

Member Packet for
PLANNING COMMISSION
MEETING DATE: Tuesday, May 14, 2019

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Chairwoman Jennifer Swallow
Vice-Chairman Jim Smolik
Member Jim Maleski

CITY OF NORTH RIDGEVILLE

OFFICE OF THE CLERK OF COUNCIL

PLANNING COMMISSION

7307 Avon Belden Road
North Ridgeville, Ohio 44039
(440) 353-0513



Member Steve Ali
Council Liaison Bruce F. Abens

AGENDA

TUESDAY, MAY 14, 2019, REGULAR MEETING

TO ORDER: 7:00 p.m., Council Chambers

ROLL CALL:

MINUTES: Regular meeting held April 9, 2019

CORRESPONDENCE: Structural analysis report provided by applicant Edward Block, agent for AT&T Mobility/GPD Group, in response to comments from Chief Building Official and City Engineer.

OLD BUSINESS:

NEW BUSINESS:

APPLICANT: Edward Block, agent for AT&T Mobility; GPD Group
520 South Main St, Ste 2531, Akron, OH 44311

OWNER: North Ridgeville CSD Board of Education
34620 Bainbridge Rd, North Ridgeville, OH 44039

REQUEST: Cellular telephone co-location on existing tower.

LOCATION: 7323 Avon Belden Road; north of Bainbridge Road and east of Avon Belden Road, in an R-1 zoning district.
Permanent Parcel No. 07-00-021-117-015

APPLICANT: John Reyes; Star Builders
46405 Telegraph Rd, Amherst, OH 44001

OWNER: Patton's Five Star Towing
P.O. Box 450784, Westlake, OH 44145

REQUEST: New construction of 6,000-square-foot building for towing and impound company.

LOCATION: 31684 Cook Road, west of the Cuyahoga-Lorain County, in a B-3 zoning district.
Permanent Parcel No. 07-00-004-110-037

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**NORTH RIDGEVILLE PLANNING COMMISSION
AGENDA – TUESDAY, MAY 14, 2019**

PAGE 2

APPLICANT: Gavril Budai; G & S Property Investments, LLC.
1960 Radcliffe Dr, Westlake, OH 44145

OWNER: Gavril Budai; G & S Property Investments, LLC.
1960 Radcliffe Dr, Westlake, OH 44145

REQUEST: Preliminary approval for commercial storage units.

LOCATION: 34515 Mills Road and 34555 Mills Road; east of Jaycox Road and west of
Mills Industrial Parkway, in an I-2 zoning district.
Permanent Parcel Nos. 07-00-018-101-280, 07-00-018-101-020

ADJOURNMENT:

NEXT REGULAR MEETING WILL BE HELD TUESDAY, JUNE 11, 2019

**NORTH RIDGEVILLE PLANNING COMMISSION
MINUTES OF
REGULAR MEETING APRIL 9, 2019**

TO ORDER:

Chairwoman Swallow called the Planning Commission meeting to order with the Pledge of Allegiance at 7:00 P.M.

ROLL CALL:

Present were members Steve Ali, James Maleski, Vice-Chairman James Smolik, Chairwoman Jennifer Swallow and Council Liaison Bruce Abens.

Also present was Chief Building Official Guy Fursdon, City Engineer Dan Rodriguez and Deputy Clerk of Council Michelle A. Owens.

MINUTES:

Chairwoman Swallow asked if there were any corrections or additions to the minutes of the regular meeting dated March 12, 2019. No discussion was offered. The minutes stand approved.

CORRESPONDENCE: None

OLD BUSINESS: None

NEW BUSINESS:

Chairperson Swallow asked the Clerk to read the first application.

APPLICANT: Gary Smitek; North Ridge Pointe, LLC
 36715 Avalon Ct, Avon, OH 44011

OWNER: Same

REQUEST: Approval of recreation complex within North Ridge Pointe Subdivision Phase No. 4

LOCATION: North of Capri Lane, south of West Shore Parkway; in an R-1 zoning district.
 Permanent Parcel No. 07-00-030-000-277

Deputy Clerk of Council Owens read the application along with the comments received from Administrative Officers, including Safety-Service Director Armbruster, Chief Building Official Guy Fursdon, City Engineer Dan Rodriguez and Fire Chief John Reese.

Chairwoman Swallow asked the applicant to step forward to provide an explanation of his request.

Gary Smitek, Managing Member of North Ridge Pointe, LLC, 36715 Avalon Ct, Avon, OH 44011, requested to first address the Administrative comments. In response to comments from

Chief Building Official Fursdon, he stated he believed plans provided to the Commission illustrate a five-foot fence surrounding each swimming pool, exceeding the required four-foot minimum. He then stated he will be asking for a variance for the tennis court fence, which he believed to be ten feet in height. He discussed the comments from City Engineer Rodriguez and indicated there had been communication from Dale Haywood, Engineer for North Ridge Pointe, LLC, in response to these comments. Mr. Smitek indicated he will bid the parking lot and it will be either concrete or asphalt. He remarked that the Administrative comments would not be a problem and have been addressed or will be addressed.

Mr. Smitek discussed plans to maintain two tennis courts and four pickleball courts, of which he intends to consult with Dan Hreha, a North Ridge Pointe resident and owner of North Ridge Tennis and Golf Club. He explained that the four pickleball courts will be painted onto the tennis court surface and will have portable nets. He then referenced the site plan to describe the location of the proposed recreation complex in relation to the development. Mr. Smitek identified various structures, specifically noting a retention basin and potential swale, and commented that – if not a swale – it would be underground pipe. He addressed the walking path, and stated that it will be accessible to pedestrians from both West Shore Parkway and Capri Lane. He then discussed the parking lot and proposed that the total number of parking spots be reduced to 27. He stated that these changes, which have been provided to City Engineer Rodriguez, would eliminate the 5 parking spots to the east. Mr. Smitek indicated that these spots were eliminated due to their proximity to houses east of the parking lot, which would be in direct line of vehicle headlights. He stated that the remaining 27 parking spots would accommodate the projected volume. He cited Highland Park of Avon – a larger development with 550 homes – which provides 40 parking spaces without issue. He then spoke about the two swimming pools – one adult and one kiddie pool – which will be situated west of the retention basin, south of the greenspace, north of the pool house. He stated that a fence will surround both swimming pools, with a smaller gate between them. He discussed Ohio law which requires a lifeguard for swimming pools at 2000 square feet and above. He stated that the larger swimming pool will measure between 1950 and 1960 square feet and will therefore not require a lifeguard. Mr. Smitek suggested a lifeguard be hired due to reduced insurance costs, but stated that the smaller pool size allows for more flexibility. He described the pool house, which will feature changing rooms but will otherwise be used for storage. He stated that it will not be used as a meeting room. South of the parking lot, he proposed approximately 70-90 cluster mailboxes.

Chairwoman Swallow asked if there were any questions or comments from Commission members.

Vice-Chairman Smolik asked whether there will be handicapped parking.

Mr. Smitek answered that there will be two handicapped parking spaces.

Vice-Chairman Smolik asked why the tennis courts seem to be favoring to the north.

Mr. Smitek responded that the tennis courts are in the middle, with greenspace and a swale

connecting the two basins to the north. He mentioned that the connection of the two basins, if not a swale, could potentially be underground pipe. He then stated he believed there to be at least 50 feet between the tennis courts and the backyard to the north. He indicated that he wanted more of an isolated location for the tennis courts, away from the noise of the swimming pool.

Vice-Chairman Smolik referred to the planting plan. He stated that some of the mounding appeared to be encroaching on an adjacent parcel. He asked if this was an oversight.

Mr. Smitek responded that it was.

Vice-Chairman Smolik asked if there would be enough room for drainage swales on the backside of the mound.

Mr. Smitek stated yes. He added that the mounts are approximately 5 feet.

Vice-Chairman Smolik asked if this was done to control headlights from going into adjacent parcels.

Mr. Smitek stated with regard to parking no headlights will aim directly into neighboring properties; but that vehicles entering or leaving the parking lot could still pose a problem. He stated that the landscaping will provide some privacy to the houses and reduce noise.

Chairwoman Swallow asked if there were any other questions or comments.

Council Liaison Abens asked how many people the swimming pool could accommodate at one time.

Mr. Smitek replied that it was designed for 370 houses but, based on experience, could handle 600 homes without a problem. He cited Highland Park, which has a 1950-square-foot pool and a 20-foot-by-10-foot kiddie pool. He said that the pool was crowded for the first couple years but, when they looked into expanding, it was voted down. He stated that there are currently 550 homes in Highland Park.

Council Liaison Abens commented that the restroom facilities seem inadequate.

Mr. Smitek responded that he has never seen a problem. He stated that the North Ridge Pointe pool house and Hampton pool house were designed by the same person; that they have the same capacity. He then stated there had been a question concerning the gate, which will be self-locking with keycard entrance.

Chairwoman Swallow asked if there were any other questions or comments from the Commission.

Council Liaison Abens asked if there would be enough parking spots with the removal of the 5.

Chief Building Official Fursdon stated there is no regulation on parking spots.

Mr. Smitek answered that the design was based on the Highland Park clubhouse, which accommodates 550 homes with no trouble.

Chairwoman Swallow asked for any other questions or comments from the Commission. No discussion was offered. She then opened the floor for public comment. No discussion was offered. She asked if there were any further comments from Administration. No discussion was offered.

It was moved by Smolik and seconded by Maleski to approve the application as presented.

A voice vote was taken and the motion carried.

Yes – 5 No – 0

ADJOURNMENT:

Chairwoman Swallow announced the next regular meeting scheduled for May 14, 2019.

The meeting was adjourned at 7:21 P.M.

Jennifer Swallow
Chairwoman

Michelle A. Owens
Deputy Clerk of Council

Date Approved Tuesday, May 14, 2019

Engineering Fee Paid: \$ 1125.00

Planning Commission & Bldg. Admin. Fees: \$ 114.00

Receipt No. 271129

See attached for description of fees



RECEIVED

**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
REQUEST FOR ACTION**



Received: MAR 22 2019 Date released to Planning Commission: _____
Date of Planning Commission meeting: 5/14/19 (unless otherwise notified)

APPLICANT INFORMATION AND REQUEST:

APPLICANT:	Edward Block (agent for AT&T Mobility)	PROPERTY OWNER:	North Ridgeville CSD Board of Education
COMPANY NAME:	GPD Group	ADDRESS:	34620 Bainbridge Rd.
ADDRESS:	520 South Main St., Suite 2531	CITY/STATE:	North Ridgeville, OH ZIP 44039
CITY/STATE:	Akron, OH ZIP 44311	PHONE NO:	(440) 327-4444
PHONE NO.:	(330) 572-2192	SIGNATURE:	
SIGNATURE:		(Owner's original signature must be submitted with application)	

Applicant: please provide an email address, fax number or mailing address to send Administrative comments in advance of the Planning meeting: eblock@gpdgroup.com

LOCATION OF PROPERTY/ADDRESS: 7323 Avon Belden Rd., N. Ridgeville, OH 44039
PERMANENT PARCEL NO: 0700021117015 **ZONING OF PROPERTY:** R1
ZONING OF ADJACENT PROPERTY TO: NORTH R1 EAST R1 SOUTH R1 WEST R1
DESCRIPTION OF REQUEST: AT&T proposes to add antennas to the existing tower at 7323 Avon Belden Rd. as well as a radio equipment cabinet and generator within the tower compound.

Have the Planning Commission or Board of Zoning and Building Appeals considered any prior request concerning this property? Yes ___ No X. If yes, list dates and nature of each: _____

On the attached form, list the current record title owners(s) adjacent to the property of request. Include on this list the record title owner(s) name, permanent parcel number and mailing address. Adjacent properties shall include those properties bordering to the north, south, east, west, across a street from the property involved and those properties meeting corners of the property involved.

In the event of property transfers, the applicant shall be responsible for providing an updated list of current adjacent record title owner(s) to the office of the Clerk of Council twenty-five days prior to the date of any public hearing when the applicant will appear on the agenda.

PLANNING COMMISSION USE ONLY: ☐ APPROVED ☐ DISAPPROVED

All approvals are conditional until applicant fully meets the requirements of applicable City ordinances enforced by the Chief Building Official, City Engineer, Fire Department and Police Department with respect to safety and design.

- ☐ Board of Building & Zoning Appeals approval required
☐ Conditions as set forth by the Commission on this date are _____

Date: _____ Signature: _____
(Presiding officer at meeting)

Return completed form to Building Dept., 7307 Avon Belden Road, North Ridgeville, Ohio, after Commission action.

TO BE FILLED OUT BY APPLICANTI, Edward Block

(Print Name)

(Signature)

verify that the following are the names, mailing addresses and permanent parcel numbers of the current record title owners adjacent to the property of request for:

Applicant: Edward Block, GPD Group (agent for AT&T Mobility)Owner: North Ridgeville CSD Board of EducationProject address: 7323 Avon Belden Rd., N. Ridgeville, OH 44039Permanent parcel no. 0700021117015

**THE FOLLOWING INFORMATION MAY BE OBTAINED AT THE LORAIN COUNTY AUDITOR'S OFFICE,
ADMINISTRATION BUILDING, 226 MIDDLE AVENUE, ELYRIA, OHIO.
PHONE: 440-329-5207 WEBSITE: WWW.LORAINCOUNTY.COM/AUDITOR**

	<u>ADJACENT PROPERTY OWNER/ADDRESS</u>	<u>PARCEL NUMBER</u>
✓1	City of North Ridgeville 7307 Avon Belden Rd., N. Ridgeville, OH 44039 Bainbridge Rd., N. Ridgeville, OH 44039	✓0700021117016, 0700021117059
✓2	Robert M. & Irene M. Slattery 7275, 7277, 7279, 7281 Avon Belden Rd., N. Ridgeville, OH 44039	0700021117014
✓3	Dennis Jalowiec & Jeanette Brooks 7255 Avon Belden Rd., N. Ridgeville, OH 44039	0700021117013
✓4	James M. & Monica M. Dorrance 7229 Avon Belden Rd., N. Ridgeville, OH 44039	0700021117012
✓5	Joyce Weimer 7205 Avon Belden Rd., N. Ridgeville, OH 44039	0700021117011
✓6	Matthew T. & Laura L. Calvey 7185 Avon Belden Rd., N. Ridgeville, OH 44039	0700021117010
✓7	Deborah L. Hunt Trustee & James R. Lovell Trustee 7169 Avon Belden Rd., N. Ridgeville, OH 44039	0700021117009
✓8	North Ridgeville CSD Board of Education 35895 Center Ridge Rd., N. Ridgeville, OH 44039	✓0700021117071, 0700021117057, 0700021117061,
✓9	Diocese of Cleveland, Richard G. Lennon, Bishop 35749, 35777 Center Ridge Rd., N. Ridgeville, OH 44039	✓0700021117076
10		

SEE REVERSE SIDE FOR ADDITIONAL LISTINGS.**OFFICE USE ONLY**CBO verification by: 

BZA/PC verification by: _____

Date/time stamp: _____

**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
RECOMMENDATIONS**

Name of Applicant:	Edward Block
Name of Owner:	North Ridgeville Board of Education
Date Submitted for Consideration:	3-22-19
Date to Return to Planning Commission:	4-24-19
Regarding: Cellular Telephone Co-location on Existing Tower at 7323 Avon Belden Road	

RECOMMENDATIONS:

1. Provide copy of FCC license.
2. Provide copy of Engineer's report showing tower is sufficient to support the additional loads.

(use additional sheets if necessary)

Department Head Signature & Title: _____

 CBO

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 12-13-2005.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter. (Planning Commission By-

Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
RECOMMENDATIONS**

Name of Applicant:	Edward Block, agent for AT&T Mobility; GPD Group 520 South Main St, Ste 2531, Akron, OH 44311
Name of Owner:	North Ridgeville CSD Board of Education 34620 Bainbridge Rd, North Ridgeville, OH 44039
Date of Planning Commission Meeting:	Tuesday, May 14, 2019
Date to Return to Deputy Clerk of Council:	Thursday, May 02, 2019
Regarding:	Cellular telephone co-location on existing tower at 7323 Avon Belden Road, in an R-1 zoning district. Permanent Parcel No. 07-00-021-117-015

Recommendations:

Engineering approves this plan. Please See Building Department comments.

