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: 2017-12017

Applicant: **Crown Castle NG Central LLC/Shift Companies**

Job Location Site: **3902 1/2 Greenbusch Road, 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.

On this 28th day of February, 2017, Upon Motion of Commissioner Morales, seconded by Commissioner Patterson, 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: Charles O. Dy
for County Engineer

N/A
By: _____
Drainage District Engineer/Manager

Presented to Commissioners Court and approved.

Date Recorded 3-9-17 Comm. Court No. 14H

Clerk of Commissioners Court
By: Linda Wilson
Deputy

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

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: 2017-12017

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.

Charles O. Ay
Permit Administrator

2/21/17
Date

SHIFT

November 28, 2016

Carmen Escobar, CFM
Permit Administrator
Fort Bend County Engineering
301 Jackson St, Richmond, TX 77469

RE: Cinco Ranch Traffic Control Plan
- Shift Project #160614

Carmen,

Per our conversation on the phone, the work we are doing in the ROW will not require any road closures. There is no TCP required, the contractor will take adequate measure to ensure they are not impeding the public way.

Please let me know if you need anything else.

Thank you,

Chris Myers
Principal
SHIFT Companies

C:\Users\ruebe_000\Documents\AAA - Shift Companies\AAA - CROWN CASTLE\Houston\Cinco Ranch Expansion\Sites\CCR-46 - Project - 12.14.15.rvt

12/7/2016 3:09:58 PM

CROWN CASTLE

PROJECT NAME: CINCO RANCH EXPANSION
PROJECT ADDRESS: GREENBUSCH RD & WILLOW FORK RD

PROJECT TYPE: METAL SLIMLINE POLE
HUB AREA: CINCO RANCH - HGCW
NODE #(s): **CCR-46**
COORDINATES: LAT: 29.740344, LONG: -95.810474

T1.1 - SHEET INDEX

FORT BEND COUNTY ENGINEER

ENGINEER: Richard W. Stolleis, P.E.

DATE: 1/27/17

THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN (1) YEAR FROM DATE OF APPROVAL.

APPROVED: Development Coordinator

DATE: 1/27/17

TEAM MEMBER'S REVIEW	REVIEWED/DATE
R.F. ENGINEERING	
PRODUCT MANAGEMENT	
NETWORK REAL ESTATE TEAM	
UTILITY TEAM	
IMPLEMENTATION	
OPERATIONS	

PROJECT TEAM

ARCHITECT
Company: SHIFT CONSULTING
Address: 7333 E. MONTE VISTA RD. SCOTTSDALE, AZ 85257
Phone Number: 480.264.0829
Fax Number: 480.264.0163
Contact: CHRIS MYERS

STRUCTURAL
Company: T.B.D.
Address: -
Phone Number: -
Fax Number: -
Contact: -

FIBER ENGINEERING
Company: TDC2
Address: 710 EAST PARK BLVD, SUITE 110 PLANO, TX 75074
Phone: 972.423.9080
Email: scrum@tdc2.com
Contact: SCOTT CRUM

OWNER INFO
Company: CROWN CASTLE
Address: 1220 AUGUSTA DR. HOUSTON, TX 77057
Phone #: 817.449.3113
Email: BARRY.CAMPAU@CROWNCASTLE.COM
Contact: BARRY CAMPAU

RF ENGINEER
Company: CROWN CASTLE
Address: 1220 AUGUSTA DR. HOUSTON, TX 77057
Phone Number:
Fax Number:
Contact:

PROJECT SUMMARY

PROJECT NAME:
CINCO RANCH EXPANSION

PROJECT AREA:
CINCO RANCH - HGCW

JURISDICTION:
FORT BEND COUNTY ENGINEERING DEPT.
1124 BLUME RD.
ROSENBERG, TX 77471
PH: 281.633.7500
CONTACT: JOHNNY ORTEGA

HANDICAPPED REQUIREMENTS:
-FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
-HANDICAPPED ACCESS REQUIREMENTS ARE NOT REQUIRED.

APPLICANT:
CROWN CASTLE
1220 AUGUSTA DR.
HOUSTON, TX 77057
CONTACT: BARRY CAMPAU

CODES:
2009 INTERNATIONAL BUILDING CODE (IBC)
2009 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
2008 NATIONAL ELECTRICAL CODE (NEC)
2008 NATIONAL ELECTRICAL SAFETY CODE (NESC)

PLUMBING REQUIREMENTS:
FACILITY HAS NO PLUMBING.

POWER COMPANY:
CENTERPOINT ENERGY
5431 HIGHWAY BLVD.
KATY, TX 77494
PH: 281.520.6275
CONTACT: KEN CORTEZ

PROJECT DESCRIPTION

CROWN CASTLE PROPOSES TO PROVIDE AN ENHANCED RESIDENTIAL WIRELESS COMMUNICATIONS SYSTEM FOR THE KATY, TEXAS AREA. THE SYSTEM WILL IMPROVE CELLULAR COMMUNICATIONS AND INCREASE CALL CAPACITY. THE NETWORK AND ASSOCIATED EQUIPMENT HAVE BEEN DESIGNED TO MINIMIZE VISUAL IMPACTS IN URBAN SETTINGS. THE PROPOSED SYSTEM WILL PROVIDE A CELLULAR NETWORK THAT CAN BE UTILIZED SIMULTANEOUSLY BY DIFFERENT LICENSED TELECOMMUNICATIONS COMPANIES.

A SUBJECT NODE WILL CONSIST OF NEW METAL SLIMLINE POLE. THEY WILL HAVE GROUND MOUNTED RADIO EQUIPMENT INSIDE A CABINET WITH A METER AND DISCONNECT ATTACHED. THERE WILL ALSO BE POLE-TOP ANTENNAS CONCEALED IN SHROUDS.

NOTE: NOT ALL SITES ARE INCLUDED IN THIS SET. SEE NODE # IS ABOVE FOR SITES THAT ARE IN THIS SET.

KEYMAP PAGE #: 484U

OVERALL NODE LOCATION MAP

CROWN CASTLE
CROWN CASTLE
800 E. JOHN CARPENTER FWY.
SUITE 300
IRVING, TX 75062

RECORD DRAWINGS ISSUE DATE: 10.18.16

RECORD DRAWING DRAFTING ONLY

SHIFT
Shift Companies, LLC
7333 E. MONTE VISTA ROAD
SCOTTSDALE, ARIZONA 85257
ph: 480.264.0829
fax: 480.264.0163

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RELEASE	
DATE	SUBMITTAL
6.03.16	1ST CITY SUBMITTAL
10.18.16	2ND CITY SUBMITTAL

REVISIONS		
NO.	DATE	COMMENT
	10.18.16	CITY COMMENTS

PROJECT NAME
CINCO RANCH EXPANSION

NODE ADDRESS
NODE #:CCR-46
GREENBUSCH RD & WILLOW FORK RD

HUB AREA
CINCO RANCH - HGCW

SHIFT JOB NUMBER	IN HOUSE
150602	DRAWN BY: RA CHECKED BY: CM

SHEET TITLE
TITLE SHEET

SHEET NUMBER	PAGE
T1.1	1 OF 14

PLOT SCALE: 1:1 @ 24"x36"; 1:2 @ 11"x17"

PLAN CHECK #

CASE #

PART 2 - EXECUTION

2.1 **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 a # 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 6" 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 slotted 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 the 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 as 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 sides 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
   f. Nut on the bolt, turned to "three threads showing at maximum torque"
   g. 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. Excess welds on CadWelds 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.

PART 3 - TESTING AND DOCUMENTATION

3.1 **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.

3.2 **DOCUMENTATION**

A. Photos of the tests are required as well as test results in formal document format. Submit result of test to CC Construction Manager prior to final walkthrough. Submit all photos and tests with closeout package per Section 017700 - Closeout Procedures and Required Documents.

GROUNDING SPECIFICATIONS

SCALE: NTS | 6

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 SACK 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 PED-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 R1-1 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

SCALE: NTS | 8

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

SCALE: NTS | 10

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-LUCENT1 • 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

SCALE: NTS | 11

AIC	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
REQ'D	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
TINNED	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
W/DW	WINDOW
W/O	WITHOUT
WP	WORKING POINT
WTR	WATER

ABBREVIATIONS AND SYMBOLS

SCALE: NTS | 20

CENTER LINE

PROPERTY LINE

RIGHT-OF-WAY

FIBER

GAS

POWER

SANITARY SEWER

STORM DRAIN

WATER

LIGHT CIRCUIT POWER

OVERHEAD POWER LINE

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

APPROVED: _____

Development Coordinator

DATE: _____

CROWN CASTLE

CROWN CASTLE
600 E. JOHN CARPENTER FWY.
SUITE 300
IRVING, TX 75062

RECORD DRAWINGS ISSUE DATE: 10.18.16

SHIFT

Shift Companies, LLC
7333 E. MONTE VISTA ROAD
SCOTTSDALE, ARIZONA 85257
ph: 480.264.0829
fax: 480.264.0163

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RELEASE

DATE	SUBMITTAL
6.03.16	1ST CITY SUBMITTAL
10.18.16	2ND CITY SUBMITTAL

REVISIONS

NO.	DATE	COMMENT
	10.18.16	CITY COMMENTS

PROJECT NAME

CINCO RANCH EXPANSION

PLAN CHECK #

HUB AREA

CINCO RANCH - HGCW

SHIFT JOB NUMBER	IN HOUSE
150602	DRAWN BY: RA CHECKED BY: CM

SHEET TITLE

GENERAL NOTES
ABBREVIATIONS AND
SYMBOLS

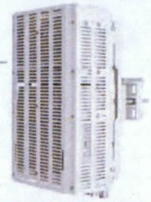
SHEET NUMBER	PAGE
T1.2	2 OF 14

CASE #

PLOT SCALE: 1:1 @ 24"x36"; 1:2 @ 11"x17"

10/17/2016 3:28:02 PM C:\Users\ruebe_000\Documents\AAA - Shift Companies\AAA - CROWN CASTLE\Houston\Cinco Ranch Expansion\Sites\Cinco Ranch Expansion - Detail Sheets - 12.14.15.rvt

Cinco Ranch Expansion
700 RRH Specifications

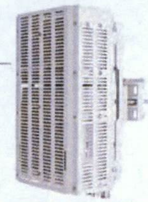


Mechanical	
Frequency Band	B13 (700UC)
Technology	LTE FDD
RF Output Power	2x60W/4x30W (SW configurable)
Operational Range	DL: 746-756 MHz
	UL: 777-787 MHz
Instantaneous BW	10 MHz (1 Carrier)
RF Configuration	2T2R, 2T4R, 4T4R
Interfaces	2 CPRI ports (rate 7)
	AISG 2.0 RS485 port
	2 integrated Smart Bias Tees
	1 port external alarms (x4)
	Tx & Rx monitor ports
Power	-48 VDC
	526W typical @ full RF load
Environmental Conditions	-40 C to +55 °C
	IP65
Connectors	DIN 7/16

Physical	
Dimensions	21.5 x 12 x 9 in
Weight	57 lbs
Mounting options	Pole/Wall
Connector Location	Bottom

CROWN CASTLE Proprietary & Confidential | 1

Cinco Ranch Expansion
PCS RRH Specifications (Future)

