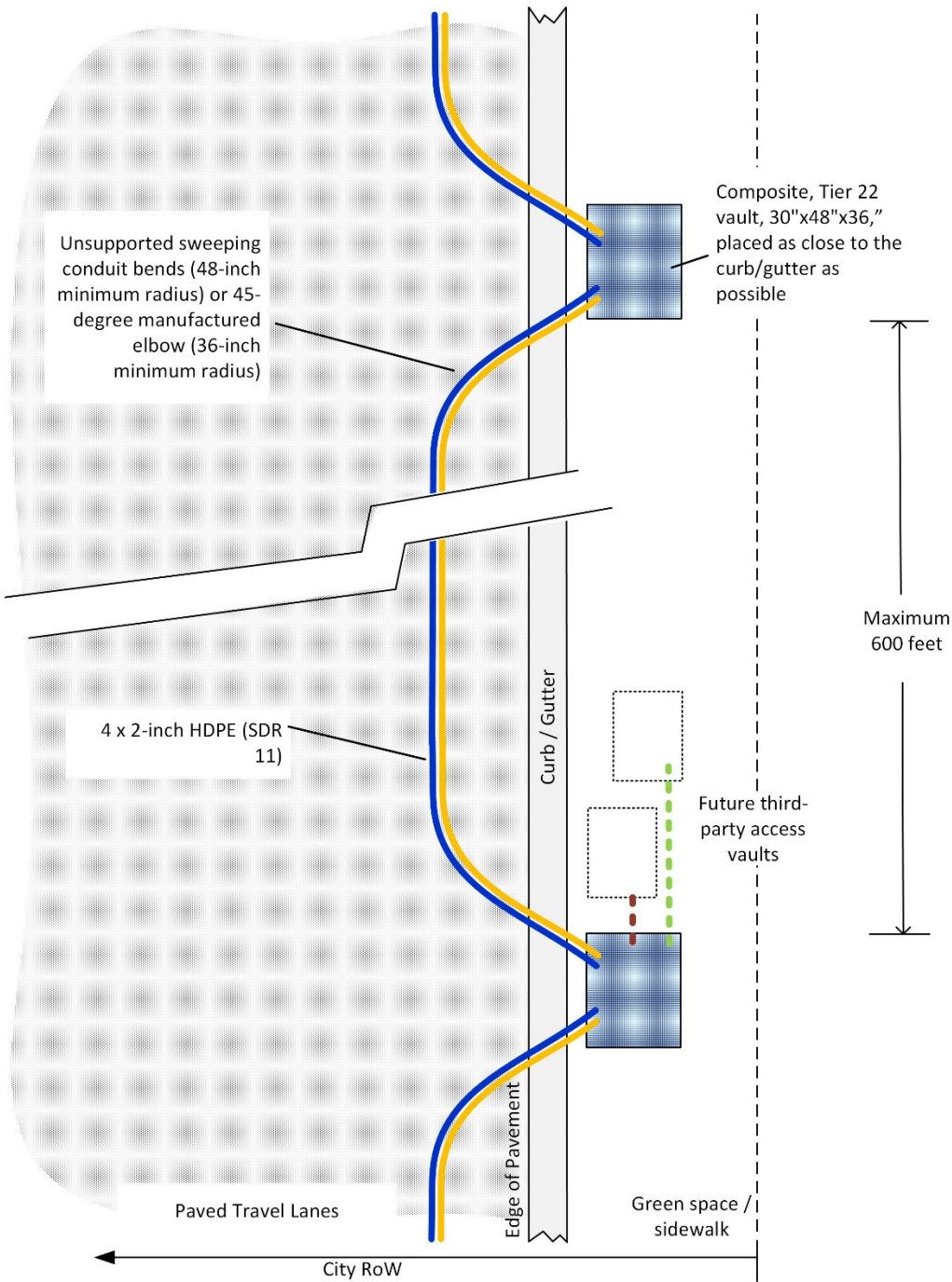


Conduit and Vault Horizontal Layout

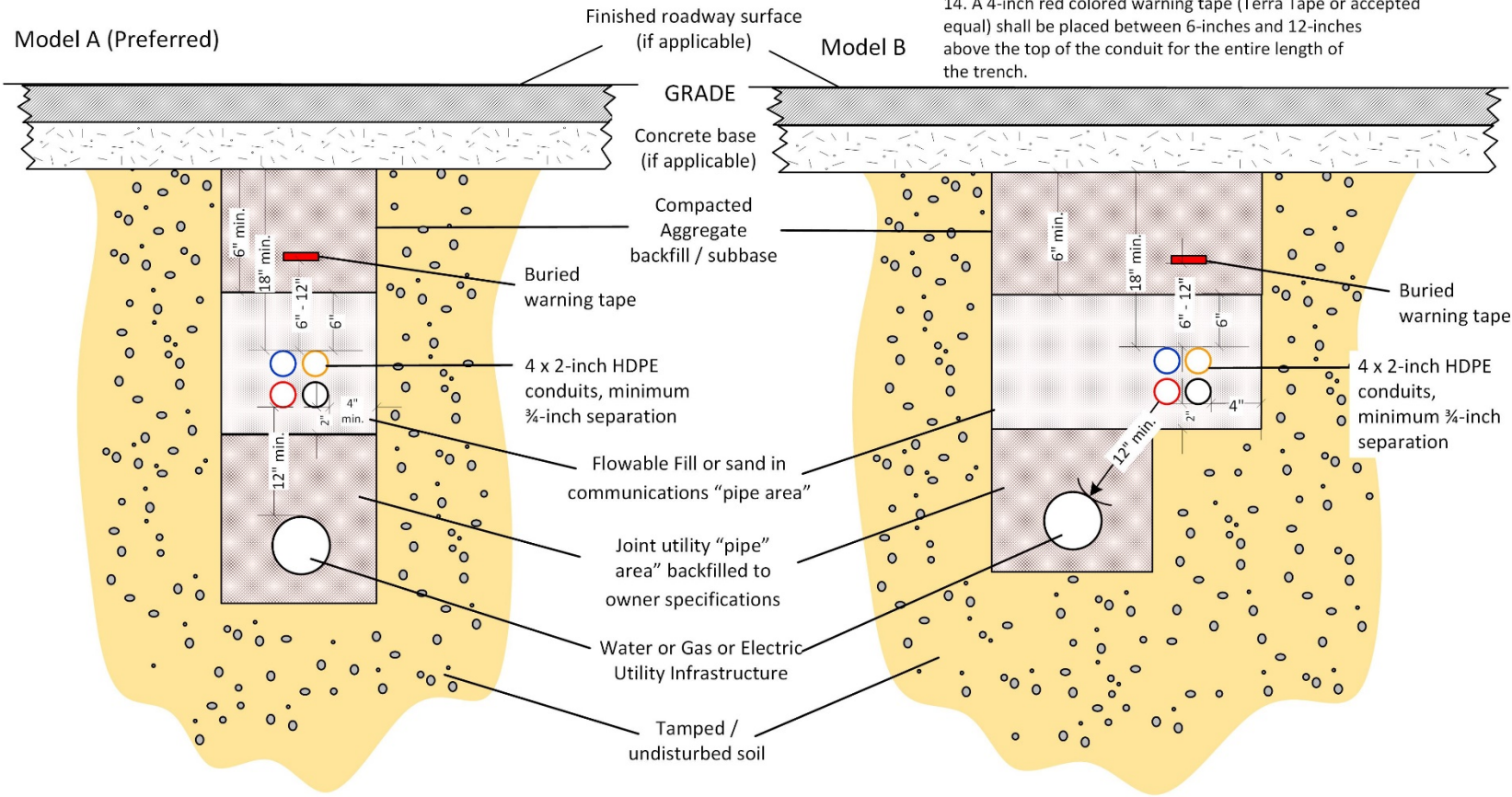


INSTALLATION AND CONSTRUCTION NOTES:

1. City communications conduit shall consist of four (4) 2-inch HDPE (SDR 11) flexible duct, with pre-installed mule tape. Each conduit shall be a different color or be uniquely striped for easy identification. Conduits shall be fastened together with spacers at 5-foot intervals, maintaining a minimum separation of 3/4-inch between each conduit.
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, 10-foot length, and tested to have an electrical resistance to ground of 25 ohms or less.
4. A 10 AWG insulated tracer wire shall be installed in one conduit in each conduit bank. Tracer wires shall consist of a solid, Copper Clad Steel (CCS) conductor and blue insulation. Insulation shall be HDPE or HMWPE). 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. Vaults and lids shall be Tier 22 load-rated. Vaults shall have external dimension of approximately 30"x 48"x 36" (WxLxD). Vault lids shall be etched with the words, "City of Santa Cruz Fiber Optics"
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, or a minimum of 18-inches below the concrete base where located under paved roadway surfaces. Where feasible, conduit shall be placed with a maximum of 48-inch cover below grade.
9. Conduit shall be placed with sweeping bends from the roadway to each vault location having a minimum bend radius of 48-inches. If using manufactured elbows, 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 communications conduit area shall be flowable fill or sand. Trench area surrounding joint utility pipe backfilled per utility owner specifications.
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 4-inch red colored warning tape (Terra Tape or accepted equal) shall be placed between 6-inches and 12-inches above the top of the conduit for the entire length of the trench.