(Use additional sheets if necessary.)

Department Head Signature: _____



Title: City Engineer

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 03-22-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
(Planning Commission By-Laws, Article V, Section 3)

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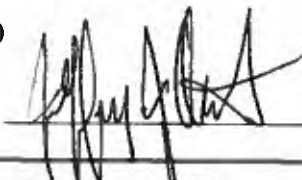
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RECOMMENDATIONS**

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Regarding:	Cellular telephone co-location on existing tower at 7323 Avon Belden Road, in an R-1 zoning district. Permanent Parcel No. 07-00-021-117-015

Recommendations:

(Use additional sheets if necessary.)

Department Head Signature:



Title: [Select Title...]

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 03-22-2019.

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**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
RECOMMENDATIONS**

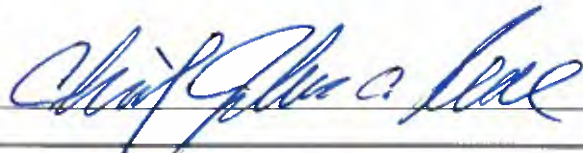
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Recommendations:

No comments at this time.

(Use additional sheets if necessary.)

Department Head Signature:



Title: Fire Chief

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 03-22-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
(Planning Commission By-Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

February 26, 2019

Melissa Prosser
GrainComm, LLC
100 N. Washington Blvd., Suite 201
Sarasota, FL 34236
(941) 704-9932



Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
Structures@tepgroup.net

Subject: Structural Analysis Report

Carrier Designation:

AT&T Mobility Co-Locate

Carrier Site Number:

NOH6223

Carrier Site Name:

BDN_Add_5268

GrainComm Designation:

Grain Site Number:

2055-OH-219401

Grain Site Name:

North Ridgeville

Engineering Firm Designation:

TEP Project Number:

66353.230474

Site Data:

7323 Avon Belden Rd., North Ridgeville, Lorain County, OH 44039

Latitude 41° 23' 11.31", Longitude -82° 01' 00.83"

300 ± Foot - Self Supporting Tower

Dear Melissa Prosser,

Tower Engineering Professionals is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC1: Existing + Proposed + Reserved Loading

Note: See Table 1 for the existing, proposed, and reserved loading

Sufficient Capacity

Structure Capacity	Foundation Capacity
104.9%	69.2%

The analysis has been performed in accordance with the ANSI/TIA-222-G-2-2009 Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2 and the 2017 Ohio Building Code.

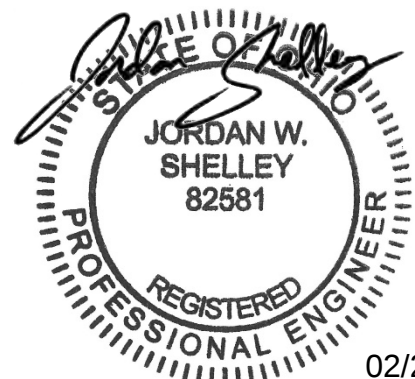
All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Table 1 for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* appreciate the opportunity of providing our continuing professional services to you and *GrainComm, LLC*. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: G. Hunter Morrow, E.I.

Respectfully submitted by:

Jordan W. Shelley, P.E.



02/26/2019

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2) ANALYSIS CRITERIA

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3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Table 4 - Tower Component Stresses vs. Capacity

Table 5 - Dish Twist/Sway Results for 60 mph Service Wind Speed

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Additional Calculations

1) INTRODUCTION

This tower is a 300-ft± model S3TL-HD1 self supporting tower designed by Sabre in March of 2014. The tower was originally designed for a basic wind speed of 90 mph with no ice, 40 mph with 0.75 inch ice and 60 mph service wind speed using Structure Class III, Exposure Category C, and Topographic Category 1 per ANSI/TIA-222-G. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the ANSI/TIA-222-G-2-2009 Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2 using an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph with no ice per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1, 40 mph with 0.75 inch ice thickness, and 60 mph under service loads. Risk Category III was used in this analysis with the following design criteria:

Type of Analysis: **Rigorous**

Classification of Structure: **Class III**

Exposure Category: **Exposure C**

Topographic Category: **Category 1**

Earthquake Category: **Not Considered**

Earthquake effects may be ignored per this standard for site locations where Ss does not exceed 1.0. (Site Location Ss = 0.142).

Table 1 - Existing, Proposed, and Reserved Antenna and Cable Information

Existing/ Proposed/ Reserved	Mount Level (ft)	Ant CL (ft)	Qty	Antenna Model	Mount Type	Qty Coax	Coax Size	Coax Location	Owner/ Tenant
Existing	285.0	289.0	1	8' x 4-Element Dipole	6' Sidearm	1	7/8	AB Face	FBI
Existing	277.0	289.0	1	22' x 2.5"Ø Omni	6' Sidearm	1	7/8	AB Face	FBI
Existing	268.0	268.0	3	Laird OEM2326-110	Direct	1	1/4"Ø	AB Face	FBI
Existing	258.0	263.0	1	8' x 2.5" Ø Omni	6' Sidearm	1	1 5/8	AB Face	FBI
Existing	203.3	204.0	1	1-Element Dipole	Pipe Mount	1	3/8"Ø	AB Face	FBI
Proposed	195.0	195.0	6	Commscope RV4PX310R-V2	(3) Sector Mounts¹	1	3/8"Ø	BC Face	AT&T
Proposed	195.0	195.0	3	Nokia AHLBA	-	3	3/4"Ø	BC Face	AT&T
Proposed	195.0	195.0	3	Nokia AHFIB	-	-	-	-	AT&T
Proposed	195.0	195.0	1	Raycap DC6-48-60-18-8C-EV	-	-	-	-	AT&T
Existing	178.0	182.0	1	Telewave ANT450D6-9	5' Sidearm	1	7/8	AB Face	FBI
Existing	173.0	174.0	6	Cellmax CMA-BDHH/6521/EO-6	(3) Sector Mounts	1	1 1/2	AB Face	T-Mobile
Existing	173.0	174.0	3	Andrew SBNHH-1D65C	-	-	-	-	T-Mobile
Existing	173.0	174.0	3	Nokia FRIG	-	-	-	-	T-Mobile
Existing	173.0	174.0	3	Nokia FRLB	-	-	-	-	T-Mobile
Existing	173.0	174.0	3	Nokia FSMF	-	-	-	-	T-Mobile
Existing	173.0	174.0	1	Nokia FRIE	-	-	-	-	T-Mobile
Existing	173.0	174.0	3	Raycap RNSNDC-7771-PF-48	-	-	-	-	T-Mobile

Notes:

1) Proposed mount is to be a Sabre C10857007C.

Table 1 - Existing, Proposed, and Reserved Antenna and Cable Information - Continued

Existing/ Proposed/ Reserved	Mount Level (ft)	Ant CL (ft)	Qty	Antenna Model	Mount Type	Qty Coax	Coax Size	Coax Location	Owner/ Tenant
Reserved	163.0	165.0	-	-	-	1	0.3"	CA Face	Sprint
Reserved	163.0	165.0	-	-	-	1	0.25"	CA Face	Sprint
Existing	163.0	165.0	2	KMW ET-X-TS-70-16-62-18-iR-RD	(3) Sector Mounts	3	1 1/4	CA Face	Sprint
Existing	163.0	165.0	1	Andrew SBCHH-1D90B	-	-	-	-	Sprint
Existing	163.0	165.0	3	Samsung SMM-2CR0480800	-	-	-	-	Sprint
Existing	163.0	165.0	3	Samsung SMM-BMR004	-	-	-	-	Sprint
Existing	153.0	156.0	1	6' x 4-Element Dipole	5' Sidearm	1	7/8	AB Face	FBI
Existing	149.0	149.0	1	RadioWaves 2' Dish w/ Radome (C-Leg)	Direct	1	5/16"Ø	AB Face	FBI
Existing	149.0	149.0	1	Exalt ExploreAir rc11110	-	-	-	-	FBI
Existing	147.0	149.0	1	RadioWaves 2' Dish w/ Radome (B-Leg)	Pipe Mount	1	5/16"Ø	AB Face	FBI
Existing	147.0	149.0	1	Exalt ExploreAir rc11110	-	-	-	-	FBI
Reserved	120.0	120.0	1	Raycap RC3DC-3315-PF-48	-	-	-	-	Verizon
Reserved	120.0	120.0	2	Raycap RC3DC-3315-PF-48	-	-	-	-	Verizon
Reserved	120.0	120.0	3	Ariscale B5/B13 320W RRH	-	-	-	-	Verizon
Reserved	120.0	120.0	3	Airscale B25/66a 320W RRH	-	-	-	-	Verizon
Existing	120.0	120.0	6	Commscope SBNHH-1D65B	(3) Sector Mounts	2	1 5/8 Hybrid	BC Face	Verizon
Existing	120.0	120.0	6	JMA X7CAP-665-VR0	-	18	1 5/8	BC Face	Verizon

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Source
Tower Design	Sabre, dated June 4, 2014 Job No. 104869	Grain
Foundation Design	Vertical Solutions, Inc., dated March 19, 2014 Job No. 140453	Grain
Geotechnical Report	Tower Engineering Professionals, Inc., dated March 7, 2014 TEP Job No. 52937.15687	TEP
Tower Mapping Report	Tower Engineering Professionals, Inc., dated March 28, 2016 TEP Job No. 66353_43462	TEP
Previous Structural Analysis	Tower Engineering Professionals, Inc., dated April 26, 2018 TEP Job No. 66353.166443, Revision 1	TEP
Correspondence	Correspondence from GrainComm, LLC in reference to the existing, proposed and reserved loading.	Grain

3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) The tower and foundation were built in accordance with the manufacturer's specifications.
- 2) The tower and foundation have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of existing antennas, transmission cables, mounts and other appurtenances are as specified in the tower mapping report by TEP.
- 4) Unless specified by the client or tower mapping, the location of the existing and proposed coax is assumed by TEP and listed in Table 1.
- 5) All tower components are in sufficient condition to carry their full design capacity.
- 6) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance. See Table 5.
- 7) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not analyze antennas supporting mounts as part of this structural analysis report.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	øP _{allow} (lb)	% Capacity	Pass / Fail
T1	300 - 280	Leg	Sabre 2.375"x0.154"	2	-4471.590	31617.199	14.1	Pass
T2	280 - 266	Leg	Sabre 2.375"x0.154"	31	-16029.200	33396.699	48.0	Pass
T3	266 - 260	Leg	Sabre 2.375"x0.154"	55	-20545.900	26226.400	78.3	Pass
T4	260 - 240	Leg	Sabre 2.875" x 0.276"	65	-49255.602	74507.203	66.1	Pass
T5	240 - 220	Leg	Sabre 3.5" x 0.2160"	95	-66058.898	82509.500	80.1	Pass
T6	220 - 200	Leg	Sabre 3.5" x 0.3"	125	-80583.000	110613.000	72.9	Pass
T7	200 - 180	Leg	Sabre 4.5" x 0.337"	152	-101101.000	159914.000	63.2	Pass
T8	180 - 160	Leg	Sabre 5.5625" x 0.375"	173	-129482.000	239358.000	54.1	Pass
T9	160 - 140	Leg	Sabre 5.5625" x 0.375"	193	-161925.000	239358.000	67.6	Pass
T10	140 - 120	Leg	Sabre 8.625" x 0.322"	214	-191396.000	334421.000	57.2	Pass
T11	120 - 100	Leg	Sabre 8.625" x 0.322"	229	-229704.000	334421.000	68.7	Pass
T12	100 - 80	Leg	Sabre 8.625"x0.5"	244	-268424.000	505555.000	53.1	Pass
T13	80 - 60	Leg	Sabre 8.625"x0.5"	261	-308066.000	505555.000	60.9	Pass
T14	60 - 40	Leg	Sabre 8.625"x0.5"	276	-348422.000	505555.000	68.9	Pass
T15	40 - 20	Leg	Sabre 12.75"x0.375"	291	-390096.000	620860.000	62.8	Pass
T16	20 - 13.3333	Leg	Sabre 12.75"x0.375"	306	-409290.000	640172.000	63.9	Pass
T17	13.3333 - 0	Leg	Sabre 12.75"x0.375"	318	-408536.000	640172.000	63.8	Pass
T1	300 - 280	Diagonal	L2x2x1/8	10	-1241.680	8830.220	14.1 19.8 (b)	Pass
T2	280 - 266	Diagonal	L2x2x1/8	44	-2162.080	9063.620	23.9 38.7 (b)	Pass
T3	266 - 260	Diagonal	L2x2x1/8	59	-3036.550	8089.900	37.5 48.3 (b)	Pass
T4	260 - 240	Diagonal	L2x2x1/8	70	-3999.670	8892.010	45.0 65.4 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	øP _{allow} (lb)	% Capacity	Pass / Fail
T5	240 - 220	Diagonal	L2x2x1/8	100	-2182.040	7201.600	30.3 37.7 (b)	Pass
T6	220 - 200	Diagonal	L2x2x1/8	127	-2346.300	5108.100	45.9	Pass
T7	200 - 180	Diagonal	L2 1/2x2 1/2x3/16	154	-4313.200	9321.010	46.3	Pass
T8	180 - 160	Diagonal	L2 1/2x2 1/2x3/16	175	-6519.560	7245.580	90.0	Pass
T9	160 - 140	Diagonal	L3x3x3/16	196	-7401.720	9938.710	74.5	Pass
T10	140 - 120	Diagonal	L3 1/2x3 1/2x1/4	217	-8744.670	14628.700	59.8	Pass
T11	120 - 100	Diagonal	L4x3 1/2x1/4 (SLV)	232	-11100.100	14680.900	75.6	Pass
T12	100 - 80	Diagonal	L4x4x1/4	248	-11724.100	15593.600	75.2	Pass
T13	80 - 60	Diagonal	L4x4x5/16	266	-12555.900	16318.600	76.9	Pass
T14	60 - 40	Diagonal	L4x4x5/16	281	-13464.300	17258.301	78.0	Pass
T15	40 - 20	Diagonal	L4x4x3/8	297	-14327.000	18576.699	77.1	Pass
T16	20 - 13.3333	Diagonal	L4x4x5/16	315	-18333.600	17482.600	104.9	Pass ³
T17	13.3333 - 0	Diagonal	L 5 x 3.5 x 5/16 (SLV)	331	-23419.301	28256.801	82.9	Pass
T17	13.3333 - 0	Horizontal	L4x4x5/16	313	-7097.960	16876.100	42.1	Pass
T1	300 - 280	Top Girt	L2x2x1/8	4	-86.849	6009.560	1.4	Pass
T2	280 - 266	Top Girt	L2x2x1/8	36	-97.511	6009.560	1.6	Pass
T4	260 - 240	Top Girt	L2x2x1/8	68	-513.712	6009.560	8.5	Pass
T5	240 - 220	Top Girt	L2x2x1/8	99	-195.436	6113.680	3.2	Pass
T17	13.3333 - 0	Redund Horz 1 Bracing	L3x3x1/4	332	-7084.880	19302.199	36.7	Pass
T17	13.3333 - 0	Redund Diag 1 Bracing	L3x3x1/4	330	-4808.480	10661.700	45.1	Pass
T17	13.3333 - 0	Inner Bracing	L3x3x1/4	339	-28.426	4135.470	0.8	Pass
							Summary	
						Leg (T5)	80.1	Pass
						Diagonal (T16)	104.9	Pass ³
						Horizontal (T17)	42.1	Pass
						Top Girt (T4)	8.5	Pass
						Redund Horz 1 Bracing (T17)	36.7	Pass
						Redund Diag 1 Bracing (T17)	45.1	Pass
						Inner Bracing (T17)	0.8	Pass
						Bolt Checks	65.5	Pass
						RATING =	104.9	Pass³

Table 4 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
-	Anchor Rods	-	47.4	Pass
2	Base Foundation Soil Interaction	-	69.2	Pass
2	Base Foundation Structural	-	16.9	Pass

Structure Rating (max from all components) =	104.9%
---	---------------

Notes:

- 2) See additional documentation in "Appendix B - Additional Calculations" for calculations supporting the % capacity listed.
- 3) A structure rating of 105% or less is within engineering tolerances and considered acceptable.