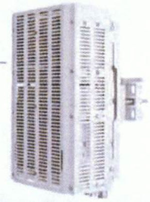


Mechanical	
Frequency Band	B2 & B25 (1900)
Technology	LTE FDD
RF Output Power	2x60W/4x30W (SW configurable)
Operational Range	DL: 1930-1995 MHz
	UL: 1850-1915 MHz
Instantaneous BW	65 MHz (4 Carriers)
RF Configuration	2T2R, 2T4R, 4T4R
Interfaces	2 CPRI ports (rate 7)
	AISG 2.0 RS485 port
	2 integrated Smart Bias Tees
	1 port external alarms (x4)
	Tx & Rx monitor ports
	2 pin twist-off DC power connector
Power	-48 VDC
	580W typical @ full RF load
Environmental Conditions	-40 C to +55 °C
	IP65
Connectors	DIN 7/16

Physical	
Dimensions	21.2 x 12 x 7.1 in
Weight	53 lbs
Mounting options	Pole/Wall
Connector Location	Bottom

CROWN CASTLE Proprietary & Confidential | 2

Cinco Ranch Expansion
AWS RRH Specifications

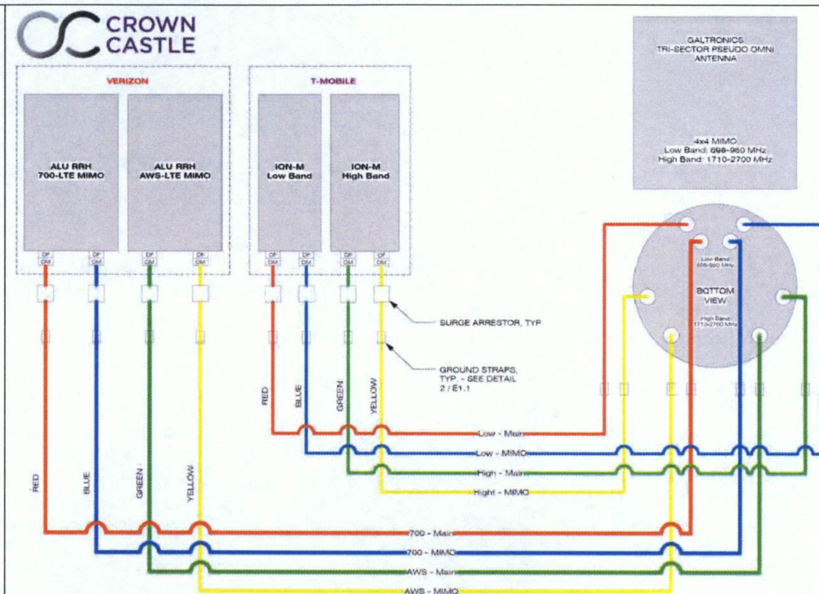


Mechanical	
Frequency Band	B4 (2100)
Technology	LTE FDD
RF Output Power	2x90W/4x45W (SW configurable)
Operational Range	DL: 2110-2180 MHz
	UL: 1695-1780 MHz
Instantaneous BW	70 MHz
RF Configuration	2T2R, 2T4R, 4T4R
Interfaces	2 CPRI ports (rate 7)
	AISG 2.0 RS485 port
	Integrated Smart Bias Tees
	1 port external alarms (x4)
Power	-48 VDC
Environmental Conditions	-40 C to +55 °C
	IP65
Connectors	Mini-DIN 4.3-10

Physical	
Dimensions	30 x 12 x 7.7 in
Weight	75 lbs
Mounting options	Pole/Wall
Connector Location	Bottom

CROWN CASTLE Proprietary & Confidential | 3

RADIO SPECIFICATIONS — SCALE: N.T.S. — 10



WIRING DIAGRAM — SCALE: N.T.S. — 18

Amphenol Antenna Solutions — 696-960 / 696-960 / 1695-2700 / 1695-2700 MHz

2C2UT360X12Fxyz0

Features

Connector Description

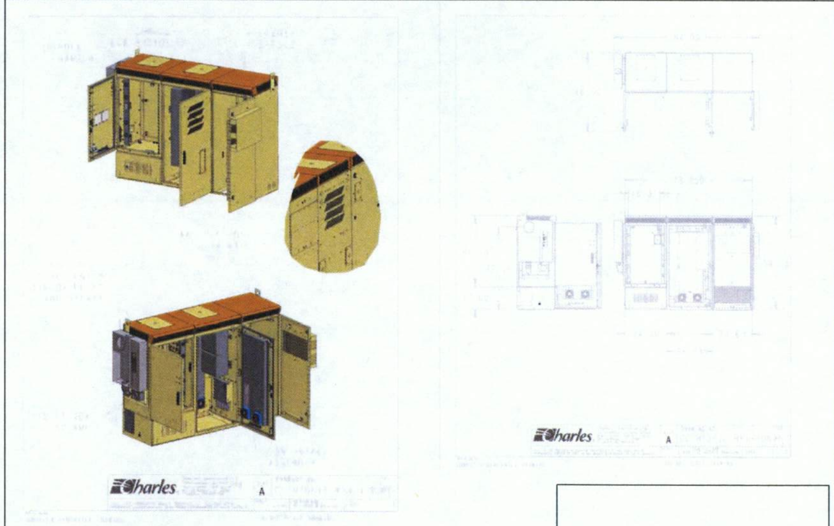
Electrical Characteristics — Low Band #1 and #2 — High Bands #1 and #2

Mechanical Characteristics

Antenna Dimensions (Height x Diameter)	1219 x 371 mm	48.0 x 14.6 in
Weight without Mounting Bracket Kit	17.5 kg	38.1 lbs
Survival Wind Speed	200 km/hr	125 mph
Wind Area	0.47 m²	5.0 ft²
Wind Load (160 km/hr or 100 mph)	391 N	88 lbf

REV042616R — www.amphenol-antennas.com — 1 of 5

ANTENNA SPECIFICATIONS — SCALE: N.T.S. — 12



APPROVED: ______________________
Development Coordinator
DATE: ______________________

EQUIPMENT CABINET SPECIFICATIONS — SCALE: N.T.S. — 20

CROWN CASTLE
600 E. JOHN CARPENTER FWY.
SUITE 300
IRVING, TX 75062

RECORD DRAWINGS ISSUE DATE: 10.18.16

SHIFT
Shift Companies, LLC
7333 E. MONTE VISTA ROAD
SCOTTSDALE, ARIZONA 85257
ph: 480.264.0829
fax: 480.264.0163

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RELEASE

DATE	SUBMITTAL
6.03.16	1ST CITY SUBMITTAL
10.18.16	2ND CITY SUBMITTAL

REVISIONS

NO.	DATE	COMMENT
	10.18.16	CITY COMMENTS

PROJECT NAME: CINCO RANCH EXPANSION

PLAN CHECK #

HUB AREA: CINCO RANCH - HGCW

SHIFT JOB NUMBER: 150602 — IN HOUSE — DRAWN BY: RA — CHECKED BY: CM

SHEET TITLE: EQUIPMENT SPECIFICATIONS

SHEET NUMBER: T1.3 — PAGE: 3 OF 14

PLOT SCALE: 1:1 @ 24"x36"; 1:2 @ 11"x17"

CASE #

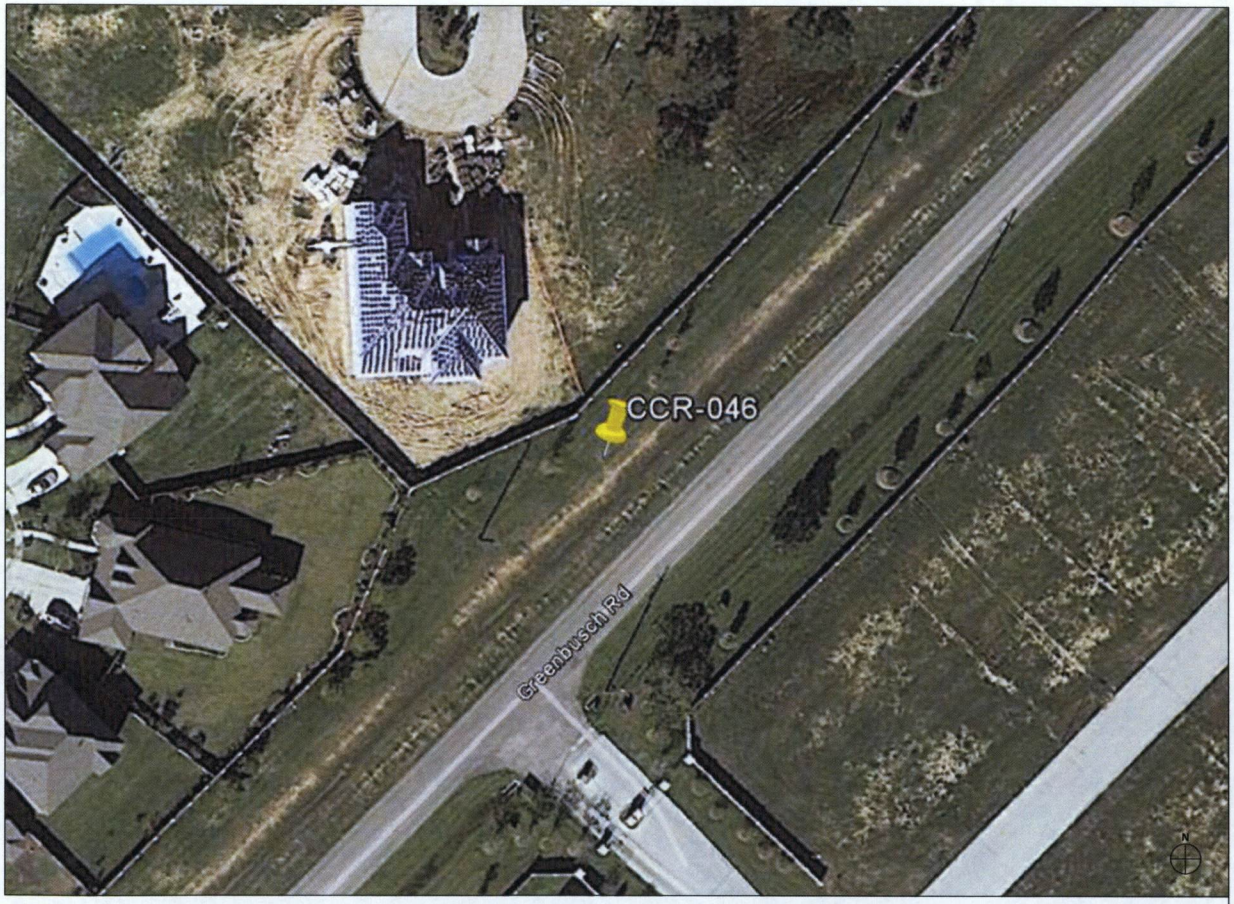
C:\Users\ruebe_000\Documents\AAA - Shift Companies\AAA - CROWN CASTLE\Houston\Cinco Ranch Expansion\Sites\CCR-46 - Project - 12.14.15.rvt

