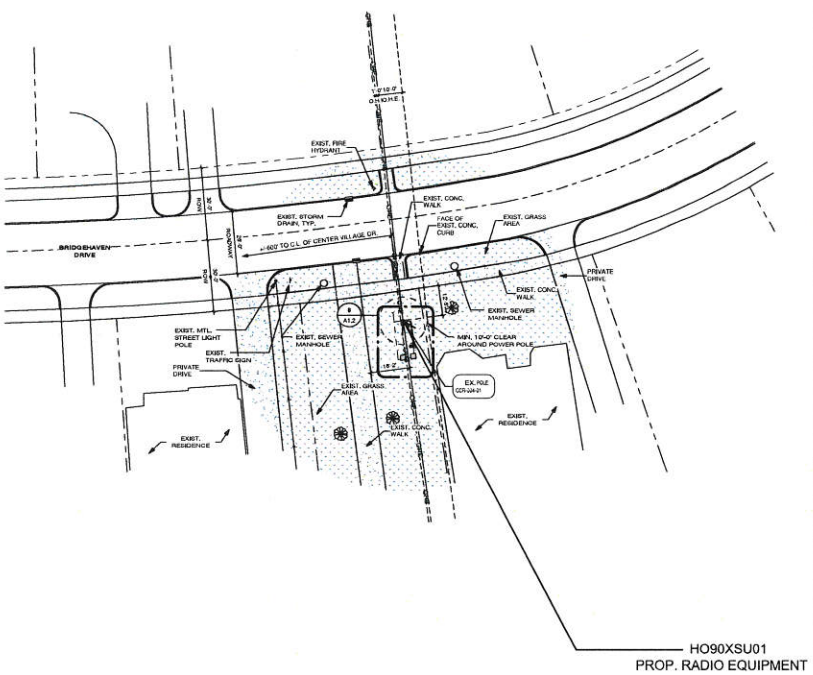


NODE ID: VZW CINCO RANCH DAS/NODE 1

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: 22319 BRIDGEHAVEN DR., HOUSTON, TX 77494

LATITUDE:	29.714360
LONGITUDE:	-95.766700
POLE TYPE:	WOOD POWER POLE
POLE ID #:	N/A



NODE ID: VZW CINCO RANCH DAS/NODE 4

NOTE

1. CONTRACTOR SHALL RESTORE DISTURBED AREAS DURING CONSTRUCTION TO THE SAME OR BETTER CONDITION THAN FOUND PRIOR TO PROJECT COMMENCEMENT.

2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE IMMEDIATE VICINITY OF THE PROPOSED POLE LOCATION PRIOR TO COMMENCING CONSTRUCTION ON THIS PROJECT. IF A CONFLICT IS FOUND THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TREE NOTE

- NO EXCAVATION WITHIN FIFTEEN FEET OF TREES
- MINIMUM BORE DEPTH OF FOUR FEET UNDER TREES. NO OPEN CUT WITHIN TWELVE FEET OF TREES.

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

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PLAN AND PROFILE
HO90XST99 AND HO90XSU01

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FORT BEND COUNTY

TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

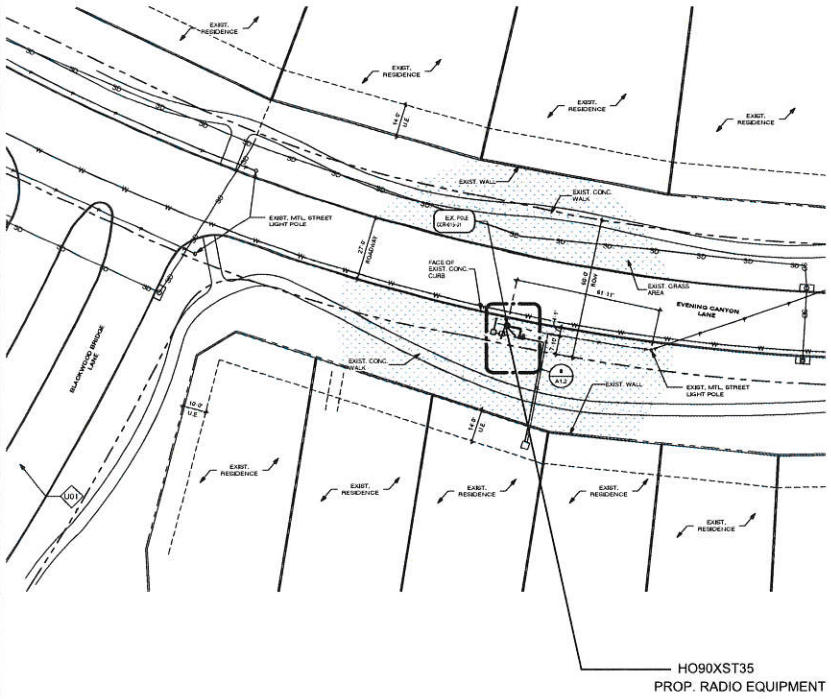
HORZ :
VERT :

SHEET No: 6 OF 16

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: EVENING CANYON LN. AND BLACKWOOD BRIDGE LN., HOUSTON, TX 77494

LATITUDE:	29.728929
LONGITUDE:	-95.812045
POLE TYPE:	METAL SLIMLINE POLE
POLE ID #:	N/A

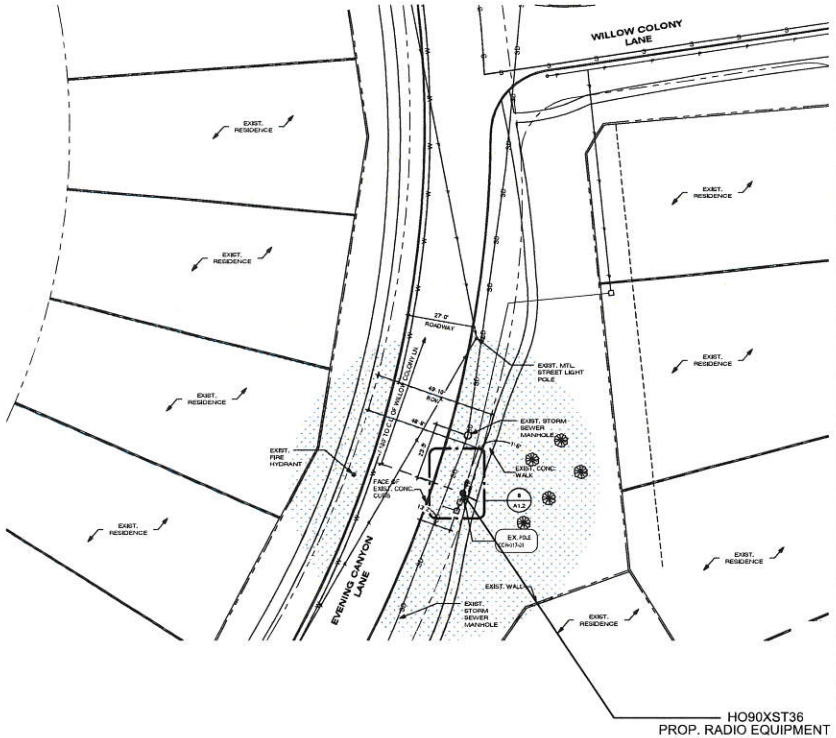


NODE ID: VZW CINCO RANCH DAS/NODE 15

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: EVENING CANYON LN. ANDWILLOW COLONY LN., HOUSTON, TX 77494

LATITUDE:	29.727290
LONGITUDE:	-95.809960
POLE TYPE:	METAL SLIMLINE POLE
POLE ID #:	N/A



NODE ID: VZW CINCO RANCH DAS/NODE 17

NOTES

1. CONTRACTOR SHALL RESTORE DISTURBED AREAS DURING CONSTRUCTION TO THE SAME OR BETTER CONDITION THAN FOUND PRIOR TO PROJECT COMMENCEMENT.

2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE IMMEDIATE VICINITY OF THE PROPOSED POLE LOCATION PRIOR TO COMMENCING CONSTRUCTION ON THIS PROJECT. IF A CONFLICT IS FOUND THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TREE NOTE

- NO EXCAVATION WITHIN FIFTEEN FEET OF TREES
- MINIMUM BORE DEPTH OF FOUR FEET UNDER TREES, NO OPEN CUT WITHIN TWELVE FEET OF TREES.

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

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PLAN AND PROFILE
HO90XST35 AND HO90XST36

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

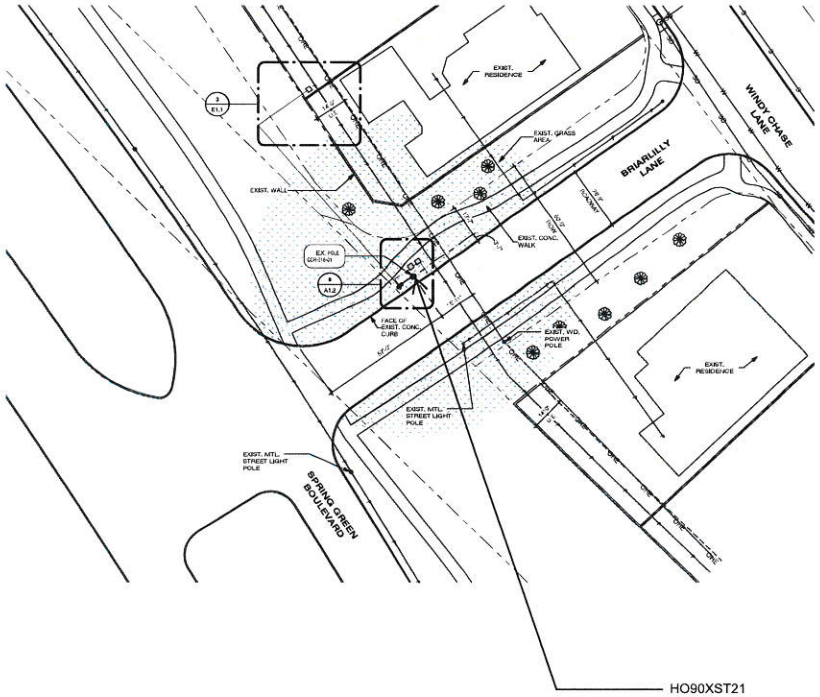
HORZ :
VERT :

SHEET No: 7 OF 16

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: SPRING GREEN BLVD AND BRIARLILLY LN., HOUSTON, TX 77494

LATITUDE:	29.725420
LONGITUDE:	-95.817400
POLE TYPE:	METAL SLIMLINE POLE
POLE ID #:	N/A

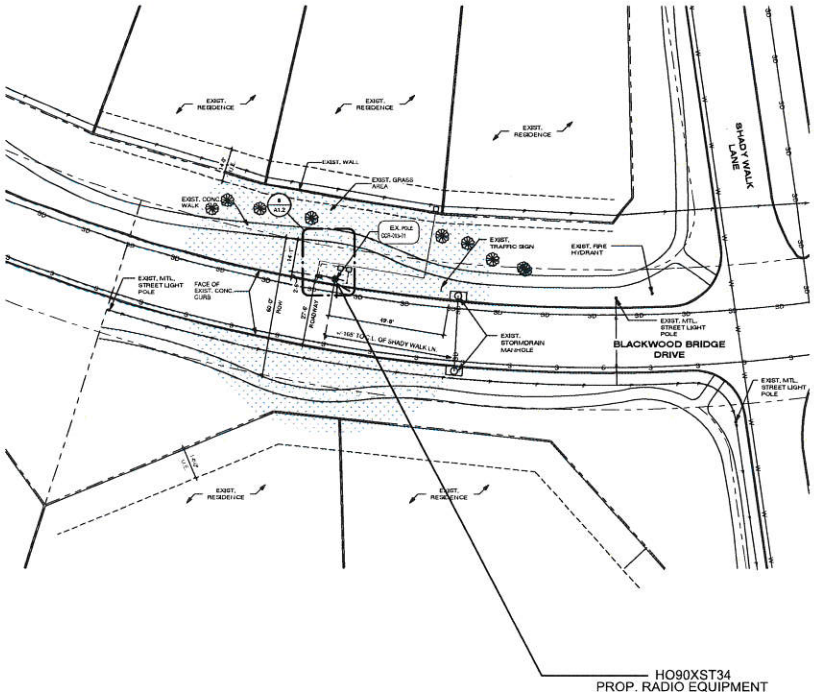


NODE ID: VZW CINCO RANCH DAS/NODE 16

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: BLACKWOOD BRIDGE LN., AND SHADY WALK LN., HOUSTON, TX 77494

LATITUDE:	29.724680
LONGITUDE:	-95.812980
POLE TYPE:	METAL SLIMLINE POLE
POLE ID #:	N/A



NODE ID: VZW CINCO RANCH DAS/NODE 13

NOTES

1. CONTRACTOR SHALL RESTORE DISTURBED AREAS DURING CONSTRUCTION TO THE SAME OR BETTER CONDITION THAN FOUND PRIOR TO PROJECT COMMENCEMENT.
2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE IMMEDIATE VICINITY OF THE PROPOSED POLE LOCATION PRIOR TO COMMENCING CONSTRUCTION ON THIS PROJECT. IF A CONFLICT IS FOUND THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TREE NOTE

- NO EXCAVATION WITHIN FIFTEEN FEET OF TREES
- MINIMUM BORE DEPTH OF FOUR FEET UNDER TREES, NO OPEN CUT WITHIN TWELVE FEET OF TREES.

