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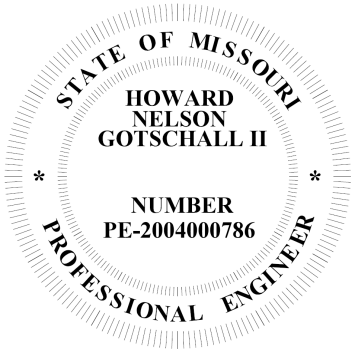

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 W. CAPITOL AVE.
JEFFERSON CITY, MO 65101
Phone (888) 275-6636

HANSON PROFESSIONAL SERVICES INC.
600 Washington Avenue
Suite 950
St. Louis, MO 63101

Certificate of Authority: 001632
Consultant Phone: (314) 770-0467

If a seal is present on this sheet, JSP's has been electronically sealed and dated.

JOB NO. JSR0326
Taney County, MO
Date Prepared: 11/6/2025

Only the following items of the Job Special Provisions (Bridge) are authenticated by this seal: A-C

A. CONTRUCTION REQUIREMENTS

1.0 Description. This provision contains general construction requirements for this project.

2.0 Construction Requirements.

2.1 The geotechnical report is included in the contract in the bridge electronic deliverables zip file for informational purposes only.

2.2 Provisions shall be made to prevent any debris and materials from falling into the stream. Any debris and materials that fall outside the construction limits or if determined necessary by the engineer, the debris shall be removed as approved by the engineer at the contractor's expense.

2.3 Provisions shall be made to prevent damage to any existing utilities. Any damage sustained to the utilities as a result of the contractor's operations shall be the responsibility of the contractor. All costs of repair and disruption of service shall be as determined by the utility owners and as approved by the engineer.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for other items included in the contract.

B. SOLDIER PILE PLACEMENT IN DRILLED SHAFTS

1.0 Description. This provision contains requirements for the placement of soldier piles in the drilled shafts in addition to general drilled shaft construction described in Sec 701.

2.0 Preconstruction Submittals. In addition to Sec 701.2, the contractor’s installation plan shall also be of sufficient detail to outline the intended construction sequence and methods for placement of soldier pile, including support and centralization methods.

3.0 Construction.

3.1 Technique Shafts. In addition to Sec 701.4.2, construction of the first production shaft will also be used to determine if the methods and equipment used by the contractor are acceptable for handling, lifting, placing and supporting the soldier pile during construction.

3.2 Soldier Pile. The soldier pile consisting of a HP14 inch by 89 lb/ft pile, anchor soldier pile connection pipe, spacers, centering devices, and other necessary appurtenances shall be completely assembled as a prefabricated unit and placed immediately after the shaft excavation is inspected and accepted, and just prior to shaft concrete placement. Where necessary, the soldier pile shall be cut to length such that the anchor soldier pile connector pipe is at the design elevation.

3.2.1 Concrete Cover for Soldier Pile.

Concrete Cover			
Shaft Diameter	**Uncased**	**Casing Remains**	**Casing Withdrawn**
2'-0" or less	2"	2"	2"
2'-6"	3"	3"	4"

3.2.2 Spacers for Soldier Pile. Unless other types of spacers are approved by the engineer, rolling spacers for soldier pile shall be used to minimize disturbance of the shaft sidewalls and to facilitate removal of the casing during concrete placement. Concrete spacers or other approved non-corrosive spacing devices shall be used along the shaft at intervals not exceeding 10 feet to ensure concentric location of the soldier pile within the shaft excavation. As a minimum, a set of centering devices shall be provided within 2 feet above the top of bedrock. The centering devices shall be of adequate dimension to maintain the specified clearance between the outside of the soldier pile and the side of the excavated hole or casing.

3.2.3 Bottom Supports for Soldier Pile. In the event that the shaft has been excavated below the anticipated tip elevation, the soldier pile shall be extended at the tip (low) end by welded splices as necessary in conformance with the Standard Specifications.

