

COUNTY OF SAN JOAQUIN

DEPARTMENT OF PUBLIC WORKS

P.0. BOX 1810-1810 E. HAZELTON AVENUE STOCKTON, CALIFORNIA 95201 (209) 468-3000 FAX # (209) 468-9324 Permit No: PS-1701423 Date Issued: 05/18/2017 Start Date: 05/22/2017 Exp. Date: 07/01/2017 Project No: PWP110005

Permit Section

Quad: SW

ENCROACHMENT PERMIT

To:	SEFNCO/COMCAST
	5340 BRISA ST
	LIVERMORE CA 94550

YELLOW

PINK

-Field Inspection

-Permit Section

Encroachi	nent Type:			
Aerial Wo	rk & Traffic Control			
Location: S/S OF LA	RCH RD. 100' W/O	I FRACY BLVD. (COUNTY PORT	ION)	
application		terms, conditions and restrictions wr	y granted to do work in County right- ritten below or printed as general or s	
Director. S to depth of undergroun	urface of trench patch utilities through roads	es shall match in kind and be smootlide area in anticipation of future drai	nin ten feet (10') of pavement centerli h and even with that of abutting surfa inage facilities, road profile and/or fro ensioned on sketches from surveyed o	ce. Special attention shall be given ontage development. All
forty-eight	hours prior to begin	ning any work within the County	neering Division (Permit Inspection right of way. All work performed urnia Division of Industrial Safety and	under this permit shall conform to
pedestrian o	r automobile traffic.	All necessary traffic convenience and	emoval of any excess dirt or debris when devices and personnel sha with the latest edition of the CALTRA	ll be provided, placed and
neat workm	anlike manner. Imme	nitted herein, all debris, lumber, bar diately following completion of cons d) provided by Grantor.	ricades, or any excess material shall l struction permitted herein, Permittee	pe removed and the jobsite left in a shall fill out and mail notice of
Special Con	nments:			
Traffic Con	trol Per MUTCD			
FORMS:	SS/WW			
Fet Permit	Fee: \$436.00			
Est. 1 ci ilit	rec \$450.00			BALAJI, Director
WHITE	-Permittee			
GOLDENROD	-PWD Central	File		

ENCROACHMENT PERMIT GENERAL PROVISIONS

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1. This permit is issued under and subject to all laws and ordinances of agencies-governing the encroachment herein permitted. See the following references:

STREETS AND HIGHWAYS CODE

- 1. Division 1, Chapter 3
- 2. Division 2, Chapter 2, Section 942
- 3. Division 2, Chapter 4, Section 1126
- 4. Division 2, Chapter 5.5 and Chapter 6

SAN JOAQUIN COUNTY ORDINANCES NUMBERED: 324, 441, 648, 662, 672, 695, 700, 860, 892, 3359, and 3675.

- 2. It is understood and agreed by the Permittee that the performance of any work under this permit shall constitute an acceptance of all the provisions contained herein and failure on the Permittee's part to comply with any provision will be cause for revocation of this permit. Except as otherwise provided for public agencies and franchise holders, this permit is revocable on five days notice.
- 3. All work shall be done subject to the supervision of and the satisfaction of the grantor. The Permittee shall at all times during the progress of the work keep the County Highway in as neat and clean condition as is possible and upon completion of the work authorized herein, shall leave the County Highway in a thoroughly neat, clean and usable condition.
- 4. The Permittee also agrees by the acceptance of this permit to properly maintain any encroachment structure-placed by the Permittee on any part of the County Highway and to immediately repair any damage to any portion of the highway, which occurs as a result of the maintenance of the said encroachment structure, until such time as the Permittee may be relieved of the responsibility for such maintenance by the County of San Joaquin.
- 5. The Permittee also agrees by the acceptance of this permit to make, at its own expense, such repairs as may be deemed necessary by the County Department of Public Works.
- 6. It is further agreed by the Permittee that whenever construction, reconstruction or maintenance work upon the highway is necessary, the installation provided for herein shall, upon request of the County Department of Public Works, be immediately moved or removed by and at the sole expense of the Permittee.
- 7. No material used for fill or backfill in the construction of the encroachment shall be borrowed or taken from within the County right of way.
- 8. All work shall be planned and carried out with as little inconvenience as possible to the traveling public. No material shall be stacked within eight feet (8') of the edge of the pavement or traveled way unless otherwise provided herein. Adequate provision shall be made for the protection of the traveling public. Traffic control standards shall be utilized including barricades; approved signs and lights; and flagmen, as required by the particular work in progress.
- 9. The Permittee, by the acceptance of this permit, shall assume full responsibility for all liability for personal injury or damage to property which may arise out of the work herein permitted or which may arise out of the part of the Permittee to properly perform the work provided under this permit. In the event any claim of such liability is made against the County of San Joaquin or any department, official or employee thereof, the Permittee shall defend, indemnify, and hold each of them harmless for such claim.
- 10. All backfill material is to be moistened as necessary and thoroughly compacted with mechanical means. If required by the County Director of Public Works, such backfill shall consist of gravel or crushed rock. The Permittee shall maintain the surface over structures placed hereunder as may be necessary to insure the return of the roadway to a completely stable condition and until relieved of such responsibility by the County Department of Public Works. Wherever a gravel, crushed rock or asphalt surface is removed or damaged in the course of work related to the permitted encroachment, such material shall either be separately stored and replaced in the roadway as nearly as possible in its original state or shall be replaced in kind, and the roadway shall be left in at least as good a condition as it was before the commencement of operations of placing the encroachment structure.
- 11. Whenever it becomes necessary to secure permission from abutting property owners for the proposed work, such authority must be secured by the Permittee prior to starting work.
- 12. The current and future safety and convenience of the traveling public shall be given every consideration in the location and methods of construction utilized.
- 13. The Permittee is responsible for the preservation of survey monuments located within the area of work herein permitted. Prior to the start of construction, survey monuments that potentially may be disturbed shall be located and referenced by a Licensed Land Surveyor, and a Corner Record filed with the County Surveyor. Any Survey Monuments disturbed during the course of construction shall be reestablished by a Licensed Land Surveyor and another Corner Record filed with the County Surveyor. (Land Surveyors' Act Section 8771)
- 14. Prior to any excavation, the Permittee shall notify USA North (Underground Service Alert of Northern California and Nevada) at 811 or 800-227-2600 forty-eight (48) hours in advance.

