



City of Norman

Floodplain Permit Application

Floodplain Permit No. 588

Building Permit No. _____

Date 6/28/2017

FLOODPLAIN PERMIT APPLICATION (\$100.00 Application Fee Required)

SECTION 1: GENERAL PROVISIONS (APPLICANT to read and sign):

1. No work may start until a permit is issued.
2. The permit may be revoked if any false statements are made herein.
3. If revoked, all work must cease until permit is re-issued.
4. Development shall not be used or occupied until a Certificate of Occupancy is issued.
5. The permit will expire if no work is commenced within 2 years of issuance.
6. Applicant is hereby informed that other permits may be required to fulfill local, state and federal regulatory requirements and must be included with this floodplain permit application.
7. Applicant hereby gives consent to the City of Norman or his/her representative to access the property to make reasonable inspections required to verify compliance.
8. The following floodplain modifications require approval by the City Council:
 - (a) A modification of the floodplain that results in a change of ten percent (10%) or more in the width of the floodplain.
 - (b) The construction of a pond with a water surface area of 5 acres or more.
 - (c) Any modifications of the stream banks or flow line within the area that would be regulatory floodway whether or not that channel has a regulatory floodplain, unless the work is being done by the City of Norman staff as part of a routine maintenance activity.
9. All supporting documentation required by this application is required along with the permit fee by the submittal deadline. Late or incomplete applications will not be accepted.
10. I, THE APPLICANT, CERTIFY THAT ALL STATEMENTS HEREIN AND IN ATTACHMENTS TO THIS APPLICATION ARE, TO THE BEST OF MY KNOWLEDGE, TRUE AND ACCURATE.

SECTION 2: PROPOSED DEVELOPMENT (To be completed by APPLICANT.)

APPLICANT: City of Norman ADDRESS: 201 W. Gray

TELEPHONE: 405-366-5424 SIGNATURE: _____

BUILDER: _____ ADDRESS: _____

TELEPHONE: _____ SIGNATURE: _____

ENGINEER: Freese and Nichols, Inc. ADDRESS: 6303 N Portland Ave, Suite 100, Oklahoma City, OK 73112

TELEPHONE: 405-607-7065 SIGNATURE: 

PROJECT LOCATION

To avoid delay in processing the application, please provide enough information to easily identify the project location. Provide the street address, subdivision addition, lot number or legal description (attach) and, outside urban areas, the distance to the nearest intersecting road or well known landmark. A sketch attached to this application showing the project location would be helpful.

See Attached Exhibit 1

DESCRIPTION OF WORK (Check all applicable boxes):

A. STRUCTURAL DEVELOPMENT

- | <u>ACTIVITY</u> | <u>STRUCTURE TYPE</u> |
|--|---|
| <input type="checkbox"/> New Structure | <input type="checkbox"/> Residential (1-4 Family) |
| <input type="checkbox"/> Addition | <input type="checkbox"/> Residential (More than 4 Family) |
| <input type="checkbox"/> Alteration | <input type="checkbox"/> Non-Residential (Flood proofing? <input type="checkbox"/> Yes) |
| <input type="checkbox"/> Relocation | <input type="checkbox"/> Combined Use (Residential & Commercial) |
| <input type="checkbox"/> Demolition | <input type="checkbox"/> Manufactured (Mobile) Home |
| <input type="checkbox"/> Replacement | <input type="checkbox"/> In Manufactured Home Park? <input type="checkbox"/> Yes |

ESTIMATED COST OF PROJECT \$ 527,136.50 Work that involves substantial damage/substantial improvement requires detailed cost estimates and an appraisal of the structure that is being improved.

B. OTHER DEVELOPMENT ACTIVITIES:

- Fill Mining Drilling Grading
- Excavation (Beyond the minimum for Structural Development)
- Watercourse Alteration (Including Dredging and Channel Modifications)
- Drainage Improvements (Including Culvert Work) Road, Street or Bridge Construction
- Subdivision (New or Expansion) Individual Water or Sewer System

In addition to items A. and B. provide a complete and detailed description of proposed work (failure to provide this item will be cause for the application to be rejected by staff). Attach additional sheets if necessary.

The damaged articulated concrete block (ACB) in Imhoff Channel will be removed and replaced with a trapezoidal concrete lining that maintains the same channel dimensions as before. A drop structure will be constructed to protect the downstream end of the channel and allow for the dissipation of the channel energy in the existing plunge pool.

C. ATTACHMENTS WHICH ARE REQUIRED WITH EVERY APPLICATION:

The applicant must submit the documents listed below before the application can be processed. If the requested document is not relevant to the project scope, please check the Not Applicable box and provide explanation.

A. Plans drawn to scale showing the nature, location, dimensions, and elevation of the lot, existing or proposed structures, fill, storage of materials, flood proofing measures, and the relationship of the above to the location of the channel, floodway, and the regulatory flood-protection elevation.

