

## SECTION 02200

### EARTHWORK

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Definitions: Over excavation; Additional Excavation.
- B. Excavation: Safety; Classification; Limits and Conditions; Structure Foundations; Trenching; Boring; Tunneling; Stockpiling; Drainage; Disposal.
- C. Backfill: Materials; Placing.
- D. Embankment: Materials; Foundation Preparation; Placing.

##### 1.02 DEFINITIONS

- A. Overexcavation: Any and all excavation outside prescribed lines, whether done for convenience or required as a result of Contractor's operations.
- B. Additional Excavation: Any and all excavation outside prescribed lines ordered and authorized by Engineer.

##### 1.03 EXCAVATION

- A. Safety: Provide and maintain safe working conditions within excavations by shoring, sheeting, bracing, benching, or sloping as required.
- B. Classification: No classification as to type, origin, condition, or other characteristic will be made of excavated material.
- C. Limits and Conditions:
  - 1. Excavate to lines and grades shown on the *Drawings*, described in the *Specifications*, or established by Engineer.
  - 2. Excavate in the dry. Provide and maintain adequate dewatering equipment and systems to remove and dispose of surface and ground water entering excavations; maintain ground water levels at least one foot below bottom of excavation. Discontinue dewatering operations only after construction has progressed to the extent necessary to prevent damage to the Work by such discontinuance. Do not excavate in frozen materials.
  - 3. No blasting or explosives will be permitted. Take necessary precautions and exercise due care to preserve material beyond prescribed lines in soundest condition possible. Remove material rendered unsuitable by excavation or other operations: such removal will be deemed Overexcavation. Refill with compacted suitable material or structural grade concrete.
  - 4. Overexcavation, and refill work occasioned thereby, shall be at no cost to Owner. Additional Excavation, and refill work occasioned thereby, will be paid for by *Change Order*.
- D. Structure Foundations: Accurately finish excavation surfaces to receive concrete. Moisten and tamp or roll surfaces to provide a firm foundation for concrete. Refill Overexcavation and Additional Excavation in earth foundations with compacted suitable material; in rock foundations, refill with structural grade concrete.

- E. Trenching: Except where boring or tunneling is required or permitted, excavate trenches by open cut from the surface. Use hand methods where trenching equipment would damage trees, buildings, utilities, or other property or structures above or below ground.
  - 1. From at least one foot above top of pipe to trench bottom, trench walls shall be vertical and trench width shall be not less than 12 inches not more than 24 inches wider than the pipe's outside diameter, unless otherwise shown on the *Drawings*.
  - 2. Accurately finish trench bottoms to prescribed lines and grades. Provide suitable holes for bells, flanges, and other protrusions to ensure uniform longitudinal support under the pipe. Refill Overexcavation and Additional Excavation with compacted pipe embedment material.
- F. Boring: Utilize only dry methods, such as percussion or rotary, for horizontal boring operations: no sluicing or jetting will be permitted. Bored hole diameter shall not exceed maximum section pipe diameter by more than 1 ½ inches for 12 inch pipe and smaller, or 2 inches for pipe larger than 12 inch. Fill excessive voids, cavities, cave-ins, and abandoned bore holes by pressure-grouting with sand-and-cement slurry (minimum of 2 bags cement per cubic meter slurry) as directed and approved by Engineer and at no cost to Owner.
- G. Tunneling: Utilize only dry methods: no sluicing or jetting will be permitted. Tunneling will not be permitted where the resultant tunnel length, measured at pipe grade, would exceed 8 feet.
- H. Stockpiling: Pile excavated material so as to not endanger the Work, property, or people, so as to avoid obstructing traffic paths, vehicular and pedestrian, and so as to retain accessibility to fire hydrants, valves, call boxes, utility controls, and similar features. Keep gutters, ditches, culverts, and similar drainage facilities clear or provide for otherwise maintaining satisfactory drainage.
- I. Drainage: Provide and maintain drainage through and across the Work at all times during construction. Drainage shall be sufficient to prevent ponding or standing water in excavations or other Work areas. Do not dam or divert runoff in such a manner as to cause damage to adjacent properties.
- J. Disposal: Use suitable materials from required excavations, or as much thereof as may needed, in the permanent construction required under the *Contract Documents*. Waste unsuitable and unneeded material away from the site at locations subject to Engineer's approval. Waste banks shall not interfere with natural drainage nor detract from property. Grade and shape waste banks to reasonably even and uniform lines and surfaces, and provide for proper drainage.