FOR COMCAST APPLICATION FOR ENCROACHMENT PERMITS AN

PLEASE PRINT:	2017 APR -5 AM II: 33
Date 3-31-17	OFFICE USE ONLY
To: San Joaquin County Department of Public Works	JOB# //0005 REF# CR# CR#
SEFUCO/CNEIS PERRY	VALID 5/22/17 TO 7/1/17 DRIVEWAYS:
(Applicant Name) 544 INDUSTRIAL PARK DR.	STREET LARCH RD. AREA TRACY QUAD SW TYPE ARRIVE WORK ONLY- TOP
(Mailing Address)	FORMS SS/WW NOTES
MAINTISCA, CA 95337 (City, State, Zip Code)	SHOULDER WORK-NO PAKEMENT
925) 783-4877	Caning
(Area Code - Telephone Number)	
Sketch (Detailed plans may be submitted)	
SEE	- ATTACHED
	nstruct and/or otherwise encroach on County Highway Right-of-Way on
the SOUTH side of CARCH RD OF N. TRACK RLVD TRA	approximately 100 (feet/mile WEST) by performing the following work (description of work):
	ACE CABLE ON PINT POLES
Work will commence on or about 5-4-17	for approximately 30 days.
	property, or am qualified to represent the owner and agree to do the ons of San Joaquin County and subject to inspection and approval.
Signature of Applicant - Title	Date

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SPECIAL PROVISIONS

Winter Weather Utility Work

- 1. <u>SUPERVISION:</u> The utility company (**permittee**) shall furnish full-time supervision of all work to insure compliance with the permit provision.
- 2. <u>START OF WORK:</u> No work within the County right-of-way shall be started until the utility company representative has made an evaluation of weather conditions and has determined the work can be accomplished under the provisions of the permit.
- 3. <u>CLEAN PAVEMENT:</u> Dirt and mud shall not be deposited on the pavement outside the area of work, and if inadvertently tracked onto the road travel way shall be removed immediately.
- 4. **DAILY RESTORATION:** Private driveways and road intersections shall be restored daily.
- **5.** <u>WEATHER-TIGHT CONDITIONS:</u> All trenches shall be filled and compacted, ditches and other drainage facilities regarded and opened, and the entire work area restored to weather-tight condition prior to any rain.

GENERAL PROVISIONS

GOVERNING INSTALLATION OF SUBSURFACE STRUCTURES AND PIPELINES WITHIN COUNTY ROAD RIGHTS-OF-WAY

PUBLIC CONVENIENCE AND SAFETY:

- A. Before obstructing any private driveway entrance or County road traveled way with a trench, spoil bank, equipment or other barrier permitted for any prolonged period of time, the Permittee shall notify the known users of the respective thoroughfare(s) involved, and shall provide access for vehicular and pedestrian traffic to and from the road.
 - Unless otherwise permitted, all work shall be conducted in such a manner that no less than one lane of the existing County road traveled way will be maintained open to public traffic during working hours in a smooth and safe riding condition(s). Two lanes shall be open after working hours.
 - In cases where road closure is permitted, the permission to close the road will be granted under the condition that the Permittee notify the following persons and/or agencies of the time, the period of closure, and the detour route at least twenty-four (24) hours prior to said road closure.

f

The County of San Joaquin Public Works Department

The local fire district d. e.

