CITY OF NORMAN, OK
FLOODPLAIN PERMIT COMMITTEE MEETING
Development Center, Room B, 225 N. Webster Ave., Norman, OK 73069
Monday, October 21, 2024 at 3:30 PM

AGENDA

It is the policy of the City of Norman that no person or groups of persons shall on the grounds of race, color, religion, ancestry, national origin, age, place of birth, sex, sexual orientation, gender identity or expression, familial status, marital status, including marriage to a person of the same sex, disability, relation, or genetic information, be excluded from participation in, be denied the benefits of, or otherwise subjected to discrimination in employment activities or in all programs, services, or activities administered by the City, its recipients, sub-recipients, and contractors. In the event of any comments, complaints, modifications, accommodations, alternative formats, and auxiliary aids and services regarding accessibility or inclusion, please contact the ADA Technician at 405-366-5424, Relay Service: 711. To better serve you, five (5) business days' advance notice is preferred.

ROLL CALL

MINUTES

1. Approval of minutes from the September 3, 2024 meeting.

ACTION ITEMS

2. **Floodplain Permit Application No. 702 -** This permit application is for the proposed elevation of a residential structure at 624 Sinclair Dr. in the floodway of a tributary of Bishop Creek.

3. **Floodplain Permit Application No. 703 -** This permit application is for the construction of a patio and replacement of a fence at 3124 Meadow Ave. in the Canadian River floodplain.

4. **Floodplain Permit Application No. 704 -** This permit application is for the construction of a patio and installation of a fence at 3126 Meadow Ave. in the Canadian River floodplain.

5. **Floodplain Permit Application No. 705 -** This permit application is for the proposed elevation of a residential structure and the installation of a fence at 454 W. Tonhawa in the floodway of Imhoff Creek.

6. **Floodplain Permit Application No. 706 -** This permit application is for the proposed installation of a generator for a cellular tower located at 3199 S. Berry Road in the Imhoff Creek floodplain.

MISCELLANEOUS COMMENTS

ADJOURNMENT

CITY OF NORMAN, OK
FLOODPLAIN PERMIT COMMITTEE MEETING

Development Center, Conference Room B, 225 N. Webster Avenue, Norman, OK 73069
Tuesday, September 3, 2024 at 3:30 PM

MINUTES

The Floodplain Permit Committee of the City of Norman, Cleveland County, State of Oklahoma, met in Regular Session in Conference Room B at the Development Center, on the 3rd day of September, 2024, at 3:30 p.m., and notice of the agenda of the meeting was posted at the Norman Municipal Building at 201 West Gray, Development Center at 225 N. Webster and on the City website at least 24 hours prior to the beginning of the meeting.

ROLL CALL

The meeting was called to order by Mr. Sturtz at 3:30 p.m. Roll was called and all members were present. Others in attendance included, Todd McLellan, Capital Projects Manager; Jason Murphy, Stormwater Program Manager; Kim Freeman, Staff; Mary Eva Cook, Resident; Gary Keen, Keen Engineering; Chris Anderson, SMC Consulting; Donnie Broms, Resident; Diana Broms, Resident; Lindsay Flesher, CEC; Brandon Perez, Norman Regional Health.

MINUTES

1. Approval of minutes from the August 19, 2024 meeting

Mr. Sturtz asked for any comments, questions or corrections on the minutes from the meeting of August 19, 2024. Mr. Sturtz asked for a motion from the committee to approve the minutes from the meeting of August 19, 2024. The motion was made by Mr. Scanlon and seconded by Ms. Stansel. The minutes were approved 7-0.

ACTION ITEMS

2. Floodplain Permit No. 699

Mr. Sturtz said the Application for Permit 699 is for the proposed excavation of material from the Little River floodplain for the development of Flint Hills Section 2. Mr. Sturtz asked Mr. Murphy to present the staff report. Mr. Murphy said the Applicant is IH Development and the Engineer is SMC Consulting Engineers, P.C. The applicant is constructing Section 2 of the Flint Hills Addition located approximately at Tecumseh Rd. and 12th Ave. NW. The location of the development is entirely outside of the regulatory floodplain, but they are requesting to excavate approximately 14,880 CY of material from the floodplain adjacent, as shown on the plans in your packets, for fill to use for the development. The plans indicate that the area will be graded with an approximate 5’ wide ditch being left to facilitate drainage from the borrow area towards the Little River to prevent ponding.

Mr. Murphy reviewed plans and aerial maps of the project location provided to members in their packets.

Mr. Murphy confirmed all ordinance requirements have been met and said staff recommends Floodplain Permit Application No. 699 be approved.

Mr. Sturtz asked for any comments from the Applicant. Chris Anderson, SMC Consulting, said no comments, just needed some more dirt.

Mr. Sturtz called for any questions from the committee. Mr. Danner asked what are you allowed as far as grading in the WQPZ. Mr. Murphy said my understanding is you are not allowed to develop there, but as far as grading out for a road, that's actually a good question and not something I considered for the floodplain permit. I know that you can do grading for roads and utility installation, but does that create a problem for excavation for a borrow pit. I'm not sure of that answer. Mr. Sturtz said that is a concern I have but it doesn't really fall to this committee. We need to have further discussions with staff. WQPZ Ordinance does allow for there to be grading done within the WQPZ with the initial work, but the question is what's initial. We need to have further discussions before the work begins, but I don't know that it impacts the floodplain permit directly. Mr. Sturtz called for any other questions or comments.

Mr. Sturtz called for any questions or comments from the public. Hearing none, Mr. Sturtz brought it back to the committee. Mr. Scanlon asked Mr. Danner if he had an opinion. Mr. Danner said on the preliminary plat it stated there would be no grading in the WQPZ as a note. Ms. Hudson asked if this changes the covenants. Mr. Danner said I don't know about the filed covenants. Mr. Scanlon said if this is a legal issue, should we be given counsel on what our legal position might be. Ms. Hudson said the WQPZ is separate from what this request is. I don't know if our motion is the floodplain permit is approved based on negotiations for the work in the WQPZ. Mr. Danner said if you approve the floodplain permit, they are going to have the opinion that they can violate the WQPZ. Ms. Hudson said legal is not here so I can't speak, but my understanding is we have always kept them separate. Mr. Danner said I don't think we have ever had this come up. Ms. Hudson said not necessarily this one. Mr. Scanlon said he would like to table this until we get a legal opinion or approve contingent upon legal approval. Ms. Hudson said she thinks it should be contingent on. Todd McLellan, Capital Projects Manager, said he thinks they would need to turn in a drawing that would have the WQPZ shown and show the limits of where the trees are, to show that they are not getting into any trees. Mr. Sturtz said that's part of the trouble I'm having, we have drawings and aerials but we don't have anything that's put together to get a good feeling of location. I agree the two options are to postpone or to approve contingent on further discussions with staff and legal on WQPZ.

Mr. Scanlon motioned to approve Permit 699 contingent upon approval of the WQPZ by staff. Ms. Hoggatt seconded the motion. The committee voted to approve the application 7-0.

3. Floodplain Permit No. 700

Mr. Sturtz said the Application for Permit 700 is for the proposed medical office building at 2361 36th Ave NW in the Brookhaven Creek floodplain. Mr. Sturtz asked Mr. Murphy to present the staff report. Mr. Murphy said the Applicant is Terri McMahon and the Engineer is CEC/Lindsay Flesher, P.E. The applicant is constructing a medical office building at 2361 36th Ave. NW. The office building and parking lots will be located out of the regulatory floodplain, but reconstruction of storm sewer outlet into Brookhaven Creek will be necessary. As shown in the plans specifically C-402, the existing drive along the creek on the eastern side of the lot will be cut and a 15" HDPE storm sewer line will be installed and integrated into the existing drain outlet. A 15" HDPE end section will be installed and rip rap placed to stabilize the outlet structure and creek bank. There

is an existing concrete culvert that drains from a curb cut at this section as well as rip rap used to stabilize creek bank.

Mr. Murphy reviewed plans and aerial maps of the project location provided to members in their packets.

Mr. Murphy confirmed all ordinance requirements have been met and said staff recommends Floodplain Permit Application No. 700 be approved.

Mr. Sturtz called for any questions from the committee. Mr. Sturtz asked Mr. McLellan if 15" is the minimum allowed or if it was 18". Mr. McLellan said 18". Mr. Sturtz said we need to require 18". Lindsay Flesher, CEC, said it's not a problem. Mr. Sturtz said it's a minor change, just brings it into compliance with the subdivision regulations of the EDC. Mr. Scanlon asked changing from 15 to 18. Mr. Sturtz confirmed. Mr. Sturtz called for any questions or comments.

Mr. Sturtz called for any questions or comments from the public. Hearing none, Mr. Sturtz asked for any comments, questions or a motion from the committee. Mr. Scanlon made a motion to approve Permit 700 with the change from 15" to 18". Mr. Danner seconded the motion. The committee voted to approve the application 7-0.

4. Floodplain Permit No. 701

Mr. Sturtz said the Application for Permit 701 is for 3124 Meadow Ave. in the Canadian River floodplain. Mr. Sturtz asked Mr. Murphy to present the staff report. Mr. Murphy said the Applicant is Holly Hawk and the Engineer is Gary Keen, P.E. The applicant owns a condo that is one of four units in the same structure on the fringe of the Canadian River floodplain. Ms. Hawk replaced the masonry blocks that composed her patio with a pour-cast concrete pad and replaced a wooden fence. This work was completed without a floodplain permit as the applicant wasn't aware that one was needed. There is a FEMA approved LOMA on the structure itself but it does not include the backyard. Staff has reviewed the engineer's report which is provided in your packets, that was provided by the applicant's engineer and staff agrees with the findings based on the evidence Mr. Keen and Ms. Hawk provided. The replacement fence is constructed with wood slats and has approximately an inch of clearance from the ground to bottom of the panels. Based on images provided, the concrete porch slab was poured at grade so no new fill was added as a result of this project.

Mr. Murphy reviewed plans and aerial maps of the project location provided to members in their packets.

Mr. Murphy confirmed all ordinance requirements have been met and said staff recommends Floodplain Permit Application No. 701 be approved, but the fence may require modification. The fence meets ordinance because there is a gap and water can flow, but it isn't exactly there.

Mr. Sturtz called for any questions from the committee. Ms. Hudson asked Mr. Murphy if the fence meets definition. Mr. Murphy said it has to be able to allow flood waters to enter and exit without restriction. If this were something on Imhoff Creek, absolutely no way. In this case, if you are expecting water to rise as more of a ponding and its ability to come in and out of the yard, I don't think it would be restrictive. I agree with Applicants Engineer and his assessment, but the fence isn't modified how we would normally expect it on something that is more volatile. Ms. Hudson asked if there is separation on all sides. Mr. Murphy reviewed photos provided to the committee in their packets on the sides where the separation could be seen. Mr. Murphy

reviewed the plans and said on the south side, immediately adjacent to the golf course, a lot of that is above the BFE. If you look at the east side, you've got about 3-4 inches that the fence is technically below the BFE. A fence is allowed. The idea is that is not going to cause something that's so restrictive that it would cause a rise in the BFE.

Gary Keen, Keen Engineering, said most of the area shown in the photo is above the BFE, so water can't flow in there. On the right side, and beyond the right fence, there are other restrictions to flow. There's another yard, another fence and a sidewalk. Beyond that, is another yard with a lot of other obstructions. My opinion, there will be no flow across that yard, but there is storage volume within that yard. I think the thing that's needed here is for water to be able to flow in and fill that yard to avoid losing storage and then flow back out. There's about an inch under that fence, which I think is adequate to flow in and flow out. The fence on the left, the way the fence is built, it would be easy to cut a little bit off the bottom of the fence. It would be difficult to cut off of the other fences because the rail is lower and it's a double panel fence. This one could be done if you think it's necessary, but I think it's not.

Donnie Broms, resident, said he owns the adjacent property at 3122. Mr. Broms pointed to an area in the photo being shown to the committee, identified as common space up to the patio line. Although, there was a fence when Holly moved in, a small fence with open grate, that was really just to protect from one of the animals the neighbor had bought. We've always had good run off and I've never had a problem in the 12 years that I've lived here with pooling. This unit (3124) has always had a problem with pooling. What's been described here is not entirely accurate. This fence was added and included beds that are lined with metal that prevent what normally was the flow from west to east. This fence also blocks the normal flow, which was out to the parking lot at Trails Golf Course. There was a pipe in between the 2 units, that routes out to the Trails Golf Course parking lot that has been damaged in part of the construction. Part of this is HOA banter. Whether we treated that as common space or not, is a civil matter. The part that I'm really concerned about, and what I want this committee to understand, is that since she has put up the fence, it has caused pooling in my backyard that I've never experienced before. The manhole is sump pump that Ms. Cook put in years ago when she was the owner of 3124. Pooling used to exist over behind 3124 and she has now regraded that up a little bit in my opinion. I'm not an engineer, but she extended the patio, regraded the entire lawn, put sod in, raised her lawn and now I got the pooling issue. The fence does not allow proper drainage. The old fence was a picket fence. The fence and flower bed fixture, which basically creates a barrier to any water that could go across this yard like it used to, has created a problem for me at 3122. Ms. Stansel asked if it was her property line. Mr. Broms said the way the covenants and restrictions are written, that she agreed to when she purchased the house, says that this area is all common space. Mr. Scanlon said one thing is an HOA concern, how they did it, is ours. Mr. Broms said he's not trying to exacerbate the two, one is civil matter and one is floodplain matter. Mr. Scanlon said we can't get involved in the common area, but we can if there are impediments to flow. Mr. Broms said that's the main concern. Even though she says there's an inch underneath here, that's closed up now. There's only one area with a manhole that is used to fish out the pipe that went out to the parking lot. We left that there and she built the fence just high enough over it so we could pull that manhole cover off and fish that pipe out. I had a plumber out and to fish that out and it's blocked. So we're having to come up with another solution. Mr. Scanlon said the application reads, there is about a one inch gap under most areas. That's pretty flaky wording as far as I'm concerned. Mr. Scanlon asked Mr. Keen about the potential remedy for the fence. Mr. Keen said the remedy would be to cut off the bottom of the boards. The owner is concerned that if too much is removed, her dogs might get out. I don't think we need very much, probably just 2 or 3 inches would be adequate. Mr. Sturtz said we still have a landscape border that's going to stop that

from being fully effective. My big concern is, we have no idea what the ground elevation was prior, and I can't tell you if there's been fill added or not. Mr. Keen said he spent a lot of time looking at this and fortunately I was able to get these before photographs from the owner. Mr. Sturtz said you can't tell from a photo if that's 4 or 5 inches higher. Mr. Keen said I looked at the brick lines on the wall. I was able to enlarge them and get a real good view. By counting the brick lines, I could tell you the new slab is the same elevation. I also used the manhole cover as a reference point. I believe they took out a bunch of trees. Mr. Broms said the area was a flower bed that we maintained as a common unit by the HOA. The whole area is mound and there's a manhole cover that we surrounded with crepe myrtles. She wanted to take over that flower bed which wasn't a concern unless she actually changed the grade of the flower bed. She took all that out, I don't know if that affects the grade.

Mr. Scanlon asked if the main concern is the flow from west to the east. Mr. Broms said what would happen in the past, in a torrential rain, water would flow and pool at 3124 and flood the home. So a sump pump was installed and that helped to drain all of that water out in torrential rains.

Mr. Sturtz said the issues as far as floodplain goes are, one is the fence proper and, two is there fill added in the floodplain.

Mr. Keen said there was another reference he used to figure this out, the brick around the manhole cover have been there a long time. Mr. Broms said no, they were not around the manhole cover.

Mary Eva Cook, resident, said I lived there in 7, 8 and 9. When I lived there my downstairs vents were full of water. I spent thousands of dollars to coat the pipes, then I put a sump pump in there and there were no bricks. I never had a water problem. The engineer can say what he wants, but I know I spent thousands of dollars to get that fixed. Mr. Keen said the floor of that house is six tenths of a foot above the hundred year floodplain. If they have vents in the floor, that would be below the floodplain and that's a miserable situation to be in.

Mr. Sturtz asked for any comments, questions or a motion from the committee. Ms. Hoggatt asked if that is plated open space, can they split it up like that. Mr. Danner said they're not splitting it off, it's how they're using it. Mr. Murphy said there is an open Notice Of Violation on this. It is pending a floodplain permit. Ms. Hudson said the other part of it is, there's a lot of steps here, but any paving requires a permit and there's no permit for the paving that was done here on this property. That would be another issue as far as Permitting and Development Services is concerned. Mr. Sturtz said that probably would have gotten us to the point of floodplain permit.

Ms. Hoggatt said if they come back and do breakaway panels, because to me this is not meeting what the code requires, can they still have the edging on the flower beds. Mr. Sturtz said the only thing to me, is that's fill and this area is so flat. Outside of that, it becomes an issue of 2 private property owners having the common enemy of water. For me, has there been fill, is this higher now, that is creating now a rise in the BFE on the adjacent property. For me as an engineer, I don't have anything here that I can say that it is not exceeding .05 foot rise on their property because of what they have impacted on this property. Mr. Keen said the floodplain there is more than a mile wide. Mr. Sturtz said that's irrelevant if you're causing a rise in the BFE on their property because it can't flow. I have no way of knowing what was there before, what has occurred to say that there hasn't been an increase, there hasn't been fill added and this fence definitely doesn't meet requirements. Mr. Danner said correct there's 2

things, how do you prove the previous elevation and current elevation. Mr. Keen said I made my very best effort to make a determination about that. Mr. Sturtz said there's no way from photos and eyeballing. Mr. Broms said what if we had previous elevation surveys and had a current survey done. Mr. Sturtz said that may help.

Ms. Hudson said I have 2 options, one we deny this application or two we table it until they come back with fencing that meets the code and additional elevation certificates that can determine what was there and what's there now. I'm not the engineer in the room, but I can clearly look at this tree bed and see the changes in elevation and the fence does not meet the code and that's not something I can approve. Mr. Scanlon and Ms. Stansel agreed. Mr. Danner said I think the motion is to postpone pending additional information, including the required fencing in the floodplain. Ms. Hoggatt asked if the Applicant was willing to postpone or do they want a vote today. Mr. Danner said a vote today will get a denial. Diana Broms, resident, asked what additional information is needed to postpone. Mr. Danner said we have required designs for fencing that they need to meet. As far as the other elevations, that's going to have be previous surveys. Mr. Keen said there's going to be question about the precision or accuracy of those surveys, I think. Mr. Danner said I understand but I think it's obvious if they brought in sod, they increased the elevation. Mr. Keen said I wish the owner was here because she told me they actually hauled out soil instead of bringing soil, but I wasn't there. Mr. Sturtz said I don't think a breakaway fence would be appropriate in this situation, but if we had more spacing to allow water to flow. Mr. Keen said we're willing to cut the bottom of the fence off and rip out the border, would that satisfy. Ms. Broms said no. I feel the opportunity for us to review the proper planning was taken away from us. Mr. Broms said the bottom of the fence still doesn't account for the increase in the level and any change that was made putting this patio in. Mr. Scanlon said if we find the original surveys and compare against what we have now, we can make that determination. At a minimum the fence is out of line, the fence is going to have to be fixed.

Ms. Hudson said I would move, because there's so much outstanding information, the property owner has to gather the information as far as prior evaluation certificates on the property, that needs to be their responsibility. I say we reject this application. They need to start over. They need to find the elevations and they need to make those determinations instead of us trying to figure that out. They need to come back with appropriate fence design.

Ms. Hudson made a motion to deny Permit 701. Mr. Scanlon seconded the motion. Mr. Miles asked if we wanted to postpone. Mr. Sturtz said personal opinion, postpone is hard for me on this one. Mr. Sturtz asked for any other comments from the committee. The committee voted to deny the application 7-0.

MISCELLANEOUS COMMENTS

Mr. Sturtz asked for any miscellaneous comments. Mr. Murphy said there are no applications for the next meeting.

Mr. Scanlon asked what do we do about the fence farther to the east. It's obviously blocking water flow. I wonder how it got there. There's too much we didn't know going on. Mr. Murphy said we do a mail out every year for any property in the floodplain. Mr. Sturtz asked if the letter says anything you do in the floodplain requires a permit from the City of Norman. Mr. Murphy said yes. Mr. McLellan said it even mentions fences. Mr. Scanlon said it just comes up so often that if we tell people what the consequences are and have been enforced, that this can cost you money. I think we should strengthen the letter.

Ms. Hoggatt notified the committee that she and Ms. Hudson would be unable to attend th October 7th meeting.

ADJOURNMENT

Mr. Sturtz adjourned the meeting at 4:39 p.m.

Passed and approved this _____ day of _____, 2024

_____
City of Norman Floodplain Administrator, Scott Sturtz

STAFF REPORT 10/21/2024 **PERMIT NO. 702**

ITEM: Floodplain Permit application for proposed elevation of a residential structure in the floodway of a tributary to Bishop Creek.

BACKGROUND:
APPLICANT: Jobin Cherian
ENGINEER: Urban James Engineering, Uwem Ekpenyong P.E.

624 Sinclair Ave. is located in the floodway in the upper reaches of a tributary to Bishop Creek. It is a two story duplex constructed in 1977. The property was purchased in March of 2023 by Resilient Visionary Investments at which time they were informed that floodplain permits would be required to proceed with renovations of the structure. The previous owner had began renovations without obtaining permits. The interior of the structure had been stripped down to studs and windows, siding and possibly roofing had already been replaced. It was determined at that time that this would constitute a substantial improvement and the structure would have to come into full compliance with the Flood Hazard Ordinance before a permit could be issued. Cost of renovations were estimated to be $80 thousand dollars and the County Assessor value of the structure was estimated at approximately $70 thousand dollars.

Detailed engineering plans are included in the packet submitted with the application. The BFE for this location is 1164.0'. According the applicant's engineer, the existing slab elevation is 1163.52'. The proposed plan would leave the slab at existing elevation and elevate the structure so that the lowest finished floor elevation would be 1167.19' and be mounted on concrete piers. This would amount to elevating the residence approximately 3.7' and place the first finished floor elevation at 3.19' above the BFE. In the engineer's statement, it is indicated that this would allow for the structure to meet the ordinance requirements and leave room for structural, electrical and mechanical underfloor elements to be installed more than 2 feet about the BFE as well. The applicant has also indicated that if it is decided to enclose the foundation space, that 1227 square inches of flood venting will be installed no higher than 1 foot above grade with a minimum of two openings on each side of the structure.

STAFF ANALYSIS:
Site located in Little River Basin or Tributaries? yes__ no✓

According to the latest DFIRM, this project is located in the floodway of a tributary of Bishop Creek (Zone AE).

Applicable Ordinance Sections:		Subject Area:
36-533	(e)(2)(a) ..…..……..	Fill restrictions in the floodplain
	(e)(2)(e) ...……	Compensatory storage
	(e)(2)(j) ...…….	Utilities constructed to minimize flood damage
	(e)3(a) ……..…..……	Elevation of Structures
	(f)(3)(8) …….....	No rise considerations

(e)(2)(a) and (e)(2)(e) Fill Restrictions in the Floodplain and Compensatory Storage – The use of fill is restricted in the floodplain unless compensatory storage is provided.

The plans indicate the existing structure will be elevated off of the existing slab by approximately 3.7'. The calculated volume that the structure occupies in the floodplain pre and post elevation is calculated at 1472 cu. ft. indicating zero fill.

(e)2(j) - All new construction or substantial improvements shall be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

The applicant has indicated all electrical and mechanical underfloor elements will be installed at least 2.0' above the BFE.

(e)3(a) Elevation of Structures – Residential structures shall be constructed on fill including any attendant utility and sanitary facilities, shall be designed so that the lowest floor (including basement) is elevated at least two feet above base flood elevation and the fill shall be at a level no lower than 1 foot above the base flood elevation for the particular area and shall extend at such elevation at least (15) fifteen feet beyond the limits of any structure or building erected thereon.

The project engineer has indicated that the existing structure will be elevated and placed on piers so that the lowest finished floor elevation is 3.19' above the BFE. It was indicated that all structural, electrical, and mechanical underfloor elements to be installed at least 2.0' above the BFE.

(f)(3)(8) No Rise Considerations – For proposed development within any flood hazard area (except for those designated as regulatory floodways), certification that a rise of no more than 0.05 ft. will occur in the BFE on any adjacent property as a result of the proposed work is required.

The project engineer has indicated in their No-Rise statement that this activity will cause no rise on any adjacent property.

RECOMMENDATION: Staff recommends Floodplain Permit Application #702 be approved with the following condition:

1. Elevation Certificate provided for the residential structure prior to final acceptance. Elevation of electrical and mechanical components should also be provided and verified by staff. Staff will also confirm that flood venting meets requirements of the ordinance.

ACTION TAKEN: _____

City of Norman

Floodplain Permit Application

Floodplain Permit No. 702

Building Permit No. _____

Date ~~09-26-2024~~ 10/21/2024

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: Jobin Cherian ADDRESS: 7809 Sunset Blvd Rowelett, Texas 75088

TELEPHONE: 214-673-8160 SIGNATURE: _____

BUILDER: Edward Harill ADDRESS: _____

TELEPHONE: 405-600-4335 SIGNATURE: _____

ENGINEER: Uwem Ekpenyong ADDRESS: _____

TELEPHONE: 405-243-0672 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.

624 Sinclair Dr. Norman, OK 73072

DESCRIPTION OF WORK (Check all applicable boxes):

A. STRUCTURAL DEVELOPMENT

ACTIVITY	STRUCTURE TYPE
☐ New Structure	☑ Residential (1-4 Family)
☐ Addition	☐ Residential (More than 4 Family)
☑ Alteration	☐ Non-Residential (Flood proofing? ☐ Yes)
☐ Relocation	☐ Combined Use (Residential & Commercial)
☐ Demolition	☐ Manufactured (Mobile) Home
☐ Replacement	☐ In Manufactured Home Park? ☐ Yes

ESTIMATED COST OF PROJECT $ 80,000 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.

Please see attached Proposal

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:

_____

_____

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:

_____

_____

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:

_____

_____

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

☑ Not Applicable:

_____

_____

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

☐ Not Applicable:

_____

_____

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:

_____

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.

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.: 0285H, 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 1164.0' Ft. NGVD (MSL) ☐ Unavailable

See Section 4 for additional instructions.

SIGNED: _____ **DATE:** 10/9/2024

SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by Permit Staff.)

The applicant must also submit the documents checked below before the application can be processed.

☐ Flood proofing protection level (non-residential only) _____ Ft. NGVD (MSL). For flood proofed structures applicant must attach certification from registered engineer.

☐ Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.

☐ Certification from a registered engineer that the proposed activity in a regulatory flood plain will result in an increase of no more than 0.05 feet in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.

☐ All other applicable federal, state, and local permits have been obtained.

Other: _____

_____

_____

SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Chairman.)

The proposed activity: **(A)** ☐ **Is**; **(B)** ☐ **Is Not** in conformance with provisions of Norman's City Code Chapter 22, Section 429.1. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED: _____ DATE: _____

If **BOX A** is checked, the Floodplain committee chairman may issue a Floodplain Permit.

If **BOX B** is checked, the Floodplain committee chairman will provide a written summary of deficiencies. Applicant may revise and resubmit an application to the Floodplain committee or may request a hearing from the Board of Adjustment.

APPEALS: Appealed to Board of Adjustment: ☐ Yes ☐ No

Hearing date: _____

Board of Adjustment Decision - Approved: ☐ Yes ☐ No

Conditions:

_____

_____

_____

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.

Tuesday, October 1, 2024

Jobin Cherian
Resilient Visionary Investments, LLC
7908 Sunset Blvd
Rowlett, TX 75088

Subject: **Structural Evaluation and Recommendation**
624-626 Sinclair Drive
Norman, OK, 73072

Mr. Jobin Cherian,

This statement is presented as part of a floodplain permit application to the City of Norman for the construction of duplexes located at 624-626 Sinclair Dr. in Norman. According to the elevation certificate provided by Golden Land Surveying, PLLC, the current first floor elevation is 1,163.52 ft. (Datum). According to the Elevation Certificate, the Base Flood Elevation is 1164 ft. After visiting and reviewing the site and the topography of the area, I observed that the grading of the site is sloped to the culvert that is adjacent to the east and north of the site. Water movement to or from the culvert/waterway is not obstructed.

To conform to FEMA requirements. The you are proposing to elevate the structure to raise the 1st floor to an elevation above the BFE. Pursuant to that I have designed and details the necessary structure to support the home on pilasters. The designed drawings may be submitted with the application for a Floodplain construction permit. It is this engineer's opinion that this project will result in a floor elevation 3'-0" or more above the flood BFE. This should give ample room for structural, electrical, and mechanical underfloor elements to be installed 2'-0" higher than the BFE. Additionally, the proposed construction will return 1419 cubic feet of flood volume back the flood zone.

Closing:

Thank you again for the opportunity to provide a structural evaluation and report. Photos taken during my site observations are available on request. If you have any questions or if I may be of any more assistance, please let me know.

Kind regards,

Uwem J. Ekpenyong P.E.
Urban James Engineering

DESIGN CRITERIA

1. GOVERNING BUILDING CODES (INCLUDES STATE AND LOCAL AMENDMENTS)
   - A. 2018 INTERNATIONAL BUILDING CODE
   - B. 2018 INTERNATIONAL EXISTING BUILDING CODE
   - C. 2018 INTERNATIONAL RESIDENTIAL CODE

2. WIND DESIGN CRITERIA

A. ULTIMATE WIND SPEED (V_{ult})	115 MPH
B. NOMINAL DESIGN WIND SPEED (V_{asd})	89 MPH
C. EXPOSURE CATEGORY	B
D. INTERNAL PRESSURE COEFFICIENT	+/- 0.18

3. SEISMIC DESIGN CATEGORY

A. RISK CATEGORY	II
B. SEISMIC IMPORTANCE FACTOR (I_e)	1.0
C. SITE CLASS	D
D. SEISMIC DESIGN CATEGORY	C

4. DEAD LOADS

A. ROOF	6 PSF
B. CEILINGS	6 PSF
C. FLOOR	6 PSF

5. LIVE LOADS

A. ROOF	20 PSF
B. CORRIDORS	100 PSF
C. STAIRS	100 PSF
D. LIVING AREAS	40 PSF
E. BEDROOMS	30 PSF

6. SNOW LOADS

A. GROUND SNOW LOAD (P_g)	10 PSF
B. FLAT ROOF SNOW LOAD (P_f)	10 PSF
C. SLOPED ROOF SNOW LOAD (P_s)	8 PSF
D. SNOW IMPORTANCE FACTOR (I_s)	1.0
E. SNOW EXPOSURE FACTOR (C_e)	1.0
F. SNOW THERMAL FACTOR (C_t)	1.0

7. ASSUMED FOUNDATION DESIGN CRITERIA

A. NET ALLOWABLE SOIL BEARING FOR SPREAD FOOTINGS	1500 PSF
B. NET ALLOWABLE SOIL BEARING FOR CONT FOOTINGS	1500 PSF
C. CODE MINIMUM BEARING DEPTH	30 INCHES

FLOOD ZONE CRITERIA

1. BASE FLOOD ELEVATION CRITERIA

A. BASE FLOOD ELEVATION (BFE):	1164.00 FEET
B. LOWEST GRADE LEVEL:	1162.08 FEET
C. VERTICAL DISTANCE IMPACTED BELOW BFE: (FROM LOWEST GRADE TO BFE)	1.2 FEET

2. PREVIOUS CONSTRUCTION

A. AREA IN FLOOD ZONE:	1227.00 SQ. FT.
B. VOLUME BELOW BFE:	1472.00 CU. FT.

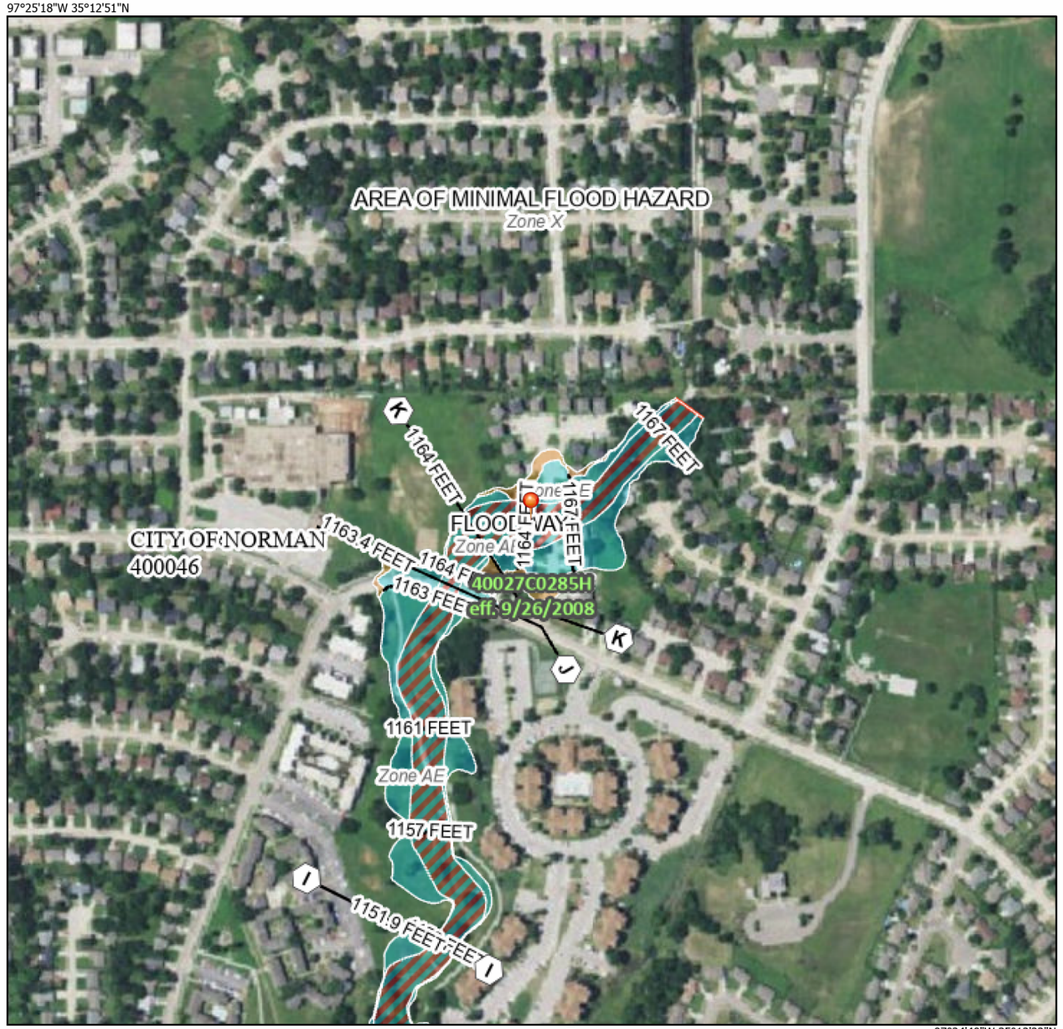
3. PROPOSED ELEVATED CONSTRUCTION:

A. AREA IN FLOOD ZONE:	
a. NOT ENCLOSED:	44.42 SQ. FT.
b. ENCLOSED:	1227.00 SQ. FT
B. VOLUME BELOW BFE:	
a. NOT ENCLOSED:	53.31 CU. FT.
b. ENCLOSED:	1472.00 CU. FT.
C. FLOOD VENTING REQUIREMENTS:	
a. NOT ENCLOSED:	NOT APPLICABLE
b. ENCLOSED:	1227.00 SQ. IN

National Flood Hazard Layer FIRMette

FEMA

97°25'18"W 35°12'51"N



Feet
0 250 500 1,000 1,500 2,000
1:6,000
97°24'40"W 35°12'22"N

Basemap Imagery Source: USGS National Map 2023

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, Areas 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 D*
- OTHER AREAS
  - NO SCREEN Area of Minimal Flood Hazard *Zone X*
  - Effective LOMRs
  - Area of Undetermined Flood Hazard *Zone D*
- GENERAL STRUCTURES
  - Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
- OTHER FEATURES
  - 20.2 Cross Sections with 1% Annual Chance
  - 17.5 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

N

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 10/1/2024 at 1:26 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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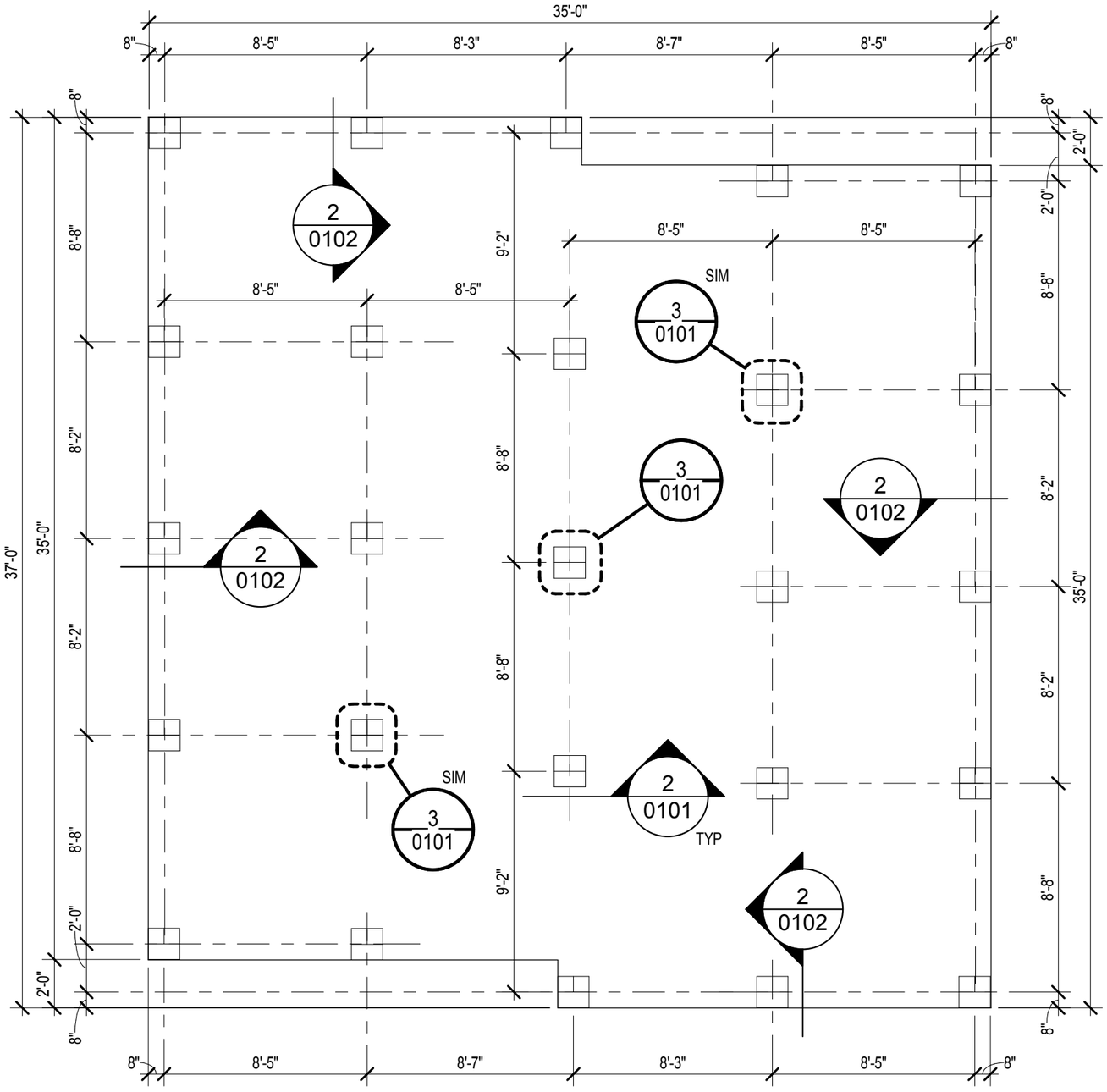
REGISTERED PROFESSIONAL ENGINEER
UWEM JACKSON EKPENYONG
20920
OKLAHOMA
10/04/2024

urbanjames

PROJECT: 624-626 SINCLAIR DRIVE
624-626 SINCLAIR DR
NORMAN, OK 73072

CLIENT: RESILIENT VISIONARY INVESTMENTS, LLC

0001
EVALUATION AND DESIGN CRITERIA

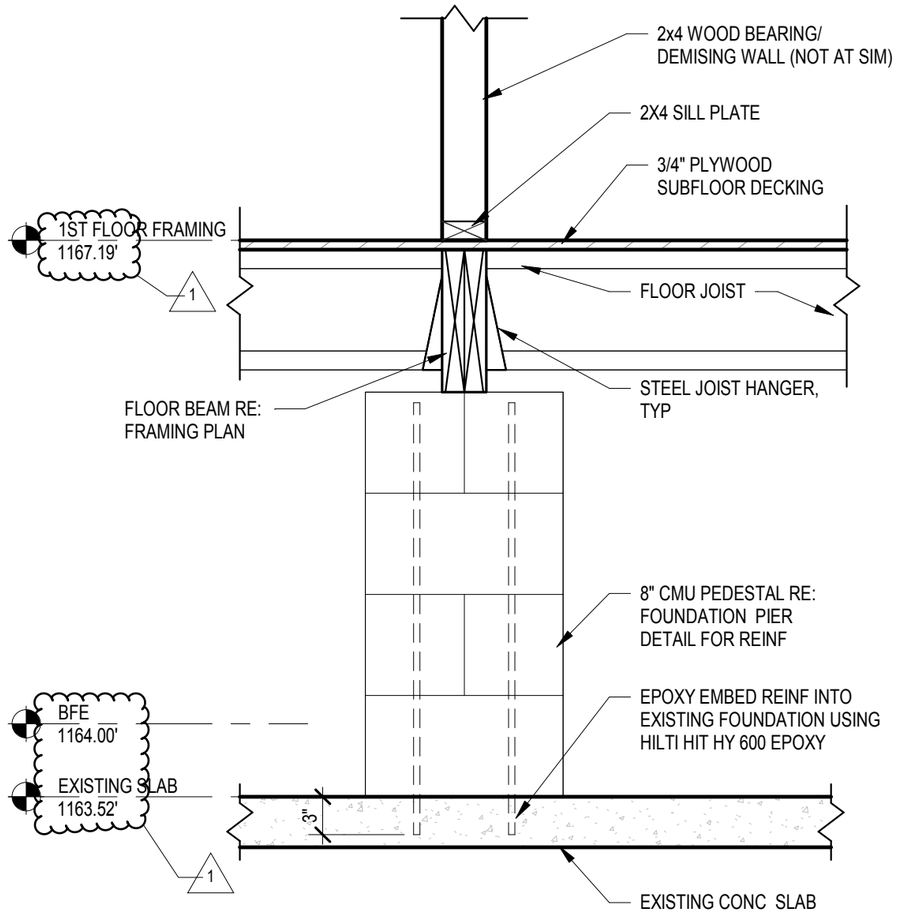


1 FOUNDATION PLAN

SCALE: 3/16" = 1'-0"

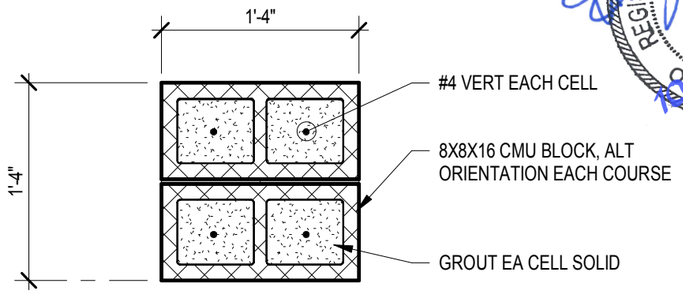
FLOOR RELIEF OPENINGS FOR OPTIONAL FOUNDATION ENCLOSURE:

- PROVIDE A TOTAL OF 1227 SQ. IN. OF FLOOD RELIEF OPENINGS ON FOUR SIDES OF THE HOME.
- FLOOR RELIEF OPENINGS CANNOT BE PLACE HIGHER THAN 1'-0" ABOVE ADJACENT GRADE
- PROVIDE A MINIMUM OF 2 OPENINGS PER SIDE OF THE STRUCTURE



2 PEDESTAL ELEVATION

SCALE: 1" = 1'-0"



3 CMU FOUNDATION PIER

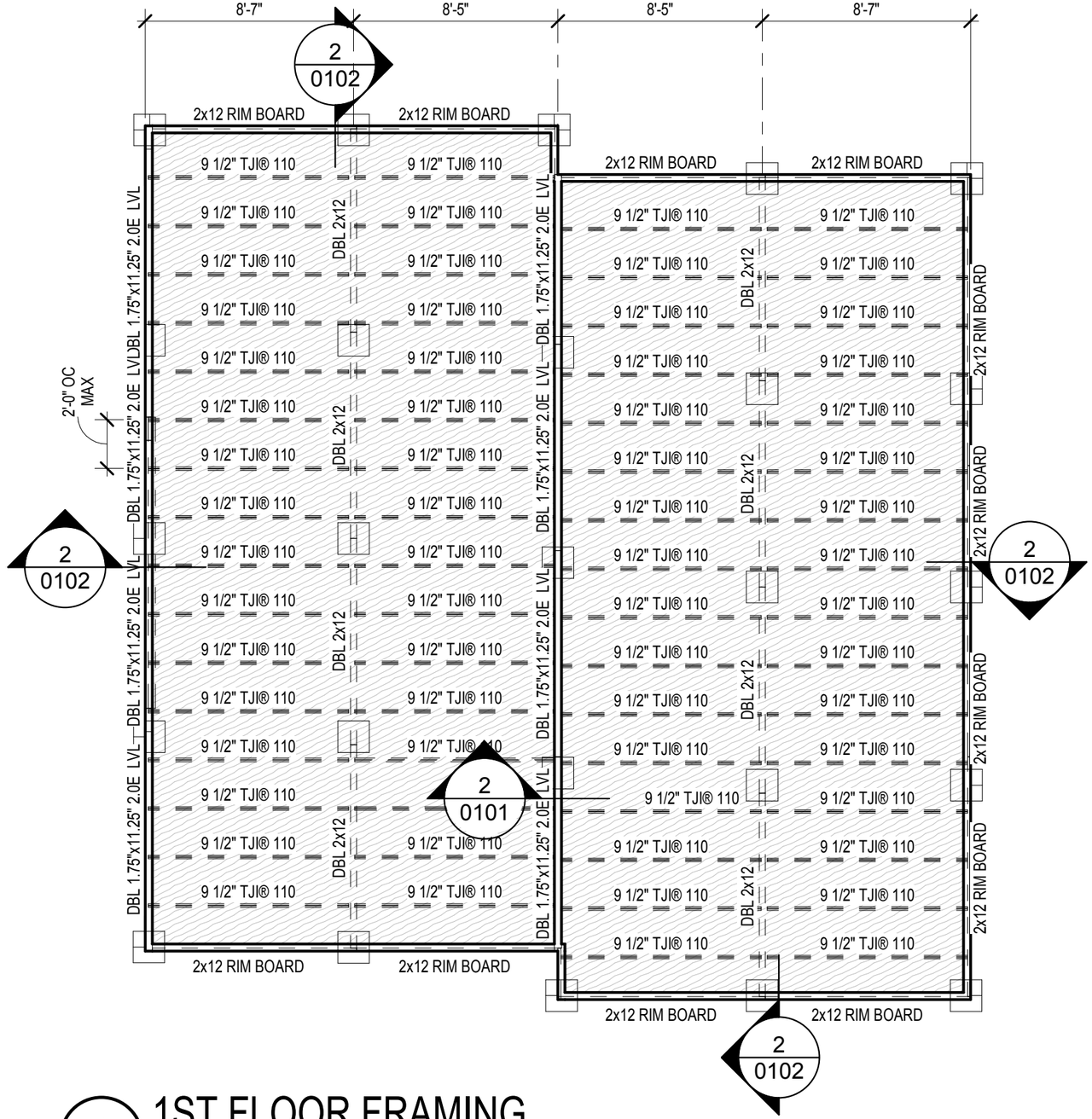
SCALE: 1" = 1'-0"

urbanjames

PROJECT: 624-626 SINCLAIR DRIVE
624-626 SINCLAIR DR
NORMAN, OK 73072

CLIENT: RESILIENT VISIONARY INVESTMENTS, LLC

0101
GROUND FLOOR PLAN

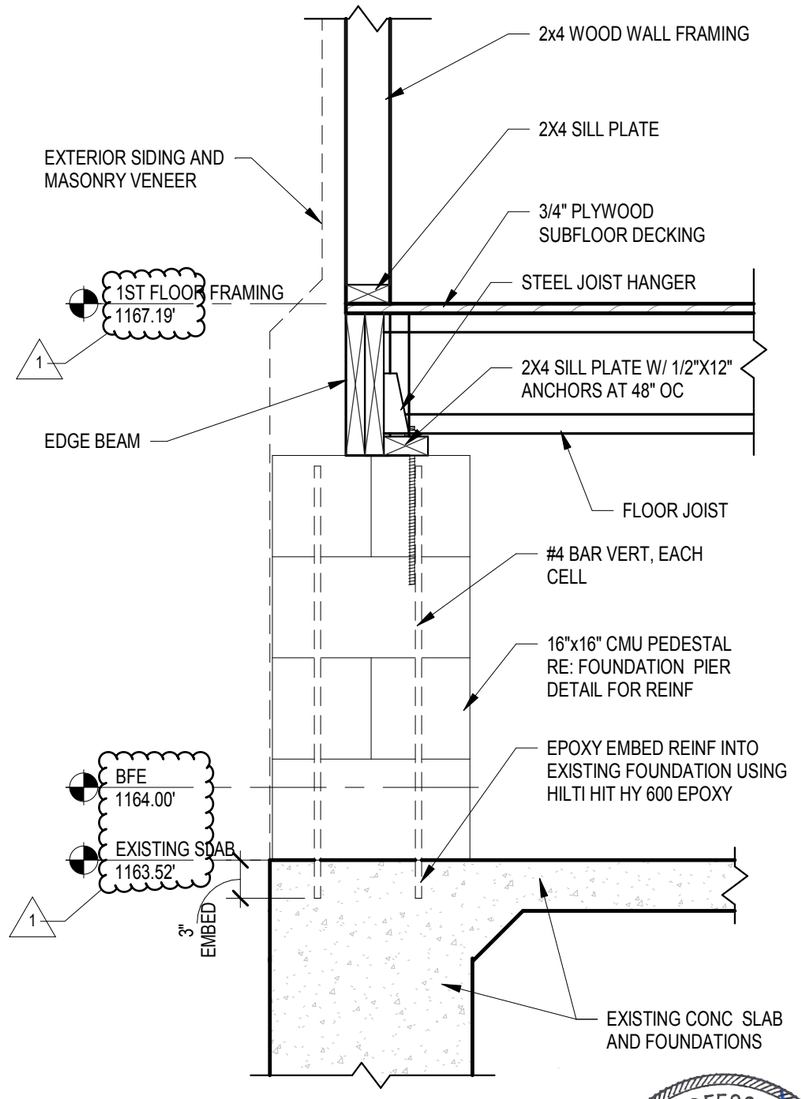


1 1ST FLOOR FRAMING

SCALE: 3/16" = 1'-0"

FLOOR RELIEF OPENINGS FOR OPTIONAL FOUNDATION ENCLOSURE:

- PROVIDE A TOTAL OF 1227 SQ. IN. OF FLOOD RELIEF OPENINGS ON FOUR SIDES OF THE HOME.
- FLOOR RELIEF OPENINGS CANNOT BE PLACE HIGHER THAN 1'-0" ABOVE ADJACENT GRADE
- PROVIDE A MINIMUM OF 2 OPENINGS PER SIDE OF THE STRUCTURE



2 WALL SECTION

SCALE: 1" = 1'-0"

urbanjames

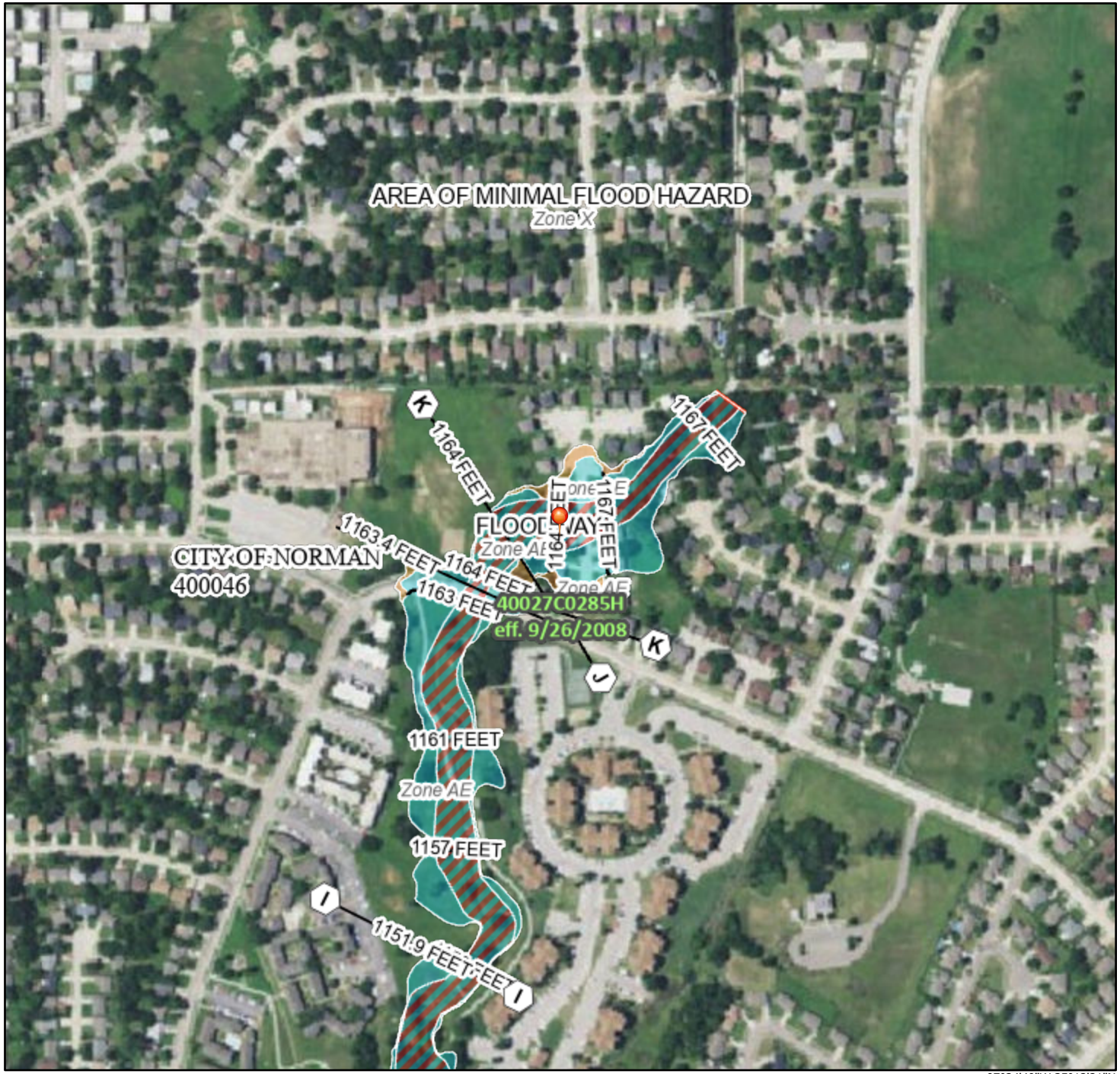
PROJECT: 624-626 SINCLAIR DRIVE
624-626 SINCLAIR DR
NORMAN, OK 73072