#### 1.04 BACKFILL

- A. Materials: As available, obtain backfill material from material moved in required excavations; if not available therefrom, obtain backfill material from an approved source. Backfill material shall be free of debris and organic material, and masses of moist, stiff clay shall not be used. Material used for backfill shall be subject to Engineer's approval.
  - 1. Backfill not to be Compacted: maximum particle size of 3 inches
  - 2. Backfill to be Compacted: maximum particle size of 1 ½ inches or 1 inch if used for pipe embedment material.
  - 3. Sand Backfill: clean, pit-run sand with 1 inch maximum particle size and less than 5 percent by weight passing No. 200 standard sieve.
- B. Placing: Place backfill to lines and grades shown on the *Drawings*, described in the *Specifications*, or established by Engineer. The manner of depositing backfill material shall be subject to Engineer's approval.

1. Place backfill in approximately horizontal, uniform layers and spread to fill spaces about rocks and clods. Backfill shall be free of lenses, pockets, and layers of material differing substantially from surrounding material.
2. Do not drop backfill directly on pipe. Place backfill to about the same elevation on both sides of pipe to prevent unequal loading and displacement of pipe.
3. Do not place backfill against newly constructed concrete walls until either the wall, concrete, and any supporting or bracing concrete, has attained design strength or the wall has been adequately braced to support the lateral load.
4. Ram tunnel backfill in place to completely fill the excavated section and provide maximum compaction practicable. Do not transmit damaging shocks to pipe or structures.
5. Determine and place adequate depth of fill over pipe and conduit to prevent damage from construction equipment loads.
6. Backfill in the dry. Do not place backfill when either the material or the receiving surfaces are frozen.

#### 1.05 EMBANKMENT

- A. Materials: As available, obtain embankment material from material moved in required excavations; if not available therefrom, obtain embankment material from an approved source. Embankment material shall be free of rubbish, refuse, roots, stumps, logs, vegetation, and other foreign or objectionable material. Material used for embankment shall be subject to Engineer's approval.
  1. Embankment not to be Compacted: maximum particle size of 12 inches.
  2. Embankment to be Compacted: maximum particle size of 6 inches.
  3. Sand Embankment: clean, pit-run sand or gravelly sand with 3 inch maximum particle size and less than 5 percent by weight passing No. 200 standard sieve.
- B. Foundation Preparation: Prior to placing embankment, strip foundation areas of all vegetation, scarify to 6 inch depth, and compact to the same requirements as the embankment to be placed thereon.
- C. Placing: Place and maintain embankment to lines and grades shown on the *Drawings*, described in the *Specifications*, or established by Engineer. The manner of depositing and leveling embankment material shall be subject to Engineer's approval.
  1. Place embankment in approximately horizontal, uniform layers across the entire width of the embankment. Spread and level material so that rock and gravel are well distributed and not nested within or under the embankment. Embankment shall be free of lenses, pockets, and layers of material differing substantially from surrounding material.
  2. Route hauling equipment to evenly distribute travel over entire width of previously placed layers.
  3. Construct embankment in the dry. Do not place embankment when either the material or the receiving surfaces are frozen.