The County of San Joaquin Sheriff's Office

The local school district

The local postal service

- The local residents involved
- Should hazardous conditions relative to the installation operations warrant flagmen, as many capable flagmen as may be necessary shall be provided by the Permittee and stationed in advance of work to warn and direct traffic.
- Lights, signs and barricades shall be furnished, erected and maintained by the Permittee for the adequate warning and convenience of the public, with particular attention to be taken in this regard after dark.
- Any excess dirt and/or debris which might be a hazard to either automobile or pedestrian traffic, uncontrollable by lights, signs and barricades, shall be removed from the jobsite daily.

STRUCTURES:

- Walls of structures shall be such quality and strength that they will resist all pressures and will not crack or be deformed in such a way as to create a hazard or maintenance problem at any time. Therefore, the minimum structural requirements for concrete pipe placed under county road rights-of-way shall conform to the following American Association of State Highway and transportation Officials (AASHTO) designations.
 - For concrete pipe up to and including thirty-three inches (33") inside diameter, extra strength concrete conforming to AASHTO Designation M
 - 2. For concrete pipe thirty-six inches (36") inside diameter and larger, reinforced concrete pipe conforming to AASHTO Designation M 170M Class
 - Plastic pipe conforming to AASHTO Designation M294. 3.
- All concrete pipe joints with County road rights-of-way shall be sealed against leakage and/or infiltration with rubber gasket in conformance with Section 65-1:06 of the California Standard Specifications, or with other methods as may be permitted under the Special Provisions.
- Cast-in-place concrete pipe, vitrified clay pipe, spiral welded steel pipe, or corrugated aluminum alloy pipe shall not be installed within the County road rights-of-way unless specifically so stated in the Special Provisions, and only under the conditions as provided.
- All structures to be buried within the County rights-of-way shall be set at such elevations as to allow minimum coverage of thirty inches (30") to the centerline of the roadways and twelve inches (12") at the bottoms of borrow ditches each side of the roadways. The depths of structures shall be established below a flat plane extending across the rights-of-way, no part of which shall extend above the elevations stated above; manholes, lampholes, valves, etc. not included. Future surface elevations shall be anticipated as nearly as possible and structure elevations shall be established for future adjustments accordingly.
- The County hereby reserves the right to specify in the Special Provisions the gage and surface treatment of any galvanized corrugated metal pipe that is to be installed.
- All longitudinal utility facilities are to be established (and dimensioned on sketches) from surveyed centerline of road right-of-way, not from right-of-way (border) lines.

REPAIRS OF THE COUNTY RIGHT-OF-WAY:

- All excavations shall be backfilled and compacted immediately after work therein has been completed.
- Trenched shall not be left open farther than 300 feet in advance of pipe laying operations, or 200 feet to the rear thereof, unless otherwise permitted by the Engineer.
- C. Unless otherwise permitted under the Special Provisions, backfill shall be placed and mechanically compacted in such a manner that the relative compaction throughout the entire fill within the County road right-of-way shall conform to the percentages of compaction as shown on the Trench detail.
- Backfill material shall be placed in horizontal uniform layers not to exceed in thickness, before compaction, 0.67 foot in the bedding region, one -foot where D. 90% compaction is required, and two-feet where 80% compaction is required.
- No portion of the excavation(s) shall be compacted by ponding or jetting unless a maintenance bond is provided.
- Gravel backfill material shall be utilized only where specifically so stated on the face of the permit. It shall be compacted by means of a high-frequency internal vibrator, the compactor to be a size and type approved by the Engineer. Points of compaction shall not be greater than 18" centers and to the full depth of the lift.
- All pavements, curbs, gutters, sidewalks, borrow ditches, pipes, head walls, road signs, trees, shrubbery, and/or other permanent road facilities impaired by or as a result of construction operations at the construction site(s) occupied by materials and/or equipment, shall be restored immediately upon backfilling of the excavation to the original grades and cross sections, and to a condition as good as, or better than existing prior to construction.
- All surfacing materials of roadways and driveway approaches cut or damaged by or as a result of construction operations, shall be replaced within ONE WEEK following the backfilling of excavation, weather permitting, with compacted layers of surfacing materials at least as thick as the existing, and no less than two inches (2") of asphalt concrete over six inches (6") of aggregate base, both as specified below.
 - Asphalt Concrete: Combined mineral aggregate shall conform to the quality and gradation requirements for Type "B" one-half inch(1/2) maximum aggregate, coarse or medium gradation as specified in Section 39 of the California Standard Specifications. The bituminous binder to be mixed with mineral aggregate shall be paving asphalt having (Grade PG 64-10), unless otherwise directed by the Engineer. Placement of asphalt concrete surfacing shall conform to the applicable provisions of Section 39 of the California Standard Specifications.
 - Aggregate Base: Combined mineral aggregates shall conform to the quality and the grading for three-quarter inch (3/4") maximum size aggregate Class 2 Aggregate Base specified in Section 26 of the California Standard Specifications.
- Before acceptance of repairs to the County road rights-of-way, all unsightly and detrimental dirt, dust and/or debris shall be removed and the construction areas left in a neat and presentable condition(s).
 - If necessary, County road traveled way and driveway pavements shall be washed with water to remove dirt and dust.
 - Driveway approaches and field entrance pavements damaged by equipment or spoil banks shall be repaired as directed by the Engineer
- Upon request by the County, any settlement, sagging of surface, or cracking of pavement shall be repaired immediately by and at the sole expense of the Permittee for a period of one year following acceptance of the work.