B. A typical valley cross-section showing the channel of the stream, elevation of land areas adjoining each side of the channel, cross-sectional areas to be occupied by the proposed development, and high-water information.

Not Applicable:

See attached.

C. Subdivision or other development plans (If the subdivision or other developments exceeds 50 lots or 5 acres, whichever is the lesser, the applicant **must** provide 100-year flood elevations if they are not otherwise available).

Not Applicable:

This is a channel repair project not a subdivision development.

D. Plans (surface view) showing elevations or contours of the ground; pertinent structure, fill, or storage elevations; size, location, and spatial arrangement of all proposed and existing structures on the site; location and elevations of streets, water supply, sanitary facilities; photographs showing existing land uses and vegetation upstream and downstream, soil types and other pertinent information.

Not Applicable:

See attached

E. A profile showing the slope of the bottom of the channel or flow line of the stream.

Not Applicable:

See attached

F. Elevation (in relation to mean sea level) of the lowest floor (including basement) of all new and substantially improved structures.

Not Applicable:

This is not a habitable structure.

G. Description of the extent to which any watercourse or natural drainage will be altered or relocated as a result of proposed development.

Not Applicable:

The water course and drainage will not be altered because the channel geometry will stay the same, only the channel lining material will change.

- H. For proposed development within any flood hazard area (except for those areas designated as regulatory floodways), certification that a rise of no more than five hundredths of a foot (0.05') will occur on any adjacent property in the base flood elevation as a result of the proposed work. For proposed development within a designated regulatory floodway, certification of no increase in flood levels within the community during the occurrence of the base flood discharge as a result of the proposed work. All certifications shall be signed and sealed by a Registered Professional Engineer licensed to practice in the State of Oklahoma.
- I. A certified list of names and addresses of all record property owners within a three hundred fifty (350) foot radius of the exterior boundary of the subject property not to exceed 100 feet laterally from the Special Flood Hazard Area. The radius to be extended by increments of one hundred (100) linear feet until the list of property owners includes not less than fifteen (15) individual property owners of separate parcels or until a maximum radius of one thousand (1,000) feet has been reached.
See attached plans for adjacent property owners.
- J. A copy of all other applicable local, state, and federal permits (i.e. U.S. Army Corps of Engineers 404 permit, etc).

After completing SECTION 2, APPLICANT should submit form to Permit Staff for review.

SECTION 3: FLOODPLAIN DETERMINATION (To be completed by Permit Staff.)

The proposed development is located on FIRM Panel No.: 0280H, Dated: 9/26/2008

The Proposed Development:

Is NOT located in a Special Flood Hazard Area
 (Notify the applicant that the application review is complete and NO FLOODPLAIN PERMIT IS REQUIRED).

Is located in a Special Flood Hazard Area.

The proposed development is located in a floodway.

100-Year flood elevation at the site is 1129-1123 Ft. NGVD (MSL) Unavailable

See Section 4 for additional instructions.

SIGNED: Carrie Swenson DATE: 6/30/2017

SECTION 6: AS-BUILT ELEVATIONS (To be submitted by APPLICANT before Certificate of Occupancy is issued.)

1. FEMA Elevation Certificate
and/or
2. FEMA Floodproofing Certificate

NOTE: The completed certificate will be reviewed by staff for completeness and accuracy. If any deficiencies are found it will be returned to the applicant for revision. A Certificate of Occupancy for the structure will not be issued until an Elevation and /or Floodproofing Certificate has been accepted by the City.

TO: City of Norman Floodplain Committee

CC: Tim Miles P.E.

FROM: Tricia Hatley P.E.
Justin Oswald P.E. (TX), CFM

SUBJECT: City of Norman Floodplain Permit Application Memorandum

DATE: June 27, 2017

PROJECT: NRN15595 Imhoff Creek Channel Improvements – Site 17

INTRODUCTION

The purpose of the memorandum is to describe the Imhoff Creek Channel Improvements construction project and to address the requirements of the City of Norman floodplain permit. The project is located along a portion of Imhoff Creek in the southwest quadrant of the city. The project area is generally bounded by Westbrooke Terrace to the north, S Berry Road to the west, Whispering Pines Circle to the east, and Walnut Road to the south. The project location is shown on Exhibit 1. The project area lies within a Special Flood Hazard Area (SFHA) Zone AE as shown on FIRM panel 40027C0280H. This SFHA has a mapped floodway. The FEMA mapping in the project area is also shown on Exhibit 2.

PROJECT DESCRIPTION

In May 2015, a large storm washed out an approximately 250-ft section of the articulated concrete block (ACB) channel lining in Imhoff Creek. The banks and channel bottom in this area were significantly scoured. In June 2017, another 150-ft section of ACB channel lining was washed out. The picture below shows part of the damage area.