12/7/2016 3:09:51 PM

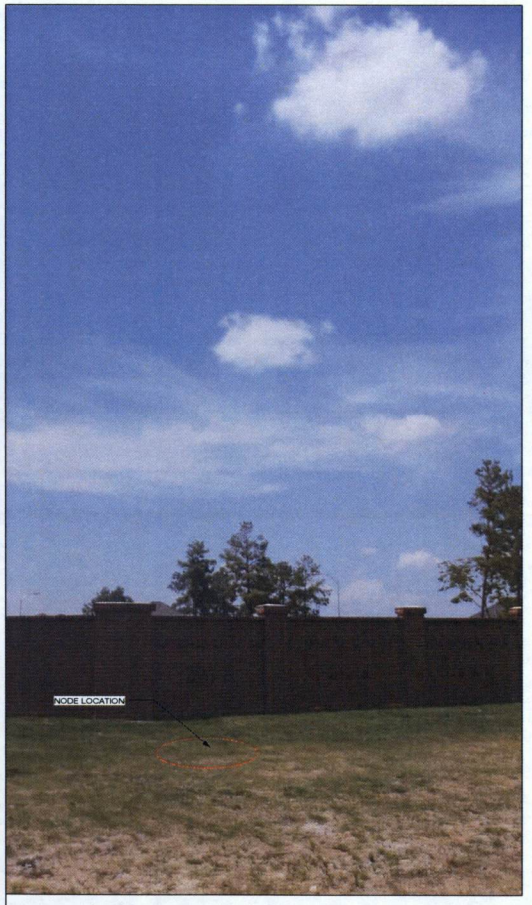
SUBJECT POLE:	CCR-46
GPS COORDINATES:	
LAT:	29.740344
LONG:	-95.810474
POLE TYPE:	METAL SLIMLINE POLE
POLE ID #:	
UPPER ANTENNA RAD CENTER:	32' - 0" A.F.G.
LOWER ANTENNA RAD CENTER:	30' - 0"A.F.G.

APPROVED: _____
Development Coordinator

DATE: _____



NODE AERIAL PLAN



SITE PHOTO (EXISTING) N.T.S.

CROWN CASTLE
600 E. JOHN CARPENTER FWY.
SUITE 300
IRVING, TX 75062

RECORD DRAWINGS ISSUE DATE: 10.18.16

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DATE	SUBMITTAL
6.03.16	1ST CITY SUBMITTAL
10.18.16	2ND CITY SUBMITTAL

REVISIONS

NO.	DATE	COMMENT
	10.18.16	CITY COMMENTS

PROJECT NAME

CINCO RANCH EXPANSION

PLAN CHECK #

NODE ADDRESS

NODE #:CCR-46

GREENBUSCH RD &
WILLOW FORK RD

HUB AREA

CINCO RANCH - HGCW

SHIFT JOB NUMBER	IN HOUSE
150602	DRAWN BY: RA CHECKED BY: CM

SHEET TITLE

AERIAL

SHEET NUMBER	PAGE
A1.0	4 OF 14

CASE #

PLOT SCALE: 1:1 @ 24"x36"; 1:2 @ 11"x17"

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12/7/2016 3:09:54 PM

KEYNOTE LEGEND		
KEYNOTE	DESCRIPTION	DETAIL
A01	PROPOSED CROWN CASTLE OMNI ANTENNA	16/D1.1
A02	PROPOSED CROWN CASTLE 2" U.G. CONDUIT (APPROXIMATE LOCATION, F.V.)	2/D1.1
A03	PROPOSED CROWN CASTLE REMOTE RADIO UNIT INSIDE EQUIPMENT CABINET	18/D1.1
A04	PROPOSED NEW METAL SLIMLINE POLE	20/D1.1
A05	PROPOSED CROWN CASTLE UNDERGROUND CONC. FIBER VAULT	5/D1.2
A06	PROPOSED CROWN CASTLE NODE IDENTIFICATION SIGNAGE	20/D1.2
A07	PROPOSED CROWN CASTLE EQUIPMENT CABINET	18/D1.1
A08	PROPOSED CROWN CASTLE PIER FOUNDATION	12/D1.1
A09	PROPOSED ELECTRICAL HAND HOLE	

KEYNOTE LEGEND		
KEYNOTE	DESCRIPTION	DETAIL
E01	PROPOSED POWER METER MOUNTED TO EQUIPMENT CABINET (DISTRIBUTED PANEL AND DISCONNECT)	18/D1.1
U01	PROPOSED 2" CROWN CASTLE U.G. POWER CONDUIT (APPROXIMATE LOCATION, F.V.)	2/D1.1 & 6/D1.2
U02	PROPOSED CROWN CASTLE 2" U.G. FIBER CONDUIT BY OTHERS (APPROXIMATE LOCATION, F.V.)	2/D1.1 & 6/D1.2

811 CALL TWO WORKING DAYS BEFORE YOU DIG.

UNDERGROUND SERVICE ALERT OF TEXAS
1-800-545-6005

GENERAL NOTES

1. PAINT PROPOSED GROUND EQUIPMENT A NATURAL EARTH COLOR OR AS APPROVED BY CITY.
2. CONTRACTOR TO FIELD LOCATE EXIST. UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION
3. EX. LANDSCAPE PLANTINGS AND DECORATIVE HARDSCAPES DISTURBED OR DESTROYED AS A RESULT OF CONSTRUCTION SHALL BE REPLACED WITH A LIKE SIZE AND SPECIE.
4. CONTRACTOR TO HAND LOCATE EX. IRRIGATION PRIOR TO EXCAVATION.
5. SITE PLAN IS A DIAGRAMMATIC REPRESENTATION ONLY; VERIFY ALL DIMENSIONS.
6. VERIFY ALL PROPERTY LINE INFORMATION WITH AVAILABLE R.O.W. DATA.
7. EXIST. UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE ONLY (AS PROVIDED BY LOCAL UTILITIES).

SUBJECT POLE: CCR-46

GPS COORDINATES:

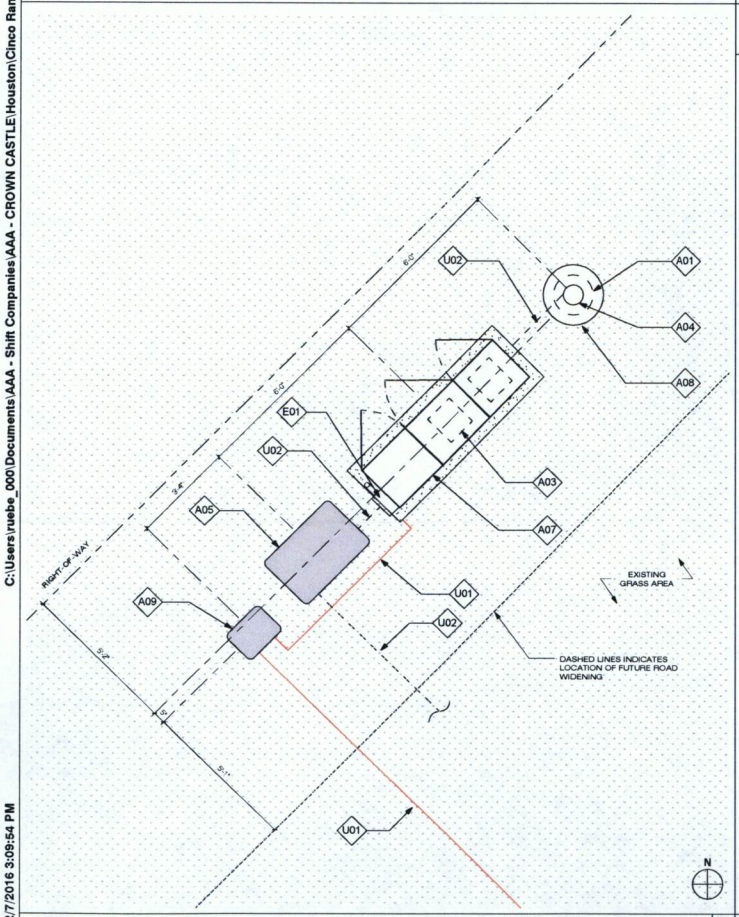
LAT: 29.740344

LONG: -95.810474

POLE TYPE:	METAL SLIMLINE POLE
POLE ID #:	
UPPER ANTENNA RAD CENTER:	32' - 0" A.F.G.
LOWER ANTENNA RAD CENTER:	30' - 0"A.F.G.
SUBJECT POLE IS LOCATED IN:	FORT BEND COUNTY R.O.W.

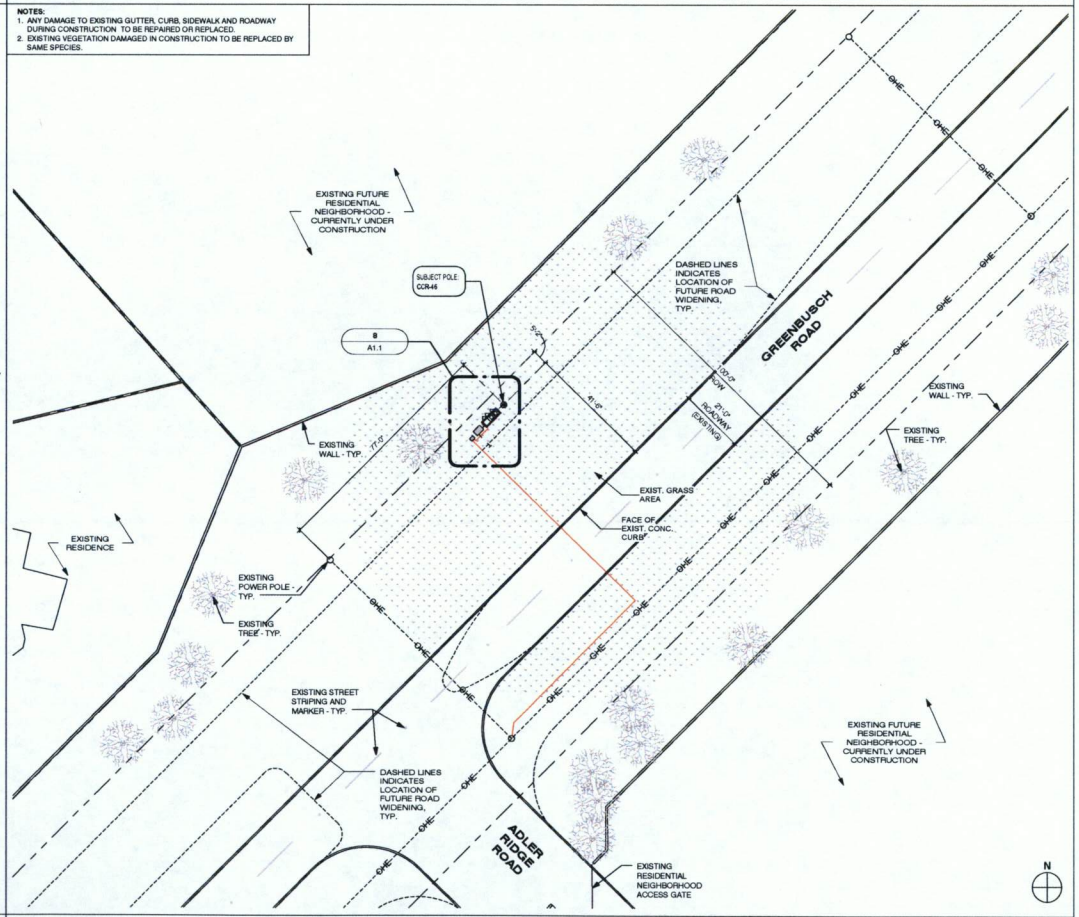
APPROVED: _____
Development Coordinator

DATE: _____



EQUIPMENT AND ANTENNA PLAN | 1/2" = 1'-0" | 8

NOTES:
1. ANY DAMAGE TO EXISTING GUTTER, CURB, SIDEWALK AND ROADWAY DURING CONSTRUCTION TO BE REPAIRED OR REPLACED.
2. EXISTING VEGETATION DAMAGED IN CONSTRUCTION TO BE REPLACED BY SAME SPECIES.