Table 5 - Dish Twist/Sway Results for 60 mph Service Wind Speed

Elevation (ft)	Dish Model	Beam Deflection		
		Deflection (in)	Tilt (deg)	Twist (deg)
149.0	RadioWaves 2' Dish w/ Radome	2.177	0.138	0.010
149.0	RadioWaves 2' Dish w/ Radome	2.177	0.138	0.010

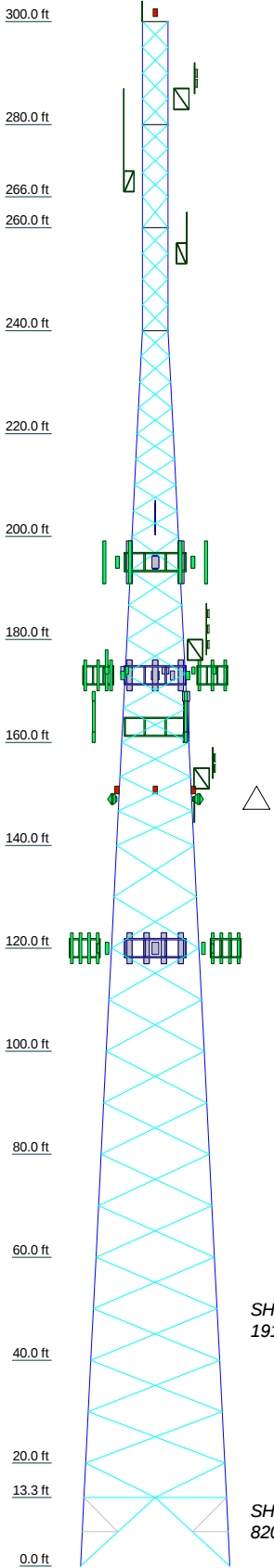
4.1) Recommendations

- 1) If the load differs from that described in Table 1 of this report or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
- 2) The tower and its foundation have sufficient capacity to carry the existing, proposed, and reserved loading. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	Sabre 12.75"x0.375"																
Leg Grade	Sabre 8.625"x0.5"																
Diagonals	Sabre 5.5625"x0.375"																
Diagonal Grade	A572-50																
Top Girts	A36																
Horizontals	N.A.																
Red. Horizontals	N.A.																
Red. Diagonals	N.A.																
Inner Bracing	N.A.																
Face Width (ft)	29	27	25	23	21	19	17	15	13	11	9	7	12 @ 5				
# Panels @ (ft)	29	27	25	23	21	19	17	15	13	11	9	7	12 @ 5				
Weight (lb)	42575.4	4375.7	6285.0	5158.3	4978.6	4381.6	3241.9	3020.0	2285.3	2008.7	1565.9	990.2	789.8	704.5	143.1	381.2	523.8

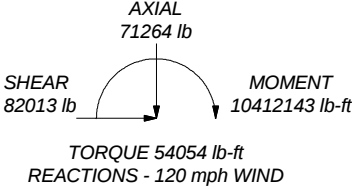
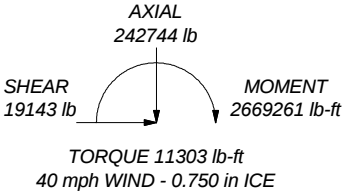


ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 438338 lb
SHEAR: 51013 lb

UPLIFT: -368742 lb
SHEAR: 44157 lb



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Sabre 2.875" x 0.276"	F	L4x4x5/16
B	Sabre 3.5" x 0.2160"	G	L 5 x 3.5 x 5/16 (SLV)
C	Sabre 3.5" x 0.3"	H	1 @ 6.66667
D	Sabre 4.5" x 0.337"	I	1 @ 13.3333
E	L4x3 1/2x1/4 (SLV)		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Lorain County, Ohio.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category III and IV.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 104.9%

Tower Engineering Professionals, Inc.

Tower Engineering Professionals, Inc.

326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: **2055-OH-219401 - North Ridgeville**

Project: **TEP #66353.230474**

Client: GrainComm, LLC Drawn by: G. Hunter Morrow, E.I. App'd:

Code: TIA-222-G Date: 02/26/19 Scale: NTS

Path: T:\66353\2P-178429 L-230474 2055-OH-219401 North Ridgeville Tower SAI.mxd 2055-OH-219401.dwg Dwg No. E-1

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	2055-OH-219401 - North Ridgeville	Page	1 of 36
	Project	TEP #66353.230474	Date	15:26:02 02/26/19
	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	2055-OH-219401 - North Ridgeville	Page	2 of 36
	Project	TEP #66353.230474	Date	15:26:02 02/26/19
	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 300.000 ft above the ground line.

The base of the tower is set at an elevation of 0.000 ft above the ground line.

The face width of the tower is 5.000 ft at the top and 29.000 ft at the base.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in Lorain County, Ohio.

ASCE 7-10 Wind Data is used.

Basic wind speed of 120 mph.

Risk Category III and IV.

Exposure Category C.

Topographic Category 1.

Crest Height 0.000 ft.

Nominal ice thickness of 0.750 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 40 mph is used in combination with ice.

Temperature drop of 50 °F.

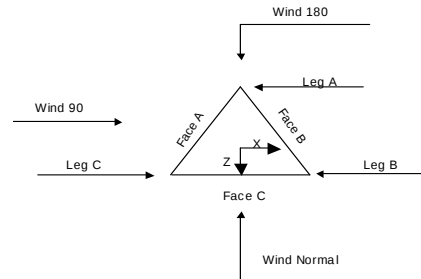
Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	300.000-280.000			5.000	1	20.000
T2	280.000-266.000			5.000	1	14.000
T3	266.000-260.000			5.000	1	6.000
T4	260.000-240.000			5.000	1	20.000
T5	240.000-220.000			5.000	1	20.000
T6	220.000-200.000			7.000	1	20.000
T7	200.000-180.000			9.000	1	20.000
T8	180.000-160.000			11.000	1	20.000
T9	160.000-140.000			13.000	1	20.000
T10	140.000-120.000			15.000	1	20.000
T11	120.000-100.000			17.000	1	20.000
T12	100.000-80.000			19.000	1	20.000
T13	80.000-60.000			21.000	1	20.000
T14	60.000-40.000			23.000	1	20.000
T15	40.000-20.000			25.000	1	20.000
T16	20.000-13.333			27.000	1	6.667
T17	13.333-0.000			27.667	1	13.333

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	√ SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
√ Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known

Tower Section Geometry (cont'd)

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	2055-OH-219401 - North Ridgeville	Page	3 of 36
	Project	TEP #66353.230474	Date	15:26:02 02/26/19
	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	300.000-280.000	5.000	X Brace	No	No	0.000	0.000
T2	280.000-266.000	4.667	X Brace	No	No	0.000	0.000
T3	266.000-260.000	6.000	X Brace	No	No	0.000	0.000
T4	260.000-240.000	5.000	X Brace	No	No	0.000	0.000
T5	240.000-220.000	5.000	X Brace	No	No	0.000	0.000
T6	220.000-200.000	5.000	X Brace	No	No	0.000	0.000
T7	200.000-180.000	6.667	X Brace	No	No	0.000	0.000
T8	180.000-160.000	6.667	X Brace	No	No	0.000	0.000
T9	160.000-140.000	6.667	X Brace	No	No	0.000	0.000
T10	140.000-120.000	10.000	X Brace	No	No	0.000	0.000
T11	120.000-100.000	10.000	X Brace	No	No	0.000	0.000
T12	100.000-80.000	10.000	X Brace	No	No	0.000	0.000
T13	80.000-60.000	10.000	X Brace	No	No	0.000	0.000
T14	60.000-40.000	10.000	X Brace	No	No	0.000	0.000
T15	40.000-20.000	10.000	X Brace	No	No	0.000	0.000
T16	20.000-13.333	6.667	K Brace Up	No	Yes	0.000	0.000
T17	13.333-0.000	13.333	K1 Down	No	Yes	0.000	0.000

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T1	Pipe	Sabre 2.375"x0.154"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
300.000-280.000	Pipe	Sabre 2.375"x0.154"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T2	Pipe	Sabre 2.375"x0.154"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
280.000-266.000	Pipe	Sabre 2.375"x0.154"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T3	Pipe	Sabre 2.375"x0.154"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
266.000-260.000	Pipe	Sabre 2.875" x 0.276"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T4	Pipe	Sabre 2.875" x 0.276"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
260.000-240.000	Pipe	Sabre 3.5" x 0.2160"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T5	Pipe	Sabre 3.5" x 0.2160"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
240.000-220.000	Pipe	Sabre 3.5" x 0.3"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T6	Pipe	Sabre 3.5" x 0.3"	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
220.000-200.000	Pipe	Sabre 4.5" x 0.337"	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7	Pipe	Sabre 4.5" x 0.337"	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
200.000-180.000	Pipe	Sabre 5.5625" x 0.375"	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8	Pipe	Sabre 5.5625" x 0.375"	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
180.000-160.000	Pipe	Sabre 5.5625" x 0.375"	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T9	Pipe	Sabre 5.5625" x 0.375"	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
160.000-140.000	Pipe	Sabre 8.625" x 0.322"	A572-50 (50 ksi)	Single Angle	L4x3 1/2x1/4 (SLV)	A36 (36 ksi)
T10	Pipe	Sabre 8.625" x 0.322"	A572-50 (50 ksi)	Single Angle	L4x3 1/2x1/4 (SLV)	A36 (36 ksi)
140.000-120.000	Pipe	Sabre 8.625" x 0.322"	A572-50 (50 ksi)	Single Angle	L4x3 1/2x1/4 (SLV)	A36 (36 ksi)
T11	Pipe	Sabre 8.625" x 0.322"	A572-50 (50 ksi)	Single Angle	L4x3 1/2x1/4 (SLV)	A36 (36 ksi)
120.000-100.000	Pipe	Sabre 8.625" x 0.322"	A572-50 (50 ksi)	Single Angle	L4x3 1/2x1/4 (SLV)	A36 (36 ksi)
T12	Pipe	Sabre 8.625" x 0.5"	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
100.000-80.000	Pipe	Sabre 8.625" x 0.5"	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T13	Pipe	Sabre 8.625" x 0.5"	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
80.000-60.000	Pipe	Sabre 8.625" x 0.5"	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
T14	Pipe	Sabre 8.625" x 0.5"	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
60.000-40.000	Pipe	Sabre 8.625" x 0.5"	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
T15	Pipe	Sabre 12.75"x0.375"	A572-50 (50 ksi)	Single Angle	L4x4x3/8	A36 (36 ksi)
40.000-20.000	Pipe	Sabre 12.75"x0.375"	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
T16	Pipe	Sabre 12.75"x0.375"	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
20.000-13.333	Pipe	Sabre 12.75"x0.375"	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
T17 13.333-0.000	Pipe	Sabre 12.75"x0.375"	A572-50 (50 ksi)	Single Angle	L 5 x 3.5 x 5/16 (SLV)	A36 (36 ksi)

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<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
			(50 ksi)			(36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
<i>ft</i>						
T1	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
300.000-280.000	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T2	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
280.000-266.000	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T4	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
260.000-240.000	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T5	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
240.000-220.000	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>No. of Mid Girts</i>	<i>Mid Girt Type</i>	<i>Mid Girt Size</i>	<i>Mid Girt Grade</i>	<i>Horizontal Type</i>	<i>Horizontal Size</i>	<i>Horizontal Grade</i>
<i>ft</i>							
T16	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x5/16	A36 (36 ksi)
20.000-13.333	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x5/16	A36 (36 ksi)
T17 13.333-0.000	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x5/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Secondary Horizontal Type</i>	<i>Secondary Horizontal Size</i>	<i>Secondary Horizontal Grade</i>	<i>Inner Bracing Type</i>	<i>Inner Bracing Size</i>	<i>Inner Bracing Grade</i>
<i>ft</i>						
T17 13.333-0.000	Solid Round		A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Redundant Bracing Grade</i>	<i>Redundant Type</i>	<i>Redundant Size</i>	<i>K Factor</i>
<i>ft</i>				

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Tower Elevation	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
ft					
T17	A36	Horizontal (1)	Equal Angle	L3x3x1/4	1
13.333-0.000	(36 ksi)	Diagonal (1)	Equal Angle	L3x3x1/4	1

Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _v	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
T1	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
300.000-280.000									
T2	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
280.000-266.000									
T3	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
266.000-260.000									
T4	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
260.000-240.000									
T5	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
240.000-220.000									
T6	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
220.000-200.000									
T7	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
200.000-180.000									
T8	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
180.000-160.000									
T9	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
160.000-140.000									
T10	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
140.000-120.000									
T11	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
120.000-100.000									
T12	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
100.000-80.000									
T13	0.000	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
80.000-60.000									
T14	0.000	0.500	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
60.000-40.000									
T15	0.000	0.500	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
40.000-20.000									
T16	0.000	0.500	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
20.000-13.333									
T17	0.000	0.500	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
13.333-0.000									

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Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹						
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
ft										
T1	Yes	Yes	1	1	1	1	1	1	1	1
300.000-280.000				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
280.000-266.000				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
266.000-260.000				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
260.000-240.000				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
240.000-220.000				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
220.000-200.000				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
200.000-180.000				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
180.000-160.000				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
160.000-140.000				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
140.000-120.000				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
120.000-100.000				1	1	1	1	1	1	1
T12	Yes	Yes	1	1	1	1	1	1	1	1
100.000-80.000				1	1	1	1	1	1	1
T13	Yes	Yes	1	1	1	1	1	1	1	1
80.000-60.000				1	1	1	1	1	1	1
T14	Yes	Yes	1	1	1	1	1	1	1	1
60.000-40.000				1	1	1	1	1	1	1
T15	Yes	Yes	1	1	1	1	1	1	1	1
40.000-20.000				1	1	1	1	1	1	1
T16	Yes	Yes	1	1	1	1	1	1	1	1
20.000-13.333				1	1	1	1	1	1	1
T17	Yes	Yes	1	1	1	1	1	1	1	1
13.333-0.000				1	1	1	1	1	1	1

¹Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

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Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 300.000-280.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 280.000-266.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 266.000-260.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 260.000-240.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 240.000-220.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 220.000-200.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 200.000-180.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 180.000-160.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 160.000-140.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 140.000-120.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 120.000-100.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T12 100.000-80.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T13 80.000-60.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T14 60.000-40.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T15 40.000-20.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T16 20.000-13.333	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T17 13.333-0.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 300.000-280.000	Flange	0.750 A325N	6	0.625 A325X	1	0.625 A325X	1	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T2 280.000-266.000	Flange	0.750 A325N	0	0.625 A325X	1	0.625 A325X	1	0.000 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T3 266.000-260.000	Flange	0.750 A325N	6	0.625 A325X	1	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T4 260.000-240.000	Flange	0.750 A325N	6	0.625 A325X	1	0.625 A325X	1	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T5 240.000-220.000	Flange	0.750 A325N	6	0.625 A325X	1	0.625 A325X	1	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T6 220.000-200.000	Flange	1.000 A325N	6	0.625 A325X	1	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T7 200.000-180.000	Flange	1.000 A325N	6	0.625 A325X	1	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T8 180.000-160.000	Flange	1.000 A325N	6	0.625 A325X	1	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T9 160.000-140.000	Flange	1.250 A325N	6	0.750 A325X	1	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T10 140.000-120.000	Flange	1.250 A325N	6	0.750 A325X	1	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T11 120.000-100.000	Flange	1.250 A325N	6	0.750 A325X	1	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T12 100.000-80.000	Flange	1.250 A325N	6	0.750 A325X	1	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T13 80.000-60.000	Flange	1.250 A325N	6	0.750 A325X	1	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T14 60.000-40.000	Flange	1.500 A325N	8	0.625 A325X	2	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T15 40.000-20.000	Flange	1.500 A325N	8	0.625 A325X	2	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0
T16 20.000-13.333	Flange	0.000 A325N	0	0.750 A325X	2	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.750 A325X	2	0.625 A325N	0
T17 13.333-0.000	Flange	0.000 A325N	0	0.750 A325X	2	0.625 A325X	0	0.625 A325X	0	0.625 A325N	0	0.750 A325X	2	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Step Pegs	A	No	No	Ar (CaAa)	140.000 -	0.000	0.5	1	1	0.350	0.350	0.487

