



CITY OF FORT BRAGG

416 N. FRANKLIN, FORT BRAGG, CA 95437

PHONE 707/961-2823 FAX 707/961-2802

COUNCIL COMMITTEE ITEM SUMMARY REPORT

MEETING DATE: JULY 10, 2019

TO: PUBLIC WORKS & FACILITIES COMMITTEE

FROM: TOM Z. VARGA, PUBLIC WORKS DIRECTOR

AGENDA ITEM TITLE: RECEIVE REPORT AND DISCUSS A "DIG ONCE" POLICY TO MINIMIZE THE NUMBER OF AND SCALE OF EXCAVATIONS WHEN INSTALLING TELECOMMUNICATIONS INFRASTRUCTURE IN RIGHTS-OF-WAY

BACKGROUND AND OVERVIEW:

During a presentation at the April 22, 2019 City Council meeting on the "*Mendocino County Digital Infrastructure Plan 2019 – 2025*", there was Council discussion about the City developing a "Dig Once" policy. Such a policy is designed to take advantage of trenching or excavating in public streets or similar environments and add underground communications facilities at the same time to minimize the cost and disruption associated with placing facilities underground. More specifically, Council was interested in a policy that focused on placing optical fiber conduit underground to encourage the development of broadband service in the City.

Staff has been following the progress of various "Dig Once" programs throughout the State. Two of the more successful programs can be found in Santa Monica and San Francisco. Other communities that are investigating policies or are implementing basic programs include: City of Santa Cruz/Santa Cruz County, Brentwood, and Davis. In addition, the State of California is examining the matter. Caltrans has been directed to develop a statewide "Dig Once" policy. The City's Inland General Plan has a policy goal regarding the installation of conduit in new roads and road reconstruction projects. There is not a comparable provision in the Coastal General Plan.

A summary:

City of Santa Cruz/Santa Cruz County, the city and county are working together to develop a "Dig Once" policy. The County prepared a draft Ordinance in 2013, but has not passed it yet. They modeled their policy after that of San Francisco. The City has a policy that has been incorporated into their budget goals. At this time, fiber infrastructure has been primarily installed in the City of Santa Cruz by the local communication provider (Cruzio). A formal master plan does not seem to have been developed.

Brentwood, the City adopted an "Advanced Technology Master Plan" that was most recently revised in 2013. This master plan includes provisions for undergrounding fiber infrastructure. A "ring" type of backbone network was identified to help guide the future location of this infrastructure. Standard design/construction details were created to specify the construction of joint utility trenches. These details do not apply to water or sewer trenches. The master plan focuses on the expansion of infrastructure accompanying development.

Davis, The City of Davis and neighboring communities are collaborating with Yolo County to develop broadband policies, including provision for "Dig Once". They are in the information gathering stage and considering options similar to Mendocino County and its cities.

State of California, the Governor recently directed Caltrans to develop a statewide "Dig Once" program with an appropriate policy. The status of this work is uncertain as all references to "Dig Once" have been removed from State websites.

Santa Monica, The City has a fully realized fiber optic network and associated “Dig Once” policy. They own their network and are guided by, “*Santa Monica City Net – An Incremental Approach to Building a Fiber Optic Network*”. They started their network by identifying major nodes or centers of activity that could be used to create a backbone network connecting these nodes. Nodes were chosen from locations of major public activity (e.g. City Hall) and major employment centers, (e.g. technology parks). Construction projects along these primary backbone alignments then installed fiber optic facilities. Detailed construction standards were developed to ensure that the infrastructure met the technology needs.

San Francisco, The City and County of San Francisco also has an effective “Dig Once” policy. They base their policies on a guide called, “*Technical Guide to Dig Once Policies*” produced by CTC Technology & Energy and most recently updated in April 2017. It is a concise summary of practices employed elsewhere and a good summary of how to develop effective “Dig Once” policies. This appears to be the same guide used by the City of Santa Cruz and Santa Cruz County as noted earlier.

The CTC Guide utilizes a system of priorities to aid in the development of a “Dig Once” policy. Prioritizing construction should ensure that dig once opportunities are identified and that resources not be wasted installing conduit that is unlikely to be used. Briefly, the following priorities lead to successful deployment of underground fiber facilities:

Construction:

1. Place conduit (facilities) over, long continuous corridors.
2. Develop standard specification(s) that provide for:
 - a. capacity (e.g. size and number of conduits)
 - b. separation from other underground facilities
 - c. access via vaults/boxes
 - d. other parts (e.g. sweeps/ends and the space to accommodate them)
 - e. incremental costs (e.g. increasing trench size to accommodate the new fiber conduits).
3. Lack of existing local communications infrastructure, including utility poles.
4. Synergies with other right-of-way projects that improve the affected right-of-way, (e.g. streets, utilities, etc.).