OVERALL SITE PLAN | 1" = 20'-0" | 20

CROWN CASTLE
600 E. JOHN CARPENTER FWY.
SUITE 300
IRVING, TX 75062

RECORD DRAWINGS ISSUE DATE: 10.18.16

SHIFT
Shift Companies, LLC
7333 E. MONTE VISTA ROAD
SCOTTSDALE, ARIZONA 85257
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RELEASE

DATE	SUBMITTAL
8.03.16	1ST CITY SUBMITTAL
10.18.16	2ND CITY SUBMITTAL

REVISIONS

NO.	DATE	COMMENT
	10.18.16	CITY COMMENTS

PROJECT NAME

CINCO RANCH EXPANSION

PLAN CHECK #

NODE ADDRESS

NODE #:CCR-46

GREENBUSCH RD &
WILLOW FORK RD

HUB AREA

CINCO RANCH - HGCW

SHIFT JOB NUMBER	IN HOUSE
150602	DRAWN BY: RA CHECKED BY: CM

SHEET TITLE

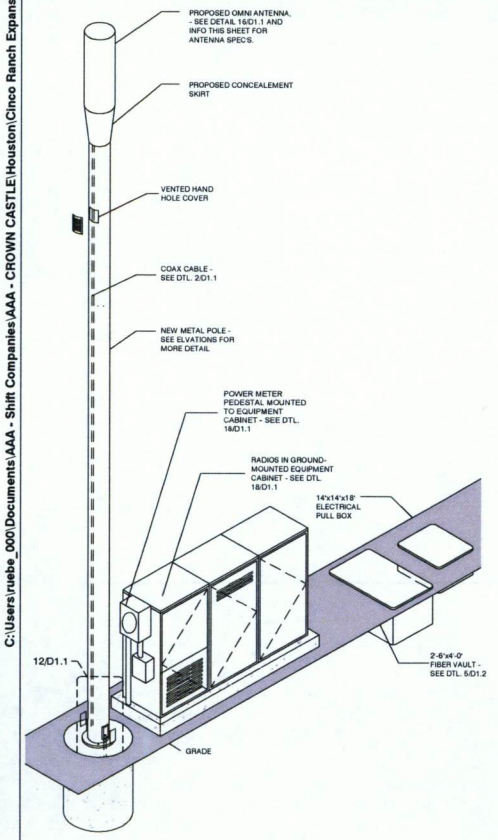
SITE PLAN, EQUIPMENT AND ANTENNA PLAN

SHEET NUMBER	PAGE
A1.1	5 OF 14

CASE #

PLOT SCALE: 1:1 @ 24"x36"; 1:2 @ 11"x17"

NOTE:
ISO IS SCHEMATIC IN NATURE. FIBER VAULT, POWER METER PEDESTAL AND GROUND-MOUNTED RADIO EQUIPMENT PEDESTAL CAN BE RECONFIGURED TO SUIT PROJECT LOCATION



METAL POLE ISOMETRIC — SCALE: SCALE: N.T.S. | 4

KEYNOTE LEGEND		
KEYNOTE	DESCRIPTION	DETAIL NUMBER
A01	PROPOSED CROWN CASTLE OMNI ANTENNA	16/D1.1
A02	PROPOSED CROWN CASTLE 2" U.G. CONDUIT (APPROXIMATE LOCATION, F.V.)	2/D1.1
A03	PROPOSED CROWN CASTLE REMOTE RADIO UNITS INSIDE EQUIPMENT CABINET	18/D1.1
A04	PROPOSED NEW METAL SLIMLINE POLE	20/D1.1
A05	PROPOSED CROWN CASTLE UNDERGROUND CONC. FIBER VAULT	5/D1.2
A06	PROPOSED CROWN CASTLE NODE IDENTIFICATION SIGNAGE	20/D1.2
A07	PROPOSED CROWN CASTLE EQUIPMENT CABINET	18/D1.1
A08	PROPOSED CROWN CASTLE POLE FOUNDATION	12/D1.1
A09	PROPOSED ELECTRICAL HAND HOLE	
E01	PROPOSED POWER METER MOUNTED TO EQUIPMENT CABINET (DISTRIBUTED PANEL AND DISCONNECT)	18/D1.1

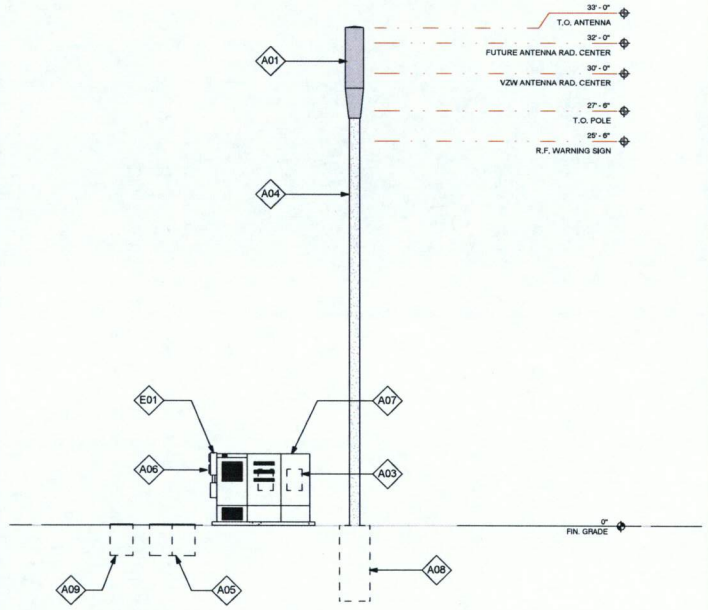
MODEL: AMPHENOL - 2C2JT360X12Fxgz0
LENGTH: 48"
WIDTH: 14.6" DIA.
DEPTH: N/A
WEIGHT: 38.1 LBS

PROPOSED PANEL ANTENNA SPECS

PROPOSED POLE WIDTH = 8"Ø
PROPOSED POLE HEIGHT = 27' - 6"
(+ 4'-0" ANTENNA AND 1'-6" ANTENNA MOUNT)

POLE INFO

APPROVED: _____
Development Coordinator
DATE: _____



POLE ELEVATION (PROPOSED) — SCALE: 1/4" = 1'-0" | 20

CROWN CASTLE
600 E. JOHN CARPENTER FWY.
SUITE 300
IRVING, TX 75062

RECORD DRAWINGS ISSUE DATE: 10.18.16

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7333 E. MONTE VISTA ROAD
SCOTTSDALE, ARIZONA 85257
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6.03.16	1ST CITY SUBMITTAL
10.18.16	2ND CITY SUBMITTAL

REVISIONS		
NO.	DATE	COMMENT
	10.18.16	CITY COMMENTS

PROJECT NAME
CINCO RANCH EXPANSION

NODE ADDRESS
NODE #:CCR-46
GREENBUSCH RD & WILLOW FORK RD

HUB AREA
CINCO RANCH - HGCW

SHIFT JOB NUMBER	IN HOUSE
150602	DRAWN BY: RA CHECKED BY: CM

SHEET TITLE
POLE ELEVATION, PROPOSED

SHEET NUMBER	PAGE
A1.2	6 OF 14

PLOT SCALE: 1:1 @ 24"x36"; 1:2 @ 11"x17"

PLAN CHECK #

CASE #

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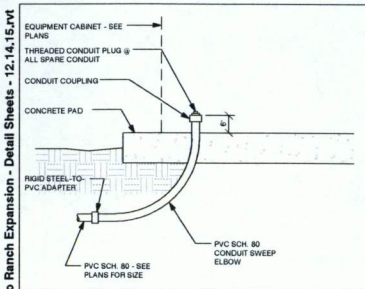
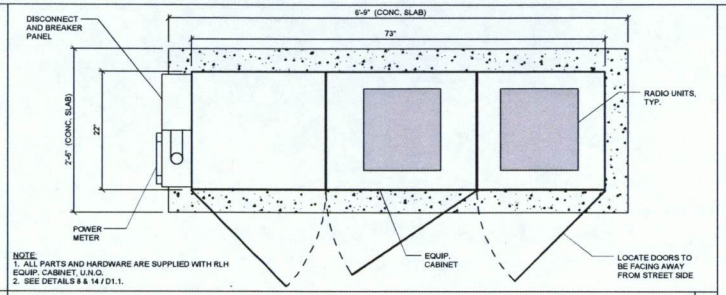
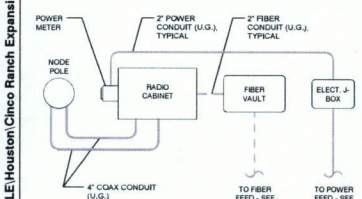


EQUIPMENT CABINET STUB UP DTL. SCALE N.T.S. 1

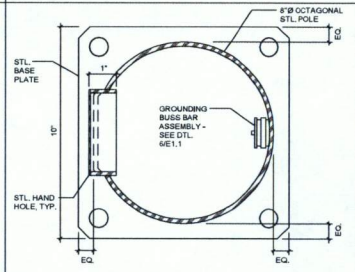


NOTE:
1. ALL PARTS AND HARDWARE ARE SUPPLIED WITH RLH EQUIP. CABINET, U.N.O.
2. SEE DETAILS 8 & 14 / D1.1.

