TRENCH DETAILS FOR NON-PAVEMENT AREA Finished grade -Finished arade -Finished grade Detectable Detectable underground underground metalized mylar . Detectable metalized mylar conduit marking conduit marking underaround metalized mylar tape 48 min conduit marking -Compact backfills in 8" layers per TxDOT item 400. 48 Compact backfills in Compact backfills in Compaction per min 8" layers per TxDOT item 400. 8" layers per TxDOT TxDOT item 132. item 400. Embankment density Compaction per Compaction per control TxDOT item 132. TxDOT item 132. 12 min Embankment density Fine granular materia 12" min control. Fine granular See Detail A 4)56). Fine granular material material 1234 123 See Detail A -See Detail A 1-4 - 4" Conduits 1-2 - 4" Conduits 1-3 - 4" Conduits - 4" Conduits W/ 1.25" Inner Ducts - 4" Conduits W/ 1.25" Inner Ducts - 4" Conduits W/ 1.25" Inner Ducts EIGHT DUCT TRENCH DETAILS FOUR DUCT TRENCH DETAILS SIX DUCT TRENCH DETAILS **JOINT TRENCH (OPEN CUT) JOINT TRENCH (OPEN CUT) JOINT TRENCH (OPEN CUT)** _ 18" ₋ min --Finished grade -Finished grade _22" min -Prop 4" Detectable Detectable Conduit underground underground metalized mylar metalized mylar -Prop 1.25" conduit markina conduit markina Inner Ducts tane 48 48 min Compact backfills in Compact backfills in A- Yellow 8" lavers per TxDOT 8" lavers per TxDOT B- Orange item 400. item 400. Compaction per Compaction per TxDOT item 132. TxDOT item 132. Embankment density Embankment density <u>DETAIL A</u> control control Fine granular material (17)(18)(19)(20) Fine granular material (13)(14)(15)(16) See Detail B See Detail B Prop 4" Conduit -See Detail A See Detail A -Prop 1.5" Q23 1234 Inner Ducts 1-4 -4" Conduits 1-12 - 4" Conduits -4" Conduits W/ 1.25" Inner Ducts 13-16 -4" Conduits W/ 1.25" Inner Ducts A- Yellow 9-12 -4" Conduits W/ 1.5" Inner Ducts 17-20 -4" Conduits W/ 1.5" Inner Ducts B- Orange TWELVE DUCT TRENCH DETAILS TWENTY DUCT TRENCH DETAILS JOINT TRENCH (OPEN CUT) **JOINT TRENCH (OPEN CUT)** DETAIL B 1. Contractor shall provide buried detectable underground metalized mylar conduit marking tape, i.e. utility tape, at 12" min below finished grade 4" Conduit 2. Contractor shall pull mule tape in each installed ducts/inner duct

3.Furnishing and installation of pressure grouting will not be paid for directly but considered incidental to item 619

"Intelligent Transportation Systems (ITS) Multi-duct Conduit" or item 618, "Conduit."

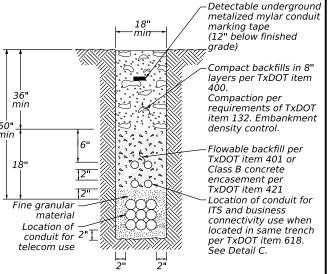
TRENCH DETAILS FOR PAVEMENT/DRIVEWAYS

Match existing pavement material. Remove saw cut width to accomodate conduit installation. Replace removed pavement with like material to equivalent condition or better. Remove/replace reflectorized pavement markings per TxDOT item 666. Replace rebar, as necessary, lapped and tied a minimum 3" to existing rebar -Sawed ioint Detectable 48 underground min metalized mylar conduit marking tape Flowable backfill per TxDOT item 401 or Class B concrete encasement per TxDOT item 421 Fine granular material

-Proposed 4" Ducts TYPICAL TRENCH DETAIL WITH DRIVEWAY RESTORATION

Match existing pavement material. Remove saw cut width to accomodate conduit installation. Replace removed pavement with like material to equivalent condition or better. Remove/replace reflectorized pavement markings per TxDOT item 666. Replace rebar, as necessary, lapped and tied a minimum 3" to existing rebar -Sawed ioint Detectable 48 underground metalized mylar conduit marking tape Flowable backfill per TxDOT item 401 or Class B concrete encasement per TxDOT item 421 -Fine granular material ► Proposed 4" Ducts TYPICAL TRENCH DETAIL FOR **INSTALLATIONS BELOW** EXISTING/PROPOSED PAVEMENT OR RIP RAP