1.06 COMPACTION

- A. Where compacted backfill or compacted embankment is required, compact material to such extent that no further or future settlement occurs: at any time during the correction period under the *Contract Documents*, settlement requiring repair will be deemed Defective Work and Contractor's responsibilities and Owner's rights shall be as set forth in the *Contract Documents*.
- B. Unless otherwise specified or shown, compaction may be accomplished by mechanical methods. Do not transmit damaging shocks to pipe or structures. Do not disturb or damage previously placed pipe embedment or compacted materials.
  - 1. Mechanical Methods:
    - a. Add water or dry out as may be required to obtain a uniform moisture content and achieve required density with compaction method being used.
    - b. Place material in horizontal layers so that the thickness of each layer before compaction is not more than 6 inches.
    - c. Use methods and equipment suitable and appropriate for the location to be compacted. Compact with rollers or hand or power tampers. Rollers used on any one layer shall be the same type and same weight per foot. Tampers used in confined areas, such as pipe haunches, shall be equipped with suitably shaped heads.

**PART 2 PRODUCTS (Not Used)**

**PART 3 EXECUTIONS (Not Used)**

END OF SECTION

SECTION 02930

SEEDING

PART 1 GENERAL

1.01 SUMMARY

- A. Seed areas from back of curb to right-of-way line and all other areas disturbed by construction and shown on the *Drawings*, described in the *Specifications*, or established by Engineer.
- B. Provide protective and remedial measures as may be required to establish a satisfactory stand of grass in all such seeded areas. A grass stand will be deemed satisfactory when bare spots do not exceed one square foot in size and do not make up more than 3 percent of the seeded area, and when grass is uniform in color and density.
  - 1. When the Work under the *Contract Documents* has been otherwise completed, if a determination of the satisfactory condition of such seeded areas cannot be made, payment for undetermined areas will be withheld until such determination can be made.
  - 2. Contractor will not be held responsible for unsatisfactory areas provided that (i) the unsatisfactory condition is attributable to the property owner's lack of maintenance, and (ii) the property owner was promptly and duly notified, including maintenance instructions, at the completion of seeding operations for that area.

1.02 SUBMITTALS

- A. Submit in accordance with Section 01300 - **Submittals**.
- B. Prior to sowing, submit to Engineer for information a Supplier certification that each lot of seed has been tested by a recognized seed testing laboratory within 6 months of date of delivery. Certification shall include:
  - 1. Name and address of testing laboratory.
  - 2. Lot number for each kind of seed tested, and date of test.
  - 3. Test results, including type of seed, percentages of purity, germination, and weed content, and proportions of mixtures as applicable.

PART 2 PRODUCTS

2.01 SEED

- A. Grass Seed: Standard containers labeled in accordance with U.S. Department of Agriculture "Rules and Regulations under the Federal Seed Act" as to type, lot number, net weight, and percentages of purity, germination, and weed content. Seed mixture per acre shall consist of:

<u>Seed Type</u>	<u>Pounds Pure Live Seeds per Acre</u>
Brome	50.0
K31 Fescue	150.0

Total Pounds PLS Per Acre 200.0

2.02 FERTILIZER

- A. Fertilizer: Commercial carrier of available nitrogen; 12-12-12; no cyanamide compounds or hydrated lime; unopened original containers clearly marked with guaranteed analysis of contents and net weight.

2.03 MULCH

- A. Mulch: prairie (native) hay or other approved material free of bindweed, Johnson grass, and other undesirable weeds.

**PART 3 EXECUTIONS**

3.01 SEEDBED PREPARATION

- A. Backfill the top 6 inches of trenched or excavated areas with soil equivalent to or better than that beneath adjacent grassed areas.
- B. Scarify or otherwise loosen seedbeds to a depth of at least 5 inches.
- C. Immediately prior to seeding operations, the top 3 inches of seedbeds shall be free of stones larger than 2 inches in maximum dimension, large clods, compacted areas, roots, established turf, sticks, stumps, debris, and other objectionable matter which could interfere with sowing, growing, or maintenance of seeded areas.

3.02 SEEDING

- A. Following seedbed preparation, spread fertilizer uniformly to provide a minimum of 30 pounds of available nitrogen per acre. Equipment capable of applying fertilizer and sowing seed simultaneously will be permitted.
- B. Immediately after (or concurrent with) fertilizing, sow grass seed by drilling, or other approved method, at specific rate. Drill as required to provide row spacing of 3 to 6 inches, and shall sow seed to a depth of ¼ to ½ inch. Cover fertilizer and seed to an average depth of ½ inch.