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

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PLAN AND PROFILE
HO90XST21 AND HO90XST34

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

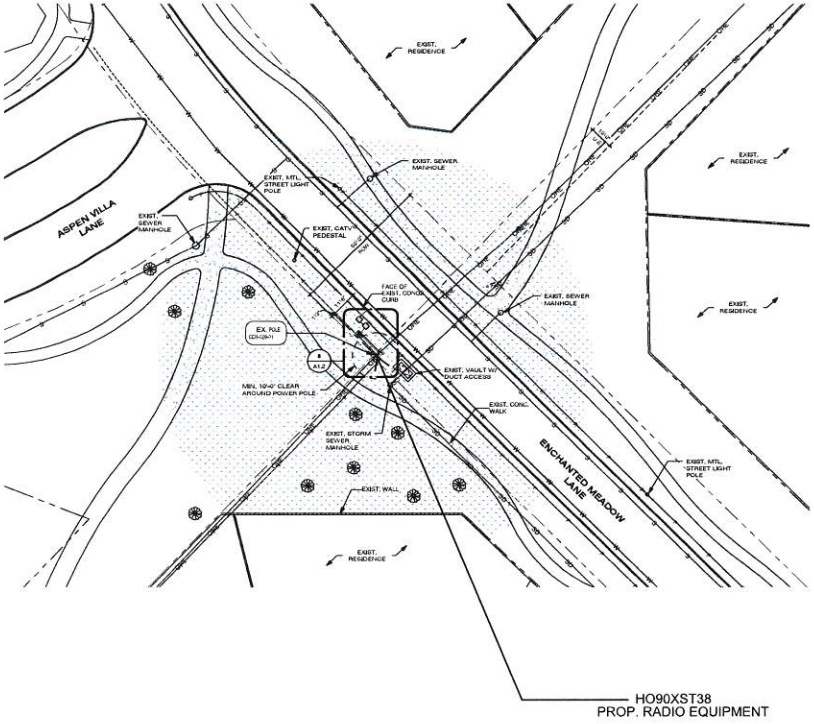
HORZ :
VERT :

SHEET No: 8 OF 16

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: 4903 SLATE RIVER LN., HOUSTON, TX 77494

LATITUDE:	29.722990
LONGITUDE:	-95.807610
POLE TYPE:	WOOD POWER POLE
POLE ID #:	N/A

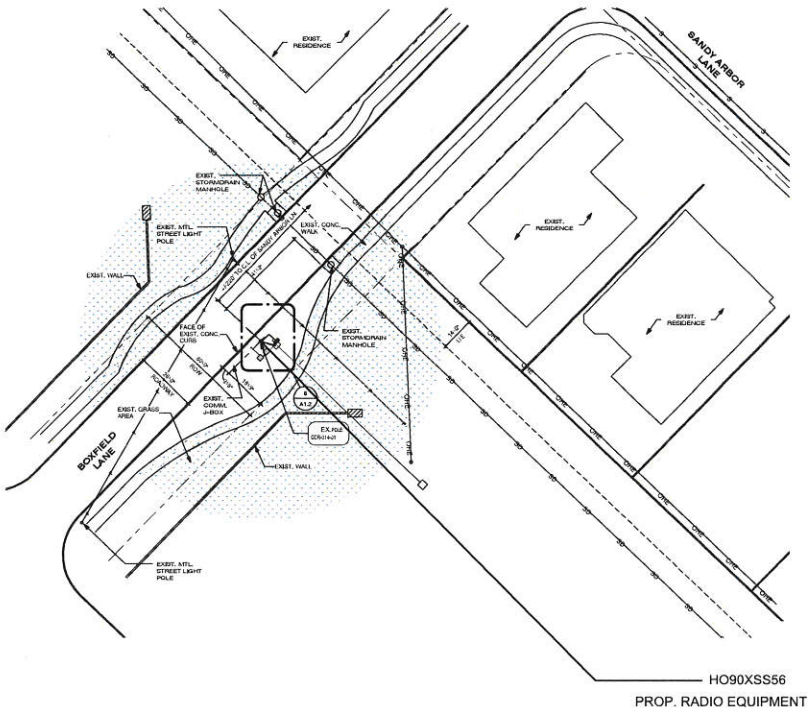


NODE ID: VZW CINCO RANCH DAS/NODE 20

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: 26827 SANDY ARBOR LN., HOUSTON, TX 77494

LATITUDE:	29.721719
LONGITUDE:	-95.813370
POLE TYPE:	WOOD POLE
POLE ID #:	N/A



NODE ID: VZW CINCO RANCH DAS/NODE 14

NOTES:

1. CONTRACTOR SHALL RESTORE DISTURBED AREAS DURING CONSTRUCTION TO THE SAME OR BETTER CONDITION THAN FOUND PRIOR TO PROJECT COMMENCEMENT.
2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE IMMEDIATE VICINITY OF THE PROPOSED POLE LOCATION PRIOR TO COMMENCING CONSTRUCTION ON THIS PROJECT. IF A CONFLICT IS FOUND THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TREE NOTE

- NO EXCAVATION WITHIN FIFTEEN FEET OF TREES
- MINIMUM BORE DEPTH OF FOUR FEET UNDER TREES. NO OPEN CUT WITHIN TWELVE FEET OF TREES.

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

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PLAN AND PROFILE
HO90XST38 AND HO90XSS56

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

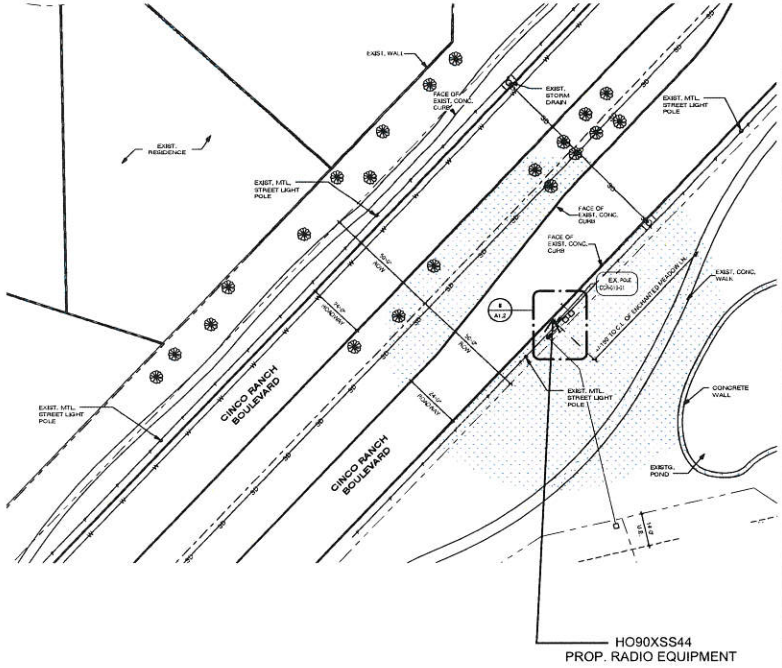
HORZ :
VERT :

SHEET No: 9 OF 16

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: 4910 CADENCREST CT., HOUSTON, TX 77494

LATITUDE:	29.720922
LONGITUDE:	-95.806294
POLE TYPE:	METAL SUMLINE POLE
POLE ID #:	N/A

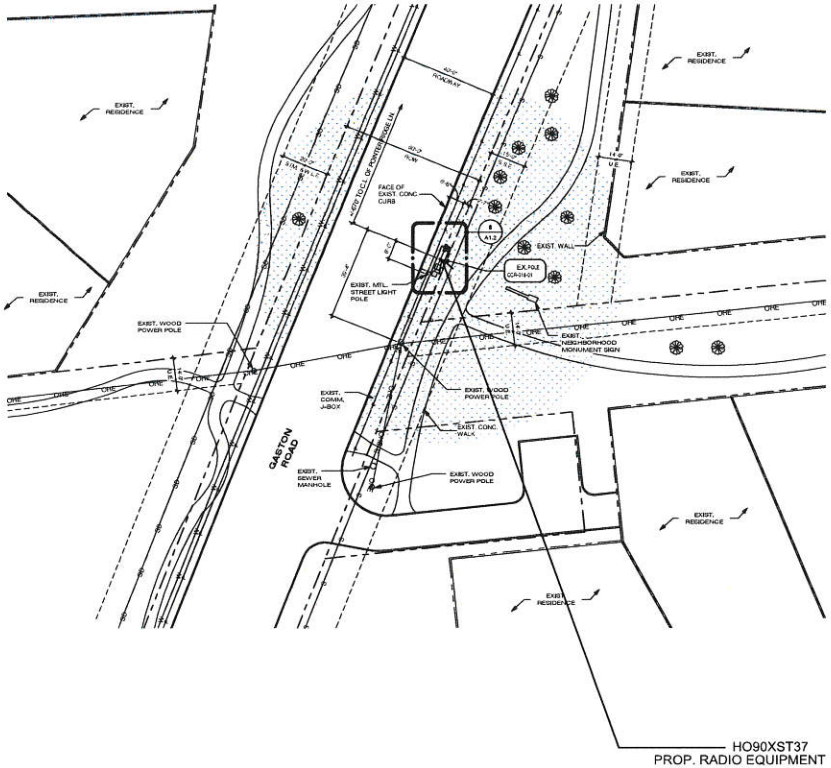


NODE ID: VZW CINCO RANCH DAS/NODE 19

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: GASTON RD. AND POINTER RIDGE LN., HOUSTON, TX 77494

LATITUDE:	29.719860
LONGITUDE:	-95.799840
POLE TYPE:	WOOD POLE
POLE ID #:	N/A



NODE ID: VZW CINCO RANCH DAS/NODE 18

NOTES

1. CONTRACTOR SHALL RESTORE DISTURBED AREAS DURING CONSTRUCTION TO THE SAME OR BETTER CONDITION THAN FOUND PRIOR TO PROJECT COMMENCEMENT.

2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE IMMEDIATE VICINITY OF THE PROPOSED POLE LOCATION PRIOR TO COMMENCING CONSTRUCTION ON THE PROJECT. IF A CONFLICT IS FOUND THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TREE NOTE

- NO EXCAVATION WITHIN FIFTEEN FEET OF TREES
- MINIMUM BORE DEPTH OF FOUR FEET UNDER TREES. NO OPEN CUT WITHIN TWELVE FEET OF TREES.

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

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PLAN AND PROFILE
HO90XSS44 AND HO90XST37

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

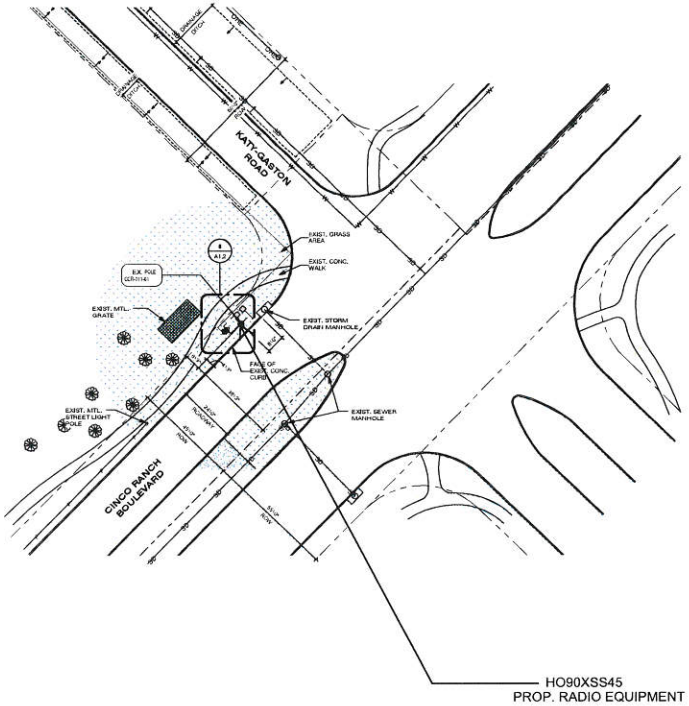
HORZ :
VERT :

SHEET No: 10 OF 16

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: 26900 CINCO RANCH BLVD HOUSTON, TX 77494

LATITUDE:	29.718380
LONGITUDE:	-95.809560
POLE TYPE:	METAL SLIMLINE POLE
POLE ID #:	N/A

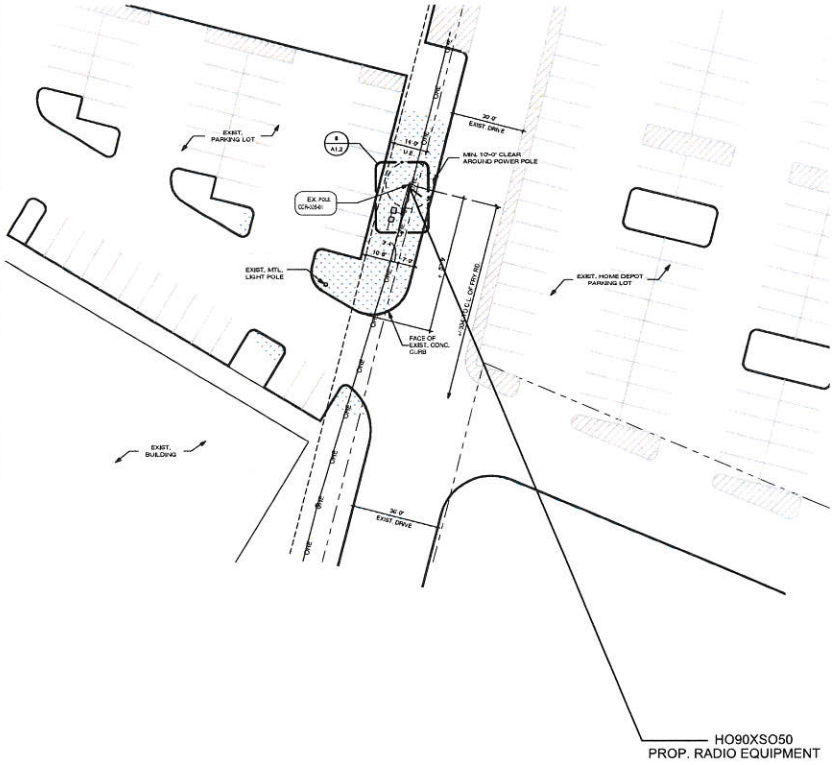


NODE ID: VZW CINCO RANCH DAS/NODE 11

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS: 6920 S FRY RD., HOUSTON, TX 77494

LATITUDE:	29.715860
LONGITUDE:	-95.778210
POLE TYPE:	WOOD POLE
POLE ID #:	N/A



NODE ID: VZW CINCO RANCH DAS/NODE 8

NOTES

1. CONTRACTOR SHALL RESTORE DISTURBED AREAS DURING CONSTRUCTION TO THE SAME OR BETTER CONDITION THAN FOUND PRIOR TO PROJECT COMMENCEMENT.

