

SECTION 13200 PEDESTRIAN BRIDGE

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Requirements for a fully engineered prefabricated clear span pedestrian bridge of steel construction.

1.2 SUBMITTAL

- A. The Contractor shall submit pedestrian bridge plans in accordance with Section 01300: Submittals.
- B. The submittal shall contain the following information:
 - 1. Shop drawing, showing member sizes, bridge reactions, and details, signed and sealed by a licensed professional engineer.
 - 2. Structural calculations, signed and sealed by a licensed professional engineer.
- C. Welder certifications.
- D. Welding procedures.
- E. Detailed written instruction in the proper lifting procedures and splicing procedures.
- F. Written inspection and maintenance procedures.

1.3 QUALITY CERTIFICATION

- A. Pedestrian bridge shall be fabricated by a fabricator currently certified by the American Institute of Steel Construction to produce fabricated structural steel for the category "Major Steel Bridges".
- B. Bridge shall be fabricated in a facility owned and/or leased by the corporate owner of the manufacturer, and fully dedicated to bridge manufacturing.

1.4 WARRANTY

- A. The bridge manufacturer shall warrant the access pedestrian bridge to be free of design, material and workmanship defects for a period of 10 years from the date of delivery.

PART 2- PRODUCTS

2.1 GENERAL FEATURES OF DESIGN

- A. Bridge span shall be 143 feet and shall be measured from each end of the bridge structure.
- B. Bridge width shall be 10 feet, and shall be measured from the inside face of structural elements at deck level.
- C. Bridge shall be designed as a Pratt Truss system or an approved equal, with one (1) diagonal per panel and plumb end vertical members. Interior members may be either plumb or perpendicular to the chord faces.
- D. The bridge manufacturer shall determine the distance from the top of the deck to the top and bottom truss members.
- E. All members of the vertical trusses shall be fabricated from square and/or rectangular structural steel tubing. Other structural members and bracing shall be fabricated from structural steel shapes or square and rectangular structural steel tubing.
- F. Vertical safety rails or pickets shall be placed on the structure to a minimum height of 42-inches above the deck surface. The pickets shall be spaced so as to prevent a 4-inch sphere from passing through the truss. Pickets shall be placed on the outside of the structure. The top of the pickets shall have a continuous cap angle or some other means to prevent bridge users from cutting or scraping their hands. The picket safety system shall be designed for an infill loading of 200 pounds, applied horizontally at right angles, to a one square foot area at any point in the system.
- G. The bridge shall have a wood rubbing rail.
- H. The bridge shall have a vertical camber dimension at midspan equal to 100 percent of the full dead load deflection plus 1 percent of the full length of the bridge.
- I. The bridge abutments shall be constructed at the same elevation on both ends of the bridge.

2.2 ENGINEERING

- A. Structural design of the bridge shall be performed by or under the direct supervision of a licensed professional engineer, and done in accordance with recognized engineering practice and principles.
- B. Design loads:
 - 1. Dead Load: The bridge structure shall be designed considering its own dead load that includes the superstructure and the original decking.
 - 2. Uniform Live Load: Main supporting members, including girders, trusses, and arches shall be designed for a pedestrian live load of 85 pounds per

square foot of bridge walkway area. Bridge decks and supporting floor systems, including secondary stringers, floor beams and their connections to main supporting members, shall be designed for a live load of 85 pounds per square foot, with no reduction allowed.

3. Concentrated Loads: The bridge superstructure, floor system, and decking shall be designed for each of the following point load conditions:
 - a. A concentrated load of 1000 pounds placed on any area 2.5 feet x 2.5 feet square.
 - b. A 1200-pound two-wheel vehicle with a wheelbase and tire print placed 60 inches apart along the direction of the bridge span.
 - c. A 20,000-pound truck with HS-10 loading condition.
4. Wind Load:
 - a. 25 pounds per square foot on the full vertical projected area of the bridge, applied horizontally at right angles to the longitudinal axis of the structure. This wind loading shall be considered both in the design of the lateral load bracing system and in the design of the truss vertical members, floor beams, and their connections.
 - b. Calculate the effects of forces tending to overturn the structure assuming the wind direction is at right angles to the longitudinal axis of the structure. In addition, an upward force shall be applied at the windward quarter point of the transverse superstructure width. This force shall be 20 pounds per square foot of deck.