3.2.4 Support and Protection of Soldier Pile. During concrete placement, the soldier pile shall be supported at or near the top of shaft such that the bottom supports are positioned approximately 1 inch above the top of shaft excavation. Not sooner than 24 hours after completion of concrete placement, temporary supports shall be removed. Soldier pile supports may be briefly released during casing removal as long as unacceptable soldier pile settlement does not occur. The support must be replaced immediately after casing removal. The contractor shall provide the needed equipment, including extra cranes if necessary, to provide this support.

Prior to placing the soldier pile, the contractor shall demonstrate to the satisfaction of the engineer that the fabrication and handling methods to be used result in a soldier pile placed in the proper position, with the proper clearances. During this demonstration, the soldier pile shall be brought to an upright position, lowered into a shaft excavation, and supported as if for concrete placement.

3.2.5 Check of Tolerances for Placement of Soldier Pile. The elevation of the top of the soldier pile shall be checked before and after the concrete is placed. The soldier pile shall be maintained within the specified tolerances, and the contractor shall make corrections to those tolerances, as required, to the satisfaction of the engineer. No additional shafts shall be constructed until the contractor has modified the soldier pile support to obtain the required tolerances.

3.3 Concrete Placement Around Soldier Pile. Concrete shall be placed through a tremie or concrete pump for each shaft with the flow of concrete directed into the centers of the spaces

between the flanges of the soldier pile. Care shall be taken to place concrete equally on both sides of the web so that the soldier pile will not be displaced.

4.0 Method of Measurement. No measurement will be made.

5.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for other items included in the contract.

C. TIEBACK ANCHORS

1.0 Description. This provision includes the installation and testing of tieback anchors consisting of high-strength steel bars or steel prestressing strands grouted into dolomite bedrock. Work in this provision includes:

(1) Installation and load testing one anchor to verify the design bond capacity of the anchors in dolomite bedrock.
(2) Installation of tieback anchors into rock.
(3) Proof testing each tieback anchor.

In addition, the contractor shall follow the guidance and requirements of the Post Tensioning Institute (PTI) — Recommendations for Prestressed Soil and Rock Anchors (1996).

2.0 Tieback Anchors.

2.1 Tieback Capacity. The contractor shall be responsible for obtaining the design tieback capacity in accordance with the tieback testing section of these specifications. The design tieback capacity, location, and inclination are shown in the drawings.

2.2 Tieback Length. The minimum tieback bond length, and unbonded length are shown in the drawings.

3.0 Materials. All materials are subject to inspection and verification of quality prior to use.

3.1 Class 1 Corrosion Protected Anchor. The contractor has the option to select a threaded bar anchor or a steel prestressing strand anchor system. The threaded bar (threadbar) shall have a continuous rolled-in pattern of deformations along its entire length that allows anchorage hardware or couplers to thread onto the bar at any point. The threadbar shall be at least 1-3/4 in. (45mm) nominal diameter, unspliced, with a guaranteed minimum ultimate tensile strength of at least 150 ksi (1035 MPa) conforming to ASTM A 722. The steel prestressing strands shall be continuous, unspliced, seven-wire, low-relaxation strands with a guaranteed minimum ultimate tensile strength of at least 270 ksi (1862 MPa) conforming to AASHTO M 203. The stress in the threadbar or steel prestressing strands at the design load shall not exceed 60 percent of the guaranteed ultimate tensile strength of the bar or strand. Corrugated high strength PVC sheathing with plastic end caps shall be installed over the full length of the anchor. The annular space between the threadbar or steel prestressing strands and PVC shall be fully grouted before the anchor is installed. To accommodate the bar elongation during stressing, a short length of threadbar or steel prestressing strands shall be left free of the corrugated sheathing under the stressing anchorage. A steel pipe welded to the anchor plate and filled with corrosion

preventive compound or grout shall be installed to protect the free end of the bar against corrosion. A smooth plastic sheathing shall be installed over the corrugated sheathing in the stressing length that will allow the bar to elongate during stressing. A protective steel cap filled with a corrosion preventive compound shall be installed over the anchor nut after stressing, completing the full encapsulation of the anchor bar. The cap shall be removable for checking and/or adjusting the force level in the anchor. Centralizers, bearing and anchor plates, wedges, trumpet, nuts, washers, and other hardware for the tieback assembly shall be consistent and fit up with the anchor.