2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE IMMEDIATE VICINITY OF THE PROPOSED POLE LOCATION PRIOR TO COMMENCING CONSTRUCTION ON THIS PROJECT. IF A CONFLICT IS FOUND THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TREE NOTE

- NO EXCAVATION WITHIN FIFTEEN FEET OF TREES
- MINIMUM BORE DEPTH OF FOUR FEET UNDER TREES. NO OPEN CUT WITHIN TWELVE FEET OF TREES.

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

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PLAN AND PROFILE
HO90XSS45 AND HO90XSO50

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

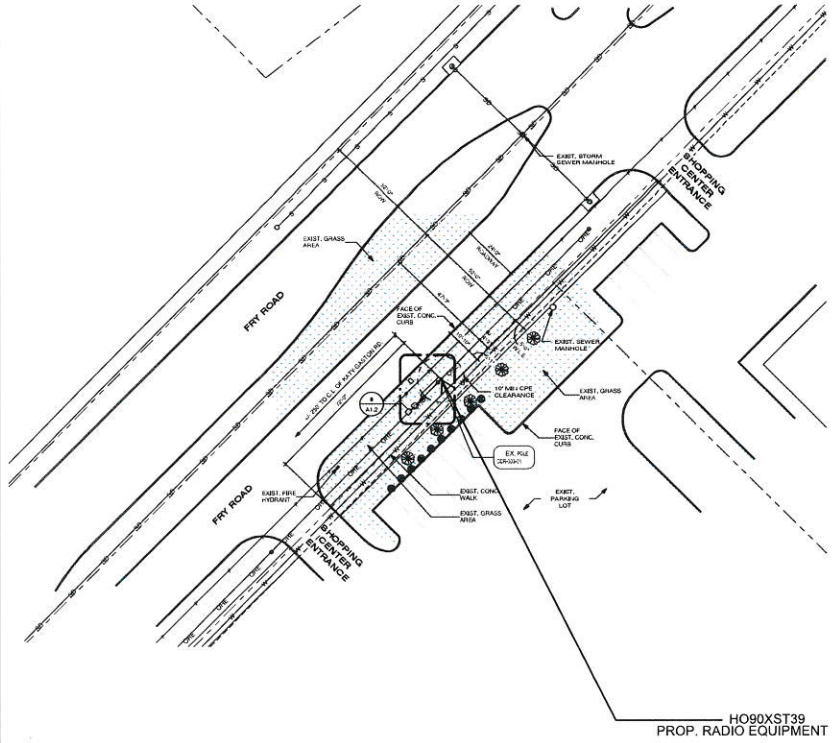
HORZ :
VERT :

SHEET No: 11 OF 16

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS:
8951 S FRY RD.,
HOUSTON, TX 77494

LATITUDE:	29.712240
LONGITUDE:	-95.805409
POLE TYPE:	WOOD POWER POLE
POLE ID #:	N/A

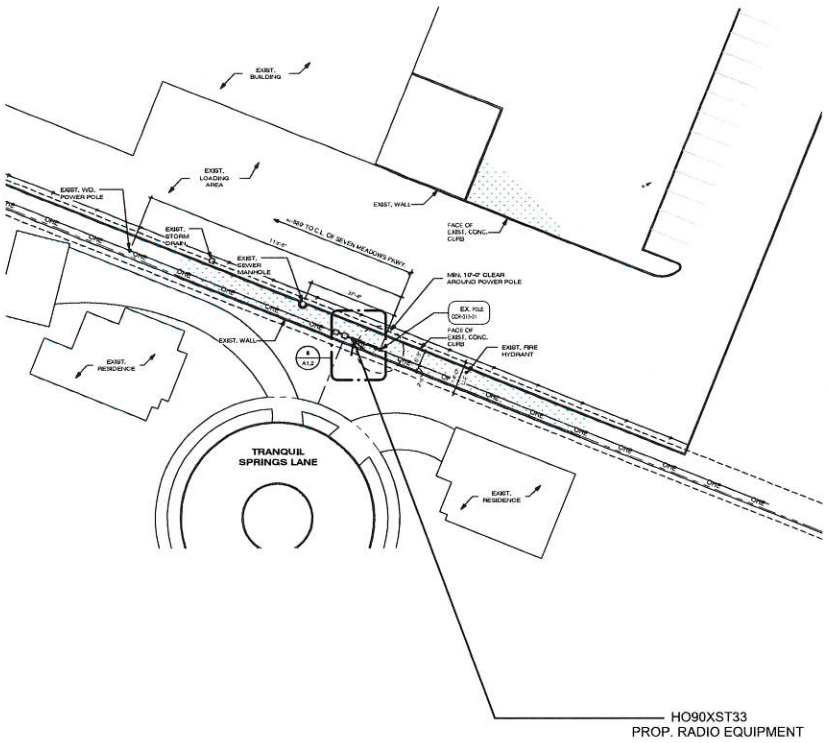


NODE ID: VZW CINCO RANCH DAS/NODE 3

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS:
23103 TRANQUIL SPRING LN.,
HOUSTON, TX 77494

LATITUDE:	29.711960
LONGITUDE:	-95.775470
POLE TYPE:	WOOD POWER POLE
POLE ID #:	N/A



NODE ID: VZW CINCO RANCH DAS/NODE 10

NOTES

1. CONTRACTOR SHALL RESTORE DISTURBED AREAS DURING CONSTRUCTION TO THE SAME OR BETTER CONDITION THAN FOUND PRIOR TO PROJECT COMMENCEMENT.

2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE IMMEDIATE VICINITY OF THE PROPOSED POLE LOCATION PRIOR TO COMMENCING CONSTRUCTION ON THIS PROJECT. IF A CONFLICT IS FOUND THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TREE NOTE

- NO EXCAVATION WITHIN FIFTEEN FEET OF TREES
- MINIMUM BORE DEPTH OF FOUR FEET UNDER TREES, NO OPEN CUT WITHIN TWELVE FEET OF TREES.

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	DETAIL

CobbFendley
Texas Registration No. 274
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262 | www.cobbfendley.com

PLAN AND PROFILE
HO90XST39 AND HO90XST33

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

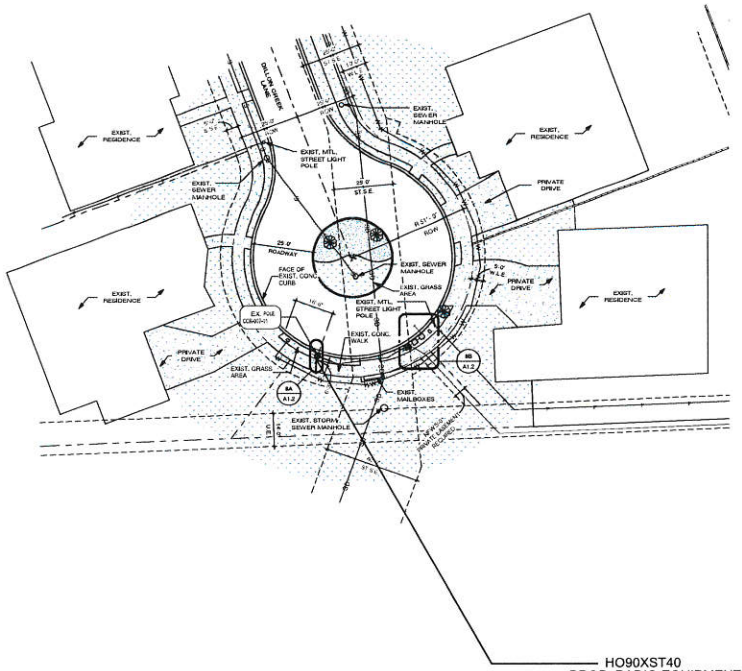
HORZ :
VERT :

SHEET No: 12 OF 16

REFER TO SHEET 4 OF THE APPROVED PLAN SET FOR ADDITIONAL NODE DETAILS.

NEAREST ADDRESS:
6010 DILLON CREEK
HOUSTON, TX 77494

LATITUDE:	29.711070
LONGITUDE:	-95.706460
POLE TYPE:	METAL SLIMLINE POLE
POLE ID #:	N/A



NODE ID: VZW CINCO RANCH DAS/NODE 7

NOTES

1. CONTRACTOR SHALL RESTORE DISTURBED AREAS DURING CONSTRUCTION TO THE SAME OR BETTER CONDITION THAN FOUND PRIOR TO PROJECT COMMENCEMENT.

2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE IMMEDIATE VICINITY OF THE PROPOSED POLE LOCATION PRIOR TO COMMENCING CONSTRUCTION ON THIS PROJECT. IF A CONFLICT IS FOUND THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

TREE NOTE

- NO EXCAVATION WITHIN FIFTEEN FEET OF TREES
- MINIMUM BORE DEPTH OF FOUR FEET UNDER TREES. NO OPEN CUT WITHIN TWELVE FEET OF TREES.

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

CobbFendley
Texas Registration No. 274
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3252 | www.cobbfendley.com

PLAN AND PROFILE
HO90XST40

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

TELECOMMUNICATION DATE

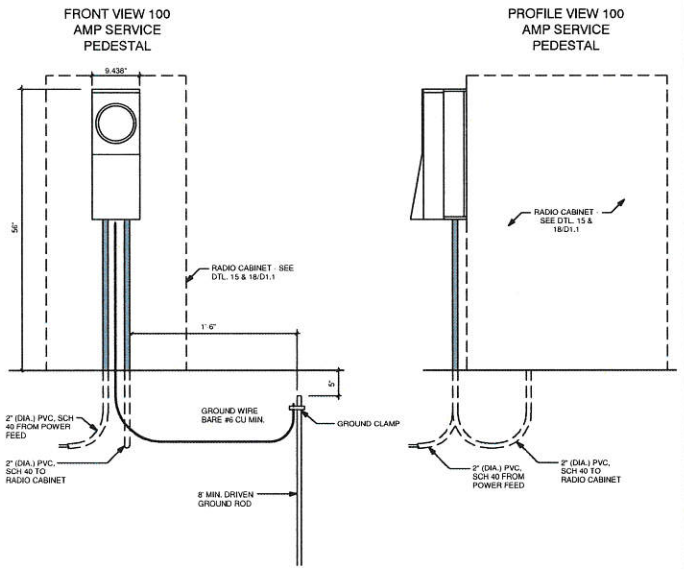
FILE NO:

FOR CITY OF HOUSTON USE ONLY

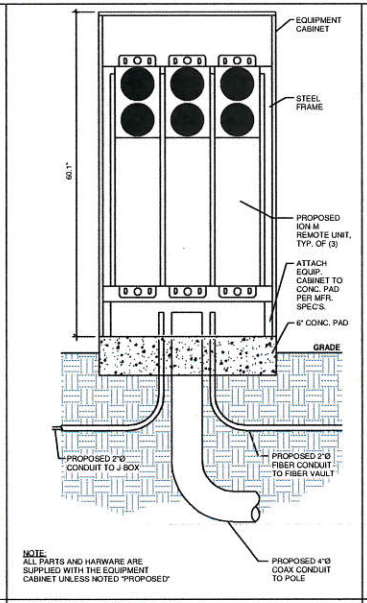
DRAWING SCALE

HORZ :
VERT :