METER / BBU / RADIO EQUIPMENT CABINET PLAN SCALE: N.T.S. 9

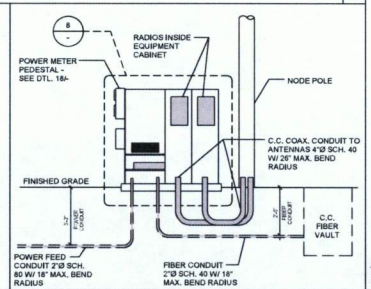


CONDUIT ROUTE SCALE: N.T.S. 2

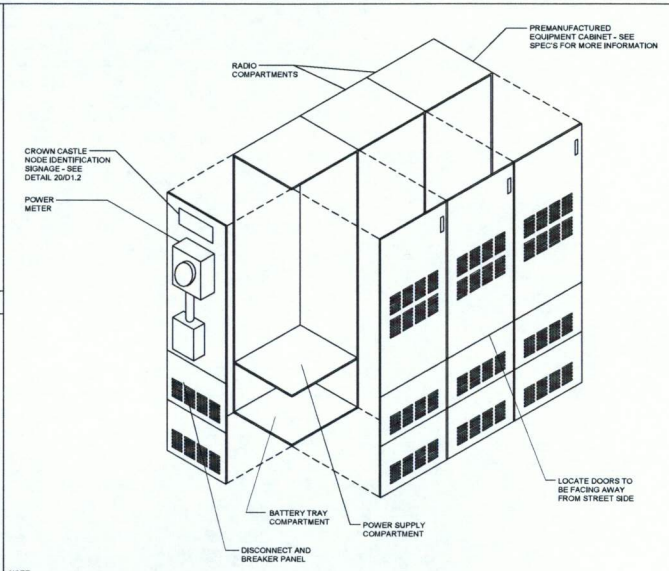


NOTE: SEE DTL. 20/- FOR ISOMETRIC VIEW

PLAN VIEW @ POLE SCALE: N.T.S. 6

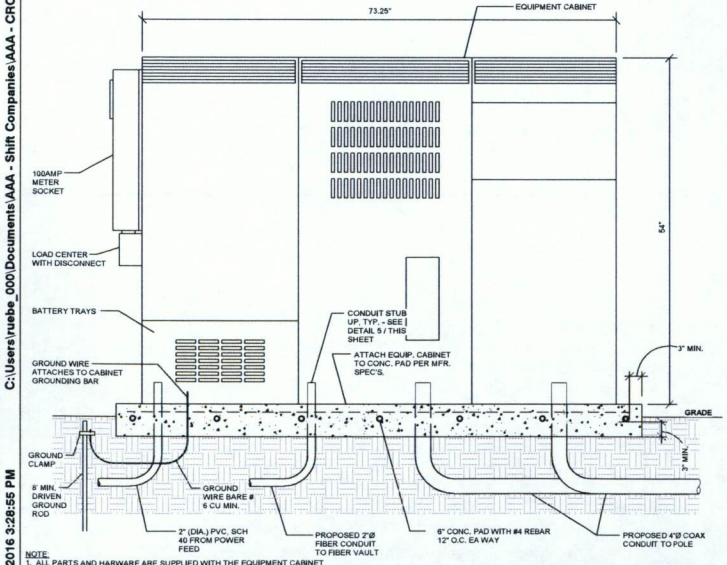


CONDUIT AND POWER RISER DIAGRAM SCALE: N.T.S. 10



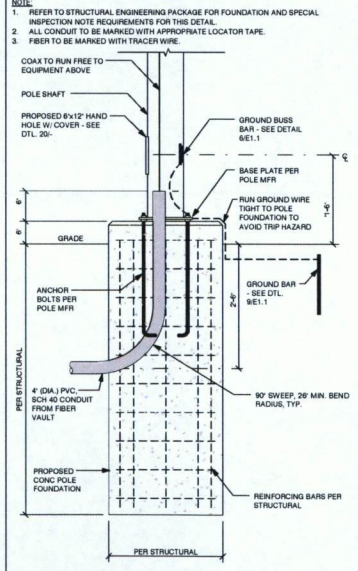
NOTE:
1. SEE DETAILS 8, 9 AND 10 THIS SHEET
2. DETAIL IS SCHEMATIC. SEE SHOP DRAWINGS FOR MORE INFO.

EQUIPMENT CABINET WITH METER ISOMETRIC SCALE: N.T.S. 18

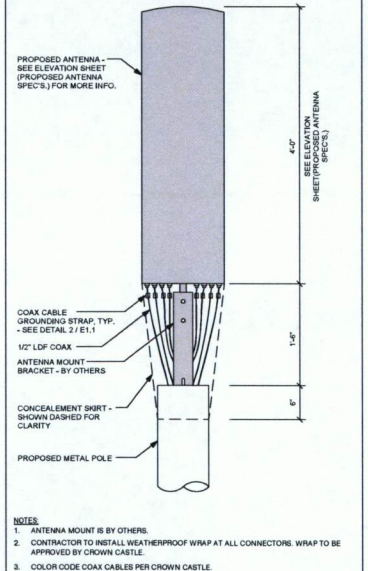


NOTE:
1. ALL PARTS AND HARWARE ARE SUPPLIED WITH THE EQUIPMENT CABINET UNLESS NOTED OTHERWISE.
2. SEE SHEET T1.3 FOR MORE INFORMATION.

METER / EQUIPMENT CABINET SECTION SCALE: N.T.S. 8

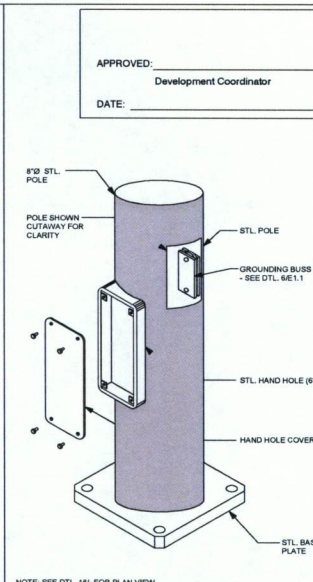


CONDUIT ROUTE AT POLE FOUNDATION SCALE: 3/4" = 1'-0" 12



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.

POLE DETAIL - ISOMETRIC - SLIMLINE POLE SCALE: N.T.S. 16



NOTE: SEE DTL. 18/- FOR PLAN VIEW

POLE DETAIL - ISOMETRIC - SLIMLINE POLE SCALE: N.T.S. 20

APPROVED: _____
Development Coordinator
DATE: _____

CROWN CASTLE
600 E. JOHN CARPENTER FWY.
SUITE 300
IRVING, TX 75062

RECORD DRAWINGS ISSUE DATE: 10.18.16

SHIFT
Shift Companies, LLC
7333 E. MONTE VISTA ROAD
SCOTTSDALE, ARIZONA 85257
ph: 480.264.0929
fax: 480.264.0163

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RELEASE	
DATE	SUBMITTAL
6.03.16	1ST CITY SUBMITTAL
10.18.16	2ND CITY SUBMITTAL

REVISIONS		
NO.	DATE	COMMENT
	10.18.16	CITY COMMENTS

PROJECT NAME
CINCO RANCH EXPANSION

HUB AREA
CINCO RANCH - HGCW

SHIFT JOB NUMBER	IN HOUSE
150602	DRAWN BY: RA CHECKED BY: CM

SHEET TITLE
CONSTRUCTION DETAILS

SHEET NUMBER	PAGE
D1.1	7 OF 14

PLOT SCALE: 1:1 @ 24"x36"; 1:2 @ 11"x17"

PLAN CHECK #

CASE #

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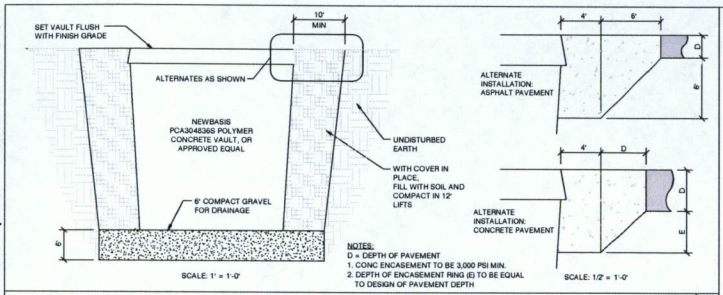
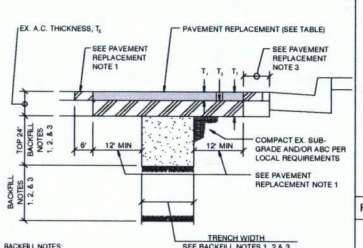


NOTES:
D = DEPTH OF PAVEMENT
1. CONC ENCASEMENT TO BE 3,000 PSI MIN.
2. DEPTH OF ENCASEMENT RING (E) TO BE EQUAL TO DESIGN OF PAVEMENT DEPTH

VAULT INSTALLATION

SCALE:AS NOTED | 5

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_T
$T_E \leq 3'$	3' MINIMUM	NONE	3' MINIMUM
$T_E > 3'$	2' MINIMUM	2' MINIMUM	T_E (MATCH EXIST)



BACKFILL NOTES:

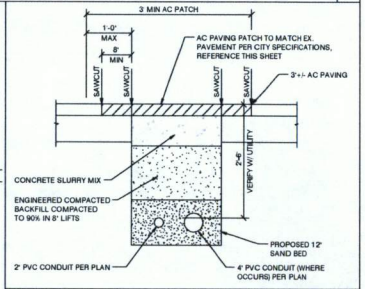
1. TRENCHES LESS THAN 24' IN WIDTH - 1/2 SACK CSLM, FULL DEPTH OF BACKFILL BOTTOM OF AGGREGATE BASE COURSE (ABC) LAYER IN PAVEMENT STRUCTURE OR 6' BELOW PAVEMENT IN FULL DEPTH PAVEMENT STRUCTURES. CONSTRUCT PAVEMENT STRUCTURE TO MATCH EXISTING AND IN ACCORDANCE WITH CITY DETAILS.
2. TRENCHES 24' TO 6' 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' 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 8' 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.

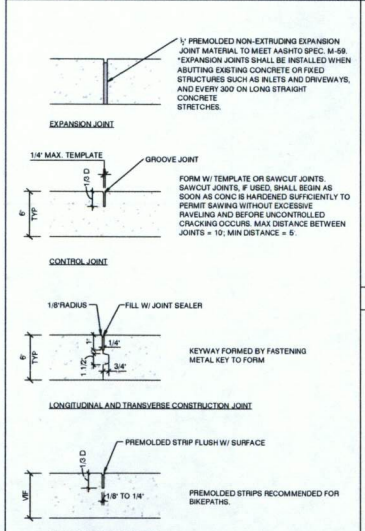
TRENCH AND PATCHING REQUIREMENTS

SCALE:N.T.S. | 4



POWER TRENCH

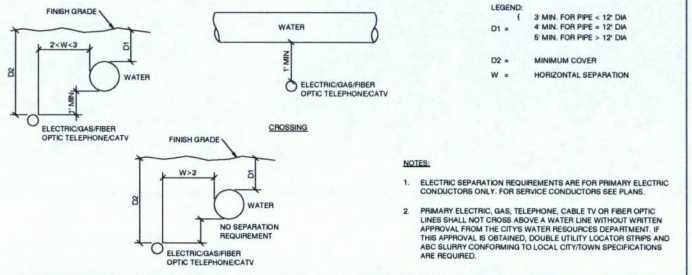
SCALE:3/4" = 1'-0" | 6



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

CONCRETE JOINT DETAILS

SCALE:1 1/2" = 1'-0" | 8

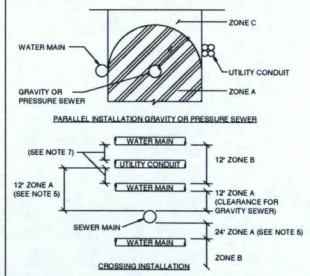


LEGEND:
D1 = 3' MIN. FOR PIPE < 12' DIA; 4' MIN. FOR PIPE = 12' DIA; 6' MIN. FOR PIPE > 12' DIA
D2 = MINIMUM COVER
W = HORIZONTAL SEPARATION

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

SCALE:NTS | 15



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.