COMCAST

AMERICAN CUSTOM MEATS

4276 N TRACY BLVD TRACY, CA 95304

CONTACTS:

SEFNCO

SID AGUIRRE

925-350-1920

SCOPE OF WORK:

-AERIAL OVERLASH ON EXISTING POLES ALONG ROUTE AS SHOWN.

PROJECT MAP:



SHEET INDEX:

COVER SHEET

2 - NOTES & LEGEND SHEET

3-5 - SITE PLANS

THIS IS PROPRITORY INFORMATION AND NOT MEANT FOR GENERAL PUBLICATION. ALL RIGHTS RESERVED SEFNCO COMMUNICATIONS

AMERICAN CUSTOM MEATS
4276 N TRACY BLVD

JT#232611 PERMIT

ac	XX		
BY	XXX		
REVISION	PERMIT		
DATE	MM-DD-YY PERMIT		



COVER

1 OF 5

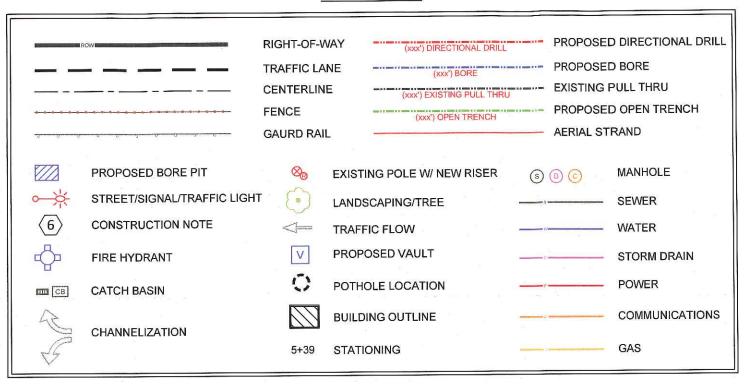
GENERAL NOTES:

- 1. ALL VAULTS / HANDHOLES TO BE EQUIPPED WITH SECURITY LIDS WITH LOCKING BOLTS.
- 2. GROUND RESTORATION/RIGHT-OF-WAY SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION.
- ALL 90 DEGREE BENDS IN CONDUIT CONSTRUCTION WILL BE A MINIMUM OF 36" RADIUS UNLESS SPECIFIED OTHERWISE.
- BURIED FIBER OPTIC WARNING SIGNS SHALL BE PLACED AT EACH SIDE OF ALL ROAD CROSSINGS, AT CULVERTS, DITCHES AND IN A STRAIGHT LINE OF SIGHT SPACING OF APPROXIMATELY 500 FEET.
- DEVIATIONS FROM THE ENGINEERED ROUTE REQUIRES A PROJECT MANAGER AND RIGHT-OF-WAY OWNER OR CARETAKER APPROVAL PRIOR TO CONSTRUCTION.
- 6. WHERE PERMITS FROM STATE, COUNTY, CITY, RAILROAD OR GOVERNMENT AGENCIES ARE REQUIRED, ALL WORK PERFORMED WILL COMPLY WITH THESE AGENCIES STANDARD SPECIFICATIONS.
- THE PROJECT MANAGER WILL NOTIFY BUILDING MANAGEMENT WHEN WORK WILL BEGIN ON BUILDING. CONTRACTOR TO COORDINATE ROOM ACCESS AND WORK START AND STOP TIMES WITH BUILDING MANAGEMENT.
- 8. THE PROJECT MANAGER IS TO BE NOTIFIED BY THE CONTRACTOR 24 HOURS PRIOR TO CONSTRUCTION. SEE COMPANY CONTACT LIST FOR CONTACT NAME(s) AND TELEPHONE NUMBER(s).
- 9. THE PROJECT MANAGER WILL RESERVE THE RIGHT TO INSPECT AT ANY TIME THE WORK BEING PERFORMED BY THE CONTRACTOR. IF PROJECT MANAGER DETERMINES THAT THE WORK IS NOT BEING PERFORMED TO MINIMUM QUALITY STANDARDS, THEN THE CONTRACTOR SHALL PROVIDE REWORK AT HIS OWN COST.
- ANY CHANGE IN PROJECT SCOPE, INCLUDING BUT NOT LIMITED TO, CONDUIT LENGTH, CONDUIT PATH. AERIAL PATH ETC., MUST BE APPROVED BY THE PROJECT MANAGER.
- 11. ALL CORING/CONSTRUCTION THAT WILL CAUSE NOISE AND/OR VIBRATION SHALL BE DONE WITHIN ALLOWED (9AM-3PM) BUSINESS HOURS.
- 12. ANY AND ALL UNDERGROUND UTILITIES ENCOUNTERED ARE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE, PROTECT, AND REPAIR, IF DAMAGED.
- 13. ALL FOOTAGES ARE BASED ON FIELD GATHERED MEASUREMENTS, AS SUCH SOME VARIANCE SHOULD BE ANTICIPATED. ADJUST AS NEEDED.
- 14. ALL BURIED CONDUIT/CABLE WILL BE PLACED AT 36" MINIMUM COVER. SITE HAS POTENTIAL FOR ROCK THAT WOULD PREVENT THE ABILITY TO PROVIDE THE MINIMUM COVER. IN CASES WHERE THE MINIMUM COVER CAN NOT BE ACHIEVED, THE CONDUIT SHALL BE PLACED IN A SCH 40 EMT SLEEVE OR APPROVED EQUIVALENT.
- WATER, SEWER, STORM SEWER AND EASEMENT LOCATIONS ARE BASED OFF OF CITY MAPS, NOT FIELD VERIFIED.
- 16. BORING OF AC PAVING IS REQUIRED AT ALL LOCATIONS AS INDICATED ON PLANS.
- 17. AT NO TIME SHALL CURBS, GUTTERS OR HANDICAP BE DISTURBED.
- 18. DOOR HANGERS ARE TO BE PLACED A MINIMUM OF 72 HOURS PRIOR TO START OF CONSTRUCTION.
- 19. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL PLACE MESSAGE BOARDS STATING LANE CLOSURES, AND DELAYS A WEEK IN ADVANCE. LOCATION OF THE MASSAGE BOARD SHALL BE COORDINATED WITH THE CITY INSPECTOR AT THE PRE-CONSTRUCTION MEETING.
- 20. LANE CLOSURES CANNOT EXCEED MORE THAN 300 FT. AT A TIME. FOR SAFETY PURPOSES THERE SHALL BE ONLY ONE CLOSURE AT A TIME ALONG INTERNATIONAL BLVD. MORE FLAGGERS WILL BE NECESSARY TO HELP VEHICLES AND PEDESTRIANS IN THE WORK ZONES DURING THE LANE CLOSURES.