SHEET No: 13 OF 16

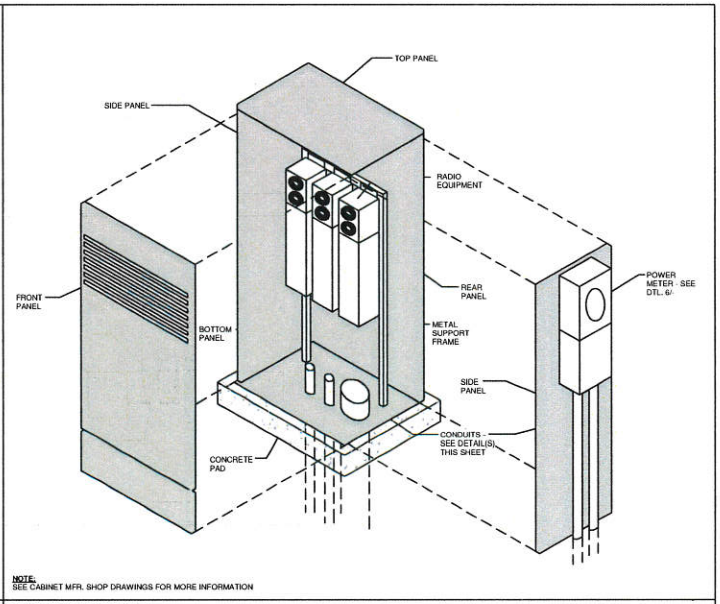


POWER METER - MOUNTED TO RADIO CABINET



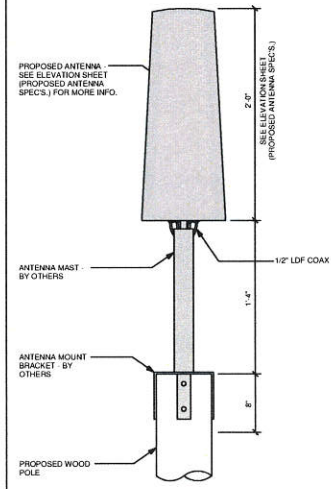
NOTE:
ALL PARTS AND HARWARE ARE SUPPLIED WITH THE EQUIPMENT CABINET UNLESS NOTED "PROPOSED"

EQUIPMENT CABINET SECTION



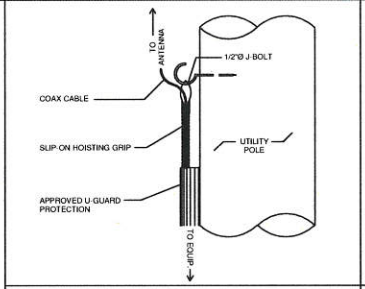
NOTE:
SEE CABINET MFR. SHOP DRAWINGS FOR MORE INFORMATION

EQUIPMENT ENCLOSURE

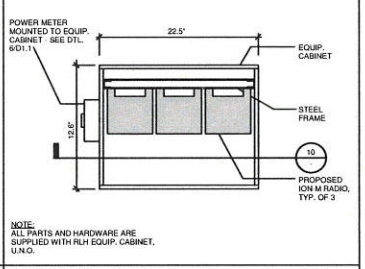


NOTES:
1. ANTENNA MOUNT IS BY OTHERS.
2. CONTRACTOR TO INSTALL WEATHERPROOF WRAP AT ALL CONNECTORS. WRAP TO BE APPROVED BY CROWN CASTLE.
3. COLOR CODE COAX CABLES PER CROWN CASTLE.

ANTENNA MOUNTING DETAIL

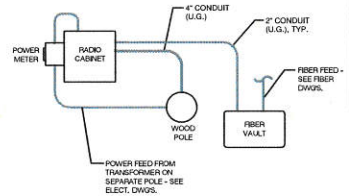


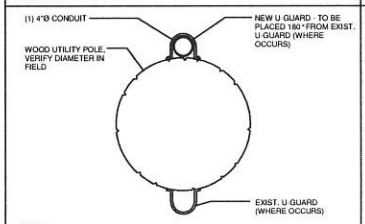
COAX HANGER DETAIL



NOTE:
ALL PARTS AND HARDWARE ARE SUPPLIED WITH RLH EQUIP. CABINET, U.N.O.

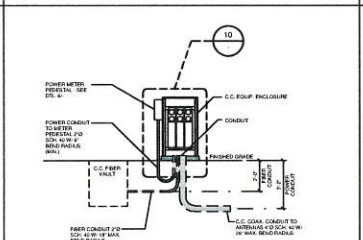
EQUIPMENT ENCLOSURE PLAN





NOTE:
ALL CABLES WILL BE ATTACHED DIRECTLY TO THE POLE WITH U GUARD PROTECTION PROVIDED THAT EXIST. ATTACHMENTS, IF ANY, AND THE PROPOSED ATTACHMENT COMBINED DOES NOT EXCEED THE 40% USE OF FACE OF THE POLE

U0GARD TYP. DETAIL



CONDUIT AND POWER RISER DIAGRAM

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

CobbFendley
Texas Registration No. 274
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262 | www.cobbfendley.com

CONSTRUCTION DETAILS (1 OF 3)

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

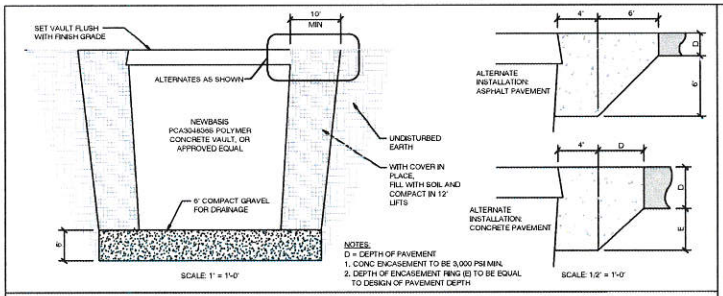
TELECOMMUNICATION DATE

FILE NO:

DRAWING SCALE

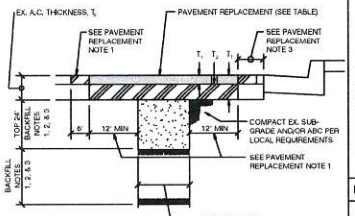
HORZ :
VERT :

SHEET No: 14 OF 16



VAULT INSTALLATION

EXISTING PAVEMENT THICKNESS, T_e	ASPHALT CONCRETE (A.C.) PAVEMENT REPLACEMENT		
	A.C. SINGLE COURSE OR SURFACE COURSE, T_1	A.C. BASE COURSE, T_2	TOTAL THICKNESS, T_3
$T_e \leq 3'$	3' MINIMUM	NONE	3' MINIMUM
$T_e > 3'$	2' MINIMUM	T_e - 2'	T_e (MATCH EXIST)



BACKFILL NOTES:

1. TRENCHES LESS THAN 24" IN WIDTH - 1/2 SACK CSLM, FULL DEPTH OF BACKFILL BOTTOM OF AGGREGATE BASE COURSE (ABC) LAYER IN PAVEMENT STRUCTURE OR 6" BELOW PAVEMENT IN FULL DEPTH PAVEMENT STRUCTURES. CONSTRUCT PAVEMENT STRUCTURE TO MATCH EXISTING AND IN ACCORDANCE WITH CITY DETAILS.
2. TRENCHES 24" TO 6'-0" IN WIDTH - 1/2 SACK CSLM AS DESCRIBED IN NOTE 1 ABOVE WITHIN THE TOP 24" OF THE TRENCH, FOR BALANCE OF BACKFILL.
3. TRENCHES OVER 6'-0" IN WIDTH - FULL DEPTH OF BACKFILL.
4. TREAT ENTIRE DISTURBED SURFACE OF UNPAVED ALLEYS WITH LIGNIN-BASED DUST PALLIATIVE, 1:1 DILUTION RATIO, 0.50 GAL/SY APPLICATION RATE.
5. CSLM SHALL NOT BE USED FOR WATER OR SEWER PIPE BEDDING. SEE BEDDING DETAIL.
6. RECYCLED ASPHALT SHALL NOT BE USED FOR BACKFILL.

PAVEMENT REPLACEMENT NOTES:

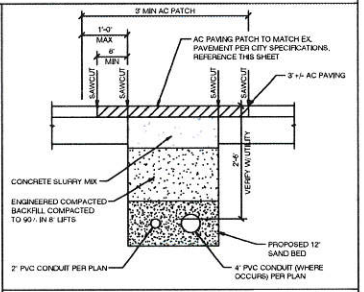
1. "T"-TOP REQUIRED FOR ALL TRENCHES. ASPHALT CONCRETE (A.C.) SURFACE COURSE REPLACEMENT TO BE MILLED DOUBLE "T" CONFIGURATION AS SPECIFIED BELOW FOR PAVEMENTS 4" AND THICKER.

   A. FOR PAVEMENT 4 YEARS AND OLDER: INITIAL A.C. REMOVAL TO BE THE MINIMUM WIDTH REQUIRED FOR PROPER TRENCH COMPACTION. SAWCUT & REMOVE 12" OF A.C. MINIMUM ON EACH SIDE OF THE TRENCH FOR THE "T"-TOP AFTER THE BACKFILL MATERIAL IS PLACED. PAVEMENTS 4" AND THICKER, MILL AND REMOVE THE TOP 2" OF THE SURFACE COURSE A MINIMUM OF 6" ON EACH SIDE OF THE T-TOP PRIOR TO PLACEMENT OF THE FINAL SURFACE COURSE LIFT.

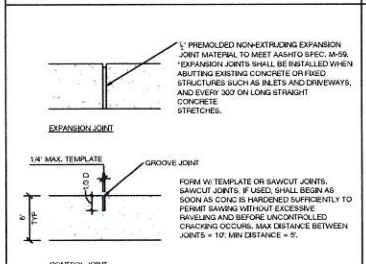
   A. FOR NEW AND OVERLAID PAVEMENT LESS THAN 4 YEARS OLD AND WHEN ALLOWED UNDER THE PROVISIONS OF LOCAL CITY/TOWN CODE AND ALL PAVEMENTS WITH RUBBERIZED SURFACE COURSES: INITIAL A.C. REMOVAL TO BE THE MINIMUM WIDTH REQUIRED FOR PROPER TRENCH COMPACTION. SAWCUT & REMOVE 12" OF A.C. MINIMUM ON EACH SIDE OF THE TRENCH FOR THE "T"-TOP AFTER THE BACKFILL MATERIAL IS PLACED. PAVEMENTS 4" AND THICKER, MILL AND REMOVE THE TOP 2" OF THE SURFACE COURSE EQUALLY ON BOTH SIDES OF THE TRENCH TO A MINIMUM TOTAL WIDTH OF 10 FEET. FOR PAVEMENTS LESS THAN 4" THICK SAWCUT, REMOVE AND REPLACE THE ENTIRE PAVEMENT SURFACE TO A MINIMUM TOTAL WIDTH OF 10 FEET, AS DIRECTED BY THE ENGINEER.

   B. FOR DEEP PAVEMENT STRUCTURES REQUIRING TWO OR MORE PAVEMENT BASE LIFTS: INITIAL A.C. REMOVAL TO BE THE MINIMUM WIDTH REQUIRED FOR PROPER TRENCH COMPACTION. SAWCUT, REMOVE AND REPLACE A.C. ON BOTH SIDES OF THE TRENCH AS NECESSARY TO ACCOMMODATE A RIDE ON TYPE VIBRATORY ROLLER COMPACTOR FOR PLACEMENT OF THE A.C. BASE COURSE LIFTS. MATCH EXISTING A.C. DEPTH. MILL AND REMOVE THE TOP 2" OF THE SURFACE COURSE EQUALLY ON BOTH SIDES OF THE TRENCH TO A MINIMUM TOTAL WIDTH OF 10 FEET.
2. ASPHALT CONCRETE SHALL BE IN ACCORDANCE WITH THE LOCAL REQUIREMENTS.
3. IF PAVEMENT REMNANT IS LESS THAN 36", REMOVE AND REPLACE PAVEMENT AS PER THIS DETAIL.
4. AGGREGATE BASE COURSE SHALL BE PROVIDED TO MATCH EXISTING ABC THICKNESS IN ADJACENT ROADWAY.
5. REFER TO LOCAL JURISDICTION SPECIFICATIONS. FOR PAVEMENT SMOOTHNESS REQUIREMENTS.

TRENCH AND PATCHING REQUIREMENTS

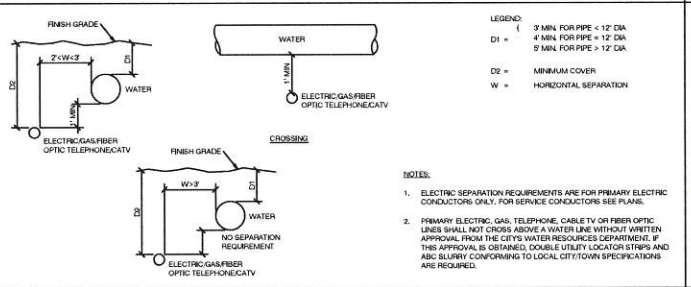


POWER TRENCH



NOTE:
JOINT LAYOUT FOR CONC. STREETS IS TO BE SUBMITTED TO APPROPRIATE GOVERNING MUNICIPALITY FOR APPROVAL.

