

The Town of Paradise
Department of Public Works
Survey Requirements

I have read and understand the conditions contained within this document and agree to fully comply with these standards.

Signature

Date

Survey Requirements

All point descriptions shall accurately describe the feature. All point descriptions shall not exceed 16 characters in length. Point descriptions shall include pertinent information such as tree diameter, the type of tree such as conifer or deciduous, type of utility, beginning or end of linear feature, material types such as AC or Concrete, and any other descriptions required to easily and accurately identify the feature. The use of abbreviations is encouraged. The Surveyor shall use the attached point descriptors when naming field points. If additional descriptors are used, a copy of the additional descriptor keys or abbreviations must be provided to the Town. The use of generalized descriptions, such as "misc" or "util" shall not be used.

When there is insufficient room in the descriptor to adequately describe the features, a Plus (+) sign shall be added to the end of the descriptor and additional information shall be placed into the survey notes or raw files (example: pipe diameter, direction, and invert data).

Utility Premarks

- Surveyor shall send a letter to all utility companies requesting utility premarks. The letter shall be on company letterhead and state that this is a Town project. The Town engineer shall be sent or emailed a copy of this letter. If the surveyor has any difficulties obtaining premarks, the Town engineer shall be notified. A list of utility contacts is provided below.
- The Surveyor shall then tie all utility premarks.
- Allow 5 weeks for utility companies to provide premarks.

AT&T

PG&E Electric

Comcast Cable

Paradise Irrigation District

PG&E Gas

Town of Paradise

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Control

- Randomly positioned horizontal control points consisting of, at the minimum PK nails and shiners or other appropriate material, shall be in place throughout the project limits.
- Horizontal survey control shall be on State Plane Coordinates and established using 2 or more published control points.
- Vertical control throughout the project limits shall be based on Town datum and level loop calculations shall be provided to the Town. Calculations shall also include a closed level loop from the recorded Town Datum marker that the survey is based on. Surveyor shall contact the Town of Paradise Public Works Department and confirm that the bench mark they intend to use is valid Town bench mark. Level loop shall meet first order, Class 1 accuracy and comply with Federal Geodetic Control Subcommittee standards.
- A permanent project benchmark shall be placed within the Town right of way, centrally located within the proposed survey, and outside of the main survey boundaries. The surveyor shall coordinate with the Town Engineer as to the location of this benchmark.
- Control points shall be easily locatable throughout the project limits, spaced no farther than 300' apart, and intervisible with at least two other control points. Control points must be placed to last 10 yrs or until the project is built, whichever is first.
- All control shall be established on the horizontal and vertical control system stated above prior to starting topographic survey

Topographic Survey

- Each survey must consist of current data. Points from older projects must not be substituted for this current data unless prior written approval is received from the Town.
- Unless the Town specifies otherwise, every shot in the public right of way must be field marked with a small white paint dot so that Staff can verify shots.
- Monuments - Surveyor must put in substantial effort into locating existing property corners. All property corner monuments located shall be tied in the horizontal direction only.
- Three sets of shots on every curve, minimum.
- Required shots within the right of way street section shall include but not limited to:
 - Grade breaks
 - Back of walk
 - Back of curb
 - Flowline
 - Lip of gutter (including shots around bulbouts at drain inlets)
 - Mailboxes and yard lights
 - Fences - enough shots along fences to accurately describe the feature, including fence corners and gates.
 - Trees – All trees 6" diameter and over and all landscape trees within the survey area.
 - Elderberry plants must be tied, including drip line, and clearly labeled on the topo map.
 - All environmental features, such as vernal pools shall be delineated.
 - Utility Vaults – Three corners minimum.
 - Round valve cans and pull boxes – center shot only, with diameter.
 - All buildings that are within 20' of the limits of the survey.
 - Centerline crown and stripe if different than crown.
 - All visible traffic loops and hand holes.
 - Striping (signify end of improvements like stripe-end and color if other than white)
 - AC shots including edge of pavement
 - Valve cans
 - Tops and toes of cuts and fills, and daylight lines
 - Utility poles of any kind, including supporting structures
 - Signs, Posts, guard rail, bridge railing, limits of bridge deck, etc.
 - Planters, pillars, concrete paths and other landscaping and irrigation features.
 - Handicap ramps (8 shots min each), refer to Figure 1.
 - Driveways (8 shots min each, top and bottom of curb transitions and back of walk at wing) Refer to Figure 1
 - Manholes (center only with description of utility whether SS, SD, PacBell, etc. Refer to description list), Inverts, pipe directions, pipe sizes, and materials should be noted. Surveyor shall take two digital photos of the inside of each manhole, noting the number or grade rings, material of manhole and cone, and condition of structure.