This repair project will include removing the 250-ft damaged section of ACB lining and replacing it with a concrete lining that matches the pre-damaged trapezoidal dimensions. If funding allows, the 150-ft section will be repaired likewise. The project will also include a concrete drop structure and the excavation of the natural plunge pool at the downstream end of the project. The drop structure will protect the downstream end of the improvements and dissipate stream energy within the plunge pool. Select sheets from the plan set have been attached to this document including plan and profile sheets and cross section sheets. The project layout is also shown over aerial imagery on Exhibit 3.



Damaged Area of the Channel

FLOODPLAIN IMPACTS

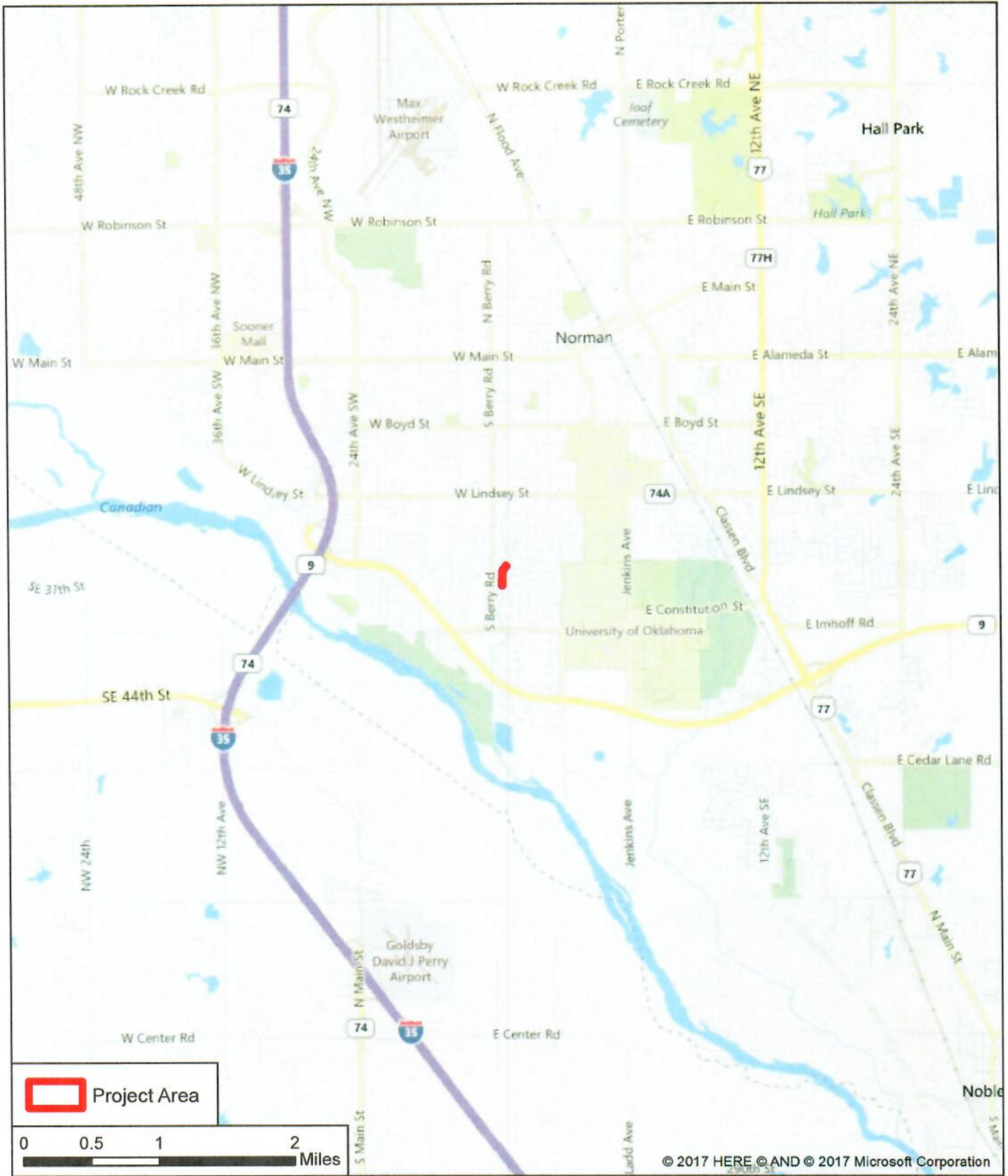
The City of Norman floodplain ordinances and FEMA National Flood Insurance Program standards dictate that a project within the limits of a SFHA with a floodway must demonstrate that no rise in base flood elevations will occur. Because the channel will maintain its existing geometry, the only hydraulic change to the floodplain will be the slight reduction in the roughness of the lining where the ACBs have been replaced by concrete with a smooth finish. The expected impact of this change is minimal and would only serve to decrease flood elevations. Based on this fundamental understanding of hydraulics, the project will cause no rise in water surface elevations. A no-rise certification has been provided at the end of this memorandum to address this requirement of the permit.