C. Design Limitations:

1. Vertical deflection:
 - a. The vertical deflection of the main trusses due to service pedestrian live load shall not exceed $1/400$ of the span.
 - b. The vertical deflection of cantilever spans due to service pedestrian live load shall not exceed $1/300$ of the cantilever arm length.
 - c. The deflection of the floor system members due to service pedestrian live load shall not exceed $1/360$ of their respective spans.
 - d. The service pedestrian live load shall be 85 pounds per square foot.
2. Horizontal deflection: The horizontal deflection due to lateral wind loads shall not exceed $1/500$ of the span under an 85 mile per hour wind load.
3. The minimum thickness of all structural steel members shall be $3/16$ -inch nominal and be in accordance with the AISC Manual of Steel Construction, Standard Mill Practice Guidelines.

D. Design Codes and References:

1. Structural steel allowable stresses: American Institute of Steel Construction (AISC).
2. Welded tubular connections: American National Standards Institute (ANSI), American Welding Society (AWS), and Canadian Institute of Steel Construction (CISC).
3. Concrete: Building Code Requirements for Structural Concrete, ACI 318.
4. Top Chord Stability: Structural Research Council.
5. AASHTO Standard Specifications for Highway Bridges, except as modified by the AASHTO LRFD Guide Specification for the Design of Pedestrian Bridges.

2.3 MATERIALS

- A. Steel: Unpainted weathering steel, atmospheric corrosion resistant, ASTM A847 cold-formed welded square and rectangular tubing, and/or ASTM A588 or ASTM A606 plate and structural steel shapes, yield strength 50,000 psi. The minimum corrosion index of atmospheric corrosion resistant steel, as determined according to ASTM G101, shall be 6.0.
- B. Concrete decking: Furnish a stay-in-place galvanized steel form deck suitable for placing a reinforced concrete slab. The form deck shall be designed to carry the dead load of the wet concrete, weight of form decking, plus a construction load of 20 pounds per square foot, or a 150-pound concentrated load on a 1-foot wide section of deck. The form deck shall be either smooth or composite.
- C. Reinforced concrete deck shall be cast-in-place in the field, as shown on the Drawings, and in accordance with Section 03300: Structural Concrete.
- D. Bearing devices: Steel setting or slide plate placed on the abutment or grout pad. The bearing seat shall be minimum 16 inches wide.

PART 3 – EXECUTION

3.1 WELDING

- A. Welding and weld procedure qualification tests shall conform to ANSI/AWS D1.1 "Structural Welding Code", 1996 Edition.
- B. Welders shall be properly accredited operators with a minimum of 6 months expertise in welding tubular structures.

3.2 FABRICATION

- A. Provide drain holes inside structural tubes.
- B. Fillet weld shall be in accordance with AWS D1.1, Section 3.9.

3.3 FINISHING

- A. All exposed surfaces of steel shall be blast-cleaned in accordance with Steel Structures Painting Council Surface Preparation Specifications No. 7 Brush-Off Blast Cleaning, SSPC-SP7, latest edition. All blast cleaning shall be done in a dedicated OSHA approved indoor facility.
- B. Exposed surfaces of steel shall be defined as those surfaces seen from the deck and from outside of the structure. Stringers, floor beams, lower brace diagonals and the inside face of the truss below deck and bottom face of the bottom chord shall not be blasted.