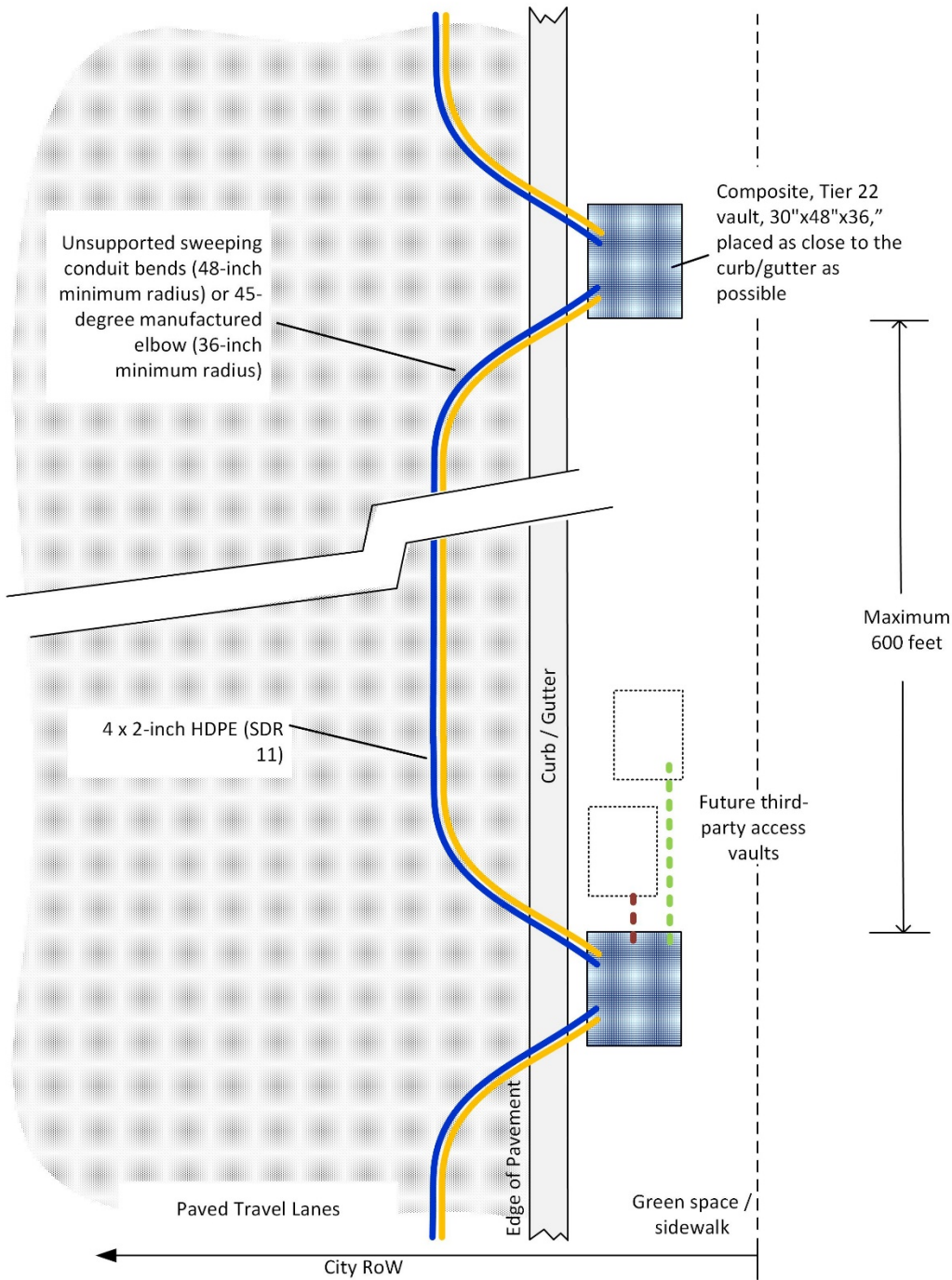
Trench Details

Model A (Preferred)