DISCLAIMER:

- IT IS THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR TO VERIFY ALL RIGHT OF WAY BEFORE CONSTRUCTION IS TO BEGIN. NO UNDERGROUND INSTALLATION REPRESENTED WITHIN THESE PLAN SHEETS IS PROPOSED OUTSIDE OF THE RIGHT OF WAY.
- 2. THE UNDERGROUND ROUTE DEPICTED IS PRELIMINARY AND WILL/MAY VARY ONCE UTILITIES HAVE BEEN FIELD LOCATED.
- ANCHORING FOR THE AERIAL CONSTRUCTION IS TYPICALLY DETERMINED DURING CONSTRUCTION AND IS COLLECTED IN THE AS-BUILT PHASE.

LEGEND:



FIBER PLACEMENT NOTES:

- CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY SEE LOCAL DIRECTORY FOR CONTACT TELEPHONE NUMBER OF LOCAL CALL BEFORE YOU DIG AGENCY.
- CONTRACTOR SHALL RECORD SEQUENCE # OF FIBER CABLE AT EVERY WORK POLE, MANHOLE, FIBER STORAGE LOOP AND TAIL LOCATION. CONTRACTOR TO PROVIDE PROJECT MANAGER WITH SEQUENCE NUMBERS AT PROJECT COMPLETION.
- 3. SLACK LOOP AND SNOWSHOE STORAGE LOCATIONS SHALL BE DETERMINED ON CONSTRUCTION DRAWINGS, HOWEVER, REEL LENGTHS OF FIVE HUNDRED FEET (500') OR LESS ON LARGE COUNT FIBER OR THREE HUNDRED FEET (300') OR LESS ON SMALL COUNT FIBER ARE DIFFICULT TO USE AND SHOULD BE PLACED AS FSL'S, NOT CUT AND RETURNED.
- 4. FIBER OPTIC IDENTIFICATION TAGS SHALL BE PLACED AT EVERY WORK POLE, MANHOLE, FIBER, STORAGE LOOPS, SPLICE CASES AND WHERE INDICATED BY PROJECT MANAGER. TAGS NEED TO BE PLACED SO AS TO BE READ FROM THE GROUND.
- 5. CABLE LUBRICATION SHALL BE USED TO REDUCE PULLING TENSION. LUBRICANTS MUST NOT CONTAIN ANY PETROLEUM PRODUCTS.
- 6. A 100 FOOT FIBER COIL MUST REMAIN IN ALL VAULTS UNLESS OTHERWISE NOTED.
- 7. ALL BURIED INFRASTRUCTURE MUST BE ACCOMPANIED WITH WARNING TAPE AND A TRACER WIRE, AT RISER POLES THE LOCATE WIRE SHALL BE ACCESSIBLE AT THE BASE OF THE RISER.
- 8. ALL RISERS WILL BE CAPPED AT ALL TIMES.
- 9. ALL FIBER SHALL BE MARKED AS TO DIRECTION IN EACH VAULT. RED-NORTH, GREEN-SOUTH, YELLOW-EAST, AND BLUE-WEST. DO NOT TAPE FIBER CABLES TOGETHER IN RISER.