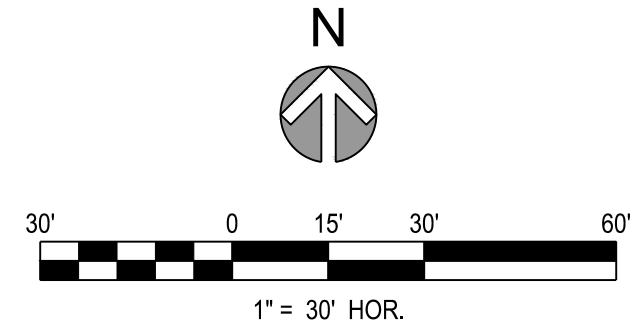
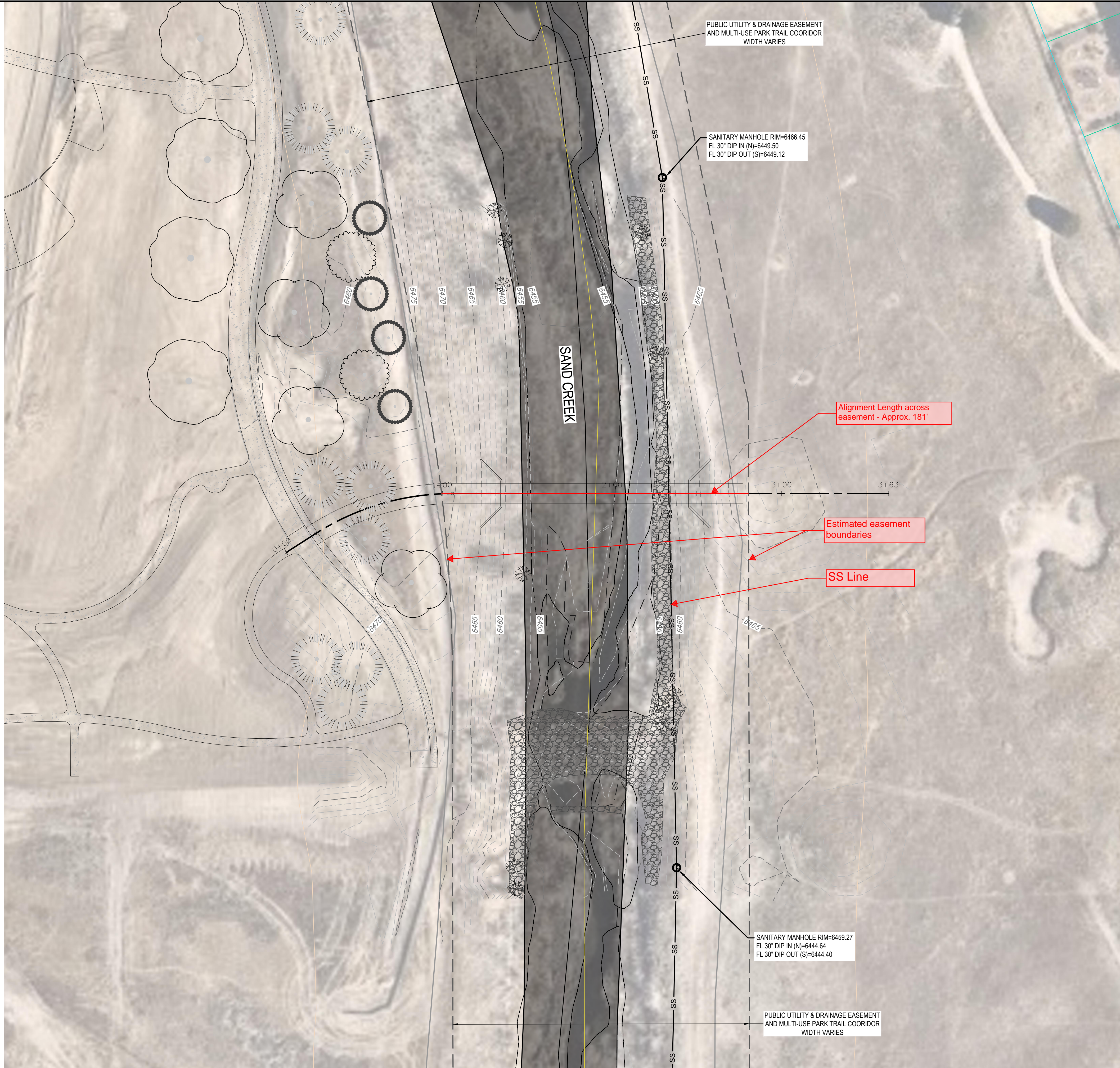
3.4 DELIVERY AND ERECTION

- A. Deliver to a location nearest the site which is easily accessible to normal over-the-road tractor/trailer equipment. All trucks delivering bridge materials shall be unloaded at the time of arrival.
- B. The access bridge shall be placed between the concrete abutments on either side of the creek bed as shown on the Drawings.
- C. The bridge bearing plate which is welded to the bridge structure shall bear on the setting plate.
- D. One end of the bridge shall be fixed by fully tightening the nuts on the anchor bolts at that end. The opposite end shall have finger-tight only nuts to allow movement under thermal expansion or contraction.
- E. Place concrete deck in accordance with Section 03300: Structural Concrete.