In open channel hydraulics, the flow area and flow velocity are inversely related. Therefore, if the reduction in channel roughness leads to a marginal decrease in water surface elevations, it would also marginally increase the velocity. Any increase in velocity will not impact the channel as it will be effectively armored by the concrete lining. The improved channel will flow in a supercritical flow regime and will therefore transition to a subcritical flow regime at the natural portion of the creek downstream. This transition occurs as a hydraulic jump which is turbulent flow that causes a loss of energy. With the proposed downstream drop structure, the hydraulic jump and the loss of energy will occur in the existing plunge pool at the end of the project. This energy dissipation will mitigate downstream velocities for any marginal changes within the upstream channel. Large storm events may flow past the plunge pool. These events are expected to be influenced by backwater caused by the natural downstream floodplain. This backwater will also cause a hydraulic jump in the vicinity of the plunge pool, so the velocities within the project will be mitigated in either case.

Based on these findings it is understood that the proposed project meets the requirements of the City of Norman ordinances as well as the requirements of the FEMA NFIP and is therefore eligible to be permitted by the City. Please contact us with any concerns regarding this project.

This is to certify that I am a duly qualified engineer licensed to practice in the State of Oklahoma. I further certify that the included technical data support the finding that the proposed Imhoff Creek Channel Improvements will not cause a rise in the Base Flood Elevations in the floodway of Imhoff Creek.





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 Project Area



FREASE & NICHOLS
 6303 N. Portland Ave.
 Suite 100
 Oklahoma City, OK 73112
 P: 405-607-7060