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(5/8" SR) 7-in. w/30" step Step Pegs	B	No	No	Ar (CaAa)	140.000 - 0.000	0.000	0.5	1	1	0.350	0.350		0.487
(5/8" SR) 7-in. w/30" step Step Pegs	C	No	No	Ar (CaAa)	300.000 - 0.000	0.000	0.5	1	1	0.350	0.350		0.487
(5/8" SR) 7-in. w/30" step Safety Line 3/8 *****	C	No	No	Ar (CaAa)	300.000 - 0.000	0.000	0.5	1	1	0.375	0.375		0.220
Rail L2x2x1/8 (T-Mobile)	B	No	No	Af (CaAa)	170.000 - 0.000	0.000	-0.4	2	2	29.500	2.000		1.650
Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step) (T-Mobile)	B	No	No	Af (CaAa)	170.000 - 0.000	0.000	-0.4	1	1	1.269	1.269		0.925
Rail L1 3/4 x 3/4 x 1/8 (FBI)	B	No	No	Af (CaAa)	290.000 - 0.000	0.000	0.4	2	2	34.000	1.750		1.063
Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step) (FBI)	B	No	No	Af (CaAa)	290.000 - 0.000	0.000	0.4	1	1	1.230	1.230		1.047
Rail L2x2x1/8 (Verizon)	C	No	No	Af (CaAa)	120.000 - 5.000	0.000	0.4	2	2	38.500	2.000		1.650
Rung C 1 3/4x 3/4x 1/8 (38" width, 48" step) (Verizon)	C	No	No	Af (CaAa)	120.000 - 5.000	0.000	0.4	1	1	1.385	0.000		1.010
Rail L1 3/4 x 3/4 x 1/8 (Sprint)	A	No	No	Af (CaAa)	160.000 - 3.000	0.000	-0.05	1	1	26.500	1.750		1.063
Rung C 1 3/4x1 3/4x1/8 (27" Width, 39" Step) (Sprint) *****	A	No	No	Af (CaAa)	160.000 - 3.000	0.000	-0.05	1	1	1.212	1.212		1.472
1.5" Hybrid (T-Mobile)	B	No	No	Ar (CaAa)	174.000 - 5.000	0.000	-0.4	1	1	1.500	1.500		1.680
Cat-5 (5/16") (FBI)	B	No	No	Ar (CaAa)	149.000 - 8.000	0.000	0.35	2	1	0.500	0.313		0.088
3/8" Coax (FBI)	B	No	No	Ar (CaAa)	204.000 - 8.000	0.000	0.37	1	1	0.375	0.375		0.075
LDF5-50A (7/8 FOAM) (FBI)	B	No	No	Ar (CaAa)	156.000 - 8.000	0.000	0.4	4	4	0.500	1.090		0.330
LDF5-50A (7/8 FOAM) (FBI)	B	No	No	Ar (CaAa)	182.000 - 156.000	0.000	0.4	3	3	0.500	1.090		0.330
LDF5-50A (7/8 FOAM) (FBI)	B	No	No	Ar (CaAa)	289.000 - 182.000	0.000	0.4	2	2	0.500	1.090		0.330
LDF7-50A (1-5/8 FOAM) (FBI)	B	No	No	Ar (CaAa)	263.000 - 8.000	0.000	0.43	1	1	0.500	1.980		0.820

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1/4 Coax (FBI)	B	No	No	Ar (CaAa)	268.000 - 8.000	0.000	0.44	1	1	0.250	0.250		0.100
LDF7-50A (1-5/8 FOAM) (Verizon)	C	No	No	Ar (CaAa)	120.000 - 8.000	0.000	0.4	18	11	0.500	1.980		0.820
1 5/8 Hybrid DC/Fiber (Verizon)	C	No	No	Ar (CaAa)	120.000 - 8.000	0.000	0.45	2	2	0.500	1.625		0.820
5/8" Cable (Lights)	A	No	No	Ar (CaAa)	150.000 - 0.000	0.000	-0.5	2	2	0.500	0.625		0.300
5/8" Cable (Lights)	A	No	No	Ar (CaAa)	300.000 - 150.000	0.000	-0.5	1	1	0.500	0.625		0.300
1.24" Hybrid (Sprint)	A	No	No	Ar (CaAa)	165.000 - 3.000	0.000	-0.05	3	3	0.500	1.240		1.050
0.24" Fiber (Sprint)	A	No	No	Ar (CaAa)	165.000 - 3.000	0.000	-0.07	1	1	0.250	0.240		0.211
0.315" RET Cable (Sprint) ***	A	No	No	Ar (CaAa)	165.000 - 3.000	0.000	-0.03	1	1	0.315	0.315		0.080
3/8" Fiber Cable (AT&T)	C	No	No	Ar (CaAa)	195.000 - 8.000	0.000	0.05	1	1	0.375	0.375		0.067
3/4" DC (AT&T)	C	No	No	Ar (CaAa)	195.000 - 8.000	0.000	-0.05	3	3	0.500	0.750		1.240

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	Ar ft ²	Ar ft ²	CAaA In Face ft ²	CAaA Out Face ft ²	Weight lb
T1	300.000-280.000	A	0.000	0.000	1.250	0.000	6.000
		B	0.000	0.000	9.845	0.000	37.678
		C	0.000	0.000	1.450	0.000	14.140
T2	280.000-266.000	A	0.000	0.000	0.875	0.000	4.200
		B	0.000	0.000	14.139	0.000	53.873
		C	0.000	0.000	1.015	0.000	9.898
T3	266.000-260.000	A	0.000	0.000	0.375	0.000	1.800
		B	0.000	0.000	6.782	0.000	26.063
		C	0.000	0.000	0.435	0.000	4.242
T4	260.000-240.000	A	0.000	0.000	1.250	0.000	6.000
		B	0.000	0.000	24.587	0.000	95.076
		C	0.000	0.000	1.450	0.000	14.140
T5	240.000-220.000	A	0.000	0.000	1.250	0.000	6.000
		B	0.000	0.000	24.587	0.000	95.076
		C	0.000	0.000	1.450	0.000	14.140
T6	220.000-200.000	A	0.000	0.000	1.250	0.000	6.000
		B	0.000	0.000	24.737	0.000	95.376
		C	0.000	0.000	1.450	0.000	14.140
T7	200.000-180.000	A	0.000	0.000	1.250	0.000	6.000
		B	0.000	0.000	25.555	0.000	97.236
		C	0.000	0.000	5.388	0.000	70.942
T8	180.000-160.000	A	0.000	0.000	3.387	0.000	23.207
		B	0.000	0.000	38.398	0.000	168.946
		C	0.000	0.000	6.700	0.000	89.876
T9	160.000-140.000	A	0.000	0.000	20.297	0.000	128.536

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<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face</i>	<i>A_R</i> <i>ft²</i>	<i>A_F</i> <i>ft²</i>	<i>C_AA_A</i> <i>In Face ft²</i>	<i>C_AA_A</i> <i>Out Face ft²</i>	<i>Weight</i> <i>lb</i>
T10	140.000-120.000	B	0.000	0.000	50.386	0.000	228.138
		C	0.000	0.000	6.700	0.000	89.876
		A	0.000	0.000	21.622	0.000	141.276
T11	120.000-100.000	B	0.000	0.000	52.210	0.000	241.132
		C	0.000	0.000	6.700	0.000	89.876
		A	0.000	0.000	21.622	0.000	141.276
T12	100.000-80.000	B	0.000	0.000	52.210	0.000	241.132
		C	0.000	0.000	97.813	0.000	504.076
		A	0.000	0.000	21.622	0.000	141.276
T13	80.000-60.000	B	0.000	0.000	52.210	0.000	241.132
		C	0.000	0.000	97.813	0.000	504.076
		A	0.000	0.000	21.622	0.000	141.276
T14	60.000-40.000	B	0.000	0.000	52.210	0.000	241.132
		C	0.000	0.000	97.813	0.000	504.076
		A	0.000	0.000	21.622	0.000	141.276
T15	40.000-20.000	B	0.000	0.000	52.210	0.000	241.132
		C	0.000	0.000	97.813	0.000	504.076
		A	0.000	0.000	21.622	0.000	141.276
T16	20.000-13.333	B	0.000	0.000	52.210	0.000	241.132
		C	0.000	0.000	97.813	0.000	504.076
		A	0.000	0.000	7.207	0.000	47.092
T17	13.333-0.000	B	0.000	0.000	17.403	0.000	80.377
		C	0.000	0.000	32.604	0.000	168.025
		A	0.000	0.000	11.651	0.000	76.254
		B	0.000	0.000	27.985	0.000	132.428
		C	0.000	0.000	28.664	0.000	153.006

Feed Line/Linear Appurtenances Section Areas - With Ice

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R</i> <i>ft²</i>	<i>A_F</i> <i>ft²</i>	<i>C_AA_A</i> <i>In Face ft²</i>	<i>C_AA_A</i> <i>Out Face ft²</i>	<i>Weight</i> <i>lb</i>
T1	300.000-280.000	A	2.330	0.000	0.000	10.571	0.000	174.259
		B		0.000	0.000	32.355	0.000	529.040
		C		0.000	0.000	20.091	0.000	320.767
T2	280.000-266.000	A	2.316	0.000	0.000	7.360	0.000	120.716
		B		0.000	0.000	47.718	0.000	767.612
		C		0.000	0.000	13.985	0.000	222.132
T3	266.000-260.000	A	2.308	0.000	0.000	3.144	0.000	51.404
		B		0.000	0.000	24.880	0.000	403.466
		C		0.000	0.000	5.973	0.000	94.569
T4	260.000-240.000	A	2.296	0.000	0.000	10.433	0.000	169.855
		B		0.000	0.000	89.214	0.000	1462.689
		C		0.000	0.000	19.817	0.000	312.398
T5	240.000-220.000	A	2.277	0.000	0.000	10.357	0.000	167.434
		B		0.000	0.000	88.699	0.000	1444.370
		C		0.000	0.000	19.664	0.000	307.800
T6	220.000-200.000	A	2.256	0.000	0.000	10.275	0.000	164.835
		B		0.000	0.000	90.097	0.000	1453.999
		C		0.000	0.000	19.499	0.000	302.867
T7	200.000-180.000	A	2.234	0.000	0.000	10.185	0.000	162.027
		B		0.000	0.000	97.545	0.000	1554.087
		C		0.000	0.000	44.050	0.000	654.198
T8	180.000-160.000	A	2.209	0.000	0.000	21.499	0.000	323.410
		B		0.000	0.000	130.030	0.000	2195.362
		C		0.000	0.000	51.825	0.000	760.279
T9	160.000-140.000	A	2.182	0.000	0.000	87.417	0.000	1323.464
		B		0.000	0.000	165.190	0.000	2834.559

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<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R</i> <i>ft²</i>	<i>A_F</i> <i>ft²</i>	<i>C_AA_A</i> <i>In Face ft²</i>	<i>C_AA_A</i> <i>Out Face ft²</i>	<i>Weight</i> <i>lb</i>
T10	140.000-120.000	C		0.000	0.000	51.305	0.000	746.177
		A	2.151	0.000	0.000	100.666	0.000	1460.772
		B		0.000	0.000	183.425	0.000	3075.029
T11	120.000-100.000	C		0.000	0.000	50.718	0.000	730.447
		A	2.115	0.000	0.000	99.458	0.000	1425.566
		B		0.000	0.000	181.366	0.000	3000.351
T12	100.000-80.000	C		0.000	0.000	194.010	0.000	3551.429
		A	2.073	0.000	0.000	98.033	0.000	1384.636
		B		0.000	0.000	178.937	0.000	2913.494
T13	80.000-60.000	C		0.000	0.000	192.157	0.000	3476.848
		A	2.021	0.000	0.000	96.289	0.000	1335.393
		B		0.000	0.000	175.964	0.000	2808.935
T14	60.000-40.000	C		0.000	0.000	189.890	0.000	3386.657
		A	1.955	0.000	0.000	94.023	0.000	1272.804
		B		0.000	0.000	172.100	0.000	2675.942
T15	40.000-20.000	C		0.000	0.000	186.944	0.000	3271.249
		A	1.857	0.000	0.000	90.725	0.000	1184.613
		B		0.000	0.000	166.477	0.000	2488.348
T16	20.000-13.333	C		0.000	0.000	182.659	0.000	3107.034
		A	1.751	0.000	0.000	29.045	0.000	364.153
		B		0.000	0.000	53.452	0.000	764.014
T17	13.333-0.000	C		0.000	0.000	59.332	0.000	977.737
		A	1.598	0.000	0.000	45.747	0.000	531.641
		B		0.000	0.000	73.319	0.000	1017.975
		C		0.000	0.000	56.238	0.000	872.362

Feed Line Center of Pressure

<i>Section</i>	<i>Elevation ft</i>	<i>CP_x</i> <i>in</i>	<i>CP_z</i> <i>in</i>	<i>CP_x</i> <i>Ice in</i>	<i>CP_z</i> <i>Ice in</i>
T1	300.000-280.000	2.349	2.327	-0.612	4.138
T2	280.000-266.000	5.090	3.465	2.803	4.932
T3	266.000-260.000	6.274	4.076	4.892	6.285
T4	260.000-240.000	6.218	3.947	4.900	5.739
T5	240.000-220.000	6.833	4.373	5.829	6.865
T6	220.000-200.000	8.339	5.401	8.048	9.297
T7	200.000-180.000	9.228	6.577	9.905	12.542
T8	180.000-160.000	9.660	1.308	9.509	6.636
T9	160.000-140.000	5.900	-3.568	4.784	0.591
T10	140.000-120.000	6.681	-3.611	7.528	0.281
T11	120.000-100.000	-17.964	3.718	-10.729	7.957
T12	100.000-80.000	-18.462	3.786	-11.493	8.425
T13	80.000-60.000	-19.604	4.000	-12.402	8.956
T14	60.000-40.000	-20.661	4.197	-13.304	9.423
T15	40.000-20.000	-20.618	4.107	-13.799	9.455
T16	20.000-13.333	-23.268	4.650	-15.365	10.197
T17	13.333-0.000	-8.779	-1.261	-8.306	1.681