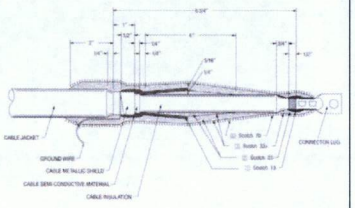
SANITARY SEWER SEPARATION / PROTECTION FROM WATER & UTILITIES

SCALE:NTS | 16

COAX WATERPROOFING - JMA TYPE

SCALE:N.T.S. | 18

APPROVED: _____
Development Coordinator
DATE: _____



COAX WATERPROOFING - FUSION TAPE TYPE

SCALE:N.T.S. | 19

(3/8" TEXT HEIGHT)
CROWN CASTLE
(1/4" TEXT HEIGHT)
NODE SITE ID:
(1/4" TEXT HEIGHT)
IN CASE OF EMERGENCY CONTACT
NOC: 888.632.0931
(3/16" TEXT HEIGHT)
FACILITY COMPLIES WITH FCC EMISSION REQUIREMENTS.
FACILITY DESIGN APPROVED BY THE THE (LOCAL CITY/TOWN)

NOTE: 4' x 6 1/2' STICKER

NODE IDENTIFICATION SIGNAGE

SCALE:N.T.S. | 20

CROWN CASTLE
600 E. JOHN CARPENTER FWY.
SUITE 300
IRVING, TX 75062

SHIFT
Shift Companies, LLC
7333 E. MONTE VISTA ROAD
SCOTTSDALE, ARIZONA 85257
ph: 480.264.0829
fax: 480.264.0163

RECORD DRAWINGS ISSUE DATE: 10.18.16

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RELEASE	
DATE	SUBMITTAL
6.03.16	1ST CITY SUBMITTAL
10.18.16	2ND CITY SUBMITTAL

REVISIONS		
NO.	DATE	COMMENT
	10.18.16	CITY COMMENTS

PROJECT NAME
CINCO RANCH EXPANSION

HUB AREA
CINCO RANCH - HGCW

SHIFT JOB NUMBER	IN HOUSE
150602	DRAWN BY: RA CHECKED BY: CM

SHEET TITLE
CONSTRUCTION DETAILS

SHEET NUMBER	PAGE
D1.2	8 OF 14

PLOT SCALE: 1:1 @ 24"x36"; 1:2 @ 11"x17"

PLAN CHECK #

CASE #

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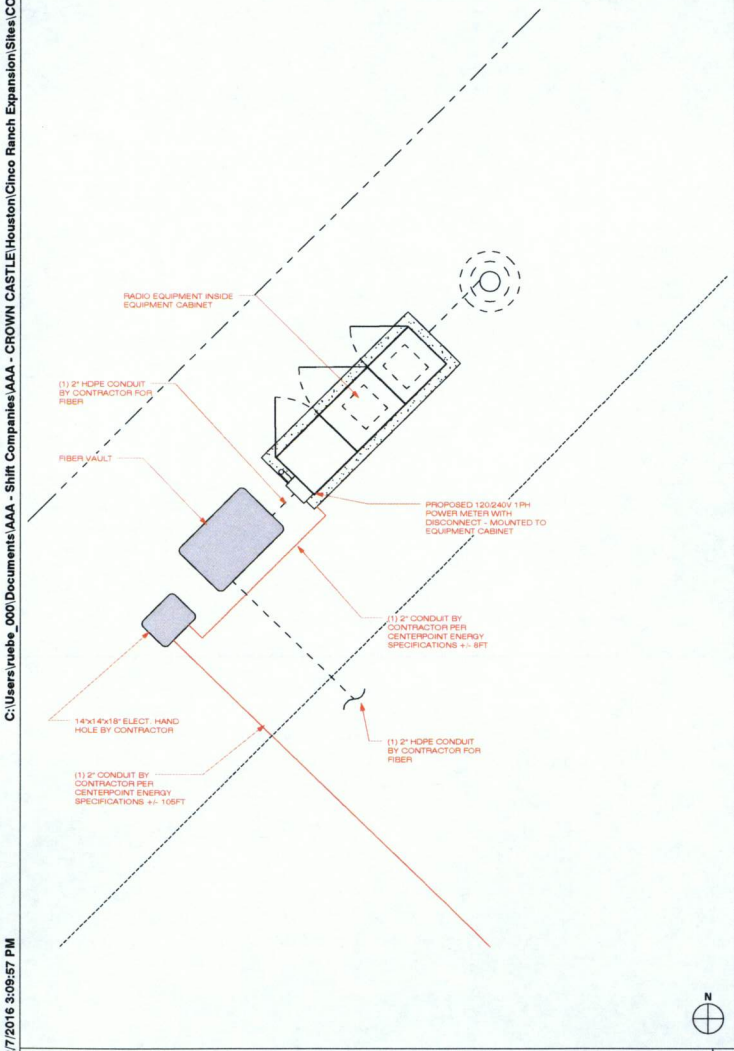
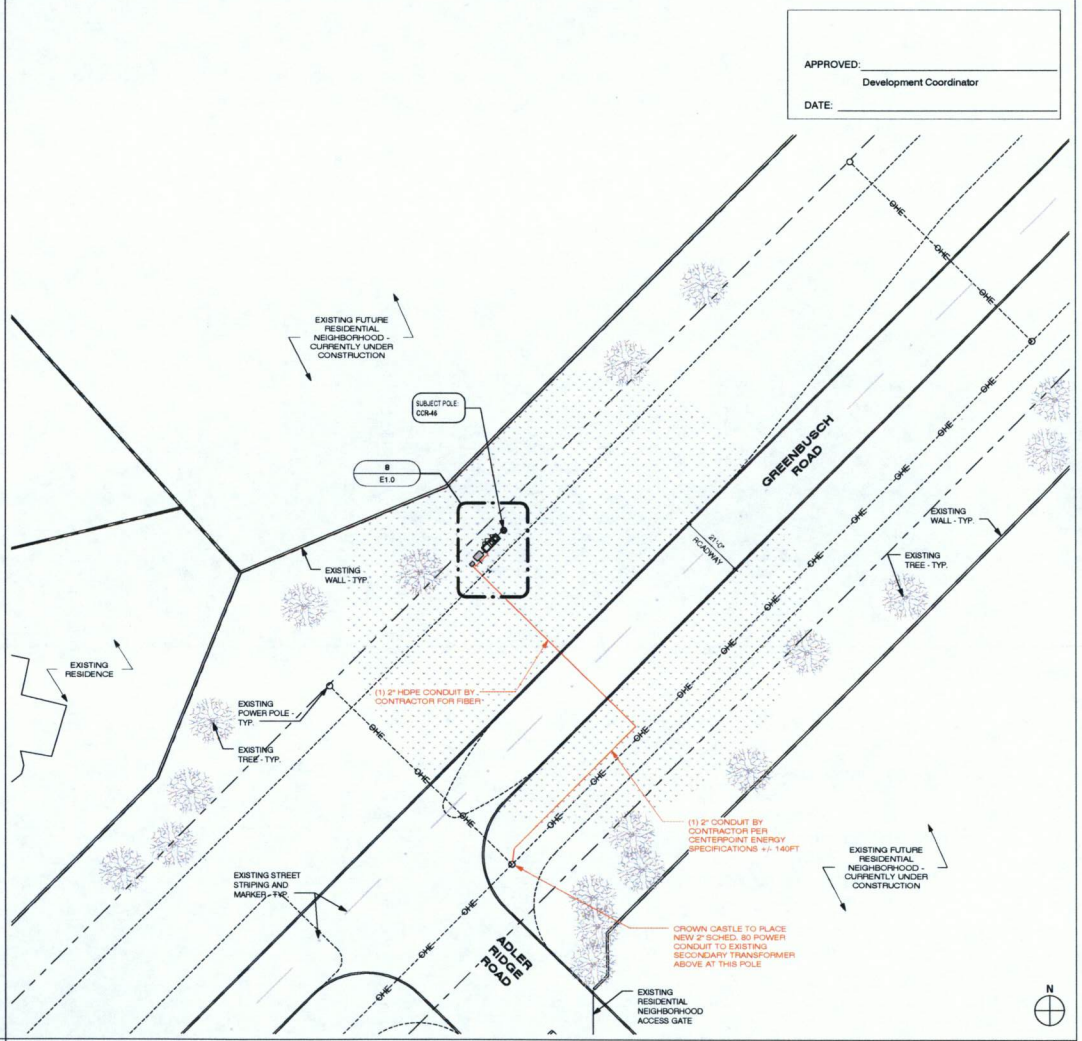
12/7/2016 3:09:57 PM



ENLARGED ELECTRICAL PLAN | 1/2" = 1'-0" | 8



ELECTRICAL SITE PLAN | 1" = 20'-0" | 20

APPROVED: _____
Development Coordinator
DATE: _____

CROWN CASTLE
600 E. JOHN CARPENTER FWY.
SUITE 300
IRVING, TX 75062

SHIFT
Shift Companies, LLC
7333 E. MONTE VISTA ROAD
SCOTTSDALE, ARIZONA 85257
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RELEASE	
DATE	SUBMITTAL
6.03.16	1ST CITY SUBMITTAL
10.18.16	2ND CITY SUBMITTAL

REVISIONS		
NO.	DATE	COMMENT
	10.18.16	CITY COMMENTS

PROJECT NAME
CINCO RANCH EXPANSION

NODE ADDRESS
NODE #:CCR-46
GREENBUSCH RD &
WILLOW FORK RD

HUB AREA
CINCO RANCH - HGCW

SHIFT JOB NUMBER	IN HOUSE
150602	DRAWN BY: RA CHECKED BY: CM

SHEET TITLE
ELECTRICAL PLANS

SHEET NUMBER	PAGE
E1.0	9 OF 14

PLOT SCALE: 1:1 @ 24"x36"; 1:2 @ 11"x17"

PLAN CHECK #

CASE #

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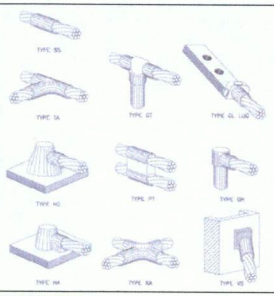
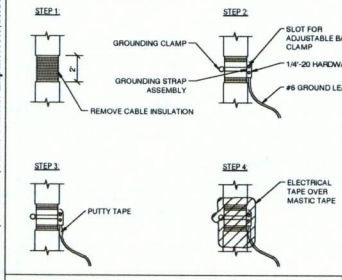
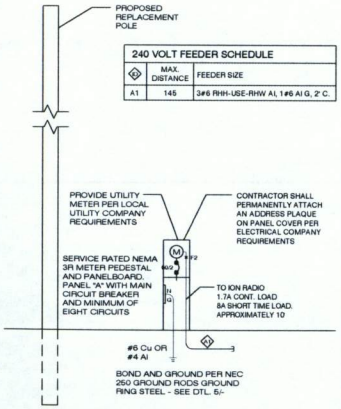


CADWELD DETAILS — SCALE: N.T.S. — 1



COAXIAL CABLE GROUNDING — SCALE: NTS — 2



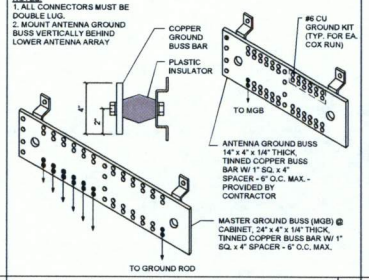
240 VOLT FEEDER SCHEDULE

	MAX. DISTANCE	FEEDER SIZE
A1	145	3#6 RHH-USE-RHW Al, 1#6 Al G, 2" C.