3.2 Corrosion Protection. Corrosion protection shall include a grout filled sheath in the unbonded and bonded length meeting PTI requirements for encapsulated tendons.

3.3. Anchorages. Anchorages shall be capable of developing 95 percent of the guaranteed ultimate tensile strength of the threadbar or strands.

3.4 Bearing plate. The bearing plate shall be fabricated from mild steel and it shall be capable of developing 95 percent of the guaranteed ultimate tensile strength of the threadbar or strands. The bearing plate shall be designed to allow post-lockoff grouting of the annular space between the steel trumpet and the Anchor-Soldier pile Connection Pipe.

3.5 Couplets. Couplers shall be capable of developing 100 percent of the guaranteed ultimate tensile strength of the threadbar.

3.6 Wedges. Wedges shall be designed to preclude premature failure of the prestressing steel due to notch or pinching effects under static and dynamic strength requirements of Section 3.1.6 (1) and Section 3.1.8 (1) and 3.1.8 (2) of the PTI "Post Tensioning Manual." Wedges shall not be reused.

3.7 Anchor Grout. Flowable, neat cement grout made from Type I, II, or III Portland cement conforming to ASTM C150. The grout proportions shall be one sack (94 lbs.) of cement to 4.5 to 5 gallons of water. No admixtures will be allowed. Grout strength at the time of stressing anchors shall be at least 3000 psi based on cube tests of grout specimens (ASTM C109). Mix grout to a colloidal state and agitate continuously until used.

3.8 Water for Grout. Water used in the grout should be potable, clean and free of injurious quantities of substances known to be harmful to Portland cement or prestressing steel.

3.9 Anchor-Soldier Pile Connection Pipe. Anchor-Soldier Pile Connection Pipe shall consist of extra strong pipe, ASTM A53, Grade B, as shown in the plans and shall include reinforcing plates on the HP- pile as shown.

3.10 Permanent Steel Casing. Seamless or ERW steel pipe, Grade A 36 or stronger, with a minimum wall thickness of 0.25 inches.

4.0 Construction. Furnish all supervision, labor, materials, and equipment to construct the proposed tiebacks.

5.0 Definitions.

5.1 Duplex Drilling. A method to advance a borehole that simultaneously advances an outer casing and inner drill string. The drilling fluid (air or water) removes drill cuttings as they return to the ground surface in the annular space between the drill string and casing. The “Odex" and “Tubex" drilling systems are acceptable duplex drilling methods.
Bond Length. The portion of the tieback anchor that transmits the anchor force to the dolomite rock.

5.2 Unbonded Length. The portion of the tieback anchor that is sheathed to prevent load transfer to the grout. Also referred to as the Free Length.

5.3 Total Length. Unbonded length plus bond length.

5.4 Jack Length. Length of bar between the anchor plate and the grip on the jack when stressing the anchor. The jack length is in addition to the total length.

5.5 Apparent Free Length. Apparent Free Length = A x E x Δ / (TL — AL), where A = tieback cross-sectional area, E = elastic modulus of the tieback steel, Δ = elastic elongation, TL= Total Load, AL = alignment load (0.05 x Design Load).

5.6 Obstruction. Concrete, steel, or timber man-made materials that slow the rate of drilling below that which would normally be achieved without the obstruction. Limestone and dolomite boulders whether in fill or naturally occurring will not be considered obstructions.

6.0 Submittals

6.1 Jack Calibration. At least one week prior to the performance test provide jack calibration data. Calibration data shall include jack and pump proposed for the performance test.

6.2 Tieback and Installation Details.

6.2.1 Description of tieback installation including drilling, grouting, and stressing information two weeks prior to production anchor installation.

6.2.2 Shop drawings and design calculations of tieback details including capacity, bond length and diameter, unbonded length and diameter, grout, corrosion protection, permanent steel casing (if required by the contractor), threadbar or prestressing strands, wedges, bearing plates, and anchorages.

6.2.3 Performance Test information including: Shop drawings of tieback details including capacity, bond length and diameter, unbonded length and diameter, corrosion protection, grout, threadbar or prestressing strands, wedges, bearing plates, and anchorages and proposed reaction system. Submit two weeks prior to installation of Performance Test Anchor.