Site 17

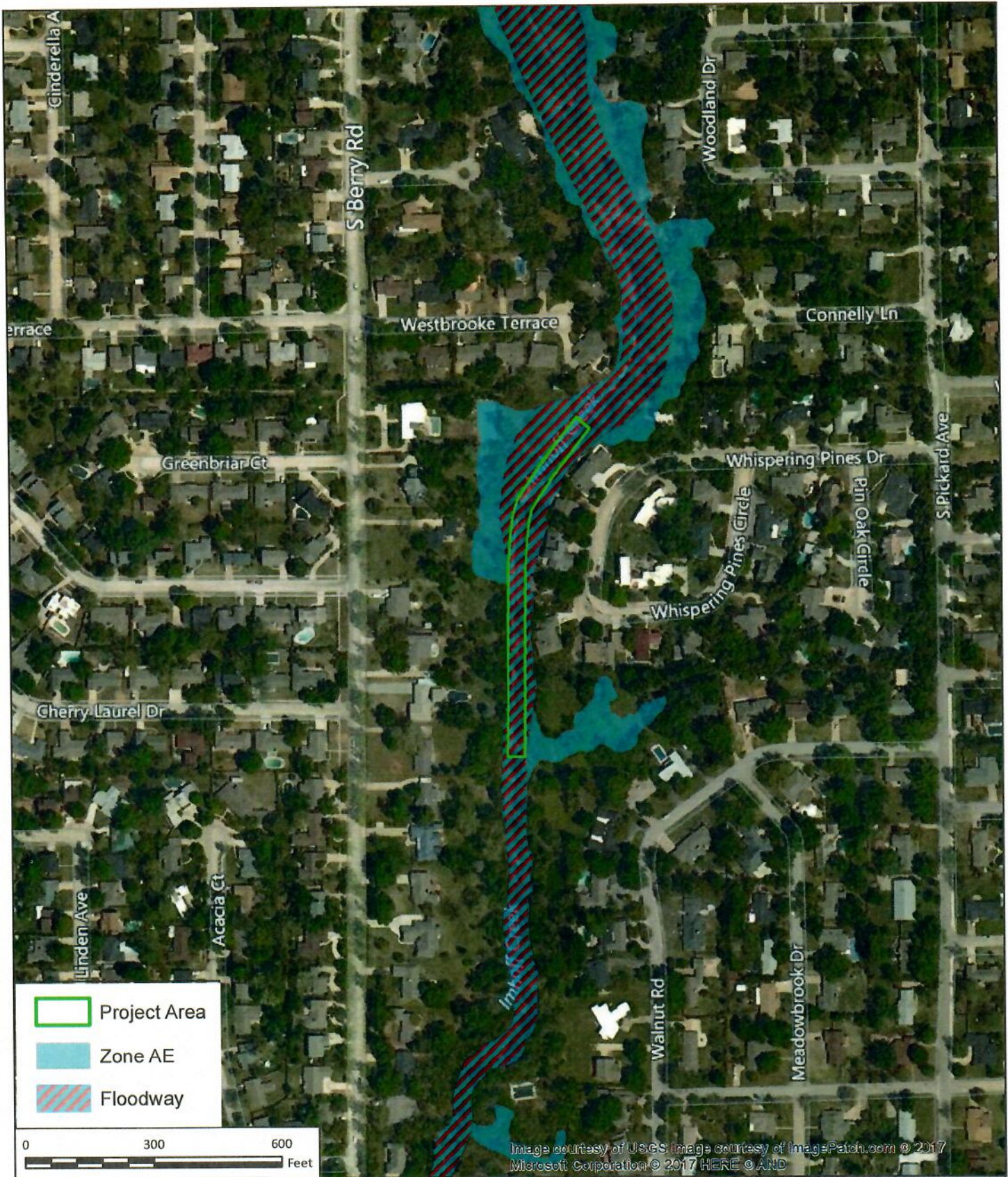
Vicinity Map

FN JOB NO	NRN15595
FILE NAME	Vicinity Map.mxd
DATE	6/27/2017
SCALE	1:60,000
DESIGNED	LCA
DRAFTED	02420