CLIENT: RESILIENT VISIONARY INVESTMENTS, LLC

0102
FLOOR FRAMING PLAN

National Flood Hazard Layer FIRMette

97°25'18"W 35°12'51"N



97°24'40"W 35°12'21"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR F UT

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, Areas 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 D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 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

N

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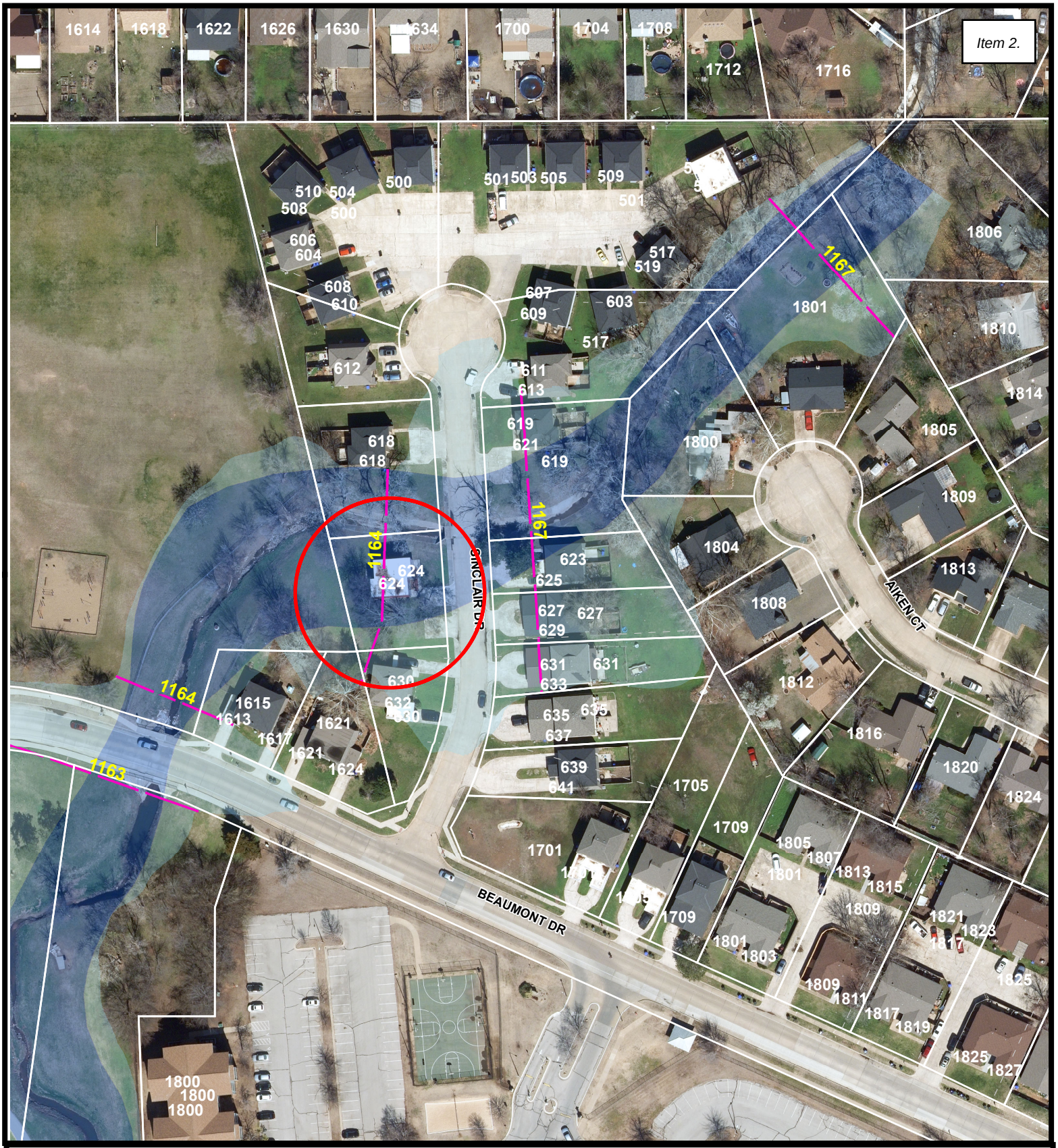


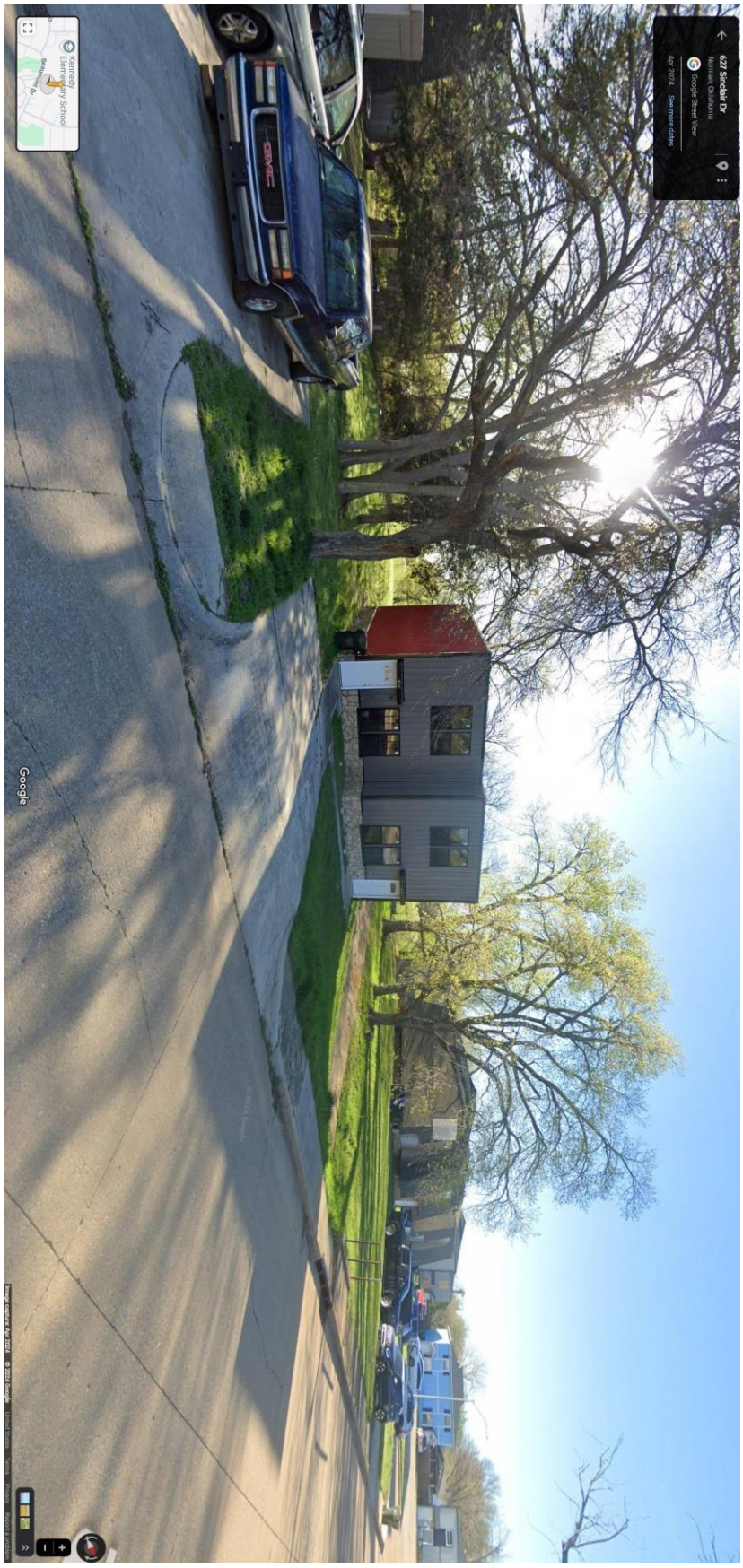
624 Sinclair Dr.

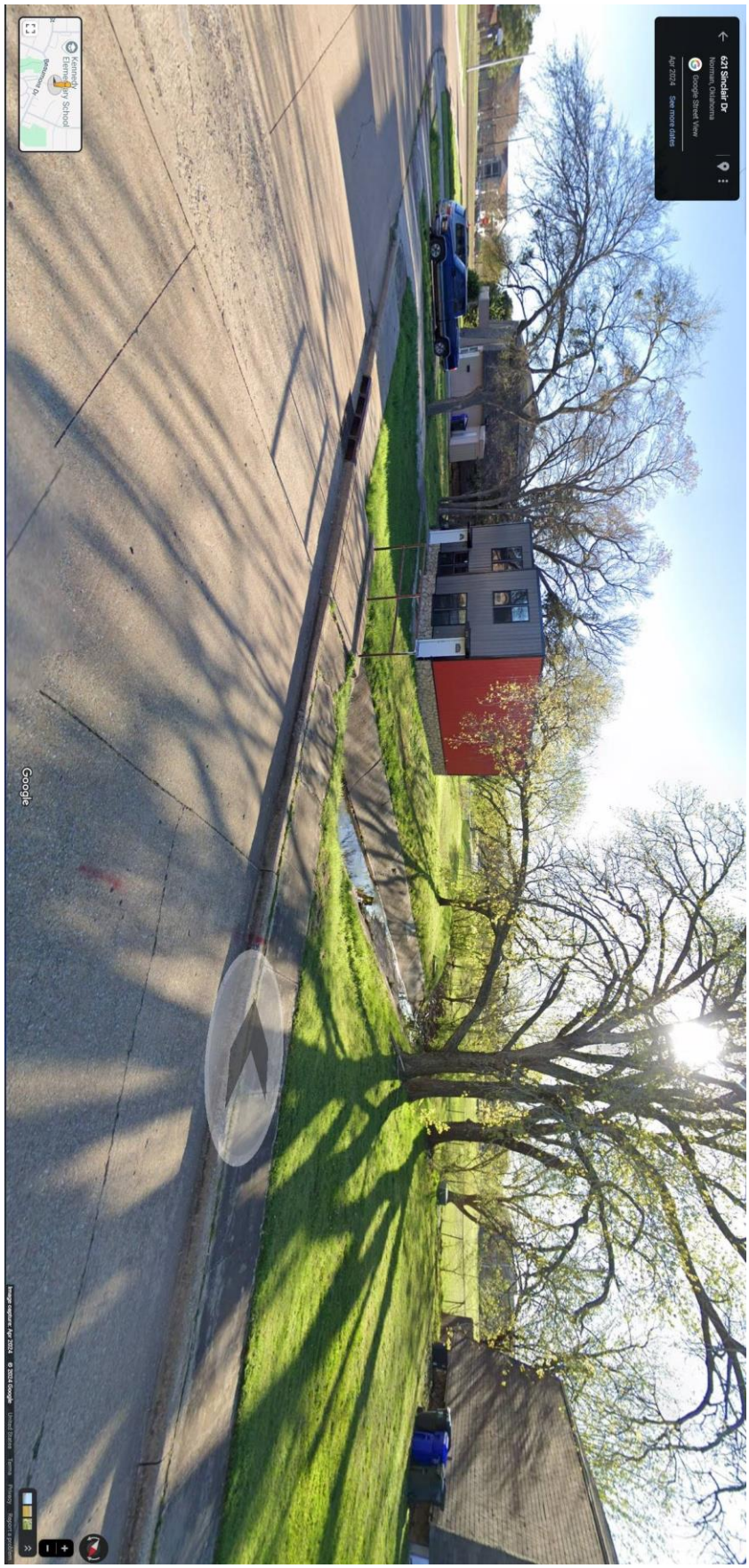
1 inch = 120 feet

Legend

- BFE 2021
- 1% Chance Floodplain
- Floodway
- Lot Line
- Parcel

The City of Norman assumes no responsibility for errors or omissions in the information presented.


627 Sinclair Dr
Norman, Oklahoma
Google Street View
Apr 2024 See more dates
Kennedy Elementary School
Google


621 Sinclair Dr
Norman, Oklahoma
Google Street View
Apr 2024 See more dates
Kennedy Elementary School
Google

STAFF REPORT 10/21/2024 **PERMIT No. 703**

ITEM: Floodplain Permit application for the construction of a patio and replacement of a fence at 3124 Meadow Ave. in the Canadian River floodplain.

BACKGROUND:
APPLICANT: Holly Hawk
ENGINEER: Gary Keen, P.E.

The applicant owns a condo that is one of four units in the same structure on the fringe of the Canadian River floodplain. Ms. Hawk replaced the masonry blocks that composed her patio with a pour in place concrete pad and replaced a wooden fence. This work was completed without a floodplain permit as the applicant wasn't aware that one was needed. There is a FEMA approved LOMA on the structure but it does not cover the backyard. A previous permit application was filed and denied by the Floodplain Permit Committee due to fence not meeting ordinance requirements and insufficient evidence that fill had not been brought into the floodplain with the work.

For this permit application, the applicant has proposed that the fence be cut off at the elevation of the BFE and wire mesh replaced in the section that was removed to ground level. The applicant has further indicated that they will remove nine shrubs, bushes and hedge plants and all flower bed edging that was installed previously. Additionally, it is proposed that sod be removed from the yard, two inches of soil removed (3.2 cu. yd. total) and sod reinstalled at new grade.

The applicant's engineer also provided a detailed report related to drainage across this property onto and from adjacent properties. Detailed surveying was done of this property and adjacent properties (3122 and 3126 Meadow Ave.). That report indicates that drainage should occur south and east across the backyard of 3124 Meadow Ave and should not hinder flow off of 3122.

STAFF ANALYSIS:
Site located in Little River Basin or its Tributaries? Yes __ no ✓

According to the DFIRM, the patio and fence were installed on the fringe of the Canadian River floodplain. The BFE at the planned location is approximately 1100.0'.

Applicable Ordinance Sections:		Subject Area:
36-533	(e)2(a) …..……..	Fill Restrictions in the Floodplain
	(e)2(e) ……	Compensatory storage
	(e)(3)(j)..…….	Fencing in the floodplain
	(f)3(a)8 …….	No Rise Considerations

(e)2(a) and (e)2(e) - Fill Restrictions in the Floodplain and Compensatory Storage – The use of fill in the floodplain is restricted. However, the placement of fill is allowed to elevate structures if compensatory storage is provided.

Since this work was performed without a floodplain permit, determining fill amounts is difficult in this case. The proposal calls for the removal of 2 inches of soil from the yard or 3.2 cubic yards, along with the removal of the new flower beds and shrubs. Additionally, the manhole that is located in the porch area of the yard was originally flush with the grade and still remains flush with grade after the improvements, indicating that there is no new fill or at least a very minimal amount. Surveys of the yard indicate a drainage direction that is consistent with what was reported as the historical flow pattern. The engineer's report goes into greater detail on the evidence to support that volumes for

fill have been accounted for. Based on the engineer report and the proposed corrections, this proposal would indicate that this section of the ordinance has been satisfied.

(e)(3)(j) Fencing in the Floodplain – All new fences or replacement of existing fences in the SFHA require a floodplain permit. Approved fences shall be designed and installed to be breakaway or in some other manner so that flows will not be impeded.

The applicant has proposed to remove the sections of the fence below the BFE and install a wire mesh type fence along this section. This would allow the free flow of flood waters and meet this ordinance requirement.

5(a)(viii) No Rise Considerations – For proposed development within any flood hazard area (except for those designated as regulatory floodways), certification that a rise of no more than 0.05 ft. will occur in the BFE on any adjacent property as a result of the proposed work must be provided. For proposed development within a regulatory floodway, certification of no increase in the BFE is required.

The engineer has certified that the project will not cause a rise of more than 0.05 feet to the BFE which meets this ordinance requirement.

RECOMMENDATION: Staff recommends that Floodplain Permit Application #703 be approved with the following condition:

1. Photos should be taken before work is started, and during soil removal process, as well as post construction. These photos should be submitted to City staff to help verify that the work was done in accordance with the application.

ACTION TAKEN: _____

City of Norman

Flood plain Permit Application

Floodplain Permit No. 703

Building Permit No. ______

Date 10/21/2024

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: Holly Hawk ADDRESS: 3124 Meadow Avenue Norman, OK 73072

TELEPHONE: 214-493-1529 SIGNATURE: Holly Hawk

BUILDER: Holly Hawk ADDRESS: 3124 Meadow Ave Norman, OK 73072

TELEPHONE: 214-493-1529 SIGNATURE: Holly Hawk

ENGINEER: Earl Harry Kern ADDRESS: P.O. BOX 891200 OKLA.CITY, OK 73189

TELEPHONE: 405-823-8240 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.

DIRECTIONS TO SITE: FROM INTERSECTION OF BERRY ROAD AND HIGHWAY 9, GO SOUTH ON BERRY ROAD TO MEADOW AVENUE. TURN RIGHT ON MEADOW AVENUE FOR APPROXIMATELY ONE BLOCK. 3124 IS ON THE LEFT. IT IS THE SECOND UNIT IN A CONDO OF FOUR UNITS. LEGAL DESCRIPTION: SMOKING OAKS SOUTH 3 LT 1 AND 2 BLK 3 UNIT 3124 SUNSET TRAILS DEVELOPMENT ASSOCIATION

DESCRIPTION OF WORK (Check all applicable boxes):

A. STRUCTURAL DEVELOPMENT

ACTIVITY	STRUCTURE TYPE
☐ New Structure	☒ Residential (1-4 Family)
☐ Addition	☐ Residential (More than 4 Family)
☒ Alteration	☐ Non-Residential (Flood proofing? ☐ Yes)
☐ Relocation	☐ Combined Use (Residential & Commercial)
☐ Demolition	☐ Manufactured (Mobile) Home
☐ Replacement	☐ In Manufactured Home Park? ☐ Yes

ESTIMATED COST OF PROJECT $ 15,000.00 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.

WORK IS MAKING IMPROVEMENTS TO PATIO AREA LOCATED IN BACK YARD OF THIS UNIT. SOME WORK WAS DONE PRIOR TO GETTING F.P. PERMIT. ADDITIONAL WORK IS REQUIRED TO GAIN COMPLIANCE AND TO QUALIFY FOR REQUESTED F.P. PERMIT. WORK COMPLETED INCLUDED REMOVAL OF SOIL TO LOWER THE ELEVATION AND FOLLOWED BY CONSTRUCTION OF LARGER PATIO SLAB. SOIL WAS REMOVED TO DIRECT RUNOFF TO SE CORNER OF THE YARD AT THE CURRENT LOCATION OF A GATE. VARIOUS PLANTS WERE PROVIDED AND MOST OF THE PLANTS ARE IN PLANTER BEDS ON LEGS. SEE ENGINEER'S STATEMENT AND CONTRACTOR'S STATEMENT FOR MORE INFORMATION. TWO CROSS FENCES AND A FENCE ALONG THE BACK P/L WERE CONSTRUCTED. PRIOR TO CONSTRUCTION, TREES AND BUSHES AND SOIL WERE REMOVED ALONG THE BACK P/L SEE ENGINEER'S STATEMENT AND CONTRACTOR'S STATEMENT FOR MORE INFORMATION.

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.
A SITE PLAN IS PROVIDED TO SHOW THE YARD AND EXISTING ELEVATIONS.

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:
THE FLOODPLAIN OF THE IMPACTING STREAM IS MORE THAN 1/2 MILE WIDE AND THIS WORK IS LOCATED AT THE EDGE OF THE FLOODPLAIN.

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:
NOT A NEW SUBDIVISION DEVELOPMENT. FEMA FIRM SHOWS B.F.E. TO BE 1100.00' (B' INTERPOLATIONS BETWEEN CROSS-SECTIONS ON FIRM).

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:
CONTOURS FROM THE NORMAN GIS INTERACTIVE MAP ARE SHOWN ON EXHIBIT.
SURVEY SPOT ELEVATION ARE SHOWN IN THE WORK AREA (EXISTING ELEVATIONS).

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

☒ Not Applicable:
A STREAM PROFILE FROM THE FEMA FIS (STUDY) IS INCLUDED AS AN EXHIBIT.

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

☒ Not Applicable: THIS WORK IS OUTSIDE THE STRUCTURE. STRUCTURE HAS BEEN REMOVED FROM THE FLOODPLAIN BY FEMA APPROVED LOMA. HOWEVER, THE ELEVATION OF THE THRESHOLD AT THE DOORWAY AS SURVEYED IS SHOWN ON THE EXHIBIT.

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 WORK COMPLETED WAS DONE IN CONJUNCTION TO CONSTRUCTING A LARGER PATIO SLAB AND TO IMPROVE DRAINAGE FROM THIS YARD AS A RESULT OF LOCAL RAINFALL.
LANDSCAPING WORK WAS DONE. THIS PROPOSAL INCLUDES REMOVING THE BOTTOM PORTION OF THE TWO CROSS FENC REMOVING PLANTER BEDS, MULCH, SHRUBS AND OTHER PLANTS LOCATED IN THE F.P. REMOVE A MINIMUM OF 3" OF SOD AND SOIL AT ALL POINTS IN THE YARD, EXCEPT IN AREA THAT WOULD CAUSE PONDING AT GATE. PLACE 1-1/2" SOD IN EXCAVATION.

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.
STATEMENT BY EARL GARY KEEN, PE 11438 IS INCLUDED IN DOCUMENTS.
MANY PHOTOS OF THE SITE ARE SUBMITTED FOR REVIEW.

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.
THE REQUIRED MAILING LIST IS INCLUDED IN THE EXHIBITS.

J. A copy of all other applicable local, state, and federal permits (i.e. U.S. Army Corps of Engineers 404 permit, etc). NO OTHER PERMITS ARE REQUIRED.

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.: 0280J, Dated: 1/15/2021

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 1160.0' Ft. NGVD (MSL) ☐ Unavailable

See Section 4 for additional instructions.

SIGNED: _____ **DATE:** 10/9/2024

SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by Permit Staff.)

The applicant must also submit the documents checked below before the application can be processed.

☐ Flood proofing protection level (non-residential only) _____ Ft. NGVD (MSL). For flood proofed structures applicant must attach certification from registered engineer.

☐ Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.

☐ Certification from a registered engineer that the proposed activity in a regulatory flood plain will result in an increase of no more than 0.05 feet in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.

☐ All other applicable federal, state, and local permits have been obtained.

Other: _____

_____

_____

SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Chairman.)

The proposed activity: **(A)** ☐ **Is**; **(B)** ☐ **Is Not** in conformance with provisions of Norman's City Code Chapter 22, Section 429.1. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED: _____ DATE: _____

If **BOX A** is checked, the Floodplain committee chairman may issue a Floodplain Permit.

If **BOX B** is checked, the Floodplain committee chairman will provide a written summary of deficiencies. Applicant may revise and resubmit an application to the Floodplain committee or may request a hearing from the Board of Adjustment.

APPEALS: Appealed to Board of Adjustment: ☐ Yes ☐ No

Hearing date: _____

Board of Adjustment Decision - Approved: ☐ Yes ☐ No

Conditions:

_____

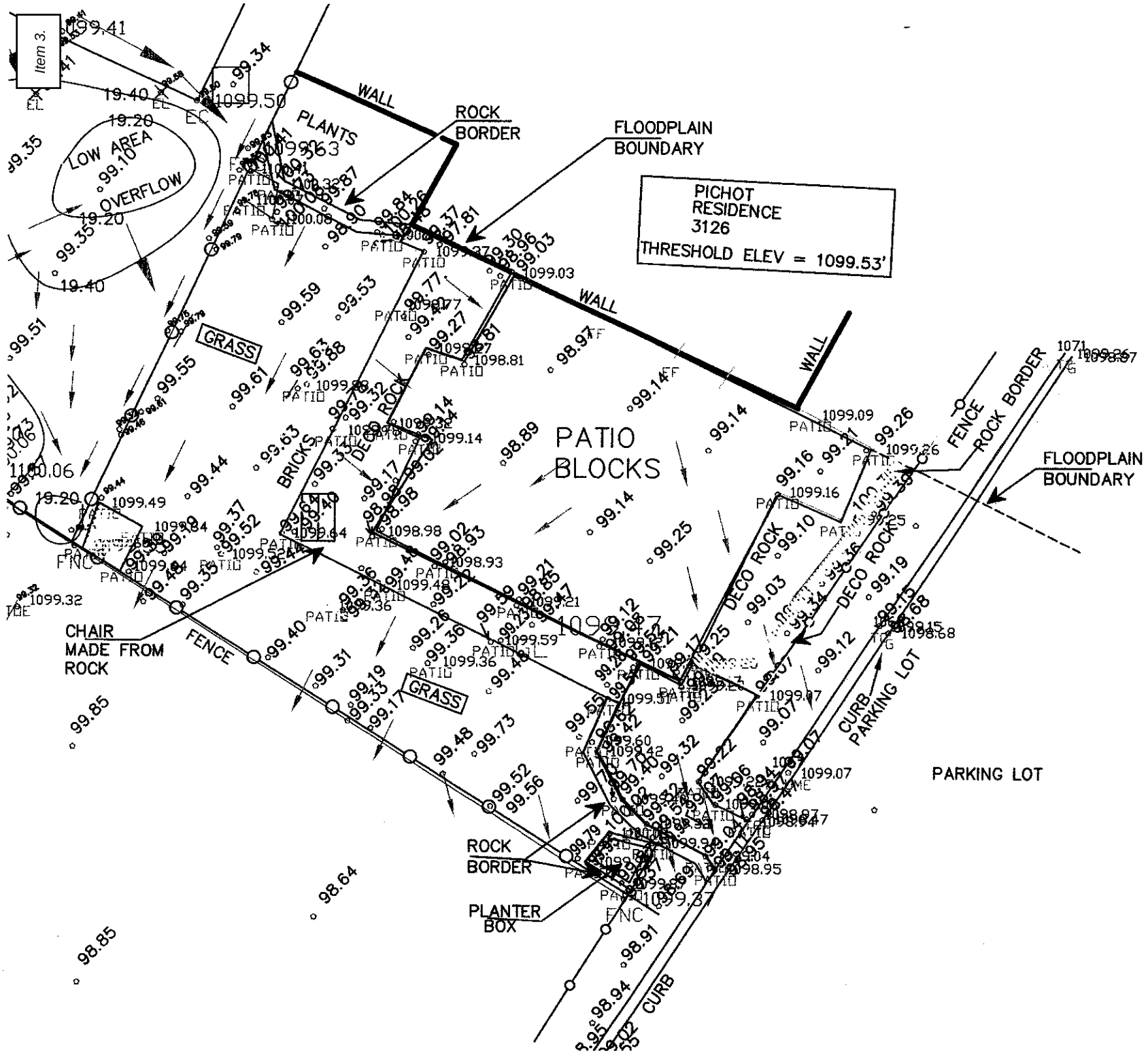
_____

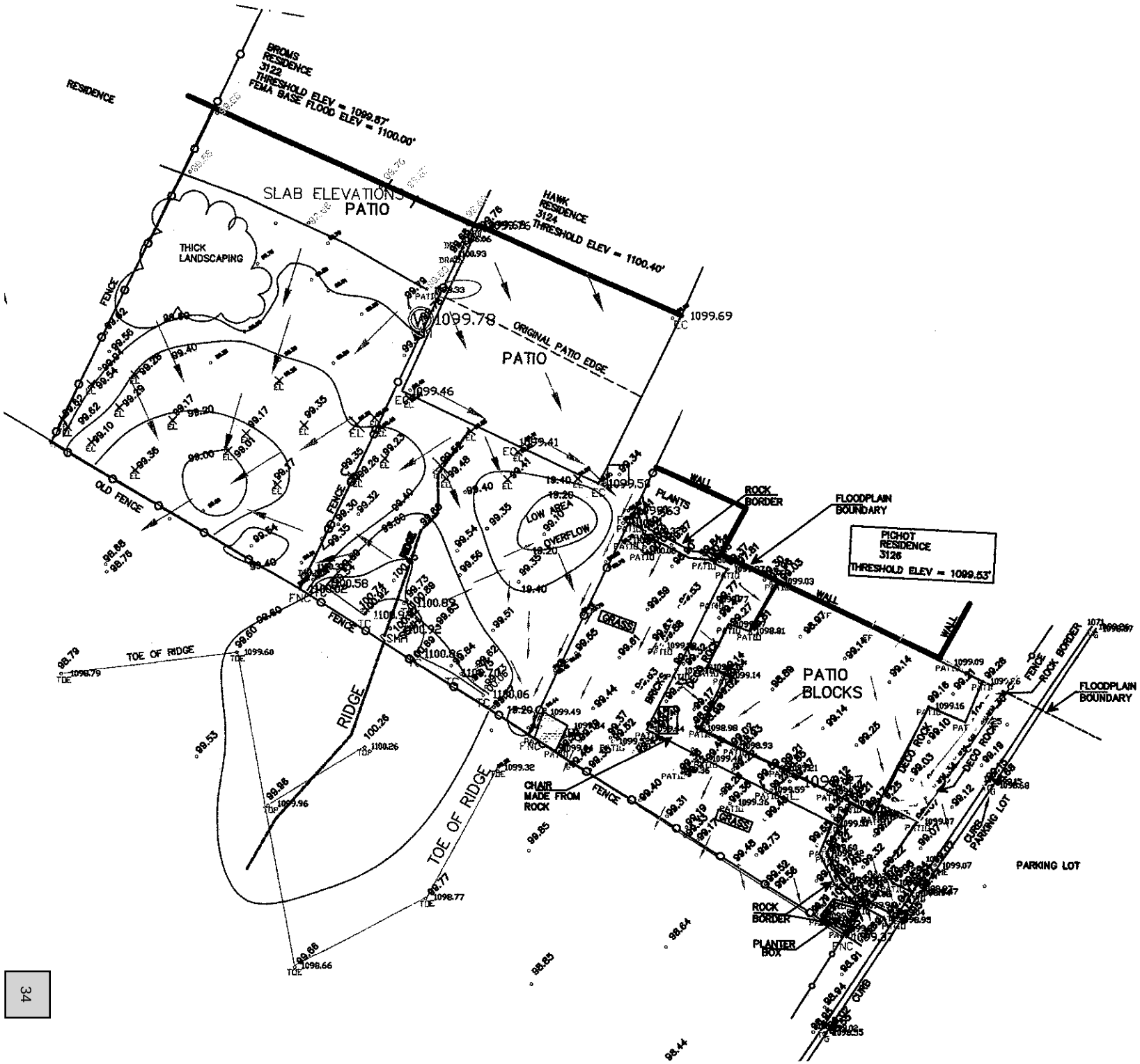
_____

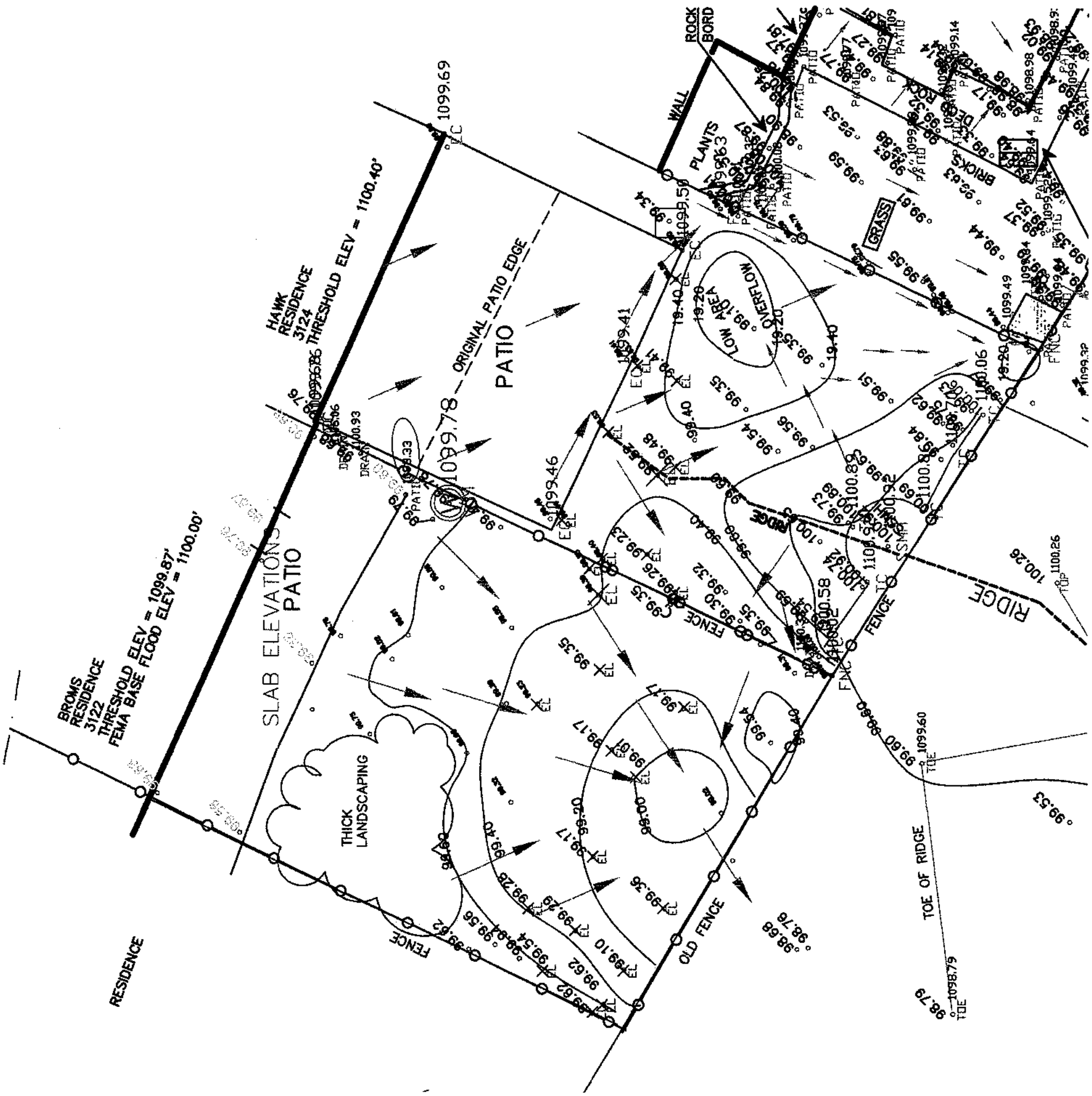
SECTION 6: AS-BUILT ELEVATIONS (To be submitted by APPLICANT before Certificate of Occupancy is issued.)

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.

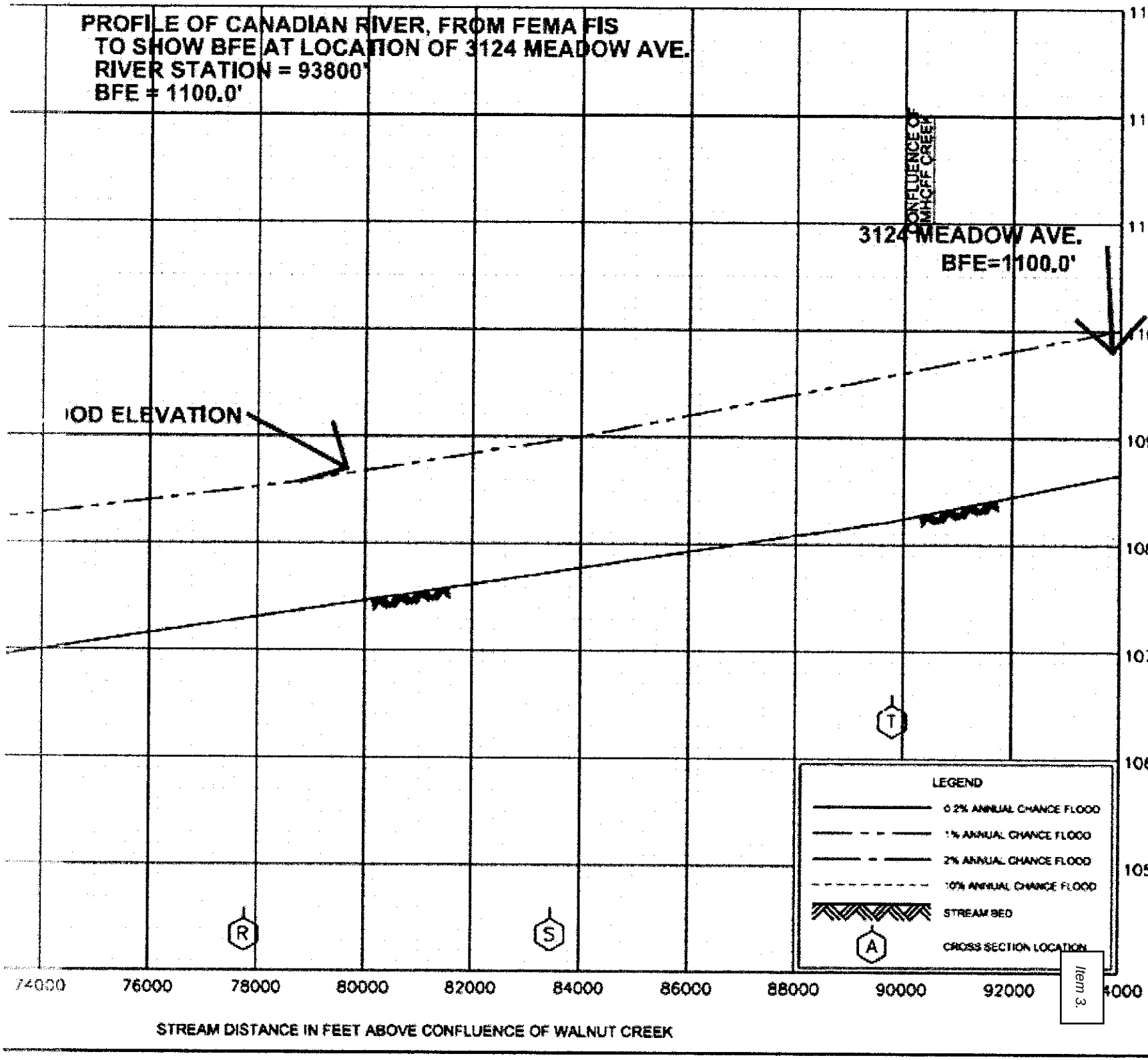

PICHOT
RESIDENCE
3126
THRESHOLD ELEV = 1099.53'
FLOODPLAIN
BOUNDARY
WALL
ROCK
BORDER
PLANTS
LOW AREA
OVERFLOW
GRASS
PATIO
BLOCKS
BRICKS
DECO ROCK
FENCE
CHAIR
MADE FROM
ROCK
ROCK
BORDER
PLANTER
BOX
CURB
PARKING LOT
PARKING LOT


BROMS RESIDENCE 3122 THRESHOLD ELEV = 1099.87 FEMA BASE FLOOD ELEV = 1100.00'
HAWK RESIDENCE 3124 THRESHOLD ELEV = 1100.40'
PICHOT RESIDENCE 3126 THRESHOLD ELEV = 1099.53'
SLAB ELEVATIONS
PATIO
THICK LANDSCAPING
1099.78 - ORIGINAL PATIO EDGE
PATIO
LOW AREA OVERFLOW
PLANTS
WALL
ROCK BORDER
FLOODPLAIN BOUNDARY
PATIO BLOCKS
GRASS
FENCE
OLD FENCE
TOE OF RIDGE
RIDGE
CHAIR MADE FROM ROCK
DECO ROCKS
CURB
PARKING LOT
PLANTER BOX


HAWK
RESIDENCE
3124
THRESHOLD ELEV = 1100.40'
BROMS
RESIDENCE
3122
THRESHOLD ELEV = 1099.87'
FEMA BASE FLOOD ELEV = 1100.00'
SLAB ELEVATIONS
PATIO
ORIGINAL PATIO EDGE
PATIO
THICK LANDSCAPING
RESIDENCE
FENCE
OLD FENCE
LOW AREA
OVERFLOW
RIDGE
TOE OF RIDGE
WALL
ROCK BORD
PLANTS
GRASS
BRICKS

W STATE HWY 9 HWY
CONESTOGA DR
S BERRY RD
TRAILS CT
MEADOW AVE
OLD FARM RD

MEADOW AVE
FRALEY CT


PROFILE OF CANADIAN RIVER, FROM FEMA FIS
TO SHOW BFE AT LOCATION OF 3124 MEADOW AVE.
RIVER STATION = 93800'
BFE = 1100.0'
CONFLUENCE OF MH/CFF CREEK
3124 MEADOW AVE.
BFE=1100.0'
OD ELEVATION
R
S
T
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
A
CROSS SECTION LOCATION
74000
76000
78000
80000
82000
84000
86000
88000
90000
92000
STREAM DISTANCE IN FEET ABOVE CONFLUENCE OF WALNUT CREEK

EARL GARY KEEN, PE
PO BOX 891200
OKLAHOMA CITY, OK 73189
(405) 823-8240
EMAIL: garykeen47@att.net
October 01, 2024

ENGINEERS'S REPORT REGARDING 3124 MEADOW AVENUE NORMAN, OK

ADDENDUM TO PREVIOUS REPORT DATED JULY 28.2024

INTRODUCTION

Work consisting of constructing a new patio slab, fences along three sides of the yard , creating flower beds, planting various shrubs, and placing shrubs was done without getting the necessary floodplain permit from the City. This is unfortunate and it creates a situation where it is difficult to evaluate the effect that the work has on the floodplain. When a permit application is made prior to any construction, then the City staff, applicant and applicant's engineer have an opportunity to conduct an elevation survey of existing ground. Then the work can be before approval and again after completion to insure that the work complies with the applicable floodplain regulations. In cases where the pre-construction survey was not done, as in this case, it is impossible to get the precise elevation survey data that is needed. In this case, we have to rely on other information.

PRIOR APPLICATION

A floodplain permit application and engineer's report was submitted to the City of Norman in regard to the first application. That previous application was recommended for approval by staff. However, a neighbor that is the owners of Unit 3122, which is located within the same condo-type structure appeared at the FP committed meeting and objected to the work that was done and expressed concern that the work done in the yard of Unit 3124 might cause flooding of the interior of his unit. A former tenant of Unit 3124 also appeared at the FP meeting and made comments that reinforced the concern about potential flooding within the main structure.

After, hearing comments from these FP committee members expressed concern that the unpermitted work performed might be causing water to back-up in the yard of Unit 3122, and that this situation might cause stormwater to enter that unit. One member of the FP committee actually stated that his concern regarding this matter is more about the possible impact on Unit 3124 than on the impact on the floodplain. The FP committee ultimately voted overwhelmingly to deny the first application submitted for this project.

APPLICATION TWO AND REVISED RECOMMENDATIONS

Statements made by various committee members at that meeting are being used as guidance in preparing a new application and proposing corrective work that involves removing a lower portion of the two cross-fences (the portion located lower than the BFE). Also, the current proposal includes removing approximately nine shrubs and three flower beds. The metal edging located along the perimeter of the flower beds will also be removed. Sod was placed in this back yard, and I have not been able to establish that adequate soil was removed prior to placing this sod; therefore, it is possible that the placement of the sod has resulted in an increase in the elevation of the back yard. The contractor that build the fences and the concrete patio slab stated that after he completed the patio slab, he removed soil from a portion of the unpaved portion of the back yard of Unit 3124 and that he shaped the yard to cause the flows occurring south of the ridge will flow to the location of the gate in the back fence and onward across the golf course. Further, he stated that he graded this yard so that the soil adjacent to the patio slab was an estimated one-half inch lower than the top of the patio slab. In addition, this contractor stated that he finished his work at the point where the yard had been graded. He stated that he is not the contractor that placed sod and did the landscaping work—that work was done by somebody else. Consequently, I am recommending that the sod in the back yard be removed along with two inches of additional soil. Then new sod be placed. This will result in a lowering of the grassed area of the back yard by approximately two inches (which will also lower the top of the ridge by about two inches). This work will result in removing two inches of soil across an area of 520 square feet for a removal volume of approximately 3.2 cubic yards.

The contractor stated that he constructed the new patio slab by placing the top of the slab at existing grade elevation along the side of the slab adjacent to the property line. And, he sloped this pad downward toward the back fence and downward toward the property line of Unit 3126. The contractor further stated that the chamber located in the yard of Unit 3124 and containing a sump pump was not disturbed during the construction work. Originally the top of this chamber was flush with the soil and after the pad was constructed this chamber is flush with the top of the concrete slab. This information indicates that the top of the slab matches the original ground at this point. In addition, there is photographic evidence that the top of the original patio blocks and the top of the new patio slab are at approximately the same elevation at the location of a window on the back wall of the residence. This information. This information is consistent with statements made by the contractor and so is the survey data regarding this new patio slab. Consequently, I am recommending that this concrete slab remain and be included in the permit.

During the meeting, testimony from concerned residents stated that the brick wall that surrounds the public sanitary sewer manhole located in this yard near the back fence was recently constructed. The same comment was made about the bricks located adjacent to the back fence that create a flower bed. These bricks and mortar appear to be aged so I originally concluded that these bricks have existed for a long time. Since the first meeting regarding this property, I discussed the unpermitted work separately with the owners of Units 3122, 3124, 3126 and the contractor that did the wok on the yards of Unit 3124 and Unit 3126. The owners of Units 3124 and 3126 and the contractor all stated that these brick have been in place for a long time. During my discussing with the owner of Unit 3122, he stated that the work in question probably did not include adding any additional bricks. So, it seems that the bricks around the manhole and the back flower bed have been there for a long time and can remain. And, it seems that it will be okay to place some flowers, roses, or shrubs, etc. inside the back bricked flower bed.

DETAILED ELEVATION SURVEY OF UNITS 3122, 3124 AND 3126

After the first permit application being denied, the owner of 3124 requested that I prepare a new application and that I include doing all of the things that the City will require for approval. That is exactly my current objective. Incidentally, at about the same time, the owner of Unit 3126 asked me to prepare a floodplain permit application for that was done on her yard. I am submitting a separate appication for that Unit.

I hired a Oklahoma License Professional Surveyor (PLS) to make a detailed elevation survey of the back yards of Units 3122,3124 and 3126 and adjacent area on the golf course property. I have prepared a detailed site plan showing the results of this survey.

A summary of this survey indicated that the yard of Unit 3126 flows partially toward the southerly fence and partially toward the back fence and onto the golf course. Most of the runoff from local rainfall will flow southward and pass under the southern fence. Some of the local rainfall will go westerly under the back fence and onto the golf course. Flow from an elevated river floodplain during flooding conditions will from generally from he north-west to the south-east and will pass under the southern fence and onto the parking lot of the gold course property.

Regarding Unit 3124 flows from local rainfall will be divided by a ridge that runs across the back part of the yard, between the sanitary sewer manhole and the center of the new patio slab. This ridge does not extend onto the new patio slab. The grass-covered part of this yard that is located west of this ridge actually flows toward and onto the yard of Unit 3122and then turn toward the golf course and exists the yard of Unit 3122 at the center of the back yard fence, which is the low point on the yard of Unit 3122.

The grassed portion of the yard of Unit 3124 located south of the ridge will flow toward the yard of Unit 3126, but will turn westerly at a point close to the southerly fence of Unit 3124, then the flow will go to the back gate of Unit 3124 and go onto the golf course. The contractor stated that the yard of Unit 3124 was intentionally sloped to carry the drainage to the back gate. Excavated soil was removed from the stie.

Survey data shows that the new patio slab is sloped to drain from the NE corner of the slab toward the SW corner of the slab. Therefor the flow from this slab will be westerly and easterly. Some of this flow from this patio will go north of the ridge and some will go south of the ridge. The floodwater from local rainfall going north of the ridge will flow onto the lawn of Unit 3122 along the property line and exist the yard of the lawn of Unit 3122 onto the golf course property. The flow going south of the ridge will flow toward the property line of Unit 3124 and then go westward to the gate in the back yard of Unit 3124 and then continue onward across the golf course. In my opinion the flow onto Unit 3122 is similar to the historic flow that existed before the construction in Unit 3124.

Incidentally, there is a underground drainage system in the yard of Unit 3124 that consists of area inlets, a sump pump and underground piping. This system collects rainwater on the patio of Unit 3126 and transports this rainwater along the back property line to the parking lot on the golf course property. The construction date of this drainage system is unknown but I was told that this system was installed by the HOA a long time ago to help prevent stormwater seepage into Unit 3124. Since the completion of the recent work on the yard of Unit 3124, this system may be unnecessary. This system will not impact the flow of water in the overall floodplain.

Major floodplain flow that will result from major flooding of the river will be generally from the northwest to the southeast and this flow is predicted to follow a path from the yard of Unit 3124 directly onto the yard of Unit 3126.

DRAINAGE ON THE YARD OF UNIT 3122

The owners of Unit 3122 are understandably concerned about the potential of flooding of their residence. My surveyor made a elevation survey of their yard and patio area, I am appreciative tht the owner granted approval for this survey. Also, I observed the drainage on this yard during a period of moderate rainfall.

The patio door threshold on this unit is only slightly higher than the adjacent patio slab (only about one and one-half inches difference.) The patio lab is lowest at the NW corner. I observed this patio slab as the rainfall began, and I watched for a considerable length of time. I observed the water falling on this patio slab to flow to the NW corner, where it began ponding due to adjacent vegetation that was higher than the slab. The roof gutters were overflowing at this time due to some kind of restriction in the system and the overflow was falling directly on the patio slab. This water from the gutter was greater than the water that was falling directly on the patio slab. As I watched, the depth of the ponding water increased, and as that happened, the edge of the pool of water moved toward the southerly end of the patio. This puddle was about four inches (horizontally) away from the north fence of Unit 3124 when the rainfall decreased to a spinkle. Incidentally, there is a piece of landscape edging along the side of the patio slab that is adjacent to the property line with Unit 3124, and this edging will block flow onto or off this side of this patio slab. This edging ends at the ends at the corner of the patio slab. Also, there is landscaping mulch and some plants behind the landscape edging.

I did observe that water from the patio slab was flowing (more like seeping through the grass) and traveling toward the low spot at the back yard fence and then onto the golf course. At first, it was difficult to observe the movement of the clear water through the green lawn grass, but this flow was clearly observed when I turned the water red.

I did observe that the lawn grass is slightly higher than the patio slab along the edge of the slab and this grass is restricting the flow of stormwater from this patio. Stormwater will flow more rapidly toward the back fence and there will be less ponding on the patio slab if the ground adjacent to the patio is lower. And, there will be less risks of flooding of the interior of the unit. Perhaps the sod can be pealed back, soil removed, and then the sod replaced to reduce ponding on the patio. The survey shots indicated that there is a continuous downward slope from this patio slab to the back fence and onto the golf course, which is consistent with the observed water flow. Repairing the roof gutter system will be helpful, also.

Much of the stormwater from local rainfall that might frow from the yard of Unit 3122 onto Unit 3124 will turn toward the NW corner of the yard of the yard of Unit 3124 and return to the yard of Unit 3122 and then flow onto the golf course, as indicated by the elevation survey. Please refer to the site plan that contains spot elevations and contours of this area.

During a 1% chance flow of the river (and perhaps a smaller flow) the flow in the floodplain will certainly flow across all of the three yards discussed herein. Flow as a result of river flooding will be in a direction parallel to the back fence; therefore the fence will have a negligible impact on this floodplain.

SUMMARY OF PROPOSED CORRECTIVE WORK (back yard—Unit 3124).

1. Cut off bottom part of the two cross-fences at the elevation of the BFE. Place wire mesh across opening below the fence (optional). (Include these cross fences in the permit.)
2. Cut off gate in rear fence at the bottom of the lower cross plank. Please wire mesh across the opening below the gate (optional). (Include in the permit.)
3. Remove nine shrubs, bushes, and hedge plants.
4. Remove all metal flower bed edging (three areas).
5. Remove several rose bushes planted near the sanitary sewer manhole.
6. Remove sod in the grassed area of the yard; remove two inches of additional soil; place new sod. Take photos as this work is performed to document progress. (Include this work in the permit).
7. Include the new concrete patio slab in the permit.
8. The bricks around the sanitary sewer manhole and adjacent to the back yard fence can remain. (Include in the permit.)