Shielding Factor Ka

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	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T1	3	Step Pegs (5/8" SR) 7-in. w/30" step	280.00 - 300.00	0.6000	0.4963
T1	4	Safety Line 3/8	280.00 - 300.00	0.6000	0.4963
T1	8	Rail L1 3/4 x 3/4 x 1/8	280.00 - 290.00	0.6000	0.4963
T1	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	280.00 - 290.00	0.6000	0.4963
T1	20	LDF5-50A (7/8 FOAM)	280.00 - 289.00	0.6000	0.4963
T1	27	5/8" Cable (Lights)	280.00 - 300.00	0.6000	0.4963
T2	3	Step Pegs (5/8" SR) 7-in. w/30" step	266.00 - 280.00	0.6000	0.4783
T2	4	Safety Line 3/8	266.00 - 280.00	0.6000	0.4783
T2	8	Rail L1 3/4 x 3/4 x 1/8	266.00 - 280.00	0.6000	0.4783
T2	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	266.00 - 280.00	0.6000	0.4783
T2	20	LDF5-50A (7/8 FOAM)	266.00 - 280.00	0.6000	0.4783
T2	23	1/4 Coax	266.00 - 268.00	0.6000	0.4783
T2	27	5/8" Cable (Lights)	266.00 - 280.00	0.6000	0.4783
T3	3	Step Pegs (5/8" SR) 7-in. w/30" step	260.00 - 266.00	0.6000	0.5444
T3	4	Safety Line 3/8	260.00 - 266.00	0.6000	0.5444
T3	8	Rail L1 3/4 x 3/4 x 1/8	260.00 - 266.00	0.6000	0.5444
T3	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	260.00 - 266.00	0.6000	0.5444
T3	20	LDF5-50A (7/8 FOAM)	260.00 - 266.00	0.6000	0.5444
T3	22	LDF7-50A (1-5/8 FOAM)	260.00 - 263.00	0.6000	0.5444
T3	23	1/4 Coax	260.00 - 266.00	0.6000	0.5444
T3	27	5/8" Cable (Lights)	260.00 - 266.00	0.6000	0.5444
T4	3	Step Pegs (5/8" SR) 7-in. w/30" step	240.00 - 260.00	0.6000	0.4918
T4	4	Safety Line 3/8	240.00 - 260.00	0.6000	0.4918
T4	8	Rail L1 3/4 x 3/4 x 1/8	240.00 - 260.00	0.6000	0.4918
T4	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	240.00 - 260.00	0.6000	0.4918
T4	20	LDF5-50A (7/8 FOAM)	240.00 - 260.00	0.6000	0.4918
T4	22	LDF7-50A (1-5/8 FOAM)	240.00 - 260.00	0.6000	0.4918
T4	23	1/4 Coax	240.00 - 260.00	0.6000	0.4918
T4	27	5/8" Cable (Lights)	240.00 - 260.00	0.6000	0.4918
T5	3	Step Pegs (5/8" SR) 7-in. w/30" step	220.00 - 240.00	0.6000	0.5352
T5	4	Safety Line 3/8	220.00 - 240.00	0.6000	0.5352

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	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T5	8	Rail L1 3/4 x 3/4 x 1/8	220.00 - 240.00	0.6000	0.5352
T5	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	220.00 - 240.00	0.6000	0.5352
T5	20	LDF5-50A (7/8 FOAM)	220.00 - 240.00	0.6000	0.5352
T5	22	LDF7-50A (1-5/8 FOAM)	220.00 - 240.00	0.6000	0.5352
T5	23	1/4 Coax	220.00 - 240.00	0.6000	0.5352
T5	27	5/8" Cable (Lights)	220.00 - 240.00	0.6000	0.5352
T6	3	Step Pegs (5/8" SR) 7-in. w/30" step	200.00 - 220.00	0.6000	0.6000
T6	4	Safety Line 3/8	200.00 - 220.00	0.6000	0.6000
T6	8	Rail L1 3/4 x 3/4 x 1/8	200.00 - 220.00	0.6000	0.6000
T6	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	200.00 - 220.00	0.6000	0.6000
T6	17	3/8" Coax	200.00 - 204.00	0.6000	0.6000
T6	20	LDF5-50A (7/8 FOAM)	200.00 - 220.00	0.6000	0.6000
T6	22	LDF7-50A (1-5/8 FOAM)	200.00 - 220.00	0.6000	0.6000
T6	23	1/4 Coax	200.00 - 220.00	0.6000	0.6000
T6	27	5/8" Cable (Lights)	200.00 - 220.00	0.6000	0.6000
T7	3	Step Pegs (5/8" SR) 7-in. w/30" step	180.00 - 200.00	0.6000	0.6000
T7	4	Safety Line 3/8	180.00 - 200.00	0.6000	0.6000
T7	8	Rail L1 3/4 x 3/4 x 1/8	180.00 - 200.00	0.6000	0.6000
T7	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	180.00 - 200.00	0.6000	0.6000
T7	17	3/8" Coax	180.00 - 200.00	0.6000	0.6000
T7	19	LDF5-50A (7/8 FOAM)	180.00 - 200.00	0.6000	0.6000
T7	20	LDF5-50A (7/8 FOAM)	182.00 - 200.00	0.6000	0.6000
T7	22	LDF7-50A (1-5/8 FOAM)	180.00 - 200.00	0.6000	0.6000
T7	23	1/4 Coax	180.00 - 200.00	0.6000	0.6000
T7	27	5/8" Cable (Lights)	180.00 - 200.00	0.6000	0.6000
T7	32	3/8" Fiber Cable	180.00 - 195.00	0.6000	0.6000
T7	33	3/4" DC	180.00 - 195.00	0.6000	0.6000
T8	3	Step Pegs (5/8" SR) 7-in. w/30" step	160.00 - 180.00	0.6000	0.6000
T8	4	Safety Line 3/8	160.00 - 180.00	0.6000	0.6000
T8	6	Rail L2x2x1/8	160.00 - 170.00	0.6000	0.6000
T8	7	Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step)	160.00 - 170.00	0.6000	0.6000

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	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T8	8	Rail L1 3/4 x 3/4 x 1/8	160.00 - 180.00	0.6000	0.6000
T8	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	160.00 - 180.00	0.6000	0.6000
T8	15	1.5" Hybrid	160.00 - 174.00	0.6000	0.6000
T8	17	3/8" Coax	160.00 - 180.00	0.6000	0.6000
T8	19	LDF5-50A (7/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T8	22	LDF7-50A (1-5/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T8	23	1/4 Coax	160.00 - 180.00	0.6000	0.6000
T8	27	5/8" Cable (Lights)	160.00 - 180.00	0.6000	0.6000
T8	28	1.24" Hybrid	160.00 - 165.00	0.6000	0.6000
T8	29	0.24" Fiber	160.00 - 165.00	0.6000	0.6000
T8	30	0.315" RET Cable	160.00 - 165.00	0.6000	0.6000
T8	32	3/8" Fiber Cable	160.00 - 180.00	0.6000	0.6000
T8	33	3/4" DC	160.00 - 180.00	0.6000	0.6000
T9	3	Step Pegs (5/8" SR) 7-in. w/30" step	140.00 - 160.00	0.6000	0.6000
T9	4	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T9	6	Rail L2x2x1/8	140.00 - 160.00	0.6000	0.6000
T9	7	Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step)	140.00 - 160.00	0.6000	0.6000
T9	8	Rail L1 3/4 x 3/4 x 1/8	140.00 - 160.00	0.6000	0.6000
T9	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	140.00 - 160.00	0.6000	0.6000
T9	12	Rail L1 3/4 x 3/4 x 1/8	140.00 - 160.00	0.6000	0.6000
T9	13	Rung C 1 3/4x1 3/4x1/8 (27" Width, 39" Step)	140.00 - 160.00	0.6000	0.6000
T9	15	1.5" Hybrid	140.00 - 160.00	0.6000	0.6000
T9	16	Cat-5 (5/16")	140.00 - 149.00	0.6000	0.6000
T9	17	3/8" Coax	140.00 - 160.00	0.6000	0.6000
T9	18	LDF5-50A (7/8 FOAM)	140.00 - 156.00	0.6000	0.6000
T9	19	LDF5-50A (7/8 FOAM)	156.00 - 160.00	0.6000	0.6000
T9	22	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T9	23	1/4 Coax	140.00 - 160.00	0.6000	0.6000
T9	26	5/8" Cable (Lights)	140.00 - 150.00	0.6000	0.6000
T9	27	5/8" Cable (Lights)	150.00 - 160.00	0.6000	0.6000
T9	28	1.24" Hybrid	140.00 - 160.00	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T9	29	0.24" Fiber	140.00 - 160.00	0.6000	0.6000
T9	30	0.315" RET Cable	140.00 - 160.00	0.6000	0.6000
T9	32	3/8" Fiber Cable	140.00 - 160.00	0.6000	0.6000
T9	33	3/4" DC	140.00 - 160.00	0.6000	0.6000
T10	1	Step Pegs (5/8" SR) 7-in. w/30" step	120.00 - 140.00	0.6000	0.6000
T10	2	Step Pegs (5/8" SR) 7-in. w/30" step	120.00 - 140.00	0.6000	0.6000
T10	3	Step Pegs (5/8" SR) 7-in. w/30" step	120.00 - 140.00	0.6000	0.6000
T10	4	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T10	6	Rail L2x2x1/8	120.00 - 140.00	0.6000	0.6000
T10	7	Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step)	120.00 - 140.00	0.6000	0.6000
T10	8	Rail L1 3/4 x 3/4 x 1/8	120.00 - 140.00	0.6000	0.6000
T10	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	120.00 - 140.00	0.6000	0.6000
T10	12	Rail L1 3/4 x 3/4 x 1/8	120.00 - 140.00	0.6000	0.6000
T10	13	Rung C 1 3/4x1 3/4x1/8 (27" Width, 39" Step)	120.00 - 140.00	0.6000	0.6000
T10	15	1.5" Hybrid	120.00 - 140.00	0.6000	0.6000
T10	16	Cat-5 (5/16")	120.00 - 140.00	0.6000	0.6000
T10	17	3/8" Coax	120.00 - 140.00	0.6000	0.6000
T10	18	LDF5-50A (7/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T10	22	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T10	23	1/4 Coax	120.00 - 140.00	0.6000	0.6000
T10	26	5/8" Cable (Lights)	120.00 - 140.00	0.6000	0.6000
T10	28	1.24" Hybrid	120.00 - 140.00	0.6000	0.6000
T10	29	0.24" Fiber	120.00 - 140.00	0.6000	0.6000
T10	30	0.315" RET Cable	120.00 - 140.00	0.6000	0.6000
T10	32	3/8" Fiber Cable	120.00 - 140.00	0.6000	0.6000
T10	33	3/4" DC	120.00 - 140.00	0.6000	0.6000
T11	1	Step Pegs (5/8" SR) 7-in. w/30" step	100.00 - 120.00	0.6000	0.6000
T11	2	Step Pegs (5/8" SR) 7-in. w/30" step	100.00 - 120.00	0.6000	0.6000
T11	3	Step Pegs (5/8" SR) 7-in. w/30" step	100.00 - 120.00	0.6000	0.6000
T11	4	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T11	6	Rail L2x2x1/8	100.00 - 120.00	0.6000	0.6000

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	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T11	7	Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step)	100.00 - 120.00	0.6000	0.6000
T11	8	Rail L1 3/4 x 3/4 x 1/8	100.00 - 120.00	0.6000	0.6000
T11	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	100.00 - 120.00	0.6000	0.6000
T11	10	Rail L2x2x1/8	100.00 - 120.00	0.6000	0.6000
T11	11	Rung C 1 3/4x 3/4x 1/8 (38" width, 48" step)	100.00 - 120.00	0.6000	0.6000
T11	12	Rail L1 3/4 x 3/4 x 1/8	100.00 - 120.00	0.6000	0.6000
T11	13	Rung C 1 3/4x1 3/4x1/8 (27" Width, 39" Step)	100.00 - 120.00	0.6000	0.6000
T11	15	1.5" Hybrid	100.00 - 120.00	0.6000	0.6000
T11	16	Cat-5 (5/16")	100.00 - 120.00	0.6000	0.6000
T11	17	3/8" Coax	100.00 - 120.00	0.6000	0.6000
T11	18	LDF5-50A (7/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T11	22	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T11	23	1/4 Coax	100.00 - 120.00	0.6000	0.6000
T11	24	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T11	25	1 5/8 Hybrid DC/Fiber	100.00 - 120.00	0.6000	0.6000
T11	26	5/8" Cable (Lights)	100.00 - 120.00	0.6000	0.6000
T11	28	1.24" Hybrid	100.00 - 120.00	0.6000	0.6000
T11	29	0.24" Fiber	100.00 - 120.00	0.6000	0.6000
T11	30	0.315" RET Cable	100.00 - 120.00	0.6000	0.6000
T11	32	3/8" Fiber Cable	100.00 - 120.00	0.6000	0.6000
T11	33	3/4" DC	100.00 - 120.00	0.6000	0.6000
T12	1	Step Pegs (5/8" SR) 7-in. w/30" step	80.00 - 100.00	0.6000	0.6000
T12	2	Step Pegs (5/8" SR) 7-in. w/30" step	80.00 - 100.00	0.6000	0.6000
T12	3	Step Pegs (5/8" SR) 7-in. w/30" step	80.00 - 100.00	0.6000	0.6000
T12	4	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T12	6	Rail L2x2x1/8	80.00 - 100.00	0.6000	0.6000
T12	7	Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step)	80.00 - 100.00	0.6000	0.6000
T12	8	Rail L1 3/4 x 3/4 x 1/8	80.00 - 100.00	0.6000	0.6000
T12	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	80.00 - 100.00	0.6000	0.6000
T12	10	Rail L2x2x1/8	80.00 - 100.00	0.6000	0.6000
T12	11	Rung C 1 3/4x 3/4x 1/8 (38" width, 48" step)	80.00 - 100.00	0.6000	0.6000
T12	12	Rail L1 3/4 x 3/4 x 1/8	80.00 - 100.00	0.6000	0.6000
T12	13	Rung C 1 3/4x1 3/4x1/8 (27" Width, 39" Step)	80.00 - 100.00	0.6000	0.6000
T12	15	1.5" Hybrid	80.00 - 100.00	0.6000	0.6000