Exhibit
1

Path: T:\7.0 DELIVERABLES\Floodplain Permit\GIS\Vicinity Map.mxd

NAD 1983 StatePlane Oklahoma South FIPS 3502 Feet



**FREASE
BY NICHOLS**
6303 N. Portland Ave.
Suite 100
Oklahoma City, OK 73112
P: 405-607-7060



Site 17

Floodplain Map

FN JOB NO	NRN15595
FILE NAME	FEMA_Map.mxd
DATE	6/27/2017
SCALE	1:3,600
DESIGNED	LCA
DRAFTED	02420

Exhibit
2

Path: T:\7.0 DELIVERABLES\Floodplain Permit\GIS\FEMA_Map.mxd

NAD 1983 StatePlane Oklahoma South FIPS 3502 Feet

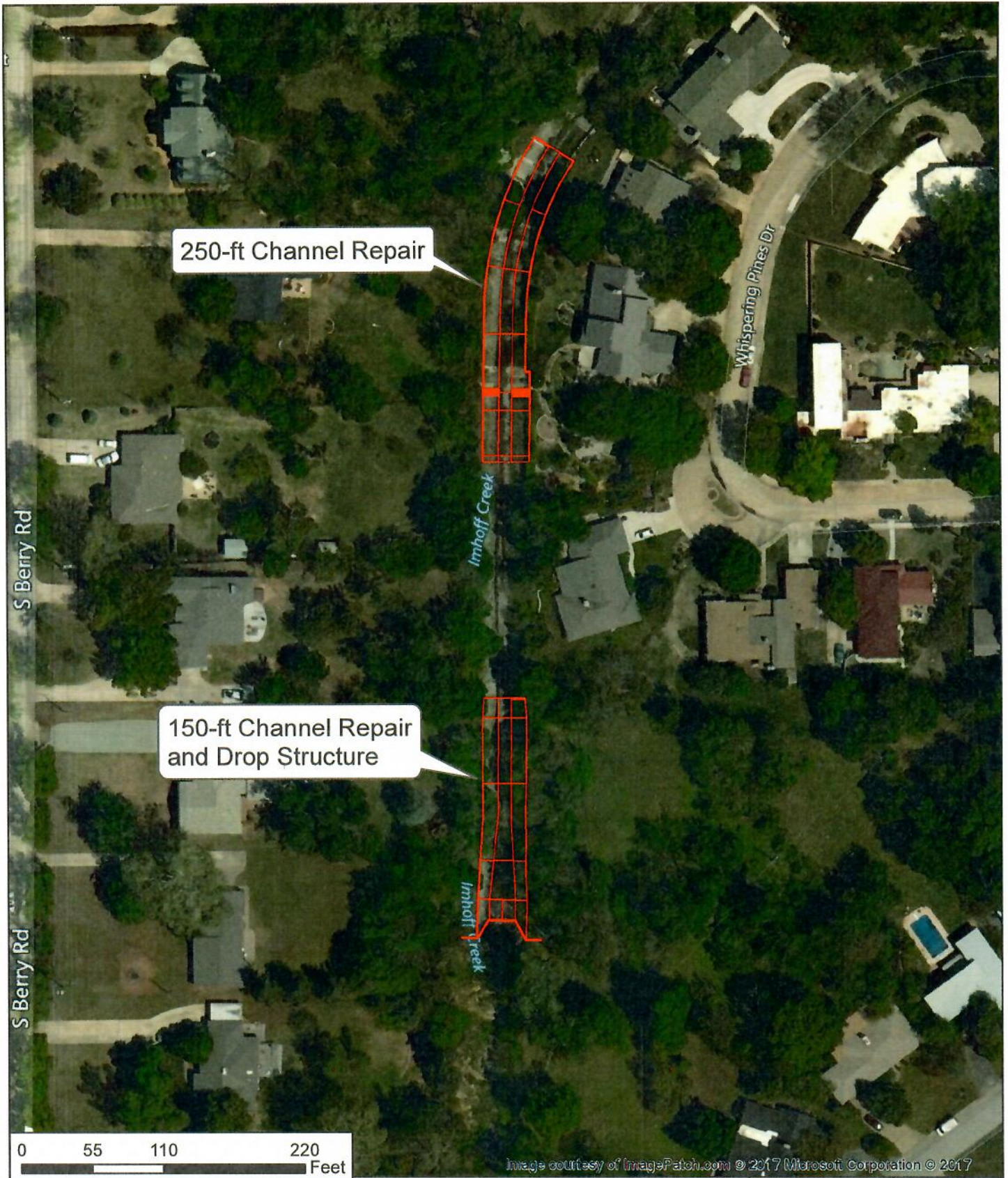


Image courtesy of ImagePatch.com © 2017 Microsoft Corporation © 2017



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Site 17

Project Layout

FN JOB NO	NRN15595
FILE NAME	Project Layout.mxd
DATE	6/27/2017
SCALE	1:1,200
DESIGNED	LCA
DRAFTED	02420

Exhibit
3



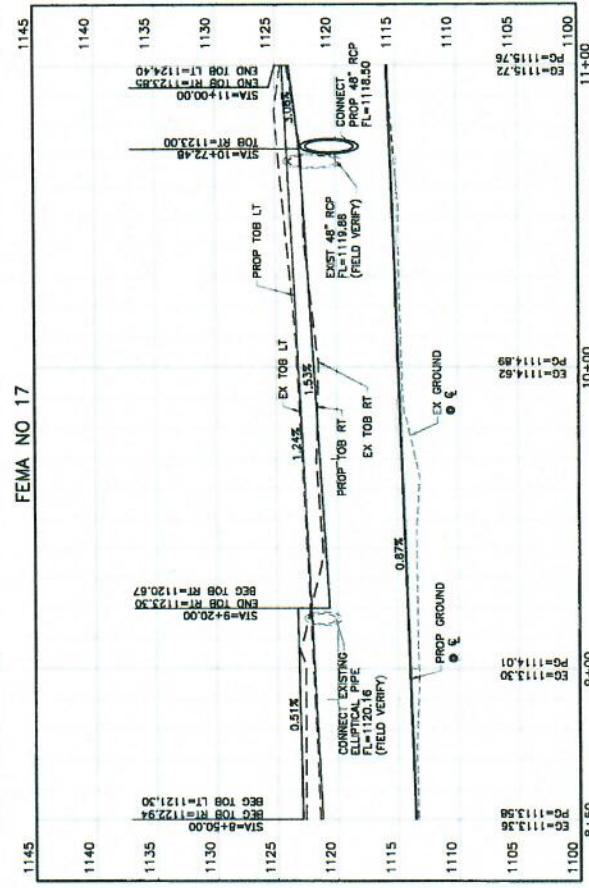
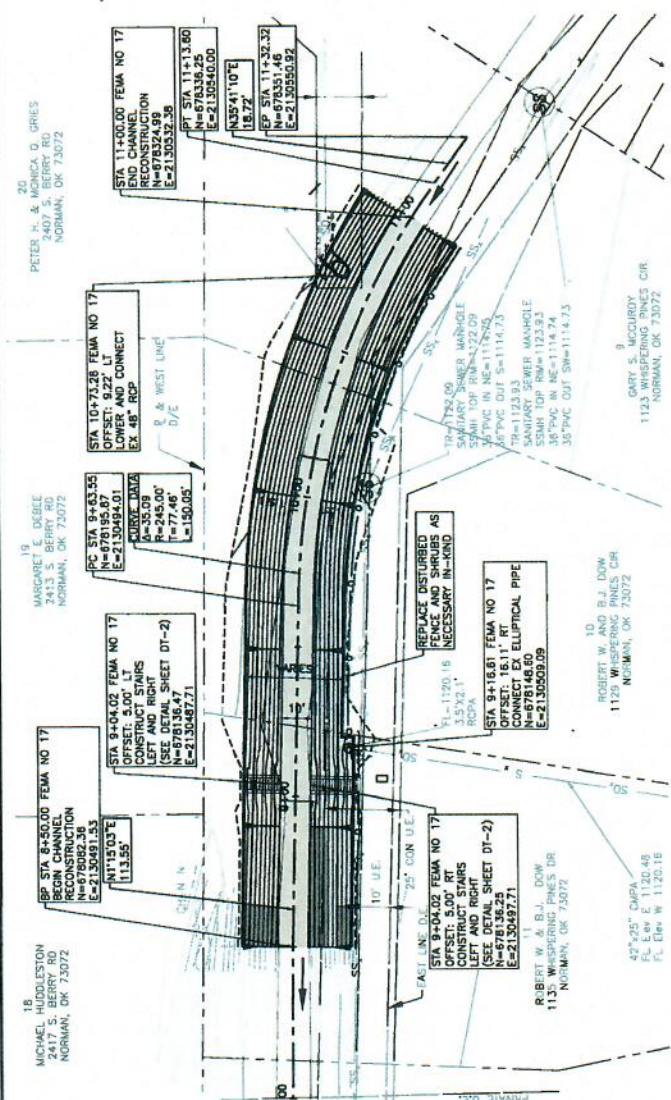
CITY OF NORMAN, OKLAHOMA
 IMHOFF CREEK IMPROVEMENTS
 FEMA SITE 17
 CHANNL PLAN AND PROFILE
 CML