LIST OF EXHIBITS SUBMITTED WITH THIS APPLICATION

1. The first application that was submitted for consideration and rejected is available for staff review.
2. Exhibits submitted with the original application:
   (Photos of the yard of unit 3124)
3. Updated mailing list and radius map.
4. Revised engineer's certification statement
5. Photographs of Unit 3122 for reference

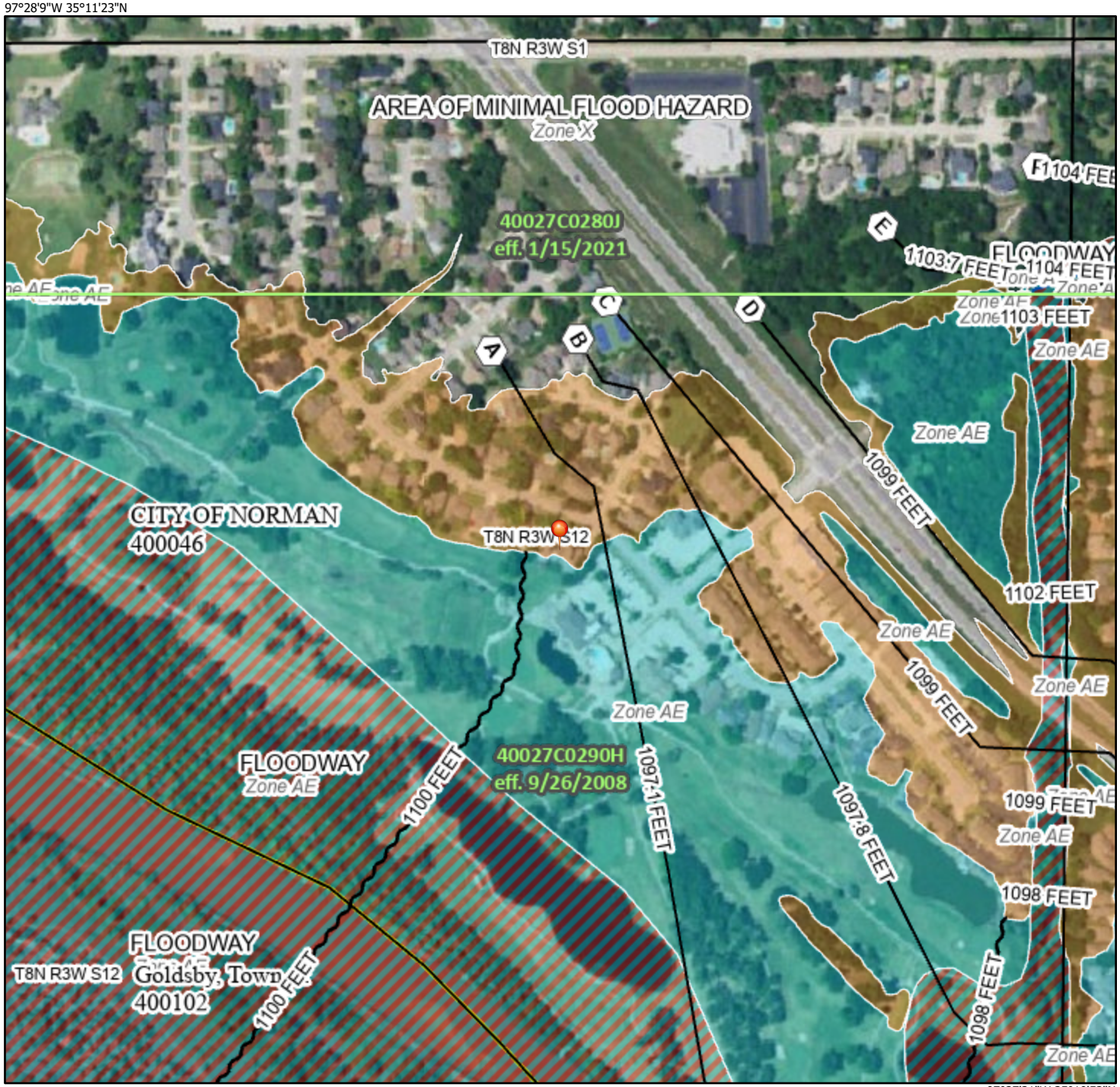
Earl Gary Keen, PE 11,438
PO. Box 891200
Oklahoma City, OK 73189

October 02, 2024

REGISTERED PROFESSIONAL ENGINEER
EARL GARY KEEN
11438
OKLAHOMA

National Flood Hazard Layer FIRMette

97°28'9"W 35°11'23"N



97°27'31"W 35°10'53"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR F UT

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, Areas 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 D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 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

N

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 8/28/2024 at 12:19 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.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community ide FIRM panel number, and FIRM effective date. Map in unmapped and unmodernized areas cannot be used regulatory purposes.


3124
LOOK ALONG OUTSIDE OF FENCE ON TRAILS SIDE, NEXT TO SOUTH SIDE OF 3124.


3126
3124
GOLF COURSE PROPERTY
SOUTH SIDE OF FENCE
UUNIT TO NORTH


3124
NORTH
FENCE
3122
3122


3124


3124
SOUTH
FENCE


3124 SHOW SE CORNER OF YARD
SHOW NEW CONCRETE
SHOW NEW SOD
SHOW SHARED FENCE ON SOUTH


3124 MEADOW
(SUBJECT PROPERTY)
3126 MEADOW AVE.
PROPERTY TO SOUTH
PATIO AREA AND SHARED FENCE
FENCE


FENCE ALONG NORTH SIDE OF YARD
NEW SOD


GOLFER
ROAMING
AREA
NORTH WALL
LANDSCAPE AREA


NEW SOD
3124
SHRUBS ALONG NORTH WALL

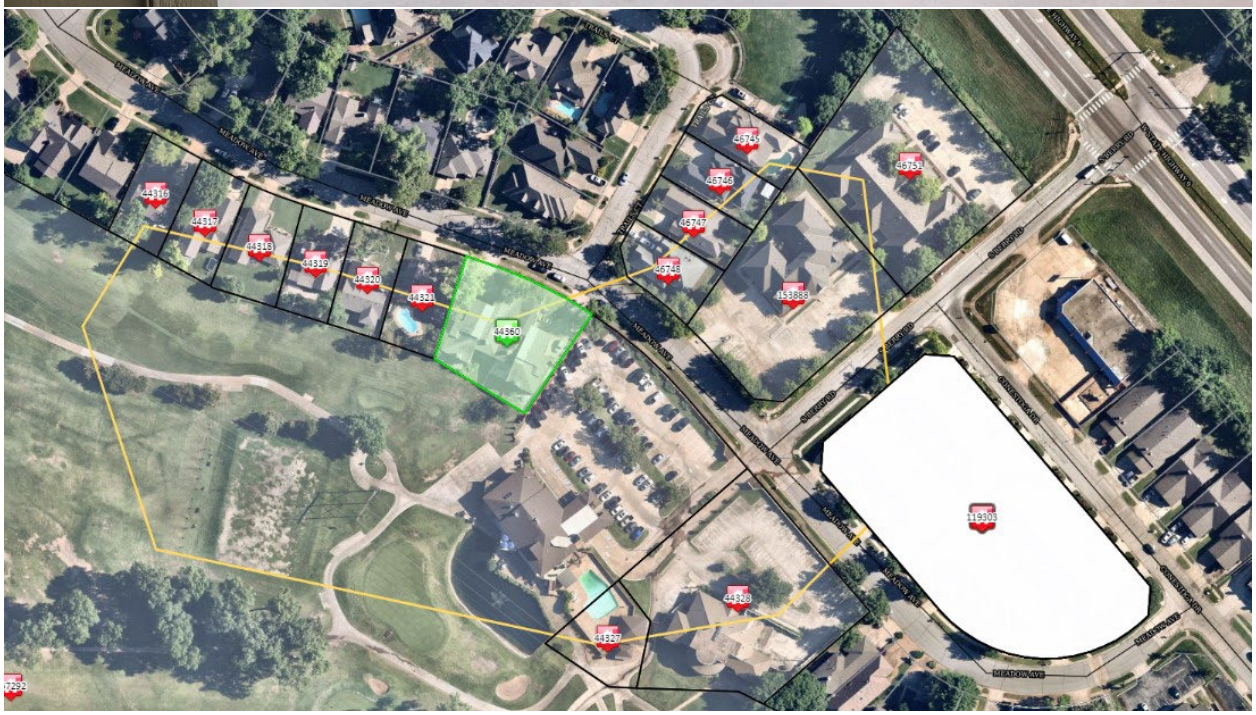

LOOK AT NW CORNER OF FENCE
NORTH FENCE
FLOWERS ALONG WEST FENCE
ONE STANDARD MANHOLE
LOCATED IN THE FLOWER BED
SOD


MANHOLE
WEST FENCE
NORTH FENCE


GOLF COURSE PROPERTY
OUTSIDE THE FENCE
WEST FENCE
SOUTH
FENCE
GATE
OLD BRICK WALL
SOD


GATE IN SW CORNER.
FENCE TO LEFT OF GATE IS SHARED WITH 3126.
FENCE TO RIGHT OF GATE IS SHARED WITH GOLF COURSE.

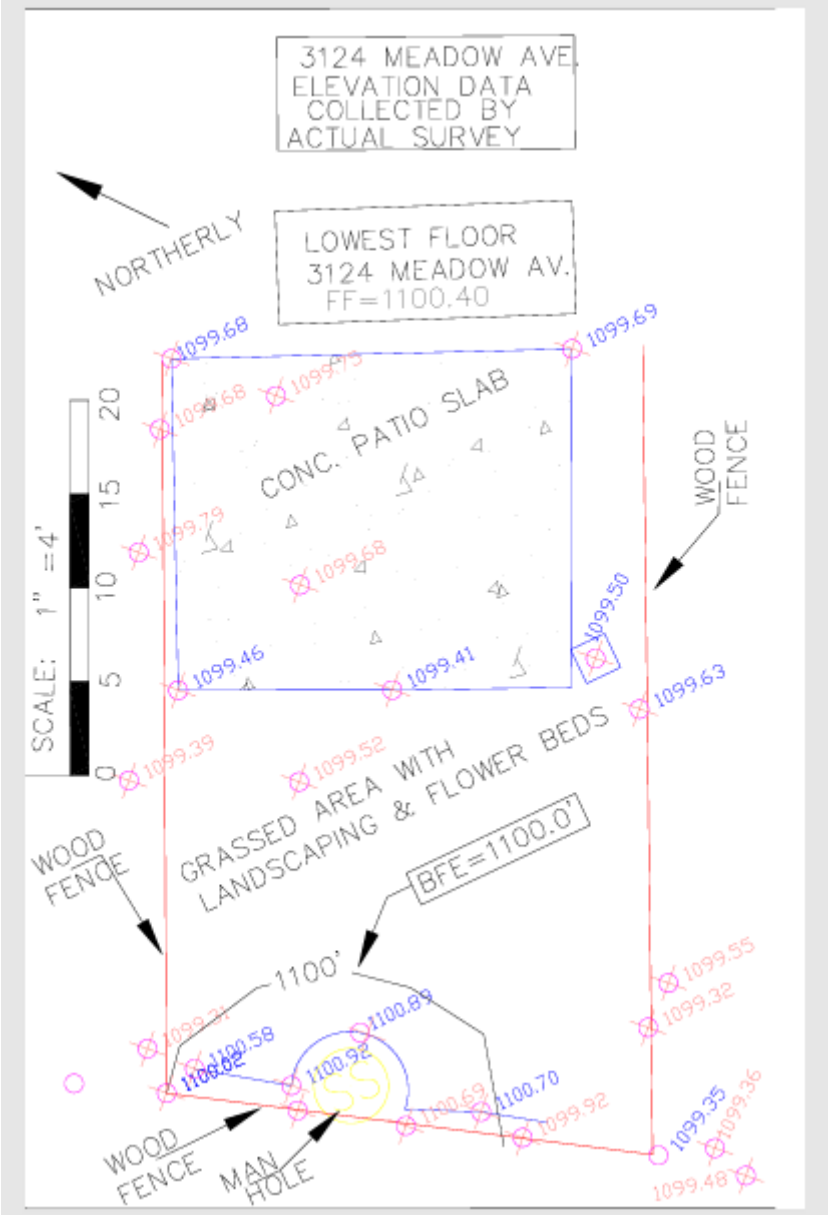

GRILLIN' TIME
SOUTH FENCE
GATE
SOD
CONC. SLAB

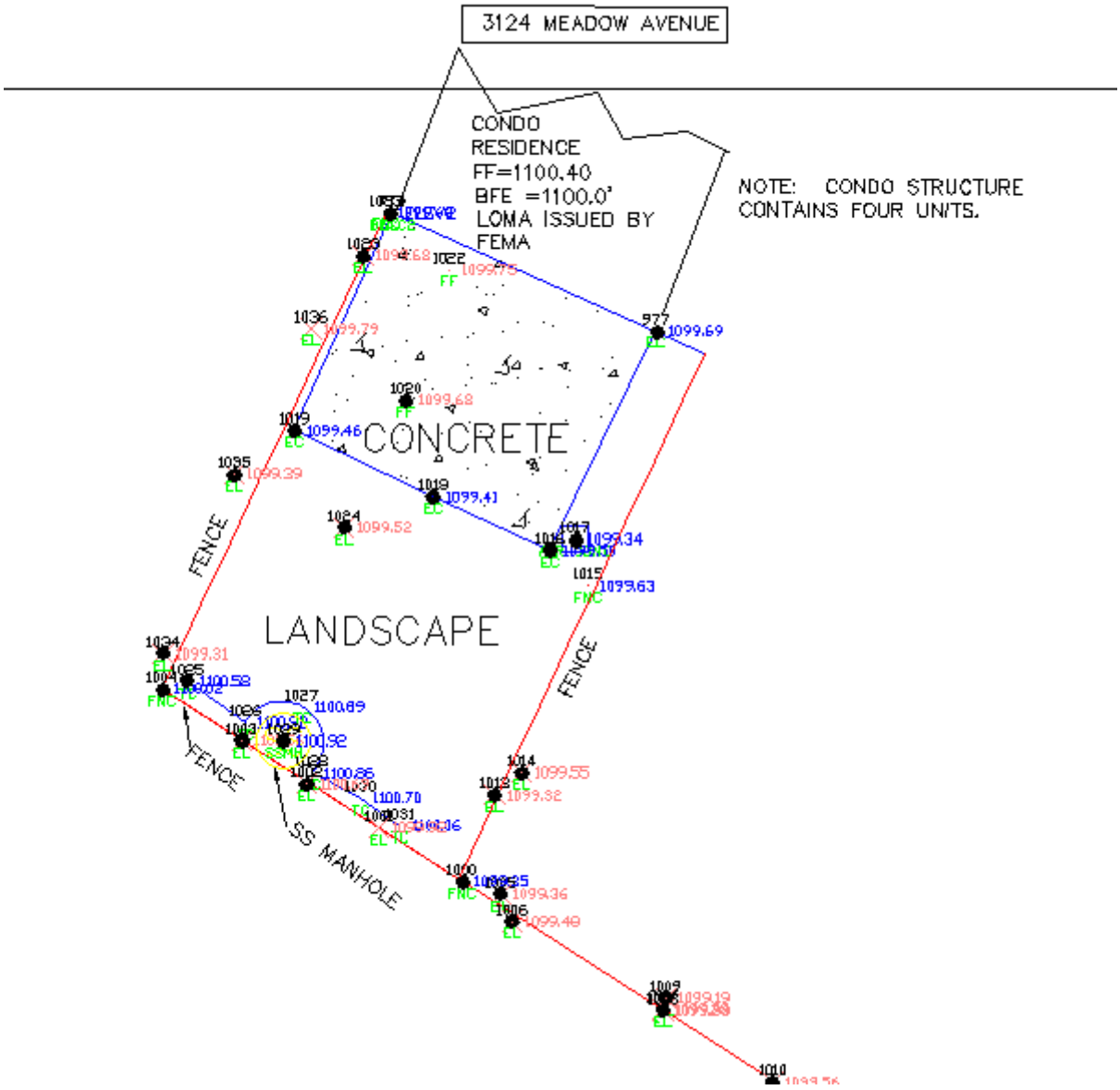



MEADOW AVE
TRAILS CT

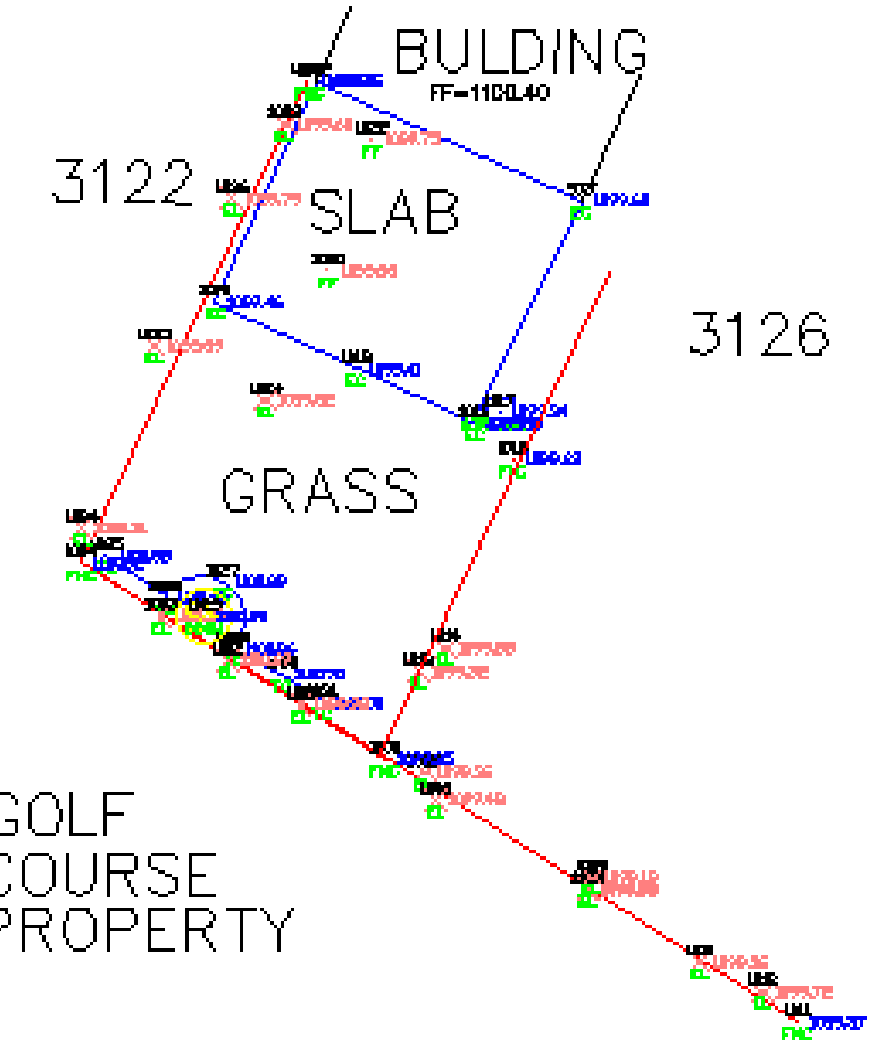

OLD FARM RD
MEADOW AVE
TRAILS CT
S BERRY RD
W STATE HWY 9 HWY
CONESTOGA DR
N LOOP
City of Norman, GIS Services Division


3124 MEADOW AVE
Write a description for your map.
Legend
3124 Meadow Ave
K. S. Oil Company, Inc
Meadow Ave
3124 Meadow Ave
K. S. Oil Company, Inc
W 97°27'46.08"
Google Earth
100 ft
N

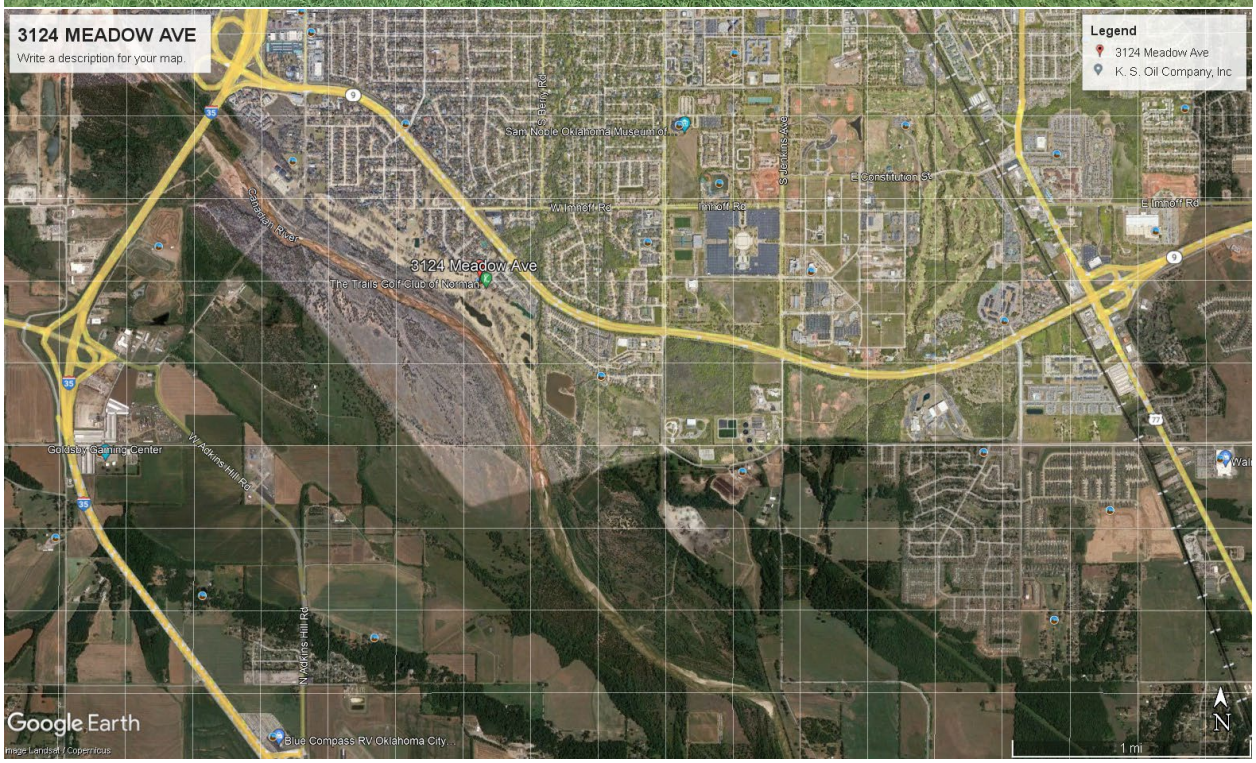

3124 MEADOW AVE.
ELEVATION DATA
COLLECTED BY
ACTUAL SURVEY
NORTHERLY
LOWEST FLOOR
3124 MEADOW AV.
FF=1100.40
CONC. PATIO SLAB
WOOD FENCE
SCALE: 1" =4'
0
5
10
15
20
GRASSED AREA WITH
LANDSCAPING & FLOWER BEDS
BFE=1100.0'
1100'
WOOD FENCE
WOOD FENCE
MAN HOLE
1099.68
1099.69
1099.46
1099.41
1099.50
1099.63
1099.39
1099.52
1099.55
1099.32
1100.89
1100.92
1100.70
1099.92
1099.35
1099.36
1099.48

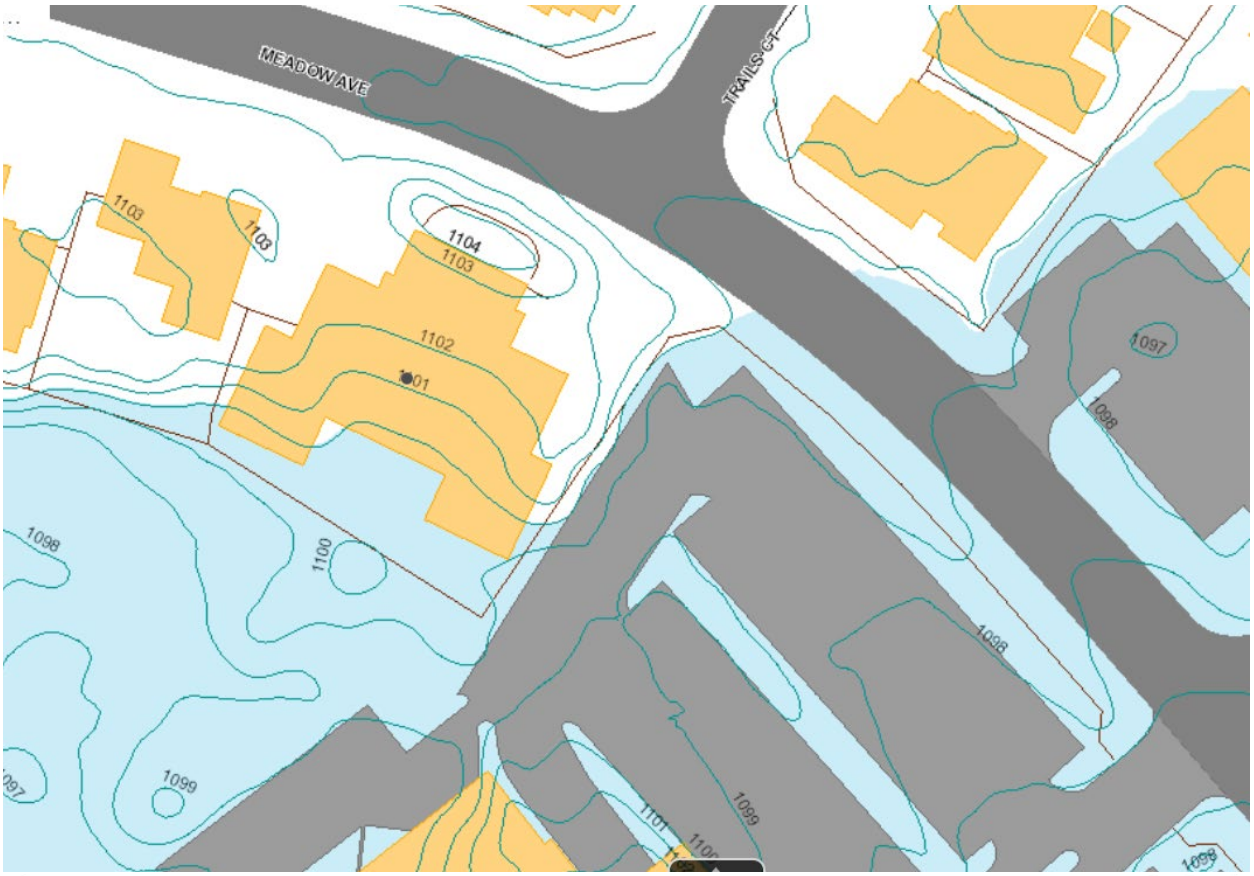

3124 MEADOW AVENUE
CONDO
RESIDENCE
FF=1100.40
BFE =1100.0'
LOMA ISSUED BY
FEMA
NOTE: CONDO STRUCTURE
CONTAINS FOUR UNITS.
CONCRETE
LANDSCAPE
FENCE
FENCE
FENCE
SS MANHOLE

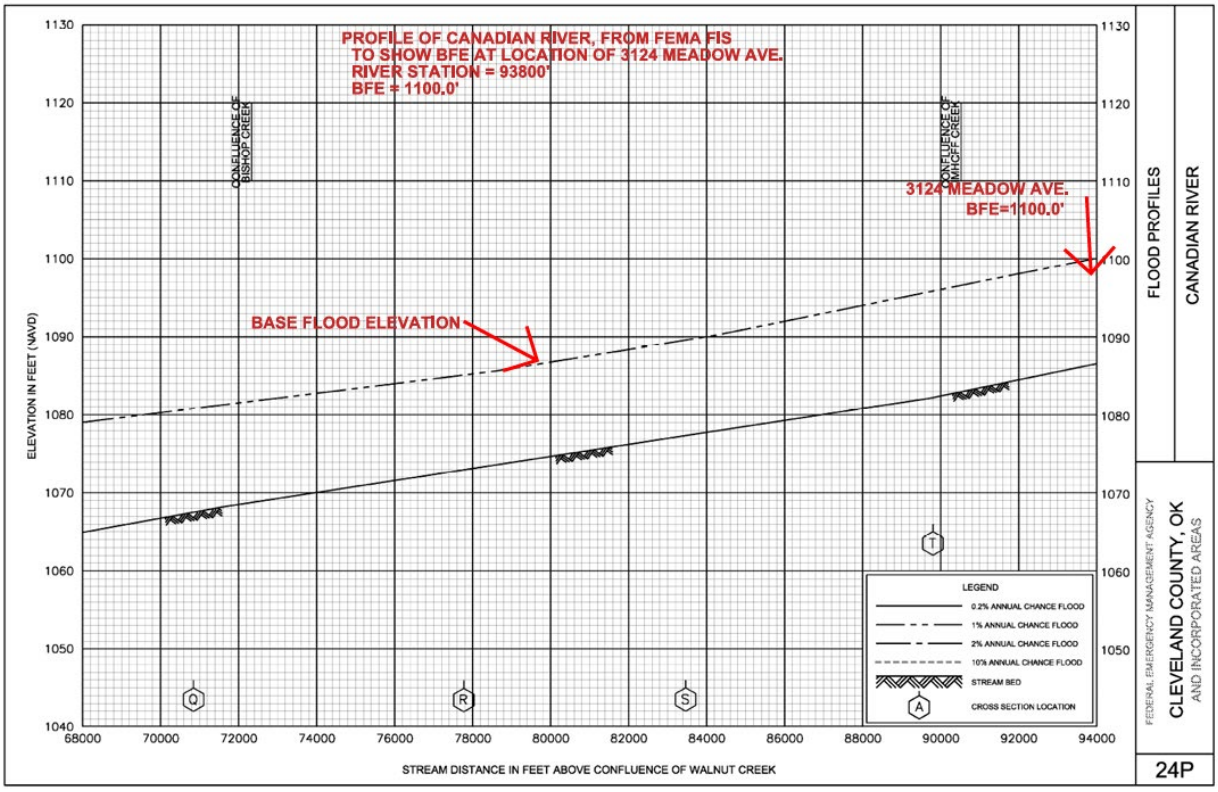
3124 MEADOW AVENUE
ELEVATIONS FOR REVIEWER




3124
MEADOW AVE.
VIEW OF WEST SIDE (BACK OF UNIT)
3124 MEADOW AVE.
THIS IS 4 UNIT CONDO. THIS UNIT IS SECOND FROM SOUTH. UNIT 3216 IS TO THE RIGHT.
NEW FENCE
NEW FENCE
NEW CONCRETE PATIO SLAB.
NEW FENCE
GOLF COURSE PROPERTY


3124 MEADOW AVE
Write a description for your map.
Legend
3124 Meadow Ave
K. S. Oil Company, Inc
3124 Meadow Ave
The Trails Golf Club of Norman
Canadian River
W Imhoff Rd
Imhoff Rd
E Imhoff Rd
E Constitution St
Sooner Rd
San Noble Oklahoma Museum of...
Goldsby Gaming Center
W Wilkins Hill Rd
Blue Compass RV Oklahoma City...
Google Earth
Image Landsat / Copernicus
1 mi
N


MEADOW AVE
TRAILS CT
1103
1104
1102
1101
1100
1099
1098
1097


PROFILE OF CANADIAN RIVER, FROM FEMA FIS
TO SHOW BFE AT LOCATION OF 3124 MEADOW AVE.
RIVER STATION = 93800'
BFE = 1100.0'
CONFLUENCE OF BISHOP CREEK
CONFLUENCE OF MIMOFF CREEK
3124 MEADOW AVE.
BFE=1100.0'
BASE FLOOD ELEVATION
ELEVATION IN FEET (NAVD)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE OF WALNUT CREEK
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
CANADIAN RIVER
FEDERAL EMERGENCY MANAGEMENT AGENCY
CLEVELAND COUNTY, OK
AND INCORPORATED AREAS
24P


3124 MEADOW AVE
PHOTO TAKEN BEFORE OUTSIDE WORK COMMENCED
PATIO BLOCKS
SIDE FENCE NOT INSTALLED YET


CLUB HOUSE
GOLF COURSE
NORTH
FENCE
WEST FENCE
GATE
SOUTH FENCE
MANHOLE &
BRICK FLOWER BED
BACK YARD
OF 3124


UNIT 3124
NORTH FENCE
LOCATION WHERE OWNER OF UNIT 3122 SAID WATER USED TO FLOW FROM HIS YARD.

STAFF REPORT 10/21/2024 **PERMIT No. 704**

ITEM: Floodplain Permit application for the construction of a patio and installation of a fence at 3126 Meadow Ave. in the Canadian River floodplain.

BACKGROUND:
APPLICANT: Cynthia Pichot
ENGINEER: Gary Keen, P.E.

The applicant owns a condo that is one of four units in the same structure on the fringe of the Canadian River floodplain. The applicant had portions of the backyard excavated to prevent flood waters from backing up into the residence, then pavers and various raised flower beds, planters, etc. were installed in the yard. Additionally, there was fencing built around the perimeter of the yard. This work was completed without a floodplain permit as the applicant wasn't aware that one was needed. There is a FEMA approved LOMA on the structure but it does not cover the backyard.

For this permit application, the applicant has proposed that the fence be cut off at the elevation of the BFE and either wire mesh replaced in that section or left open. Since the applicant and the contractor for the work completed at this address have indicated that approximately 4 to 6 inches of soil were removed when renovations were done, there is likely a net negative fill for this location as indicated in the engineer report. However, the applicant's engineer is proposing the removal of several of the borders created with landscape blocks to ensure that fill volume in the floodplain has not increased. There is also a small berm in the southwest corner of the yard that is being recommended for removal. A complete description of the proposed work and evidence of historical conditions are included in the engineer's report attached to the application.

The applicant's engineer also provided a detailed report related to drainage across this property onto and from adjacent properties. Detailed surveying was done of this property and adjacent properties (3122 and 3124 Meadow Ave.). That report indicates that drainage should occur south and east across the 3124 Meadow Ave and should not hinder flow off of adjacent properties.

STAFF ANALYSIS:
Site located in Little River Basin or its Tributaries? Yes __ no ✓

According to the DFIRM, the patio and fence were installed on the fringe of the Canadian River floodplain. The BFE at the planned location is approximately 1100.0'.

Applicable Ordinance Sections:		Subject Area:
36-533	(e)2(a) …..……..	Fill Restrictions in the Floodplain
	(e)2(e) ……	Compensatory storage
	(e)(3)(j)...…….	Fencing in the floodplain
	(f)3(a)8 …….	No Rise Considerations

(e)2(a) and (e)2(e) - Fill Restrictions in the Floodplain and Compensatory Storage – The use of fill in the floodplain is restricted. However, the placement of fill is allowed to elevate structures if compensatory storage is provided.

Since this work was performed without a floodplain permit, determining fill amounts is difficult in this case. Based on reports from the applicant and the contractor who completed the work, there was significant fill removed from the floodplain to facilitate the moving stormwater away from the residence. Photos were provided of a gas meter that appears to show that approximately 4 inches of soil depth was removed. No complaints have been filed to indicate that any new flooding or capacity loss has

occurred. The engineer report indicates that some of the additional borders blocks and a small earthen berm be removed. Calculations show in the report that an estimated 4.6 cubic yards of storage was created as a result of the work completed.

(e)(3)(j) Fencing in the Floodplain – All new fences or replacement of existing fences in the SFHA require a floodplain permit. Approved fences shall be designed and installed to be breakaway or in some other manner so that flows will not be impeded.

The applicant has proposed to remove the sections of the fence below the BFE and install a wire mesh type fence along this section. This would allow the free flow of flood waters and meet this ordinance requirement.

5(a)(viii) No Rise Considerations – For proposed development within any flood hazard area (except for those designated as regulatory floodways), certification that a rise of no more than 0.05 ft. will occur in the BFE on any adjacent property as a result of the proposed work must be provided. For proposed development within a regulatory floodway, certification of no increase in the BFE is required.

The engineer has certified that the project will not cause a rise of more than 0.05 feet to the BFE which meets this ordinance requirement.

RECOMMENDATION: Staff recommends that Floodplain Permit Application #703 be approved with the following condition:

1. Images should be taken before any work is started and after work has completed to help City staff verify that the work was done in accordance with the proposal.

ACTION TAKEN: _____

City of Norman

Floodplain Permit Application

Floodplain Permit No. 704

Building Permit No. _____

Date 10/21/2024

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: CYNTHIA KAY PICHOT ADDRESS: 3126 MEADOW AVE, NORMAN, OK 77072-7420
TELEPHONE: (405)414-3196 SIGNATURE: Cynthia Kay Pichot

BUILDER: CYNTHIA KAY PICHOT ADDRESS: 3126 MEADOW AVE, NORMAN, OK 77072-7420
TELEPHONE: (405)414-2196 SIGNATURE: Cynthia Kay Pichot

ENGINEER: EARL GARY KEEN, PE ADDRESS: P. O. BOX 891200, OKLAHOMA CITY,OK 73189
TELEPHONE: (405) 823-8240 SIGNATURE: Earl Gary Keen

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.

DIRECTIONS TO SITE: FROM INTERSECTION OF BERRY ROAD AND HIGHWAY 9, GO SOUTH ON BERRY ROAD TO MEADOW AVENUE. TURN RIGHT ON MEADOW AVENUE FOR APPROXIMATELY ONE BLOCK. 3126 IS ON THE LEFT. IT IS THE SOUTHERNMOST UNIT IN A CONDO OF FOUR UNITS. LEGAL DESCRIPTION: SMOKING OAKS SOUTH 3 LT 1 AND 2 BLK 3 UNIT 3126 SUNSET TRAILS DEVELOPMENT ASSOCIATION

DESCRIPTION OF WORK (Check all applicable boxes):

A. STRUCTURAL DEVELOPMENT

ACTIVITY	STRUCTURE TYPE
☐ New Structure	☒ Residential (1-4 Family)
☐ Addition	☐ Residential (More than 4 Family)
☒ Alteration	☐ Non-Residential (Flood proofing? ☐ Yes)
☐ Relocation	☐ Combined Use (Residential & Commercial)
☐ Demolition	☐ Manufactured (Mobile) Home
☐ Replacement	☐ In Manufactured Home Park? ☐ Yes

ESTIMATED COST OF PROJECT $_____ 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.

WORK IS MAKING IMPROVEMENTS TO PATIO AREA LOCATED IN BACK YARD OF THIS UNIT. SOME WORK WAS DONE PRIOR TO GETTING F.P. PERMIT. ADDITIONAL WORK IS REQUIRED TO GAIN COMPLIANCE AND TO QUALIFY FOR REQUESTED F.P. PERMIT. WORK COMPLETED INCLUDED REMOVAL OF SOIL TO LOWER THE ELEVATION TO PREVENT FUTURE FLOODING OF STRUCTURE. THEN PATIO BLOCKS, BRICKS, ROCK BORDERS AND DECORATIVE ROCK (GRAVEL) WERE PLACED FOR AESTHETIC IMPROVEMENTS. VARIOUS PLANTS WERE PROVIDED AND MOST OF THE PLANTS ARE IN PLANTER BEDS ON LEGS. SEE ENGINEER'S STATEMENT AND CONTRACTOR'S STATEMENT FOR MORE INFORMATION.

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.
A SITE PLAN IS PROVIDED TO SHOW THE YARD AND EXISTING ELEVATIONS.

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:
THE FLOODPLAIN OF THE IMPACTING STREAM IS MORE THAN 1/2 MILE WIDE AND THIS WORK IS LOCATED AT THE EDGE OF THE FLOODPLAIN.

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:
NOT A NEW SUBDIVISION DEVELOPMENT. FEMA FIRM SHOWS B.F.E. TO BE 1100.00' (BY INTERPOLATIONS BETWEEN CROSS-SECTIONS ON FIRM).

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:
CONTOURS FROM THE NORMAN GIS INTERACTIVE MAP ARE SHOWN ON EXHIBIT. SURVEY SPOT ELEVATION ARE SHOWN IN THE WORK AREA (EXISTING ELEVATIONS).

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

☒ Not Applicable:
A STREAM PROFILE FROM THE FEMA FIS (STUDY) IS INCLUDED AS AN EXHIBIT.

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

☒ Not Applicable: THIS WORK IS OUTSIDE THE STRUCTURE. STRUCTURE HAS BEEN REMOVED FROM THE FLOODPLAIN BY FEMA APPROVED LOMA. HOWEVER, THE ELEVATION OF THE THRESHOLD AT THE DOORWAY AS SURVEYED IS SHOWN ON THE EXHIBIT.

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 WORK COMPLETED WAS DONE TO LOWER THE FLOODPLAIN AT THE OF THE DOORWAY OF THE STRUCTURE TO ELIMINATE FLOODING THAT HAS OCCURRED AS A RESULT OF LOCAL RAINFALL. THIS PROPOSAL INCLUDED REMOVING TWO BOTTOM BOARDS ON A CROSS-FENCE (SOUTHEASTERLY), RELOCATING OR LOWERING ROCK BORDERS REMOVING PART OF BOTTOM OF FENCE (WESTERLY). MINIMAL IMPACT ON F.P. WILL RE

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.
STATEMENT BY EARL GARY KEEN, PE 11438 IS INCLUDED IN DOCUMENTS.

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.
MANY PHOTOS OF THE SITE ARE SUBMITTED FOR REVIEW.
THE REQUIRED MAILING LIST IS INCLUDED IN THE EXHIBITS.

J. A copy of all other applicable local, state, and federal permits (i.e. U.S. Army Corps of Engineers 404 permit, etc). NO OTHER PERMITS ARE REQUIRED.

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.: 0280J, Dated: 1/15/2021

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 1100.8' Ft. NGVD (MSL) ☐ Unavailable

See Section 4 for additional instructions.

SIGNED: _____ **DATE:** 10/3/2024
10/9/24

SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by Permit Staff.)

The applicant must also submit the documents checked below before the application can be processed.

☐ Flood proofing protection level (non-residential only) _____ Ft. NGVD (MSL). For flood proofed structures applicant must attach certification from registered engineer.

☐ Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.

☐ Certification from a registered engineer that the proposed activity in a regulatory flood plain will result in an increase of no more than 0.05 feet in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.

☐ All other applicable federal, state, and local permits have been obtained.

Other: _____

_____

_____

SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Chairman.)

The proposed activity: **(A)** ☐ **Is**; **(B)** ☐ **Is Not** in conformance with provisions of Norman's City Code Chapter 22, Section 429.1. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED: _____ DATE: _____

If **BOX A** is checked, the Floodplain committee chairman may issue a Floodplain Permit.

If **BOX B** is checked, the Floodplain committee chairman will provide a written summary of deficiencies. Applicant may revise and resubmit an application to the Floodplain committee or may request a hearing from the Board of Adjustment.

APPEALS: Appealed to Board of Adjustment: ☐ Yes ☐ No

Hearing date: _____

Board of Adjustment Decision - Approved: ☐ Yes ☐ No

Conditions:

_____

_____

_____

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.

EARL GARY KEEN, PE
PO BOX 891200, OKLAHOMA CITY, OK 73189
(405) 823-8240

ENGINEERING REPORT
3126 MEADOW AVENUE., NORMAN, OK
RE. FLOODPLAIN PERMIT

Engineer's Certification

The site where this work is located is within the fringe area of the floodplain of the Canadian River, and the site is located outside the regulatory floodway.

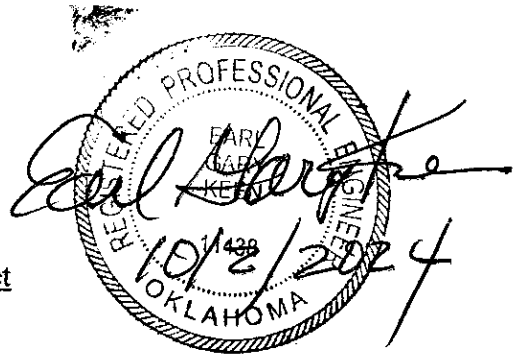
Some of the work shown at this location, in the floodplain, has already been completd. Additional work is proposed to remove potential obstruction to the flow of floodwaters across this property.

I Earl (Gary) Keen, PE, a professional licensed as such in the State of Oklahoma, PE 11438, do hereby certify that the work that has been completed (as modified by proposed modifications proposed in this floodplain permit application) will not result in an increase in the BFE of the impacting stream greater than 0.05 feet at this work site or at any location in the community.

The work proposed in this application has already been completed, and it is my professional opinion that this work has not resulted in any reduction in the storage capacity of the floodplain that exists on this site.

Signed and Sealed on this 2nd day of October, 2024.

Earl (Gary) Keen, PE
11438 PO Box 891200
Oklahoma City, OK 73189
Cell: (405) 823-8240
Email: garykeen47@att.net



EARL "GARY" KEEN, PE
P. O. BOX 89100
OKLAHOMA CITY, OK 73189
405-823-8240
Email: garykeen47@att.net

Engineer's Report
3126 Meadow Avenue
Norman, OK

INTRODUCTION

The residence located at 3126 Meadow Avenue is part of a structure that contains four units having separate ownership, which is a condo-type arrangement. This structure is located in a very attractive area that back up to The Trails Golf Course. This structure is located at the extreme easterly edge of the floodplan of the Canadian River. The floodplain of this river is more than a mile wide and part of it is located in an adjacent municipality. This structure was constructed prior to implementation of all of the current floodplain regulations; therefore this structure was constructed with the elevation of the lowest flood being lower than would be permitted today. Actually, this structure is not in the regulatory floodplain because the structure was removed from the floodplain by a LOMA approved some time ago by FEMA. However, the LOMA did not include the land located outside the structure. This engineer was requested to assist the owner in obtaining a Floodplain Permit from the City of Norman, and this report covers the activities of this engineer in regard to this matter.

Unfortunately, the owner had construction work done in the floodplain prior to obtaining the required Floodplain Permit, and this work include the removal of soil and the introduction of paving blocks, bricks, landscape blocks, etc. Since the earthwork was done before getting the permit, the engineer was deprived of the opportunity to obtain survey data to show the elevations of the ground under pre-construction conditions. Consequently, the reference data in regard to elevations is not directly available at this location.

INSPECTIONS

This engineer inspected this site on several occasions. The first time he visited the site was in 2022, At that time the owner had applied for a building permit to include substantial work on the interior of the residence at 3126. During the preliminary review of the building permit application, the staff decided that this work would require a Floodplain Permit prior to issuance of a building permit. Consequently, the owner contacted me and requested my assistance is applying for a FP permit. I went to the site along with my surveyor to get the necessary elevation data and other information needed to prepare a site plan. But, upon arriving at the site, I was informed that the City or somebody else had discovered a LOMA for this structure. Accordingly, the staff determined that the FP permit would not be required. Accordingly, we did not conduct a survey and I did not assist the owner at that time.

Since being notified by the City that a floodplain violation has occurred on her property, the owner contacted me again and requested my assistance in applying for a FP permit. I agreed to assist her in that effort, and that is why I am writing this application.

I recall from visiting the site in 2022 that the patio door threshold was only a short distance above grade at that time, but I do not recall specific details. Apparently, I did not take photographs at that

time.

Since being retained by the owner, I have assisted a licensed surveyor in making a detailed elevation survey of the back yard of this property and a detailed site plan. I took numerous photographs of this yard and surrounding area on multiple occasions. I even inspected the site during a minor rainstorm. A larger rainstorm was not available during daylight hours.

I have had multiple discussions with the contractor that did the work in the yard in an attempt to fully understand the pre-construction conditions and the work that was done. The contractor has been very cooperative, and I think he regrets the failure to obtain the FP permit in advance of the work.

The contractor is certain that the portion of the yard covered by the patio slab, as shown in photographs, is approximately four inches lower the historic ground in this yard. He stated that the owner gave his strict instructions that the ground elevation from the house to the gate must be lowered to prevent floodwater from getting into the residence around the patio door, as had happened before. The owner expressed the same concern to me and stated that I am to do everything that the City wants done, except that we should not place anything in the yard that would raise the ground. She is worried that raising the ground will cause stormwater runoff from local rainfalls to enter her residence as it has in the past. Incidentally, this area experience a major rainstorm event recently, and her residence remained completely dry; therefore, she is satisfied with the drainage improvement that her contractor did. The contractor mentioned two locations that he said show how much the patio slab was lowered. The first location is at the patio door. The current patio slab is about five inches below the threshold at the door, and he said that the original grade was only about one inch below the threshold. The second location that he referred to is the gas meter located in the decorative rock area a near the southwest corner of the patio area. He stated that prior to any excavation, the gas valve (shown in a photograph) was located with the bottom of the valve at ground level. This also indicates that the grade has been lowered about four inches.

I looked at the elevations of the ground beneath the rear fence on this yard. There is a slight ridge in the ground beneath this fence—about one inch high. West of this fence, the ground slops downward toward the golf course and away from the fence. I am recommending that a few shovels of soil be removed at this location to remove this ridge and promote drainage onto the golf course. In addition, this fence has vertical boards that extend a couple of inches below the horizontal 2 x4 plank that supports the vertical boards. I am recommending that the vertical boards be sawed-off at the bottom of the 2x4 plank to increase the opening onto the golf course and to provide a greater path for water to flow from this yard. Removing soil and cutting-off the boards will increase the opening under this fence by approximately three inches.

FLOODPLAIN DISCUSSION

The floodplain at this location is connected to the Canadian River and is very wide as mentioned previously. The flow of the river at this point is basically from the north-west to the south-east, which is parallel to the rear yard fences associated with this condo structure, that contains units with house addresses of 3120, 3122, 3124 and 3126. All of the yards have back yard fences of various ages. A portion of these fences is actually located on ground that is higher then the BFE. These fences will a minuscule impact on the floodplain because the fence runs parallel to the direction of flow of the floodplain. Cross-fences will have a much greater impact. Floodplain permits applications are being prepared for units 3124 and 3126 Meadow Avenue, and it is recommended that cross-fences associated with these properties be modified by removing the portion of these fences that extend below the BFE

(1100.00' per the FEMA FIS). Cross-fences on the other two properties are not addressed herein.

ESTIMATED VOLUME OF STORMWATER STORAGE GAINED FROM WORK PERFORMED

As stated previously, there are not precise ground elevations to show the ground elevations in the yard of this unit prior to the construction of the fence, patio slab and other improvements, as discussed herein and shown on photos submitted along with other exhibits. But, two points that appear to be adequate for making an estimate of soil volumes and stormwater storage have been identified. Accordingly, an estimated that is believed to be reasonable is hereby submitted.

The area of the patio (covered by patio blocks) is 320 square feet. The area of the decorative rock is 213 square feet. Other areas of the yard appear to be at original grade. According to the contractor, no fill material or sod was brought in. And, all of the soil dug-out was hauled off.

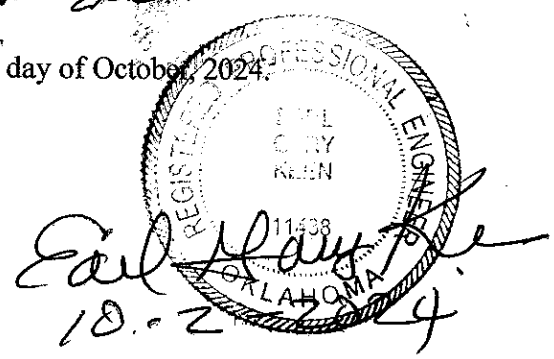
On the patio area, the estimate excavated soil is 5.9 cubic yards, a average depth of six inches. The estimated volume of soil excavated for the decorative rock is 3.3 cubic yards. The volume of additional stormwater storage created is 2.0 cubic yards and 1.3 cubic yards, respectively, for a total additional stormwater storage of 4.6 cubic yards. Incidentally, the volume of flower pots setting on the ground, etc.,which is negligible was ignore.

RECOMMENDED CORRECTIVE ACTION ON 3126 MEADOW AVENUE

1. Cut off the cross-fence on the north-side of unit 3126. This fence was constructed by the owner of unit 3124 (shared fence) and it is understood that the owner of unit 3124 is proposing to cut-off this fence at the elevation of the BFE (1100.00'). Wire fencing having large openings between wires may be placed across the open area below the fence if desired by owner. The work required on this fence will be included in a FP to be submitted for Unit 3124.
2. Remove the two bottom boards of the wooden fence existing along the SE property line, between Unit 3126 and the adjacent parking lot. Boards are to be removed from the corner of the residential structure to the west end of the fence. This will cause the bottom of the fence to be higher than the BFE. Wire fencing may be placed if desired, as described in (1) above.
3. Several borders have been created on the yard of Unit 3126 using landscape blocks of various types. These borders are slightly higher than the adjacent ground and it is recommended to either remove or lower these blocks or replace with existing blocks with shorter blocks. Such blocks are located: (a) Around small flower bed at the extreme SW corner of the yard. (b) Across the deco rock area and east of the gas meter. (c) Parallel to the easterly fence and these blocks should be removed or lowered from a point adjacent to the SW corner of the residential structure on Unit 3126 to the westerly end of this row of border blocks.
4. Cut off the fence along the property line with The Trails Golf Course at the bottom of the lower 2x4 plank, which run along the fence and parallel to the ground. This will create approximately two inches of open space beneath the fence. A slight earthen ridge exists under part of this fence, and this ridge is approximately one inch in height. Remove this ridge, which will require removing approximately one-fourth cubic yard of soil. Removing this ridge will add

approximately one inch of additional open space beneath this fence and will result in a total open space of approximately three inches below this fence. The ground immediately west of this fence slopes downward across the golf course, and drainage from the yard at Unit 3126 will be promoted. This proposed work will reduce the chances of stormwater ponding on the yard of Unit 3126.

Signed and Sealed on this 3th day of October, 2024.