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 — SCALE: NTS — 4

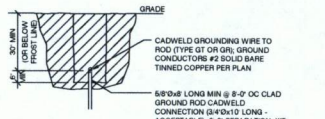
NOTES:
1. ALL CONNECTORS MUST BE DOUBLE LUG.
2. MOUNT ANTENNA GROUND BUSS VERTICALLY BEHIND LOWER ANTENNA ARRAY



GROUND BUSS BAR DETAIL — SCALE: NTS — 6

8

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 — SCALE: NTS — 9

PANEL A — FED FROM TRANSFORMER — VOLTS 240/120V 2P 3W — AIC (REFER TO FAULT CALC)
NEMA 3R — BUS AMPS 60 — MAIN BKR 60
NUETRAL 100% — LUGS STANDARD

NO.	CB	CIRCUIT DESCRIPTION	KVA LOAD A	KVA LOAD B	NO.	CB	CIRCUIT DESCRIPTION	KVA LOAD A	KVA LOAD B
1	-	SPACE	0.00		2	20/1	RADIO EQUIPMENT	1.05	
3	-	SPACE		0.00	4	20/1	RADIO EQUIPMENT		1.05
5	-	SPACE	0.00		6	20/1	SPARE	0.00	
7	-	SPACE		0.00	8	-	SPACE		0.00
							TOTAL CONNECTED KVA BY PHASE	1.05	1.05
							TOTAL CONNECTED AMPS BY PHASE	11.8	11.8

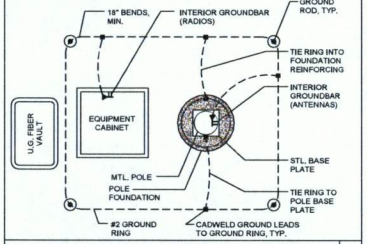
	CONN. KVA	CALC KVA	
LIGHTING	0	0	(125%)
LARGEST MOTOR	0	0	(125%)
OTHER MOTORS	0	0	(125%)
RECEPTACLES	0	0	

	CONN. KVA	CALC KVA	
CONTINUOUS	0	0	(125%)
HEATING	0	0	(100%)
NONCONTINUOUS	2.1	2.1	(100%)
TOTAL KVA	2.82	2.82	

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

ELECTRICAL PANEL SCHEDULES — SCALE: NTS — 14

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

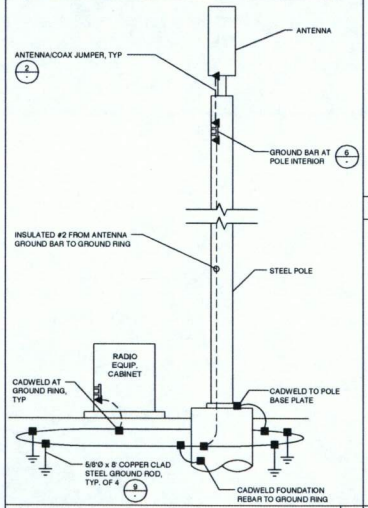


EQUIPMENT GROUNDING SCHEMATIC DTL. — SCALE: NTS — 17

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 APS JUNCTION BOX. 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 N3R LOAD CENTER.
8. CONTRACTOR TO NOTIFY ALL APPROPRIATE PARTIES PRIOR TO CONSTRUCTION AND SHALL PROVIDE AND MAINTAIN A TRAFFIC CONTROL PLAN PER NDOT 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 — SCALE: NONE — 18

■ CADWELD - SEE DETL. 1/-
◀ MECHANICAL CONNECTION
GROUND BAR (GB) 1/4" 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 — SCALE: NTS

POWER FEEDER SCHEDULE

LENGTH	SIZE (AWG/KCMIL)	GROUND SIZE	CONDUIT SIZE
320'	2	6	2"
380'	1	4	2"
470'	1/0	2	2"
550'	2/0	2	2"
680'	3/0	2	2"
800'	4/0	1	2"
920'	250	1/0	2 - 1/4"
1050'	300	2/0	2-1/2"

FEEDER SCHEDULE — SCALE: NTS — 15

Fault Point	Panel Transformer	Source (Fault Point)	Source i (amps)	Conduit Type	Wire/Bus Size	'C' value	E (volts)	L (length)	f	M	Isc	AIC Rating
1	UTILITY XFMR/FRY'S PEDESTAL		22000				240				22000	
2	Panel-A @ 20'	1	22000	NM	1 Set(s) of 2	3730	240	20'	9.651	0.54	11894	22,000
3	Panel-A @ 100'	1	22000	NM	1 Set(s) of 2	3730	240	100'	4.256	0.19	4185	10,000
4	Panel-A @ 150'	1	22000	NM	1 Set(s) of 2	3730	240	150'	6.385	0.14	2979	10,000
5	Panel-A @ 200'	1	22000	NM	1 Set(s) of 2	3730	240	200'	8.513	0.11	2313	10,000

FAULT CURRENT CALCULATION — SCALE: NTS — 20

APPROVED: _____
Development Coordinator
DATE: _____

CROWN CASTLE
600 E. JOHN CARPENTER FWY.
SUITE 300
IRVING, TX 75062

RECORD DRAWINGS ISSUE DATE: 10.18.16

SHIFT
Shift Companies, LLC
7333 E. MONTE VISTA ROAD
SCOTTSDALE, ARIZONA 85257
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RELEASE

DATE	SUBMITTAL
8.03.16	1ST CITY SUBMITTAL
10.18.16	2ND CITY SUBMITTAL

REVISIONS

NO.	DATE	COMMENT
	10.18.16	CITY COMMENTS

PROJECT NAME
CINCO RANCH EXPANSION

PLAN CHECK #

HUB AREA
CINCO RANCH - HGCW

SHIFT JOB NUMBER	IN HOUSE
150602	DRAWN BY: RA CHECKED BY: CM

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER	PAGE
E1.1	10 OF 14

PLOT SCALE: 1:1 @ 24"x36"; 1:2 @ 11"x17"

CASE #

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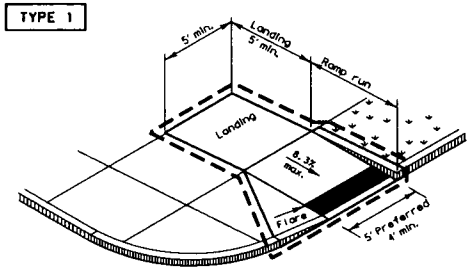
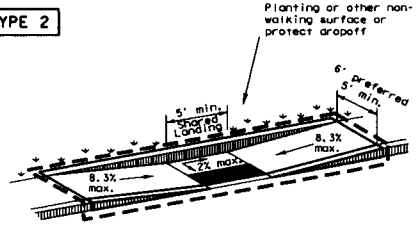
TYPE 1



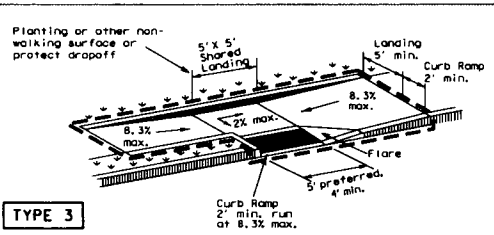
PERPENDICULAR CURB RAMP

TYPE 2



PARALLEL CURB RAMP
(Use only where water will not pond in the landing.)

TYPE 3



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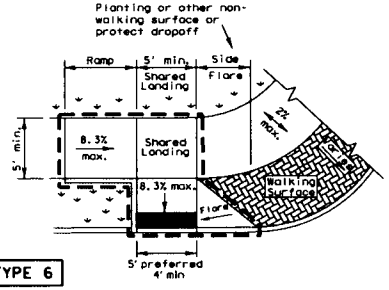
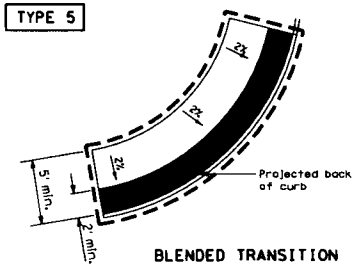


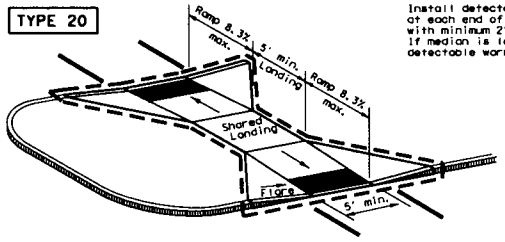
COMBINATION CURB RAMPS

TYPE 5



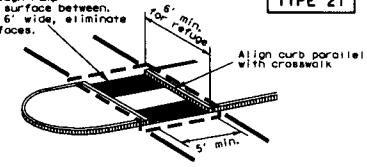
BLENDED TRANSITION

TYPE 20



Install detectable warning surface at each end of cut-through ramp with minimum 2' smooth surface between. If median is less than 6' wide, eliminate detectable warning surfaces.

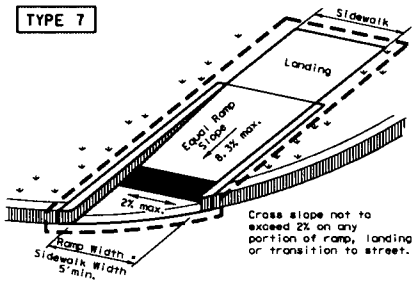
TYPE 21



Curb details are shown elsewhere in the plans.

CURB RAMPS AT MEDIAN ISLANDS

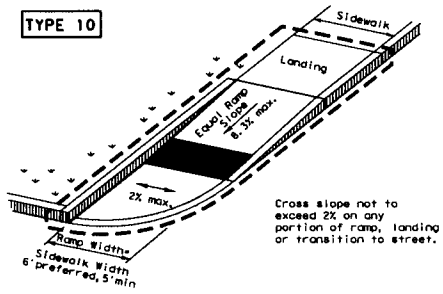
TYPE 7



Cross slope not to exceed 2% on any portion of ramp, landing or transition to street.

(Sidewalk set back from curb)

TYPE 10

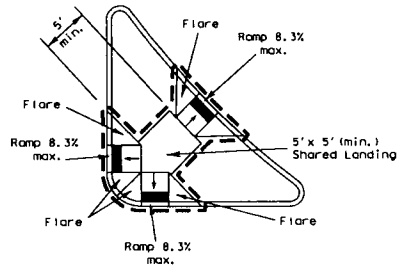


Cross slope not to exceed 2% on any portion of ramp, landing or transition to street.

(Sidewalk adjacent to curb)

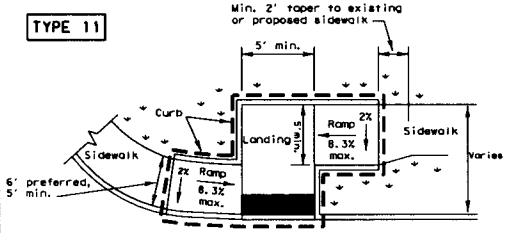
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 22



COMBINATION ISLAND RAMPS

TYPE 11



OFFSET PARALLEL CURB RAMP

NOTES / LEGEND:

See General Notes on sheet 2 of 4 for more information.

Denotes planting or non-walking surface not part of pedestrian circulation path.