Dig-Once Joint Trench Typical Configuration – Water / Gas / Electric	City of Santa Cruz, California			
	SIZE	FSCM NO	DWNG NO	REV
	11"x17"			9
	SCALE	Not to scale	SHEET	2 OF 7

Conduit and Vault Horizontal Layout

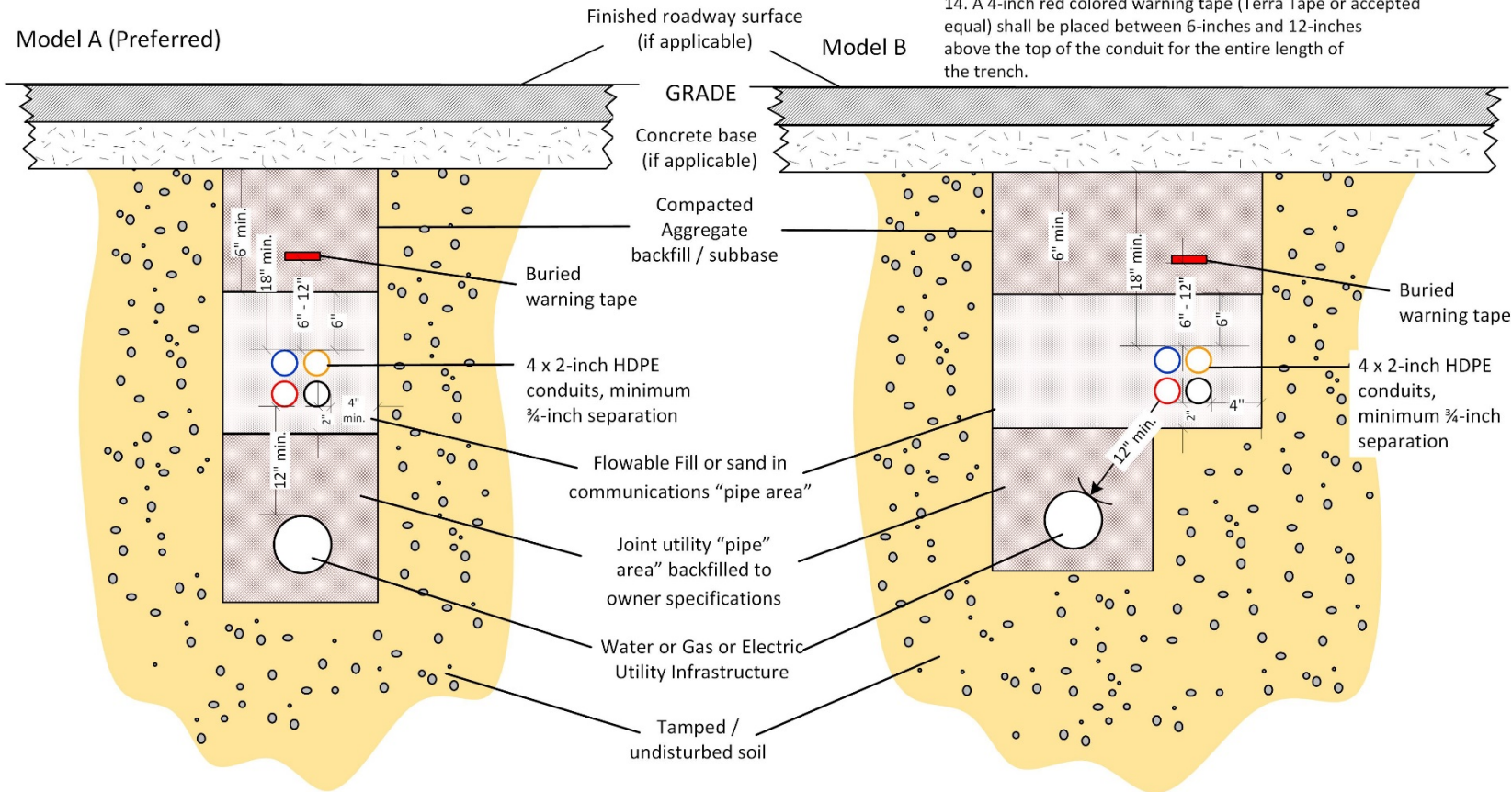


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Trench Details

Model A (Preferred)



Dig-Once Joint Trench Typical Configuration – Water / Gas / Electric	City of Santa Cruz, California			
	SIZE	FSCM NO	DWNG NO	REV
	11"x17"			9
	SCALE	Not to scale	SHEET	2 OF 7

Figure 7 is a typical diagram showing Dig Once coordination with a communications excavator.