- END OF SECTION 03110 -

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TITLE

**GREENWAYS PARK
PEDESTRIAN BRIDGE**
COLORADO SPRINGS, COLORADO
IMPROVEMENTS PLAN

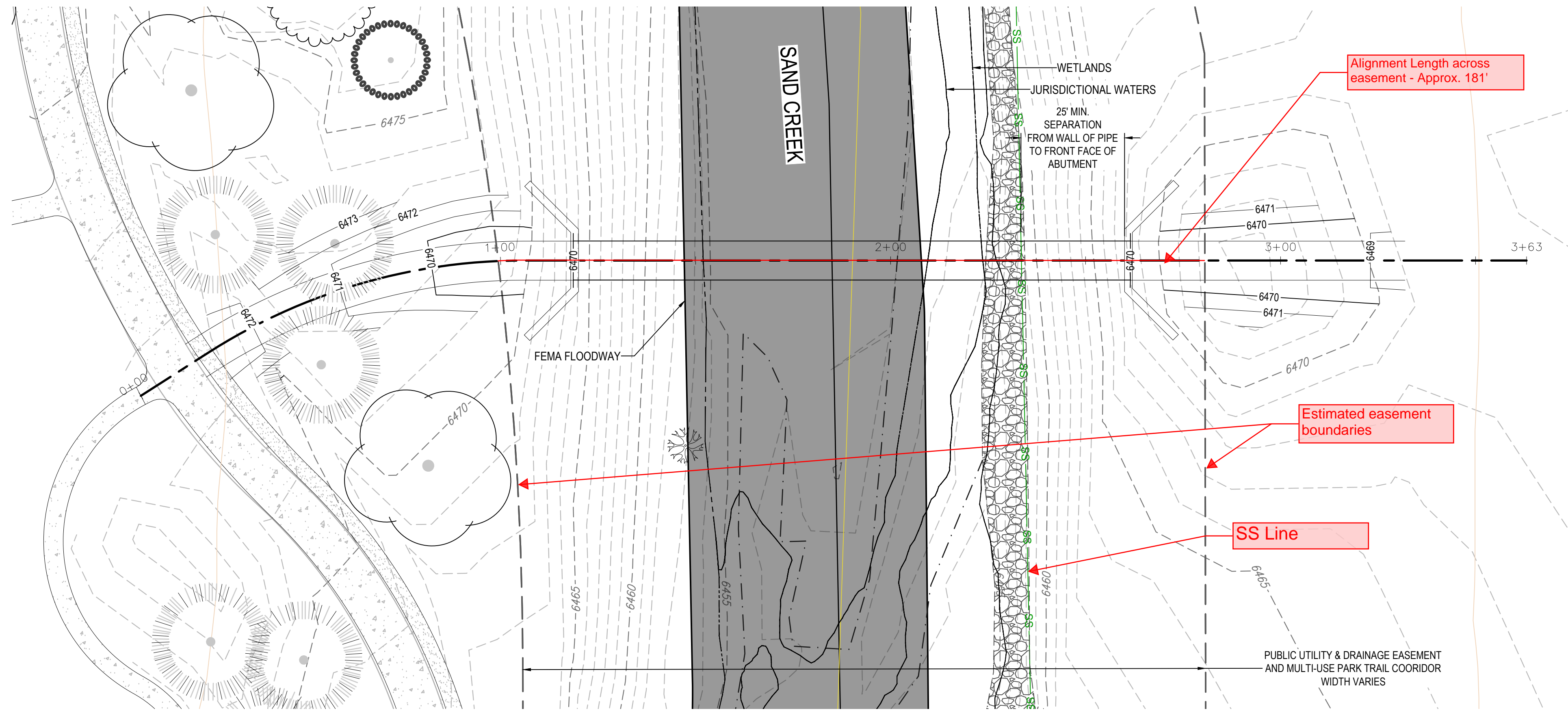