3.03 MULCHING

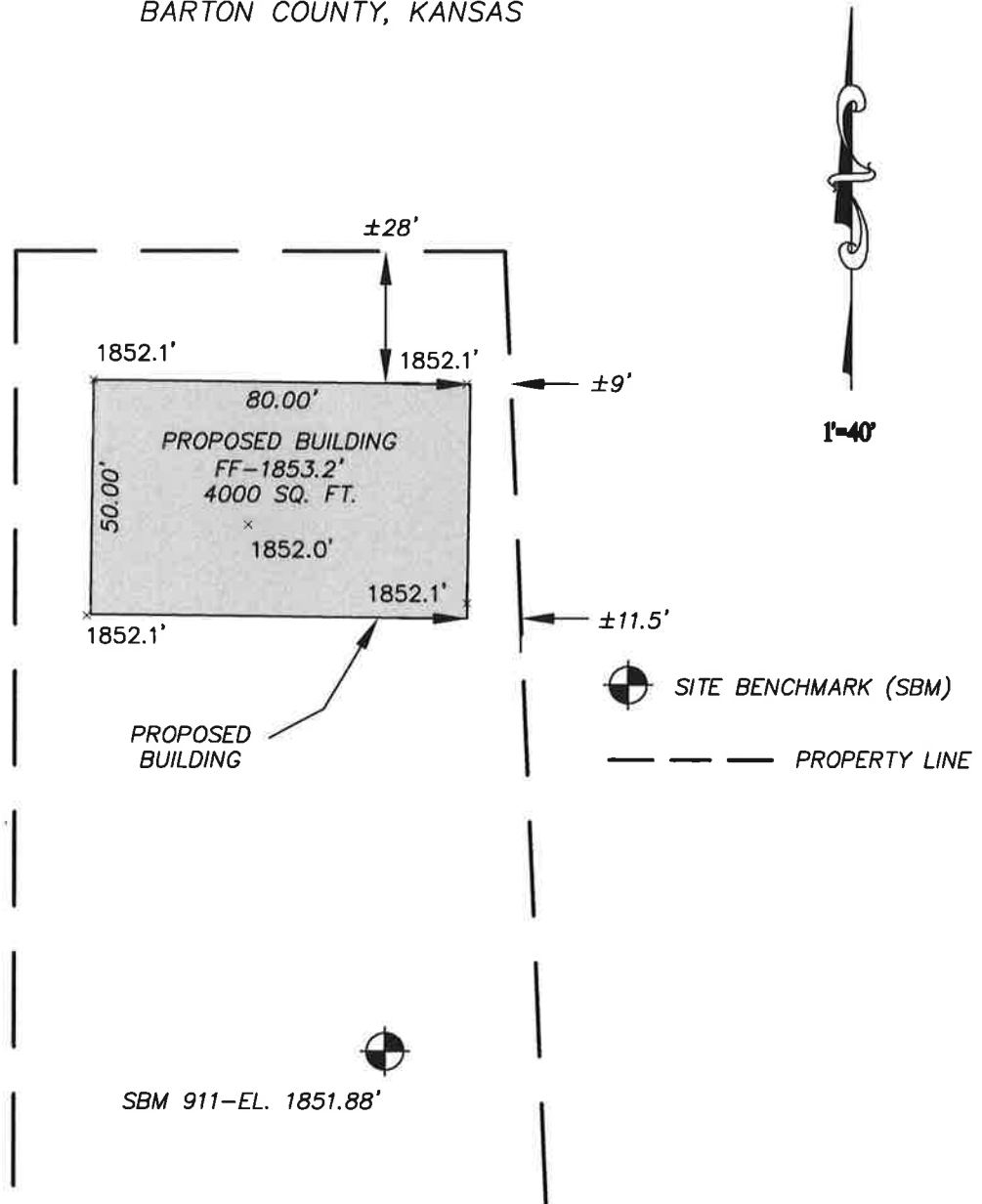
- A. Mulching will be required for areas seeded.
  - I. After seeding, spread mulch to a uniform loose thickness of 1½ to 2 inches. Anchor mulch with a straight, serrated disc weighted to press the mulch at least 2 inches into the seedbed. Disc spacing shall not exceed 12 inches. Do not leave spread mulch unanchored overnight. Mulch areas no more than 24 hours behind seeding operations.