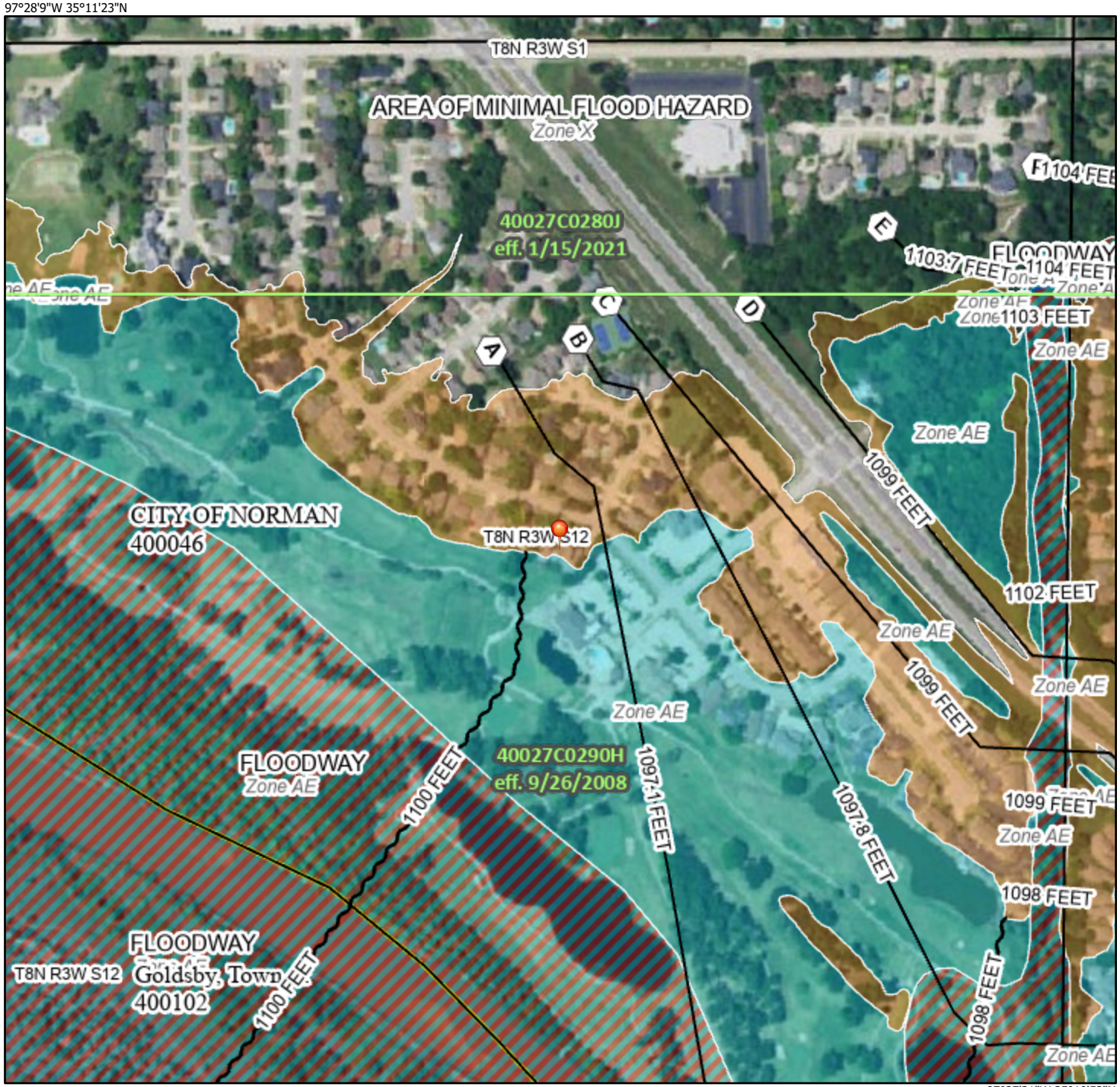


Earl (Gary) Keen, PE
11438 PO Box 891200
Oklahoma City, OK 73189
Cell: (405) 823-8240

Email: garykeen47@att.net

National Flood Hazard Layer FIRMette

97°28'9"W 35°11'23"N



97°27'31"W 35°10'53"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR F UT

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, Areas 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 D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 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

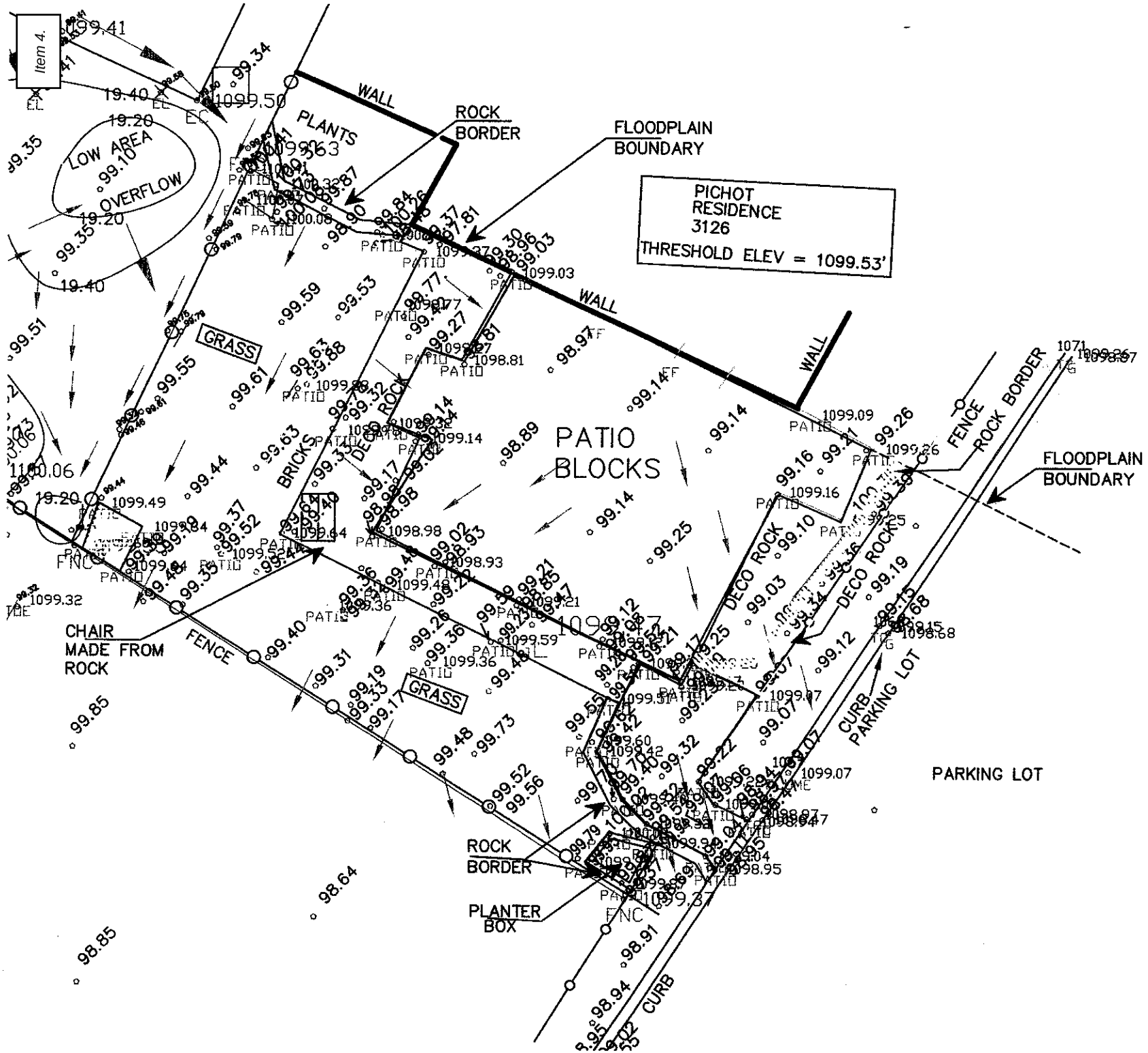
N

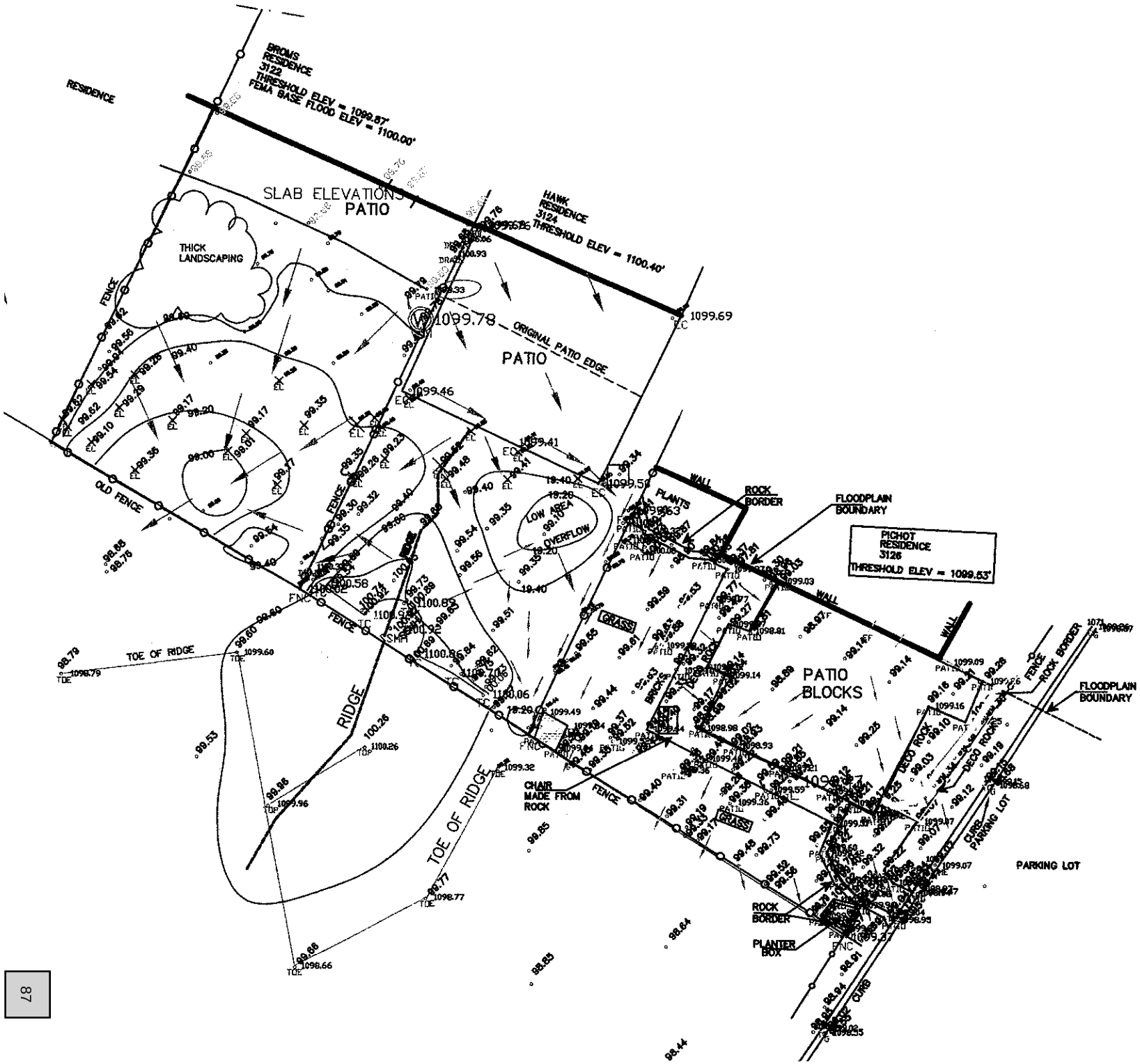
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

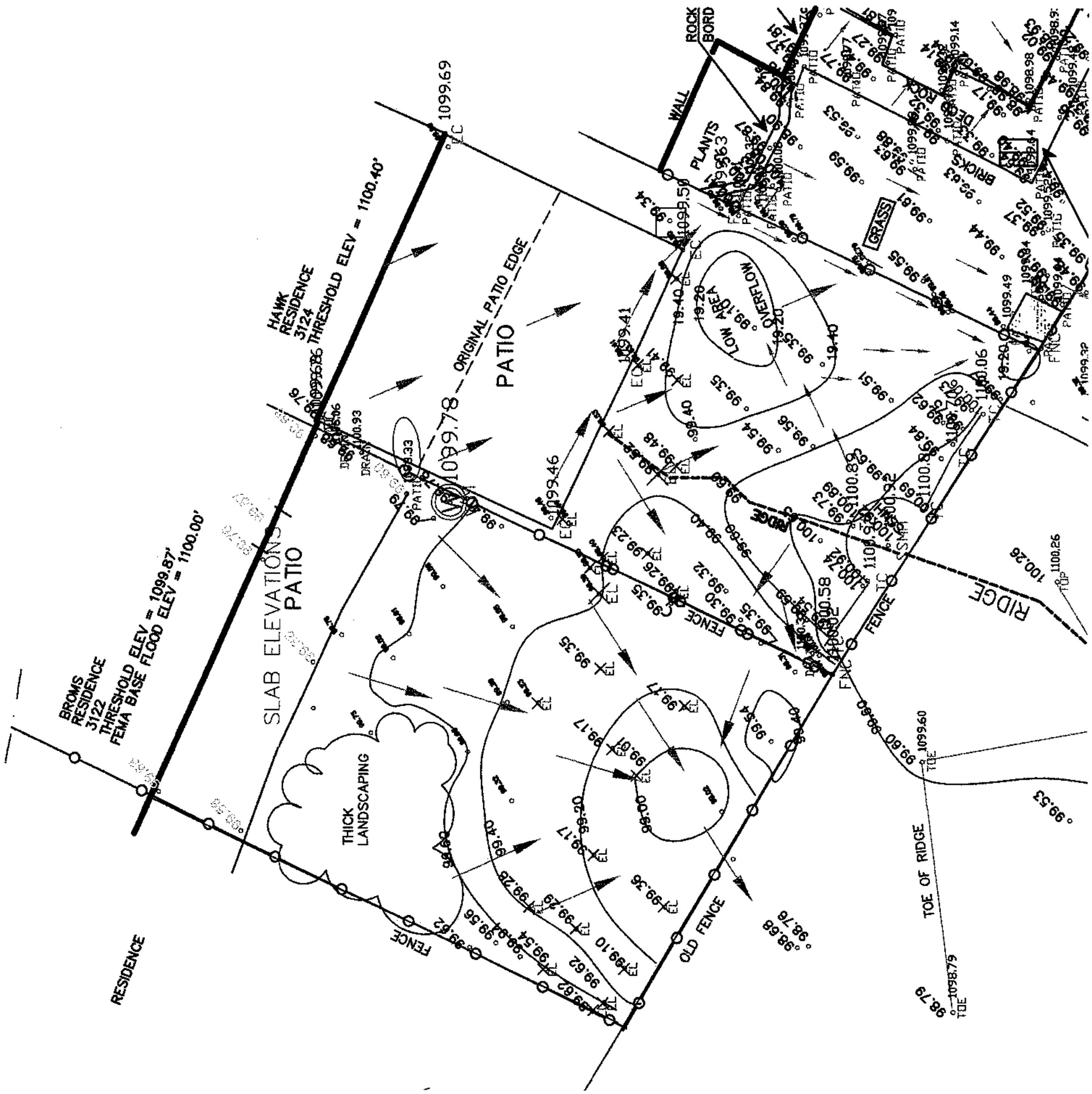
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/28/2024 at 12:19 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.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community ide FIRM panel number, and FIRM effective date. Map in unmapped and unmodernized areas cannot be used regulatory purposes.

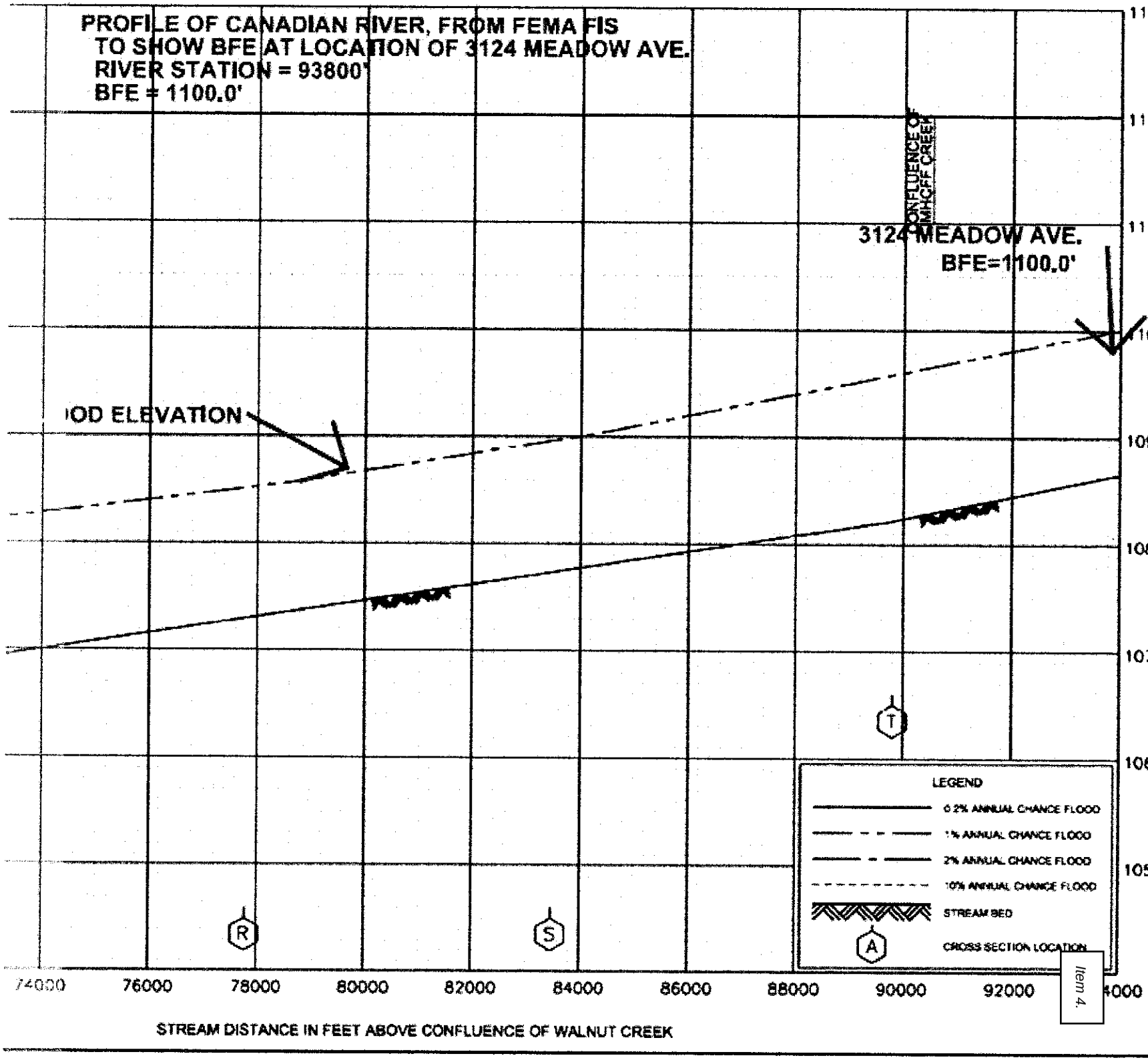

PICHOT
RESIDENCE
3126
THRESHOLD ELEV = 1099.53'
FLOODPLAIN
BOUNDARY
WALL
ROCK
BORDER
PLANTS
LOW AREA
OVERFLOW
GRASS
PATIO
BLOCKS
BRICKS
DECO ROCK
FENCE
CHAIR
MADE FROM
ROCK
ROCK
BORDER
PLANTER
BOX
CURB
PARKING LOT
PARKING LOT


BROMS RESIDENCE 3122 THRESHOLD ELEV = 1099.87 FEMA BASE FLOOD ELEV = 1100.00'
HAWK RESIDENCE 3124 THRESHOLD ELEV = 1100.40'
PICHOT RESIDENCE 3126 THRESHOLD ELEV = 1099.53'
SLAB ELEVATIONS
PATIO
THICK LANDSCAPING
1099.78 - ORIGINAL PATIO EDGE
PATIO
LOW AREA OVERFLOW
PLANTS
WALL
ROCK BORDER
FLOODPLAIN BOUNDARY
PATIO BLOCKS
FENCE
OLD FENCE
TOE OF RIDGE
RIDGE
CHAIR MADE FROM ROCK
GRASS
DECO ROCKS
CURB
PARKING LOT
PLANTER BOX


HAWK
RESIDENCE
3124
THRESHOLD ELEV = 1100.40'
BROMS
RESIDENCE
3122
THRESHOLD ELEV = 1099.87'
FEMA BASE FLOOD ELEV = 1100.00'
SLAB ELEVATIONS
PATIO
ORIGINAL PATIO EDGE
PATIO
THICK
LANDSCAPING
RESIDENCE
FENCE
OLD FENCE
LOW AREA
OVERFLOW
GRASS
PLANTS
WALL
ROCK
BORD
BRICKS
RIDGE
TOE OF RIDGE

W STATE HWY 9 HWY
CONESTOGA DR
S BERRY RD
TRAILS CT
MEADOW AVE
OLD FARM RD

MEADOW AVE
FRALEY CT


PROFILE OF CANADIAN RIVER, FROM FEMA FIS
TO SHOW BFE AT LOCATION OF 3124 MEADOW AVE.
RIVER STATION = 93800'
BFE = 1100.0'
CONFLUENCE OF MM HOFF CREEK
3124 MEADOW AVE.
BFE=1100.0'
OD ELEVATION
T
R
S
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
A
CROSS SECTION LOCATION
74000
76000
78000
80000
82000
84000
86000
88000
90000
92000
STREAM DISTANCE IN FEET ABOVE CONFLUENCE OF WALNUT CREEK


NORTH FENCE
BUILT BY 3124
BRICK
WALK
PATIO SLAB
DECO ROCK
REMOVE CONC. BLOCKS
OR LOWER TO GRADE
XXX


PATIO DOOR
(PATIO SLAB REPORTED
TO BE LOWERED 4")
XXX
PATIO SLAB
DECO ROCK


PATIO DOOR
(PATIO SLAB REPORTED
XXXX
FLOWER BED BORDER
(REMOVE OR LOWER)
BRICK WALK
XXX
DECO ROCK
PATIO SLAB


BRICK WALK
XXX
GROUND REPORTEDLY LOWERED 4" + AT GAS VALVE.
DECO ROCK


3126
BACK FENCE
PLANTER BOX
PRIVATE GAS LINE
BRICK WALK
XX
DECO ROCK
XX BLOCKS TO REMOVE
PATIO SLAB


3126
PLANTER BOX
BRICK WALK
ROCK CHAIR
(NEEDS CUSHION)
XX
XX BLOCKS TO
REMOVE
PATIO SLAB
DECO ROCK


CLUB HOUSE
SE FENCE
REAR FENCE
REMOVE 2 BOTTOM BOARDS
BRICK WALK
PATIO SLAB


CLUB HOUSE
SE FENCE
REAR FENCE
REMOVE 2 BOTTOM BOARDS
BRICK WALK
PATIO SLAB


SE FENCE
REMOVE 2
BOTTOM
BOARDS
REMOVE CONC. BLOCKS
XXX
XXXX
XXXXX
X
X
X
BRICK
WALK
DECO ROCK
PATIO SLAB


SE FENCE
REMOVE 2
BOTTOM
BOARDS
REMOVE CONC. BLOCKS
XXX
XXXX
XXXXX
X
X
X
BRICK
WALK
DECO ROCK
PATIO SLAB


SE FENCE
REMOVE 2
BOTTOM
BOARDS
REMOVE CONC. BLOCKS
OR LOWER TO GRADE
XXX XXXX XXXXX
XXX XXXXX
DECO ROCK
PATIO SLAB


SE FENCE
REMOVE 2
BOTTOM
BOARDS
REMOVE CONC. BLOCKS
OR LOWER TO GRADE
XXX XXXX XXXXX
XXX XXXXX
DECO ROCK
PATIO SLAB


3126
SOUTH FENCE
(REMOVE
BOARDS)
PATIO SLAB


3126
NORTH FENCE
BRICK
WALK


3126
PATIO DOOR
PATIO SLAB


3126
SOUTH FENCE
(VIEW FROM
PARKING LOT)
(REC . REMOVE
TWO BOARDS)


3126
CONC. BLOCKS
(REMOVE
SOME)
XXX


JUST SWINGING IN THE GRASS....
3124 FENCE (REMOVE BELOW BFE)
RAISED PLANTER BOXES
3126
BRICK WALK
PATIO SLAB


JUST SWINGING IN THE GRASS....
3124 FENCE (REMOVE BELOW BFE)
RAISED PLANTER BOXES
3126
BRICK WALK
PATIO SLAB


3124 FENCE
(REMOVE BELOW
BFE)
XXX
ROCK
CHAIR
DECO ROCK
3126


3124 FENCE
(REMOVE BELOW
BFE)
XXX
ROCK
CHAIR
DECO ROCK
3126


3124 FENCE
(REMOVE BELOW
BFE)
XXX
ROCK
CHAIR
DECO ROCK
3126


BACK FENCE
3126
PLANTER BOX
BRICK WALK

STAFF REPORT 10/21/2024 **PERMIT NO. 705**

ITEM: Floodplain Permit application for proposed elevation of a residential structure and the installation of a fence in the floodway of Imhoff Creek.

BACKGROUND:
APPLICANT: Swift Acquisition Partners
BUILDER: SH Renovations
ENGINEER: Urban James Engineering, Uwem Ekpenyong P.E.

The house at 454 W Tonhawa is located in the floodway of Imhoff Creek north of Main Street. It is a single story residence built in 1950 that is approximately 999 square feet. The property was purchased in August of 2024 at which point the owner was advised that a floodplain permit would be required to renovate. The interior of the structure has been stripped down to studs. Cost of renovations are estimated at $101,000. According to the County Assessor, the value of the structure is $75,275 making the percent cost of improvement 135% of the market value of the structure. The applicant, is aware that this project will be considered substantial improvement and require bringing the structure into full compliance with the Flood Hazard Ordinance.

Detailed engineering plans are included in the packet submitted with the application. The BFE for this location is 1158.0'. According the EC submitted with the application, the lowest floor is 1156.0' currently. The plans indicate that the structure will be elevated so that the lowest floor is 2.25' above the BFE or 1160.3'. The plans also indicate that 1113 square inches of flood venting will be provided.

In addition, the applicant is proposing the installation of a privacy fence. The fence would be a standard wooden privacy fence with the bottom section being composed of framed chain link sections to allow for water to freely flow through the area below the BFE. The applicant's engineer has calculated that 1.49 cubic yards of fill will need to be removed from the site to provide the necessary compensatory storage for the deck and fence.

The applicant submitted alternative plans that would still elevate the residence and install the fencing as listed above, but it would remove the decks from the front and rear of the house and instead install concrete steps and an at grade concrete patio. Those plans are in the committee packet as "Alternative Plan Set". This alternative would require 3.99 cubic yards of compensatory storage that would be created expanding the proposed swale as indicated on the plans. This additional storage is required for the steps leading to the structure. The concrete patio would be installed at grade with spoils removed from the floodplain. The applicant has indicated that their preference would be the original proposal with the decks.

STAFF ANALYSIS:
Site located in Little River Basin or Tributaries? yes__ no✓

According to the latest DFIRM, this project is located in the floodway of a tributary of Imhoff Creek (Zone AE).

Applicable Ordinance Sections:		Subject Area:
36-533	(e)(2)(a) ..……..……..	Fill restrictions in the floodplain
	(e)(2)(e) ...…….	Compensatory storage
	(e)(2)(j) ...…….	Utilities constructed to minimize flood damage
	(e)3(a) ……..…...……	Elevation of Structures
	(f)(3)(8) …….....	No rise considerations

(e)(2)(a) and (e)(2)(e) Fill Restrictions in the Floodplain and Compensatory Storage – The use of fill is restricted in the floodplain unless compensatory storage is provided.

> The applicant has provided calculations of the new volume occupied by fence and deck and indicated that the appropriate volume will be removed from the SW section of the yard by creating a 20'x 6' x 4" swale which equals 1.49 cubic yards. If the alternative plans are utilized instead, a 30' x 11' x 4" swale would be create to create the 3.99 cubic yards of compensatory storage meeting this requirement.

(e)2(j) - All new construction or substantial improvements shall be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

> The applicant has indicated all electrical and utility structures will be installed at least 2' above the BFE.

(e)3(a) Elevation of Structures – Residential structures shall be constructed on fill including any attendant utility and sanitary facilities, shall be designed so that the lowest floor (including basement) is elevated at least two feet above base flood elevation and the fill shall be at a level no lower than 1 foot above the base flood elevation for the particular area and shall extend at such elevation at least (15) fifteen feet beyond the limits of any structure or building erected thereon.

> The project engineer has indicated that the existing structure will be elevated so that the lowest floor elevation is 2.25' above the BFE.

(f)(3)(8) No Rise Considerations – For proposed development within any flood hazard area (except for those designated as regulatory floodways), certification that a rise of no more than 0.05 ft. will occur in the BFE on any adjacent property as a result of the proposed work is required.

> The project engineer has indicated in their No-Rise statement that this activity will cause no rise on any adjacent property.

RECOMMENDATION: Staff recommends Floodplain Permit Application #705 be approved with the following conditions:

1. Elevation Certificate provided for the residential structure prior to final acceptance. Elevation of electrical and mechanical components should also be provided and verified by staff.
2. As built drawings need to be provided to verify compensatory storage area requirements have been met for either alternative. Staff will also confirm that flood venting meets requirements of the ordinance.

ACTION TAKEN: _____

City of Norman

Floodplain Permit Application

Floodplain Permit No. 705

Building Permit No. _____

Date ~~9/30/2024~~ 10/21/2024

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: Swift Acquisition Partners ADDRESS: 2125 Whiteoak Cir. Norman, OK 73071

TELEPHONE: 4054351002 SIGNATURE: Signed by: C18F005075334...

BUILDER: SH Renovations ADDRESS: 2125 Whiteoak Cir. Norman, OK 73071

TELEPHONE: 4054351002 SIGNATURE: DocuSigned by: Hunter Thompson

ENGINEER: Urban James Engineering ADDRESS: 505 Jean Marie Dr.Norman, OK 73069

TELEPHONE: (405) 243-0672 SIGNATURE: Signed by: Uwem Ekpenyong 70172CA1D47B40F...

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.

DESCRIPTION OF WORK (Check all applicable boxes):

A. STRUCTURAL DEVELOPMENT

ACTIVITY	STRUCTURE TYPE
☐ New Structure	☐ Residential (1-4 Family)
☐ Addition	☐ Residential (More than 4 Family)
☑ Alteration	☐ Non-Residential (Flood proofing? ☐ Yes)
☐ Relocation	☐ Combined Use (Residential & Commercial)
☐ Demolition	☐ Manufactured (Mobile) Home
☐ Replacement	☐ In Manufactured Home Park? ☐ Yes

ESTIMATED COST OF PROJECT $ 101,000 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.

See attachment A.

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:
A culvert is located adjacent to the property in the same floodplain. However, it is not part of this project, and no work will be performed on or around the culvert.

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:
does not involve a large subdivision or 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:
Topo map included in plans.

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

☑ Not Applicable:
does not involve work in or near a channel or stream

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

☐ Not Applicable:
Included on plans.

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:

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.

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.: 0280J, Dated: 1/15/2021

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 1158.0' Ft. NGVD (MSL) ☐ Unavailable

See Section 4 for additional instructions.

SIGNED: _____ **DATE:** ~~9/30/2024~~ 10/9/2024

SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by Permit Staff.)

The applicant must also submit the documents checked below before the application can be processed.

☐ Flood proofing protection level (non-residential only) _____ Ft. NGVD (MSL). For flood proofed structures applicant must attach certification from registered engineer.

☐ Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.

☐ Certification from a registered engineer that the proposed activity in a regulatory flood plain will result in an increase of no more than 0.05 feet in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.

☐ All other applicable federal, state, and local permits have been obtained.

Other: _____

_____

_____

SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Chairman.)

The proposed activity: **(A)** ☐ **Is**; **(B)** ☐ **Is Not** in conformance with provisions of Norman's City Code Chapter 22, Section 429.1. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED: _____ DATE: _____

If **BOX A** is checked, the Floodplain committee chairman may issue a Floodplain Permit.

If **BOX B** is checked, the Floodplain committee chairman will provide a written summary of deficiencies. Applicant may revise and resubmit an application to the Floodplain committee or may request a hearing from the Board of Adjustment.

APPEALS: Appealed to Board of Adjustment: ☐ Yes ☐ No

Hearing date: _____

Board of Adjustment Decision - Approved: ☐ Yes ☐ No

Conditions:

_____

_____

_____

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.

Monday, September 30, 2024

Hunter Thompson
Owner, SH Renovations, LLC
(405)310-2064 | (405)435-1002
hunter@shrenovations.org
www.shrenovations.org

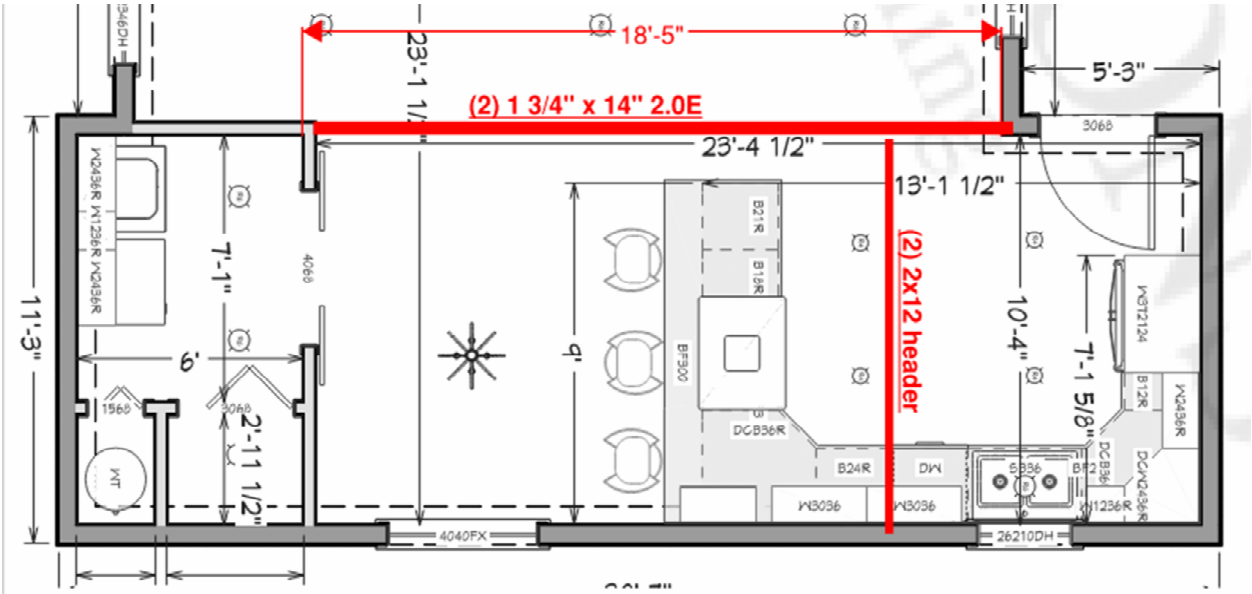
Subject: Structural Evaluation and Recommendation
454 W Tonhawa St.
Norman, OK, 73069

Mr. Hunter Thompson,

Thank you for contacting me regarding the renovation at 454 W. Tonhawa Street. As I understand, the City of Norman needs confirmation that the headers you will install to replace two bearing walls will be adequate for the renovation. Additionally, since the home is in a FEMA designated Floodway, the City of Norman requires an engineer to verify that the construction/renovation will not cause a change to the Base Flood Elevation of adjacent properties.

Header Evaluation

You are proposing to install a new double 1 3/4"x14" 2.0E LVL spanning 18'-5" that will replace the bearing wall between the existing living room and garage. Additionally, you are proposing to replace the bearing wall between the existing kitchen and laundry room with a double 1 3/4" x 7 1/4" 2.0E LVL header that will span 10'-4". **These headers are adequate for the intended construction.**



No Rise Statement

This statement is provided as part of a floodplain permit application to the City of Norman for the renovation of the home located at 454 W. Tonhawa St. in Norman. The renovations will not change the perimeter of the structure, nor require a change to the grading of the property. I observed that the grading of the site is sloped to an existing culvert that is on the west side of the property.

As I understand the existing finished floor elevation falls approximately 4" below the Base Flood Elevation established by FEMA. Consequently, the home will need to be raised as part of the renovations you are performing. The existing foundation system of concrete stem walls and CMU piers can be extended up to 2'-8" using the same materials. This allowance should allow for a floor elevation of 2'-0" or more above the BFE. This would give ample room for structural, electrical, and mechanical underfloor elements to be installed above BFE.

Finally, after elevating the home, there will be approximately 40 cubic feet of structure left in the floodway, below BFE. By providing a swale on the south side of the property as your plans indicate, the flood level will be reduced to levels before the original construction of the structure.

Closing:

Thank you again for the opportunity to provide a structural evaluation and report. Photos taken during my site observations are available on request. If you have any questions or if I may be of any more assistance, please let me know.

Kind regards,

Uwem J. Ekpenyong P.E.
Urban James Engineering

Detailed Description of Proposed Work

Project Overview: The **Tonhawa Home Revival** project at 454 W Tonhawa Ave will combine floodplain compliance efforts with a comprehensive remodel. The objective is to raise the structure above the Base Flood Elevation (BFE) while simultaneously upgrading the home's interior and exterior. All engineering and permits are in place to ensure compliance with both floodplain management regulations and local building codes.

Floodplain Compliance Scope:

The project involves elevating the structure and modifying the surrounding area to meet floodplain requirements. Specific floodplain-related work includes:

1. **Elevation of Structures:**
    - The lowest floor will be raised at least 2' above the BFE requirements of 1158 feet. This includes the decks and other external structures to ensure they are compliant with floodplain regulations.
2. **Fill Management:**
    - Approximately 1.49 cubic yards of fill will be removed to balance the impact of structures below the BFE. The grading around the property will be adjusted to ensure proper drainage and compliance with floodplain regulations. The final grading and fill removal plan will ensure that no additional flood risk is posed to neighboring properties.
3. **Deck and Fencing Adjustments:**
    - The two decks will be raised in accordance with the BFE requirements. A 6' privacy fence with breakaway sections will be installed around the backyard to comply with floodway regulations.
4. **Concrete and Landscaping:**
    - New sidewalks and driveway will be installed, ensuring compliance with floodplain drainage and structural requirements.

Remodel Scope of Work:

Structural and Exterior Work:

- The renovation will start with the removal of existing siding, kitchen cabinets, and doors.
- Structural work includes leveling the floor on the northeast side, installing new ceiling rafters, and adding an LVL beam to transfer the load as required.
- The exterior will be updated with new siding, painted in a single color with white trim, and new front and back doors will be installed.

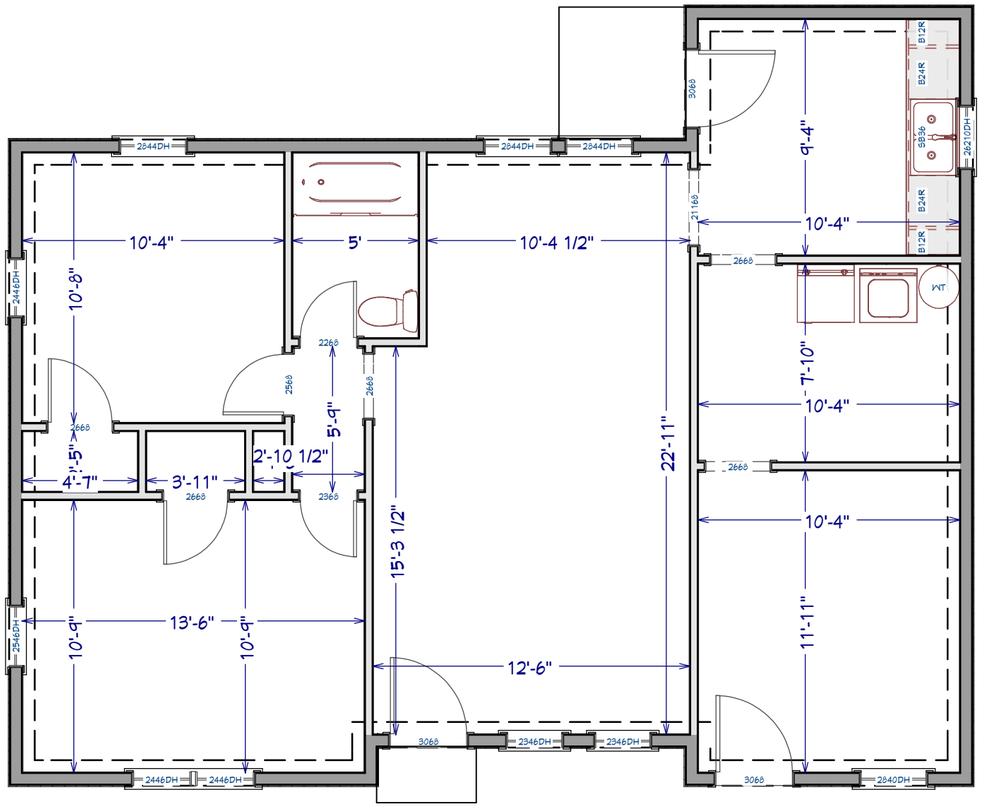
- Concrete work will replace the sidewalks and driveway ensuring flood compliance and enhancing the property's exterior.
- Landscaping will include bush removal, new flower planting, adding mulch, and sodding the front yard.

HVAC, Electrical, and Plumbing:

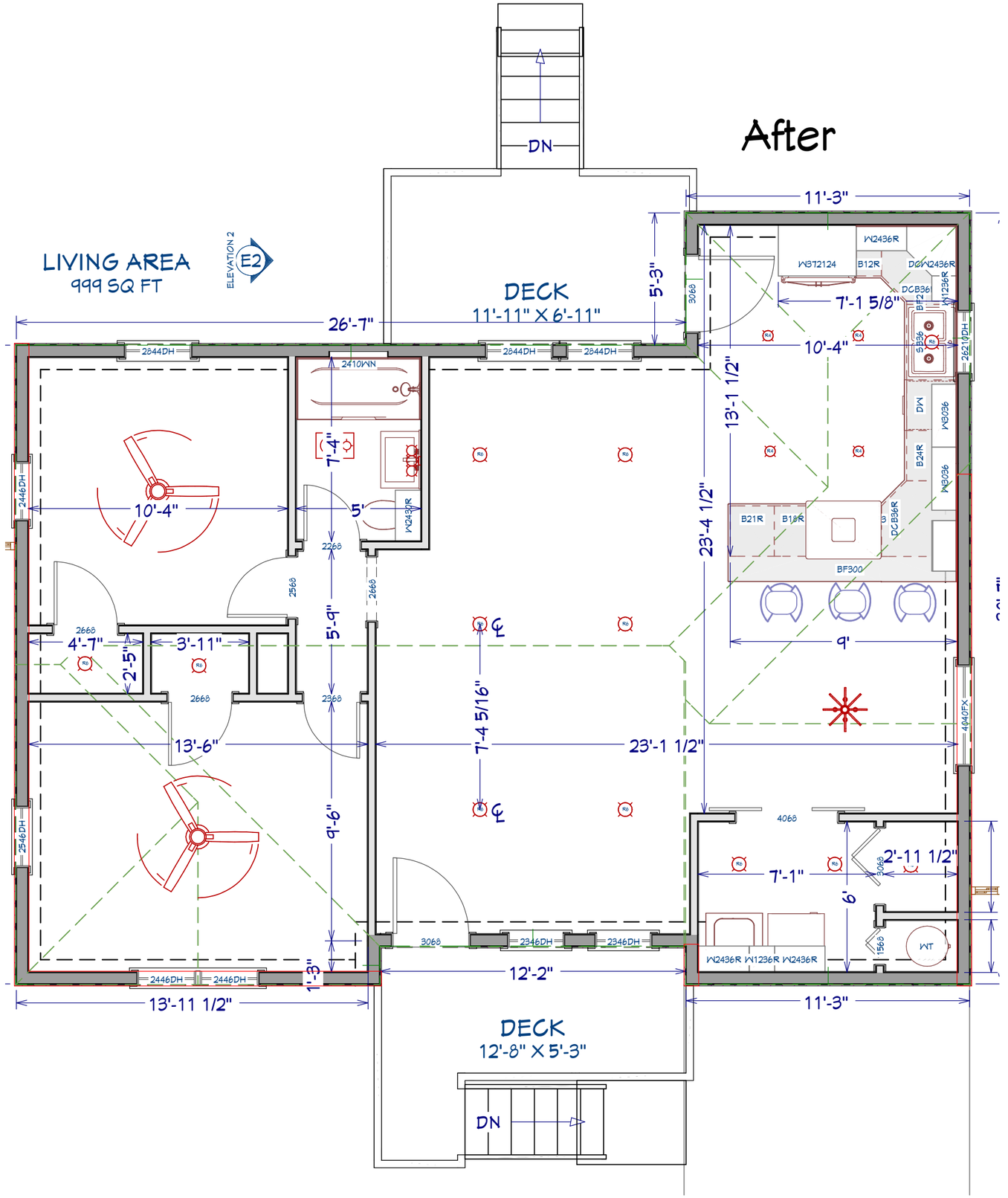
- The HVAC system will be upgraded with a new 2-ton central unit and modified ductwork.
- Electrical work will include new wiring for the AC unit, updates to lighting, and installation of new fixtures throughout the house.
- Plumbing updates will focus on relocating the washer to a new laundry area while keeping other plumbing fixtures in place.

Interior Work:

- New windows, LVP flooring, and fresh paint will be installed throughout the home, including walls, doors, ceilings, and trim.
- The kitchen will be fully remodeled with new cabinets, countertops, appliances, and a backsplash.
- The bathroom will be upgraded with a new tile surround, pedestal sink, and updated flooring.



Before



454 W. Tonhawa St. Norman, OK 73071
Contractor: SH Renovations
Owner: Swift Acquisition Partners
Contact: Hunter Thompson
hunter@shrenovations.org
(405)435-1002

SH RENOVATION
Construction and Remodeling

REVISION TABLE		
NUMBER	DATE	REVISED BY	DESCRIPTION

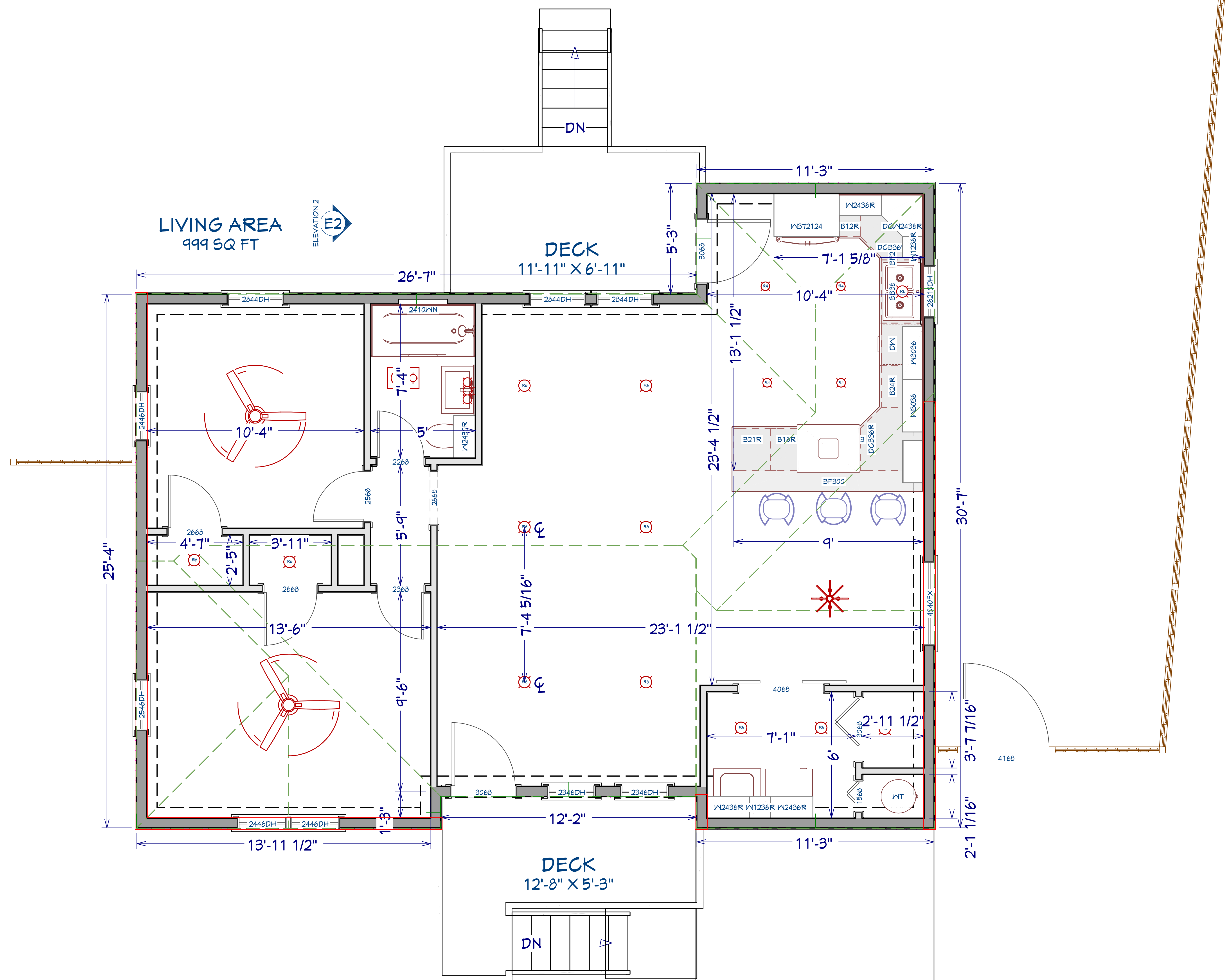
Project Overview

Designs and Graphics Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

SCALE:

SHEET:
A1


LIVING AREA
999 SQ FT
ELEVATION 2
E2
DECK
11'-11" X 6'-11"
DN
26'-7"
5'-3"
11'-3"
30'-7"
25'-4"
10'-4"
5'
7'-4"
7'-1 5/8"
10'-4"
13'-1 1/2"
23'-4 1/2"
4'-7"
2'-5"
3'-11"
5'-9"
9'
13'-6"
7'-4 5/16"
23'-1 1/2"
9'-6"
1'-3"
7'-1"
2'-11 1/2"
6'
3'-7 7/16"
2'-1 1/16"
13'-11 1/2"
12'-2"
11'-3"
DECK
12'-8" X 5'-3"
DN
2844DH
2410WN
2446DH
2546DH
2668
2268
2568
2368
3068
2346DH
4068
4040FX
4168
1568
2621DH
W3T2124
W2436R
B12R
DCW2436R
DCB36
W1236R
BF2
SB36
DW
W3036
B24R
B21R
B18R
DCB36R
BF300
W2436R W1236R W2436R
WT

SH RENOVATION
Construction and Remodeling

NUMBER	DATE	REVISED BY	DESCRIPTION
REVISION TABLE			

Designs and Graphics
Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

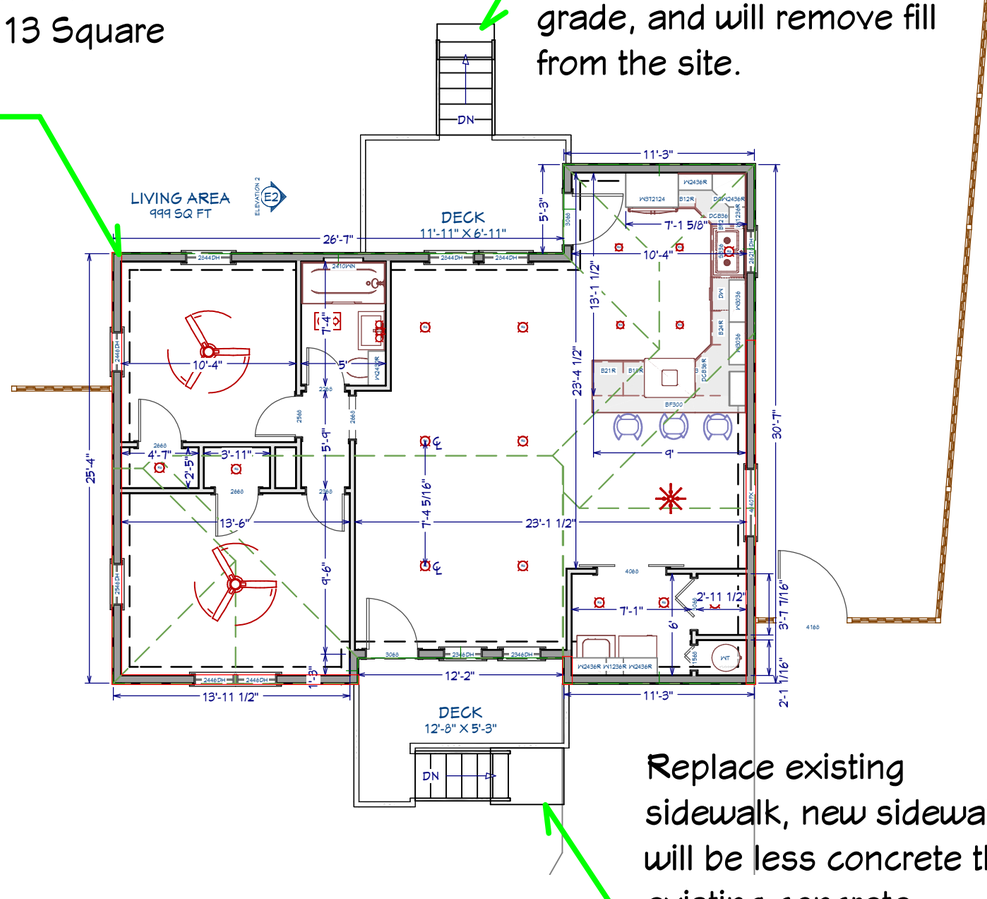
SCALE:

SHEET:

Estimated Swell Size and Location (20' Long x 6' Wide x 4" Deep)

1 Square Inch of Venting Per Square Foot
Minimum
7 vents: 15"x7"
1 vent: 27"x14"
Total: 1,113 Square Inches

Concrete will be poured at grade, and will remove fill from the site.



Replace existing sidewalk, new sidewalk will be less concrete than existing concrete.