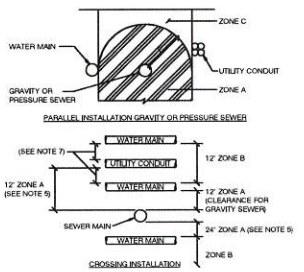
CONCRETE JOINT DETAILS



LEGEND:
D1 = 3' MIN. FOR PIPE < 12" DIA; 4' MIN. FOR PIPE = 12" DIA; 5' MIN. FOR PIPE > 12" DIA
D2 = MINIMUM COVER
W = HORIZONTAL SEPARATION

NOTES:
1. ELECTRIC SEPARATION REQUIREMENTS ARE FOR PRIMARY ELECTRIC CONDUCTORS ONLY. FOR SERVICE CONDUCTORS SEE PLANS.
2. PRIMARY ELECTRIC, GAS, TELEPHONE, CABLE TV OR FIBER OPTIC LINES SHALL NOT CROSS ABOVE A WATER LINE WITHOUT WRITTEN APPROVAL FROM THE CITYS WATER RESOURCES DEPARTMENT. IF THIS APPROVAL IS OBTAINED, DOUBLE UTILITY LOCATOR STRIPS AND ABC SLURRY CONFORMING TO LOCAL CITY/TOWN SPECIFICATIONS ARE REQUIRED.

MINIMUM UTILITY SEPARATION REQUIREMENTS



NOTES:
1. SEPARATION DISTANCES AND/OR EXTRA PROTECTION SHALL BE REQUIRED TO PROTECT WATER MAINS FROM CONTAMINATION BY SANITARY SEWER MAINS.
2. SEE CROSS INSTALLATION DETAIL ON THIS SHEET FOR LIMITS OF SEPARATION/EXTRA PROTECTION. ALL DISTANCES ARE MEASURED PERPENDICULARLY FROM THE OUTSIDE OF THE PIPES.
   A. NO WATER MAINS OR UTILITY CONDUITS SHALL FALL WITHIN ZONE A.
   B. EXTRA PROTECTION WILL BE REQUIRED WHEN THE WATER MAIN FALLS WITHIN ZONE B. EXTRA PROTECTION SHALL CONSIST OF CONSTRUCTING SANITARY SEWER MAINS WITH MECHANICAL JOINT OR RESTRAINED JOINT DUCTILE IRON PIPE. DUCTILE IRON PIPE SHALL COMPLY WITH THE REQUIREMENTS FOR SEWER INSTALLATION. IN A CROSSING, THE NUMBER OF JOINTS SHALL BE HELD TO A MINIMUM WITH ONE FULL JOINT OF PIPE CENTERED OVER/UNDER THE OTHER. AN ALTERNATIVE PROTECTION MAY CONSIST OF ENCASING SEWER MAINS IN REINFORCED CONCRETE.
   C. NO ADDITIONAL PROTECTION WILL BE REQUIRED OUTSIDE OF ZONES A AND B.
   D. WATER MAINS PERMITTED IN ZONE C ONLY WITH WRITTEN PERMISSION FROM THE WATER RESOURCES DEPARTMENT.
3. SEPARATION REQUIREMENTS FOR 4" OR 6" INDIVIDUAL HOUSE SERVICE CONNECTIONS SHALL COMPLY WITH THE PLUMBING CODES ADOPTED BY THE LOCAL CITY/TOWN.
4. RECLAIMED WATER SHALL BE CONSIDERED AS POTABLE WATER WHEN PLACED NEXT TO A SANITARY SEWER AND CONSIDERED A PRESSURE OR FORCED SANITARY SEWER MAIN, WHEN PLACED NEXT TO A POTABLE WATER MAIN.
5. ZONE A IS 24' WHERE WATER MAINS AND UTILITY CONDUITS CROSS PRESSURE SEWER MAINS.
6. REFERENCE LOCAL CITY/TOWN STANDARD DETAILS.

SANITARY SEWER SEPARATION / PROTECTION FROM WATER & UTILITIES

NOTICE

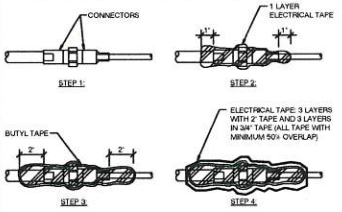
The radio frequency (RF) emissions at this site have been evaluated for potential RF exposure to personnel who may need to work near these antennae

RF EXPOSURE AT 2 FEET OR CLOSER TO THE FACE OF THE ANTENNA MAY EXCEED THE FCC PUBLIC EXPOSURE STANDARD AND THUS ONLY QUALIFIED RF WORKERS MAY WORK IN THIS 2 FOOT EXCLUSION ZONE. OTHERS WHO NEED TO WORK IN THE EXCLUSION ZONE SHOULD CALL: (866) 446-3984 FOR INSTRUCTIONS PRIOR TO COMMENCING WORK.

REFER TO SITE: _____

CROWN

FCC RF EXPOSURE SIGN



NOTE:
1. ALL TAPE ENDS SHALL BE CUT (DO NOT STRETCH), COAT WITH 3M SCOTCHKOTE SPRAY SEALER.
2. VERTICAL CONNECTIONS SHALL BE TAPED FROM THE BOTTOM UP SO OVERLAP MOVES WATER AWAY FROM CONNECTION. TYP.

CABLE CONNECTOR WATERPROOFING

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

CobbFendley
Texas Registration No. 274
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262 | www.cobbfendley.com

CONSTRUCTION DETAILS (2 OF 3)

NOTE: CITY SIGNATURE VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

FORT BEND COUNTY

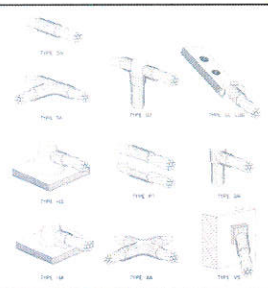
TELECOMMUNICATION DATE

FILE NO: FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE

HORZ :
VERT :

SHEET No: 15 OF 16



CADWELD DETAILS

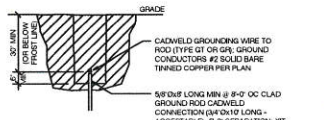
FAULT CURRENT CALCULATION					
FAULT	F1	F2	F3	F4	F5
LOCATION	CSU POS	PANEL @ 20'	PANEL @ 150'	PANEL @ 240'	PANEL @ 370'
AFC (FROM SOURCE)	49300	49300	49300	49300	49300
CONDUCTOR SIZE		#6	#4	#2	#1/0
CONDUCTOR TYPE		AL	AL	AL	AL
LENGTH		20	155	240	370
# OF SETS		1	1	1	1
TYPE OF CONDUIT		PVC	PVC	PVC	PVC
'C' VALUE		1462	2350	3730	5838
VOLTAGE PRIMARY		240	240	240	240
VOLTAGE SECONDARY (XFMR)					
XFMR IMPEDENCE					
XFMR KVA					
'f' FACTOR		5.54	27.10	26.43	26.04
MULTIPLIER		0.15	0.04	0.04	0.04
CALCULATED FAULT CURENT	49300	7533	1755	1797	1823
RATED (SERIES / FULLY)		FULLY @ 10K	FULLY @ 10K	FULLY @ 10K	FULLY @ 10K

FAULT CURRENT CALCULATION

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL OTHER APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL OBTAIN ALL PERMITS, PAY ALL PERMIT FEES, AND SCHEDULE ALL REQUIRED INSPECTIONS. CONTRACTOR SHALL OBTAIN LOCAL POWER COMPANY APPROVAL AND COORDINATE SERVICE ENTRANCE REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY SERVICE LOCATIONS AND CONTACT PROJECT MANAGER WITH DISCREPANCIES FROM PLAN.
4. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIAL DESCRIBED ON THIS DRAWING, AND ALL ITEMS INCIDENTAL TO COMPLETING AND PRESENTING THIS PROJECT AS FULLY OPERATIONAL. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED.
5. CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT (UNDERGROUND) AND IMC CONDUIT ABOVE GROUND.
6. PROVIDE 2 1/2" SCHEDULE 40 PVC UNDERGROUND CONDUIT WITH PULL WIRE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND POWER METER. CONTRACTOR SHALL DETERMINE REQUIRED NUMBER AND LOCATION OF JUNCTION BOXES PER UTILITY STANDARDS.
7. USE 1" SCHEDULE 40 PVC CONDUIT AND APPROPRIATE FITTINGS TO ENTER NSR LOAD CENTER.
8. CONTRACTOR TO NOTIFY ALL APPROPRIATE PARTIES PRIOR TO CONSTRUCTION AND SHALL PROVIDE AND MAINTAIN A TRAFFIC CONTROL PLAN PER LOCAL REQUIREMENTS.
10. CONTRACTOR TO LOCATE ALL UTILITIES IN PROJECT AREA PRIOR TO CONSTRUCTION THROUGH BLUE STAKE.
11. VERIFY DEPTH OF EXISTING UTILITY CROSSING POINTS VIA APPROVED POTHOLING METHODS AND NOTE ON PLAN SETS FOR AS-BUILT CLOSE OUT.
12. NOTE DEPTH AND LOCATIONS OF ALL INSTALLED UTILITIES ON AS-BUILT REDLINE DRAWINGS.
13. IF EXISTING IRRIGATION LINES ARE ENCOUNTERED, CONTRACTOR SHALL NOTIFY OWNER PRIOR TO DISTURBING OR MODIFYING.
14. CONTRACTOR SHALL NOT RELOCATE PROPOSED EQUIPMENT OR POLE LOCATIONS WITHOUT WRITTEN APPROVAL FROM CROWN CASTLE AND PROJECT ENGINEERS
15. MATERIAL SUBSTITUTIONS ARE SUBJECT TO CROWN CASTLE AND ENGINEERING REVIEW PRIOR TO CONSTRUCTION.

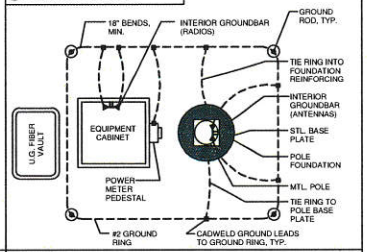
ELECTRICAL NOTES

NOTES:
1. VERIFY LIGHT GROUNDING REQUIREMENTS FOR LIGHT ARMS WHEN APPLICABLE.
2. ALL GROUND BARS ASSOCIATED WITH POLE TO BE MOUNTED AT INTERIOR (SCREENED FROM VIEW).
3. MOUNT ANTENNA GROUND BUSS VERTICALLY BEHIND LOWER ANTENNA ARRAY.
4. ALL CONNECTORS SHALL BE DOUBLE LUG.
5. GROUND BAR KITS TO INCLUDE:
1/4" THICK TIN COPPER BUSS BAR, SS BRACKET, INSULATOR OR EQUIVALENT, 3/8"Ø BOLT AND LOCKWASHER.

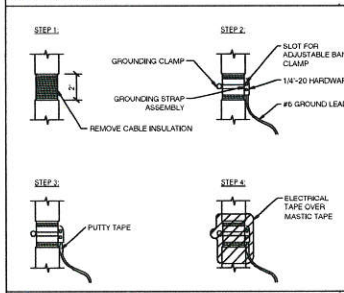


GROUND ROD DETAIL

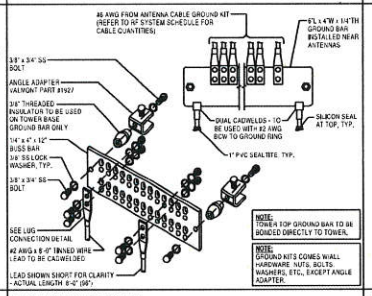
■ CADWELD CONNECTION - SEE DTL. 1/-
◀ MECHANICAL CONNECTION
◉ GROUND ROD - SEE DTL. 13/-



EQUIPMENT GROUNDING SCHEMATIC DTL.



COAXIAL CABLE GROUNDING



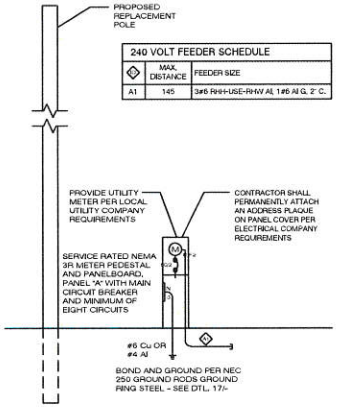
GROUND BUSS BAR DETAIL

PANEL A — AMPACITY: 60 — MAINS: MCB — KAIC: 10 — RATING: LINK FAULT CALC — VOLTAGE: 120/240V — NEMA: 3R — MOUNTING: SURF — CIRCUITS: 8

PANEL A	NO.	M	C	N	R	L	CB	PHASE		CB	L	R	N	C	M	NO.	LOAD
CONVENIENCE RECEPTACLE	1				0.36		20/1	0.91		20/1			0.55			2	RADIO EQUIPMENT
CONVENIENCE RECEPTACLE	3				0.36		20/1		0.91	20/1			0.55			4	RADIO EQUIPMENT
EXHAUST FAN	5	0.36					20/1	0.36		20/1						6	SPARE
BUSSED SPACE	7								0.36	20/1					0.36	8	SUPPLY FAN
							LIGHTING LOAD @ 125% =	0.00	0.00	KVA							
							RECEPTACLES (1ST 10KVA @ 100% + REMAINDER @ 50%) =	0.36	0.36	KVA							
							NON-CONTINUOUS LOAD @ 125% =	0.55	0.55	KVA							
							CONTINUOUS LOAD @ 125% =	0.00	0.00	KVA							
							MOTORS + 25% OF LARGEST MOTOR =	0.45	0.45	KVA							
							TOTAL PANEL A DEMAND =	1.36	1.36	KVA							
							TOTAL DEMAND AMPS =	11.33	11.33	KVA							

PER NEC 210.4(B)
PROVIDE COMMON TRIP HANDLES FOR ALL MULTI-CIRCUIT CONDUIT RUNS.