7.0 Installation of Tieback Anchors. Install anchors using the following sequence and procedures.

7.1 Performance Test Anchor

7.1.1 Install and perform performance test on one anchor per PTI at the location and inclination shown on the drawing to verify performance of the Contractor proposed tieback. Install the tieback as indicated on the Contractor approved shop drawings. Contractor shall design and install temporary load reaction system to perform the test.

7.1.2 The test anchor shall be performance tested as indicated below. No other anchors shall be installed until the test has been completed in case design modifications are necessary. The remaining anchors may be installed after the performance test on the test anchor has been completed. Advise Engineer 48 hours in advance of performance testing so that he can be present to observe the test.

7.1.3 Equipment. For performance and proof testing provide and operate a jack calibrated to an accuracy of + 2 percent. Provide calibration certificate of jack to Engineer prior to load testing showing calibration within the prior 6 months. Provide independent reference frame and dial gauge accurate to +0.001 inch to measure movement.

7.1.4 Performance Test. Performance test shall be performed by incrementally loading and unloading the anchor in accordance with the schedule given in Table 1. Except for the maximum load, each load increment shall be held only long enough to note and record load and elongation (approximately 2 minutes each load increment). Maintain jack pressure to within 50 psi of the required pressure for each load increment. Hold the maximum load for a period of 60 minutes or until creep ceases (whichever is less) as determined by the Engineer. After the performance test is complete and approved by the Engineer, cut off proof test anchor flush with grade.

Table 1
Performance Test Load Increments

Approximate Fraction of Design Load (DL)	0.05, 0.25, 0.05, 0.25, 0.50, 0.05, 0.25, 0.50, 0.75, 0.05, 0.25, 0.50, 0.75, 1.0, 0.05, 0.25, 0.50, 0.75, 1.0, 1.20, 0.05, 0.25, 0.50, 0.75, 1.0, 1.20, 1.33 (Hold for 60 min. or until creep ceases), 0.05, 1.0 (Lock-Off Load)
Alignment Load	0.05 DL

7.1.5 Performance Test Acceptance Criteria. The acceptance criteria for the Performance Tests will follow PTI and are as follows:

7.1.5.1 Creep. Creep at a load of 1.33 times the design load, during the period from 6 to 60 minutes shall not exceed 0.08 inches.

7.1.5.2 Minimum Apparent Free Length. The minimum apparent free length at a load of 1.33 times the Design Load based on elastic movement shall not be less than 80 percent of the design unbonded length plus the jack length.

7.1.5.3 Maximum Apparent Free Length. The maximum apparent free length at a load of 1.33 times the Design Load based on elastic movement shall not be more than 100 percent of the unbonded length plus 50 percent of the bond length plus the jack length.

7.1.5.4 Additional Tests. If the performance test does not meet the acceptance criteria, additional performance tests directed by the Engineer will be done by the contractor at no additional cost to the Commission until the Contractor has installed a tieback anchor that meets the acceptance criteria.

7.2 Installing Tieback Anchors. After performance test has been approved by the Engineer, install tiebacks at the locations and inclination shown on the drawings. Drill tiebacks to the diameter and length based on the Performance Test, but not less than the minimum total length shown in the drawings. Use duplex-drilling methods in fill and soil. Seat casing at least three feet into stable shale or dolomite. Once seated in stable shale or dolomite, the hole may be advanced by open-hole drilling methods, such as rotary percussion methods.

7.2.1 Anchor Grouting. Immediately after the hole is drilled and approved by the Engineer, hone the anchor to the bottom of the drill hole and grout. If the anchor cannot be honed and grouted immediately after drilling, clean the hole to the bottom with the drill tools, then home and grout the anchor. Grout from the bottom of the hole up using a grout tube until grout runs out of the top of the drill hole. Alternatively, the hole may be grouted to the surface before the anchor is honed into the grout- filled hole. If grout loss occurs add grout to raise the grout level to the top of the casing until the grout level stabilizes as approved by the Engineer. After the anchor has been grouted, the temporary casing may be partially extracted so that the bottom of the casing is at least 15 ft from the face of the wall or a minimum of 3 ft into stable rock (shale or dolomite), whichever is greater. The portion of the casing that is in fill or natural earth above the rock shall remain in place, and the Contractor shall be paid for casing left in place at the unit price for 5-ft casing increments. Top off the grout from the top of the remaining casing if the grout level drops after pulling the casing. Do not grout the space between the Anchor-Soldier Pile Connection Pipe and anchor until after the anchor is proof tested and locked off. Allow the grout to cure until it achieves a compressive strength of at least 3000 psi before starting to backfill behind the wall. Snug the anchor nut using hand tools prior to backfilling.