SH RENOVATION
Construction and Remodeling

REVISION TABLE

NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

SCALE:

SHEET:
F2

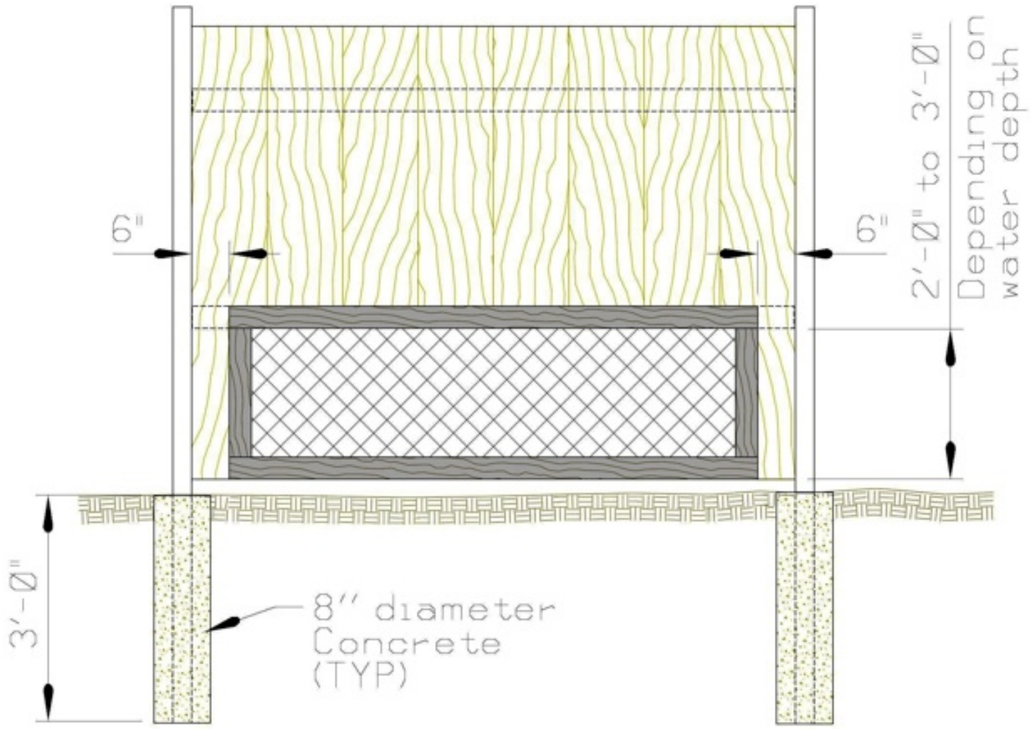
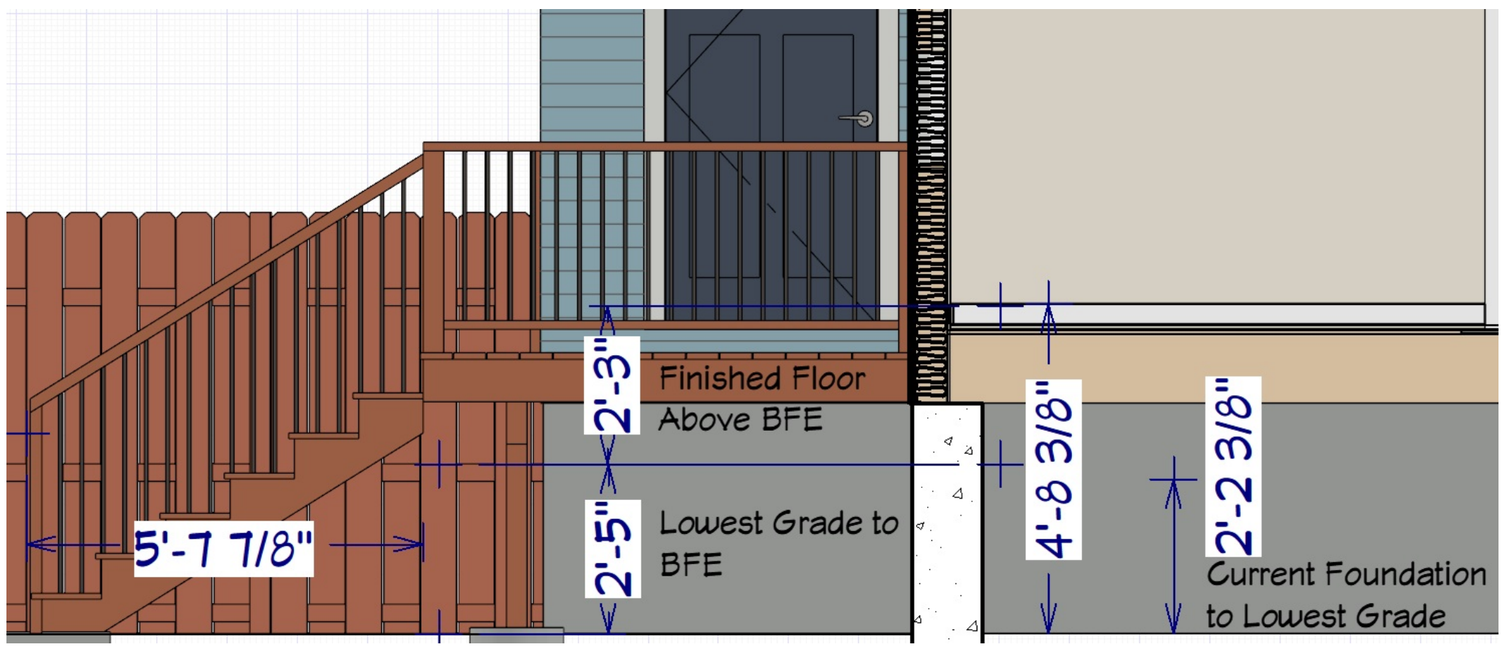


FIGURE A
WOOD PANEL WITH CHAIN LINK PICTURE FRAME
(For all water depths less than 3 feet)



**Lowest elevation used to ensure calculations account for the maximum amount of fill to be removed or the house to be raised higher than necessary. As a result, the front deck will either match or require less fill/removal than these calculations. **

Base Flood Elevation (BFE) Impact Summary

Project Information:
- Base Flood Elevation (BFE): 1158 feet
- Lowest Grade Level: 1155.5 feet
- Vertical Distance Impacted Below BFE: 2.5 feet (from lowest grade to BFE)
- Number of Decks: 2

Volume of Structures Below BFE:

1. Fencing and Posts:
- Fence Panels (5/8" thick):
  Total Length: 171 linear feet
  Volume Below BFE: 22.27 cubic feet
- Metal Fence Posts (Schedule 40):
  Number of Posts: 23
  Volume Below BFE: 1.77 cubic feet

2. Stairs and Decking (Two Decks):
- Stringers: 1.704 cubic feet
- Newels: 0.8096 cubic feet
- Decking: 13.392 cubic feet
- Railing: 0.412 cubic feet

Grand Total Volume Below BFE:
- Total: 40.36 cubic feet (approximately 1.49 cubic yards)

Notes:
- This total volume (1.49 cubic yards) represents the amount of fill created by the structural components below the Base Flood Elevation (BFE) across both decks and the fence.
- An equivalent amount of soil will need to be removed from the site to balance the fill volume, ensuring proper drainage and compliance with floodplain regulations.
- Lowest elevation used to ensure calculations account for the maximum amount of fill to be removed or the house to be raised higher than necessary. As a result, the front deck will either match or require less fill/removal than these calculations.

SH RENOVATION
Construction and Remodeling

REVISION TABLE			
NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics Provided by:
Hunter Thompson
SH Renovations

DATE: 10/9/2024

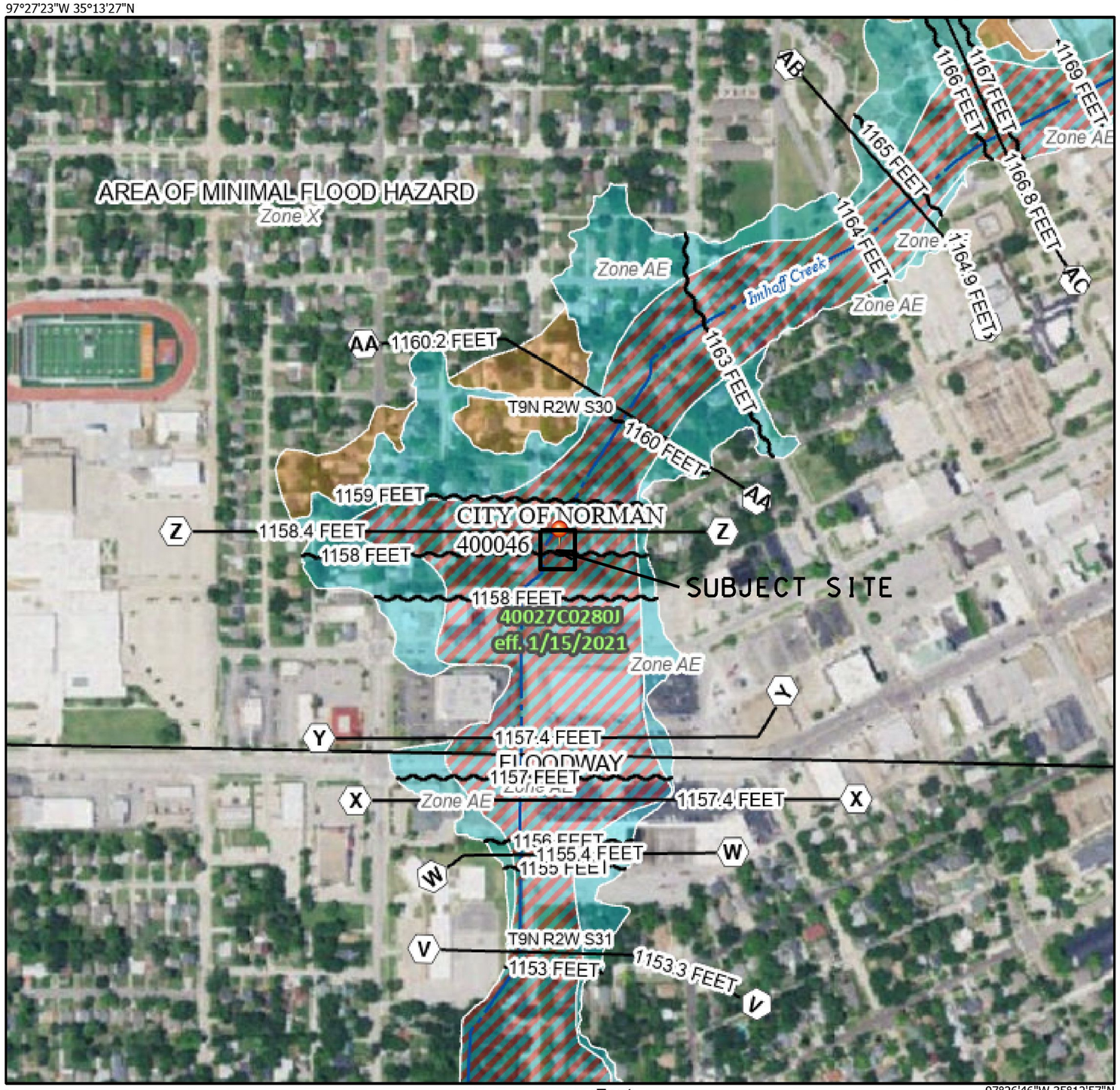
SCALE:

SHEET:

National Flood Hazard Layer FIRMette

FEMA

97°27'23"W 35°13'27"N



Basemap Imagery Source: USGS National Map 2023

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, Areas 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 D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 — 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

N

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 9/30/2024 at 11:00 AM 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.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

SH RENOVATION
Construction and Remodeling

REVISION TABLE			
NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics Provided by:
Hunter Thompson
SH Renovations

DATE: 10/9/2024

SCALE:

SHEET:

SH RENOVATION
Construction and Remodeling

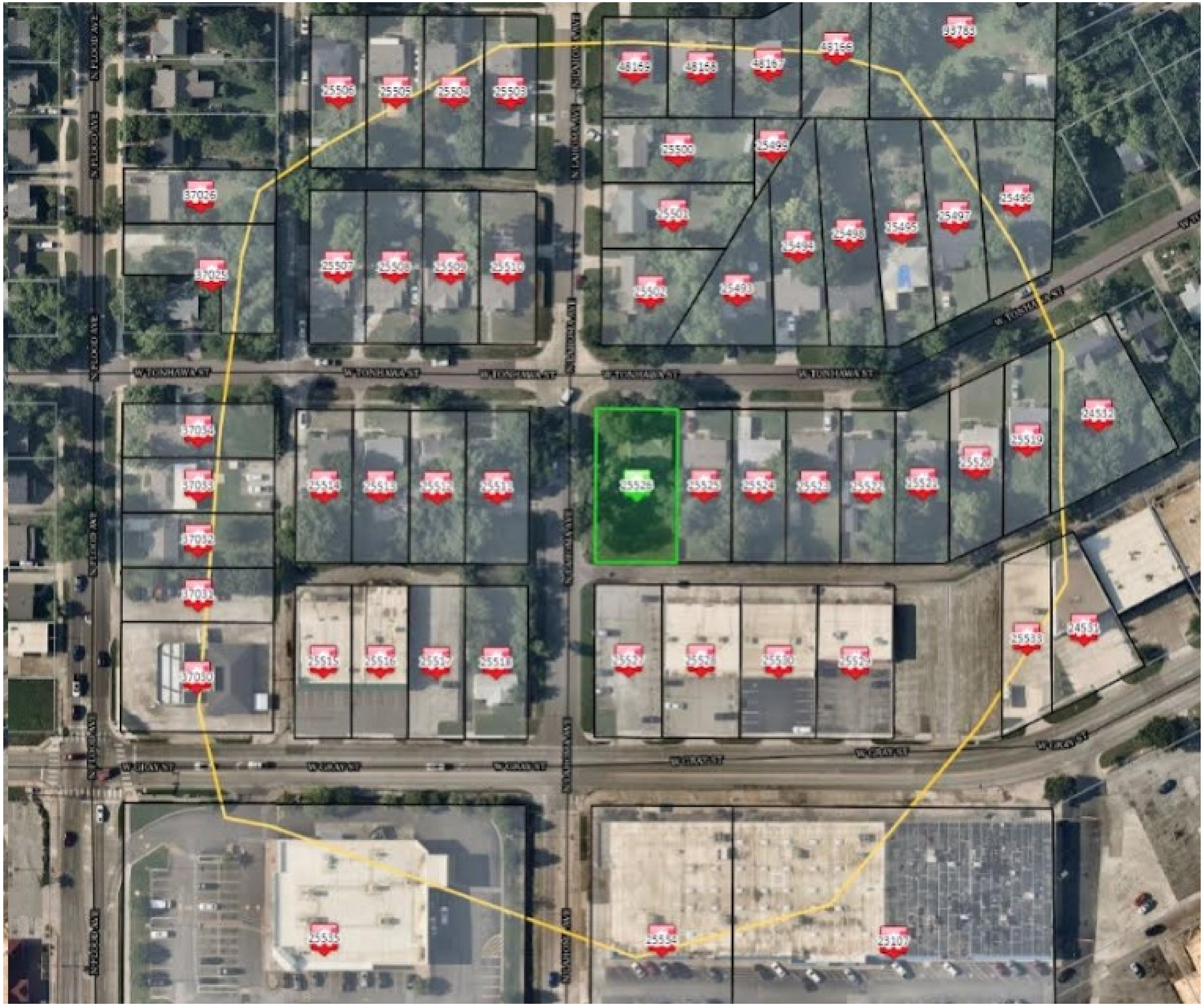
REVISION TABLE			
NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

SCALE:

SHEET:



Address Radius Map

Item 5.

SH RENOVATION
Construction and Remodeling

REVISION TABLE			
NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics
Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

SCALE:

SHEET:

EXTERIOR PHOTOS







SH RENOVATION
Construction and Remodeling

REVISION TABLE			
NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics
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SH Renovations

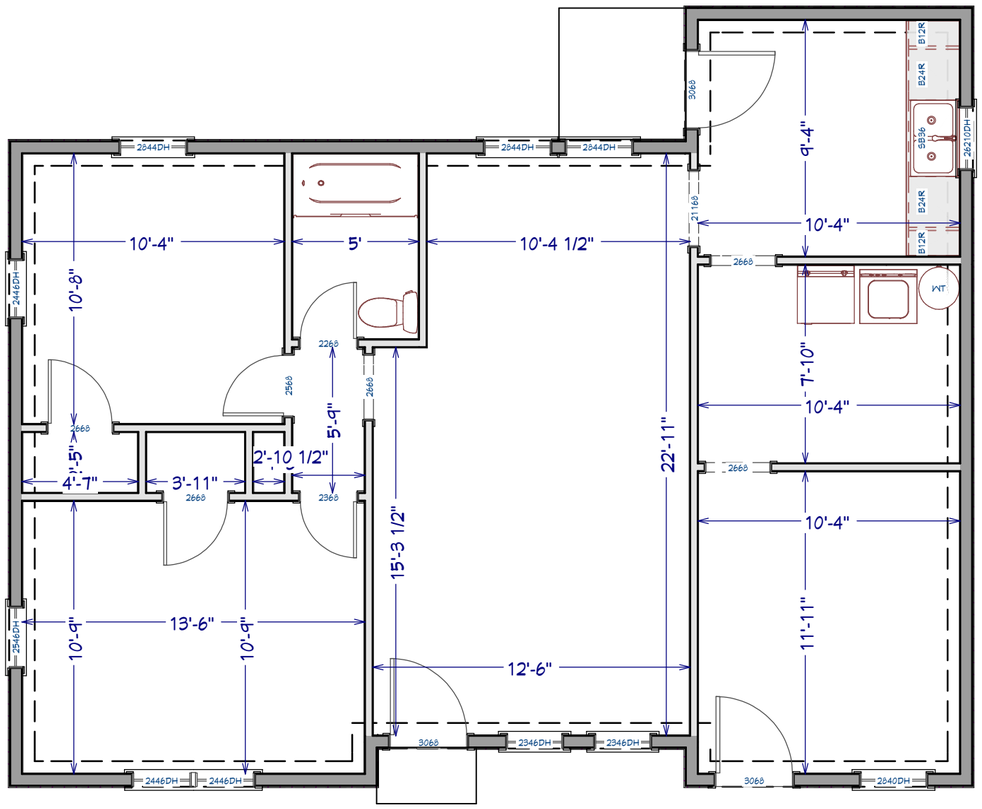
DATE:
10/9/2024

SCALE:

SHEET:

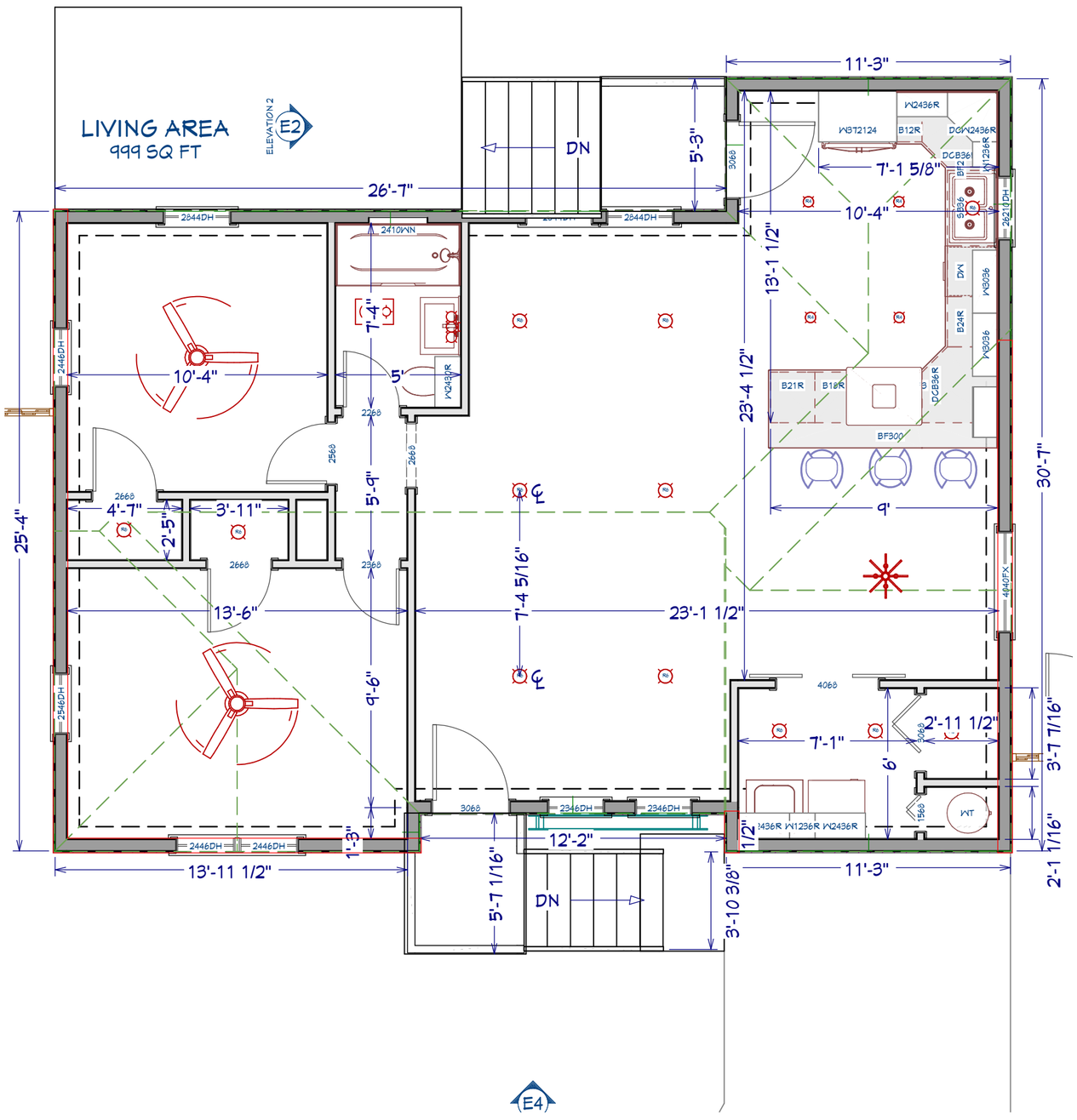
Alternative Plan Set

This set contains plans to install concrete steps instead of wooden patio at front and rear doors to residence.



Before

After



454 W. Tonhawa St. Norman, OK 73071
Contractor: SH Renovations
Owner: Swift Acquisition Partners
Contact: Hunter Thompson
hunter@shrenovations.org
(405)435-1002

Item 5.

SH RENOVATION
Construction and Remodeling

REVISION TABLE

NUMBER	DATE	REVISED BY	DESCRIPTION

Project Overview

Designs and Graphics
Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

SCALE:

SHEET:

LIVING AREA
999 SQ FT

ELEVATION 2
E2

DN

26'-7"

5'-3"

3068

11'-3"

W2436R

W3T2124

B12R

DCW2436R

DCB361

W1236R

7'-1 5/8"

BF2

SB36

2644DH

2410WN

10'-4"

26210DH

13'-1 1/2"

DW

W3036

B24R

W3036

7'-4"

2446DH

10'-4"

5'

W2430R

2268

B21R

B18R

DCB36R

BF300

23'-4 1/2"

30'-7"

2566

2666

2668

4'-7"

3'-11"

5'-9"

2'-5"

2668

2368

9'

25'-4"

13'-6"

7'-4 5/16"

23'-1 1/2"

4040FX

2546DH

9'-6"

4068

7'-1"

2'-11 1/2"

3068

6'

3'-7 7/16"

4168

WT

1568

2436R W1236R W2436R

1'-3"

3068

2346DH

2346DH

12'-2"

1/2"

2'-1 1/16"

2446DH

2446DH

13'-11 1/2"

5'-7 1/16"

DN

3'-10 3/8"

11'-3"

SH RENOVATION
Construction and Remodeling

REVISION TABLE

NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics
Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

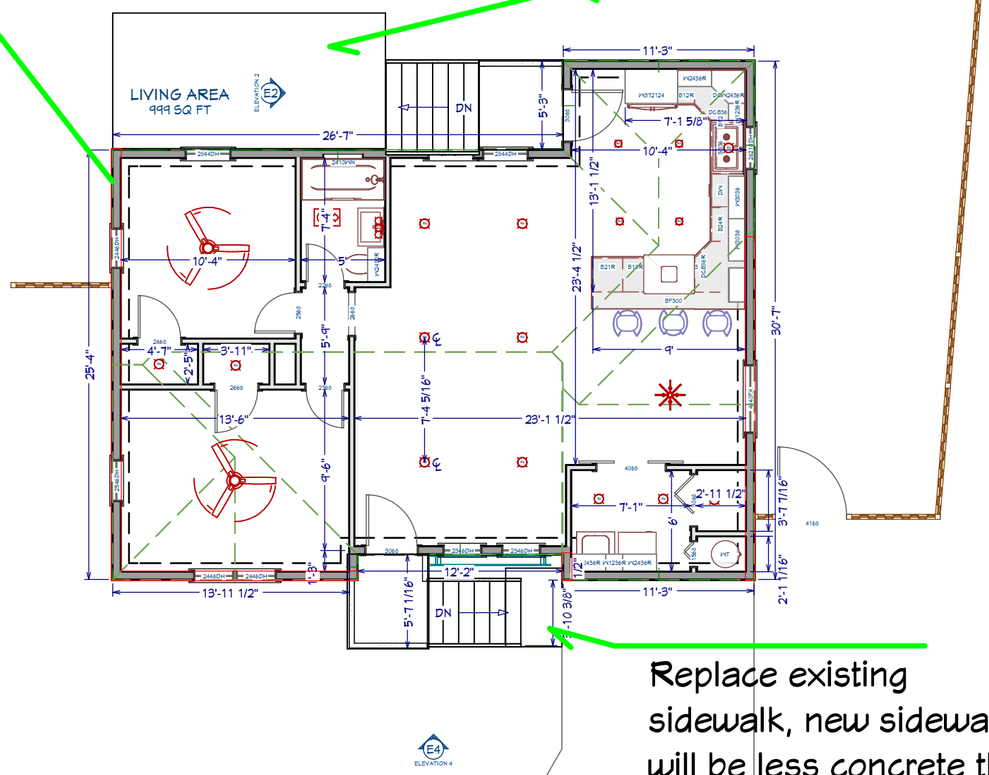
SCALE:

SHEET:

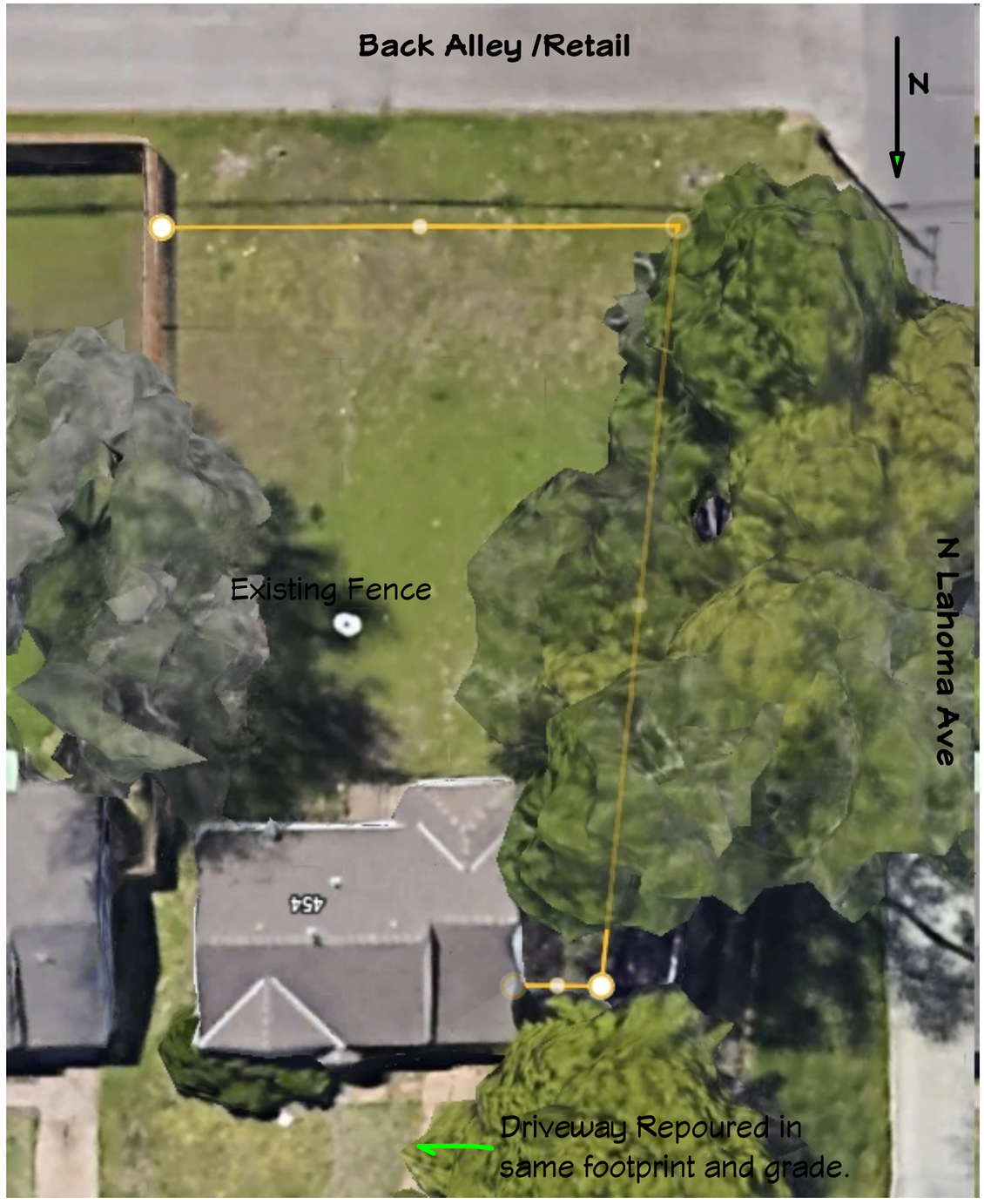
Estimated Swell Size and Location (30' Long x 11' Wide x 4" Deep)

1 Square Inch of Venting Per Square Foot Minimum
7 vents: 15"x7"
1 vent: 27"x14"
Total: 1,113 Square Inches

Concrete will be poured at grade, and will remove fill from the site.



Replace existing sidewalk, new sidewalk will be less concrete than existing concrete.



SH RENOVATION
Construction and Remodeling

REVISION TABLE

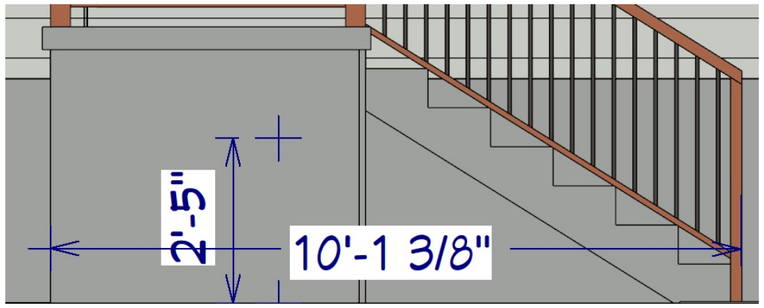
NUMBER	DATE	REVISED BY	DESCRIPTION

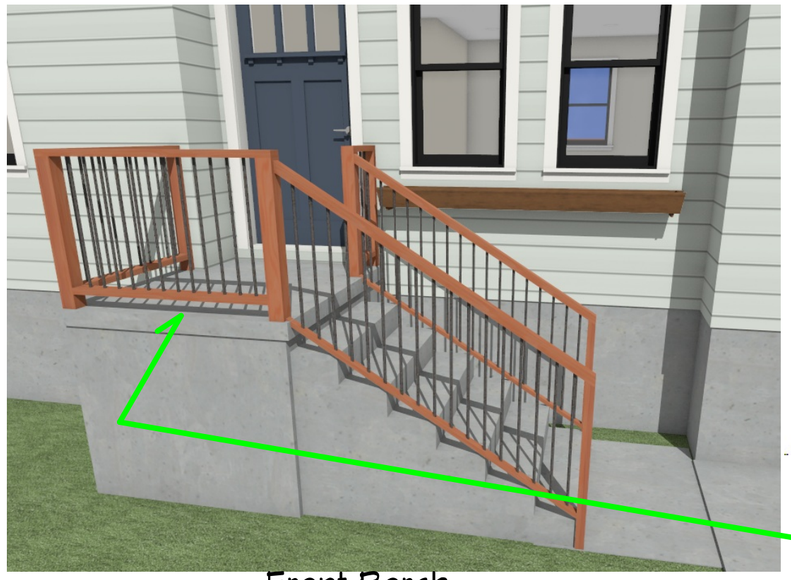
Designs and Graphics Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

SCALE:

SHEET:





Front Porch

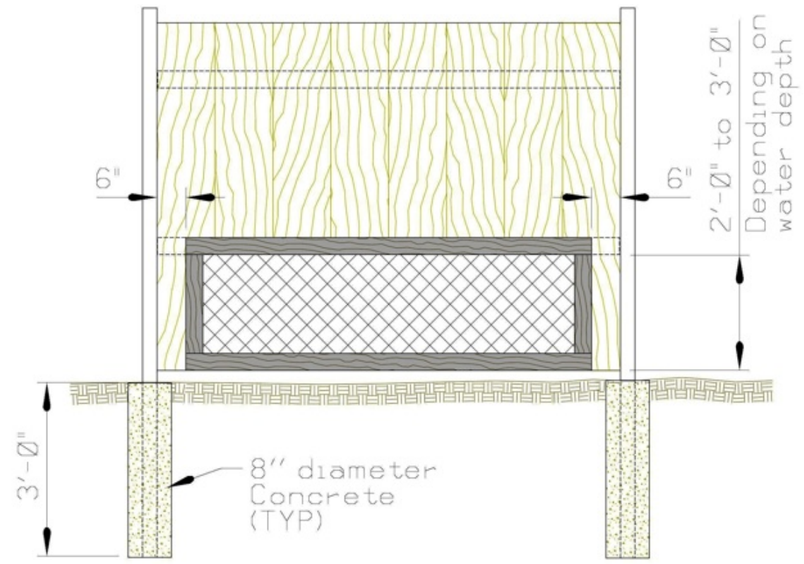
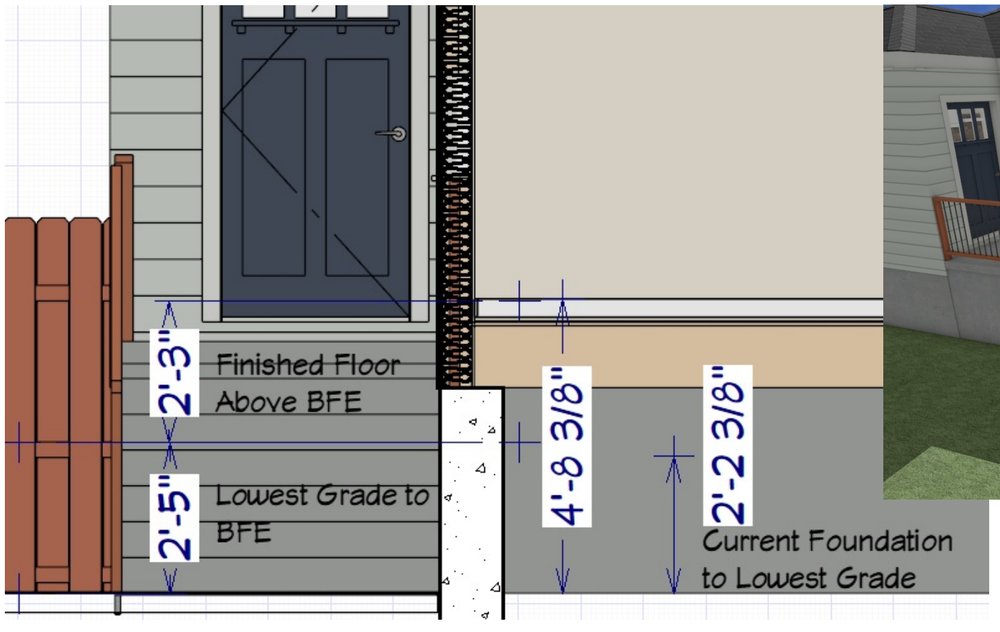


FIGURE A
WOOD PANEL WITH CHAIN LINK PICTURE FRAME
(For all water depths less than 3 feet)

BFE Calculations include an addition 2' 6" of patio depth, required to clear the front of the house with the stairs for an appropriate sized landing.



**Lowest elevation used to ensure calculations account for the maximum amount of fill to be removed or the house to be raised higher than necessary. As a result, the front deck will either match or require less fill/removal than these calculations. **

Base Flood Elevation (BFE) Impact Summary

Project Information:
- Base Flood Elevation (BFE): 1158 feet
- Lowest Grade Level: 1155.5 feet
- Vertical Distance Impacted Below BFE: 2.5 feet (from lowest grade to BFE)
- Number of Decks: 2

Volume of Structures Below BFE:

1. Fencing and Posts:
- Fence Panels (5/8" thick):
  Total Length: 171 linear feet
  Volume Below BFE: 22.27 cubic feet
- Metal Fence Posts (Schedule 40):
  Number of Posts: 23
  Volume Below BFE: 1.77 cubic feet

2. Stairs and Concrete Pads (Front Porch Only)
- Additional 2' 6" of porch and stairs below BFE:
  Stairs: 55 cubic feet
  Additional Porch: 28.65 cubic feet

Grand Total Volume Below BFE:
- Total: 107.69 cubic feet cubic feet (approximately 3.99 cubic yards)

Notes:
- This total volume (3.99 cubic yards) represents the amount of fill created by the structural components below the Base Flood Elevation (BFE) across both decks and the fence.
- An equivalent amount of soil will need to be removed from the site to balance the fill volume, ensuring proper drainage and compliance with floodplain regulations.
- Lowest elevation used to ensure calculations account for the maximum amount of fill to be removed or the house to be raised higher than necessary. As a result, the front deck will either match or require less fill/removal than these calculations.

SH RENOVATION
Construction and Remodeling

REVISION TABLE			
NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics Provided by:
Hunter Thompson
SH Renovations

DATE: 10/9/2024

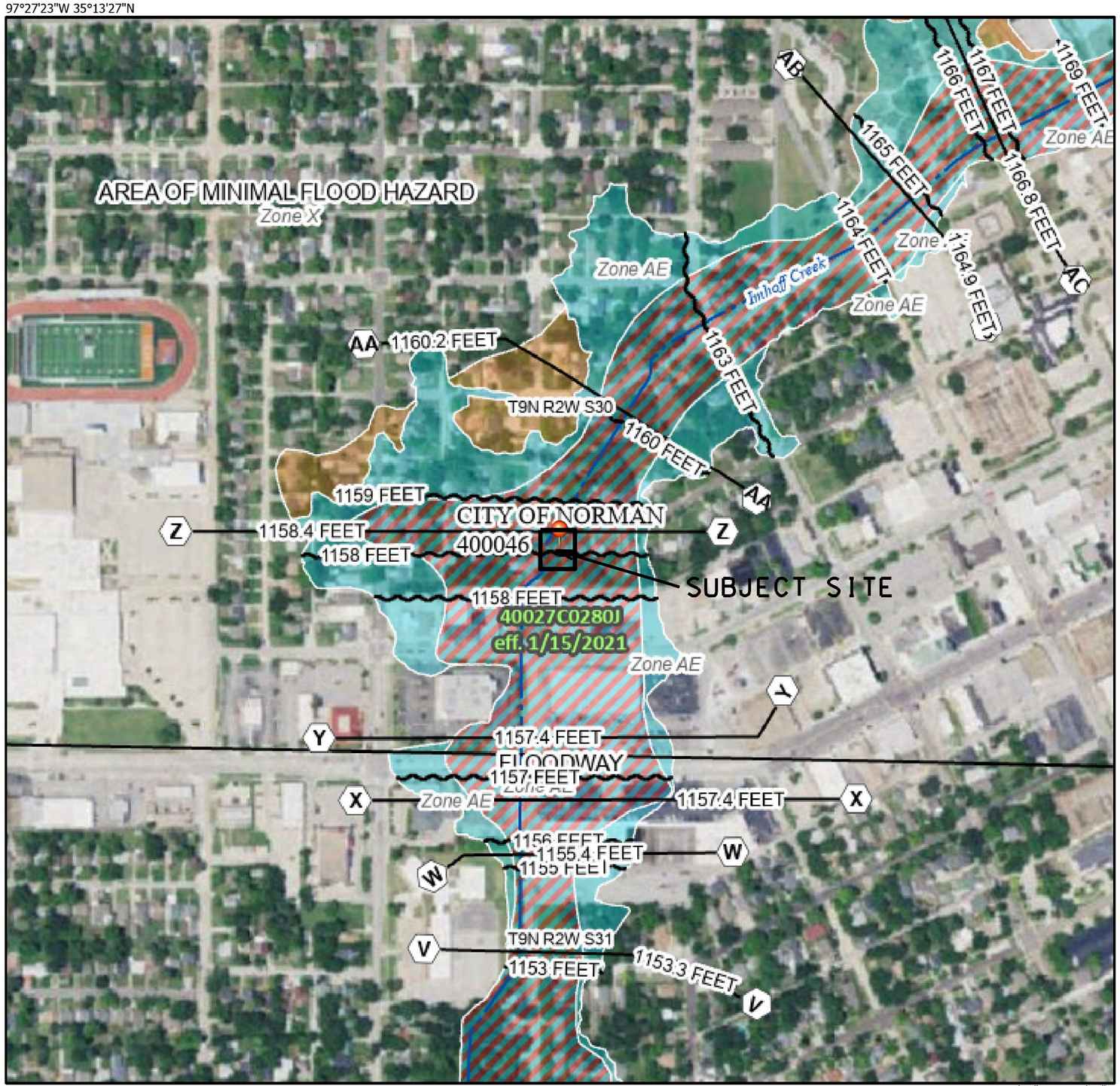
SCALE:

SHEET:

National Flood Hazard Layer FIRMette

FEMA

97°27'23"W 35°13'27"N



Basemap Imagery Source: USGS National Map 2023

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, Areas 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 D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 — 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

N

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 9/30/2024 at 11:00 AM 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.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

SH RENOVATION
Construction and Remodeling

REVISION TABLE			
NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

SCALE:

SHEET:

Item 5.

SH RENOVATION
Construction and Remodeling

REVISION TABLE

NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

SCALE:

SHEET:

Address Radius Map

SH RENOVATION Construction and Remodeling

REVISION TABLE		
NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

SCALE:

SHEET:

EXTERIOR PHOTOS







SH RENOVATION
Construction and Remodeling

REVISION TABLE			
NUMBER	DATE	REVISED BY	DESCRIPTION

Designs and Graphics
Provided by:
Hunter Thompson
SH Renovations

DATE:
10/9/2024

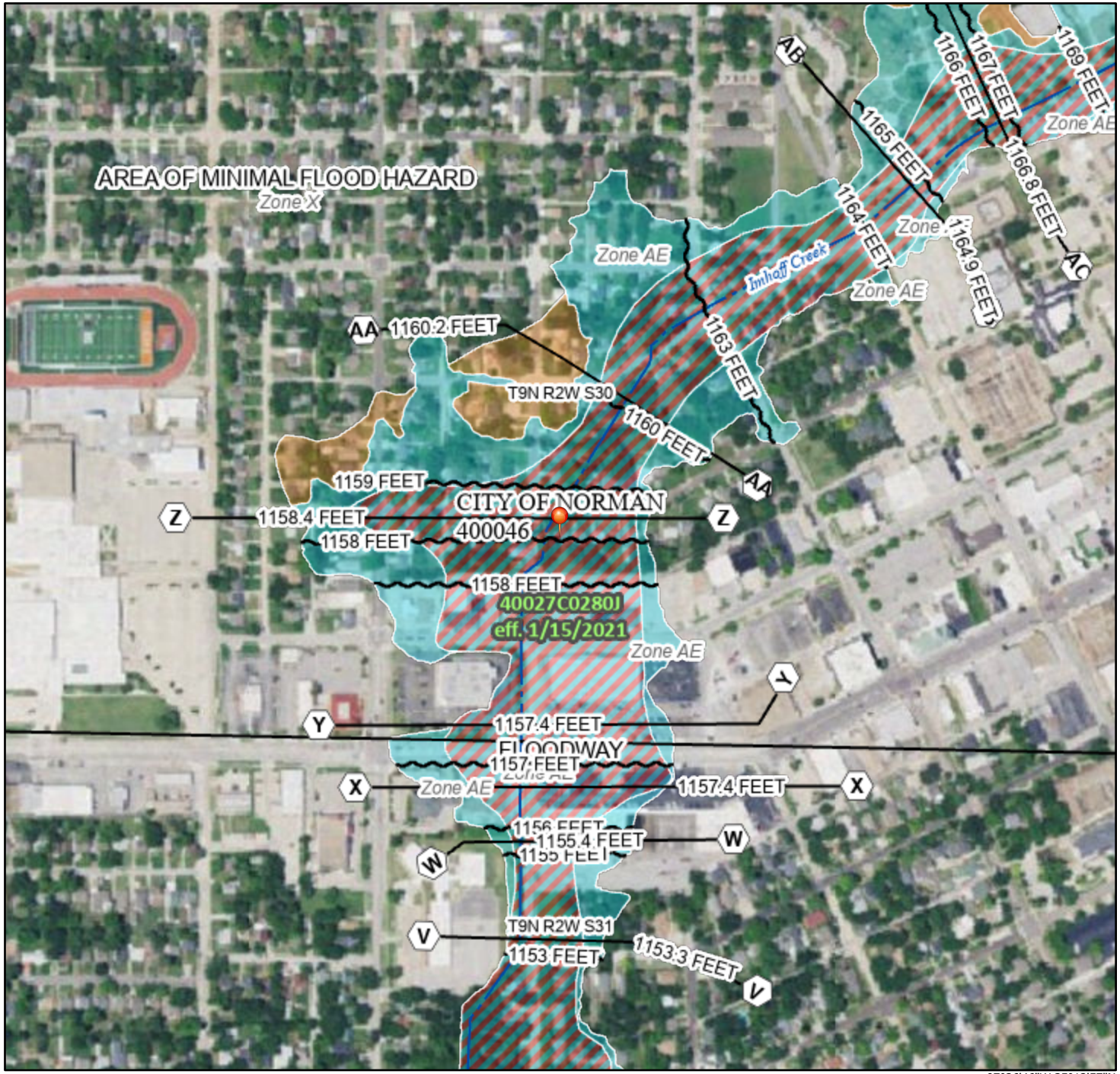
SCALE:

SHEET:

National Flood Hazard Layer FIRMette

FEMA

97°27'23"W 35°13'27"N



97°26'46"W 35°12'57"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

Item 5.

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR F UT

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, Areas 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 D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 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

N

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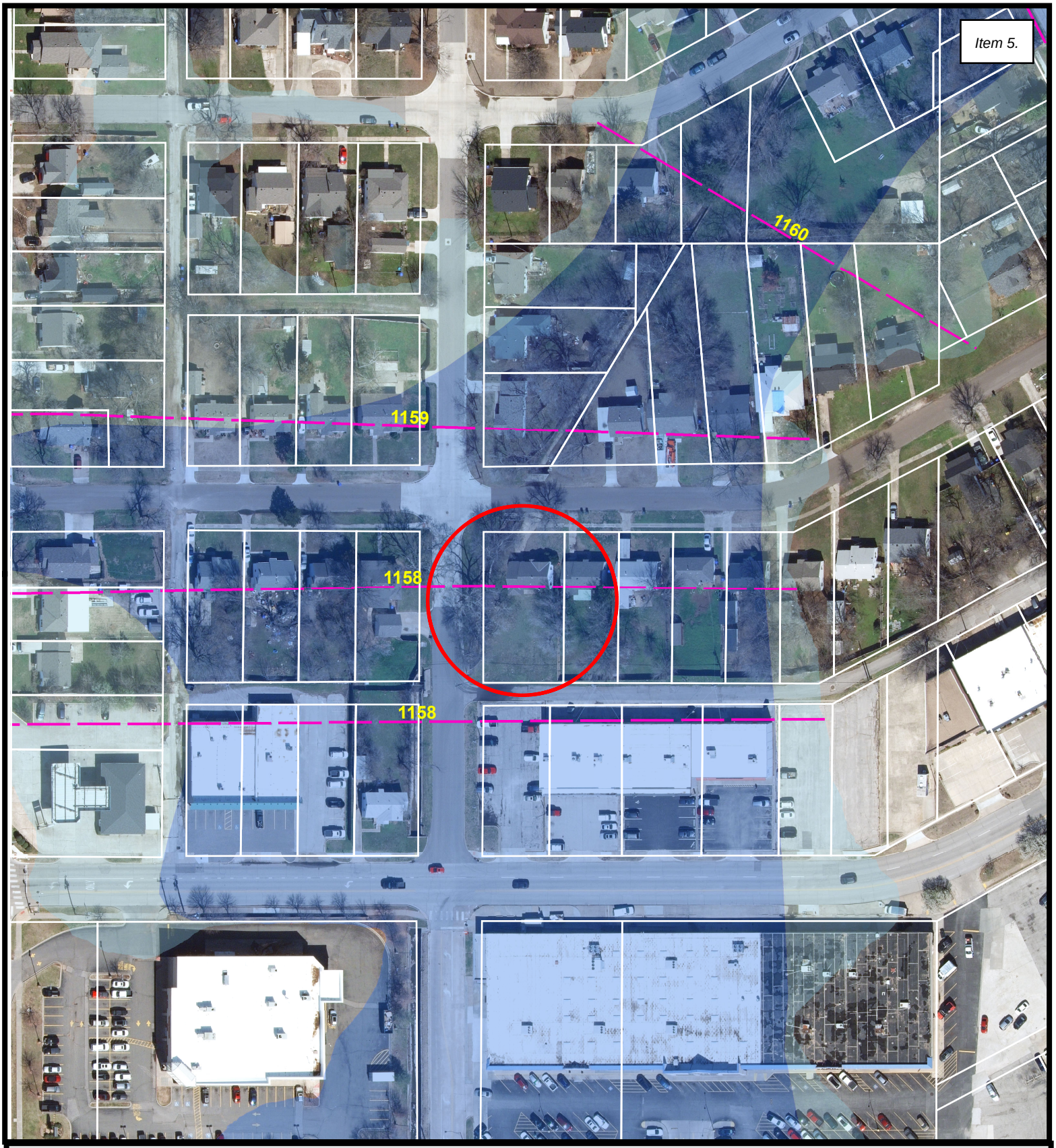
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/30/2024 at 5:34 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community id FIRM panel number, and FIRM effective date. Map i unmapped and unmodernized areas cannot be use regulatory purposes.



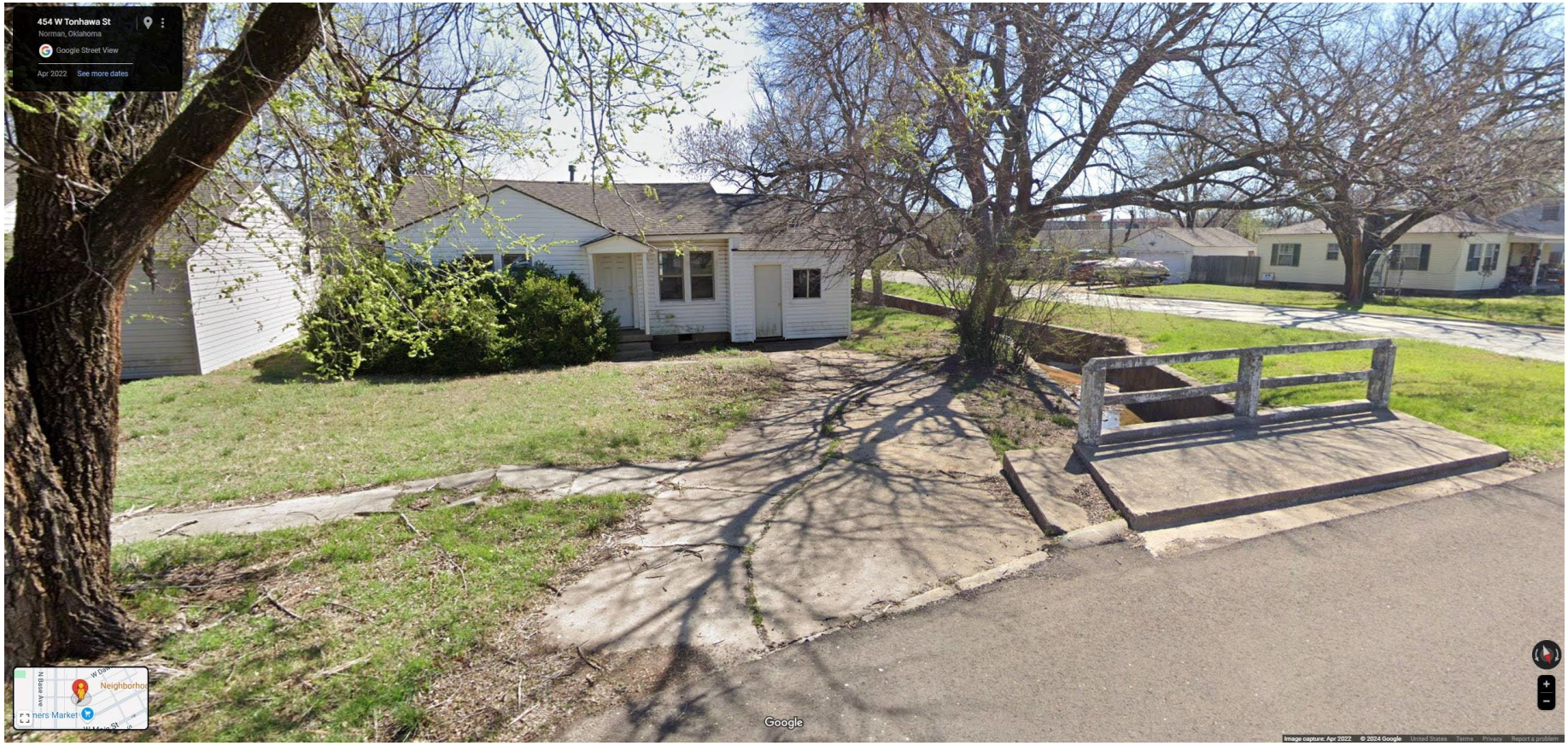
454 W Tonhawa

N
W E
S

1 inch = 120 feet

Legend

- BFE 2021
- 1% Chance Floodplain
- Floodway
- Parcel


454 W Tonhawa St
Norman, Oklahoma
Google Street View
Apr 2022 See more dates
Google
Image capture: Apr 2022 © 2024 Google United States Terms Privacy Report a problem


299 N Lahoma Ave
Norman, Oklahoma
Google Street View
Apr 2022 See more dates
N Lahoma Ave
Google
Neighborhood
N Base Ave

STAFF REPORT 10/21/2024 **PERMIT NO. 706**

ITEM: This Floodplain Permit Application is for the installation of a generator for a cellular tower located at 3199 S. Berry Road in the Imhoff Creek floodplain.