AMERICAN CUSTOM MEATS

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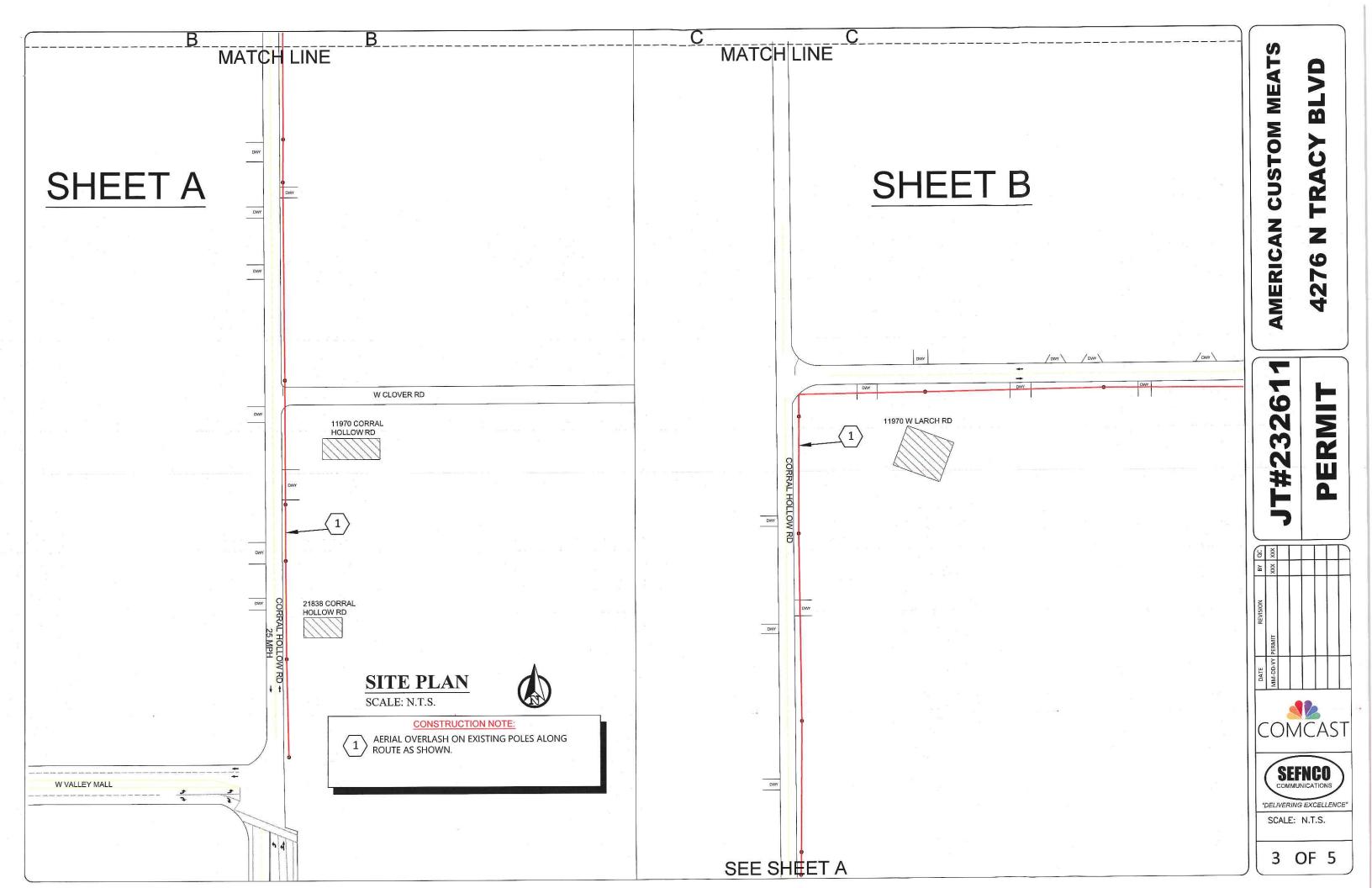
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"DELIVERING EXCELLENCE