DATE	05/12/17
SCALE	AS SHOWN
PROJECT	C-2
SHEET	7 OF 12

CAUTION!!!
 EXISTING UTILITIES IN AREA
 CONTACT UTILITY 48 HOURS
 PRIOR TO CONSTRUCTION

- GENERAL NOTES:**
1. MATCH DIMENSIONS OF THE EXISTING CHANNEL AT THE LIMITS OF THE RECONSTRUCTION
 2. CONSTRUCT CUT-OFF HEADERS AT THE UPSTREAM END OF THE RECONSTRUCTION
 3. ADJUSTMENTS TO THE CHANNEL DIMENSIONS MAY BE MADE TO AVOID CONFLICTS WITH THE PROPOSED GEOMETRY AND COORDINATE WITH THE ENGINEER.

- LEGEND**
- LIMITS OF GRADING
 - - - EX PROPERTY LINE
 - EX SANITARY SEWER
 - EX STORM DRAIN
 - EX EASEMENT LINE
 - CONCRETE CHANNEL LINER





J. MICHAEL HAMILTON
 ENGINEER
 5302 N. PROSPECT AVENUE, SUITE 100
 NORMAN, OKLAHOMA 73072
 TEL: 405-801-3000
 FAX: 405-801-3008
 WWW: WWW.JMHENGINEERING.COM

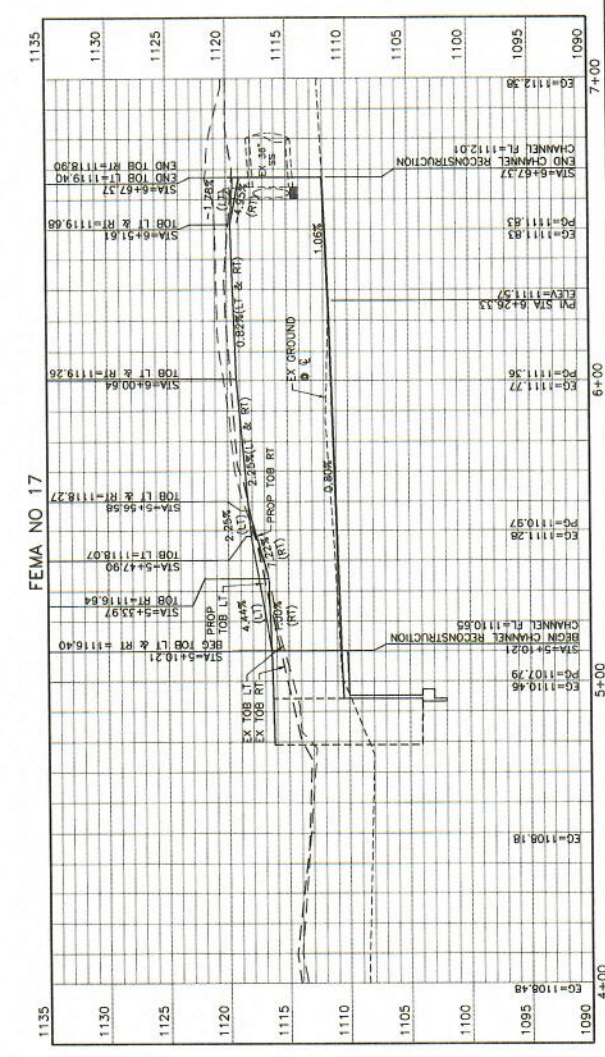
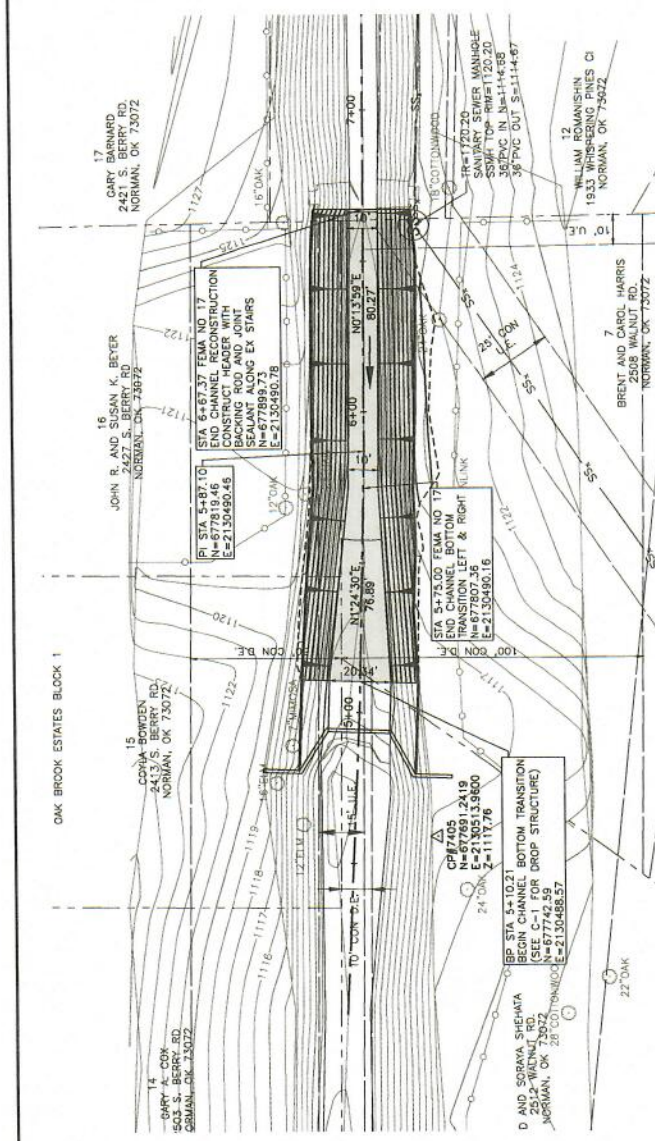
**IMHOFF CREEK IMPROVEMENTS
 FEMA SITE 17
 CHANNEL PLAN AND PROFILE**