BACKGROUND:
APPLICANT: Sherry Duff
BUILDER: CA Bass Ventures, LLC
ENGINEER: Benchmark Services, Inc.

The applicant is requesting a permit to install a 50KW diesel generator on a steel platform with underground electrical service and controls from the generator to ATS and existing AT&T equipment at the cellular tower located at 3199 S. Berry Rd. The engineering plans, included with application packet, indicate a steel platform that is 10' x 4' will be installed adjacent to an existing shelter building. The BFE for this location is 1101.8'. The existing ground elevation according the EC provided by the applicant is 1101.98'. Plans submitted indicate that the generator will be installed 24" above grade.

STAFF ANALYSIS:
Site located in Little River Basin or its Tributaries? yes__ no✓

According to the latest FIRM, the site of the proposed work is located in the Imhoff Creek floodplain (Zone AE). At the proposed site, the BFE is 1101.8 ft.

Applicable Ordinance Sections:		Subject Area:
36-533	(e)2(a)……	Fill restrictions
	(e)2(e)…..……	Compensatory storage
	(e)3(c)…….	Nonresidential freeboard
	(f)3(a)(8)…..……......	No rise considerations

(e)2(a) and (e)2(e) Fill Restrictions in the Floodplain and Compensatory Storage – Fill is restricted because storage capacity is removed from floodplains, natural drainage patterns are adversely altered, and erosion problems can develop. Compensatory storage must be provided within the general location of any storage that is displaced by fill or other development activity and must serve the equivalent hydrologic function as the portion which is displaced with respect to the area and elevation of the floodplain.

> The applicant has indicated that 4.8 cubic feet of volume will be occupied by the piers for the steel platform. Using a safety factor of 1.5, they are planning on removing 7.5 cubic feet of fill from the location for compensatory storage.

(e)3(c) Nonresidential freeboard requirements - Nonresidential construction. New construction and substantial improvement of any commercial, industrial or other nonresidential structures shall be constructed on fill as in subsection (e)(3)a of this section, including any attendant utility and sanitary facilities, shall be designed so that the lowest floor including basement, ductwork, mechanical and electrical equipment including furnaces, water heaters, and air conditioners etc. is elevated at least two feet above base flood elevation and the fill shall be at a level no lower than one foot above the base flood elevation for the particular area and shall extend at such elevation at least 15 feet beyond the limits of any structure or building erected thereon. A registered professional engineer shall submit a certification to the Director of Public Works that the standards of this chapter, as proposed in subsection (e)(1) and (2) of this section, are satisfied.

> The BFE for this location is 1101.8'. The applicant's plans show the bottom of the steel platform being 24" above grade which is 1103.98 which meets this requirement.

(f)3(a)(8) No Rise Considerations – For proposed development within any flood hazard area (except for those designated as regulatory floodways), certification that a rise of no more than 0.05 ft. will occur in the BFE on any adjacent property as a result of the proposed work is required. For proposed development within a designated regulatory floodway, certification that no increase in the BFE on any adjacent property as a result of the proposed work is required.

The project engineer has submitted a No Rise statement indicating that this project will not cause a rise in the BFE at this location, meeting the ordinance requirements.

RECOMMENDATION: Staff recommends Floodplain Permit Application #706 be approved with the following condition:

1. Elevation certificate be required for the top of the steel platform prior to final acceptance.

ACTION TAKEN: _____

City of Norman

Floodplain Permit Application

Floodplain Permit No. 706

Building Permit No. _____

Date 10/21/2024

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: Sherry Duff ADDRESS: 1779 Texas School Rd Eubank, Ky 42567

TELEPHONE: 606-303-2755 SIGNATURE: Sherry Duff

BUILDER: CA Bass Ventures, LLC ADDRESS: 11710 FM 2661 Tyler, TX 75709

TELEPHONE: _____ SIGNATURE: _____

ENGINEER: Benchmark Services, Inc ADDRESS: 318 North Main St Huntingburg, IN 47542

TELEPHONE: 317-840-6532 SIGNATURE: BBordenc

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.

3198 S. Berry Road - (1299 State Hwy 9) Parcel - NC29-8-3W-12-002

Start near Intersection of US-35 and OK-9, Head South on I-35 S, Use right 2 lanes to take exit 108 A for OK-9 E toward Tecumseh and travel 1.1 mile, continue onto OK-9 E, travel 1.3 miles turn left onto S Berry Rd, travel 262 Ft.

DESCRIPTION OF WORK (Check all applicable boxes):

A. STRUCTURAL DEVELOPMENT

ACTIVITY	STRUCTURE TYPE
☐ New Structure	☐ Residential (1-4 Family)
☑ Addition	☐ Residential (More than 4 Family)
☐ Alteration	☑ Non-Residential (Flood proofing? ☑ Yes)
☐ Relocation	☐ Combined Use (Residential & Commercial)
☐ Demolition	☐ Manufactured (Mobile) Home
☐ Replacement	☐ In Manufactured Home Park? ☐ Yes

ESTIMATED COST OF PROJECT $ 35,000.00 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.

Install a 50 kW Diesel backup Generator on a new steel platform, proposed underground electrical service and controls from generator to ATS and existing AT&T equipment. Please see full Scope of Work on A-1 Site Plan under Construction Legend.

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:

_____

_____

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:

_____

_____

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:

_____

_____

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

☐ Not Applicable:

_____

_____

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

☐ Not Applicable:

_____

_____

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:

_____

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.

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.: 40027C0290H, Dated: 09/26/2008

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 1101.8 Ft. NGVD (MSL) ☐ Unavailable

See Section 4 for additional instructions.

SIGNED: Sherry Duff **DATE:** 09/25/2024 ~~10/8/24~~ 10/9/2024

SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by Permit Staff.)

The applicant must also submit the documents checked below before the application can be processed.

☐ Flood proofing protection level (non-residential only) _____ Ft. NGVD (MSL). For flood proofed structures applicant must attach certification from registered engineer.

☐ Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.

☐ Certification from a registered engineer that the proposed activity in a regulatory flood plain will result in an increase of no more than 0.05 feet in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.

☐ All other applicable federal, state, and local permits have been obtained.

Other: _____

_____

_____

SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Chairman.)

The proposed activity: **(A)** ☐ **Is**; **(B)** ☐ **Is Not** in conformance with provisions of Norman's City Code Chapter 22, Section 429.1. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED: _____ DATE: _____

If **BOX A** is checked, the Floodplain committee chairman may issue a Floodplain Permit.

If **BOX B** is checked, the Floodplain committee chairman will provide a written summary of deficiencies. Applicant may revise and resubmit an application to the Floodplain committee or may request a hearing from the Board of Adjustment.

APPEALS: Appealed to Board of Adjustment: ☐ Yes ☐ No

Hearing date: _____

Board of Adjustment Decision - Approved: ☐ Yes ☐ No

Conditions:

_____

_____

_____

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

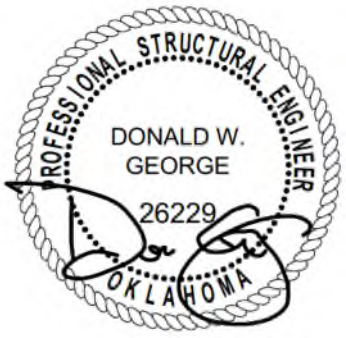
1. FEMA Elevation Certificate
   and/or
2. FEMA Floodproofing Certificate

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.

Structural Analysis Report

• Elevated Steel Platform •

Site ID:	**10006301**
Site Name:	**Trails**
Project:	**Generator Upgrade**
Prepared For:	**AT&T**
Structure Description:	**EMI 4'x10' Equipment Platform** **Diesel Backup Generator**
Site Location:	**1299 State HWY 9, HWY 9W** **Norman, OK 73072** **Cleveland County** **35.186812°, -97.461192°**
Design Codes:	**IBC 2021** **ASCE 7-16** **ASCE 24-14**



Date Signed:
9/20/2024

10006301_Gen Platform Analysis_R0 240919 5492

Revision 0
September 20, 2024

1.0 Introduction

GeoStructural has completed a structural analysis for the proposed elevated steel platform assembly at the existing AT&T *10006301* communications site located in Cleveland County, OK. The scope of this structural analysis is limited to the following:

- EMI, Inc. 1000-0030-0195 4'x10' Steel Equipment Platform w/ (8) 1007-T006-0120 1' extension columns
  - Primary steel framing members and connections (evaluation of helical pier capacity per EMI, Inc.)
- Kohler 50REOZK Diesel Generator Equipment Anchorage.

The existing communications structure/foundation and existing equipment platform(s)/shelter(s) are designed by others and beyond the scope of this analysis.

2.0 Analysis & Design Criteria

This analysis is pursuant to the following design criteria:

- IBC 2021 – International Building Code.
- ASCE 7-16 – Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- ASCE 24-14 – Flood Resistant Design and Construction
- AISC – Steel Construction Manual.

Gravity Design Loading:	
Kohler 50REOZK 50kW Generator w/ Enclosure = 2,369lbs 270gal Fuel Tank(Dry) = 1,452 lbs Diesel Fuel (100% Fill + 35% Contain) = 7.3 lb/gal(365gal) = 2,661 lbs WET Total Assembly Weight = 6.480 kips ; DRY Total Assembly Weight = 3.820 kips	
Wind Design Loading:	
Design Wind w/o ice = 109 mph *[3-sec gust Ultimate ASCE Figure 26.5-1B]*	
Exposure Category C Risk Category II	Topographic Category 1
Seismic Design Loading:	
Site Class D S_s = 0.349, S_1 = 0.086, S_{DS} = 0.354	Importance Factor, I_p = 1.0
Flood Loading: Non-coastal Zone AE; BFE = 1101.8 ft AMSL NAVD88 per Elevation Certificate	
DFE = BFE+2 = 1103.8 ft AMSL NAVD88	
Ground Elevation (G) = 1101.98 ft AMSL NAVD88 per Elevation Certificate	
Lowest Eroded Ground Elevation (GS) = 1101.98–0.5 = 1101.48 ft, assuming 6" lost to flood erosion	
Design Stillwater Flood Depth (ds)= 2.23 ft *Assuming FIRM BFE includes wave effects	
Freshwater Unit Wt. (γ) = 62.4 lb/ft^3 ; Saltwater Unit Wt. (γ) = 64 lb/ft^3	
Freshwater Mass Density (ρ)= 1.94 slugs/ft^3 ; Saltwater Mass Density (ρ)= 1.99 slugs/ft^3	
Gravitational Constant (g) = 32.2 ft/sec^2	

All data required to complete our structural analysis was furnished by our client. GeoStructural has not conducted an independent study to verify existing site conditions and the results of this analysis are based solely on the information provided.

3.0 Load Generation & Material Strength

Table 3.1 – Wind Design Loading

Wind Load – Velocity Pressure	ASCE 7-16, §29.3
$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2$	Eq. 29.3-1
$K_z = 0.85$	Table 29.3-1
$K_{zt} = 1.00$	§ 26.8.2
$K_d = 0.90$	Table 26.6-1
$V = 109$ mph	Figure 26.5
$q_z = 0.00256*0.85*1.00*0.90*(109^2)/1000 =$ 0.0233 ksf	Eq. 29.3-1
Wind Load on Generator – Other Structures (Tanks & Similar Structures)	**ASCE 7-16, §29.5**
$F = q_z G C_f A_f$	Eq. 29.5-1
$G = 0.85$	§ 26.9
$C_f = 1.32$	Figure 29.5-1
$A_f = 62.4\ ft^2$ Worst Case; $22.4\ ft^2$ Transverse (Side)	Kohler 50REOZK
$F_N = 0.0233*0.85*1.32*62.4 =$ 1.63 kip; $F_T = 0.0233*0.85*1.32*22.4 =$ 0.58 kip	Eq. 29.5-1

Table 3.2 – Wind Anchorage Loading

Wind Load	ASCE 7-16, Chapter 2
0.9D + 1.0W	Eq. 2.3.1-5
Vertical C.O.G. = 6.57/2 = 3.29 ft	
Net OTM = (1.63*3.29)-((0.9*3.820)*1.5) = 0.206 k-ft	
AB Tension = 0.206/(33/12)/(6/2) = 0.025 kip	
Net Shear = 1.63-(0.9*3.820*0.15) = 1.11 kip	
AB Shear = 1.11/(6/2) = 0.37 kip (Assume 1/2 AB engage)	

Table 3.3 – Seismic Design Loading – 100% Fill + 35%

Seismic Load – Non-Structural Components	ASCE 7-16, Chapter 13
$F_p = 0.4a_pS_{DS}W_p\{(1+2(z/h)) / (R_p/I_p)\}$	Eq. 13.3-1
$F_p \leq 1.6S_{DS}I_pW_p$	Eq. 13.3-2
$F_p > 0.3S_{DS}I_pW_p$	Eq. 13.3-3
Reversible Vert Force, $E_v = 0.2S_{DS}W_p = 0.2*0.354*6.480 =$ 0.46 kip	§ 13.3.1
$a_p = 1.0$	Table 13.6-1
$S_{DS} = (2/3)S_{MS} = 0.354$; $S_{D1} = (2/3)S_{M1}$	Eq. 11.4-3 & 4
S_s; S_1	USGS Reference
F_a ; F_v	Tables 11.4-1 & 2
$S_{MS} = F_aS_s$; $S_{M1} = F_vS_1$	Eq. 11.4-1 & 2
$W_p = 6.480$ kip (Wet Weight)	From Section 2.0 Above
$z = 3$ ft (Anchorage Height of Generator Tank to Platform)	
$h = 3+6.57$ ft (Overall Height of Generator with Tank Assembly)	
$R_p = 2.5$	Table 13.6-1
Importance Factor, Ip = 1.0	§ 11.5.1 & 13.1.3
$\rho = 1.0$ (Exception from $\rho = 1.3$, Non-Structural Components)	§ 12.3.4.2 & § 13.3.1
$F_p = 0.4a_pS_{DS}W_p\{(1+2(z/h)) / (R_p/I_p)\}$ = 0.4*1.0*0.354*6.480*(1+2*(3/9.57))/(2.5/1.0) = 0.60 kip	Eq. 13.3-1
$F_p \leq 1.6S_{DS}I_pW_p = 1.6*0.354*1.0*6.480 =$ 3.67 kip	Eq. 13.3-2
$F_p > 0.3S_{DS}I_pW_p = 0.3*0.354*1.0*6.480 =$ 0.69 kip	Eq. 13.3-3

Table 3.4 – Seismic Overstrength Anchorage Loading (ACI 318-19 § 17.2.3.4.3(d) & 17.2.3.5.3(c))

Seismic Load – Non-Structural Components	ASCE 7-16, Chapter 13
$(0.9-0.2(S_{DS}))D + \Omega_0Q_E$	Eq. 12.4.3.2 (7)
$\Omega_0 = 2.0$	Table 13.6-1
Vertical C.O.G. = ((2.369*4.6)+(4.113*1.17))/6.480 = 2.41 ft	
Net OTM = (0.69*2.41*2.0)-((((0.9-(0.2*0.354))*6.480)*1.5) = 0.00 k-ft	
Omega AB Tension = (0.0/(33/12)/(6/2))+((0.46*2.0)/6) = 0.15 kip	
Net Shear = (0.69*2.0)-((((0.9-(0.2*0.354))* 6.480)*0.3) = -0.24 kip	
Omega AB Shear = -0.24/(6/2) = 0.0 kip (Assume 1/2 AB engage)	

Table 3.5 – Flood Loading (ASCE 7-16 § 5, ASCE 24-14 & FEMA 55, A-Zones, Open Foundation)

Flood Load
*Hydrostatic Load (Fsta) = ½*γ*ds^2*w = 0.5*62.4*(2.23^2)*0.9 = 85.66*
*0 lbs N/A since acting in all directions around pile at 0.33*ds*
Width of Element Hit by Water (w) = 6.625/12 = 0.55 ft pile diameter
*Buoyancy Load (Fbuoy) = γ*Ap*de = 62.4*0.24*6 = 89.63*
89.63 lbs uplift per pile
Pile Cross-sectional Area (Ap) = 3.1415(0.55^2)/4 = 0.24 ft^2*
Pile Embedment Depth (de) = 6 ft
*Hydrodynamic Load (Fdyn) = ½*Cd*ρ*V^2*A*
*Range of 7.13 lbs to 102.9 lbs acting at ½*ds = 1.12 ft a.g.s.*
Drag Coefficient (Cd) = 1.2
*A = w*ds = 0.55*2.23 = 1.23 ft2*
Lower Bound Flood Velo (V1) = ds/t = 2.23/1 = 2.23 ft/sec
*Upper Bound Flood Velo (V2) = (g*ds)0.5 = (32.2*2.23)^0.5 = 8.47 ft/sec*
*Fdyn_low = 0.5*1.2*1.94*(2.23^2)*1.23 = 7.13*
*Fdyn_upp = 0.5*1.2*1.94*(8.47^2)*1.23 = 102.9*
*Breaking Wave Load (Fbrkp) = ½*Cdb*γ*D*Hb^2 = 0.5*1.75*62.4*0.55*(1.74^2) = 91.2*
91.2 lbs acting at ds = 2.23 ft a.g.s.
Breaking Wave Drag Coefficient (Cdb) = 1.75
Pile Diameter (a, D) = 0.55 ft
*Breaking Wave Height (Hb) = 0.78*ds = 0.78*2.23 = 1.74 ft*
Wave Slam (Fs) = ½ γ*Cs*ds*hp*wp = 0.5*62.4*2*2.23*0.66*10 = 918.4*
*918.4 lbs acting at 1.55*ds = 3.46 ft a.g.s.*
Slam Coefficient (Cs) = 2
Platform Height (hp) = 0.66 ft ; Platform Width (wp) = 10 ft
*Wave Crest Elevation = 1.55*ds = 1.55*2.23 = 3.46 ft a.g.s.*
Bottom of Platform Beam Elevation (bp) = 2.5 ft a.g.s.,
Debris Impact Load (F_i) not considered in this analysis due to limited flow path
*Scour Localized Around a Single Pile Due to Group (Smax) = 6*a = 6*0.55 = 3.31 ft*
Flood Load Combination shall be the greater of:
• *max(F_{brkp} or F_{dyn}) (front row piles) + F_{dyn} (all others) + F_i (one pile)*
• *F_s (wave slam; breaking waves alone)*

Table 3.6 – Structural Component Material Strengths

Structural Component	Nominal Strength/Material[1]
Connection Bolts & Genset Base Tank Connection Anchors	ASTM A325
Column All-thread Rod	ASTM A193 B7
Structural Shapes (L, C, W, etc.), Plate & Bar	F_y = 36 ksi (A36)
HSS Pipe Columns/ Helicals	F_y = 42 ksi (ASTM A500, Gr. B)

1. *Strengths listed were utilized for this analysis and are based upon ASTM, AISC, RCSC, MSJC, AWS and ACI preferred specification values. Values and materials are consistent with industry standards. Material strengths were taken from original design documents, geotechnical reports, etc. when available.*

Utilizing 5/8"ϕ A325 Bolts, Minimum of (6) per Gen Frame, (3) each side of Generator.

- *Wind Anchorage Forces:*

  Maximum Tension per Bolt, T_u = 0.025 kips/bolt
  Maximum Shear per Bolt, V_u = 0.37 kips/bolt

- *Seismic Anchorage Forces:*

  Maximum Tension per Bolt, T_u = 0.15 kips/bolt
  Maximum Shear per Bolt, V_u = 0.0 kips/bolt

- *Allowable Loads per AISC:*

  Allowable Tension per Bolt, ϕT_n = 13.64 kips/bolt
  Allowable Shear per Bolt, ϕV_n = 6.51 kips/bolt

  (0.025/13.64) + (0.37/6.51) = 0.059 < 1.0, OK

4.0 Conclusion & Recommendations

AT&T's proposed elevated steel platform assembly and generator mechanical anchorage will satisfy the requirements of the applicable design codes and have sufficient capacity to support the proposed backup diesel generator loading considered in this analysis.

- EMI, Inc. 1000-0030-0195 4'x10' Steel Equipment Platform w/ (8) 1007-T006-0120 1' extension columns
  - Primary steel framing members and connections (evaluation of helical pier capacity per EMI, Inc.)
- Kohler 50REOZK Diesel Generator Equipment Anchorage:
  - (6) 5/8"Ø ASTM A325 stainless steel thru-bolts, min. from base tank flange, through platform bar grating, to 3x3 plate washer with nut & lock-washer

Analysis Notes & Assumptions:

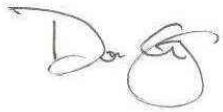
- **All data required to complete our structural analysis was furnished by our client. GeoStructural has not conducted a site visit or independent study to verify existing conditions and the results of this analysis are based solely on the information provided.**
- **Proposed anchorage shall be installed in accordance with any recommendations given in approved Construction Drawings.**
- **Proposed platform assembly and helical anchors shall be installed in accordance with manufacturer's listed installation instructions and recommendations.**

If any of the existing or proposed conditions reported in this analysis are not properly represented, please contact our office immediately to request an amended report. We appreciate the opportunity to provide our structural engineering services to you. If you have any questions regarding the content of this structural analysis report, please don't hesitate to contact us.

Prepared by:

Jesse Drennen, PE
208.761.7986
jesse.drennen@geostructural.com

Reviewed and Approved by:



Don George, PE
208.602.6569
don.george@geostructural.com

5.0 Attachments, Calculations & Software Output

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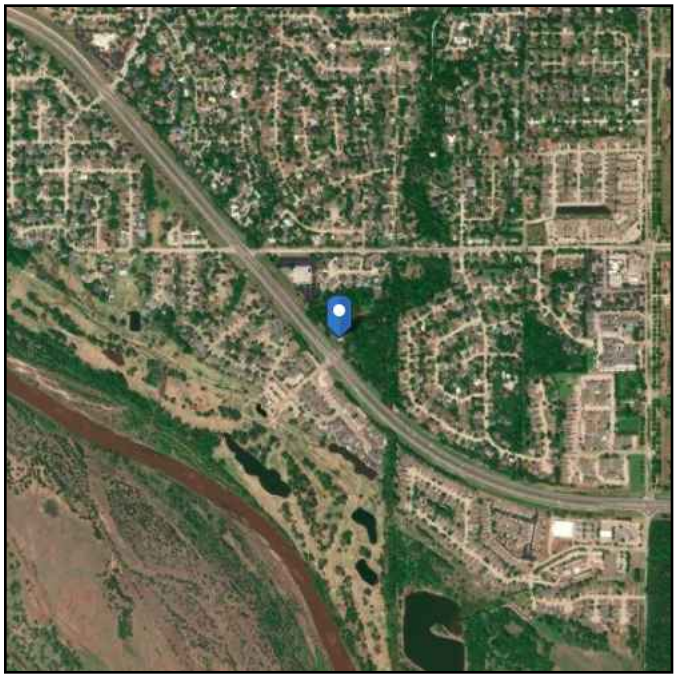
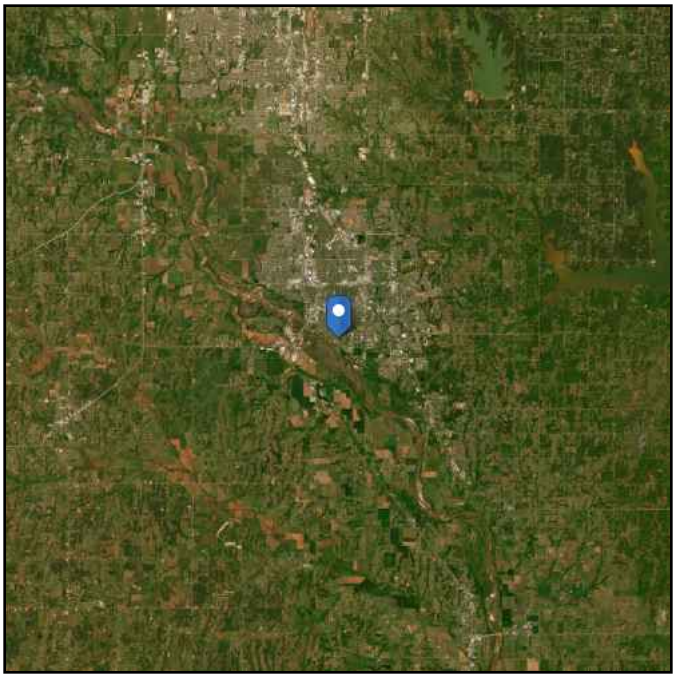
ASCE Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	35.186812
Risk Category:	II	**Longitude:**	-97.461192
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	1102.5294458944581 ft (NAVD 88)





Wind

Results:

Wind Speed	109 Vmph
10-year MRI	75 Vmph
25-year MRI	82 Vmph
50-year MRI	88 Vmph
100-year MRI	93 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Thu Sep 19 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

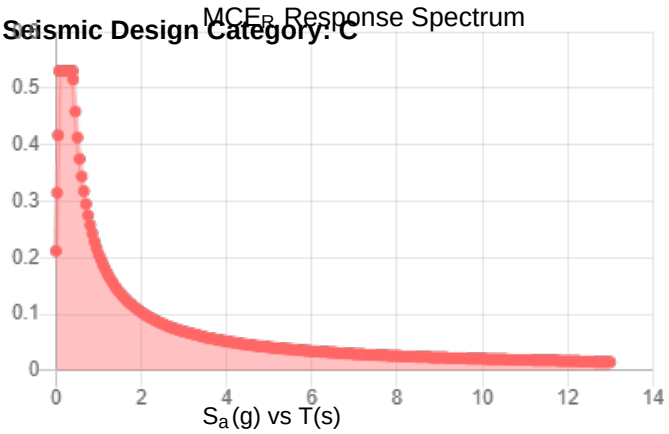
Seismic

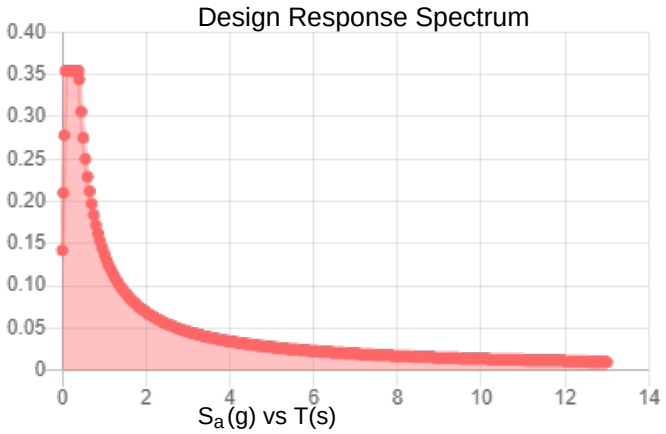
Site Soil Class: D - Default (see Section 11.4.3)

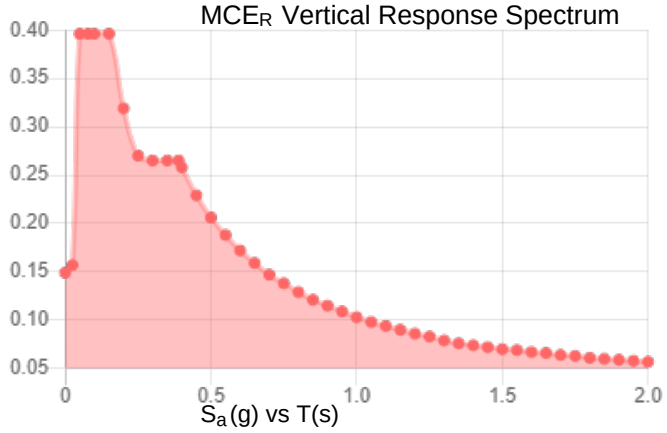
Results:

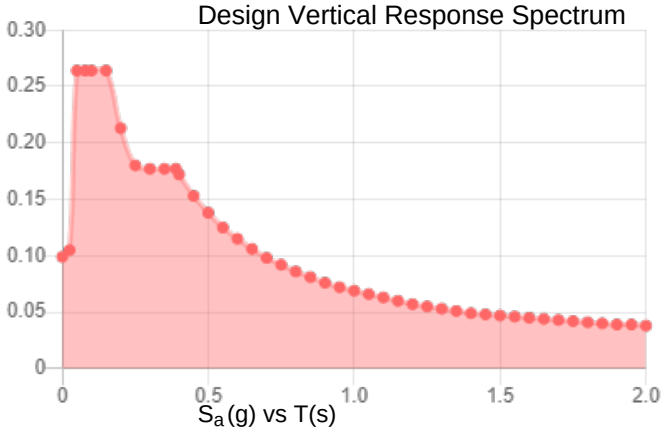
S_S :	0.349	S_{D1} :	0.138
S_1 :	0.086	T_L :	12
F_a :	1.521	PGA :	0.215
F_v :	2.4	PGA_M :	0.298
S_{MS} :	0.531	F_{PGA} :	1.385
S_{M1} :	0.206	I_e :	1
S_{DS} :	0.354	C_v :	0.933

Seismic Design Category: C









Data Accessed: **Thu Sep 19 2024**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	5 F
Gust Speed	40 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Sep 19 2024

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

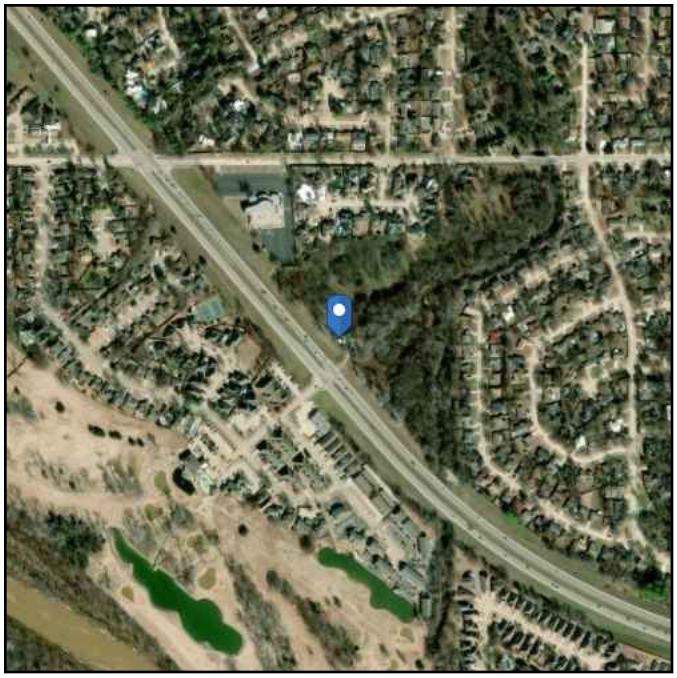
Flood

Results:

Flood Zone Categorization: AE

Base Flood Elevation:

Data Source:	FEMA National Flood Hazard Layer - Effective Flood Hazard Layer for US, where modernized (https://msc.fema.gov/portal/search)
Date Accessed:	Thu Sep 19 2024
FIRM Panel:	If available, download FIRM panel here
Insurance Study Note:	Download FEMA Flood Insurance Study for this area here



The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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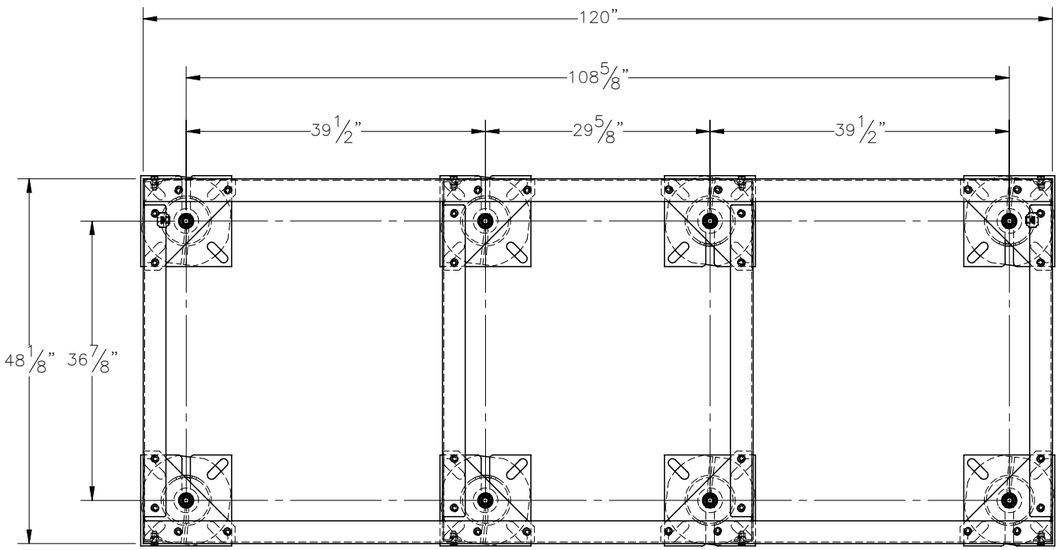
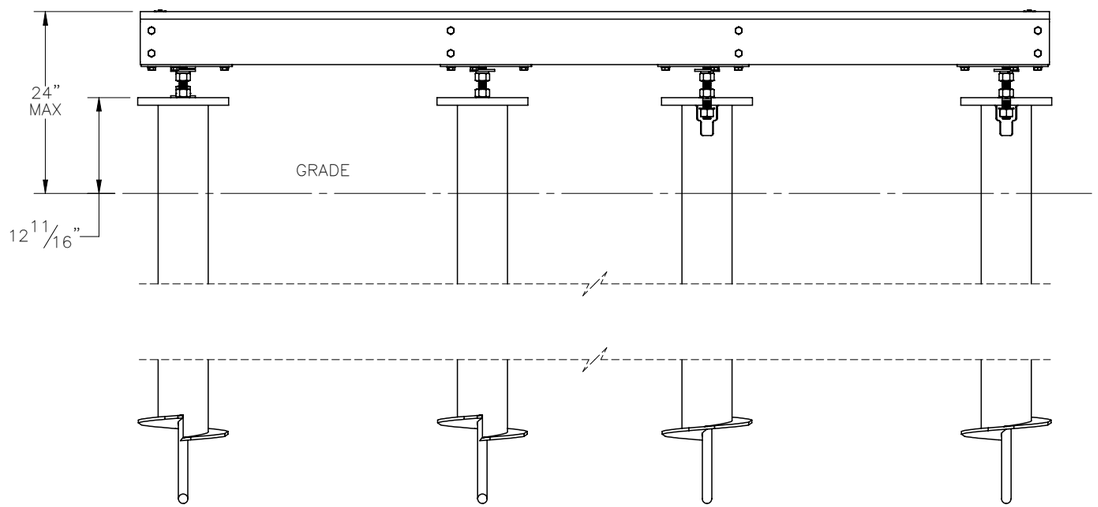
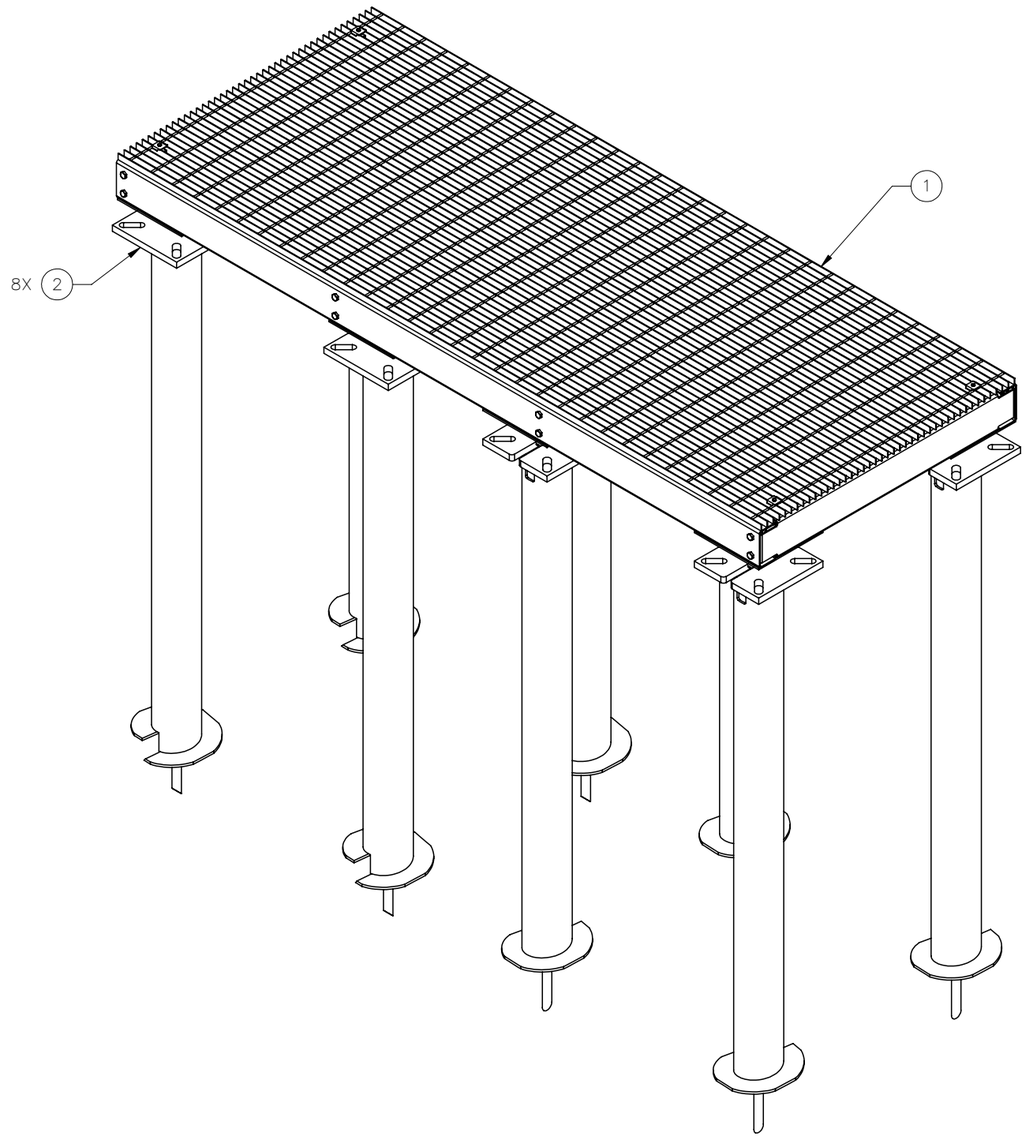
In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE Hazard Tool.



SHOWN WITHOUT GRATING





NOTES:

1. OPTIONAL PLATE PROVIDED IF REQUIRED FOR GENERATOR.

ITEM NO.	QTY REQD	PART NUMBER	DESCRIPTION	LENGTH	WEIGHT
1	1	1001-0020-0162	4' X 10' GENERATOR PLATFORM, SKIS		519.6
2	8	1008-0050-0016	6"X7', 1" BASE, 1" HARDWARE HELICAL		182
3	1	P-006-606	RODENT GUARD	36"	2.720

SURFACE FINISH: UNLESS OTHERWISE SPECIFIED

MATERIAL: SEE PARTS LIST

THIRD ANGLE PROJECTION

NEXT ASSY | USED ON

APPLICATIONS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

.0 ± .06
.00 ± .015
.000 ± .005

FRACTIONS ± 1/16

ANGLES ± .25°

HOLES:

DRILLED OR PUNCHED +1/32

BURNED ±1/32

APPROVALS	DATE
DRAWN J. Breen	02/12/2024
CHECKER J. Breen	02/12/2024
ENGINEER J. Breen	02/12/2024
PRODUCTION J. Breen	02/12/2024

ELECTRO MECHANICAL INDUSTRIES, INC.
11230 NEESHAW DRIVE
HOUSTON, TEXAS 77065
1-800-453-0050

TITLE:

4' X 10' GENERATOR PLATFORM, HELICALS

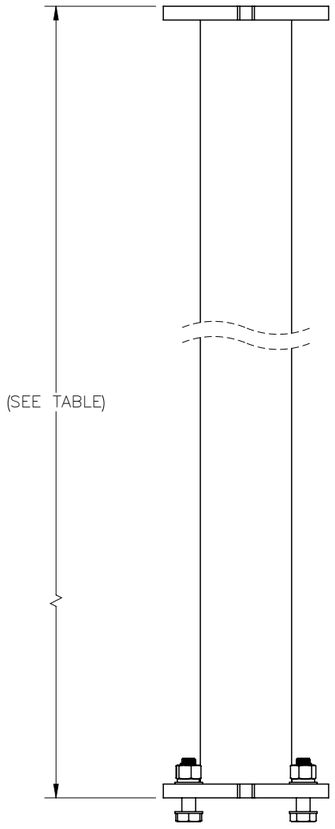
SIZE B | DRAWING NO. 1000-0030-0 | REV 0

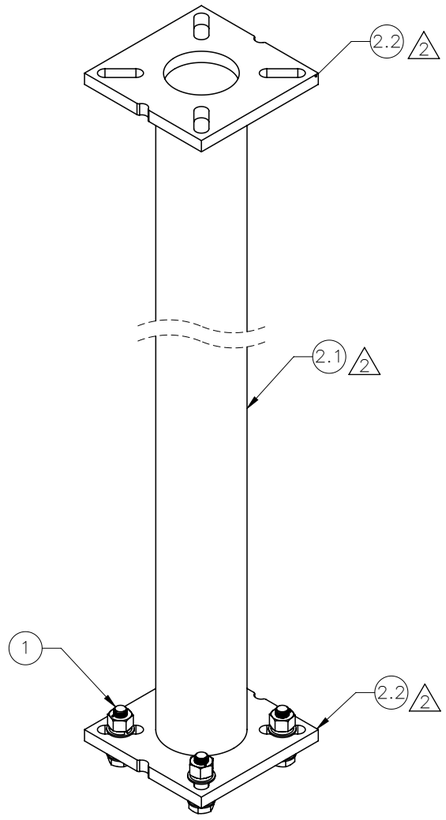
169

SCALE: 1:20 | WEIGHT: 1977.3 lbs. | SHEET 1 OF 1

REVISIONS					
REV.	DCN #	DESCRIPTION	DATE	BY	CHK'D
2	01032	CREATED SUB-B.O.M. FOR WELDMENT	4/14/2021	PG	

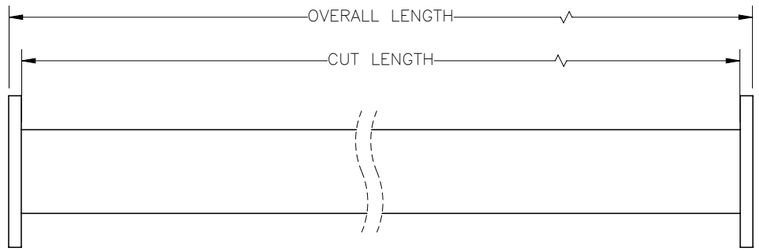
Item 6.

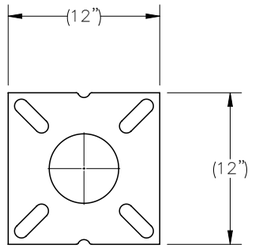


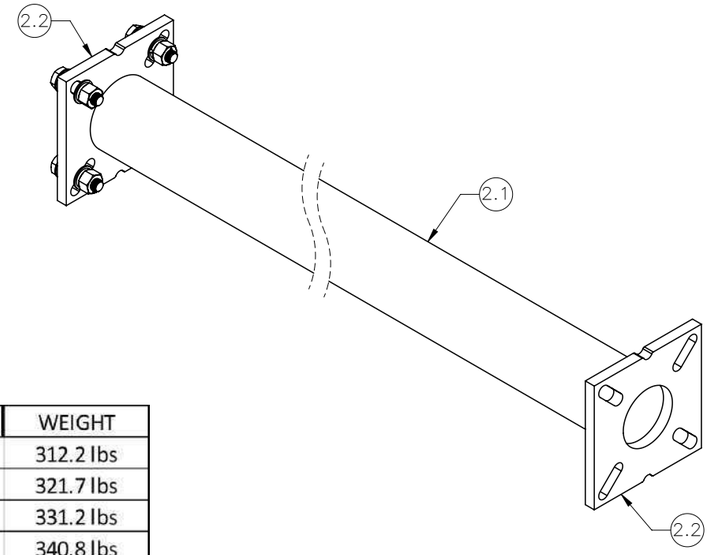


ITEM NO.	QTY REQD	PART NUMBER	DESCRIPTION	LENGTH	WEIGHT
1	1	1000-0020-0079	1'' X 4'' MOUNTING HARDWARE KIT		8
2	1	1007-T006-0000-W	6" EXTENSION WELDMENT	SEE TABLE	SEE TABLE
2.1	1	1007-T006-0000_1	HSS 6.625 X 0.280, ASTM A500, 42 KSI MIN. YIELD	SEE TABLE	SEE TABLE
2.2	2	P-000-979	TOP PLATE	12"	30.1

SURFACE FINISH ✓ UNLESS OTHERWISE SPECIFIED	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	APPROVALS	DATE	ELECTRO MECHANICAL INDUSTRIES, INC. 11230 NEESHAW DRIVE HOUSTON, TEXAS 77065 1-800-453-0050
MATERIAL SEE PARTS LIST	TOLERANCES .0 ± .06, .00 ± .01, .000 ± .005	DRAWN J. CRITELLI	3.13.19	TITLE: 6" EXTENSION TABLE DRAWING
THIRD ANGLE PROJECTION	FRACTIONS ± 1/16	CHECKED R. WOODARD	3.15.19	
	ANGLES ± .25°	ENGINEER/DESIGNER J. BREEN	3.15.19	
NEXT ASSY / USED ON	HOLES: DRILLED OR PUNCHED ± 1/32	PRODUCTION J.K.S.	3.18.19	SIZE B / DRAWING NO. 1007-T006-00 / REV 2
APPLICATIONS	BURNED ± 1/32			SCALE: 1:11 / WEIGHT: / SHEET 1 OF 2







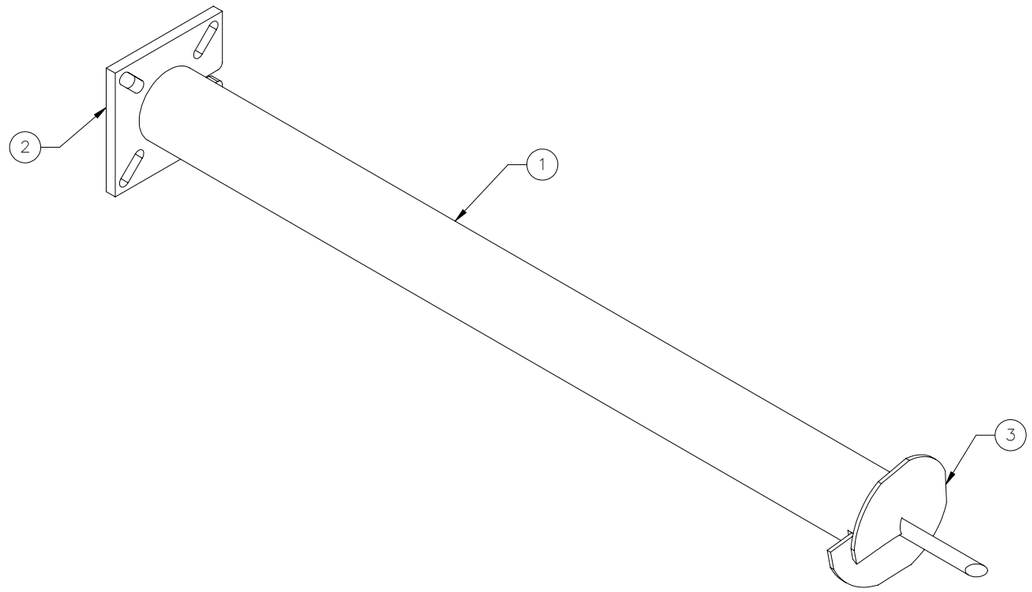
PART #	DESCRIPTION	CUT LENGTH	OVERALL LENGTH	WEIGHT
1007-T006-0060	0.5 FT EXTENSION	4 IN	6 IN	74.2 lbs
1007-T006-0120	1.0 FT EXTENSION	10 IN	12 IN	83.7 lbs
1007-T006-0180	1.5 FT EXTENSION	16 IN	18 IN	93.2 lbs
1007-T006-0240	2.0 FT EXTENSION	22 IN	24 IN	102.7 lbs
1007-T006-0300	2.5 FT EXTENSION	28 IN	30 IN	112.2 lbs
1007-T006-0360	3.0 FT EXTENSION	34 IN	36 IN	121.8 lbs
1007-T006-0420	3.5 FT EXTENSION	40 IN	42 IN	131.3 lbs
1007-T006-0480	4.0 FT EXTENSION	46 IN	48 IN	140.8 lbs
1007-T006-0540	4.5 FT EXTENSION	52 IN	54 IN	150.3 lbs
1007-T006-0600	5.0 FT EXTENSION	58 IN	60 IN	159.8 lbs
1007-T006-0660	5.5 FT EXTENSION	64 IN	66 IN	169.4 lbs
1007-T006-0720	6.0 FT EXTENSION	70 IN	72 IN	178.9 lbs
1007-T006-0780	6.5 FT EXTENSION	76 IN	78 IN	188.4 lbs
1007-T006-0840	7.0 FT EXTENSION	82 IN	84 IN	197.9 lbs
1007-T006-0900	7.5 FT EXTENSION	88 IN	90 IN	207.5 lbs
1007-T006-0960	8.0 FT EXTENSION	94 IN	96 IN	217.0 lbs
1007-T006-1020	8.5 FT EXTENSION	100 IN	102 IN	226.5 lbs
1007-T006-1080	9.0 FT EXTENSION	106 IN	108 IN	236.0 lbs
1007-T006-1140	9.5 FT EXTENSION	112 IN	114 IN	245.5 lbs
1007-T006-1200	10.0 FT EXTENSION	118 IN	120 IN	255.0 lbs
1007-T006-1260	10.5 FT EXTENSION	124 IN	126 IN	264.6 lbs
1007-T006-1320	11.0 FT EXTENSION	130 IN	132 IN	274.0 lbs
1007-T006-1380	11.5 FT EXTENSION	136 IN	138 IN	283.6 lbs
1007-T006-1440	12.0 FT EXTENSION	142 IN	144 IN	293.1 lbs
1007-T006-1500	12.5 FT EXTENSION	148 IN	150 IN	302.7 lbs

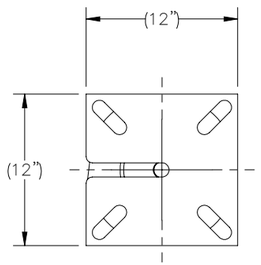
PART #	DESCRIPTION	CUT LENGTH	OVERALL LENGTH	WEIGHT
1007-T006-1560	13.0 FT EXTENSION	154 IN	156 IN	312.2 lbs
1007-T006-1620	13.5 FT EXTENSION	160 IN	162 IN	321.7 lbs
1007-T006-1680	14.0 FT EXTENSION	166 IN	168 IN	331.2 lbs
1007-T006-1740	14.5 FT EXTENSION	172 IN	174 IN	340.8 lbs
1007-T006-1800	15.0 FT EXTENSION	178 IN	180 IN	350.3 lbs
1007-T006-1860	15.5 FT EXTENSION	184 IN	186 IN	359.8 lbs
1007-T006-1920	16.0 FT EXTENSION	190 IN	192 IN	369.3 lbs
1007-T006-1980	16.5 FT EXTENSION	196 IN	198 IN	378.9 lbs
1007-T006-2040	17.0 FT EXTENSION	202 IN	204 IN	388.4 lbs
1007-T006-2100	17.5 FT EXTENSION	208 IN	210 IN	397.9 lbs
1007-T006-2160	18.0 FT EXTENSION	214 IN	216 IN	407.4 lbs
1007-T006-2220	18.5 FT EXTENSION	220 IN	222 IN	417.0 lbs
1007-T006-2280	19.0 FT EXTENSION	226 IN	228 IN	426.5 lbs
1007-T006-2340	19.5 FT EXTENSION	232 IN	234 IN	436.0 lbs
1007-T006-2400	20.0 FT EXTENSION	238 IN	240 IN	445.5 lbs
1007-T006-2460	20.5 FT EXTENSION	244 IN	246 IN	455.1 lbs
1007-T006-2520	21.0 FT EXTENSION	250 IN	252 IN	464.6 lbs
1007-T006-2580	21.5 FT EXTENSION	256 IN	258 IN	474.1 lbs
1007-T006-2640	22.0 FT EXTENSION	262 IN	264 IN	483.6 lbs
1007-T006-2700	22.5 FT EXTENSION	268 IN	270 IN	493.2 lbs
1007-T006-2760	23.0 FT EXTENSION	274 IN	276 IN	502.7 lbs
1007-T006-2820	23.5 FT EXTENSION	280 IN	282 IN	512.2 lbs
1007-T006-2880	24.0 FT EXTENSION	286 IN	288 IN	521.8 lbs
1007-T006-2940	24.5 FT EXTENSION	292 IN	294 IN	531.3 lbs
1007-T006-3000	25.0 FT EXTENSION	298 IN	300 IN	540.8 lbs

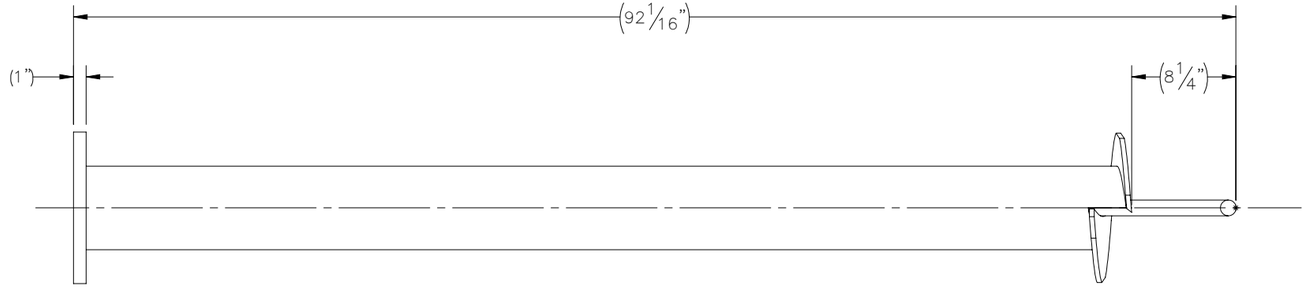
ELECTRO MECHANICAL INDUSTRIES, INC.
11230 NEESHAW DRIVE
HOUSTON, TEXAS 77065
1-800-453-