TRENCH DETAILS INCLUDING ITS AND ELECTRIC CONDUITS



TYPICAL TRENCH DETAIL JOINT TRENCH (OPEN CUT) W/ ITS

Compaction per requirements of TxDOT 18" item 132. Embankment density control. Detectable underground metalized mylar condui marking tape 18' (12" below finished grade) Location of PVC conduit 0.0 for electrical use when located in same trench per TxDOT item 618 2"

> per TxDOT item 421 Location of conduit for ITS and business connectivity use when located in same trench per TxDOT item 618. See Detail C.

> > Traffic Safety

Division Standard

Flowable backfill per

TxDOT item 401 or Class

B concrete encasement

Compact backfills in 8"

layers per TxDOT item

TYPICAL TRENCH DETAIL JOINT TRENCH (OPEN CUT) W/ ITS AND ELECTRIC

SHEET 1 of 7

Texas Department of Transportation

JOINT DUCT BANK TRENCH DETAILS JDB(1)-24

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reserved for fiber optic cabling per item 618



-4" Conduit w/ I nner Ducts reserved for fiber optic cabling (see plans for material type and inner duct size and auantity)



4" DIA. Multi-duct ITS Conduit with (4) 1.25" DIA Inner Ducts reserved for fiber optic cabling per item 619

DETAIL C

DISCLAIMER:
The second of this standard is governed by the "Texas Engineering Practice Act".
The second is made by TAXOT for any purpose whistoever, TXXOT assumes no responsibility for this croud to a this constant is a few inconstant profile or this constant is a few inconstant profile or this croud to a this croud to a thin a constant in the constant is a few inconstant profile or this croud to a thin a few inconstant profile or the constant in the constan

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Sheet Details

36'

Fine granular

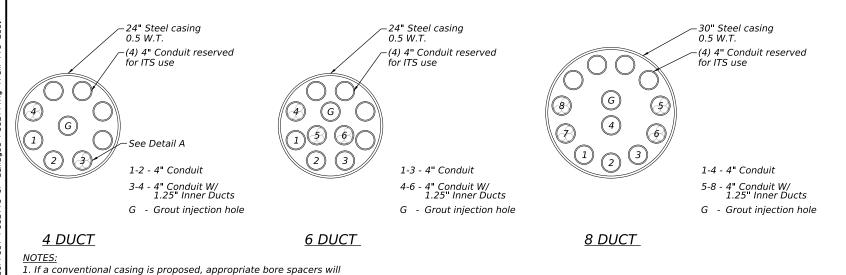
Location of

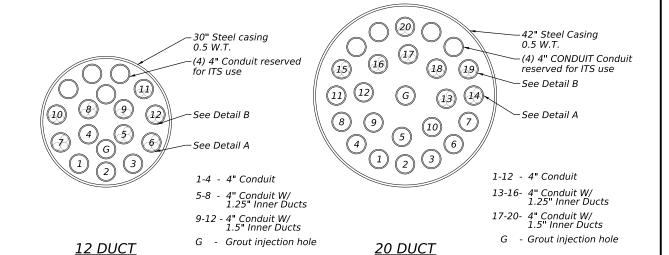
telecom use

material

conduit for 12"

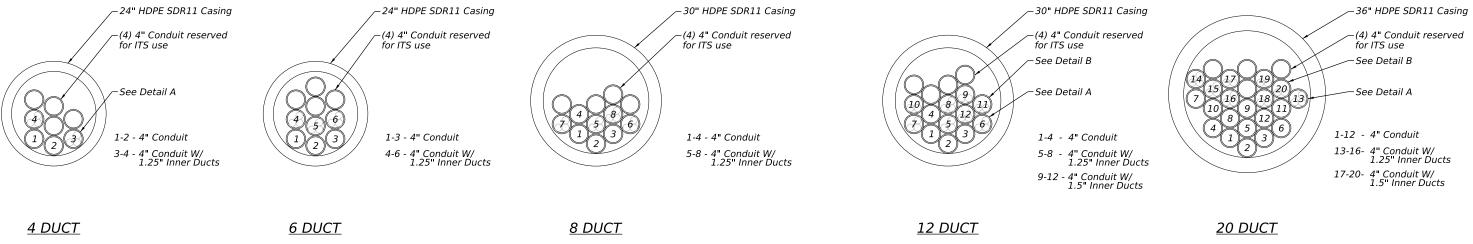
CONVENTIONAL CASING DETAIL (WITH ITS)