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- Streetlights and all traffic signal equipment
- All Utility Boxes with good description on the topo of the utility. Substantial effort shall be made to identify utility prior to using the UT category of descriptors.
- Drain Inlets and catch basins (Pick up the center of the grate at flowline, and full detailing of the transition wings at the lip also. Inverts can be dipped with a tape and added to the drawing from the survey notes. Each pipe entering and leaving must have an accurate depth and size associated with it.) If there is debris in the DI that needs to be removed prior to dipping, contact the Town and maintenance staff to request cleaning. A week's notice will be required for Town personnel to schedule the work.
- When taking shots on median curb with no gutterpan, a shot at the top back of curb and a shot at the AC at the front of curb must be included. Many times this distance is not the typical 6".
- Bollards, base only with diameter.
- All returns, angle points, points of reverse curvature, beginning and end of specific features such as curbs, etc.
- Cross-Sections no farther than 50' and in areas where more detail is required, 25' as required in scope.
- Ditches – All tops and toes of feature. If it is a flat bottom ditch, both toes showing the flat bottom.
- ADA - Sufficient elevations on public and private sidewalks, driveways and private property shall be obtained to ensure the design of acceptable conforms to the new improvements and ensure slopes will be in conformance with ADA standards.

Right of Way

- Surveyor shall notify property owners and tenants of property of intent to perform a survey in advance of the work, if accessing private property.
- In order to establish the current right of way limits, the surveyor shall;
 - Research recorded survey maps and other documents in the area of the project.
 - Provide adequate field surveying to "tie" monumentation described in these maps and documents to existing and proposed improvements.
- Right of Way Acquisitions - Any feature that might be important to the design, affect right of way acquisitions, or payment to the property owner needs to be detailed. The Town's intention is to obtain enough detail so that staff does not have to enter the field for clarification. In the case of Acquisition needs, pick up all features no matter how minor. (All bushes, trees of any size, concrete, building corners, planters, or any other feature that may affect the acquisition).

Survey Deliverables

- All control level loop notes and calculations
- Horizontal control traverse notes and closure calculations
- Copy of all survey notes
- Point description list with descriptions not contained within the Town requirements
- RAW data file and hardcopy printout.
- RAW data must include the same descriptions as the final topo for easy correlation.
- Digital photos of the inside of manholes and DI's and sectional sketches of each structure, with their locations. Measured distance down from rim of manhole to top of cone shall also be included for ALL manholes.
- Copies of maps and documents used to establish right of way.
- Include all deliverables in a digital format in addition to a 3-ring binder with signed cover letter.
- The survey point information shall be delivered in AutoCAD DWG format (2013 or newer), and in ASCII PNEZD comma delimited format on a CD, thumb drive, or fileshare software. The drawing file will be used for error checking only and will not be used as part of the final mapping.

Mapping

If mapping is required, base mapping will be reduced using AutoCad Civil 3D 2016 (or newer) software or newer. The Drafter shall use the Town of Paradise Prototype Civil 3D drawing provided by the Town of Paradise. Point descriptions and drafting shall meet the Town of Paradise Capital Projects Services Design Standards format and the base map shall include:

- Features collected during the topographic survey. All features shall have a label.
- Contours with labels at a one-foot interval.
- All points shall be grouped based on the heading contained within the attached point descriptors list and

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contained within the Town of Paradise prototype drawing.

- Spot Elevations where necessary.
- Alignment and stationing for all roadways.
- Existing right-of-way and property lines as compiled from recorded survey maps.
- AP number and address shall be labeled for each parcel.
- Basis of bearing and benchmark information.
- All control points shall have a symbol and be labeled with text showing northing, easting, elevation, and control point number.