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Figure 8 is a typical diagram showing Dig Once coordination with a water, power or sewer excavator, and provides two options—one with Dig Once conduit directly above the utility, and one with Dig Once conduit offset laterally.

Typical drawings contain recommended standards for depth, bend, location, location tape, and vaults/handholes.

Figure 5: Typical Diagram – Major Corridor – Dig Once Coordination with a Communications Excavator

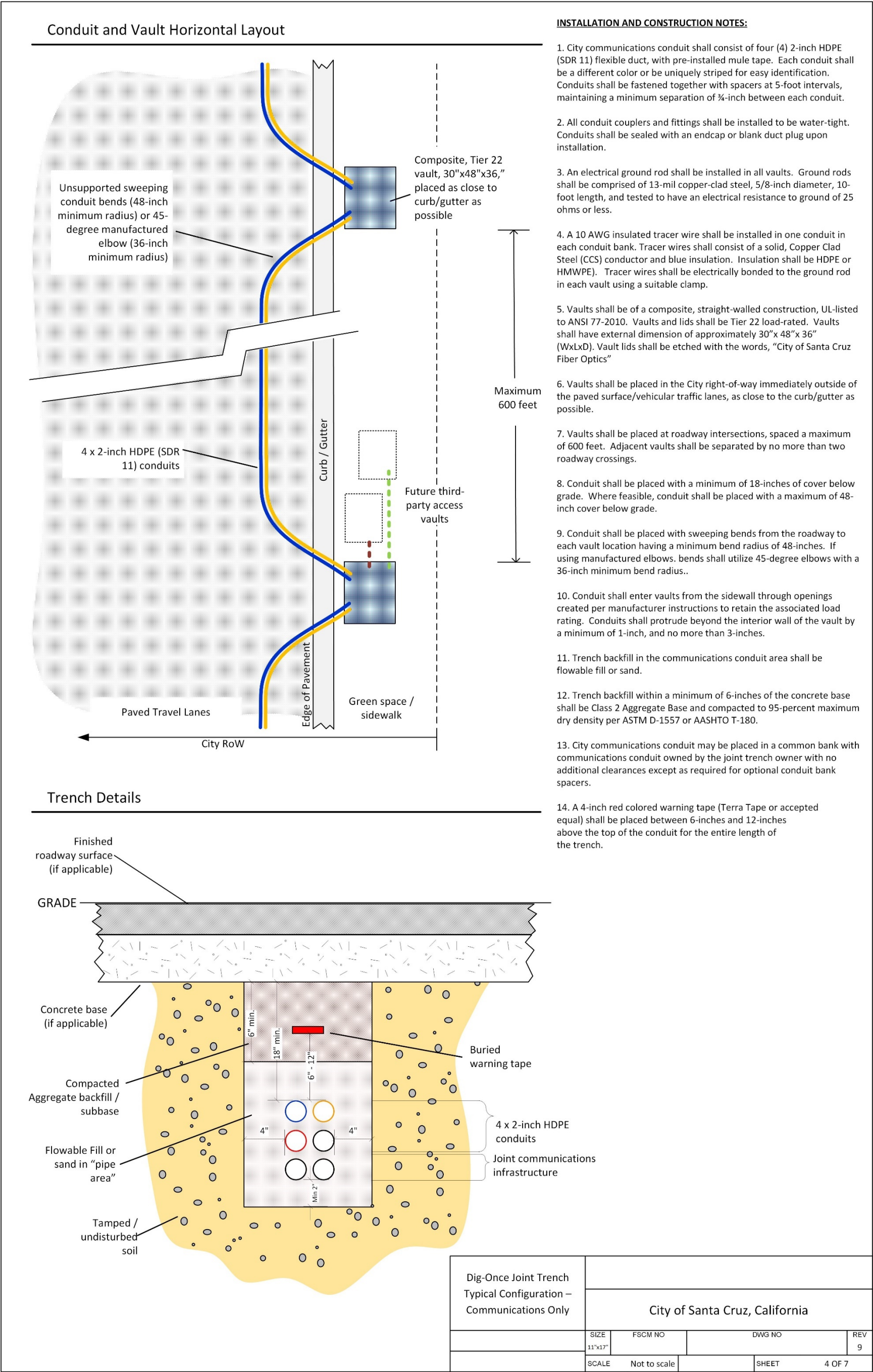


Figure 6: Typical Diagram – Major Corridor – Dig Once Coordination with a Water, Power, or Sewer Excavator