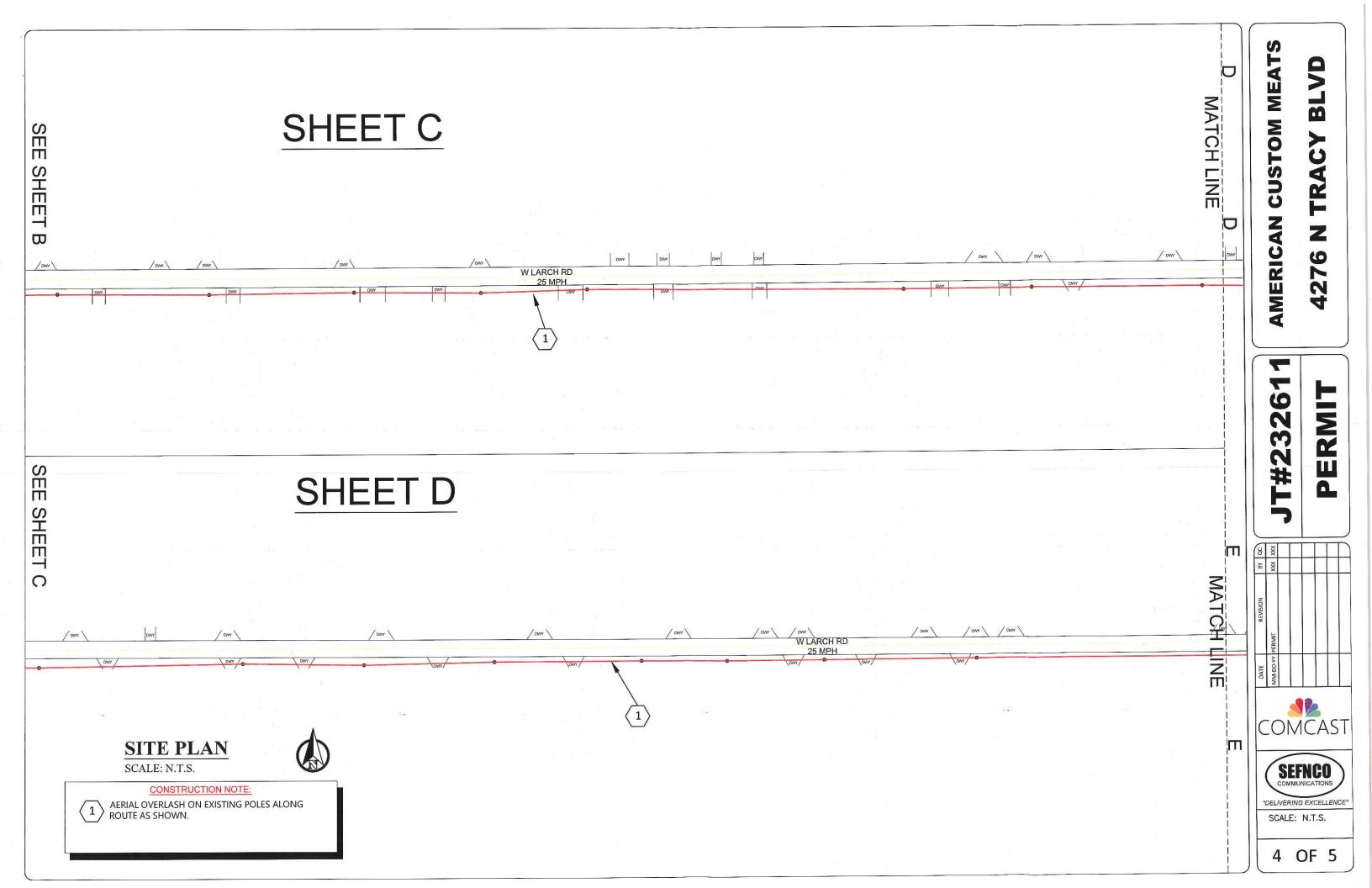
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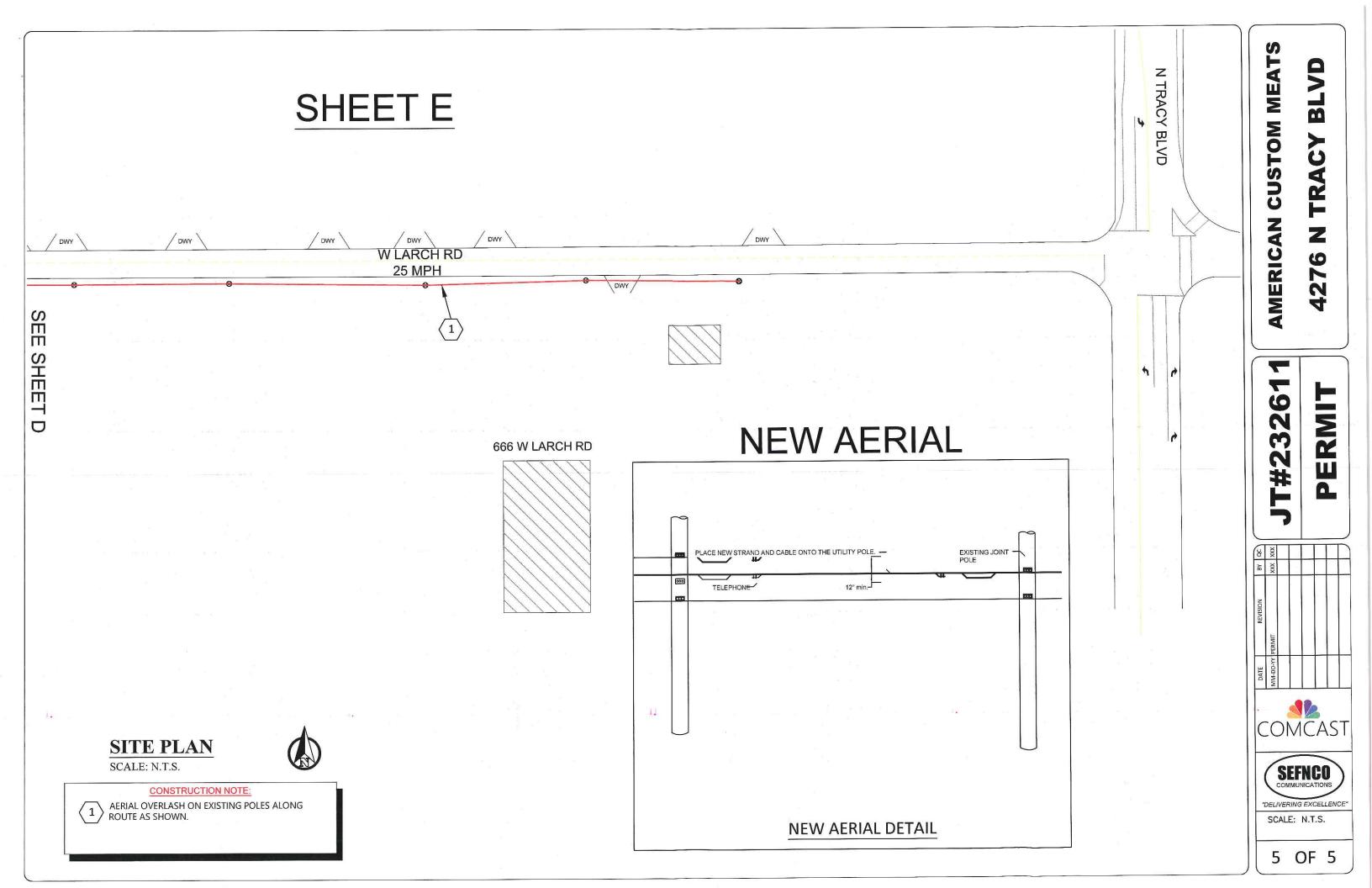
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Table A - Recommended Advance Warning Sign Spacing