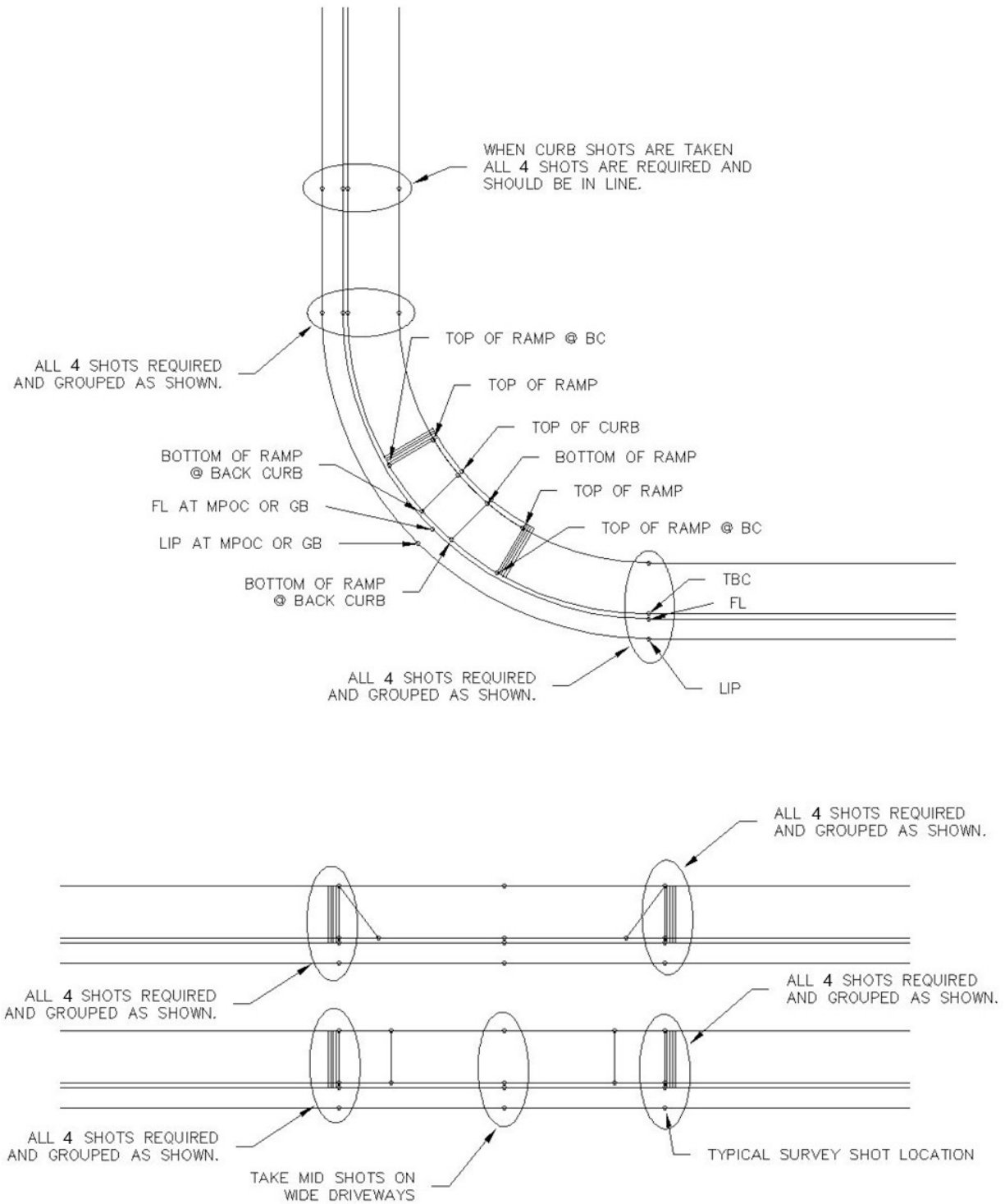
Mapping Deliverables

- An electronic copy of the updated base map in DWG format, complete with all associated project data, fonts, plot tables and external references on a USB thumb driver.
- A signed/stamped copy of the base map at 20 scale and plotted on 24x36 sheets, showing all control points and all features fully described with notes.

Prior to providing deliverables, all information shall have a QA/QC check by a registered individual within the consultant's organization to ensure accuracy and completeness of work product.

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Figure 1 - The figure shown below demonstrates where and how many shots should be taken for roadway hardscape features.



Point Descriptors

Building

B-BL..... Building Line
B-CB Corner of Building
B-DR..... Doorway
B-FF..... Finish Floor
B-OH..... Overhand

Cable TV

TV-B Box
TV-EM Electrical Meter
TV-FO..... Fiber Optics markings from USA
TV-PED Pedestal
TV-TV TV markings from USA

Control Point

CP-BM Bench Mark
CP-CH Chiseled X
CP-NAIL Nail with or without shiner
CP-SPK Spike
CP-TBM..... Temporary Bench Mark
CP-PK..... PK Nail
CP-TMP..... Temporary Control Point
CP-PC Property Corner (Add description, size, RC #, etc)
CP-MON Monument

Electrical

E-E..... Underground Electric markings from USA
E-B..... Box
E-V..... Vault
E-PP Power Pole
E-PED..... Pedestal
E-ET(N, S, E, W) Electrical "T" Connection. Use N, W, E or W for direction
E-M Meter
E-PAD..... Pad
E-PMG..... Pad Mounted Gear
E-SL..... Street Light
E-YL..... Yard Light
E-SP Service Pole