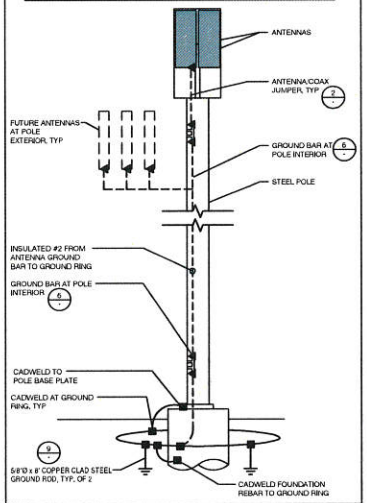
ELECTRICAL PANEL SCHEDULES



NOTES:
1. EC TO FIELD VERIFY SITE CONDITION.
2. ALL EQUIPMENT IS NEW UNLESS NOTED OTHERWISE.
3. ALL EXTERIOR EQUIPMENT SHALL BE WEATHERPROOF.
4. PROVIDE ADEQUATE SERVICE CONDUCTOR LENGTH AT THE BASE OF THE RISER POLE FOR LOCAL UTILITY COMPANY TO INSTALL UP THE POLE AND CONNECT TO UTILITY COMPANY SECONDARY LINES WITH A 12" DRIP LOOP.
5. ALL TRENCHES SHALL BE MIN. 24" IN DEPTH.
6. ALL WIRE TO BE THHN OR THWN INSULATION OR EQUIVALENT EXCEPT WHERE NOTED OTHERWISE.
7. FUTURE BREAKERS IN PANEL B SHALL BE SERIES RATED WITH THEIR RESPECTIVE UPSTREAM REMOTE MAIN PROTECTIVE DEVICE. A TWO TIER (22K/10KVA) SYSTEM IS SPECIFIED.
8. WHERE NECESSARY TO TERMINATE OVERSIZED CONDUCTORS, CONTRACTOR TO CONVERT CONDUCTORS TO PANEL LUG APPROVED SIZE USING AN NEC COMPLIANT CONNECTOR.

ONE-LINE DIAGRAM

■ CADWELD - SEE DETL. 1/-
◀ MECHANICAL CONNECTION
GROUND BAR (GB) 14" x 4" x 1/4" COPPER
MASTER GROUND BAR (GB) 24" x 4" x 1/4" COPPER
GROUND
4/0 BARE TINNED, STRANDED COPPER CONDUCTOR, MIN. 36" BELOW GRADE OR 6" BELOW LOCAL FROSTLINE



GROUNDING SCHEMATIC - METAL POLE

ENLARGED ELECTRICAL PLAN

CROWN CASTLE | FIBER

REVISION	REVISION DATE	DESCRIPTION	INITIAL

CobbFendley
Texas Registration No. 274
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262 | www.cobbfendley.com

CONSTRUCTION DETAILS (3 OF 3)

BOND, UNIT RELEASE VALID FOR ONE YEAR ONLY AFTER DATE OF RELEASE

FORT BEND COUNTY

TELECOMMUNICATION — DATE

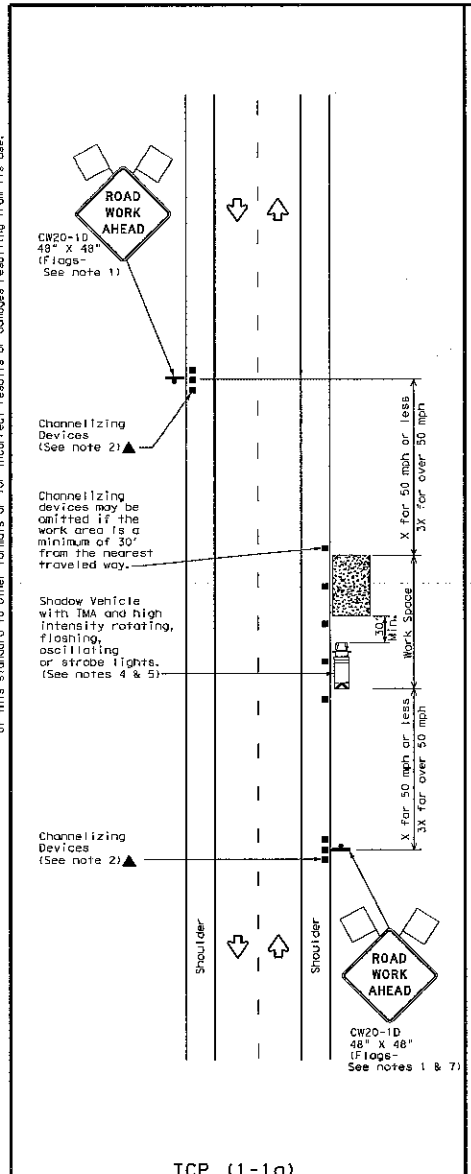
FILE NO: — FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE

HORZ :
VERT :

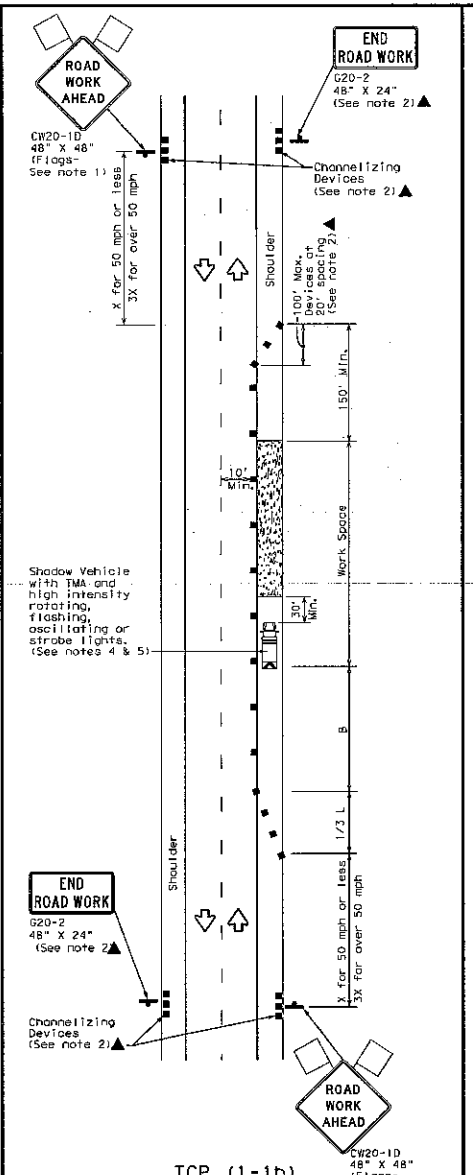
SHEET No: 16 OF 16

DATE:
FILE:



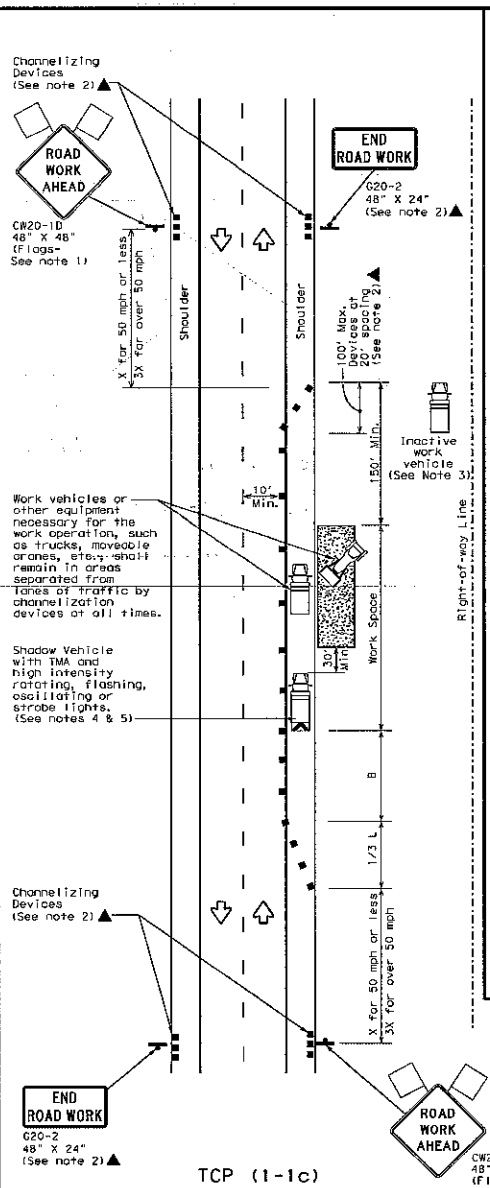
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45		450'	495'	540'	45'	90'	320'	195'
50	L=WS	500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L-Length of Taper(FT) W-Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
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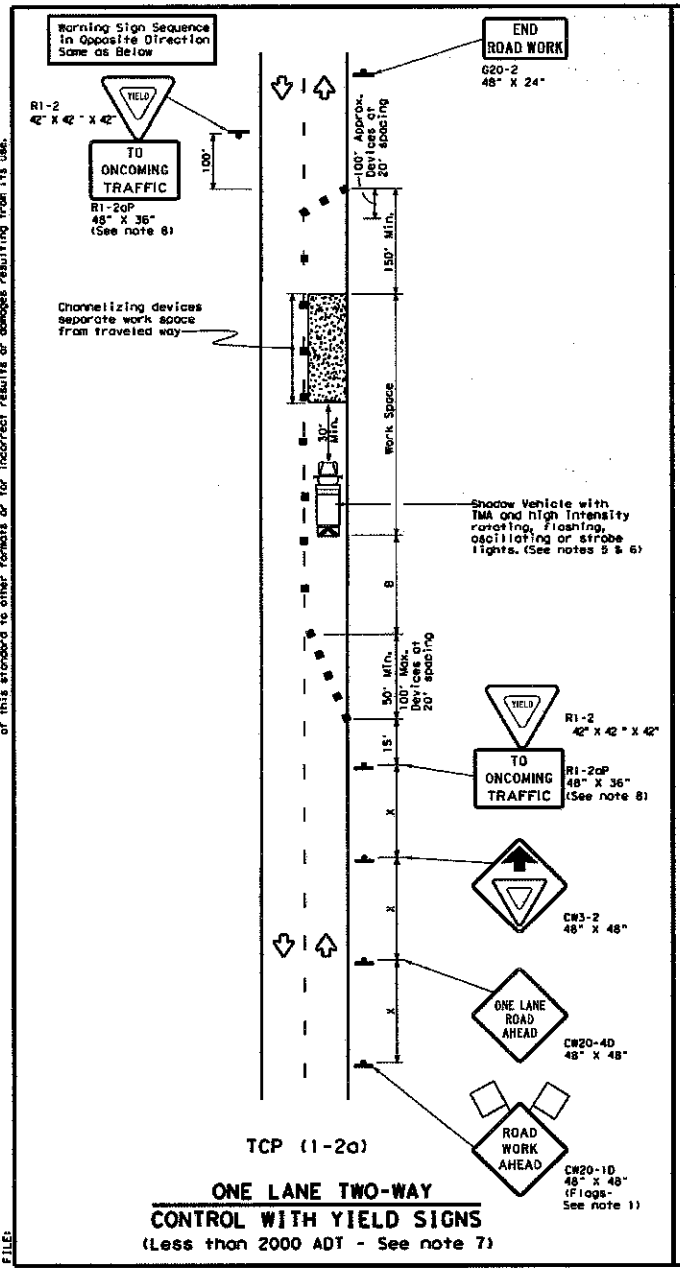
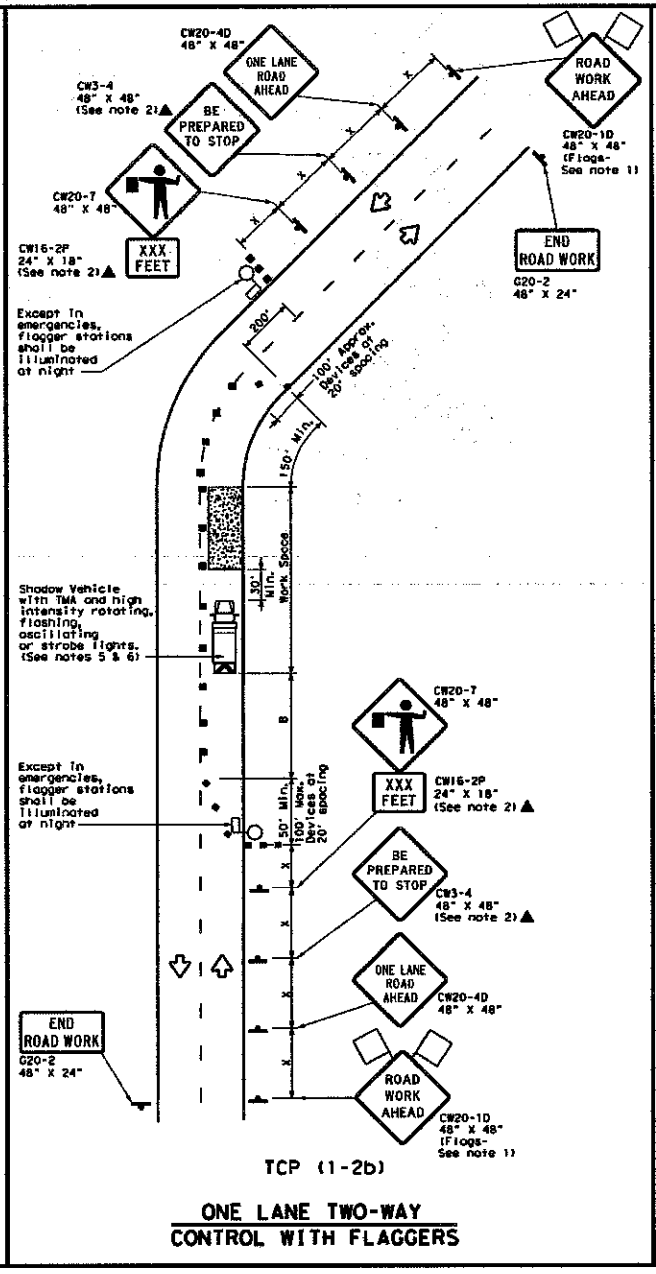
REVISIONS 2-94 4-98 / 8-95 2-12 / 1-97 2-18	DIST	COUNTY		SHEET NO.