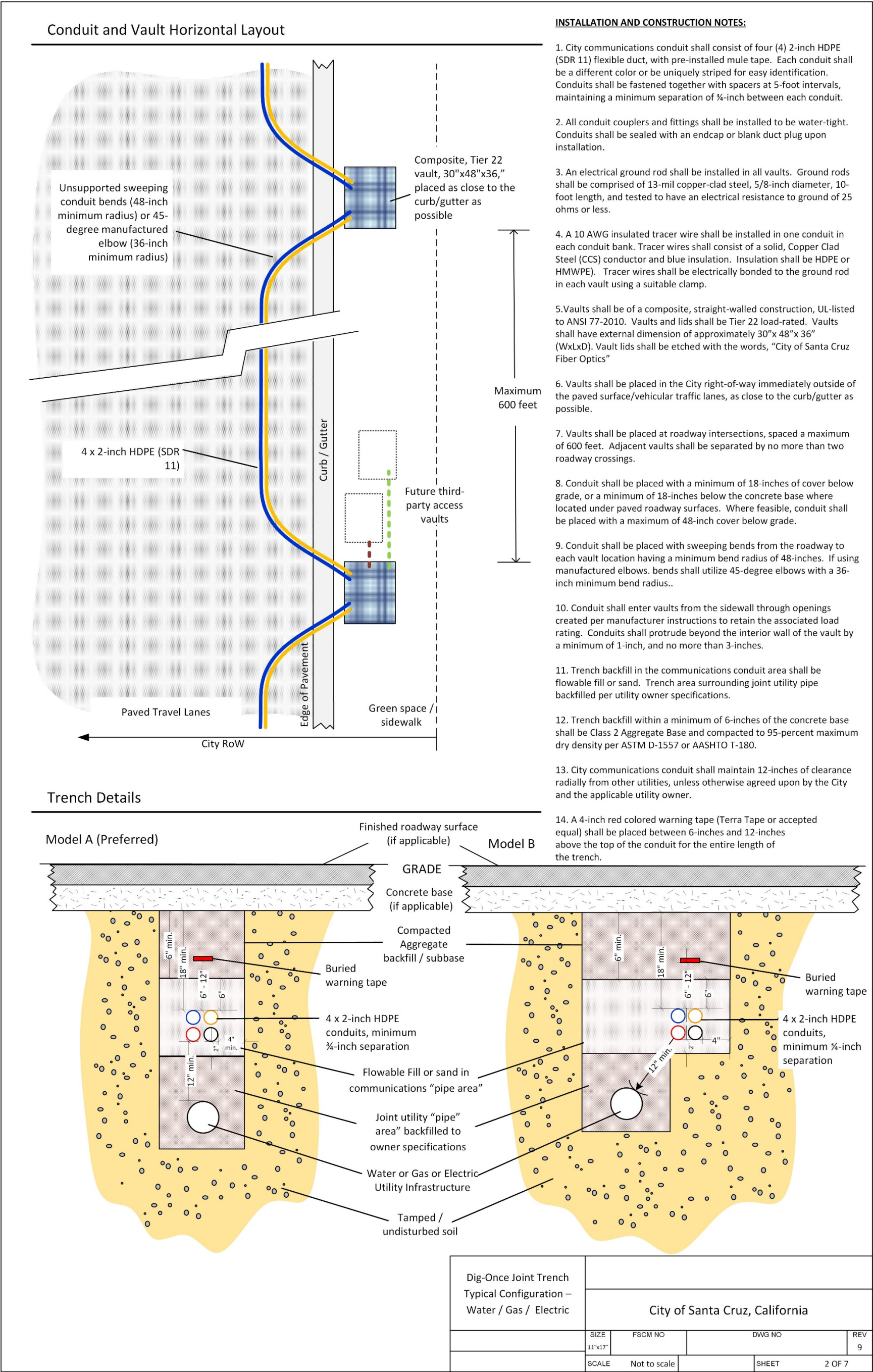


Figure 7: Typical Diagram – Dig Once Coordination with a Communications Excavator