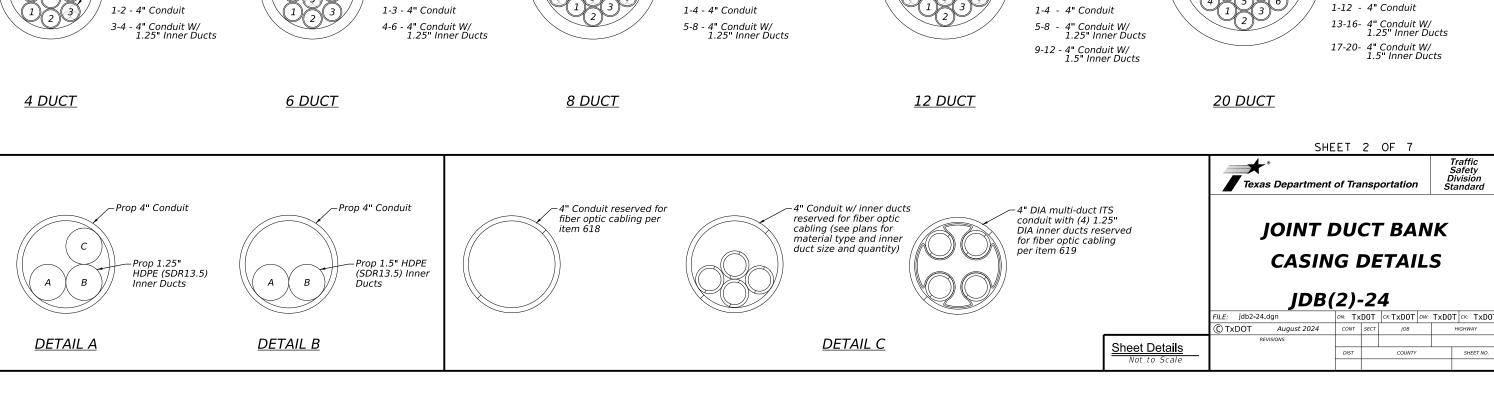




DIRECTIONAL CASING DETAIL (WITH ITS)

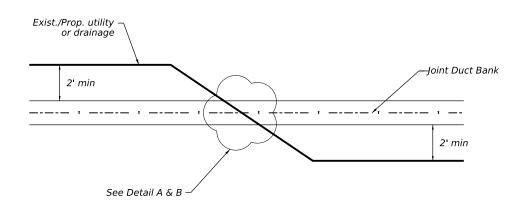
need to be provided to match the conduit configuration shown above.





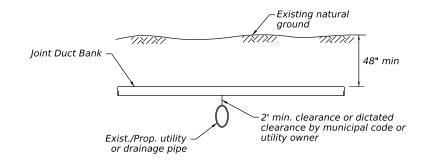
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UTILITY OR DRAINAGE PIPE CLEARANCE DETAILS FOR JOINT DUCT BANK INSTALLATION

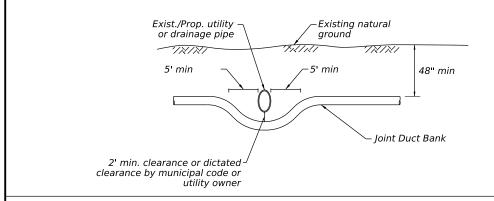


STANDARD REQUIREMENTS FOR UTILITY OR DRAINAGE CROSSINGS

DETAIL A: CROSSING CLEARANCE ABOVE

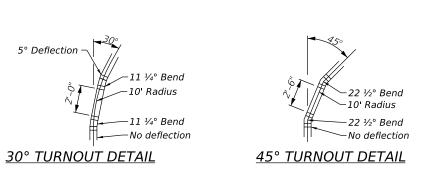


DETAIL B: CROSSING CLEARANCE BELOW

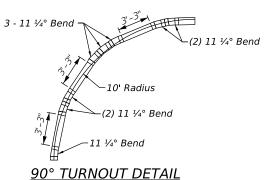


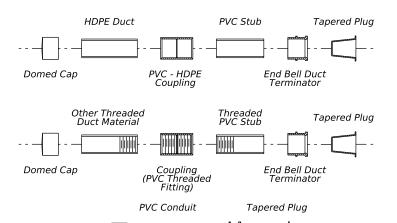
1. Contractor must field verify existing utility locations and depths prior to performing any excavation.