151





LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

7. R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
8. R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation — Traffic Operations Division Standard

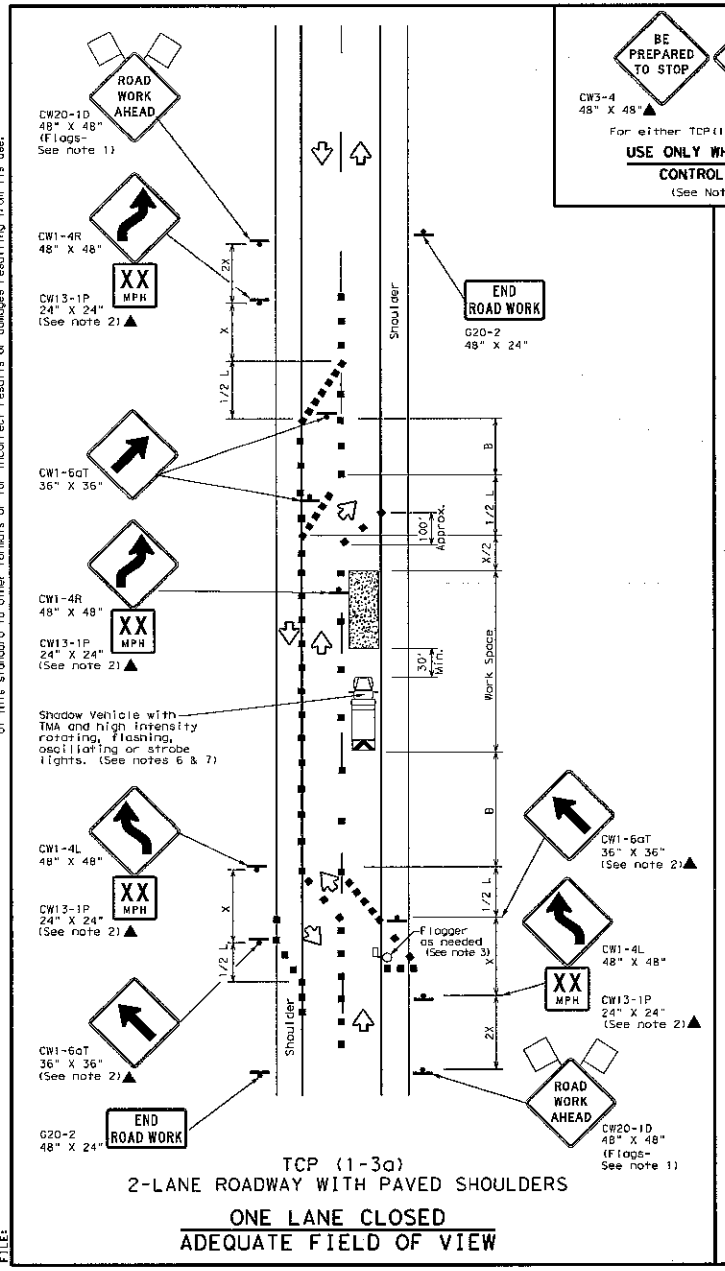
TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn | DN: | CK: | DW: | CK:
©TxDOT December 1985 | CONT | SECT | JOB | HIGHWAY
REVISIONS
4-90 4-98
2-94 2-12
1-97 2-18
DIST | COUNTY | SHEET NO.

DATE:
FILE:

DATE:
FILE:



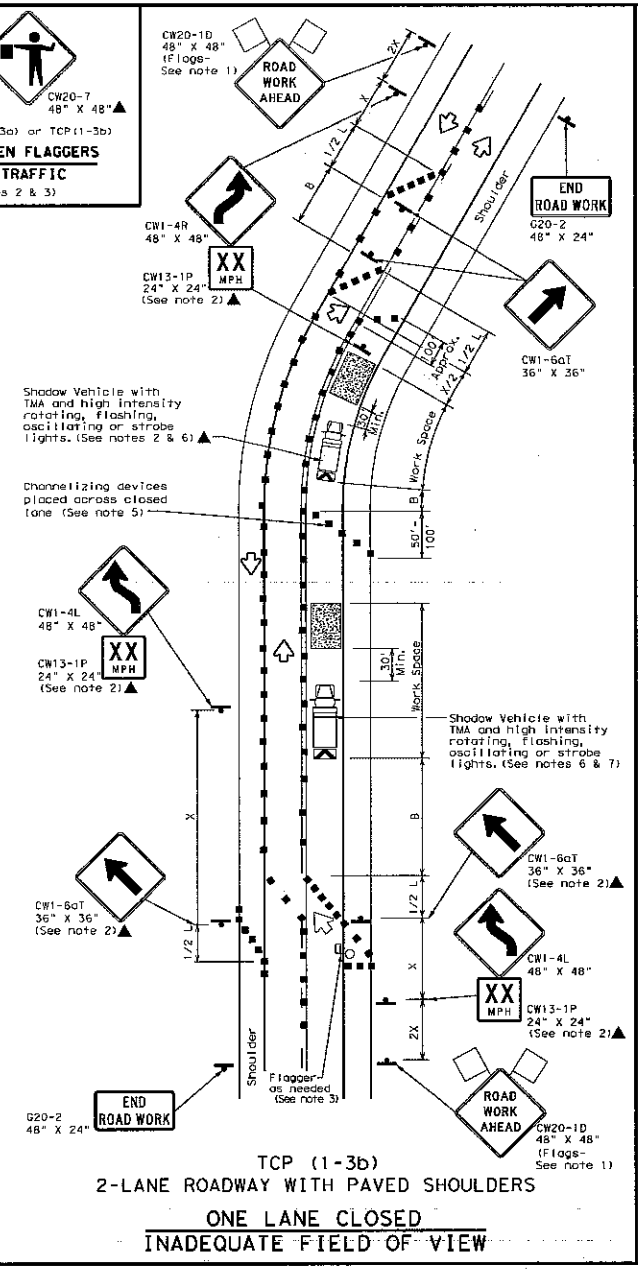
TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

For either TCP(1-3a) or TCP(1-3b)

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC

(See Notes 2 & 3)



TCP (1-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45		450'	495'	540'	45'	90'	320'	195'
50	L=WS	500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
4. DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
5. When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
8. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20', or 15' if posted speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 / 8-95 2-12 / 1-97 2-18	DIST	COUNTY		SHEET NO.

1151

DATE:
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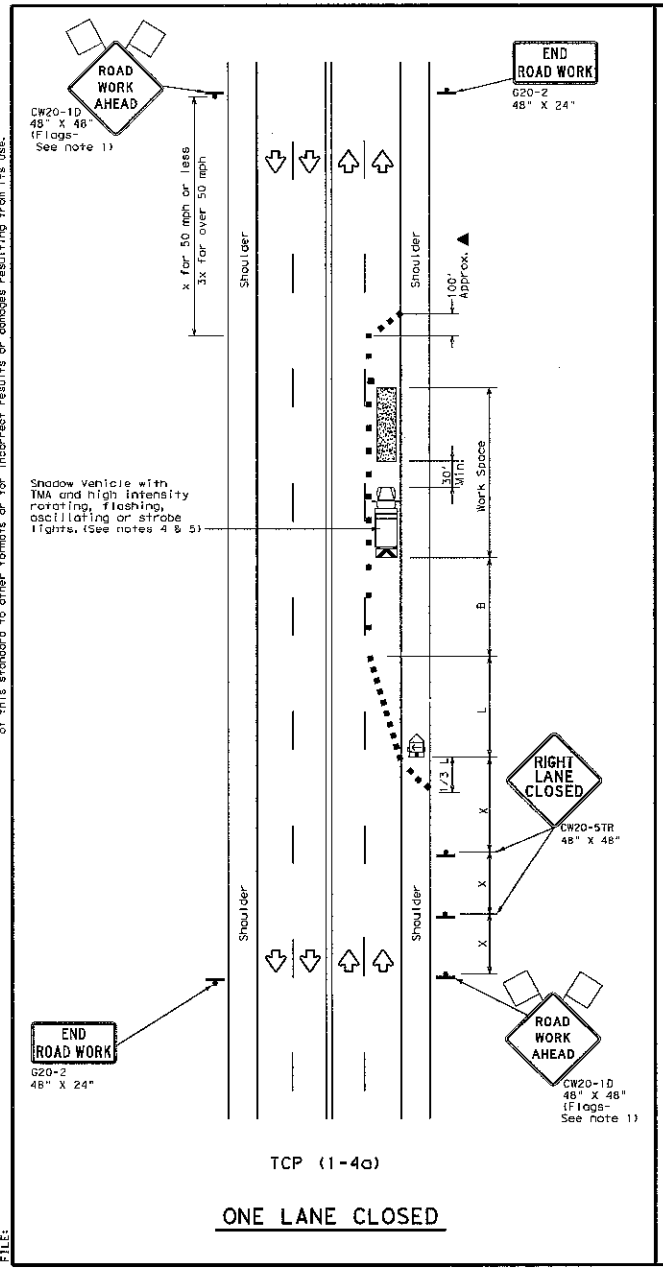
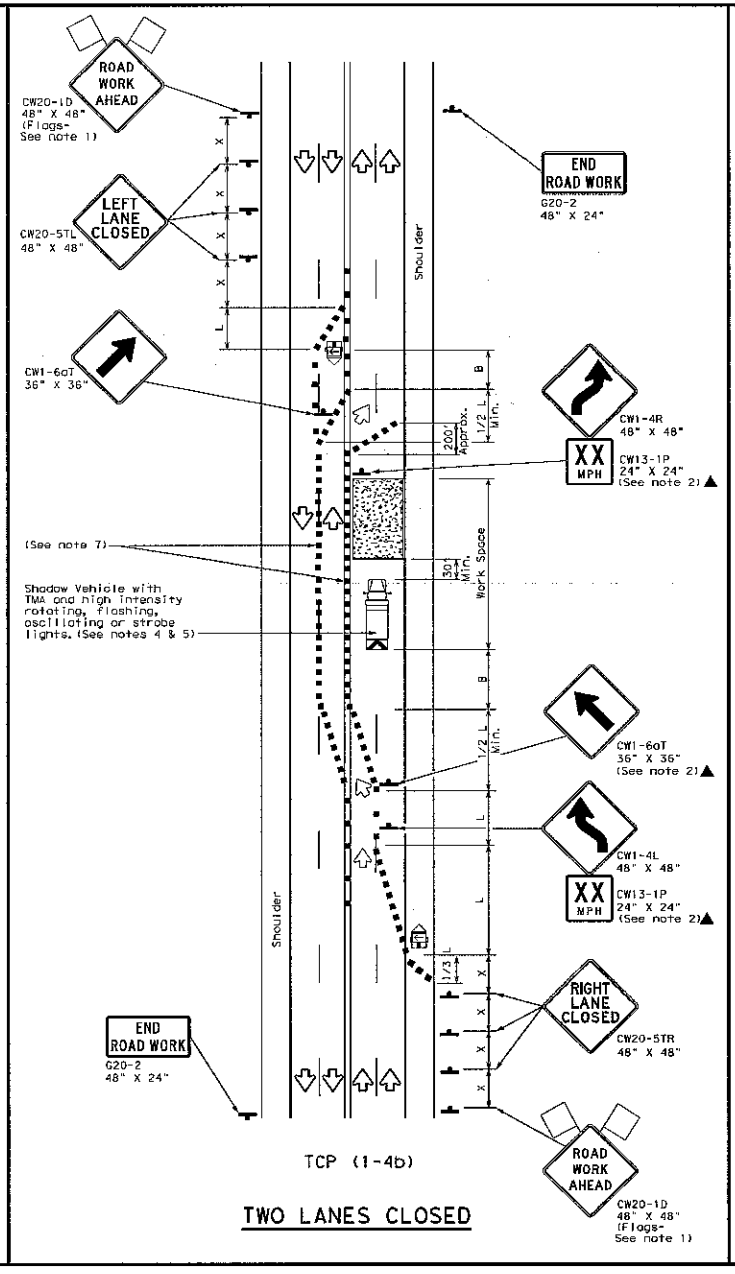


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

6. If this TCP is used for a left lane closure , CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
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REVISIONS 2-94 4-98 / 8-95 2-12 / 1-97 2-18	DIST	COUNTY		SHEET NO.