3.04 NOTIFICATION, PROTECTION AND REPAIR

- A. Promptly notify property owner when seeding of that property is completed, including instructions as to watering and care of newly planted grass.
- B. Protect seeded areas against traffic, erosional, and other construction-related damage by use of warning signs and other damage by warning signs, barricades, or other effective means until completion and acceptance of the Work under these *Contract Documents*.
- C. Repair traffic, erosional, or other construction-related damage by regrading and reseeding as required or as directed by Engineer.

END OF SECTION

MATTHEW S. AND DEBRA L. POTTER  
34 NE 20 ROAD  
GREAT BEND, KS 67530  
SW4 SECTION 16, T-19-S, R-13-W  
BARTON COUNTY, KANSAS



BASE FLOOD ELEVATION OF 1852.2' WAS DETERMINED BY THE U.S. ARMY CORPS OF ENGINEERS, TULSA DISTRICT IN A LETTER DATED 16 FEBRUARY, 2024.

THE LOWEST EXISTING GRADE IN THE AREA OF THE PROPOSED BUILDING CONSTRUCTION IS 1852.0'

THE PROPOSED FINISH FLOOR ELEVATION OF THE SLAB ON GRADE IS 1853.2'.

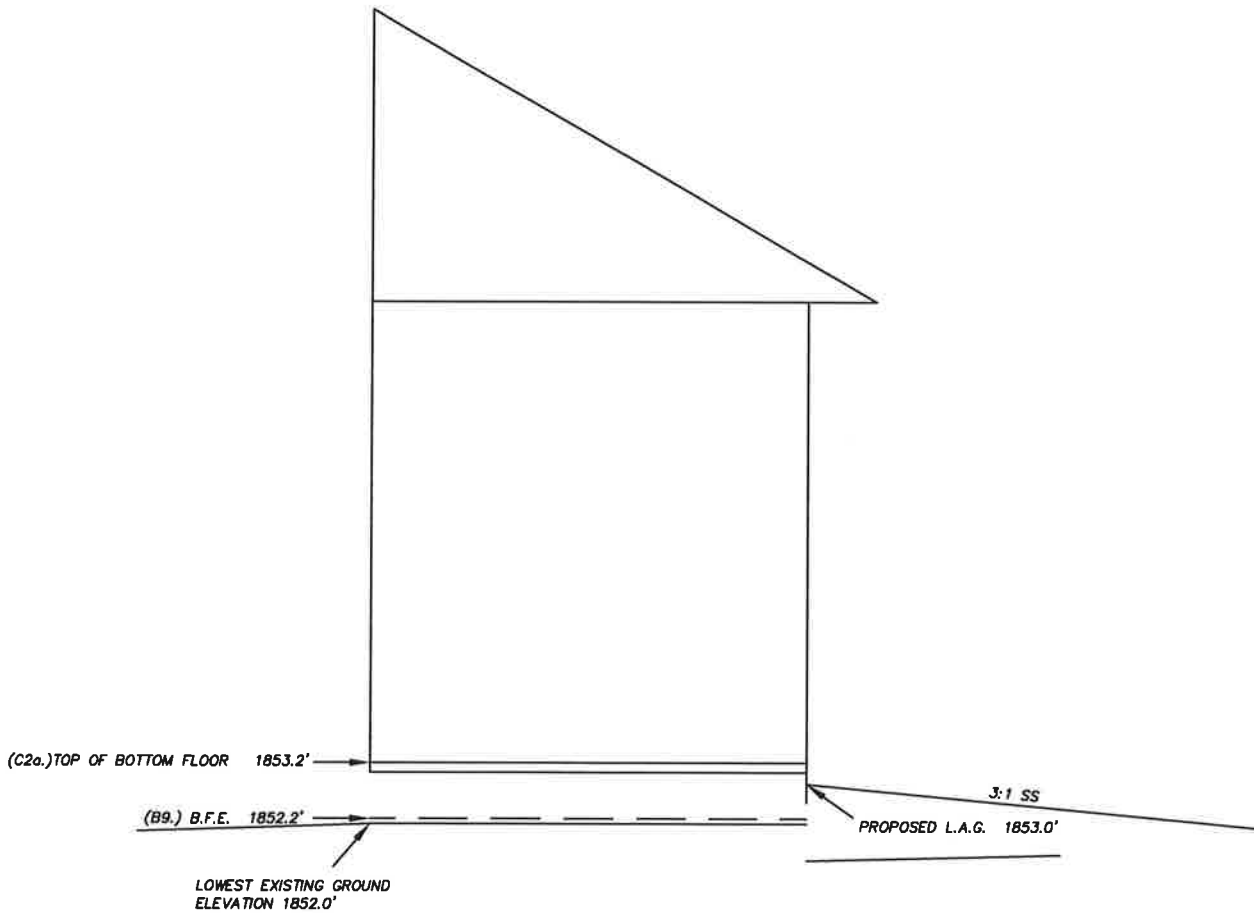
SITE BENCH MARK 911 (SBM 911) IS A 60d NAIL, +/- 5' NORTH OF A VINYL FENCE AND +/- 92' SOUTH OF THE PROPOSED BUILDING. ELEVATION-1851.88'