CONDUIT TURNOUT DETAILS



Provide this arrangement of conduit and fittings or approved equal at all 30°, 45°, and 90° bends, horizontal and vertical, to achieve a nominal 10' conduit radius.





TYPICAL COINDUIT FITTING COMBINATIONS

End Bell Duct

TYPICAL RISER DETAIL

RISER GENERAL NOTES

- 1. Risers to be grouped in quadrant that do not interfere with climbing space.
- 2. Risers shall not obscure any numbering on the pole.
- 3. Risers to follow NESC code.

Domed Cap

4. Cap proposed duct 12" above existing ground level

Texas Department of Transportation JOINT DUCT BANK **CONSTRUCTION DETAILS**

IDB(3)-24 FILE: jdb3-24.dgn

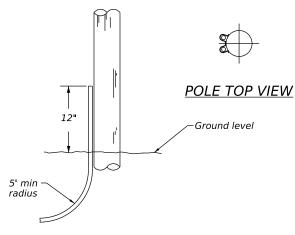
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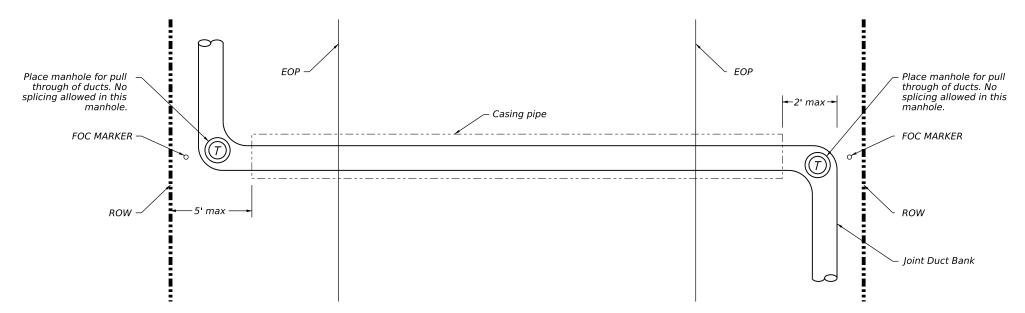
SHEET 3 OF 7

Traffic Safety Division Standard

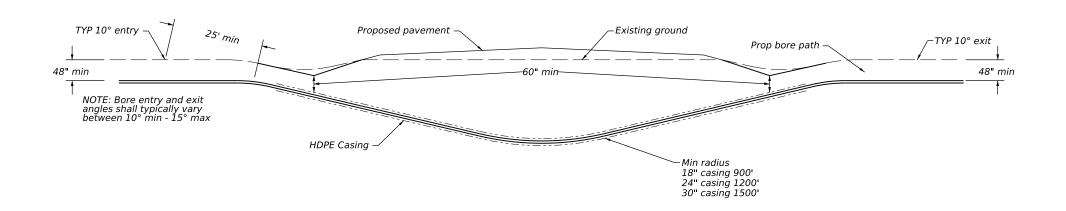
POLE ARRANGEMENT FOR **BURIED TO AERIAL**



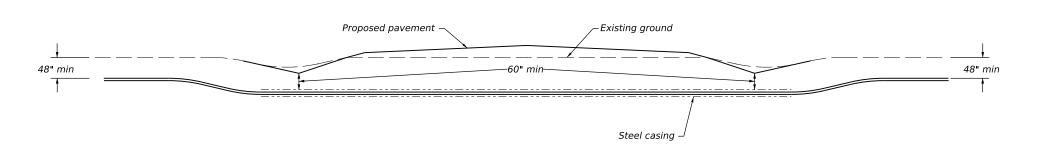
TYPICAL BORE PLAN



TYPICAL DIRECTIONAL BORE PLAN



TYPICAL CONVENTIONAL BORE PLAN



Underground utilities decal

5' min

Ground surface

1' min

FOC MARKER

Background

Background Border Orange letters 2 7/16" W X 1/2" H Black letters 2 7/16" W X 5/16" H See note 4 Black letters 1 5/8" W X 5/16" H See note 5 Black letters 2 9/16" W X 5/16" H