7.2.2 Proof Tests. All anchors except the performance test anchor shall be proof tested after the wall is backfilled by loading incrementally according to the schedule in Table 2. Hold incremental loads long enough to allow measurement of load and elongation before loading to the next increment. Hold the maximum load for a period of ten minutes for a creep test. Proof test loads may be reduced by the Engineer depending on lateral movement of wall during test.

Table 2
Proof Test Load Increments

Approximate Fraction of Design Load (DL)	0.05, 0.25, 0.50, 0.75, 1.0, 1.20, 1.33 (Hold for 10 min), 0.7 (Lock-Off Load)
Alignment Load	0.05 DL

7.2.2.1 Proof Test Acceptance Criteria. The acceptance criteria for the Proof Tests will follow PTI and are as follows:

7.2.2.2 Creep. Creep at a load of 1.33 times the design load, during the period from 1 to 10 minutes shall not exceed 0.04 inches. If so the load will be held for an additional 50 minutes with readings taken at 10-minute intervals. If the creep between 6 and 60 minutes exceeds that in the performance test, for a similar time, the Engineer will assess the anchor capacity and acceptability.

7.2.2.3 Minimum Apparent Free Length. The minimum apparent free length at a load of 1.33 times the Design Load based on elastic movement shall not be less than 80 percent of the design unbonded length plus the jack length.

7.2.2.4 Maximum Apparent Free Length. The maximum apparent free length at a load of 1.33 times the Design Load based on elastic movement shall not be more than 100 percent of the unbonded length plus 50 percent of the bond length plus the jack length. If this criterion is not met, the Engineer will assess anchor capacity and acceptability. Additional testing required to evaluate acceptability, such as creep testing, shall be done at no additional cost to the Commission.

7.3 Post Lockoff Grouting.

7.3.1 After the anchor is locked off, grout the annular space between the tieback anchor and the anchor-solider pile connection pipe using Anchor grout. Grout through the holes in the bearing plates or other approved method using a grout tube extending to the bottom of the opening. Grout from the bottom up until grout runs out of the grout tube hole. Remove the grout tube and top off the grout level if it drops below the opening.

7.4 Tolerances.

(1) Tieback Anchor Angle: + 2 degrees from design.
(2) Tieback Anchor Length: within 1.0 ft
(3) Tieback Anchor Elevation at the face of the wall: within 0.5 feet.

7.5 Abandoned Holes. If obstructions prevent drilling an anchor hole to the required depth, the obstructed hole shall be abandoned by grouting with the approval of the Engineer and a replacement hole shall be drilled at the location directed by the Engineer.

8.0 Measurement and Payment

8.1 The installation of the test anchor, design and furnishing the reaction system, and performance test will be paid for as a lump sum item.

8.2 Furnishing and installation of tieback anchors will be measured for payment per each. Payment will be made for the actual accepted installed anchor and includes the thread bar/strands, corrosion protection, permanent casing, bearing plates, trumpet, centralizers, casing left in place, other related hardware needed for the anchor assembly, drilling, homing, grouting, proof testing and post lockoff grouting.

8.3 Anchor-Soldier Pile Connection Pipe and reinforcing plates will be measured for payment in pounds per Sec 712.10.1. Payment will be made per Sec 712.11.1.

8.4 There will be no additional compensation due for permanent tieback casing, abandoned holes or unauthorized over-excavation of tieback anchors.

8.5 There will be no payment for additional tieback anchors that do not meet the Performance or Proof Test Criteria. Contractor will replace anchors, as well as connection to the soldier pile in a manner acceptable to the Engineer for tieback anchors that do not meet the acceptance criteria at no additional cost to the Commission.