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T12	16	Cat-5 (5/16")	80.00 - 100.00	0.6000	0.6000
T12	17	3/8" Coax	80.00 - 100.00	0.6000	0.6000
T12	18	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T12	22	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T12	23	1/4 Coax	80.00 - 100.00	0.6000	0.6000
T12	24	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T12	25	1 5/8 Hybrid DC/Fiber	80.00 - 100.00	0.6000	0.6000
T12	26	5/8" Cable (Lights)	80.00 - 100.00	0.6000	0.6000
T12	28	1.24" Hybrid	80.00 - 100.00	0.6000	0.6000
T12	29	0.24" Fiber	80.00 - 100.00	0.6000	0.6000
T12	30	0.315" RET Cable	80.00 - 100.00	0.6000	0.6000
T12	32	3/8" Fiber Cable	80.00 - 100.00	0.6000	0.6000
T12	33	3/4" DC	80.00 - 100.00	0.6000	0.6000
T13	1	Step Pegs (5/8" SR) 7-in. w/30" step	60.00 - 80.00	0.6000	0.6000
T13	2	Step Pegs (5/8" SR) 7-in. w/30" step	60.00 - 80.00	0.6000	0.6000
T13	3	Step Pegs (5/8" SR) 7-in. w/30" step	60.00 - 80.00	0.6000	0.6000
T13	4	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T13	6	Rail L2x2x1/8	60.00 - 80.00	0.6000	0.6000
T13	7	Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step)	60.00 - 80.00	0.6000	0.6000
T13	8	Rail L1 3/4 x 3/4 x 1/8	60.00 - 80.00	0.6000	0.6000
T13	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	60.00 - 80.00	0.6000	0.6000
T13	10	Rail L2x2x1/8	60.00 - 80.00	0.6000	0.6000
T13	11	Rung C 1 3/4x 3/4x 1/8 (38" width, 48" step)	60.00 - 80.00	0.6000	0.6000
T13	12	Rail L1 3/4 x 3/4 x 1/8	60.00 - 80.00	0.6000	0.6000
T13	13	Rung C 1 3/4x1 3/4x1/8 (27" Width, 39" Step)	60.00 - 80.00	0.6000	0.6000
T13	15	1.5" Hybrid	60.00 - 80.00	0.6000	0.6000
T13	16	Cat-5 (5/16")	60.00 - 80.00	0.6000	0.6000
T13	17	3/8" Coax	60.00 - 80.00	0.6000	0.6000
T13	18	LDF5-50A (7/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T13	22	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T13	23	1/4 Coax	60.00 - 80.00	0.6000	0.6000
T13	24	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T13	25	1 5/8 Hybrid DC/Fiber	60.00 - 80.00	0.6000	0.6000
T13	26	5/8" Cable (Lights)	60.00 - 80.00	0.6000	0.6000
T13	28	1.24" Hybrid	60.00 - 80.00	0.6000	0.6000
T13	29	0.24" Fiber	60.00 - 80.00	0.6000	0.6000
T13	30	0.315" RET Cable	60.00 - 80.00	0.6000	0.6000
T13	32	3/8" Fiber Cable	60.00 - 80.00	0.6000	0.6000
T13	33	3/4" DC	60.00 - 80.00	0.6000	0.6000
T14	1	Step Pegs (5/8" SR) 7-in. w/30" step	40.00 - 60.00	0.6000	0.6000
T14	2	Step Pegs (5/8" SR) 7-in. w/30" step	40.00 - 60.00	0.6000	0.6000
T14	3	Step Pegs (5/8" SR) 7-in. w/30" step	40.00 - 60.00	0.6000	0.6000
T14	4	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T14	6	Rail L2x2x1/8	40.00 - 60.00	0.6000	0.6000
T14	7	Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step)	40.00 - 60.00	0.6000	0.6000
T14	8	Rail L1 3/4 x 3/4 x 1/8	40.00 - 60.00	0.6000	0.6000
T14	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	40.00 - 60.00	0.6000	0.6000
T14	10	Rail L2x2x1/8	40.00 - 60.00	0.6000	0.6000
T14	11	Rung C 1 3/4x 3/4x 1/8 (38" width, 48" step)	40.00 - 60.00	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T14	12	Rail L1 3/4 x 3/4 x 1/8	40.00 - 60.00	0.6000	0.6000
T14	13	Rung C 1 3/4x1 3/4x1/8 (27" Width, 39" Step)	40.00 - 60.00	0.6000	0.6000
T14	15	1.5" Hybrid	40.00 - 60.00	0.6000	0.6000
T14	16	Cat-5 (5/16")	40.00 - 60.00	0.6000	0.6000
T14	17	3/8" Coax	40.00 - 60.00	0.6000	0.6000
T14	18	LDF5-50A (7/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T14	22	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T14	23	1/4 Coax	40.00 - 60.00	0.6000	0.6000
T14	24	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T14	25	1 5/8 Hybrid DC/Fiber	40.00 - 60.00	0.6000	0.6000
T14	26	5/8" Cable (Lights)	40.00 - 60.00	0.6000	0.6000
T14	28	1.24" Hybrid	40.00 - 60.00	0.6000	0.6000
T14	29	0.24" Fiber	40.00 - 60.00	0.6000	0.6000
T14	30	0.315" RET Cable	40.00 - 60.00	0.6000	0.6000
T14	32	3/8" Fiber Cable	40.00 - 60.00	0.6000	0.6000
T14	33	3/4" DC	40.00 - 60.00	0.6000	0.6000
T15	1	Step Pegs (5/8" SR) 7-in. w/30" step	20.00 - 40.00	0.6000	0.6000
T15	2	Step Pegs (5/8" SR) 7-in. w/30" step	20.00 - 40.00	0.6000	0.6000
T15	3	Step Pegs (5/8" SR) 7-in. w/30" step	20.00 - 40.00	0.6000	0.6000
T15	4	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T15	6	Rail L2x2x1/8	20.00 - 40.00	0.6000	0.6000
T15	7	Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step)	20.00 - 40.00	0.6000	0.6000
T15	8	Rail L1 3/4 x 3/4 x 1/8	20.00 - 40.00	0.6000	0.6000
T15	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	20.00 - 40.00	0.6000	0.6000
T15	10	Rail L2x2x1/8	20.00 - 40.00	0.6000	0.6000
T15	11	Rung C 1 3/4x 3/4x 1/8 (38" width, 48" step)	20.00 - 40.00	0.6000	0.6000
T15	12	Rail L1 3/4 x 3/4 x 1/8	20.00 - 40.00	0.6000	0.6000
T15	13	Rung C 1 3/4x1 3/4x1/8 (27" Width, 39" Step)	20.00 - 40.00	0.6000	0.6000
T15	15	1.5" Hybrid	20.00 - 40.00	0.6000	0.6000
T15	16	Cat-5 (5/16")	20.00 - 40.00	0.6000	0.6000
T15	17	3/8" Coax	20.00 - 40.00	0.6000	0.6000
T15	18	LDF5-50A (7/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T15	22	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T15	23	1/4 Coax	20.00 - 40.00	0.6000	0.6000
T15	24	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T15	25	1 5/8 Hybrid DC/Fiber	20.00 - 40.00	0.6000	0.6000
T15	26	5/8" Cable (Lights)	20.00 - 40.00	0.6000	0.6000
T15	28	1.24" Hybrid	20.00 - 40.00	0.6000	0.6000
T15	29	0.24" Fiber	20.00 - 40.00	0.6000	0.6000
T15	30	0.315" RET Cable	20.00 - 40.00	0.6000	0.6000
T15	32	3/8" Fiber Cable	20.00 - 40.00	0.6000	0.6000
T15	33	3/4" DC	20.00 - 40.00	0.6000	0.6000
T16	1	Step Pegs (5/8" SR) 7-in. w/30" step	13.33 - 20.00	0.6000	0.6000
T16	2	Step Pegs (5/8" SR) 7-in. w/30" step	13.33 - 20.00	0.6000	0.6000
T16	3	Step Pegs (5/8" SR) 7-in. w/30" step	13.33 - 20.00	0.6000	0.6000
T16	4	Safety Line 3/8	13.33 - 20.00	0.6000	0.6000
T16	6	Rail L2x2x1/8	13.33 - 20.00	0.6000	0.6000
T16	7	Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step)	13.33 - 20.00	0.6000	0.6000
T16	8	Rail L1 3/4 x 3/4 x 1/8	13.33 - 20.00	0.6000	0.6000
T16	9	Rung L1 3/4x 1 3/4x 1/8	13.33 - 20.00	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T16	10	(33.75" width, 48" step)	13.33 - 20.00	0.6000	0.6000
T16	11	Rail L2x2x1/8	13.33 - 20.00	0.6000	0.6000
T16	12	Rung C 1 3/4x 3/4x 1/8 (38" width, 48" step)	13.33 - 20.00	0.6000	0.6000
T16	13	Rail L1 3/4 x 3/4 x 1/8	13.33 - 20.00	0.6000	0.6000
T16	15	1.5" Hybrid	13.33 - 20.00	0.6000	0.6000
T16	16	Cat-5 (5/16")	13.33 - 20.00	0.6000	0.6000
T16	17	3/8" Coax	13.33 - 20.00	0.6000	0.6000
T16	18	LDF5-50A (7/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T16	22	LDF7-50A (1-5/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T16	23	1/4 Coax	13.33 - 20.00	0.6000	0.6000
T16	24	LDF7-50A (1-5/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T16	25	1 5/8 Hybrid DC/Fiber	13.33 - 20.00	0.6000	0.6000
T16	26	5/8" Cable (Lights)	13.33 - 20.00	0.6000	0.6000
T16	28	1.24" Hybrid	13.33 - 20.00	0.6000	0.6000
T16	29	0.24" Fiber	13.33 - 20.00	0.6000	0.6000
T16	30	0.315" RET Cable	13.33 - 20.00	0.6000	0.6000
T16	32	3/8" Fiber Cable	13.33 - 20.00	0.6000	0.6000
T16	33	3/4" DC	13.33 - 20.00	0.6000	0.6000
T17	1	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 13.33	0.6000	0.6000
T17	2	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 13.33	0.6000	0.6000
T17	3	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 13.33	0.6000	0.6000
T17	4	Safety Line 3/8	0.00 - 13.33	0.6000	0.6000
T17	6	Rail L2x2x1/8	0.00 - 13.33	0.6000	0.6000
T17	7	Rung C 1 3/4" x 3/4" x 1/8" (29" Width, 40" Step)	0.00 - 13.33	0.6000	0.6000
T17	8	Rail L1 3/4 x 3/4 x 1/8	0.00 - 13.33	0.6000	0.6000
T17	9	Rung L1 3/4x 1 3/4x 1/8 (33.75" width, 48" step)	0.00 - 13.33	0.6000	0.6000
T17	10	Rail L2x2x1/8	5.00 - 13.33	0.6000	0.6000
T17	11	Rung C 1 3/4x 3/4x 1/8 (38" width, 48" step)	5.00 - 13.33	0.6000	0.6000
T17	12	Rail L1 3/4 x 3/4 x 1/8	3.00 - 13.33	0.6000	0.6000
T17	13	Rung C 1 3/4x1 3/4x1/8 (27" Width, 39" Step)	3.00 - 13.33	0.6000	0.6000
T17	15	1.5" Hybrid	5.00 - 13.33	0.6000	0.6000
T17	16	Cat-5 (5/16")	8.00 - 13.33	0.6000	0.6000
T17	17	3/8" Coax	8.00 - 13.33	0.6000	0.6000
T17	18	LDF5-50A (7/8 FOAM)	8.00 - 13.33	0.6000	0.6000
T17	22	LDF7-50A (1-5/8 FOAM)	8.00 - 13.33	0.6000	0.6000
T17	23	1/4 Coax	8.00 - 13.33	0.6000	0.6000
T17	24	LDF7-50A (1-5/8 FOAM)	8.00 - 13.33	0.6000	0.6000
T17	25	1 5/8 Hybrid DC/Fiber	8.00 - 13.33	0.6000	0.6000
T17	26	5/8" Cable (Lights)	0.00 - 13.33	0.6000	0.6000
T17	28	1.24" Hybrid	3.00 - 13.33	0.6000	0.6000
T17	29	0.24" Fiber	3.00 - 13.33	0.6000	0.6000
T17	30	0.315" RET Cable	3.00 - 13.33	0.6000	0.6000
T17	32	3/8" Fiber Cable	8.00 - 13.33	0.6000	0.6000
T17	33	3/4" DC	8.00 - 13.33	0.6000	0.6000

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	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
12" x 24" Beacon	A	From Leg	0.000 0.000 1.000	0.000	300.000	No Ice 1.000 1/2" Ice 1.580 1" Ice 1.769	1.000 1.580 1.769	30.000 49.573 71.742
2.9" x 15-ft Pipe	A	From Leg	0.000 0.000 -7.500	0.000	300.000	No Ice 4.025 1/2" Ice 5.461 1" Ice 6.921	4.025 5.461 6.921	81.070 124.390 172.935
1/2" x 4' LRod	C	From Leg	0.000 0.000 2.000	0.000	300.000	No Ice 0.200 1/2" Ice 0.613 1" Ice 0.945	0.200 0.613 0.945	2.673 5.173 10.321
3" x 6" SideLight	A	From Leg	0.500 0.000 0.000	0.000	150.000	No Ice 0.084 1/2" Ice 0.136 1" Ice 0.194	0.084 0.136 0.194	0.984 2.460 4.700
3" x 6" SideLight	B	From Leg	0.500 0.000 0.000	0.000	150.000	No Ice 0.084 1/2" Ice 0.136 1" Ice 0.194	0.084 0.136 0.194	0.984 2.460 4.700
3" x 6" SideLight	C	From Leg	0.500 0.000 0.000	0.000	150.000	No Ice 0.084 1/2" Ice 0.136 1" Ice 0.194	0.084 0.136 0.194	0.984 2.460 4.700
**** 6' Sidearm (FBI)	B	From Leg	3.000 0.000 0.000	0.000	285.000	No Ice 0.706 1/2" Ice 1.220 1" Ice 1.734	3.155 5.304 7.453	45.732 72.702 99.672
8-ft 4 Element Dipole (FBI)	B	From Leg	6.000 0.000 4.000	0.000	285.000	No Ice 1.520 1/2" Ice 2.344 1" Ice 3.185	1.520 2.344 3.185	15.000 26.943 44.118
**** 6' Sidearm (FBI)	C	From Leg	3.000 0.000 0.000	-30.000	277.000	No Ice 2.248 1/2" Ice 3.271 1" Ice 4.294	6.023 8.937 11.851	97.422 148.704 199.986
22-ft x 2.5" Omni (FBI)	C	From Leg	6.000 0.000 12.000	-30.000	277.000	No Ice 5.500 1/2" Ice 7.729 1" Ice 9.975	5.500 7.729 9.975	23.000 63.629 118.104
**** Laird OEM-2326-110	B	From Leg	1.000 0.000 0.000	10.000	268.000	No Ice 0.087 1/2" Ice 0.136 1" Ice 0.194	0.087 0.136 0.194	3.000 4.500 6.000
Laird OEM-2326-110	B	From Leg	1.000 0.000 -4.000	10.000	268.000	No Ice 0.087 1/2" Ice 0.136 1" Ice 0.194	0.087 0.136 0.194	3.000 4.500 6.000
Laird OEM-2326-110	B	From Leg	1.000 0.000 4.000	10.000	268.000	No Ice 0.087 1/2" Ice 0.136 1" Ice 0.194	0.087 0.136 0.194	3.000 4.500 6.000
**** 6' Sidearm (FBI)	B	From Leg	3.000 0.000 0.000	-40.000	258.000	No Ice 0.706 1/2" Ice 1.220 1" Ice 1.734	3.155 5.304 7.453	45.732 72.702 99.672
8-ft x 2.5" Omni (FBI)	B	From Leg	6.000 0.000 5.000	-40.000	258.000	No Ice 2.000 1/2" Ice 2.829 1" Ice 3.456	2.000 2.829 3.456	15.000 29.973 50.239
3/4" Dia x 10' Pipe Stabilizer Arm	B	From Leg	3.000 0.000 10.000	-40.000	258.000	No Ice 0.000 1/2" Ice 0.000 1" Ice 0.000	0.000 0.000 0.000	0.000 0.000 0.000
**** 1.9" x 6' Pipe	A	From Leg	0.167	0.000	203.333	No Ice 1.140	1.140	16.300

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	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
(FBI)			0.000 0.000 0.167			1/2" Ice 1.764 1" Ice 2.137 No Ice 0.600	1.764 2.137 0.600	25.311 38.332 10.000
3' Single Element Dipole (FBI)	A	From Leg	0.000 0.667	0.000	203.333	1/2" Ice 1.217 1" Ice 1.839	1.217 1.839	15.600 25.119
**** Sabre 12' HD V-Boom Mounts (3) (C10857001C) (AT&T)	C	None		0.000	195.000	No Ice 15.850 1/2" Ice 23.230 1" Ice 30.610	15.850 23.230 30.610	1335.000 1602.000 1869.000
(2) RV4PX310R-V2 w/ Mount Pipe (AT&T)	A	From Leg	3.000 0.000 0.000	0.000	195.000	No Ice 13.685 1/2" Ice 14.429 1" Ice 15.158	11.135 12.711 14.312	115.575 218.809 332.471
(2) RV4PX310R-V2 w/ Mount Pipe (AT&T)	B	From Leg	3.000 0.000 0.000	0.000	195.000	No Ice 13.685 1/2" Ice 14.429 1" Ice 15.158	11.135 12.711 14.312	115.575 218.809 332.471
(2) RV4PX310R-V2 w/ Mount Pipe (AT&T)	C	From Leg	3.000 0.000 0.000	0.000	195.000	No Ice 13.685 1/2" Ice 14.429 1" Ice 15.158	11.135 12.711 14.312	115.575 218.809 332.471
AHLBA (AT&T)	A	From Leg	3.000 0.000 0.000	0.000	195.000	No Ice 3.671 1/2" Ice 3.920 1" Ice 4.175	2.305 2.513 2.727	101.400 130.933 164.129
AHLBA (AT&T)	B	From Leg	3.000 0.000 0.000	0.000	195.000	No Ice 3.671 1/2" Ice 3.920 1" Ice 4.175	2.305 2.513 2.727	101.400 130.933 164.129
AHLBA (AT&T)	C	From Leg	3.000 0.000 0.000	0.000	195.000	No Ice 3.671 1/2" Ice 3.920 1" Ice 4.175	2.305 2.513 2.727	101.400 130.933 164.129
AHFIB (AT&T)	A	From Leg	3.000 0.000 0.000	0.000	195.000	No Ice 3.676 1/2" Ice 3.925 1" Ice 4.181	2.309 2.516 2.731	88.190 117.757 150.988
AHFIB (AT&T)	B	From Leg	3.000 0.000 0.000	0.000	195.000	No Ice 3.676 1/2" Ice 3.925 1" Ice 4.181	2.309 2.516 2.731	88.190 117.757 150.988
AHFIB (AT&T)	C	From Leg	3.000 0.000 0.000	0.000	195.000	No Ice 3.676 1/2" Ice 3.925 1" Ice 4.181	2.309 2.516 2.731	88.190 117.757 150.988
DC6-48-60-18-8F (AT&T)	A	From Leg	3.000 0.000 0.000	0.000	195.000	No Ice 1.212 1/2" Ice 1.892 1" Ice 2.105	1.212 1.892 2.105	32.800 54.759 79.582
**** Side Arm Mount [SO 307-1] (FBI)	B	From Leg	2.500 0.000 0.000	-10.000	178.000	No Ice 0.980 1/2" Ice 1.700 1" Ice 2.420	2.600 4.500 6.400	48.000 70.360 92.719
ANT450D6-9 (FBI)	B	From Leg	5.000 0.000 4.000	-10.000	178.000	No Ice 1.400 1/2" Ice 2.500 1" Ice 3.600	1.400 2.500 3.600	18.000 23.400 28.800
**** (3) Sitepro VFA12-U (T-Mobile)	A	None		0.000	173.000	No Ice 11.270 1/2" Ice 16.900 1" Ice 22.530	11.270 16.900 22.530	854.550 1321.640 1788.730
(2) CMA-BDHH/6521/E0-6 w/ mount pipe (T-Mobile)	A	From Leg	3.000 0.000 1.000	10.000	173.000	No Ice 11.781 1/2" Ice 12.307 1" Ice 12.840	6.233 7.227 8.097	96.900 173.632 258.847
(2) CMA-BDHH/6521/E0-6 w/ mount pipe (T-Mobile)	B	From Leg	3.000 0.000 1.000	-10.000	173.000	No Ice 11.781 1/2" Ice 12.307 1" Ice 12.840	6.233 7.227 8.097	96.900 173.632 258.847
(2) CMA-BDHH/6521/E0-6	C	From Leg	3.000	0.000	173.000	No Ice 11.781	6.233	96.900