UNDERGROUND UTILITIES DECAL DETAILS

BORE GENERAL NOTES

See note 6

- Contractor to band/bundle inner conduits in 10' increments in casing when bore spacers are not utilized.
- Contractor shall record, maintain, and provide the engineer with all bore log trajectory, tension and pressure readings upon completion of pilot hole for verification of alignment prior to back ream process.
- 3. Contractor to provide grouting system with sufficient gauges and monitoring devices to confirm effectiveness of grouting operation and to ensure compliance with pipe specifications and design parameters to avoid crushing or damaging the ducts/casing.
- 4. Text for this line on the decal needs to read "Underground Telecom"
- 5. Text for this line on the decal needs to read "48 Hours before excavating in this area"
- 6. Text for this line on the decal needs to read "Cal TxDOT 1-800-558-9368 and call 1-800-DIG-TESS" SHEET 4 OF 7

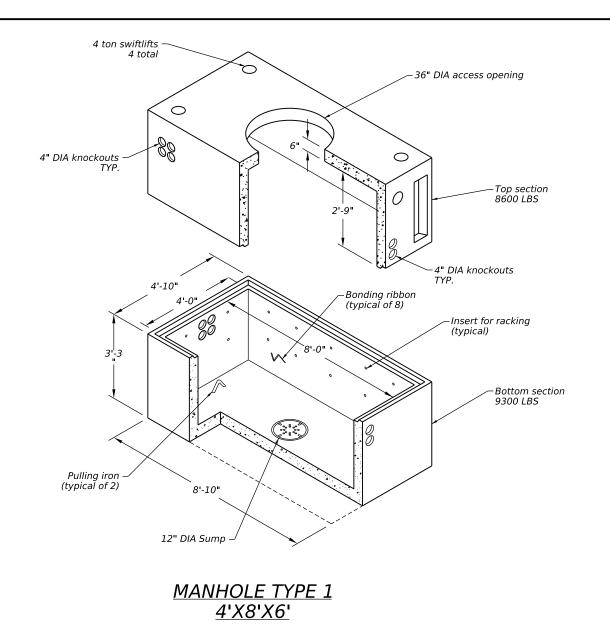


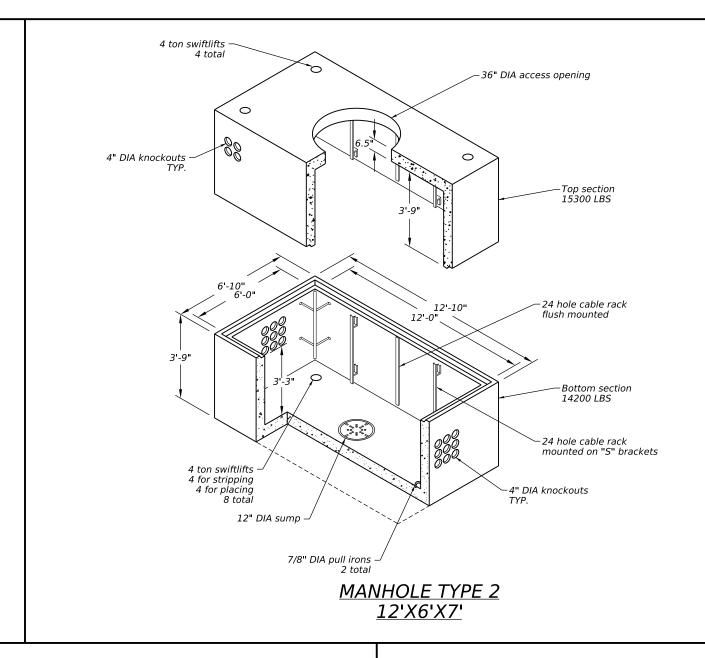
Traffic Safety Division Standard

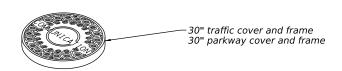
JOINT DUCT BANK BORE CROSSING DETAILS JDB(4)-24

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REVISIONS							
	DIST		COUNTY SHEET NO.			EET NO.	