SIZE B | DRAWING NO. 1007-T006-00 | REV 2

SCALE: 1:12







SURFACE FINISH √ UNLESS OTHERWISE SPECIFIED	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	APPROVALS	DATE	ELECTRO MECHANICAL INDUSTRIES, INC. 11230 NEESHAW DRIVE HOUSTON, TEXAS 77065 1-800-453-0050	
MATERIAL SEE PARTS LIST	TOLERANCES .0 ± .06 .00 ± .01 .000 ± .005 FRACTIONS ± 1/16 ANGLES ± .25°	DRAWN C. SANCHEZ	3.2.18	TITLE: 6" X 7', HELICAL, SINGLE STUD OPTION	
THIRD ANGLE PROJECTION	HOLES: DRILLED OR PUNCHED +1/32	CHECKED J. BUSHMAN	4.5.18		
	BURNED ±1/32	ENGINEER/DESIGNER J. BUSHMAN	4.5.18		
NEXT ASSY / USED ON		PRODUCTION J.K.S.	4.5.18	SIZE B / DRAWING NO. 1008-0050-00 / REV 1	
APPLICATIONS				SCALE: 1:12 / WEIGHT: 177.2 lbs. / SHEET 1 OF 1	

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Distributed	Area(Member)
1	Self Weight	DL	-1			
2	Wind Load AZI 000	WLZ		1		1
3	Wind Load AZI 090	WLX		1		1
4	Ice Weight	OL1			22	
5	Wind + Ice Load AZI 000	OL2				1
6	Wind + Ice Load AZI 090	OL3				1
7	Gen Weight	OL4		1		
8	Seismic Load AZI 000	ELZ		1		
9	Seismic Load AZI 090	ELX		1		
10	Flood Load AZI 000	OL5		8		
11	Live Load	LL				
12	Flood Load AZI 090	OL6		8		
13	Flood slam AZI 000	OL7			1	
14	Flood slam AZI 090	OL8			1	
15	BLC 2 Transient Area Loads	None			78	
16	BLC 3 Transient Area Loads	None			74	
17	BLC 5 Transient Area Loads	None			78	
18	BLC 6 Transient Area Loads	None			74	

Load Combination Design

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	1.4(D+1.2Dgen)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	1.2Dgen		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	1.0D+1.2Dgen		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	1.2D+1.0Di		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	1.2D+1.6L+0.2Di		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	1.2D+1.6L		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	2) 1.2D+1.0Wo [0deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	2) 1.2D+1.0Wo [30deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	2) 1.2D+1.0Wo [60deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	2) 1.2D+1.0Wo [90deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	2) 1.2D+1.0Wo [120deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	2) 1.2D+1.0Wo [150deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	2) 1.2D+1.0Wo [180deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	2) 1.2D+1.0Wo [210deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	2) 1.2D+1.0Wo [240deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	2) 1.2D+1.0Wo [270deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	2) 1.2D+1.0Wo [300deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	2) 1.2D+1.0Wo [330deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	3) 0.9D+1.0Wo [0deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	3) 0.9D+1.0Wo [30deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	3) 0.9D+1.0Wo [60deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	3) 0.9D+1.0Wo [90deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	3) 0.9D+1.0Wo [120deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	3) 0.9D+1.0Wo [150deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	3) 0.9D+1.0Wo [180deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	3) 0.9D+1.0Wo [210deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	3) 0.9D+1.0Wo [240deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	3) 0.9D+1.0Wo [270deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	3) 0.9D+1.0Wo [300deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	3) 0.9D+1.0Wo [330deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	4) 1.2D+1.0Di+1.0Wi [0deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	4) 1.2D+1.0Di+1.0Wi [30deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	4) 1.2D+1.0Di+1.0Wi [60deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Load Combination Design (Continued)

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
34	4) 1.2D+1.0Di+1.0Wi [90deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	4) 1.2D+1.0Di+1.0Wi [120deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	4) 1.2D+1.0Di+1.0Wi [150deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	4) 1.2D+1.0Di+1.0Wi [180deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	4) 1.2D+1.0Di+1.0Wi [210deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	4) 1.2D+1.0Di+1.0Wi [240deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	4) 1.2D+1.0Di+1.0Wi [270deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	4) 1.2D+1.0Di+1.0Wi [300deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
42	4) 1.2D+1.0Di+1.0Wi [330deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	7) (1.2+0.2Sds)D+E [0deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	7) (1.2+0.2Sds)D+E [30deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	7) (1.2+0.2Sds)D+E [60deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	7) (1.2+0.2Sds)D+E [90deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	7) (1.2+0.2Sds)D+E [120deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48	7) (1.2+0.2Sds)D+E [150deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	7) (1.2+0.2Sds)D+E [180deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50	7) (1.2+0.2Sds)D+E [210deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51	7) (1.2+0.2Sds)D+E [240deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	7) (1.2+0.2Sds)D+E [270deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	7) (1.2+0.2Sds)D+E [300deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	7) (1.2+0.2Sds)D+E [330deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55	8) (0.9-0.2Sds)D+E [0deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
56	8) (0.9-0.2Sds)D+E [30deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	8) (0.9-0.2Sds)D+E [60deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	8) (0.9-0.2Sds)D+E [90deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
59	8) (0.9-0.2Sds)D+E [120deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	8) (0.9-0.2Sds)D+E [150deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	8) (0.9-0.2Sds)D+E [180deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	8) (0.9-0.2Sds)D+E [210deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	8) (0.9-0.2Sds)D+E [240deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	8) (0.9-0.2Sds)D+E [270deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	8) (0.9-0.2Sds)D+E [300deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	8) (0.9-0.2Sds)D+E [330deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	1.4(D+Dgen)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	1.0Dgen		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69	1.0D+1.0Dgen		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
70	1.2D+1.0Di		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
71	1.2D+1.6L+0.2Di		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
72	1.2D+1.6L		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
73	2) 1.2D+1.0Wo [0deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
74	2) 1.2D+1.0Wo [30deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
75	2) 1.2D+1.0Wo [60deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
76	2) 1.2D+1.0Wo [90deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
77	2) 1.2D+1.0Wo [120deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
78	2) 1.2D+1.0Wo [150deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
79	2) 1.2D+1.0Wo [180deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
80	2) 1.2D+1.0Wo [210deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
81	2) 1.2D+1.0Wo [240deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
82	2) 1.2D+1.0Wo [270deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
83	2) 1.2D+1.0Wo [300deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
84	2) 1.2D+1.0Wo [330deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
85	3) 0.9D+1.0Wo [0deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
86	3) 0.9D+1.0Wo [30deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
87	3) 0.9D+1.0Wo [60deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
88	3) 0.9D+1.0Wo [90deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Load Combination Design (Continued)

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
89	3) 0.9D+1.0Wo [120deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
90	3) 0.9D+1.0Wo [150deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
91	3) 0.9D+1.0Wo [180deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
92	3) 0.9D+1.0Wo [210deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
93	3) 0.9D+1.0Wo [240deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
94	3) 0.9D+1.0Wo [270deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
95	3) 0.9D+1.0Wo [300deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
96	3) 0.9D+1.0Wo [330deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
97	4) 1.2D+1.0Di+1.0Wi [0deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
98	4) 1.2D+1.0Di+1.0Wi [30deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
99	4) 1.2D+1.0Di+1.0Wi [60deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
100	4) 1.2D+1.0Di+1.0Wi [90deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
101	4) 1.2D+1.0Di+1.0Wi [120deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
102	4) 1.2D+1.0Di+1.0Wi [150deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
103	4) 1.2D+1.0Di+1.0Wi [180deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
104	4) 1.2D+1.0Di+1.0Wi [210deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
105	4) 1.2D+1.0Di+1.0Wi [240deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
106	4) 1.2D+1.0Di+1.0Wi [270deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
107	4) 1.2D+1.0Di+1.0Wi [300deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
108	4) 1.2D+1.0Di+1.0Wi [330deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
109	2) 1.2D+0.5Wo [0deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
110	2) 1.2D+0.5Wo [90deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
111	2) 1.2D+0.5Wo [180deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
112	2) 1.2D+0.5Wo [270deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
113	3) 0.9D+0.5Wo [0deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
114	3) 0.9D+0.5Wo [90deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
115	3) 0.9D+0.5Wo [180deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
116	3) 0.9D+0.5Wo [270deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
117	2) 1.2D+0.5Wo [0deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
118	2) 1.2D+0.5Wo [90deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
119	2) 1.2D+0.5Wo [180deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
120	2) 1.2D+0.5Wo [270deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
121	3) 0.9D+0.5Wo [0deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
122	3) 0.9D+0.5Wo [90deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
123	3) 0.9D+0.5Wo [180deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
124	3) 0.9D+0.5Wo [270deg]+1.0Fa		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
125	2) 1.2D+1.0Wo [150deg]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B RECT	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A500 Gr.C RND	29000	11154	0.3	0.65	0.527	46	1.4	62	1.3
7	A500 Gr.C RECT	29000	11154	0.3	0.65	0.527	50	1.4	62	1.3
8	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
9	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
10	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1
11	A325	29000	11154	0.3	0.65	0.49	90	1.1	120	1.1
12	A193 B7	29000	11154	0.3	0.65	0.49	105	1.1	125	1.1

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Fu [ksi]
1	A653 SS Gr33	29500	11346	0.3	0.65	0.49	33	45
2	A653 SS Gr50/1	29500	11346	0.3	0.65	0.49	50	65

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	C6X3X0.188	C6X3X0.188	Beam	Channel	A36 Gr.36	Typical	2.13	1.888	11.817	3.366
2	HSS6.625X0.280	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical	5.2	26.4	26.4	52.7
3	SR1.0	SR1.0	Beam	BAR	A193 B7	Typical	0.785	0.049	0.049	0.098
4	SR0.5	SR0.5	Beam	BAR	A325	Typical	0.196	0.003	0.003	0.006
5	SR0.625	SR0.625	Beam	BAR	A325	Typical	0.307	0.007	0.007	0.015
6	C6x8.2	C6X8.2	Beam	Channel	A36 Gr.36	Typical	2.39	0.687	13.1	0.074
7	W6x15	W6X15	Beam	Wide Flange	A992	Typical	4.43	9.32	29.1	0.101
8	L2x2x4	L2X2X4	HBrace	Single Angle	A36 Gr.36	Typical	0.944	0.346	0.346	0.021
9	L2.5x2.5x4	L2.5X2.5X4	Beam	Single Angle	A36 Gr.36	Typical	1.19	0.692	0.692	0.026
10	HSS10.750x0.375	HSS10.750X0.375	Column	HSS Pipe	A500 Gr.B RND	Typical	11.4	154	154	309
11	3/8"X4"	3/8"X4"	Column	RECT	A36 Gr.36	Typical	1.5	0.018	2	0.066
12	SR1.0_1	SR1.0	Beam	BAR	A36 Gr.36	Typical	0.785	0.049	0.049	0.098

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	CF1	8CU1.25X057	Beam	CU	A653 SS Gr33	Typical	0.581	0.057	4.41	0.00063

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N5	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
2	M2	N2	N6	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
3	M3	N4	N8	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
4	M4	N3	N7	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
5	M5	N9	N1	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
6	M6	N10	N2	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
7	M7	N12	N4	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
8	M8	N11	N3	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
9	M53	N704	N697	C6X3X0.188	Beam	Channel	A36 Gr.36	Typical
10	M54	N11	N88	SR1.0	Beam	BAR	A193 B7	Typical
11	M57	N12	N89	SR1.0	Beam	BAR	A193 B7	Typical
12	M58	N9	N90	SR1.0	Beam	BAR	A193 B7	Typical
13	M59	N10	N91	SR1.0	Beam	BAR	A193 B7	Typical
14	M61	N274	N269	SR0.5	Beam	BAR	A325	Typical
15	M60	N275	N262	SR0.5	Beam	BAR	A325	Typical
16	M39	N346	N439	SR0.5	Beam	BAR	A325	Typical
17	M40	N442	N337	SR0.5	Beam	BAR	A325	Typical
18	M41	N494	N602	SR0.5	Beam	BAR	A325	Typical
19	M42	N607	N484	SR0.5	Beam	BAR	A325	Typical
20	M44	N517	N584	SR0.5	Beam	BAR	A325	Typical
21	M45	N696	N633	SR0.5	Beam	BAR	A325	Typical
22	M46	N697	N698	C6X3X0.188	Beam	Channel	A36 Gr.36	Typical
23	M47	N700	N118	SR0.5	Beam	BAR	A325	Typical
24	M48	N701	N208	SR0.5	Beam	BAR	A325	Typical
25	M49	N702	N514	SR0.5	Beam	BAR	A325	Typical
26	M50	N703	N529	SR0.5	Beam	BAR	A325	Typical
27	M51	N705	N704	C6X3X0.188	Beam	Channel	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
28	M52	N706	N364	SR0.5	Beam	BAR	A325	Typical
29	M55	N707	N374	SR0.5	Beam	BAR	A325	Typical
30	M56	N708	N445	SR0.5	Beam	BAR	A325	Typical
31	M62	N709	N658	SR0.5	Beam	BAR	A325	Typical
32	M63	N698	N705	C6X3X0.188	Beam	Channel	A36 Gr.36	Typical
33	M64	N605	N711	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
34	M65	N710	N712	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
35	M66	N713	N605	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
36	M67	N714	N710	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
37	M68	N713	N719	SR1.0	Beam	BAR	A193 B7	Typical
38	M69	N714	N720	SR1.0	Beam	BAR	A193 B7	Typical
39	M70	N771	N879	SR0.5	Beam	BAR	A325	Typical
40	M71	N883	N761	SR0.5	Beam	BAR	A325	Typical
41	M72	N794	N861	SR0.5	Beam	BAR	A325	Typical
42	M73	N972	N909	SR0.5	Beam	BAR	A325	Typical
43	M74	N974	N791	SR0.5	Beam	BAR	A325	Typical
44	M75	N975	N806	SR0.5	Beam	BAR	A325	Typical
45	M76	N977	N723	SR0.5	Beam	BAR	A325	Typical
46	M77	N978	N934	SR0.5	Beam	BAR	A325	Typical
47	M78	N973	N976	C6X3X0.188	Beam	Channel	A36 Gr.36	Typical
48	M79	N980	N982	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
49	M80	N979	N981	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
50	M81	N984	N980	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
51	M82	N983	N979	HSS6.625X0.280	Column	HSS Pipe	A500 Gr.B RND	Typical
52	M83	N1246	N1243	C6X3X0.188	Beam	Channel	A36 Gr.36	Typical
53	M84	N983	N989	SR1.0	Beam	BAR	A193 B7	Typical
54	M85	N984	N990	SR1.0	Beam	BAR	A193 B7	Typical
55	M86	N1115	N1110	SR0.5	Beam	BAR	A325	Typical
56	M87	N1116	N1103	SR0.5	Beam	BAR	A325	Typical
57	M88	N1154	N1239	SR0.5	Beam	BAR	A325	Typical
58	M89	N1242	N1145	SR0.5	Beam	BAR	A325	Typical
59	M90	N1244	N999	SR0.5	Beam	BAR	A325	Typical
60	M91	N1245	N1050	SR0.5	Beam	BAR	A325	Typical
61	M92	N1247	N1172	SR0.5	Beam	BAR	A325	Typical
62	M93	N1248	N1182	SR0.5	Beam	BAR	A325	Typical
63	M225_1	N1286	N1277	RIGID	None	None	RIGID	Typical
64	M227_1	N1276	N1285	RIGID	None	None	RIGID	Typical
65	M235_1	N1288	N1278	RIGID	None	None	RIGID	Typical
66	M237_1	N1279	N1287	RIGID	None	None	RIGID	Typical
67	M242_1	N304_1	N305_1	RIGID	None	None	RIGID	Typical
68	M243_1	N306_1	N307_1	RIGID	None	None	RIGID	Typical
69	M244_1	N313_1	N312_1	RIGID	None	None	RIGID	Typical
70	M112	N1270	N1271	RIGID	None	None	RIGID	Typical
71	M113	N1268	N1269	RIGID	None	None	RIGID	Typical
72	M114	N1270	N1265	RIGID	None	None	RIGID	Typical
73	M115	N1271	N1266	RIGID	None	None	RIGID	Typical
74	M116	N1275	N1274	RIGID	None	None	RIGID	Typical
75	M117	N1272	N1273	RIGID	None	None	RIGID	Typical
76	M118	N1275	N1209	RIGID	None	None	RIGID	Typical
77	M119	N1274	N1267	RIGID	None	None	RIGID	Typical
78	M120	N1277	N1276	RIGID	None	None	RIGID	Typical
79	M121	N1278	N1279	RIGID	None	None	RIGID	Typical
80	M122	N1279	N1276	RIGID	None	None	RIGID	Typical
81	M123	N1278	N1277	RIGID	None	None	RIGID	Typical
82	M124	N1271	N1274	RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
83	M125	N1281	N1282	RIGID	None	None	RIGID	Typical
84	M98	N1249	N1250	RIGID	None	None	RIGID	Typical
85	M99	N1251	N1252	RIGID	None	None	RIGID	Typical
86	M101	N1251	N1254	RIGID	None	None	RIGID	Typical
87	M105	N1252	N1256	RIGID	None	None	RIGID	Typical
88	M106	N1283	N1284	RIGID	None	None	RIGID	Typical
89	M107	N1260	N1261	RIGID	None	None	RIGID	Typical
90	M108	N1283	N1253	RIGID	None	None	RIGID	Typical
91	M109	N1284	N1259	RIGID	None	None	RIGID	Typical
92	M126	N1285	N1286	RIGID	None	None	RIGID	Typical
93	M127	N1287	N1288	RIGID	None	None	RIGID	Typical
94	M128	N1287	N1285	RIGID	None	None	RIGID	Typical
95	M129	N1288	N1286	RIGID	None	None	RIGID	Typical
96	M130	N1252	N1284	RIGID	None	None	RIGID	Typical
97	M131	N1291	N1290	RIGID	None	None	RIGID	Typical
98	M100	N307_1	N1281	RIGID	None	None	RIGID	Typical
99	M102	N306_1	N1291	RIGID	None	None	RIGID	Typical

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N5	max	-0.035	85	1.823	13	1.123	8	2.569	8	0	125	2.989	13
2		min	-1.28	13	0.243	85	0.163	92	0.433	92	0	1	0.082	85
3	N6	max	-0.035	91	1.823	7	-0.163	96	-0.432	121	0	125	2.989	7
4		min	-1.28	7	0.243	91	-1.123	12	-2.569	12	0	1	0.082	91
5	N7	max	1.28	13	1.823	13	1.123	18	2.569	18	0	125	-0.082	85
6		min	0.035	85	0.243	85	0.163	90	0.433	90	0	1	-2.989	13
7	N8	max	1.28	7	1.823	7	-0.163	86	-0.432	121	0	125	-0.082	91
8		min	0.035	91	0.243	91	-1.123	14	-2.569	14	0	1	-2.989	7
9	N711	max	-0.002	86	1.822	13	1.09	7	2.481	7	0	125	3.13	14
10		min	-1.354	14	0.243	85	0.19	91	0.504	91	0	1	0.036	86
11	N712	max	-0.002	90	1.822	7	-0.165	121	-0.416	121	0	125	3.13	18
12		min	-1.354	18	0.243	91	-1.09	13	-2.481	13	0	1	0.036	90
13	N981	max	1.354	125	1.822	13	1.09	7	2.481	7	0	125	-0.036	96
14		min	0.002	96	0.243	85	0.19	91	0.504	91	0	1	-3.13	12
15	N982	max	1.354	8	1.822	7	-0.165	121	-0.416	121	0	125	-0.036	92
16		min	0.002	92	0.243	91	-1.09	13	-2.481	13	0	1	-3.13	8
17	Totals:	max	1.451	114	11.781	1	2.441	7						
18		min	-1.303	94	6.407	91	-2.441	13						

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	M91	SR0.5	0.151	0	117	0.334	0		117	15.903	15.904	0.133	0.133	1	H1-1b
2	M75	SR0.5	0.151	0	117	0.334	0		117	15.903	15.904	0.133	0.133	1	H1-1b
3	M48	SR0.5	0.135	0	117	0.297	0		117	15.903	15.904	0.133	0.133	1	H1-1b
4	M50	SR0.5	0.135	0	117	0.297	0		117	15.903	15.904	0.133	0.133	1	H1-1b
5	M86	SR0.5	0.133	0	119	0.272	0		119	15.903	15.904	0.133	0.133	1	H1-1b
6	M70	SR0.5	0.133	0	119	0.272	0		119	15.903	15.904	0.133	0.133	1	H1-1b
7	M41	SR0.5	0.127	0	119	0.259	0		119	15.903	15.904	0.133	0.133	1	H1-1b
8	M61	SR0.5	0.127	0	119	0.259	0		119	15.903	15.904	0.133	0.133	1	H1-1b
9	M44	SR0.5	0.099	0	1	0.204	0.1		1	15.903	15.904	0.133	0.133	1	H1-1b
10	M39	SR0.5	0.099	0	1	0.204	0.1		1	15.903	15.904	0.133	0.133	1	H1-1b
11	M72	SR0.5	0.098	0	1	0.201	0.1		1	15.903	15.904	0.133	0.133	1	H1-1b
12	M88	SR0.5	0.098	0	1	0.201	0.1		1	15.903	15.904	0.133	0.133	1	H1-1b

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
13	M89	SR0.5	0.109	0	7	0.187	0.1		7	15.903	15.904	0.133	0.133	1	H1-1b
14	M73	SR0.5	0.109	0	7	0.187	0.1		7	15.903	15.904	0.133	0.133	1	H1-1b
15	M87	SR0.5	0.109	0	13	0.187	0.1		13	15.903	15.904	0.133	0.133	1	H1-1b
16	M71	SR0.5	0.109	0	13	0.187	0.1		13	15.903	15.904	0.133	0.133	1	H1-1b
17	M45	SR0.5	0.109	0	7	0.187	0.1		7	15.903	15.904	0.133	0.133	1	H1-1b
18	M40	SR0.5	0.109	0	7	0.187	0.1		7	15.903	15.904	0.133	0.133	1	H1-1b
19	M42	SR0.5	0.109	0	13	0.187	0.1		13	15.903	15.904	0.133	0.133	1	H1-1b
20	M60	SR0.5	0.109	0	13	0.187	0.1		13	15.903	15.904	0.133	0.133	1	H1-1b
21	M62	SR0.5	0.069	0	1	0.138	0.1		1	15.903	15.904	0.133	0.133	1	H1-1b
22	M55	SR0.5	0.069	0	1	0.138	0.1		1	15.903	15.904	0.133	0.133	1	H1-1b
23	M93	SR0.5	0.067	0	1	0.133	0.1		1	15.903	15.904	0.133	0.133	1	H1-1b
24	M77	SR0.5	0.067	0	1	0.133	0.1		1	15.903	15.904	0.133	0.133	1	H1-1b
25	M49	SR0.5	0.076	0	125	0.133	0.001		119	15.903	15.904	0.133	0.133	1	H1-1b
26	M47	SR0.5	0.076	0	14	0.133	0.001		119	15.903	15.904	0.133	0.133	1	H1-1b
27	M74	SR0.5	0.072	0	119	0.13	0		119	15.903	15.904	0.133	0.133	1	H1-1b
28	M90	SR0.5	0.072	0	119	0.13	0		119	15.903	15.904	0.133	0.133	1	H1-1b
29	M56	SR0.5	0.076	0	8	0.127	0.002		8	15.903	15.904	0.133	0.133	1	H1-1b
30	M52	SR0.5	0.076	0	18	0.127	0.002		18	15.903	15.904	0.133	0.133	1	H1-1b
31	M92	SR0.5	0.067	0	18	0.109	0.003		18	15.903	15.904	0.133	0.133	1	H1-1b
32	M76	SR0.5	0.067	0	8	0.109	0.003		8	15.903	15.904	0.133	0.133	1	H1-1b
33	M46	C6X3X0.188	0.167	5.026	117	0.093	40.208	z	117	68.411	69.012	3.62	12.864	1.331	H1-1b
34	M83	C6X3X0.188	0.124	11.086	7	0.055	4.031	y	7	66.114	69.012	3.022	12.864	2.192	H1-1b
35	M78	C6X3X0.188	0.124	37.289	7	0.055	44.344	y	7	66.114	69.012	3.022	12.864	2.192	H1-1b
36	M63	C6X3X0.188	0.125	37.289	7	0.051	44.344	y	7	66.114	69.012	3.022	12.864	2.192	H1-1b
37	M53	C6X3X0.188	0.125	11.086	7	0.051	4.031	y	7	66.114	69.012	3.022	12.864	2.192	H1-1b
38	M69	SR1.0	0	2.063	125	0.043	0.924		18	73.448	74.22	1.237	1.237	1	H1-1a
39	M85	SR1.0	0	2.063	125	0.043	0.924		8	73.448	74.22	1.237	1.237	1	H1-1a
40	M84	SR1.0	0	2.063	125	0.043	0.924		125	73.448	74.22	1.237	1.237	1	H1-1a
41	M68	SR1.0	0	2.063	125	0.043	0.924		14	73.448	74.22	1.237	1.237	1	H1-1a
42	M57	SR1.0	0	2.063	125	0.042	0.924		7	73.448	74.22	1.237	1.237	1	H1-1a
43	M59	SR1.0	0	2.063	125	0.042	0.924		7	73.448	74.22	1.237	1.237	1	H1-1a
44	M58	SR1.0	0	2.063	125	0.042	0.924		13	73.448	74.22	1.237	1.237	1	H1-1a
45	M54	SR1.0	0	2.063	125	0.042	0.924		13	73.448	74.22	1.237	1.237	1	H1-1a
46	M51	C6X3X0.188	0.097	109.316	18	0.039	76.647	y	7	65.762	69.012	3.022	12.864	2.148	H1-1b
47	M65	HSS6.625X0.280	0.106	12.688	18	0.024	12.688		18	196.178	196.56	33.075	33.075	1	H1-1b
48	M79	HSS6.625X0.280	0.106	12.688	8	0.024	12.688		8	196.178	196.56	33.075	33.075	1	H1-1b
49	M80	HSS6.625X0.280	0.106	12.688	125	0.024	12.688		125	196.178	196.56	33.075	33.075	1	H1-1b
50	M64	HSS6.625X0.280	0.106	12.688	14	0.024	12.688		14	196.178	196.56	33.075	33.075	1	H1-1b
51	M67	HSS6.625X0.280	0.056	10	18	0.024	10		18	196.322	196.56	33.075	33.075	1	H1-1b
52	M81	HSS6.625X0.280	0.056	10	8	0.024	10		8	196.322	196.56	33.075	33.075	1	H1-1b
53	M82	HSS6.625X0.280	0.056	10	125	0.024	10		125	196.322	196.56	33.075	33.075	1	H1-1b
54	M66	HSS6.625X0.280	0.056	10	14	0.024	10		14	196.322	196.56	33.075	33.075	1	H1-1b
55	M7	HSS6.625X0.280	0.054	10	7	0.024	0		7	196.322	196.56	33.075	33.075	1	H1-1b
56	M6	HSS6.625X0.280	0.054	10	7	0.024	0		7	196.322	196.56	33.075	33.075	1	H1-1b
57	M5	HSS6.625X0.280	0.054	10	13	0.024	0		13	196.322	196.56	33.075	33.075	1	H1-1b
58	M8	HSS6.625X0.280	0.054	10	13	0.024	0		13	196.322	196.56	33.075	33.075	1	H1-1b
59	M3	HSS6.625X0.280	0.102	12.688	7	0.023	0		7	196.178	196.56	33.075	33.075	1	H1-1b
60	M2	HSS6.625X0.280	0.102	12.688	7	0.023	0		7	196.178	196.56	33.075	33.075	1	H1-1b
61	M1	HSS6.625X0.280	0.102	12.688	13	0.023	0		13	196.178	196.56	33.075	33.075	1	H1-1b
62	M4	HSS6.625X0.280	0.102	12.688	13	0.023	0		13	196.178	196.56	33.075	33.075	1	H1-1b

Envelope AISI S100-16: ASD Member Cold Formed Steel Code Checks

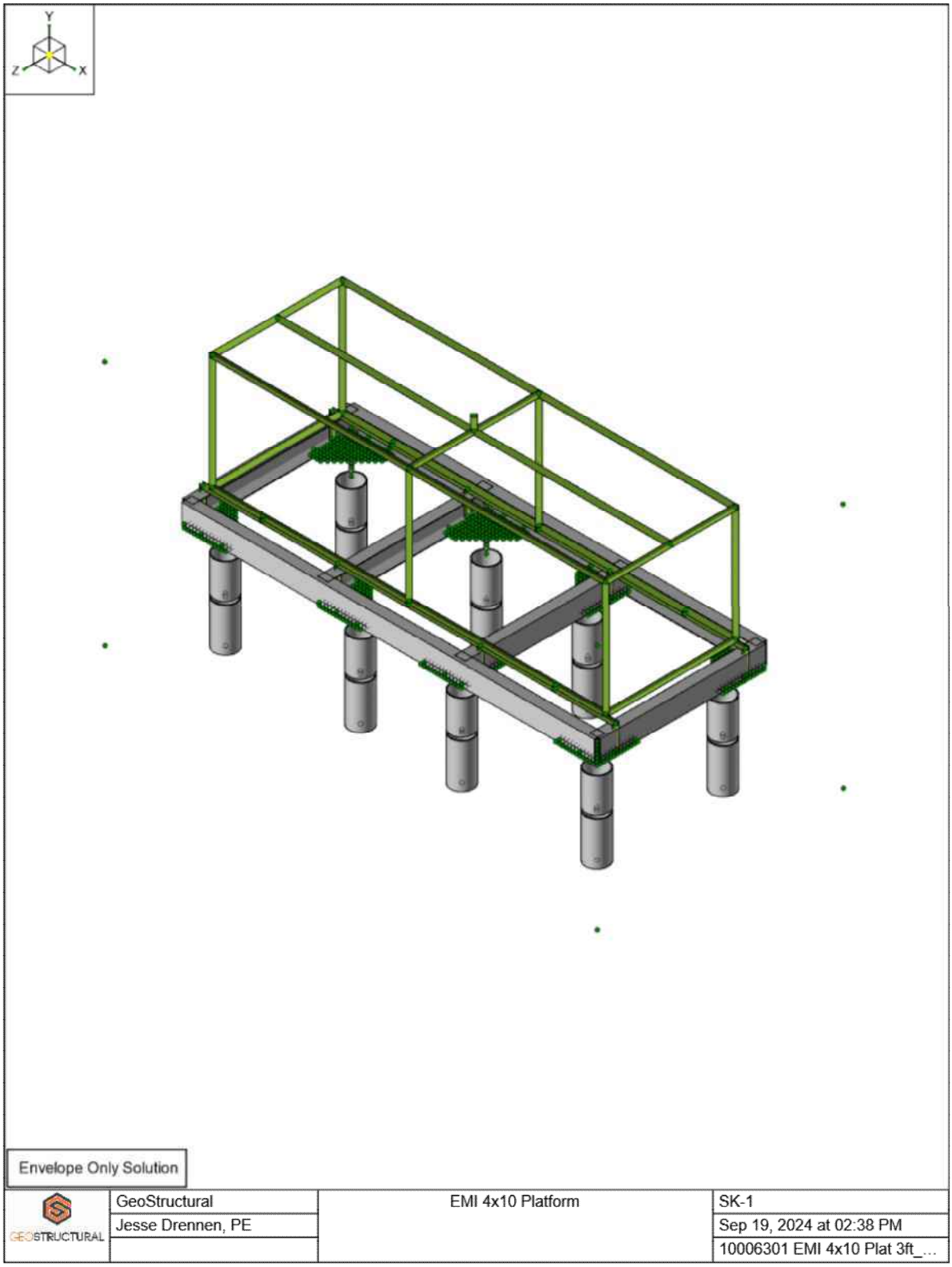
No Data to Print...

Envelope Plate Principal Stresses

	Plate		Surface	Sigma1 [ksi]	LC	Sigma2 [ksi]	LC	Tau Max [ksi]	LC	Angle [rad]	LC	Von Mises [ksi]	LC
1	P683	max	T	-6.696	91	-16.823	123	6.859	7	2.077	63	46.999	7
2		min		-39.67	1	-52.332	7	0.218	119	-0.655	15	14.704	91
3		max	B	50.817	7	36.348	1	7.42	7	2.356	45	45.26	7
4		min		15.65	91	6.749	91	0.409	63	-0.779	101	13.596	91
5	P730	max	T	-6.696	85	-16.861	85	6.859	13	2.077	57	46.999	13
6		min		-39.67	1	-52.332	13	0.729	45	-0.655	9	14.704	85
7		max	B	50.817	13	36.347	1	7.42	13	2.356	51	45.26	13
8		min		15.65	85	6.749	85	0.409	57	-0.779	107	13.596	85
9	P485	max	T	-6.525	91	-15.9	92	6.932	7	2.155	63	46.822	7
10		min		-39.342	1	-52.188	7	0.384	119	-0.611	93	13.784	92
11		max	B	50.624	7	36.272	8	7.456	7	2.355	108	45.058	7
12		min		14.658	92	6.593	91	0.231	63	-0.785	107	12.694	92
13	P391	max	T	-6.525	85	-15.9	86	6.932	13	2.155	57	46.822	13
14		min		-39.341	1	-52.188	13	0.543	45	-0.611	87	13.784	86
15		max	B	50.623	13	36.272	14	7.456	13	2.355	102	45.058	13
16		min		14.658	86	6.593	85	0.231	57	-0.785	101	12.694	86
17	P881	max	T	50.817	7	36.348	1	7.42	7	2.356	53	45.26	7
18		min		15.65	91	6.749	91	0.409	59	-0.779	105	13.596	91
19		max	B	-6.696	91	-16.823	123	6.859	7	2.077	59	46.999	7
20		min		-39.67	1	-52.332	7	0.218	119	-0.655	11	14.704	91
21	P588	max	T	50.816	13	36.347	1	7.42	13	2.356	47	45.259	13
22		min		15.65	85	6.749	85	0.409	65	-0.779	99	13.596	85
23		max	B	-6.696	85	-16.861	85	6.859	13	2.077	65	46.999	13
24		min		-39.67	1	-52.332	13	0.729	53	-0.655	17	14.704	85
25	P188	max	T	50.624	7	36.272	18	7.456	7	2.355	98	45.058	7
26		min		14.658	90	6.593	91	0.231	59	-0.785	99	12.694	90
27		max	B	-6.525	91	-15.9	90	6.932	7	2.155	59	46.822	7
28		min		-39.342	1	-52.188	7	0.384	119	-0.611	89	13.784	90
29	P291	max	T	50.624	13	36.272	125	7.456	13	2.355	104	45.058	13
30		min		14.658	96	6.593	85	0.231	65	-0.785	105	12.694	96
31		max	B	-6.525	85	-15.9	96	6.932	13	2.155	65	46.822	13
32		min		-39.342	1	-52.188	13	0.543	53	-0.611	95	13.784	96
33	P638	max	T	11.045	91	0.483	91	16.379	7	1.969	91	44.541	7
34		min		-17.958	7	-50.717	7	3.575	89	1.046	85	6.213	89
35		max	B	47.801	7	18	7	14.901	7	0.385	91	41.815	7
36		min		-1.152	91	-9.465	91	2.859	89	-0.546	86	5.004	89
37	P721	max	T	11.045	85	0.483	85	16.379	13	1.969	85	44.541	13
38		min		-17.958	13	-50.717	13	3.575	95	1.046	91	6.213	95
39		max	B	47.801	13	18	13	14.901	13	0.385	85	41.815	13
40		min		-1.152	85	-9.465	85	2.859	95	-0.546	92	5.004	95
41	P353	max	T	11.212	91	0.693	91	16.281	7	1.979	91	44.175	7
42		min		-17.723	7	-50.284	7	4.256	115	1.043	85	7.73	89
43		max	B	47.311	7	17.778	7	14.766	7	0.393	91	41.392	7
44		min		-1.338	91	-9.624	91	3.534	115	-0.547	85	6.574	89
45	P379	max	T	11.212	85	0.693	85	16.28	13	1.979	85	44.175	13
46		min		-17.723	13	-50.284	13	4.257	113	1.043	91	7.73	95
47		max	B	47.311	13	17.778	13	14.766	13	0.393	85	41.392	13
48		min		-1.338	85	-9.624	85	3.534	113	-0.547	91	6.574	95
49	P834	max	T	47.801	7	18	7	14.901	7	0.385	91	41.815	7
50		min		-1.152	91	-9.465	91	2.859	93	-0.546	96	5.004	93
51		max	B	11.045	91	0.483	91	16.379	7	1.969	91	44.541	7
52		min		-17.958	7	-50.717	7	3.575	93	1.046	85	6.213	93
53	P538	max	T	47.801	13	18	13	14.901	13	0.385	85	41.815	13
54		min		-1.152	85	-9.465	85	2.859	87	-0.546	90	5.004	87
55		max	B	11.045	85	0.483	85	16.379	13	1.969	85	44.541	13

Envelope Plate Principal Stresses (Continued)

	Plate		Surface	Sigma1 [ksi]	LC	Sigma2 [ksi]	LC	Tau Max [ksi]	LC	Angle [rad]	LC	Von Mises [ksi]	LC
3136		min		0.794	90	0.138	90	0.268	87	0.775	59	0.725	89
3137	P663	max	T	1.734	7	-0.045	123	1.31	7	0.391	96	2.308	7
3138		min		-0.018	91	-0.923	51	0.158	91	0.216	91	0.325	91
3139		max	B	0.947	18	0.033	92	1.458	7	2.276	79	2.577	7
3140		min		-0.175	123	-1.976	7	0.074	92	-0.66	90	0.143	90
3141	P769	max	T	1.734	13	1.086	123	1.31	13	2.144	117	2.308	13
3142		min		-0.018	85	-0.923	45	0.049	123	-0.366	123	0.325	85
3143		max	B	0.947	125	0.033	86	1.458	13	2.276	73	2.577	13
3144		min		-1.079	119	-2.432	121	0.074	86	-0.66	96	0.143	96
3145	P464	max	T	2.524	8	0.656	8	0.939	117	1.467	121	2.269	8
3146		min		0.703	92	0.118	92	0.293	92	0.921	92	0.652	92
3147		max	B	-0.103	92	-1.109	92	1.273	44	0.019	86	2.932	44
3148		min		-0.705	1	-3.209	8	0.457	62	-0.557	92	1.062	92
3149	P166	max	T	0.351	49	0.049	91	1.183	18	2.29	78	2.237	18
3150		min		-0.319	122	-2.082	18	0.045	91	-0.633	89	0.122	91
3151		max	B	1.856	18	0.14	121	1.117	18	0.358	86	2.072	18
3152		min		-0.05	90	-0.562	49	0.136	90	0.16	122	0.3	90
3153	P268	max	T	0.351	43	0.049	85	1.183	125	2.29	84	2.237	125
3154		min		-1.2	119	-2.082	12	0.045	85	-0.633	95	0.122	85
3155		max	B	1.856	125	1.054	123	1.117	125	2.319	117	2.072	125
3156		min		-0.05	96	-0.562	43	0.101	123	-0.368	123	0.3	96
3157	P465	max	T	1.856	8	0.14	121	1.117	8	0.358	96	2.072	8
3158		min		-0.05	92	-0.562	49	0.136	92	0.19	123	0.3	92
3159		max	B	0.351	49	0.049	91	1.183	8	2.29	80	2.237	8
3160		min		-0.279	123	-2.082	8	0.045	91	-0.633	93	0.122	91
3161	P433	max	T	1.856	14	1.054	123	1.117	14	2.319	117	2.072	14
3162		min		-0.05	86	-0.562	43	0.101	123	-0.368	123	0.3	86
3163		max	B	0.351	43	0.049	85	1.183	14	2.29	74	2.237	14
3164		min		-1.2	119	-2.082	14	0.045	85	-0.633	87	0.122	85
3165	P662	max	T	2.054	44	0.759	7	0.702	44	1.399	121	1.818	44
3166		min		0.794	92	0.138	92	0.268	95	0.775	63	0.725	93
3167		max	B	-0.137	92	-1.047	94	0.937	45	0.077	85	2.337	44
3168		min		-0.852	7	-2.619	44	0.28	95	-0.587	63	0.916	94



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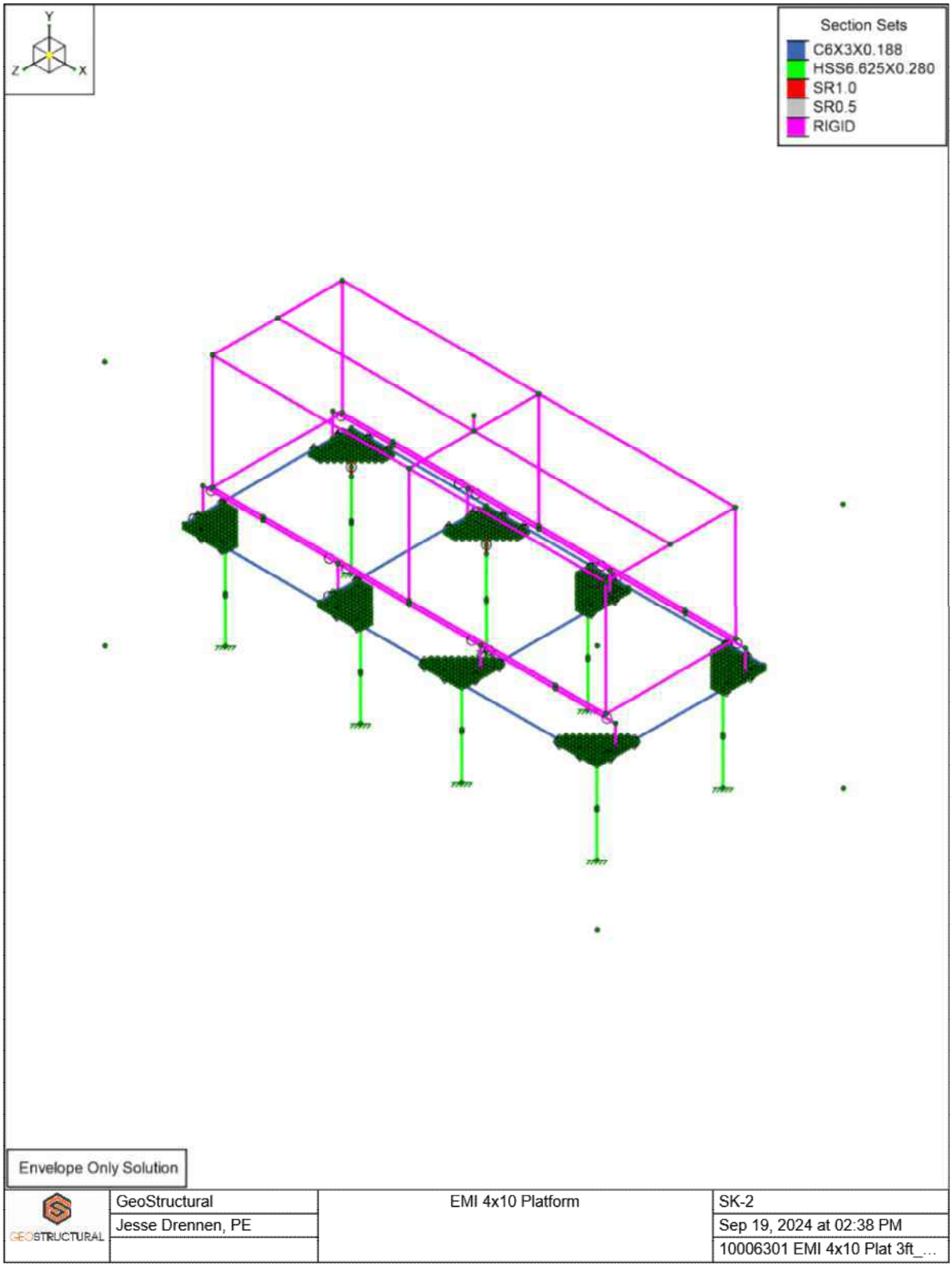
Y
Z
X
Section Sets
C6X3X0.188
HSS6.625X0.280
SR1.0
SR0.5
RIGID
Envelope Only Solution
GeoStructural
Jesse Drennen, PE
EMI 4x10 Platform
SK-2
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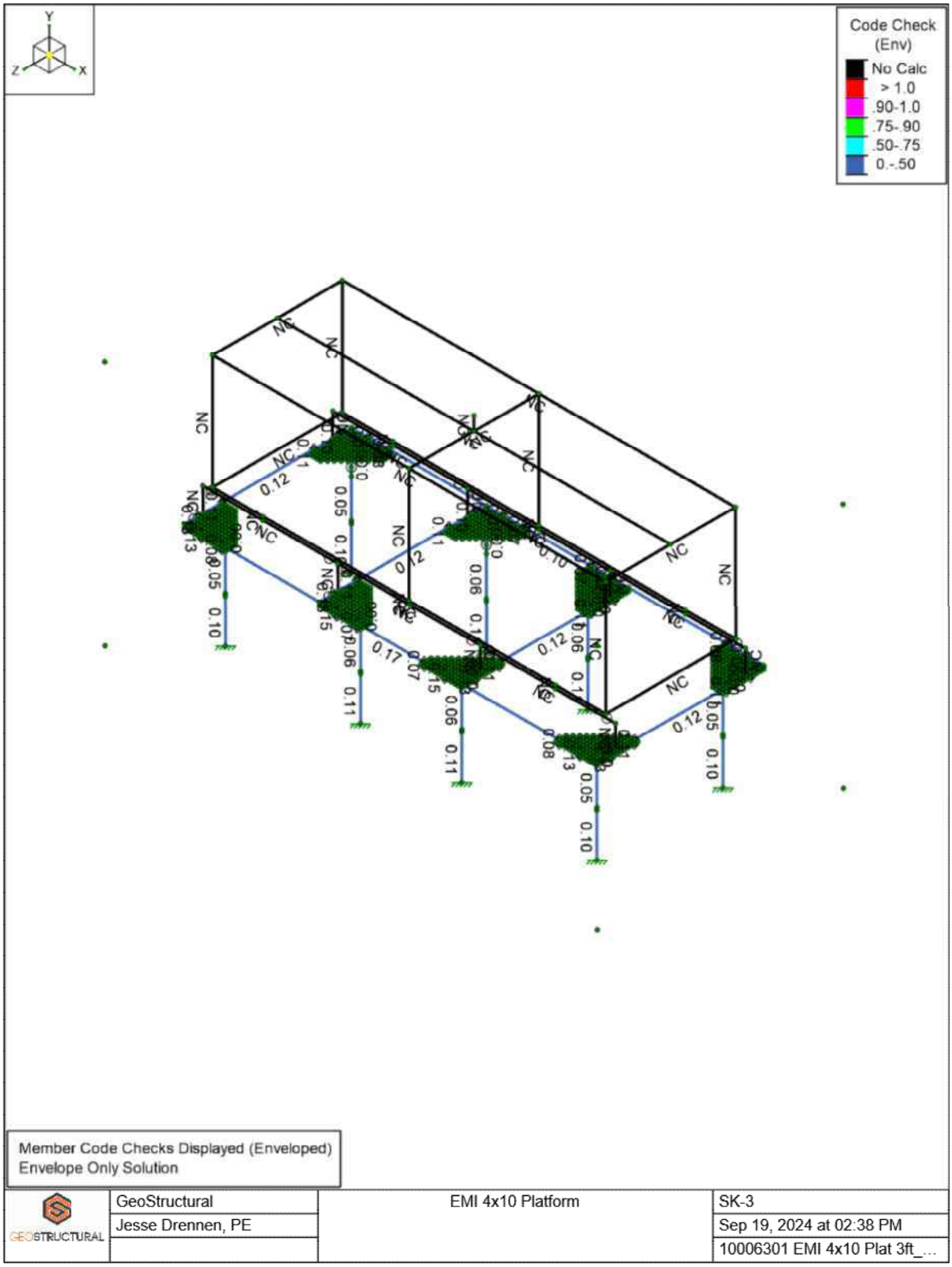
Y
Z
X
Code Check
(Env)
No Calc
> 1.0
.90-1.0
.75-.90
.50-.75
0.-.50
Member Code Checks Displayed (Enveloped)
Envelope Only Solution
GeoStructural
Jesse Drennen, PE
EMI 4x10 Platform
SK-3
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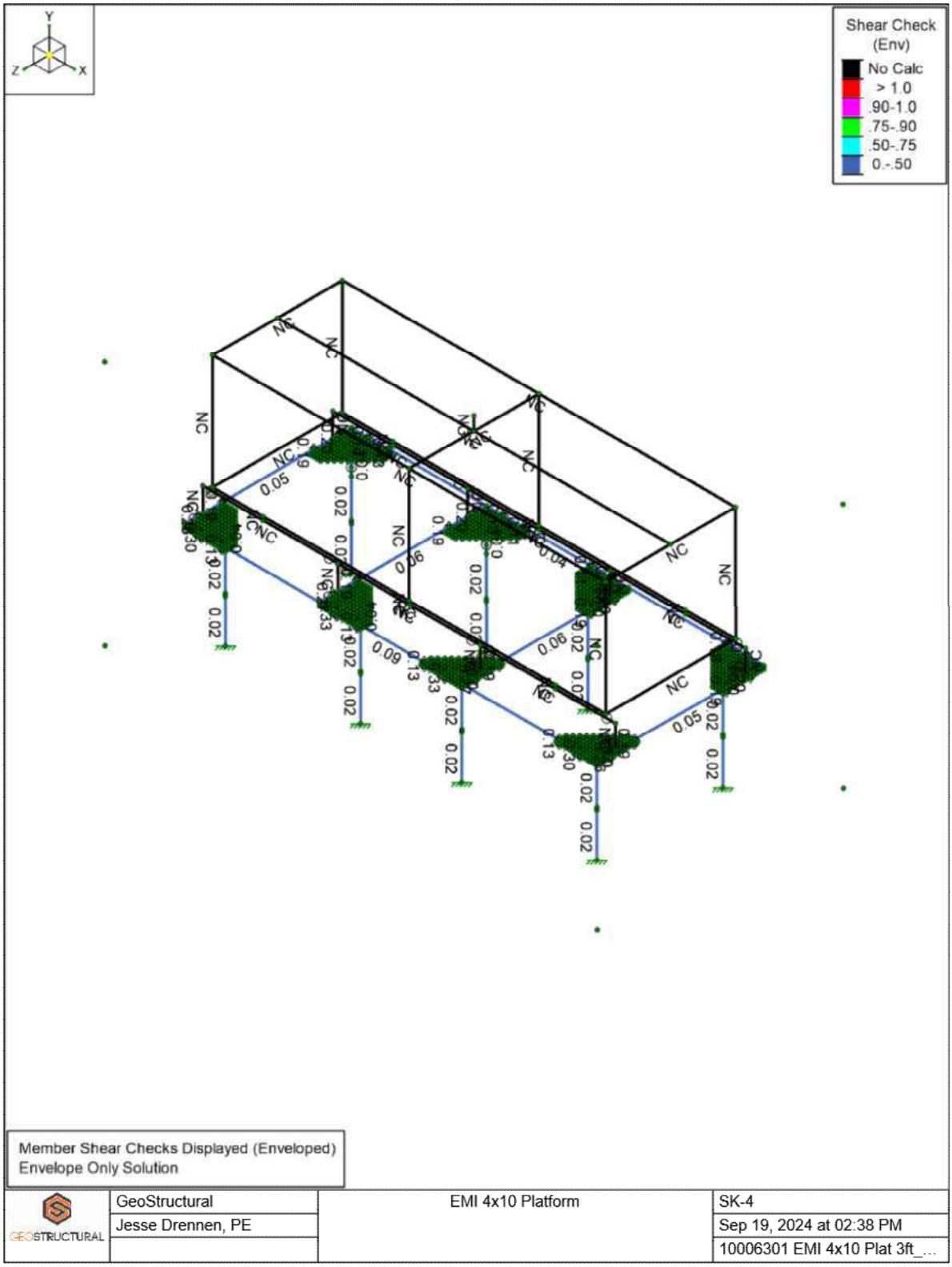
Shear Check
(Env)
No Calc
> 1.0
.90-1.0
.75-.90
.50-.75
0.-.50
Member Shear Checks Displayed (Enveloped)
Envelope Only Solution
GeoStructural
Jesse Drennen, PE
EMI 4x10 Platform
SK-4
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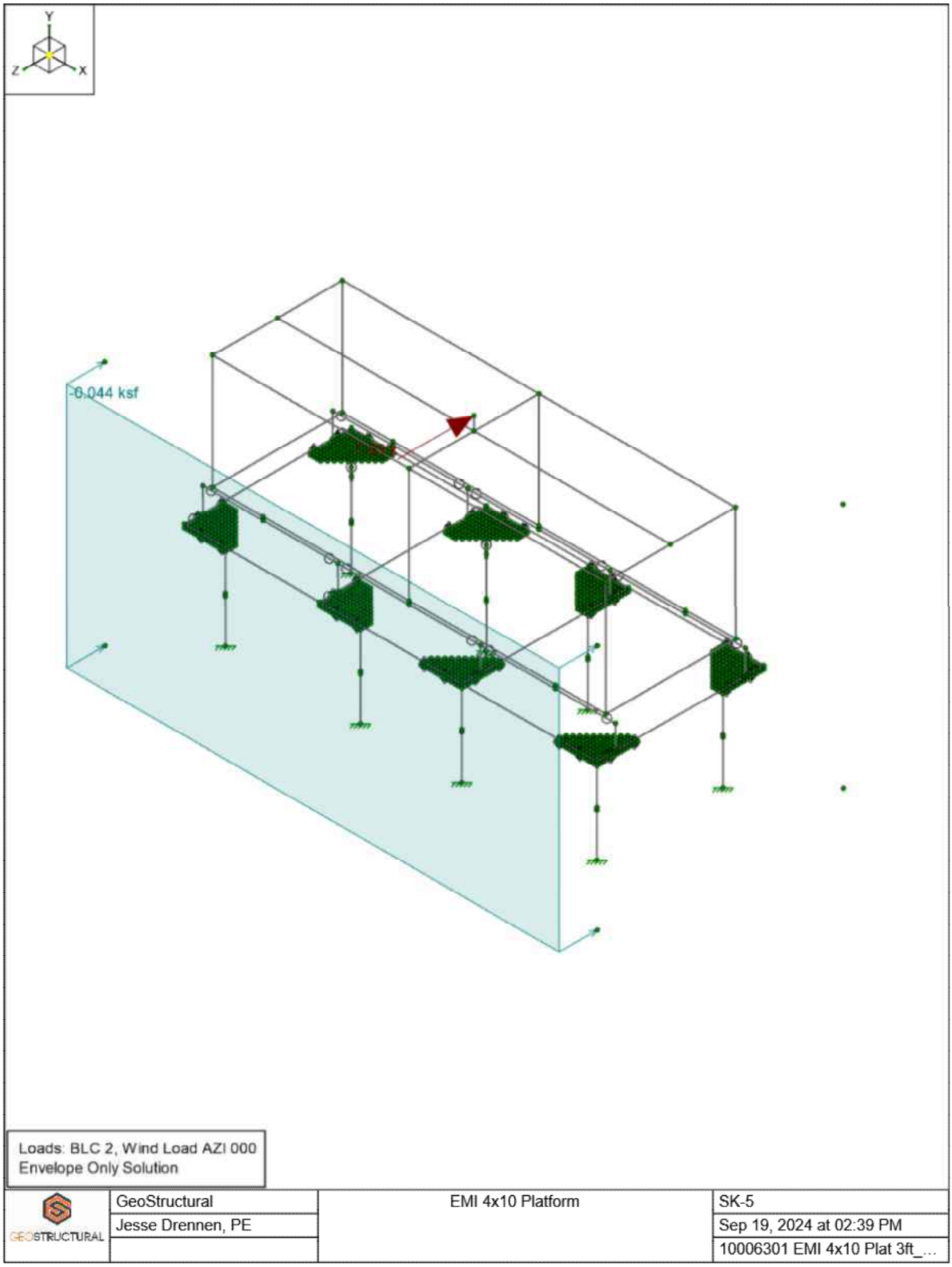
Y
Z
X
-0.044 ksf
Loads: BLC 2, Wind Load AZI 000
Envelope Only Solution
GeoStructural
Jesse Drennen, PE
EMI 4x10 Platform
SK-5
Sep 19, 2024 at 02:39 PM
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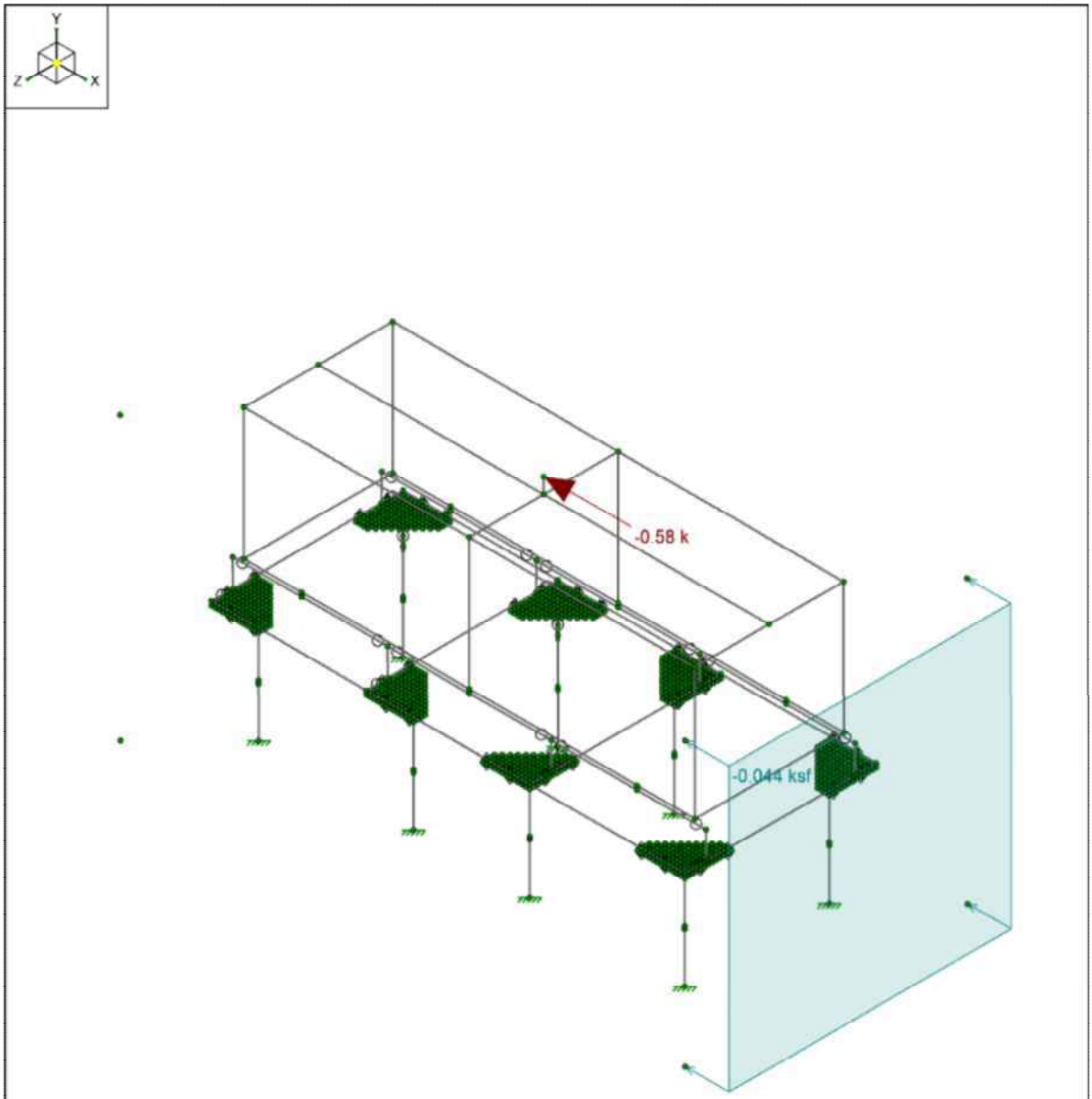