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	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
w/ mount pipe (T-Mobile)			0.000		1/2" Ice	12.307	7.227	173.632
SBNHH-1D65C w/ Mount Pipe (T-Mobile)	A	From Leg	1.000 3.000 2.000 1.000	10.000	1" Ice No Ice 1/2" Ice 1" Ice	12.840 11.699 12.417 13.143	8.097 9.854 11.376 12.922	258.847 82.450 172.152 271.824
SBNHH-1D65C w/ Mount Pipe (T-Mobile)	B	From Leg	3.000 2.000 1.000	-10.000	No Ice 1/2" Ice 1" Ice	11.699 12.417 13.143	9.854 11.376 12.922	82.450 172.152 271.824
SBNHH-1D65C w/ Mount Pipe (T-Mobile)	C	From Leg	3.000 2.000 1.000	0.000	No Ice 1/2" Ice 1" Ice	11.699 12.417 13.143	9.854 11.376 12.922	82.450 172.152 271.824
FRIG (T-Mobile)	A	From Leg	3.000 -6.000 1.000	0.000	No Ice 1/2" Ice 1" Ice	2.394 2.587 2.788	0.968 1.105 1.248	57.320 74.593 94.659
FRIG (T-Mobile)	B	From Leg	3.000 -6.000 1.000	0.000	No Ice 1/2" Ice 1" Ice	2.394 2.587 2.788	0.968 1.105 1.248	57.320 74.593 94.659
FRIG (T-Mobile)	C	From Leg	3.000 -6.000 1.000	0.000	No Ice 1/2" Ice 1" Ice	2.394 2.587 2.788	0.968 1.105 1.248	57.320 74.593 94.659
FRLB (T-Mobile)	A	From Leg	3.000 2.000 1.000	0.000	No Ice 1/2" Ice 1" Ice	2.067 2.246 2.432	0.779 0.898 1.030	59.520 74.826 92.751
FRLB (T-Mobile)	B	From Leg	3.000 2.000 1.000	0.000	No Ice 1/2" Ice 1" Ice	2.067 2.246 2.432	0.779 0.898 1.030	59.520 74.826 92.751
FRLB (T-Mobile)	C	From Leg	3.000 2.000 1.000	0.000	No Ice 1/2" Ice 1" Ice	2.067 2.246 2.432	0.779 0.898 1.030	59.520 74.826 92.751
FSMF (T-Mobile)	A	From Leg	3.000 6.000 1.000	0.000	No Ice 1/2" Ice 1" Ice	3.538 3.771 4.012	1.023 1.173 1.330	55.120 77.448 102.987
FSMF (T-Mobile)	B	From Leg	3.000 6.000 1.000	0.000	No Ice 1/2" Ice 1" Ice	3.538 3.771 4.012	1.023 1.173 1.330	55.120 77.448 102.987
FSMF (T-Mobile)	C	From Leg	3.000 6.000 1.000	0.000	No Ice 1/2" Ice 1" Ice	3.538 3.771 4.012	1.023 1.173 1.330	55.120 77.448 102.987
FRIE (T-Mobile)	B	From Face	1.000 0.500 0.000	0.000	No Ice 1/2" Ice 1" Ice	3.538 3.771 4.012	1.014 1.164 1.321	55.100 77.359 102.827
RNSNDC-7771-PF-48 (T-Mobile)	A	From Leg	0.500 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	3.203 3.425 3.654	1.027 1.171 1.322	19.000 40.363 64.842
RNSNDC-7771-PF-48 (T-Mobile)	B	From Leg	0.500 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	3.203 3.425 3.654	1.027 1.171 1.322	19.000 40.363 64.842
RNSNDC-7771-PF-48 (T-Mobile)	C	From Leg	0.500 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	3.203 3.425 3.654	1.027 1.171 1.322	19.000 40.363 64.842

(3) Sitepro VFA12-U (Sprint)	A	None		0.000	No Ice 1/2" Ice 1" Ice	11.270 16.900 22.530	11.270 16.900 22.530	854.550 1321.640 1788.730
ET-X-TS-70-16-62-18-iR-RD (Sprint)	A	From Leg	3.000 6.000 2.000	-10.000	No Ice 1/2" Ice 1" Ice	8.266 8.731 9.204	4.788 5.245 5.710	41.900 89.486 143.198

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	Project	TEP #66353.230474	Date	15:26:02 02/26/19
	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
ET-X-TS-70-16-62-18-iR-RD (Sprint)	B	From Leg	3.000 6.000 2.000	-10.000	No Ice 1/2" Ice 1" Ice	8.266 8.731 9.204	4.788 5.245 5.710	41.900 89.486 143.198
SBCHH-1D90B (Sprint)	C	From Leg	3.000 6.000 2.000	-10.000	No Ice 1/2" Ice 1" Ice	8.173 8.633 9.100	5.405 5.863 6.327	50.300 100.807 157.451
2.4" Dia x 12-ft Pipe (Sprint)	A	From Leg	3.000 6.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	2.856 4.084 5.329	2.856 4.084 5.329	40.260 61.662 90.790
2.4" Dia x 12-ft Pipe (Sprint)	B	From Leg	3.000 6.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	2.856 4.084 5.329	2.856 4.084 5.329	40.260 61.662 90.790
2.4" Dia x 12-ft Pipe (Sprint)	C	From Leg	3.000 6.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	2.856 4.084 5.329	2.856 4.084 5.329	40.260 61.662 90.790
(3) 2.4" Dia x 7-ft Mount Pipe (Sprint)	A	From Leg	3.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	1.680 2.408 2.835	1.680 2.408 2.835	25.620 38.315 55.683
(3) 2.4" Dia x 7-ft Mount Pipe (Sprint)	B	From Leg	3.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	1.680 2.408 2.835	1.680 2.408 2.835	25.620 38.315 55.683
(3) 2.4" Dia x 7-ft Mount Pipe (Sprint)	C	From Leg	3.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	1.680 2.408 2.835	1.680 2.408 2.835	25.620 38.315 55.683
SMM-SCR0480800 (Sprint)	A	From Leg	3.000 6.000 6.000	0.000	No Ice 1/2" Ice 1" Ice	2.663 2.868 3.081	1.430 1.590 1.763	59.520 80.788 105.123
SMM-SCR0480800 (Sprint)	B	From Leg	3.000 6.000 6.000	0.000	No Ice 1/2" Ice 1" Ice	2.663 2.868 3.081	1.430 1.590 1.763	59.520 80.788 105.123
SMM-SCR0480800 (Sprint)	C	From Leg	3.000 6.000 6.000	0.000	No Ice 1/2" Ice 1" Ice	2.663 2.868 3.081	1.430 1.590 1.763	59.520 80.788 105.123
SMM-BMR004 RRH (Sprint)	A	From Leg	3.000 6.000 -2.000	0.000	No Ice 1/2" Ice 1" Ice	2.836 3.054 3.279	1.873 2.057 2.248	50.000 73.830 100.932
SMM-BMR004 RRH (Sprint)	B	From Leg	3.000 6.000 -2.000	0.000	No Ice 1/2" Ice 1" Ice	2.836 3.054 3.279	1.873 2.057 2.248	50.000 73.830 100.932
SMM-BMR004 RRH (Sprint)	C	From Leg	3.000 6.000 -2.000	0.000	No Ice 1/2" Ice 1" Ice	2.836 3.054 3.279	1.873 2.057 2.248	50.000 73.830 100.932

Side Arm Mount [SO 307-1] (FBI)	B	From Leg	2.500 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	0.980 1.700 2.420	2.600 4.500 6.400	48.000 70.360 92.719
6-ft 4-Element Dipole (FBI)	B	From Leg	5.000 0.000 3.000	0.000	No Ice 1/2" Ice 1" Ice	1.000 1.393 1.703	1.000 1.393 1.703	10.000 17.865 29.140

ExploreAir RC11100-105-110 (FBI)	B	From Leg	0.500 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	0.736 0.844 0.960	0.411 0.496 0.589	8.200 15.074 23.701
3.5" Dia. x 5-ft (FBI)	B	From Leg	0.500 0.000 0.000	-60.000	No Ice 1/2" Ice 1" Ice	1.229 1.803 2.119	1.229 1.803 2.119	37.900 50.633 66.929
ExploreAir	C	From Leg	0.500	20.000	No Ice	0.736	0.411	8.200

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	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{MA} Front ft ²	C _{SA} Side ft ²	Weight lb
RC11100-105-110 (FBI) ****			0.000 2.000		1/2" Ice 1" Ice	0.844 0.960	0.496 0.589	15.074 23.701
Sector Mount [SM 1304-3] (Verizon)	A	None		0.000	No Ice 1/2" Ice 1" Ice	51.000 69.200 87.400	51.000 2649.000 3740.000	1558.000
(2) SBNHH-1D65B (Verizon)	A	From Leg	3.000 0.000 0.000	-10.000	No Ice 1/2" Ice 1" Ice	8.052 8.507 8.970	5.342 5.795 6.255	50.710 100.633 156.646
(2) SBNHH-1D65B (Verizon)	B	From Leg	3.000 0.000 0.000	-10.000	No Ice 1/2" Ice 1" Ice	8.052 8.507 8.970	5.342 5.795 6.255	50.710 100.633 156.646
(2) SBNHH-1D65B (Verizon)	C	From Leg	3.000 0.000 0.000	-10.000	No Ice 1/2" Ice 1" Ice	8.052 8.507 8.970	5.342 5.795 6.255	50.710 100.633 156.646
(2) X7CAP-665-VR0 (Verizon)	A	From Leg	3.000 0.000 0.000	-10.000	No Ice 1/2" Ice 1" Ice	8.406 8.865 9.331	5.342 5.795 6.255	37.000 88.610 146.352
(2) X7CAP-665-VR0 (Verizon)	B	From Leg	3.000 0.000 0.000	-10.000	No Ice 1/2" Ice 1" Ice	8.406 8.865 9.331	5.342 5.795 6.255	37.000 88.610 146.352
(2) X7CAP-665-VR0 (Verizon)	C	From Leg	3.000 0.000 0.000	-10.000	No Ice 1/2" Ice 1" Ice	8.406 8.865 9.331	5.342 5.795 6.255	37.000 88.610 146.352
AIRSCALE DUAL RRH 4T4R B2/66A 320W (Verizon)	A	From Leg	3.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	2.229 2.422 2.623	1.339 1.499 1.665	79.370 97.307 118.116
AIRSCALE DUAL RRH 4T4R B2/66A 320W (Verizon)	B	From Leg	3.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	2.229 2.422 2.623	1.339 1.499 1.665	79.370 97.307 118.116
AIRSCALE DUAL RRH 4T4R B2/66A 320W (Verizon)	C	From Leg	3.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	2.229 2.422 2.623	1.339 1.499 1.665	79.370 97.307 118.116
AIRSCALE DUAL RRH 4T4R B5/13 160 W (Verizon)	A	From Leg	3.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	2.229 2.422 2.623	1.259 1.416 1.580	66.140 83.530 103.760
AIRSCALE DUAL RRH 4T4R B5/13 160 W (Verizon)	B	From Leg	3.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	2.229 2.422 2.623	1.259 1.416 1.580	66.140 83.530 103.760
AIRSCALE DUAL RRH 4T4R B5/13 160 W (Verizon)	C	From Leg	3.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	2.229 2.422 2.623	1.259 1.416 1.580	66.140 83.530 103.760
RC3DC-3315-PF-48 (Verizon)	B	From Leg	1.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	3.792 4.044 4.303	2.512 2.725 2.945	32.000 63.468 98.694
RC3DC-3315-PF-48 (Verizon)	C	From Leg	1.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	3.792 4.044 4.303	2.512 2.725 2.945	32.000 63.468 98.694
RC3DC-3315-PF-48 (Verizon)	A	From Leg	1.000 0.000 0.000	0.000	No Ice 1/2" Ice 1" Ice	3.792 4.044 4.303	2.512 2.725 2.945	32.000 63.468 98.694

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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb
Radiowaves 2' Dish (FBI)	C	Paraboloid w/Radome	From Leg	0.500 0.000 0.000	0.000		149.000	2.108	No Ice 1/2" Ice 1" Ice	3.490 3.770 4.050
Radiowaves 2' Dish (FBI)	B	Paraboloid w/Radome	From Leg	0.500 0.000 2.000	0.000		147.000	2.108	No Ice 1/2" Ice 1" Ice	3.490 3.770 4.050

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	1.2D+1.0W (pattern 1) 0 deg - No Ice
4	1.2D+1.0W (pattern 2) 0 deg - No Ice
5	0.9 Dead+1.0 Wind 0 deg - No Ice
6	1.2 Dead+1.0 Wind 30 deg - No Ice
7	1.2D+1.0W (pattern 1) 30 deg - No Ice
8	1.2D+1.0W (pattern 2) 30 deg - No Ice
9	0.9 Dead+1.0 Wind 30 deg - No Ice
10	1.2 Dead+1.0 Wind 60 deg - No Ice
11	1.2D+1.0W (pattern 1) 60 deg - No Ice
12	1.2D+1.0W (pattern 2) 60 deg - No Ice
13	0.9 Dead+1.0 Wind 60 deg - No Ice
14	1.2 Dead+1.0 Wind 90 deg - No Ice
15	1.2D+1.0W (pattern 1) 90 deg - No Ice
16	1.2D+1.0W (pattern 2) 90 deg - No Ice
17	0.9 Dead+1.0 Wind 90 deg - No Ice
18	1.2 Dead+1.0 Wind 120 deg - No Ice
19	1.2D+1.0W (pattern 1) 120 deg - No Ice
20	1.2D+1.0W (pattern 2) 120 deg - No Ice
21	0.9 Dead+1.0 Wind 120 deg - No Ice
22	1.2 Dead+1.0 Wind 150 deg - No Ice
23	1.2D+1.0W (pattern 1) 150 deg - No Ice
24	1.2D+1.0W (pattern 2) 150 deg - No Ice
25	0.9 Dead+1.0 Wind 150 deg - No Ice
26	1.2 Dead+1.0 Wind 180 deg - No Ice
27	1.2D+1.0W (pattern 1) 180 deg - No Ice
28	1.2D+1.0W (pattern 2) 180 deg - No Ice
29	0.9 Dead+1.0 Wind 180 deg - No Ice
30	1.2 Dead+1.0 Wind 210 deg - No Ice
31	1.2D+1.0W (pattern 1) 210 deg - No Ice
32	1.2D+1.0W (pattern 2) 210 deg - No Ice
33	0.9 Dead+1.0 Wind 210 deg - No Ice
34	1.2 Dead+1.0 Wind 240 deg - No Ice
35	1.2D+1.0W (pattern 1) 240 deg - No Ice
36	1.2D+1.0W (pattern 2) 240 deg - No Ice
37	0.9 Dead+1.0 Wind 240 deg - No Ice
38	1.2 Dead+1.0 Wind 270 deg - No Ice
39	1.2D+1.0W (pattern 1) 270 deg - No Ice
40	1.2D+1.0W (pattern 2) 270 deg - No Ice