Ramp Limits of Payment

Detectable Warning Surface

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

FILE: ped12a.dgn	DW: TxDOT	CK: RM	DW: TxDOT	CK: VP	
©TxDOT March 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS					
VP June 13, 2012	DIST	COUNTY		SHEET NO.	

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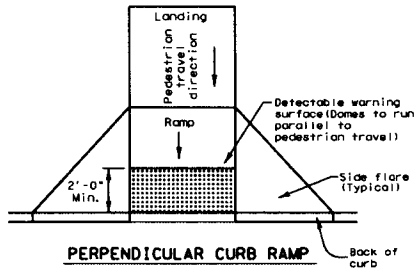
General Notes

Curb Ramps

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Lesser slopes that will still drain properly should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
4. Landings shall be 5'x 5' minimum with a maximum 2% slope in any direction.
5. Maneuvering space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
6. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the current edition of the Texas Accessibility Standards (TAS) and 16 TAC 68.102.
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Handrails are not required on curb ramps. Provide curb ramps wherever an accessible route crosses (penetrates) a curb.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Provide a smooth transition where the curb ramps connect to the street.
16. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
17. Existing features that comply with TAS may remain in place unless otherwise shown on the plans.

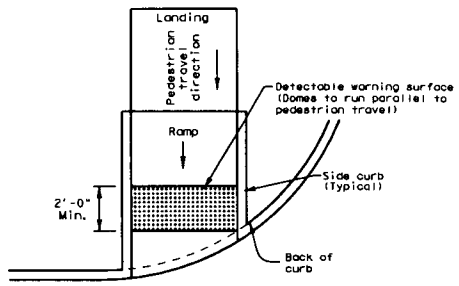
Detectable Warning Material

18. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with Section 705 of the TAS. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
19. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
20. Detectable warning surfaces must be slip resistant and not allow water to accumulate.
21. Detectable warning surfaces shall be a minimum of 24" in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
22. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb. Align the rows of domes to be perpendicular to the grade break between the ramp run and the street. Detectable warning surfaces may be curved along the corner radius.
23. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.



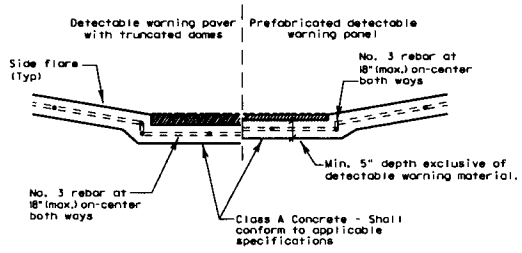
PERPENDICULAR CURB RAMP

Typical placement of detectable warning surface on sloping ramp run.

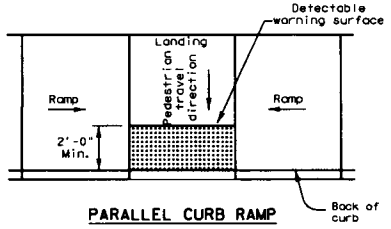


DIRECTIONAL CURB RAMP

Typical placement of detectable warning surface on sloping ramp run.



SECTION: CURB RAMP AT DETECTABLE WARNING



PARALLEL CURB RAMP

Typical placement of detectable warning surface on landing at street edge.

DETECTABLE WARNINGS

Detectable Warning Pavers

24. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
25. Lay full-size units first followed by closure units consisting of at least 25 percent of a full unit. Cut detectable warning paver units using a power saw.

Sidewalks

26. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within one or more reach ranges specified in TAS 308.
27. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
28. Street grades and cross slopes shall be as shown elsewhere in the plans.
29. Changes in level greater than 1/4 inch are not permitted.
30. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than 5% must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with TAS 505.
31. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
32. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
33. Sidewalk details are shown elsewhere in the plans.

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

FILE: ped12a.dgn	DN: TxDOT	CK: RM	DW: TxDOT	CK: VP	
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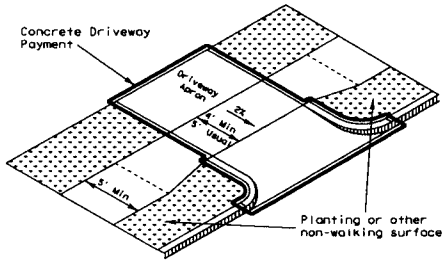
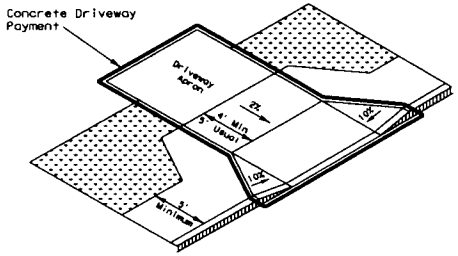
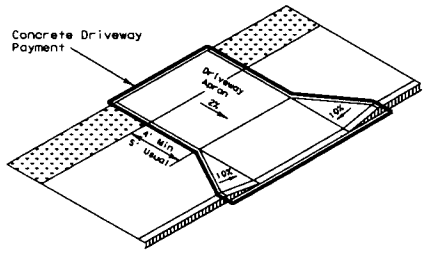


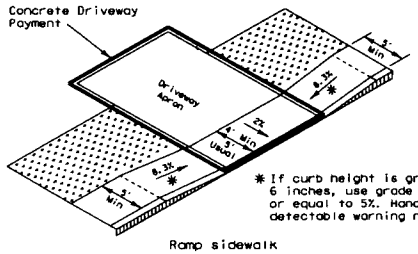
Setback sidewalk



Apron offset sidewalk



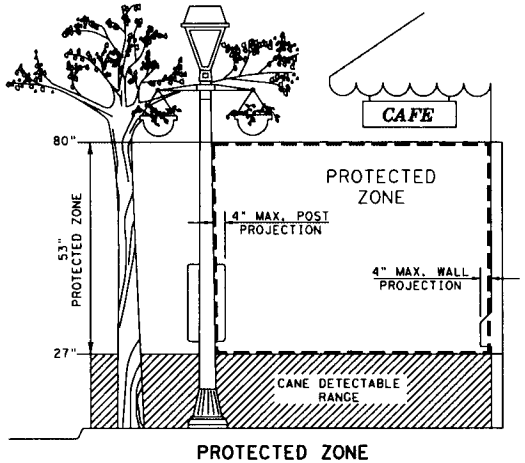
Wide sidewalk



* If curb height is greater than 6 inches, use grade less than or equal to 5%. Handrail and detectable warning not required.

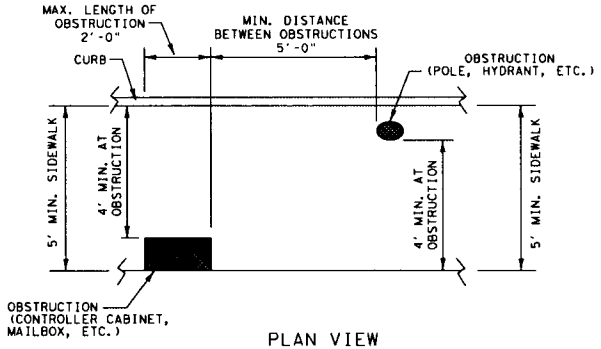
Ramp sidewalk

SIDEWALK TREATMENT AT DRIVEWAYS



PROTECTED ZONE

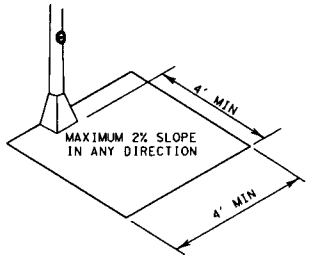
In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27"and 80" above the surface.



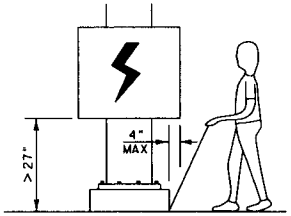
PLAN VIEW

PLACEMENT OF STREET FIXTURES

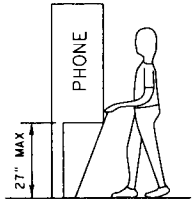
(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)



CLEAR GROUND SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



When an obstruction of a height greater than 27" from the surface would create a protrusion of more than 4" into the pedestrian circulation area, construct additional curb or foundation at the bottom to provide a maximum 4" overhang.



Protruding objects of a height ≤ 27" are detectable by cane and do not require additional treatment.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

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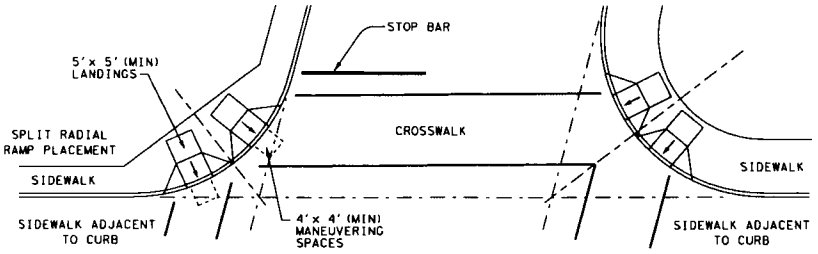
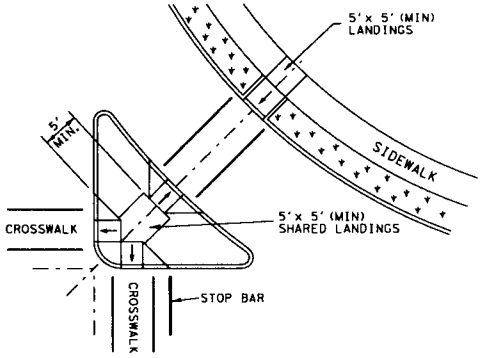
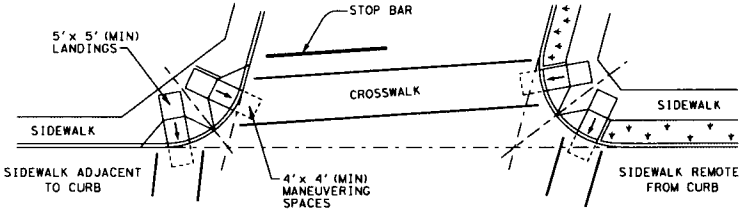


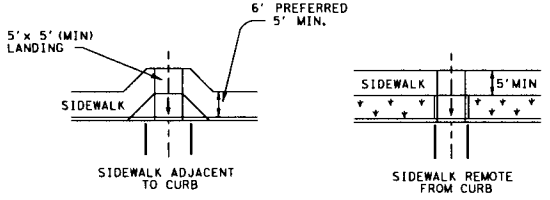
SKEWED INTERSECTION WITH "LARGE" RADIUS



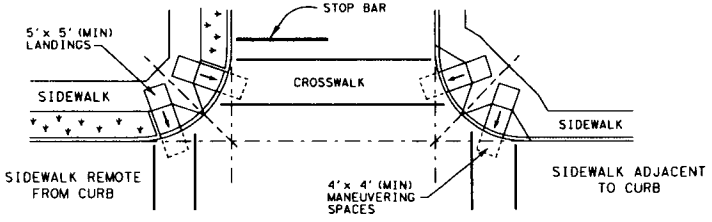
AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



SKEWED INTERSECTION WITH "SMALL" RADIUS



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS



NORMAL INTERSECTION WITH "SMALL" RADIUS

TYPICAL CROSSING LAYOUTS

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

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