154

DATE:
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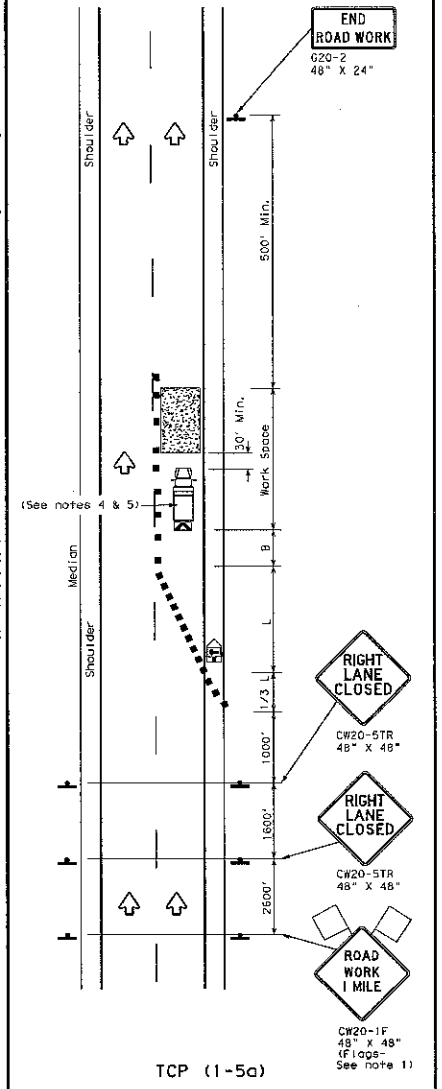
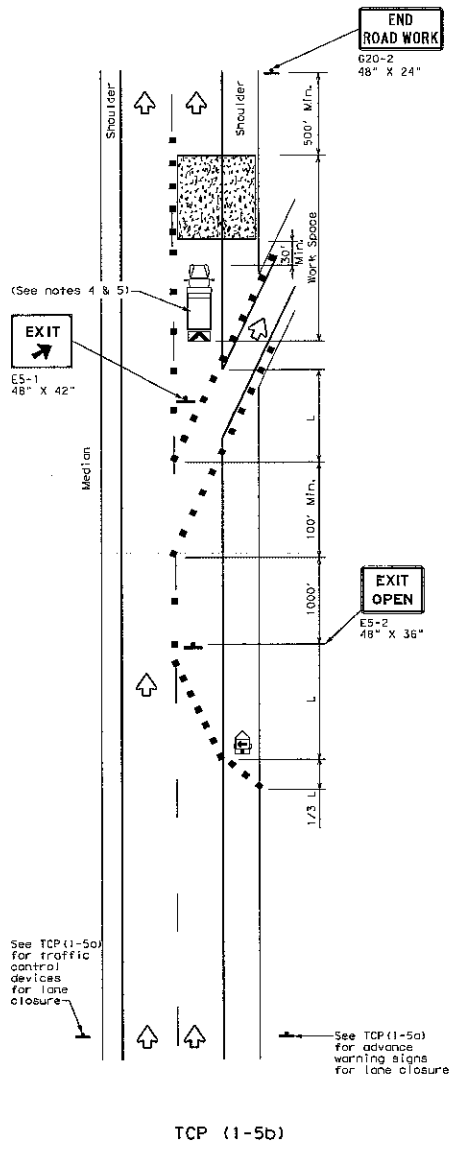


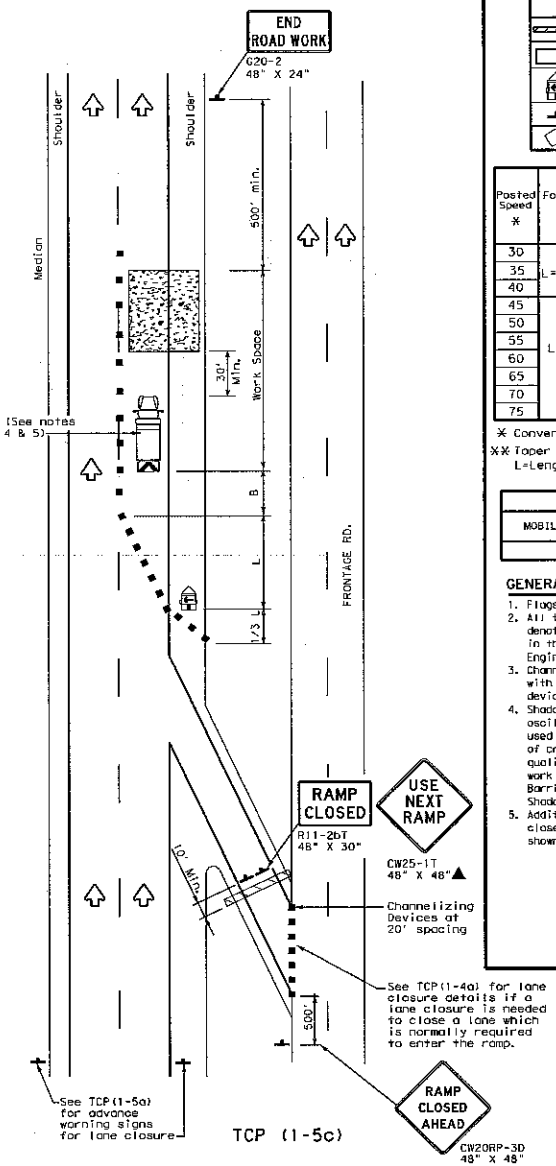
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓		

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

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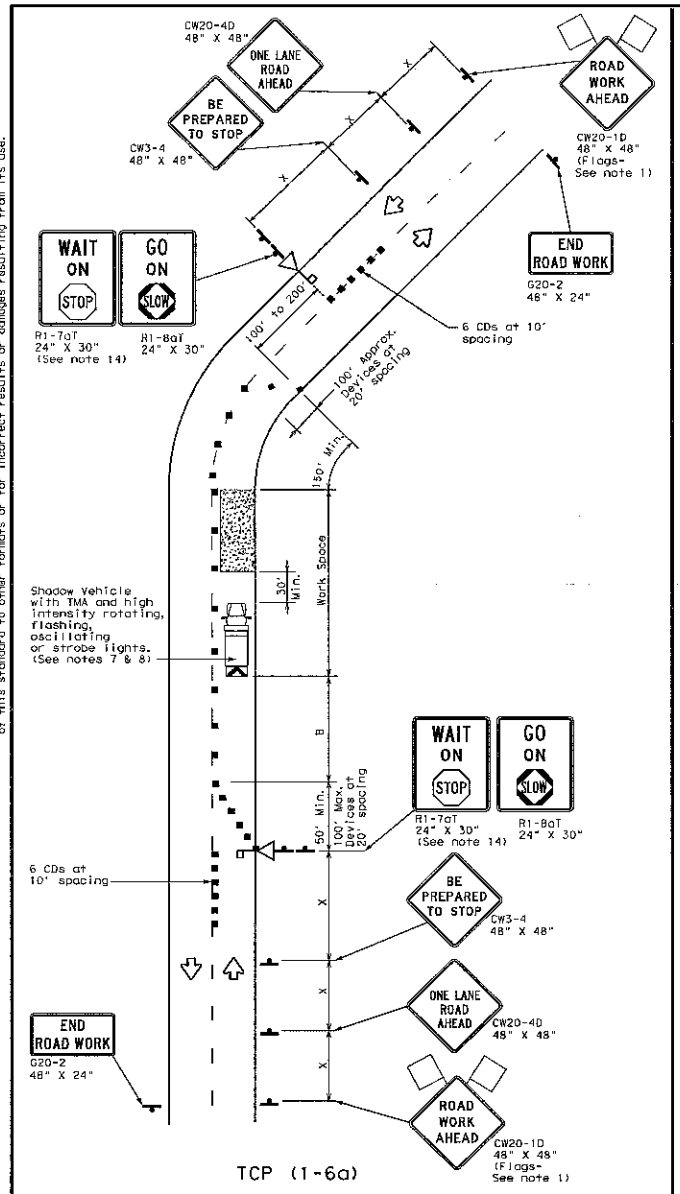
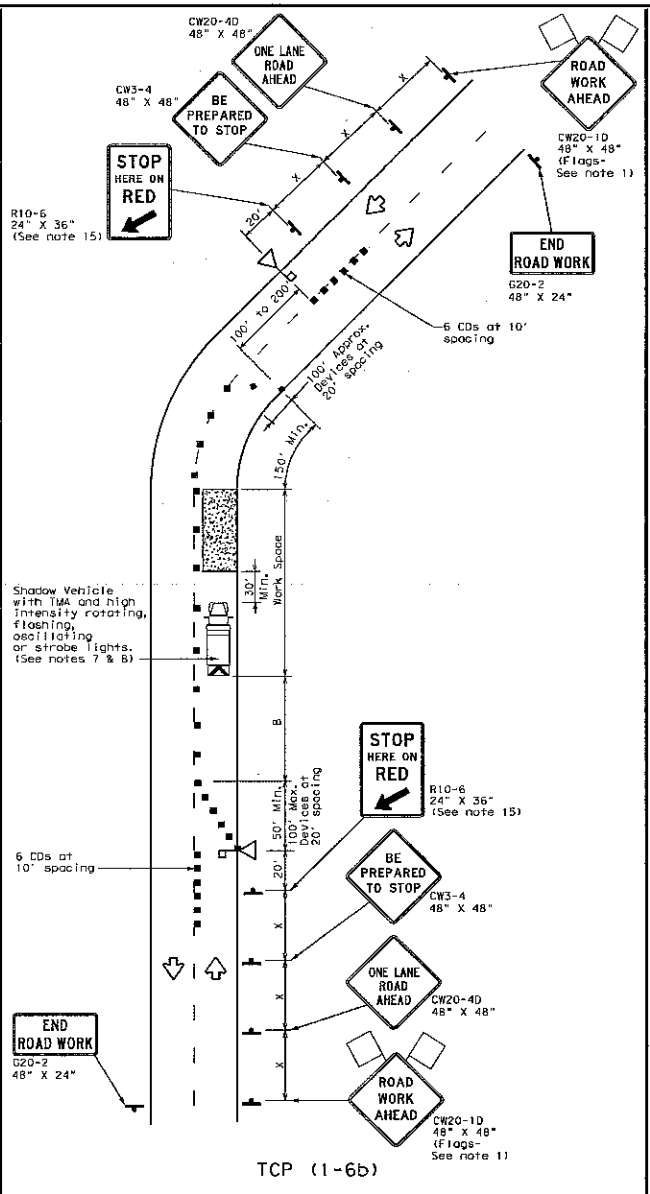


TCP (1-6a)

ONE LANE TWO-WAY CONTROL WITH STOP/SLOW AFADs



TCP (1-6b)

ONE LANE TWO-WAY CONTROL WITH RED/YELLOW LENS AFADs

LEGEND			
	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Automated Flagger Assistance Device (AFAD)	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. AFADs shall only be used in situations where there is one lane of approaching traffic in the direction to be controlled.
3. Adequate stopping sight distance must be provided to each AFAD location for approaching traffic. (See table above).
4. Each AFAD shall be operated by a qualified/certified flagger. Flaggers operating AFADs shall not leave them unattended while they are in use.
5. One flagger may operate two AFADs only when the flagger has an unobstructed view of both AFADs and of the approaching traffic in both directions.
6. When pilot cars are used, a flagger controlling traffic shall be located on each approach. AFADs shall not be operated by the pilot car operator.
7. All AFADs shall be equipped with gate arms with an orange or fluorescent red-orange flag attached to the end of the gate arm. The flag shall be a minimum of 16" square.
8. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
9. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
10. Flaggers should use two-way radios or other methods of communication to control traffic.
11. Length of work space should be based on the ability of flaggers to communicate.
12. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the AFAD.
13. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
14. The R1-7aT "WAIT ON STOP" sign and the R1-8aT "GO ON SLOW" sign shall be installed at the AFAD location on separate supports or they may be fabricated as one 48" x 30" sign. They shall not obscure the face of the STOP/SLOW AFAD.
15. The R10-6 "STOP HERE ON RED" arrow sign shall be offset so as not to obscure the lenses of the AFAD.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADS)

TCP(1-6)-18

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