NGS BM "U-37 RESET", NAVD 88. ELEVATION-1870.10'.

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R4520.1  
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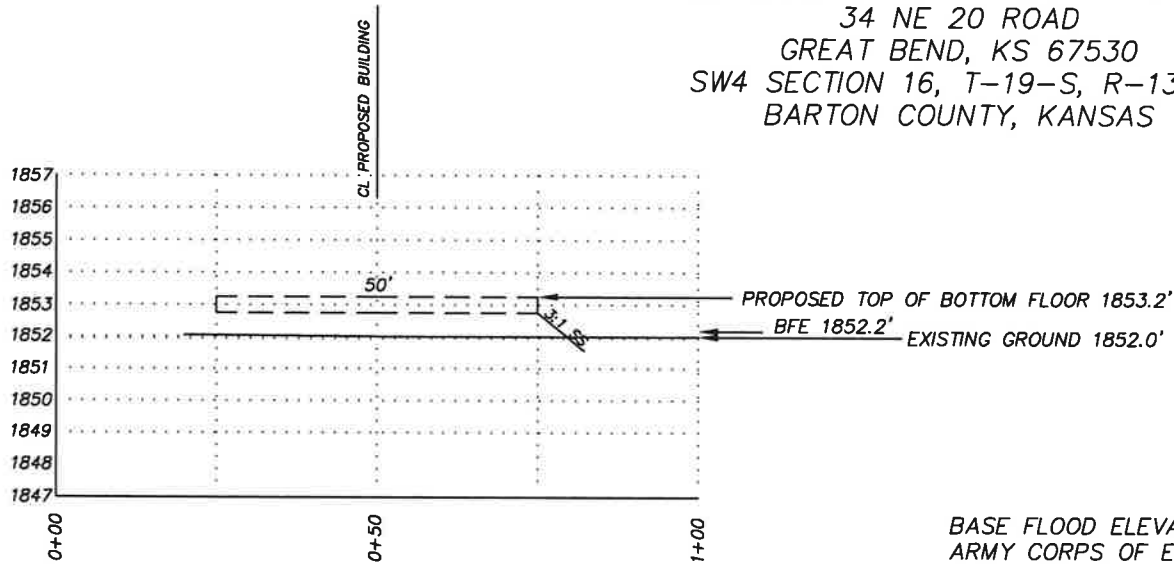
\*THIS SKETCH IS NOT TO SCALE