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3" riser 6" riser 12" riser

MANHOLE COVER

MANHOLE REDUCER RING

NOTES

- Conduit entry points shown represent the typical configuration. Plans will specify the conduit entry points.
- 2. Provide terminators for the conduit cast in the walls and placed symmetrically.
- 3. Provide terminators appropriately sized for the conduits indicated on the plans. Provide terminators with an air tight and water tight connection.
- 4. Cap and seal terminators that do not have conduits attached.
- 5. When additional conduit entry points are needed to accommodate existing conduit, core drill conduit knockouts in the field of the appropriate number and size of conduit at each location, as directed by the engineer.
- 6. Provide a bell fitting on the end of each conduit to ensure a flush fit inside the ground box

- 7. Concrete grout around the knockout (inside and out) and around the conduit and bell fitting to ensure a neat watertight fit after the conduit and bell fitting have been placed in a knockout. Ensure all openings in the handhole/manhole are sealed prior to grouting operations.
- 8. Install mule tape and plug all unused conduits with tug-plugs sized for the particular conduits.
- 9. Provide steel (ASTM A-153), glass reinforced nylon, or equivalent cable rack assemblies designed to support the amount of cable storage slack identified in the plans. Locate cable rack system on one side only (longer length side) to allow access to the inside of the manhole. Cable racks may be installed at the factory or in the field. When mounting cable racks in the field, seal all penetrations to the concrete side wall to prevent moisture penetration. Ground metallic cable rack systems to grounding system inside manhole in accordance with the national electrical code.
- 10. Ground steel covers in accordance with the national electrical code

MANHOLE RISER

SHEET 7 OF 7

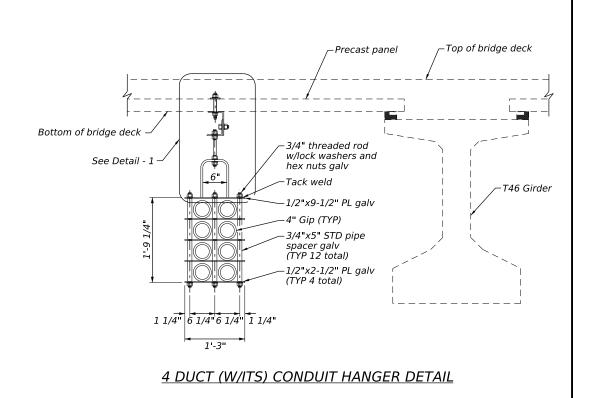
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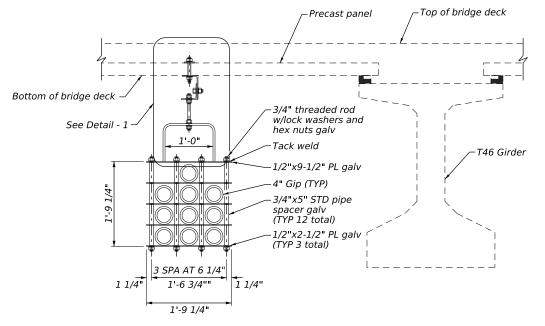
JOINT DUCT BANK
MANHOLE DETAIL
JDB(7)-24

| DIST | COUNTY | SHEET NO. |

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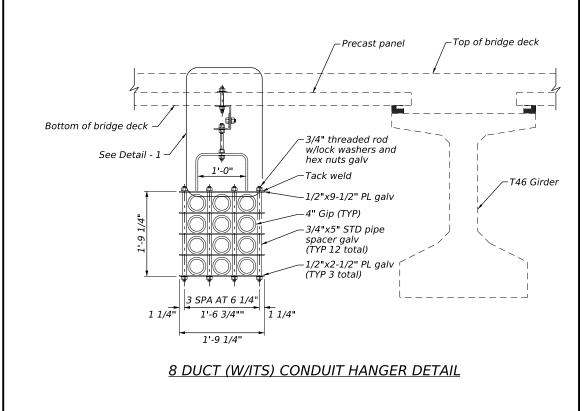


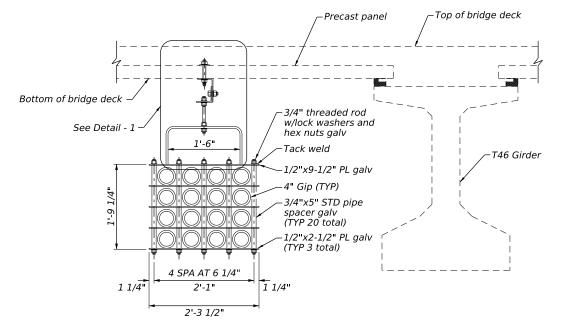


6 DUCT (W/ITS) CONDUIT HANGER DETAIL

GENERAL NOTES:

- 1. Conduit hanger support mounting details for concrete bridge deck with precast panels as shown are a suggested method for pre-stressed concrete beam structures.
- Do not extend conduit hangers below the bottom of the bridge girders (any exceptions at end spans are subject to approval).
- 3. Galvanize all hardware and structural steel that is not stainless steel. Ensure all bolt hardware used to secure hangers to steel structures conforms to A325 for high strength.
- 4. Select conduit lengths so that couplings do no coincide with conduit hanger locations.





12 DUCT (W/ITS) CONDUIT HANGER DETAIL

SHEET 1 OF 2



JOINT DUCT BANK BRIDGE ATTACHMENT DETAIL 1

Traffic Safety Division Standard

JDB(8A)-24

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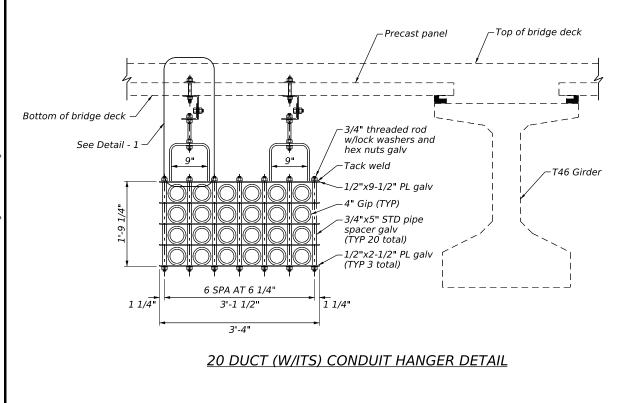
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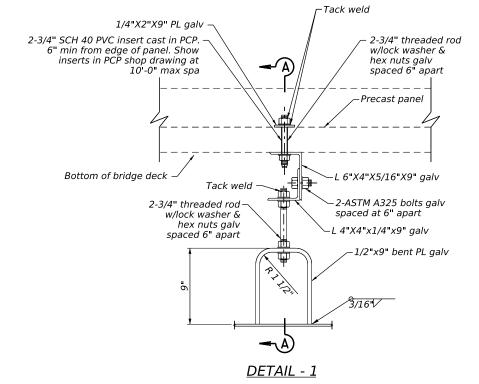
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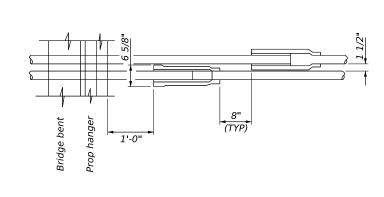
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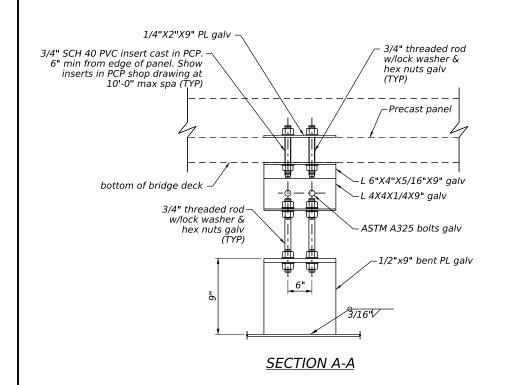


GENERAL NOTES:

- 1. Conduit hanger support mounting details for concrete bridge deck with precast panels as shown are a suggested method for pre-stressed concrete beam structures.
- 2. Do not extend conduit hangers below the bottom of the bridge girders (any exceptions at end spans are subject to approval).
- 3. Galvanize all hardware and structural steel that is not stainless steel. Ensure all bolt hardware used to secure hangers to steel structures conforms to A325 for high strength.
- 4. Select conduit lengths so that couplings do no coincide with conduit hanger locations.



EXPANSION COUPLING DETAIL



SHEET 2 OF 2

Traffic Safety Division Standard



JOINT DUCT BANK **BRIDGE ATTACHMENT DETAIL 2** JDB(8B)-24

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