NO. IN ISSUE	DATE	BY	CHKD
1	6/22/17	JMH	JMH
2	6/22/17	JMH	JMH
3	6/22/17	JMH	JMH
4	6/22/17	JMH	JMH
5	6/22/17	JMH	JMH
6	6/22/17	JMH	JMH
7	6/22/17	JMH	JMH
8	6/22/17	JMH	JMH
9	6/22/17	JMH	JMH
10	6/22/17	JMH	JMH
11	6/22/17	JMH	JMH
12	6/22/17	JMH	JMH
13	6/22/17	JMH	JMH

CAUTION!!!
 EXISTING UTILITIES IN AREA
 CONTACT UTILITY 48 HOURS
 PRIOR TO CONSTRUCTION

- GENERAL NOTES:**
1. MATCH DIMENSIONS OF THE EXISTING CHANNEL AT THE LIMITS OF THE RECONSTRUCTION
 2. CONSTRUCT CUT-OFF HEADERS AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE PROPOSED CHANNEL. WORK SEE SHEET DT-3.
 3. ADJUSTMENTS TO THE CHANNEL DIMENSIONS MAY BE NECESSARY BASED ON FIELD CONDITIONS. THE CONTRACTOR TO FIELD VERIFY CONFLICTS WITH THE PROPOSED GEOMETRY AND COORDINATE WITH THE ENGINEER.

- LEGEND**
- LIMITS OF GRADING
 - - - EX PROPERTY LINE
 - SS₁ EX SANITARY SEWER
 - SD₁ EX STORM DRAIN
 - EX EASEMENT LINE
 - CONCRETE CHANNEL LINER





FRESH
MICHOLES
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 Oklahoma City, Oklahoma 73112
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 Fax - 405-407-7000
 Web - www.fresh.com

IMHOFF CREEK IMPROVEMENTS
 FEMA SITE 17
 CIVIL
 CHANNEL CROSS SECTIONS
 STA 5+25 TO STA 6+62.12

REV	DATE	BY	DESCRIPTION
1	08/22/17	THH	ADDITIONAL NO. 2
2	08/22/17	THH	REVISED
3	08/22/17	THH	REVISED
4	08/22/17	THH	REVISED
5	08/22/17	THH	REVISED
6	08/22/17	THH	REVISED
7	08/22/17	THH	REVISED
8	08/22/17	THH	REVISED
9	08/22/17	THH	REVISED
10	08/22/17	THH	REVISED

0 20' 40'
 SCALE IN FEET
 HORIZONTAL
 0 4' 8'
 SCALE IN FEET
 VERTICAL