B.F.E. - BASE FLOOD ELEVATION  
L.A.G. - LOWEST ADJACENT GRADE



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NORTH/SOUTH CROSS-SECTION  
1"=30'

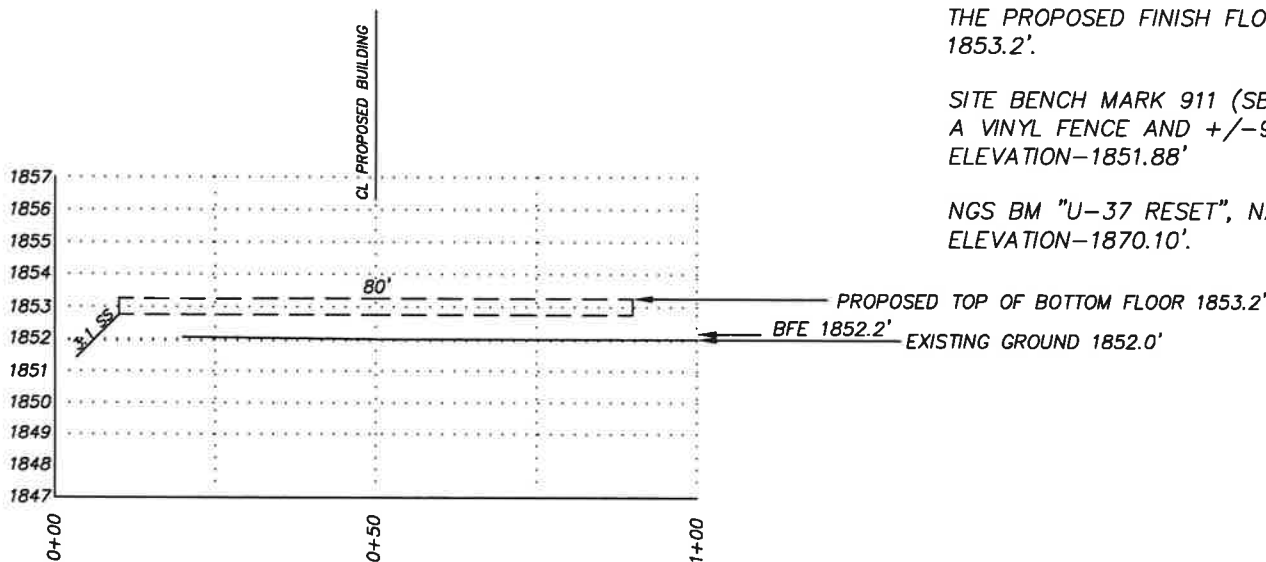
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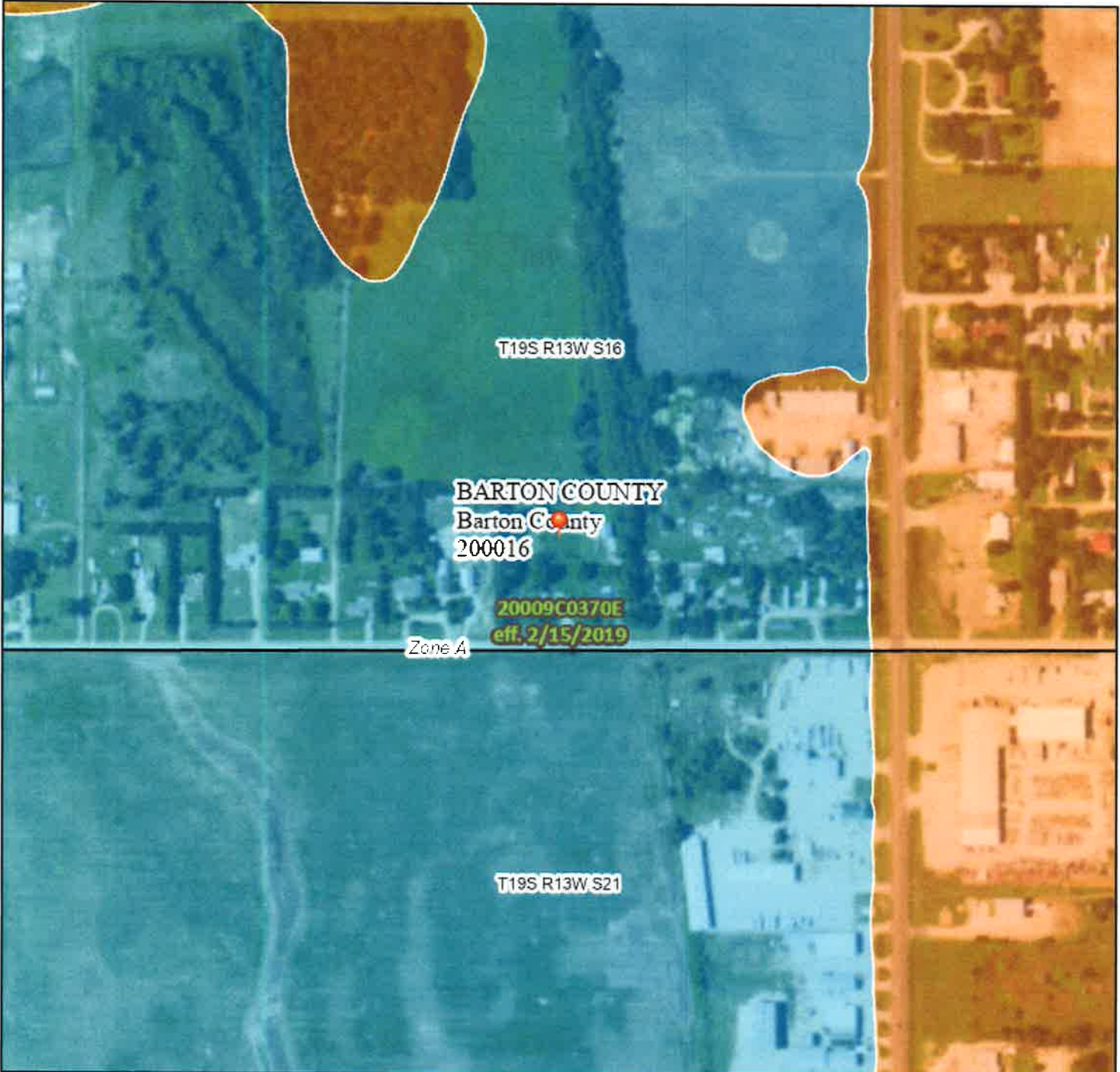