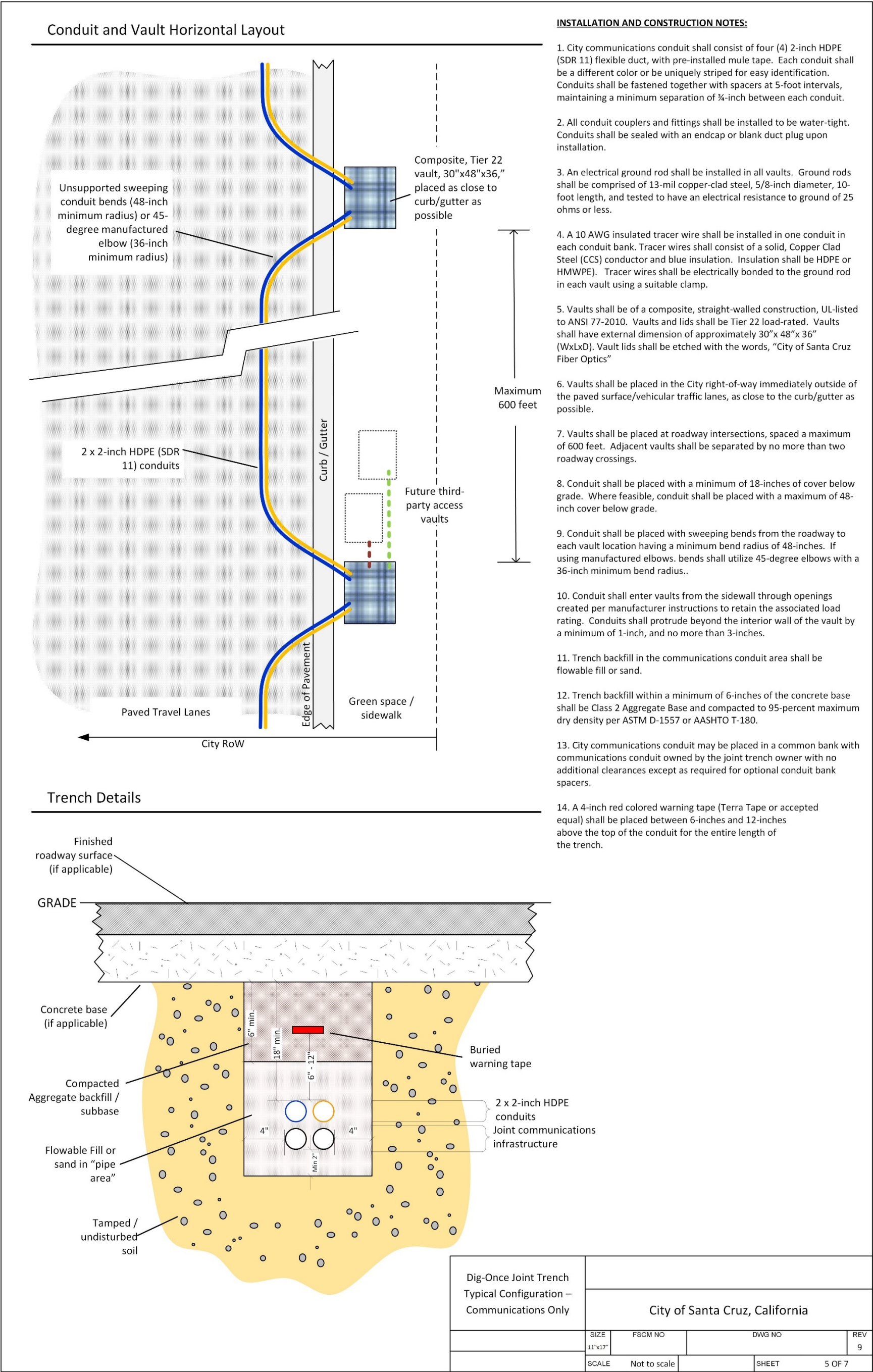


Figure 8: Typical Diagram – Dig Once Coordination with a Water, Power, or Sewer Excavator