Fence

FNC-WD Wood Fence
FNC-CL Chain Link Fence
FNC-BRICK Brick
FNC-ROCK..... Rock
FNC-CONC concrete
FNC-GP..... Gate Post
FNC-END end of fence
FNC-FT(N, W, E, W) Fence T connection. Use N, W, E or W for direction
..... Corner
FNC-RETWALL Retaining Wall

Gas

G-G..... Gas Markings from USA
G-V Valve
G-GM..... Meter

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G-S Service
G-LPG Propane Tank (both ends)

Paint Stripe

PS-TS Traffic Stripe
PS-BS..... Bike Lane Stripe
PS-FS Fog Lane Stripe
PS-CWS Cross Walk Stripe
PS-SB..... Stop Bar
PS-BIKE Bike Symbol

Roadway

R-LIP Lip of Gutter
R-EP Edge of Pavement
R-TBC..... Top Back Curb
R-TBRC Top Back Rolled Curb
R-FFC..... Front Face Curb
R-CL Centerline of road
R-VG..... Valley Gutter
R-BOW Back of Walk
R-SW Sidewalk (walkways)
R-FOW Front of Walk (separated only)
R-BAD Top Back AC Dike
R-FAD..... Bottom front AC dike
R-FL..... Flowline
R-DW Driveway shots
R-HC..... Handicap ramp shots
R-SP Sign Post
R-PM Parking Meter
R-GRP Guard Rail Post

Sanitary Sewer

SS-B Box
SS-CO Clean Out
SS-MH Manhole
SS-TOP Top of pipe
SS-INV..... Sewer Invert

Storm Drain

SD-DI..... Drain Inlet (front opening)
SD-CB Catch Basin
SD-MH..... Manhole
SD-FES Flared End Section
SD-INV Invert
SD-TOP Top Pipe
SD-YD Yard Drain
SD-HW Headwall

Telcom

T-B..... Box
T-FO Fiber Optics
T-MH..... Manhole
T-OHL..... Overhead Lines
T-P..... Pole
T-PAD..... concrete Pad

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T-PED..... Pedestal
T-PMG Pad mounted gear
T-V..... Vault
T-T Telcom Markings from USA

Traffic Signal

TS-B Box
TS-BP.....Button Post
TS-CB.....Control Box
TS-HH..... Hand hole
TS-PB interconnect box/ Pull box
TS-TL..... traffic loop
TS-P Pole

Unknown or Combined Utility

UT-B Box
UT-DP..... Drop Pole
UT-GUY..... Guy
UT-JP Joint Pole
UT-JT..... Joint trench
UT-OHL Overhead Lines
UT-PA..... Pole Anchor
UT-PAD Concrete Pad
UT-PED Pedestal
UT-PMG Pad Mounted Gear
UT-TP Trench Patch
UT-STUB Stub
UT-V Vault

Vegetation

VEG-CON..... Conifer Tree (include tree size, Inches at chest height)
VEG-DEC Deciduous Tree (include tree size, Inches at chest height)
VEG-BUSH..... Bush
VEG-SHRUB Shrub
VEG-HEDGE Hedge

Water

W-W..... Water markings from USA
W-B..... Box
W-BOV Blow Off Valve
W-CV.....check Valve
W-FH Fire Hydrant
W-FSR..... Fire Sprinkler riser
W-FSV Fire Sprinkler Valve
W-HB Hose Bib
W-IT..... Irrigation Timer
W-WM..... Water meter
W-BPV..... Backflow Prevention Valve
W-SPRK Irrigation Sprinkler
W-V..... Water valve
W-WELL Water Well
W-WS Water Service
W-WT(N, W, E, W) Water "T" connection – use N, S, E, W for direction

Non Grouped Descriptions

CAP Concrete Angle Point

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EC.....	Edge of Concrete
C	Concrete
STEP	Steps
DW.....	driveway shots (not to be used for roadway driveway shots)
FW	Front of Walk (Not to be used for roadway sidewalk shots)
BW.....	Back of Walk (Not to be used for roadway sidewalk shots)
TRASH	Trash Enclosure
SIGN.....	Private Sign
MB	Mail Box
BOL	Bollard
BMPR	Parking Bumper
BNCH	Bench
BUS	Bus Shelter
TOP	Top of Cut
TOE	Toe of Fill
DAY	Daylight
OG	Original Ground
AC.....	AC shot
EGDW	Edge Gravel Driveway
EP	Edge Pavement
FP	Flag Pole
GB	Grade Break