EAST/WEST CROSS-SECTION  
1"=30'

# National Flood Hazard Layer FIRMette



98°46'26"W 38°23'44"N



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- SPECIAL FLOOD HAZARD AREAS**
  - Without Base Flood Elevation (BFE) *Zone A, V, A99*
  - With BFE or Depth *Zone AE, AO, AH, VE, AR*
  - Regulatory Floodway
  
- OTHER AREAS OF FLOOD HAZARD**
  - 0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
  - Future Conditions 1% Annual Chance Flood Hazard *Zone X*
  - Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
  - Area with Flood Risk due to Levee *Zone C*
  
- OTHER AREAS**
  - NO SCREEN Area of Minimal Flood Hazard *Zone X*
  - Effective LOMRs
  - Area of Undetermined Flood Hazard *Zone X*
  
- GENERAL STRUCTURES**
  - Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
  
- OTHER FEATURES**
  - Cross Sections with 1% Annual Chance Water Surface Elevation
  - Coastal Transect
  - Base Flood Elevation Line (BFE)
  - Limit of Study
  - Jurisdiction Boundary
  - Coastal Transect Baseline
  - Profile Baseline
  - Hydrographic Feature
  
- MAP PANELS**
  - Digital Data Available
  - No Digital Data Available
  - Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/15/2024 at 2:09 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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98°45'48"W 38°23'16"N



4/12/2024