Loads: BLC 3, Wind Load AZI 090
Envelope Only Solution

GeoStructural		EMI 4x10 Platform	SK-6
Jesse Drennen, PE			Sep 19, 2024 at 02:39 PM
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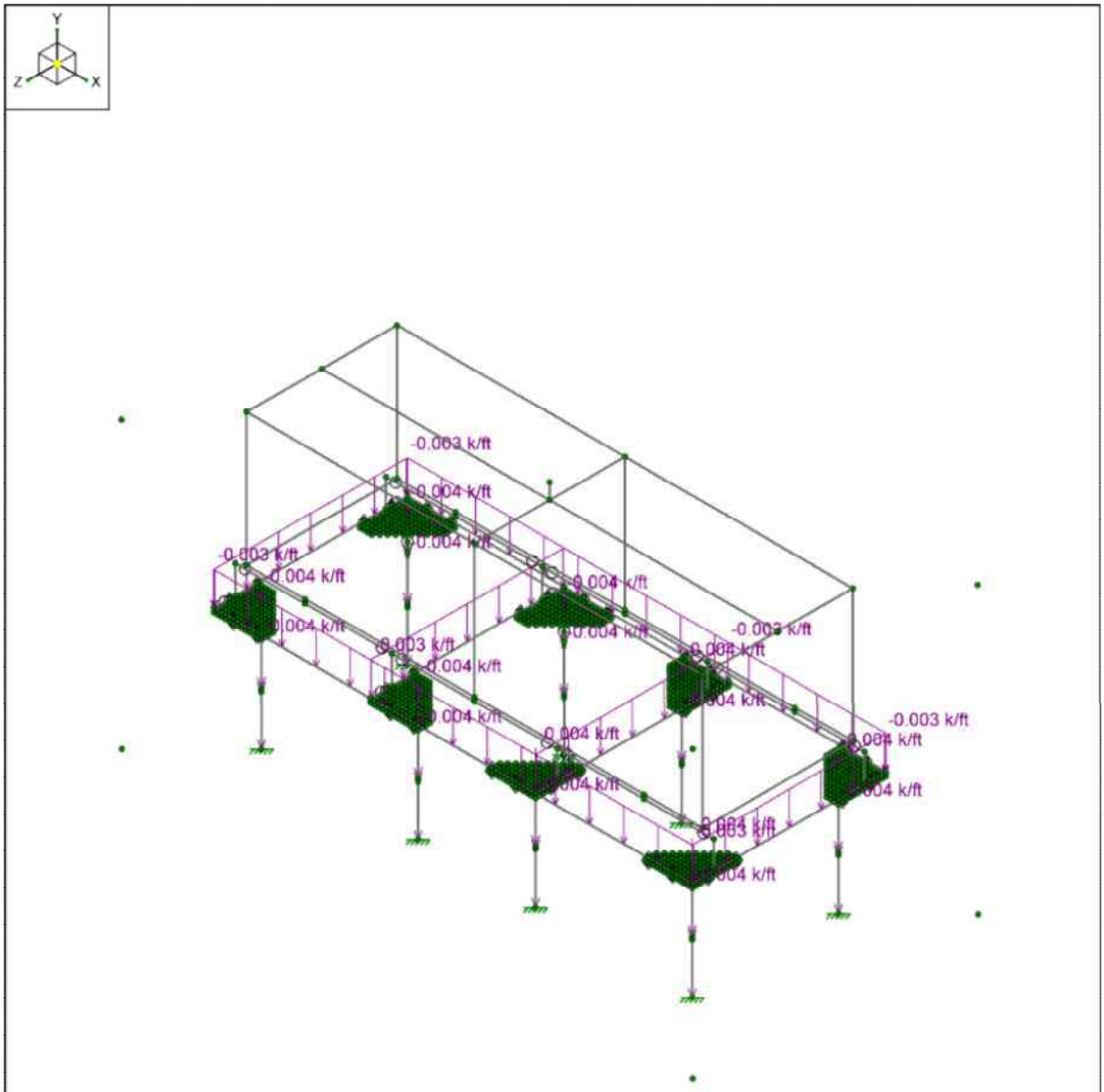

Loads: BLC 4, Ice Weight
Envelope Only Solution

GeoStructural		EMI 4x10 Platform	SK-7
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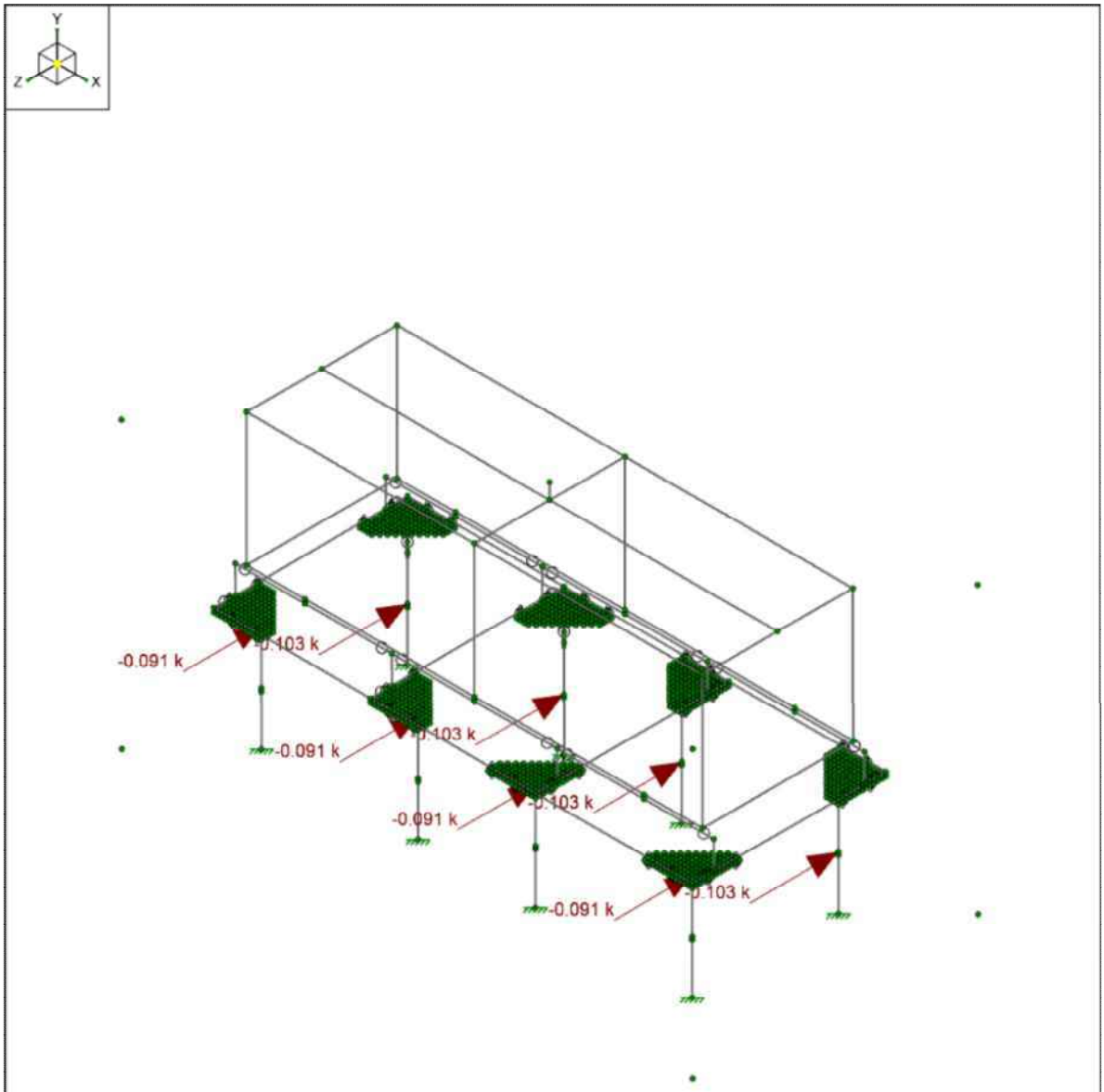

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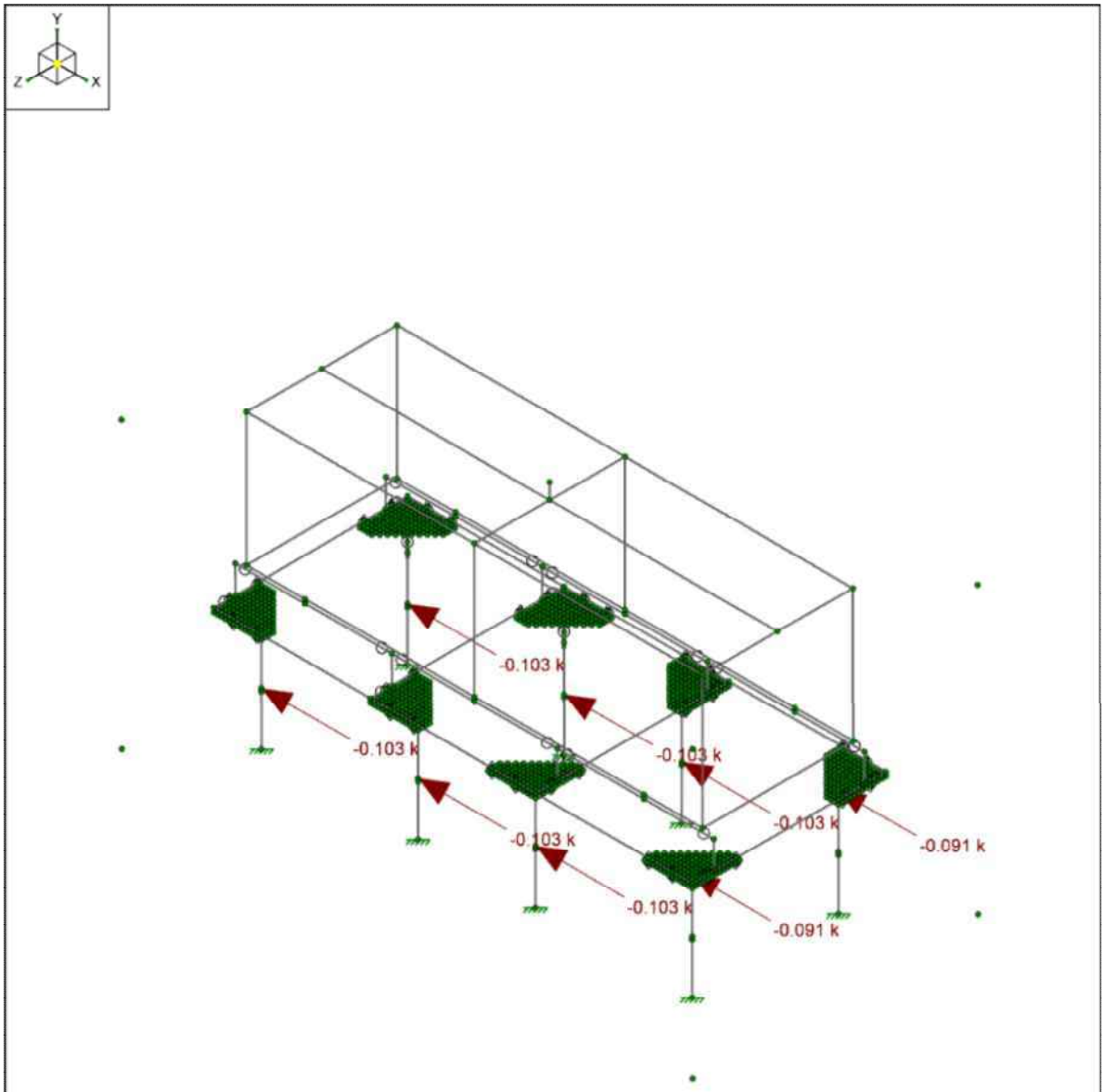

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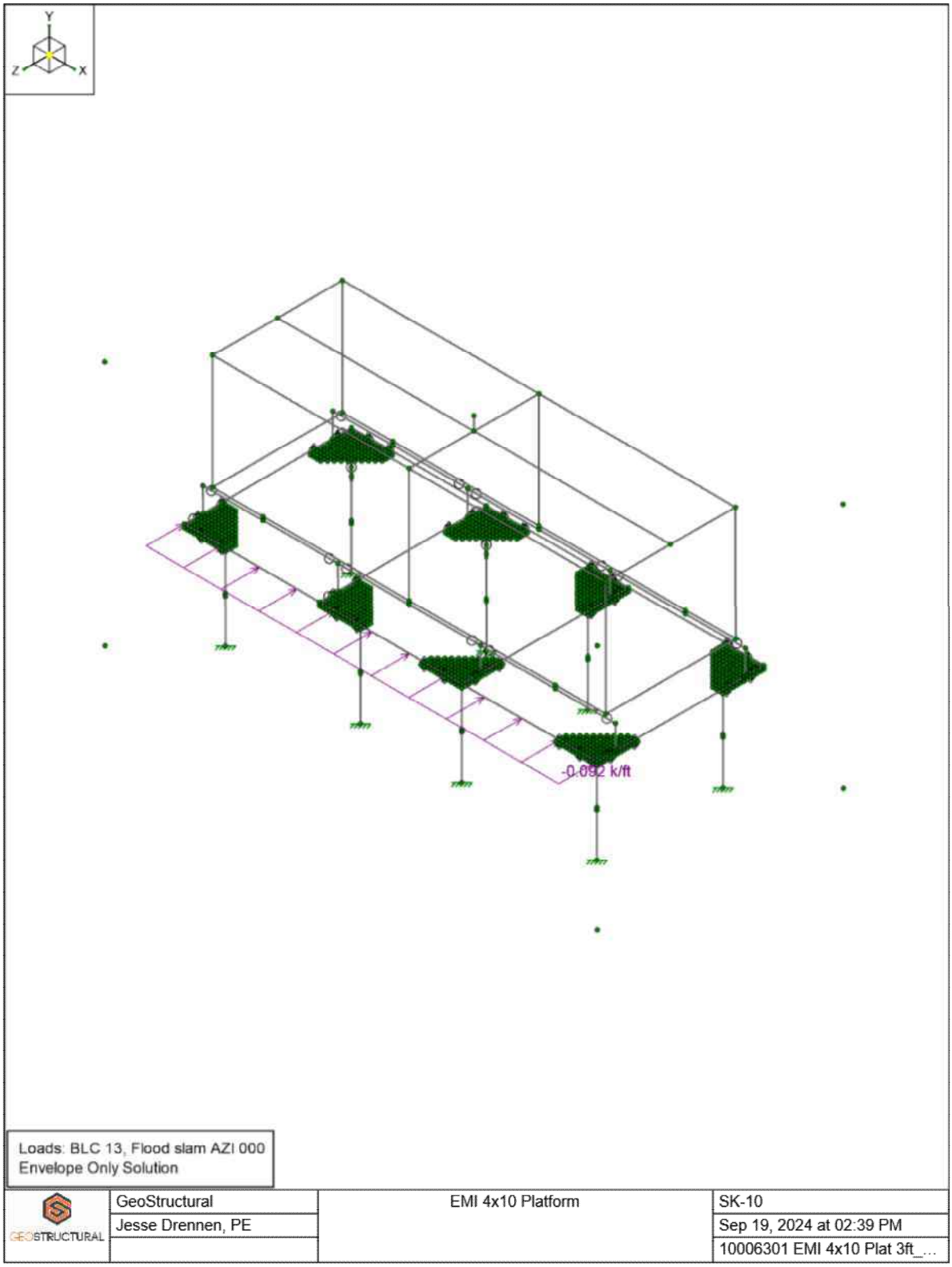
Y
Z
X
-0.092 k/ft
Loads: BLC 13, Flood slam AZI 000
Envelope Only Solution
GeoStructural
Jesse Drennen, PE
EMI 4x10 Platform
SK-10
Sep 19, 2024 at 02:39 PM
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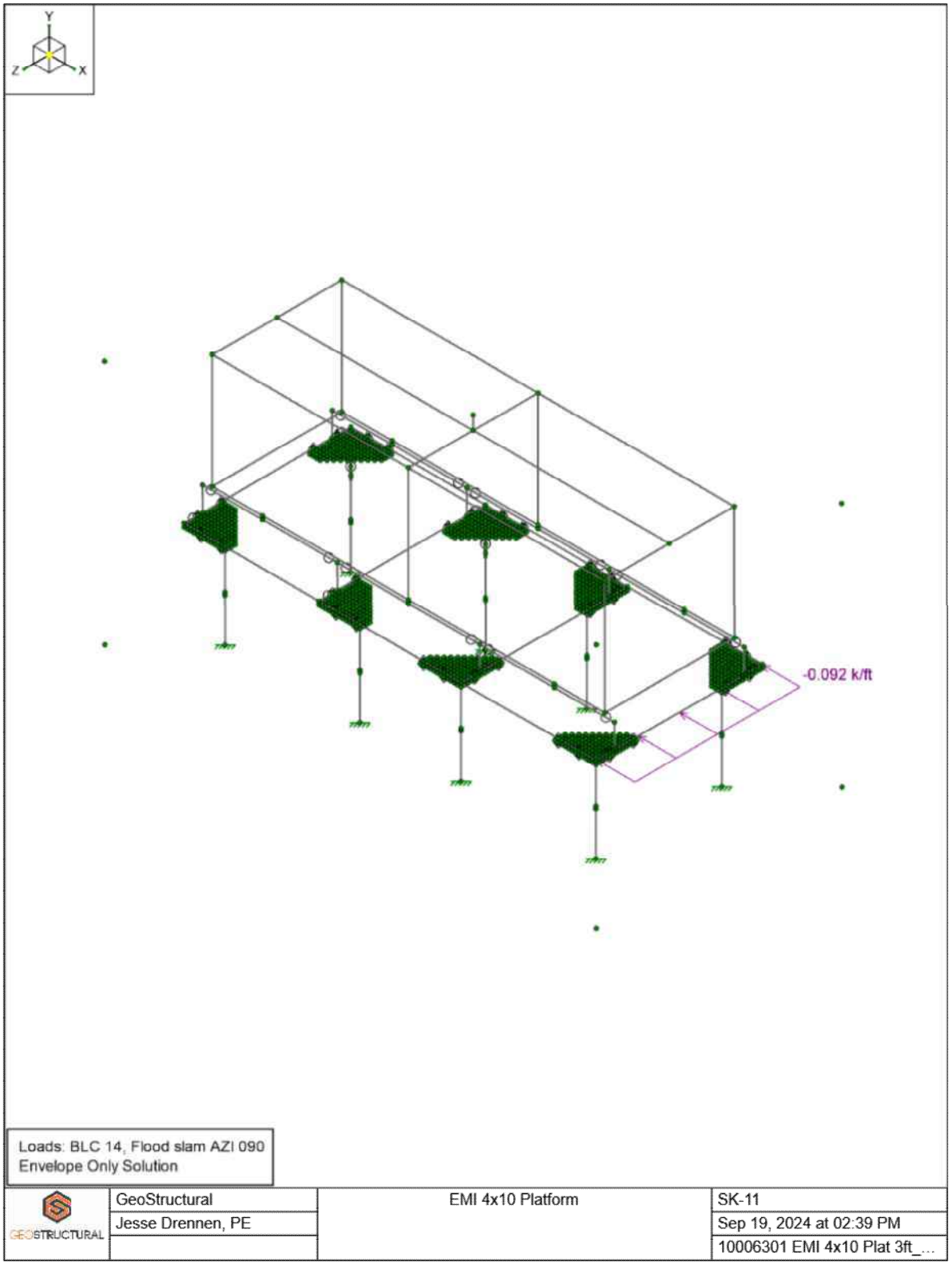

Y
Z
X
-0.092 k/ft
Loads: BLC 14, Flood slam AZI 090
Envelope Only Solution
GeoStructural
Jesse Drennen, PE
EMI 4x10 Platform
SK-11
Sep 19, 2024 at 02:39 PM
10006301 EMI 4x10 Plat 3ft_...

PLATFORM COMPONENT EFFECTIVE WIND AREAS

Designer: JD Date: 9/19/2024

LOAD DESCRIPTION:

				Round (Ca=1.2)	Flat (Ca=2.0)	
q_z =	22	psf	Ult Wind Load w/o Ice	26	44	psf
q_z =	3	psf	3-sec Wind Load w/ Ice	4	6	psf
Ice Thickness?	1.18	in.				
Ice Density?	56	pcf				

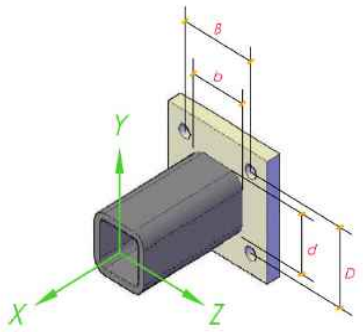
	Member 1	Member 2	Member 3	Member 4	Member 5	Member 6	Member 7
Width/Dia (in.)				6.625	6	6	
Length (ft.)				4	4	10	
Shape?				Round	Flat	Flat	
C_A =				0.81	1.43	1.83	
ΣA_A =				2.21	2.00	5.00	
ΣA_A (ICE)=				3.14	2.92	7.10	
$\Sigma C_A A_A$ =				1.78	2.87	9.15	
$\Sigma C_A A_A$ (ICE) =				2.53	4.19	12.99	
W o (klf)	#VALUE!	#VALUE!	#VALUE!	0.010	0.016	0.020	#VALUE!
W i (klf)	#VALUE!	#VALUE!	#VALUE!	0.002	0.003	0.004	#VALUE!
D i (klf)	#DIV/0!	#DIV/0!	#DIV/0!	0.012	0.014	0.013	#DIV/0!

Plate Connection Capacities at Columns

ASCE 7-16 & IBC 2018/2021
AISC 360-16

Design Parmeters:

n =	4	*# of Bolts in Conn*		P_x =	0	kip	*Applied Factored Tension X*
D_b =	0.5	in	*Bolt Diameter*	V_Y =	0.106	kip	*Applied Factored Shear Y*
Grade A	325	*Bolt Material*		V_Z =	1.059	kip	*Applied Factored Shear Z*
(Y/N)	Y	Threads Included?		M_X =	0	k-ft	*Applied Factored Torsion X*
Grade A	36	*Standoff Plate Material*		M_Y =	1.248	k-ft	*Applied Factored Moment Y*
				M_Z =	0.15	k-ft	*Applied Factored Moment Z*
t =	0.375	in	*Stand Plate Thick*				
W =	12	in	*Stand Plate Width*	φ =	0.75		*Tensile/Shear Phi Factor*
H =	12	in	*Stand Plate Height*	φ =	0.8		*Bolt Bearing Phi Factor*
B =	8	in	*Bolt Spacing B*				
D =	8	in	*Bolt Spacing D*				
b (dia)=	6.625	in	*Standoff Width (or Diameter)*				
d =	6.625	in	*Standoff Height*				
	P	***Is Standoff Tube or Pipe? (T or P)*					
wl =	3	*Fillet Weld Leg Width (16ths)*					
F_{EXX} =	70	*ksi*	*Weld Electrode*				



Weld Capacity Calculations

ϕR_n = MIN [$\phi(0.6)(0.707)(F_{EXX})(wl/16)$, $\phi(0.6)(F_{y\ plate})(t_{\ plate})$, $\phi(0.6)(F_{u\ plate})(t_{\ plate})$]

$F_{y\ plate}$ = 36 ksi *Standoff Plate Yield Strength*

$F_{u\ plate}$ = 58 ksi *Standoff Plate Minimum Tensile Strength*

φRn =	4.18	kip/in	Available Shear Resistance per Inch of Weld
φRn =	8.10	kip/in	Available Shear Yield of Standoff Plate
φRn =	9.79	kip/in	Available Shear Rupture of Standoff Plate

φRn = 4.18 kip/in **Available Shear Strength per Inch of Weld**

$Ru = \sqrt{(Rux^2 + Ruy^2 + Ruz^2)}$

Rux = P/lw + Mz/Sz + My/Sy *Axial Weld Tension + Bending Force on Weld in Z and Y*

lw = 20.81 in *Total Weld Length*

Sz = 34.47 in^2 *Unit Section Modulus of Weld about Z*

Sy = 34.47 in^2 *Unit Section Modulus of Weld about Y*

Rux = 0.49 kip/in

Ruy = Vy/lw + Mx(b/2)/Jw *Vertical Shear on Weld + Vertical Component of Torsional Shear*

Jw = 228.37 in^3 *Unit Polar Moment of Intertia of Weld*

Ruy = 0.01 kip/in

Ruz = Vz/Iw + Mx(d/2)/Jw *Horizontal Shear on Weld + Horiz Component of Torsional Shear*

Ruz = 0.05 kip/in

Ru =	0.49	kip/in	**Applied Shear per Inch of Weld Length**

Weld Capacity on Resultant Force

Ru / φRnv ≤ 1.0

CSR =	11.72%	**Utilization Ratio of 3/16 in. Standoff Perimeter Fillet Weld**

Bolt Capacity Calculations

Available Bolt Tension

$\varphi R_{nt} = \varphi(Fub)(Anb)$

Fub =	90	ksi	*Bolt Minimum Tensile Strength*
Agb =	0.20	in^2	*Bolt Area Shank*
Anb =	0.14	in^2	*Bolt Area Net*

φRnt =	9.58	kip	**Available Bolt Tension**

Available Bolt Bearing Strength

$\varphi R_{nv} = \varphi(1.2)(Lc + D/4)(t)(Fu)$ ≤ $\varphi(2.4)(D)(t)(Fu)$

Fu =	58	ksi	*Connected Part Minimum Tensile Strength*
Lc =	1.22	in	*Clear Distance, edge of hole to edge of part*
Lc(override) =		*in*	*Input Override Value as Desired*
t =	0.38	in	*Thinnest Connected Part*

φRnv = 28.06 ≤ 20.88

φRnv =	20.88	kip	**Available Bolt Bearing**

Available Bolt Shear Strength

$\varphi R_{nv} = \varphi(0.625)(Rb)(Fub)(Agb)$ OR *[Threads Included]* $\varphi R_{nv} = \varphi(0.625)(Rb)(Fub)(0.8)(Agb)$

Lb =	9.00	in	*Length Betw First and Last Bolt in Multi-Bolt Conn Assuming 3" o.c.*
Lb(override) =		*in*	*Input Override Value as Desired*
Rb =	1.00		*Connection Length Reduction Factor*

φRnv =	6.63	kip	**Available Bolt Shear**

Available Bolt Resultant Forces

Tu = P/n + [My(B/2)/Iy + Mz(D/2)/Iz] Anb

Iy =	9.08	in^4	*Bolt Group Moment of Inertia about Y*
Iz =	9.08	in^4	*Bolt Group Moment of Inertia about Z*

Tu =	1.05	kip	**Applied Tension per Bolt**

$Vu = \sqrt{(Vy^2 + Vz^2)}/n + (Mx(r)/J)Anb$

r =	5.66	in	*Diagonal Distance from Standoff Centroid to Bolt*

J = 18.16 in^4 *Bolt Group Polar Moment of Inertia*

Vu = 0.27 kip **Applied Shear per Bolt**

Bolt Capacities on Resultant Force

Tu / φRnt ≤ 1.0

CSR = 10.95% **Utilization Ratio of (1) 0.5 in. A325 bolt**

Vu / φRnv ≤ 1.0

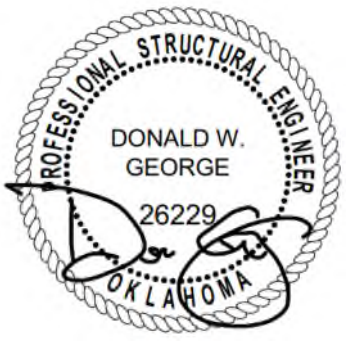
CSR = 4.02% **Utilization Ratio of (1) 0.5 in. A325 bolt**

$\sqrt{(Tub / \phi Rnt)^2 + (Vub / \phi Rnv)^2} \leq 1.0$

CSR = 11.66% **Combined Utilization Ratio of (1) 0.5 in. A325 bolt**

Flood Rise Evaluation Report

Site ID:	**10006301**
Site Name:	**Trails**
Project:	Generator Upgrade
Prepared For:	AT&T
Structure Description:	EMI 4'x10' Equipment Platform Diesel Backup Generator
Site Location:	1299 State HWY 9, HWY 9W Norman, OK 73072 Cleveland County 35.186812°, -97.461192°
Evaluation Load Case:	AT&T Final Configuration
Evaluation Result:	**Adequate w/ Recommendations** **See Conclusion**



Date Signed:
9/20/2024

10006301_No Rise Letter_R0 240919 5492

Revision 0
September 20, 2024

1.0 Introduction

GeoStructural has completed a review of the proposed elevated steel platform assembly and diesel generator installation at the existing AT&T *10006301* communications site located in Cleveland County, OK. The purpose of the review was to provide an evaluation of the installation and its affect on anticipated base water elevation in the event of a 100-year flood event (design flood).

The existing communications structures/foundations are beyond the scope of this review.

2.0 Evaluation Criteria

This evaluation utilizes the following design criteria:

- ASCE 7-16 – Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- ASCE 24-14 – Flood Resistant Design and Construction

Proposed Installation Elements:
Kohler 50REOZK 50kW Generator w/ Enclosure = 2,369lbs 270gal Fuel Tank(Dry) = 1,452 lbs EMI 4'x10' elevated equipment platform (1000-0030-0195) w/ eight (8) 1ft extension columns (1007-T006-0120) legs to helical pier anchors in grade
100-yr Design Flood Loading Criteria:
Non-coastal Zone AE; BFE = 1101.8 ft AMSL NAVD88 per Elevation Certificate
DFE = BFE+2 = 1103.8 ft AMSL NAVD88
Ground Elevation (G) / Lowest Adjacent Grade (LAG) = 1101.98 ft AMSL NAVD88 per Elevation Certificate

All data required to complete our evaluation was furnished by our client. GeoStructural has not conducted an independent study to verify existing site conditions and the results of this analysis are based solely on the information provided.

The following documents were provided:

- Construction Drawings – Generator Upgrade
  Benchmark Services, Inc., Rev-1, 6/6/24.
- FEMA Elevation Certificate – 3198 S. Berry Road, Norman, OK 73072
  AB Surveying, PLLC, 5/20/24.
- Structural Analysis – Elevated Steel Platform
  GeoStructural LLC, 9/20/24.

The calculated volume of the proposed eight (8) elevated steel generator platform legs exposed to flood waters is approximately (8)*A*L = 8*π*(6.625/12^2)/4*2.5 = 4.8 ft^3. In order to compensate for the spatial volume being added to the cellular communications facility, and equivalent volume of soil must be removed from the facility. Using a factor of safety of 1.5 to account for uncertainties, we recommend removal of approximately 7.5 ft^3 of soil. The Construction Drawings shall denote the location, methods and means of this "negative" storage volume.

3.0 Conclusion

Utilizing engineering judgement, and by comparison of increased volume exposed to flood waters due to proposed generator and elevation platform installation versus proposed provided new "negative" storage volume, we have determined that the construction project will not cause a rise of more than 0.05 ft on any adjacent property or cause any negative impact by altering flow patterns. **Removal of approximately 7.5 ft³ of soil within the extents of the existing cellular communications facility is required.**

This evaluation only encompasses AT&T's proposed elevated generator equipment platform. All other existing elements are beyond the scope of this evaluation. If any of the existing or proposed conditions reported in this evaluation are not properly represented, please contact our office immediately to request an amended report.

Prepared by:

Jesse Drennen, PE, MLE
208.761.7986
jesse.drennen@geostructural.com

Reviewed and Approved by:

Don George, PE, SE, MLSE
208.602.6569
don.george@geostructural.com

U.S. DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

OMB Control No. 1660-0008
Expiration Date: 0

Item 6.

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON INSTRUCTION PAGES 1-11

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

SECTION A – PROPERTY INFORMATION

FOR INSURANCE COMPANY USE

Policy Number:

Company NAIC Number:

A1. Building Owner's Name: TPA V, LLC

A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: 3198 S. Berry Road

City: Norman State: OK ZIP Code: 73072

A3. Property Description (e.g., Lot and Block Numbers or Legal Description) and/or Tax Parcel Number: Cleveland County Assessor Parcel I.D.: NC29 8 3W 12026

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.): Non-Residential

A5. Latitude/Longitude: Lat. 35.18682° Long. -97.46113° Horiz. Datum: ☐ NAD 1927 ☒ NAD 1983 ☐ WGS 84

A6. Attach at least two and when possible four clear color photographs (one for each side) of the building (see Form pages 7 and 8).

A7. Building Diagram Number: 1A

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s): 0 sq. ft.

b) Is there at least one permanent flood opening on two different sides of each enclosed area? ☐ Yes ☐ No ☒ N/A

c) Enter number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade:
Non-engineered flood openings: 0 Engineered flood openings: 0

d) Total net open area of non-engineered flood openings in A8.c: 0 sq. in.

e) Total rated area of engineered flood openings in A8.c (attach documentation – see Instructions): 0 sq. ft.

f) Sum of A8.d and A8.e rated area (if applicable – see Instructions): 0 sq. ft.

A9. For a building with an attached garage:

a) Square footage of attached garage: 0 sq. ft.

b) Is there at least one permanent flood opening on two different sides of the attached garage? ☐ Yes ☐ No ☒ N/A

c) Enter number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade:
Non-engineered flood openings: 0 Engineered flood openings: 0

d) Total net open area of non-engineered flood openings in A9.c: 0 sq. in.

e) Total rated area of engineered flood openings in A9.c (attach documentation – see Instructions): 0 sq. ft.

f) Sum of A9.d and A9.e rated area (if applicable – see Instructions): 0 sq. ft.

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1.a. NFIP Community Name: City of Norman B1.b. NFIP Community Identification Number: 400046

B2. County Name: Cleveland B3. State: OK B4. Map/Panel No.: 40027C0290 B5. Suffix: H

B6. FIRM Index Date: 09/26/2008 B7. FIRM Panel Effective/Revised Date: 09/26/2008

B8. Flood Zone(s): AE B9. Base Flood Elevation(s) (BFE) (Zone AO, use Base Flood Depth): 1101.80

B10. Indicate the source of the BFE data or Base Flood Depth entered in Item B9:
☐ FIS ☒ FIRM ☐ Community Determined ☐ Other:

B11. Indicate elevation datum used for BFE in Item B9: ☐ NGVD 1929 ☒ NAVD 1988 ☐ Other/Source:

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes ☒ No
Designation Date: ☐ CBRS ☐ OPA

B13. Is the building located seaward of the Limit of Moderate Wave Action (LiMWA)? ☐ Yes ☒ No

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ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON INSTRUCTION PAGES 1-11

Item 6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: 3198 S. Berry Road

City: Norman State: OK ZIP Code: 73072

FOR INSURANCE COMPANY USE

Policy Number:

Company NAIC Number:

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☒ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, AO, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, A99. Complete Items C2.a–h below according to the Building Diagram specified in Item A7. In Puerto Rico only, enter meters.
Benchmark Utilized: N.G.S. O.P.U.S. Solution Vertical Datum: NAVD 88

Indicate elevation datum used for the elevations in items a) through h) below.
☐ NGVD 1929 ☒ NAVD 1988 ☐ Other:

Datum used for building elevations must be the same as that used for the BFE. Conversion factor used? ☐ Yes ☒ No
If Yes, describe the source of the conversion factor in the Section D Comments area.

		Check the measurement used:
a) Top of bottom floor (including basement, crawlspace, or enclosure floor):	1101.98	☒ feet ☐ meters
b) Top of the next higher floor (see Instructions):	N/A	☐ feet ☐ meters
c) Bottom of the lowest horizontal structural member (see Instructions):	N/A	☐ feet ☐ meters
d) Attached garage (top of slab):	N/A	☐ feet ☐ meters
e) Lowest elevation of Machinery and Equipment (M&E) servicing the building (describe type of M&E and location in Section D Comments area):	1101.98	☒ feet ☐ meters
f) Lowest Adjacent Grade (LAG) next to building: ☐ Natural ☐ Finished	1101.98	☒ feet ☐ meters
g) Highest Adjacent Grade (HAG) next to building: ☐ Natural ☐ Finished	1102.00	☒ feet ☐ meters
h) Finished LAG at lowest elevation of attached deck or stairs, including structural support:	N/A	☐ feet ☐ meters

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by state law to certify elevation information. *I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.*

Were latitude and longitude in Section A provided by a licensed land surveyor? ☒ Yes ☐ No

☐ Check here if attachments and describe in the Comments area.

Certifier's Name: Christopher Fairchild License Number: 1743

Title: CEO

Company Name: AB Surveying, PLLC

Address: 7333 N. Hammond Circle

City: Warr Acres State: OK ZIP Code: 73132

Telephone: (405) 816-8217 Ext.: Email: chris@absurveyingok.com

Signature: Christopher Fairchild Digitally signed by Christopher Fairchild Date: 2024.05.22 14:10:20 -05'00' Date: 05/20/2024

Place Seal Here

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments (including source of conversion factor in C2; type of equipment and location per C2.e; and description of any attachments):

Elevations shown in Section C are based on construction drawings and physical elevation measurements on concrete pad that encompasses the full property and reflect the High and Low elevations in said Section C. The proposed structure is equipment to service the existing cell tower.

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ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON INSTRUCTION PAGES 1-11

Item 6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: 3198 S. Berry Road

City: Norman State: OK ZIP Code: 73072

FOR INSURANCE COMPANY USE

Policy Number: _____

Company NAIC Number: _____

SECTION E – BUILDING MEASUREMENT INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO, ZONE AR/AO, AND ZONE A (WITHOUT BFE)

For Zones AO, AR/AO, and A (without BFE), complete Items E1–E5. For Items E1–E4, use natural grade, if available. If the Certificate is intended to support a Letter of Map Change request, complete Sections A, B, and C. Check the measurement used. In Puerto Rico only, enter meters.

Building measurements are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

E1. Provide measurements (C.2.a in applicable Building Diagram) for the following and check the appropriate boxes to show whether the measurement is above or below the natural HAG and the LAG.

a) Top of bottom floor (including basement, crawlspace, or enclosure) is: _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

b) Top of bottom floor (including basement, crawlspace, or enclosure) is: _____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (C2.b in applicable Building Diagram) of the building is: _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E3. Attached garage (top of slab) is: _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is: _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown The local official must certify this information in Section G.

SECTION F – PROPERTY OWNER (OR OWNER'S AUTHORIZED REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without BFE) or Zone AO must sign here. *The statements in Sections A, B, and E are correct to the best of my knowledge*

☐ Check here if attachments and describe in the Comments area.

Property Owner or Owner's Authorized Representative Name: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Telephone: Ext.: _____ Email: _____

Signature: _____ Date: _____

Comments:

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON INSTRUCTION PAGES 1-11

Item 6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: 3198 S. Berry Road

City: Norman State: OK ZIP Code: 73072

FOR INSURANCE COMPANY USE

Policy Number: _____

Company NAIC Number: _____

SECTION G – COMMUNITY INFORMATION (RECOMMENDED FOR COMMUNITY OFFICIAL COMPLETION)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Section A, B, C, E, G, or H of this Elevation Certificate. Complete the applicable item(s) and sign below when:

G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by state law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2.a. ☐ A local official completed Section E for a building located in Zone A (without a BFE), Zone AO, or Zone AR/AO, or when item E5 is completed for a building located in Zone AO.

G2.b. ☐ A local official completed Section H for insurance purposes.

G3. ☐ In the Comments area of Section G, the local official describes specific corrections to the information in Sections A, B, E and H.

G4. ☐ The following information (Items G5–G11) is provided for community floodplain management purposes.

G5. Permit Number: _____ G6. Date Permit Issued: _____

G7. Date Certificate of Compliance/Occupancy Issued: _____

G8. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G9.a. Elevation of as-built lowest floor (including basement) of the building: _____ ☐ feet ☐ meters Datum: _____

G9.b. Elevation of bottom of as-built lowest horizontal structural member: _____ ☐ feet ☐ meters Datum: _____

G10.a. BFE (or depth in Zone AO) of flooding at the building site: _____ ☐ feet ☐ meters Datum: _____

G10.b. Community's minimum elevation (or depth in Zone AO) requirement for the lowest floor or lowest horizontal structural member: _____ ☐ feet ☐ meters Datum: _____

G11. Variance issued? ☐ Yes ☐ No If yes, attach documentation and describe in the Comments area.

The local official who provides information in Section G must sign here. *I have completed the information in Section G and certify that it is correct to the best of my knowledge. If applicable, I have also provided specific corrections in the Comments area of this section.*

Local Official's Name: _____ Title: _____

NFIP Community Name: _____

Telephone: Ext.: _____ Email: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Signature: _____ Date: _____

Comments (including type of equipment and location, per C2.e; description of any attachments; and corrections to specific information in Sections A, B, D, E, or H):

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON INSTRUCTION PAGES 1-11

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: 3198 S. Berry Road

City: Norman State: OK ZIP Code: 73072

FOR INSURANCE COMPANY USE

Policy Number: _____

Company NAIC Number: _____

SECTION H – BUILDING'S FIRST FLOOR HEIGHT INFORMATION FOR ALL ZONES (SURVEY NOT REQUIRED) (FOR INSURANCE PURPOSES ONLY)

The property owner, owner's authorized representative, or local floodplain management official may complete Section H for all flood zones to determine the building's first floor height for insurance purposes. Sections A, B, and I must also be completed. Enter heights to the nearest tenth of a foot (nearest tenth of a meter in Puerto Rico). ***Reference the Foundation Type Diagrams (at the end of Section H Instructions) and the appropriate Building Diagrams (at the end of Section I Instructions) to complete this section.***

H1. Provide the height of the top of the floor (as indicated in Foundation Type Diagrams) above the Lowest Adjacent Grade (LAG):

a) **For Building Diagrams 1A, 1B, 3, and 5–8.** Top of bottom floor (include above-grade floors only for buildings with crawlspaces or enclosure floors) is: _____ ☐ feet ☐ meters ☐ above the LAG

b) **For Building Diagrams 2A, 2B, 4, and 6–9.** Top of next higher floor (i.e., the floor above basement, crawlspace, or enclosure floor) is: _____ ☐ feet ☐ meters ☐ above the LAG

H2. Is **all** Machinery and Equipment servicing the building (as listed in Item H2 instructions) elevated to or above the floor indicated by the H2 arrow (shown in the Foundation Type Diagrams at end of Section H instructions) for the appropriate Building Diagram?

☐ Yes ☐ No

SECTION I – PROPERTY OWNER (OR OWNER'S AUTHORIZED REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and H must sign here. *The statements in Sections A, B, and H are correct to the best of my knowledge.* **Note:** If the local floodplain management official completed Section H, they should indicate in Item G2.b and sign Section G.

☐ Check here if attachments are provided (including required photos) and describe each attachment in the Comments area.

Property Owner or Owner's Authorized Representative Name: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Telephone: Ext.: _____ Email: _____

Signature: _____ Date: _____

Comments:

ELEVATION CERTIFICATE

IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON INSTRUCTION PAGES 1-11

BUILDING PHOTOGRAPHS

See Instructions for Item A6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.:
3198 S. Berry Road

City: Norman State: OK ZIP Code: 73072

FOR INSURANCE COMPANY USE

Policy Number: _____

Company NAIC Number: _____

Instructions: Insert below at least two and when possible four photographs showing each side of the building (for example, may only be able to take front and back pictures of townhouses/rowhouses). Identify all photographs with the date taken and "Front View," "Rear View," "Right Side View," or "Left Side View." Photographs must show the foundation. When flood openings are present, include at least one close-up photograph of representative flood openings or vents, as indicated in Sections A8 and A9.

Photo One

Photo One Caption: Road side view of property with cell tower and equipment

Clear Photo One

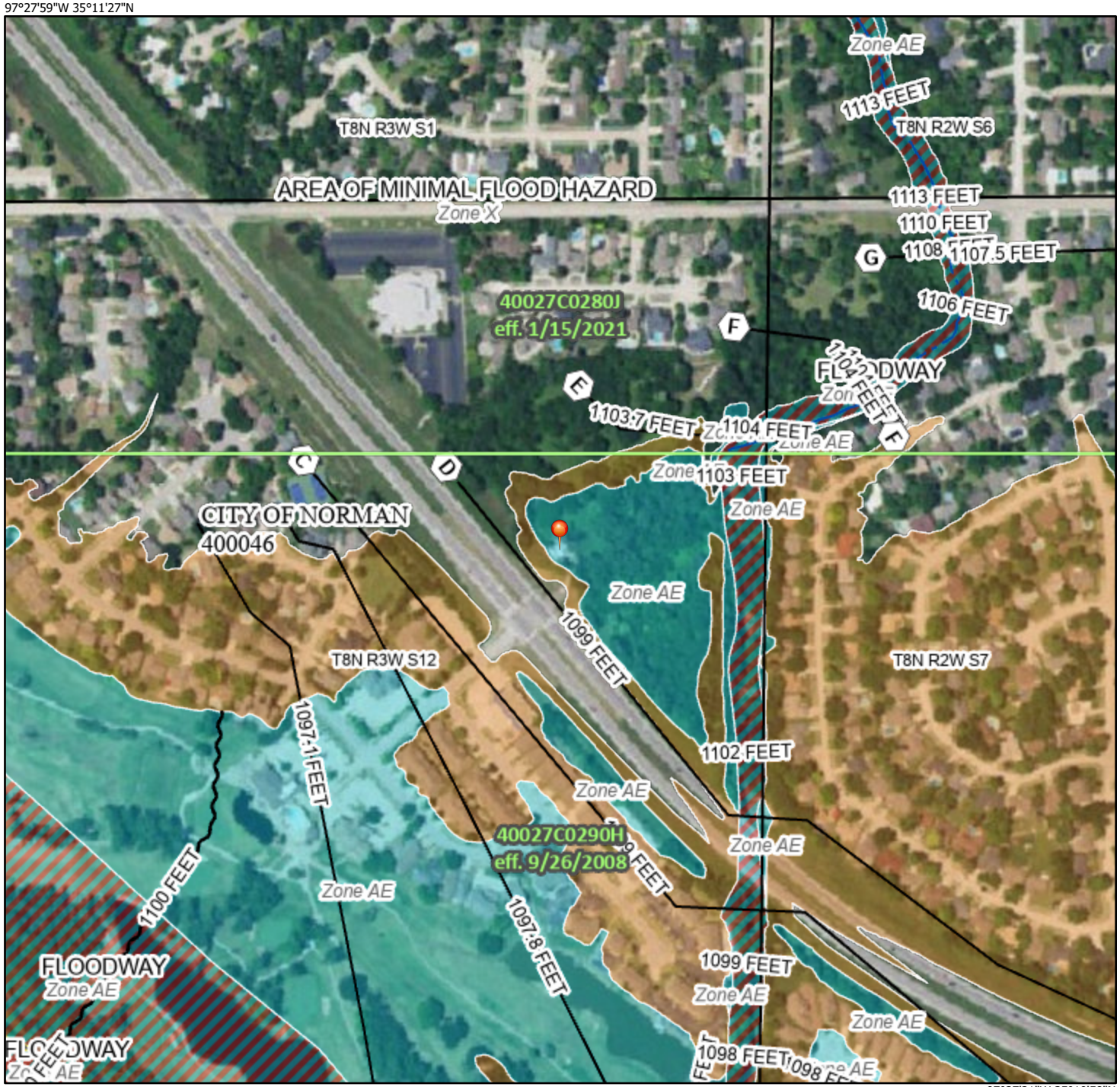
Photo Two

Photo Two Caption:

Clear Photo Two

National Flood Hazard Layer FIRMette

97°27'59"W 35°11'27"N



97°27'21"W 35°10'58"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR F UT

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, Areas 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 D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 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

N

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 10/10/2024 at 1:10 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.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community id FIRM panel number, and FIRM effective date. Map i unmapped and unmodernized areas cannot be use regulatory purposes.

3198 S Berry Road

N
W E
S

1 inch = 238 feet

Legend

- BFE 2021
- 1% Chance Floodplain
- Floodway
- Parcel


3198 S Berry Rd
OK-9
Norman, Oklahoma
Google Street View
Jul 2024 · See more dates
Google