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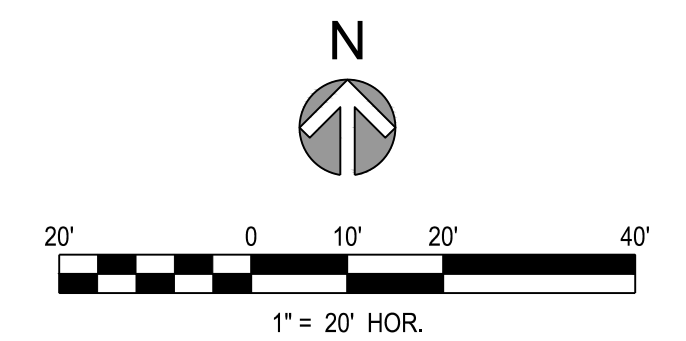
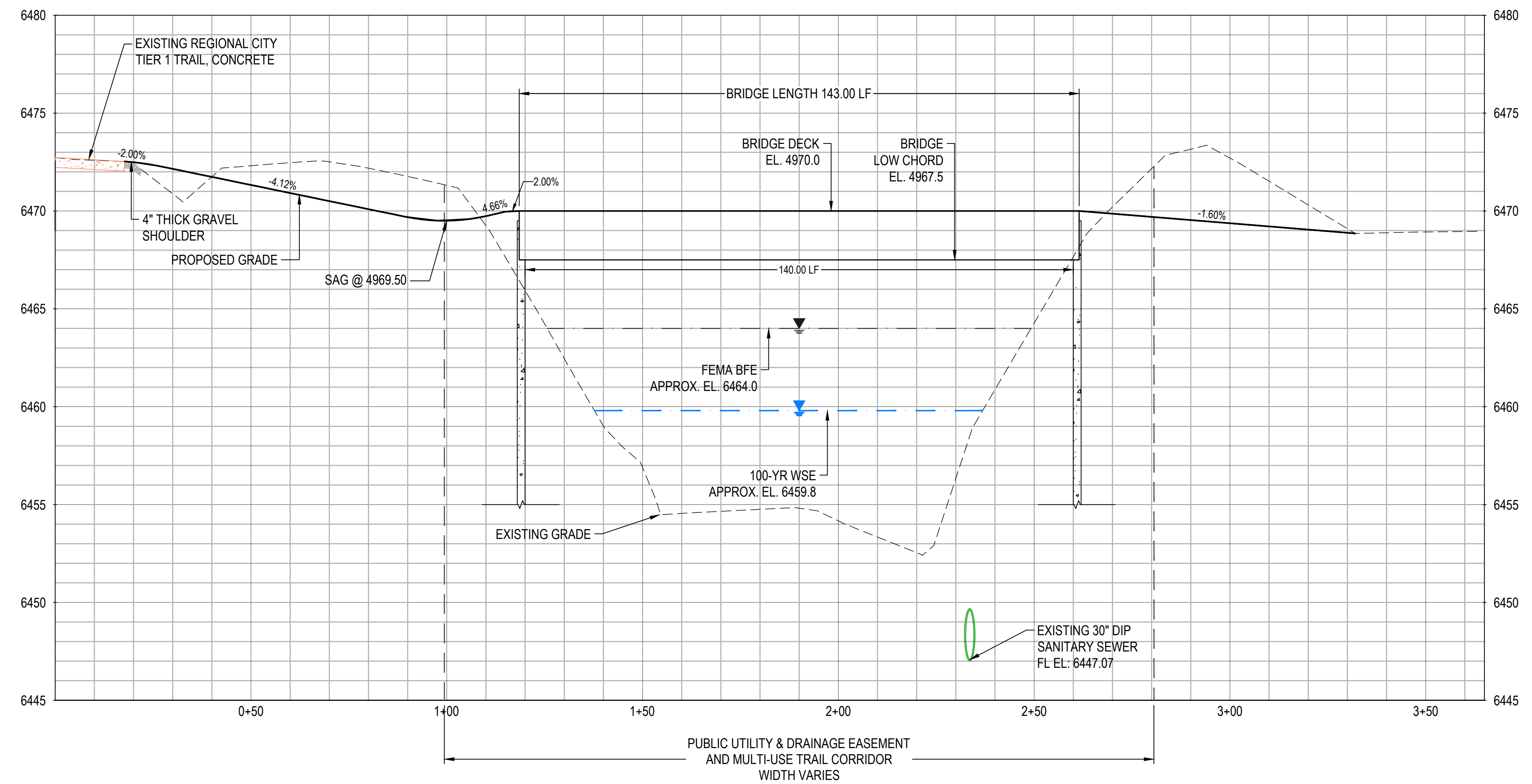
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IMPROVEMENTS PLAN