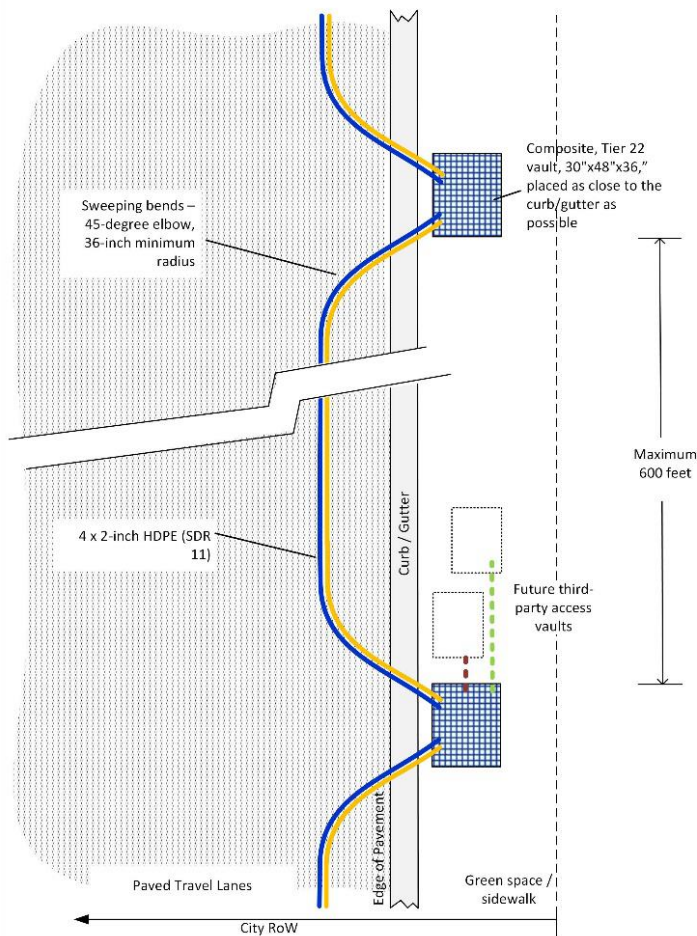
Networking:

1. Proximity to government or community anchor facilities (nodes) requiring service.
2. Potential partnering opportunities with customers, developers, or service providers.

Certain circumstances tend to not lend themselves to useful installations:

1. Ability to use existing utility poles along the same alignment/path
2. Excavation projects that extend only a few blocks
3. Excavation projects isolated from other projects or existing fiber infrastructure
4. Excavation projects in low or medium density residential neighborhoods not near anchor institutions
5. Excavations that affect only the top layer of the street, (e.g. no trenching).

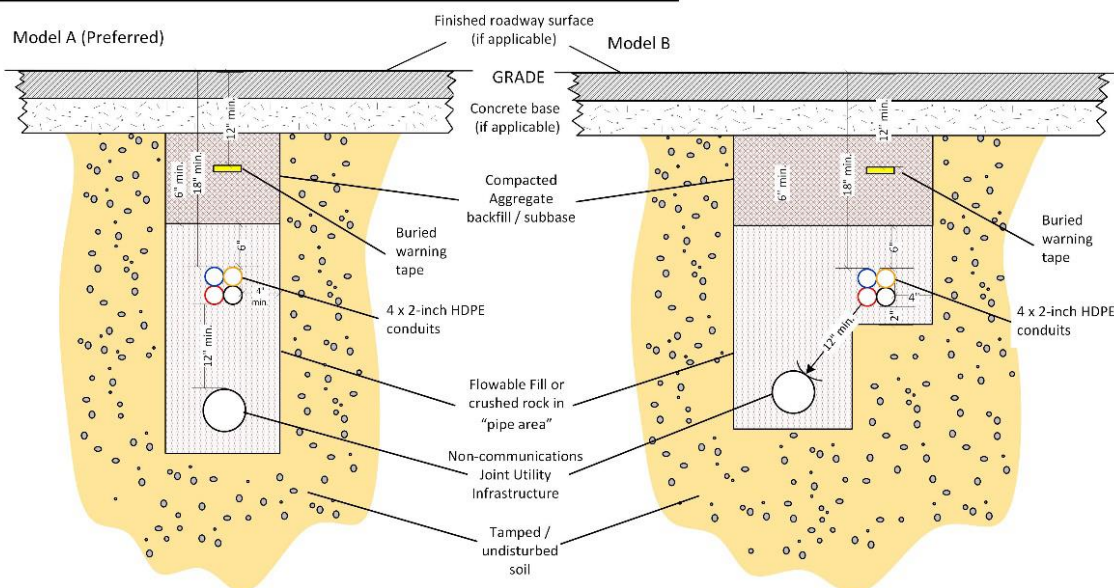
Conduit and Vault Horizontal Layout



INSTALLATION AND CONSTRUCTION NOTES:

1. City communications conduit shall consist of four (4) 2-inch HDPE (SDR 11) roll duct, with pre-installed mule tape. Each conduit shall be a different color or be uniquely striped for easy identification.
2. All conduit couplers and fittings shall be installed to be water-tight. Conduits shall be sealed with an endcap or blank duct plug upon installation.
3. An electrical ground rod shall be installed in all vaults. Ground rods shall be comprised of 13-mil copper-clad steel, 5/8-inch diameter, 8-foot length.
4. A 10 AWG insulated tracer wire shall be installed in one conduit in each conduit bank. Tracer wires shall be electrically bonded to the ground rod in each vault using a suitable clamp.
5. Vaults shall be of a composite, straight-walled construction, UL-listed to ANSI 77-2010 and Tier 22 load-rated. Handholes shall have external dimension of approximately 30"x 48"x 36" (WxLxD).
6. Vaults shall be placed in the City right-of-way immediately outside of the paved surface/vehicular traffic lanes, as close to the curb/gutter as possible.
7. Vaults shall be placed at roadway intersections, spaced a maximum of 600 feet. Adjacent vaults shall be separated by no more than two roadway crossings.
8. Conduit shall be placed with a minimum of 18-inches of cover below grade.
9. Conduit shall be placed with sweeping bends from the roadway to each handhole location. If using rigid conduit, bends shall utilize 45-degree elbows with a 36-inch minimum bend radius.
10. Conduit shall enter vaults from the sidewall through openings created per manufacturer instructions to retain the associated load rating. Conduits shall protrude beyond the interior wall of the vault by a minimum of 1-inch, and no more than 3-inches.
11. Trench backfill in the pipe area shall be flowable fill or ¾"-0 crushed rock.
12. Trench backfill within a minimum of 6-inches of the concrete base shall be Class 2 Aggregate Base and compacted to 95-percent maximum dry density per ASTM D-1557 or AASHTO T-180.
13. City communications conduit shall maintain 12-inches of clearance radially from other utilities, unless otherwise agreed upon by the City and the applicable utility owner.
14. A fiber optic warning tape shall be installed and the remainder of the fill shall be added, tamping down the top layer. All fiber shall be marked in the ground with a bright orange (preferably "ULCC" orange) or yellow warning tape at least 3 inches wide. The tape shall have integrated metallic mesh or cable to allow for easy detection. The marking tape shall be buried directly above the conduit run at a depth of approximately 12 inches below existing grade. The tape shall read "WARNING - OPTICAL CABLE" or other wording approved by the City that conveys the same message.

Trench Details



Dig-Once Joint Trench
Typical Configuration –
Non-Communications

SIZE	FSCM NO	DWG NO	REV
11"x17"			5
SCALE	Not to scale	SHEET	2 OF 2

In reviewing the policies and practices of other agencies, some common practices have become apparent. An early part of any successful “Dig Once” policy is to identify the primary users that would benefit from underground optical fiber infrastructure and develop a backbone network serving these users. These would be users depending on large volume broadband bandwidth that can justify the initial start-up costs of developing a network. In several locations, this was tied to development to provide the necessary funding.

A fairly well developed set of standard, construction specifications and plan details characterize nearly all “Dig Once” policies. Construction requirements should not only consider conduit but also all of the associated infrastructure including access boxes, bends in the conduit, the specific alignment and location of underground infrastructure, separation from other underground infrastructure and trying to anticipate likely places where future users can conveniently connect to the pre-placed “dig once” facilities, see the illustration above. This can be quite a challenge. Attempts at trying to anticipate locations of future locations for driveways, water services, and sewer services have met with mixed success.

Finally, there is the implied competition from existing aerial facilities as well as wireless services. Underground facilities need to be cost competitive with these other options.

RECOMMENDATION:

The Committee is requested to review and consider the information presented and advise staff how it wishes to proceed with the development of a “Dig Once” policy for the City of Fort Bragg. Should the next step be to develop a draft policy or continue research and investigation to further refine the topic?

ATTACHMENTS:

“Technical Guide to Dig Once Policies”