Posted Speed	Dis	stance Between Signs	3 **
*	Α	В	C
Urban (low speed) 25 mph or less	100	100	100
Urban (high speed) more than 25 mph to 40 mph	250	250	250
Urban (high speed) more than 40 mph	350	350	350
Rural	500	500	500
55 mph & above	1,000	1,500	2,640

Table B - Taper Length Criteria for Temporary Traffic Control Zones

Type of Taper	Taper Length (L)
Merging Taper	, at least L
Shifting Taper	at least 0.5L
Shoulder Taper	at least 0.33L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream taper	50 feet min., 100 feet max. per lane

Table C - Formulas for Determining Taper Lengths

Speed Limit	Taper Length (L) Feet
40 mph or less	$L = WS^2/60$
45 mph or more	L = WS

Where: L = taper length in feet

W = width of offset feet

S = posted speed limit, or off peak 85th- percentile speed prior to work starting. Or the anticipated operating speed in mph

Table D - Longitudinal Buffer Space or Flagger Station Spacing on Downgrades

Speed (mph)	% Downgrade (Buffer Space)				
	0% (ft)	-3% (ft)	-6% (ft)	-9% (ft)	
20	115	116	120	126	
25	155	158	165	173	
30	200	205	215	227	
35	250	257	271	287	
40	305	315	333	354	
45	1.360	378	400	427	
50	425	446	474	507	
55	495	520	553	593	
60	570	598	638	686	
65	645	682	728	785	
70	730	771	825	891	

Table E - Taper Length Criteria for Temporary Traffic Control zones for 12 feet Offset

Speed* S (mph)	Minimum Taper Length ** For Width of Offset 12 ft (W)				
	Merging L (ft)	Shifting L/2 (ft)	Shoulder L/3 (ft)	Down Stream (ft) ***	
20	80	40	27	50	
25	125	63	42	50	
30	180	90	60	50	
35	245	123	82	50	
40	320	160	107	50	
45	540	270	180	50	
50	600	300	200	50	
55	660	330	220	50	
60	720	360	240	50	
65	780	390	260	50	
70	840	420	280	. 50	

Table F - Maximum Spacing of Channelizing Devices

Speed (mph)	Maximum Channelizer Spacing			
	Taper* (ft)	Tangent (ft)	Conflict** (ft)	
20	20	40	10	
25	25	50	12	
30	30	60	. 15	
35	35	70	17	
40	40	80	20	
45	45	90	22	
50	50	100	25	
55	55	110	27	
60	60	120	30	
65	65	130	32	
70	70	140	35	

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