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Comb. No.	Description
41	0.9 Dead+1.0 Wind 270 deg - No Ice
42	1.2 Dead+1.0 Wind 300 deg - No Ice
43	1.2D+1.0W (pattern 1) 300 deg - No Ice
44	1.2D+1.0W (pattern 2) 300 deg - No Ice
45	0.9 Dead+1.0 Wind 300 deg - No Ice
46	1.2 Dead+1.0 Wind 330 deg - No Ice
47	1.2D+1.0W (pattern 1) 330 deg - No Ice
48	1.2D+1.0W (pattern 2) 330 deg - No Ice
49	0.9 Dead+1.0 Wind 330 deg - No Ice
50	1.2 Dead+1.0 Ice+1.0 Temp
51	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
52	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
53	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
54	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
55	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
56	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
57	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
58	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
59	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
60	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
61	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
62	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
63	Dead+Wind 0 deg - Service
64	Dead+Wind 30 deg - Service
65	Dead+Wind 60 deg - Service
66	Dead+Wind 90 deg - Service
67	Dead+Wind 120 deg - Service
68	Dead+Wind 150 deg - Service
69	Dead+Wind 180 deg - Service
70	Dead+Wind 210 deg - Service
71	Dead+Wind 240 deg - Service
72	Dead+Wind 270 deg - Service
73	Dead+Wind 300 deg - Service
74	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	11.610	71	0.447	0.080
T2	280 - 266	9.743	71	0.442	0.080
T3	266 - 260	8.470	71	0.417	0.074
T4	260 - 240	7.957	71	0.398	0.070
T5	240 - 220	6.378	71	0.341	0.051
T6	220 - 200	5.105	71	0.264	0.034
T7	200 - 180	4.090	71	0.213	0.022
T8	180 - 160	3.254	63	0.179	0.017
T9	160 - 140	2.531	63	0.153	0.012
T10	140 - 120	1.914	63	0.126	0.008
T11	120 - 100	1.412	63	0.104	0.006
T12	100 - 80	0.995	63	0.081	0.005
T13	80 - 60	0.658	63	0.065	0.005
T14	60 - 40	0.389	63	0.049	0.004
T15	40 - 20	0.187	63	0.031	0.003
T16	20 - 13.3333	0.054	63	0.016	0.001
T17	13.3333 - 0	0.024	63	0.010	0.001

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Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
300.000	12" x 24" Beacon	71	11.610	0.447	0.080	644696
285.000	6' Sidearm	71	10.209	0.445	0.080	214902
277.000	6' Sidearm	71	9.465	0.439	0.079	57447
268.000	Laird OEM-2326-110	71	8.646	0.423	0.075	19455
258.000	6' Sidearm	71	7.789	0.392	0.069	29347
203.333	1.9" x 6' Pipe	71	4.245	0.220	0.024	25003
195.000	Sabre 12' HD V-Boom Mounts (3) (C10857001C)	71	3.867	0.203	0.021	30015
178.000	Side Arm Mount [SO 307-1]	63	3.177	0.176	0.017	46650
173.000	(3) Sitepro VFA12-U	63	2.989	0.170	0.016	47172
163.000	(3) Sitepro VFA12-U	63	2.633	0.157	0.013	47566
153.000	Side Arm Mount [SO 307-1]	63	2.302	0.144	0.011	43212
150.000	3" x 6" SideLight	63	2.208	0.139	0.010	41525
149.000	Radiowaves 2' Dish	63	2.177	0.138	0.010	40992
147.000	3.5" Dia. x 5-ft	63	2.117	0.135	0.009	39965
120.000	Sector Mount [SM 1304-3]	63	1.412	0.104	0.006	60682

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	300 - 280	46.490	2	1.782	0.332
T2	280 - 266	39.037	2	1.761	0.329
T3	266 - 260	33.958	2	1.661	0.304
T4	260 - 240	31.906	2	1.585	0.288
T5	240 - 220	25.587	2	1.358	0.210
T6	220 - 200	20.486	2	1.057	0.140
T7	200 - 180	16.419	2	0.853	0.091
T8	180 - 160	13.064	2	0.716	0.070
T9	160 - 140	10.163	2	0.614	0.050
T10	140 - 120	7.683	2	0.503	0.034
T11	120 - 100	5.668	2	0.417	0.026
T12	100 - 80	3.996	2	0.325	0.022
T13	80 - 60	2.639	2	0.262	0.020
T14	60 - 40	1.561	2	0.195	0.016
T15	40 - 20	0.751	2	0.126	0.011
T16	20 - 13.3333	0.214	2	0.063	0.006
T17	13.3333 - 0	0.095	5	0.042	0.004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
300.000	12" x 24" Beacon	2	46.490	1.782	0.332	168259
285.000	6' Sidearm	2	40.894	1.774	0.333	56086

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft						
277.000	6' Sidearm	2	37.927	1.748	0.326	14339
268.000	Laird OEM-2326-110	2	34.661	1.683	0.309	4960
258.000	6' Sidearm	2	31.235	1.561	0.282	7393
203.333	1.9" x 6' Pipe	2	17.039	0.880	0.097	6284
195.000	Sabre 12' HD V-Boom Mounts (3) (C10857001C)	2	15.526	0.814	0.084	7542
178.000	Side Arm Mount [SO 307-1]	2	12.756	0.705	0.068	11736
173.000	(3) Sitepro VFA12-U	2	12.003	0.679	0.063	11865
163.000	(3) Sitepro VFA12-U	2	10.573	0.630	0.053	11959
153.000	Side Arm Mount [SO 307-1]	2	9.244	0.575	0.043	10857
150.000	3" x 6" SideLight	2	8.866	0.558	0.041	10420
149.000	Radiowaves 2' Dish	2	8.742	0.552	0.040	10282
147.000	3.5" Dia. x 5-ft	2	8.498	0.541	0.038	10016
120.000	Sector Mount [SM 1304-3]	2	5.668	0.417	0.026	15152

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T1	300	Leg Diagonal	A325N A325X	0.750 0.625	6 1	610.957 1137.720	29820.600 5756.250	0.020 0.198	1 1	Bolt Tension Member Block Shear
		Top Girt	A325X	0.625	1	75.955	5756.250	0.013	1	Member Block Shear
T2	280	Diagonal	A325X	0.625	1	2228.690	5756.250	0.387	1	Member Block Shear
		Top Girt	A325X	0.625	1	82.755	5756.250	0.014	1	Member Block Shear
T3	266	Leg Diagonal	A325N A325X	0.750 0.625	6 1	2971.370 2781.090	29820.600 5756.250	0.100 0.483	1 1	Bolt Tension Member Block Shear
T4	260	Leg Diagonal	A325N A325X	0.750 0.625	6 1	7237.160 3763.400	29820.600 5756.250	0.243 0.654	1 1	Bolt Tension Member Block Shear
		Top Girt	A325X	0.625	1	459.316	5756.250	0.080	1	Member Block Shear
T5	240	Leg Diagonal	A325N A325X	0.750 0.625	6 1	9683.510 2172.700	29820.600 5756.250	0.325 0.377	1 1	Bolt Tension Member Block Shear
		Top Girt	A325X	0.625	1	195.436	8700.000	0.022	1	Member Bearing
T6	220	Leg Diagonal	A325N A325X	1.000 0.625	6 1	11753.000 2343.570	53014.398 5756.250	0.222 0.407	1 1	Bolt Tension Member Block Shear
T7	200	Leg Diagonal	A325N A325X	1.000 0.625	6 1	14450.300 4342.580	53014.398 10673.400	0.273 0.407	1 1	Bolt Tension Member Block Shear
T8	180	Leg Diagonal	A325N A325X	1.000 0.625	6 1	18244.400 6439.960	53014.398 10673.400	0.344 0.603	1 1	Bolt Tension Member Block Shear
T9	160	Leg Diagonal	A325N A325X	1.250 0.750	6 1	23017.000 7282.780	82835.000 11183.200	0.278 0.651	1 1	Bolt Tension Member Block Shear
T10	140	Leg Diagonal	A325N A325X	1.250 0.750	6 1	27274.500 8591.510	82835.000 18922.500	0.329 0.454	1 1	Bolt Tension Gusset Bearing

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Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T11	120	Leg Diagonal	A325N A325X	1.250 0.750	6 1	32486.100 10893.200	82835.000 18922.500	0.392 0.576	1 1	Bolt Tension Gusset Bearing
T12	100	Leg Diagonal	A325N A325X	1.250 0.750	6 1	37975.801 11523.500	82835.000 18922.500	0.458 0.609	1 1	Bolt Tension Gusset Bearing
T13	80	Leg Diagonal	A325N A325X	1.250 0.750	6 1	43605.301 12395.800	82835.000 18922.500	0.526 0.655	1 1	Bolt Tension Gusset Bearing
T14	60	Leg Diagonal	A325N A325X	1.500 0.625	8 2	36921.699 6732.130	119282.000 15186.400	0.310 0.443	1 1	Bolt Tension Bolt Shear
T15	40	Leg Diagonal	A325N A325X	1.500 0.625	8 2	41166.301 7928.350	119282.000 15186.400	0.345 0.522	1 1	Bolt Tension Bolt Shear
T16	20	Diagonal	A325X	0.750	2	9166.780	21868.400	0.419	1	Bolt Shear
T17	13.3333	Diagonal	A325X	0.750	2	10353.600	18729.500	0.553	1	Member Block Shear
		Horizontal	A325X	0.750	2	3548.980	20428.699	0.174	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _e lb	ΦP _e lb	Ratio P _e ΦP _e
T1	300 - 280	Sabre 2.375"x0.154"	20.000	5.000	76.2 K=1.00	1.075	-4471.590	31617.199	0.141 ¹
T2	280 - 266	Sabre 2.375"x0.154"	14.000	4.667	71.1 K=1.00	1.075	-16029.200	33396.699	0.480 ¹
T3	266 - 260	Sabre 2.375"x0.154"	6.000	6.000	91.5 K=1.00	1.075	-20545.900	26226.400	0.783 ¹
T4	260 - 240	Sabre 2.875" x 0.276"	20.000	5.000	64.9 K=1.00	2.254	-49255.602	74507.203	0.661 ¹
T5	240 - 220	Sabre 3.5" x 0.2160"	20.033	5.008	51.7 K=1.00	2.228	-66058.898	82509.500	0.801 ¹
T6	220 - 200	Sabre 3.5" x 0.3"	20.033	5.008	52.9 K=1.00	3.016	-80583.000	110613.000	0.729 ¹
T7	200 - 180	Sabre 4.5" x 0.337"	20.033	6.678	54.3 K=1.00	4.407	-101101.000	159914.000	0.632 ¹
T8	180 - 160	Sabre 5.5625" x 0.375"	20.033	6.678	43.6 K=1.00	6.111	-129482.000	239358.000	0.541 ¹
T9	160 - 140	Sabre 5.5625" x 0.375"	20.033	6.678	43.6 K=1.00	6.111	-161925.000	239358.000	0.676 ¹
T10	140 - 120	Sabre 8.625" x 0.322"	20.033	10.017	40.9 K=1.00	8.399	-191396.000	334421.000	0.572 ¹
T11	120 - 100	Sabre 8.625" x 0.322"	20.033	10.017	40.9 K=1.00	8.399	-229704.000	334421.000	0.687 ¹
T12	100 - 80	Sabre 8.625"x0.5"	20.033	10.017	41.8 K=1.00	12.763	-268424.000	505555.000	0.531 ¹
T13	80 - 60	Sabre 8.625"x0.5"	20.033	10.017	41.8 K=1.00	12.763	-308066.000	505555.000	0.609 ¹
T14	60 - 40	Sabre 8.625"x0.5"	20.033	10.017	41.8 K=1.00	12.763	-348422.000	505555.000	0.689 ¹
T15	40 - 20	Sabre 12.75"x0.375"	20.033	10.017	27.5	14.579	-390096.000	620860.000	0.628 ¹

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Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	
T16	20 - 13.3333	Sabre 12.75"x0.375"	6.678	6.678	K=1.00 18.3	14.579	-409290.000	640172.000	0.639 ¹
T17	13.3333 - 0	Sabre 12.75"x0.375"	13.356	6.678	K=1.00 18.3 K=1.00	14.579	-408536.000	640172.000	0.638 ¹

¹ P_u / ΦP_u controls

Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	
T1	300 - 280	L2x2x1/8	7.071	3.229	103.1 K=1.06	0.484	-1241.680	8830.220	0.141 ¹
T2	280 - 266	L2x2x1/8	6.839	3.118	100.6 K=1.07	0.484	-2162.080	9063.620	0.239 ¹
T3	266 - 260	L2x2x1/8	7.810	3.584	111.1 K=1.03	0.484	-3036.550	8089.900	0.375 ¹
T4	260 - 240	L2x2x1/8	7.071	3.199	102.4 K=1.06	0.484	-3999.670	8892.010	0.450 ¹
T5	240 - 220	L2x2x1/8	8.401	4.008	121.0 K=1.00	0.484	-2182.040	7201.600	0.303 ¹
T6	220 - 200	L2x2x1/8	10.079	4.849	146.4 K=1.00	0.484	-2346.300	5108.100	0.459 ¹
T7	200 - 180	L2 1/2x2 1/2x3/16	12.580	6.099	147.9 K=1.00	0.902	-4313.200	9321.010	0.463 ¹
T8	180 - 160	L2 1/2x2 1/2x3/16	14.315	6.917	167.7 K=1.00	0.902	-6519.560	7245.580	0.900 ¹
T9	160 - 140	L3x3x3/16	16.112	7.818	157.4 K=1.00	1.090	-7401.720	9938.710	0.745 ¹
T10	140 - 120	L3 1/2x3 1/2x1/4	19.296	9.343	161.6 K=1.00	1.690	-8744.670	14628.700	0.598 ¹
T11	120 - 100	L4x3 1/2x1/4 (SLV)	21.032	10.214	167.0 K=1.00	1.813	-11100.100	14680.900	0.756 ¹
T12	100 - 80	L4x4x1/4	22.811	11.107	167.6 K=1.00	1.940	-11724.100	15593.600	0.752 ¹
T13	80 - 60	L4x4x5/16	24.624	12.015	182.3 K=1.00	2.400	-12555.900	16318.600	0.769 ¹
T14	60 - 40	L4x4x5/16	26.464	12.859	177.2 K=0.91	2.400	-13464.300	17258.301	0.780 ¹
T15	40 - 20	L4x4x3/8	28.326	13.607	186.5 K=0.90	2.860	-14327.000	18576.699	0.771 ¹
T16	20 - 13.3333	L4x4x5/16	15.058	13.923	176.1 K=0.83	2.400	-18333.600	17482.600	1.049 ¹
T17	13.3333 - 0	4.8.1 (1.05 CR) - 315 L 5 x 3.5 x 5/16 (SLV)	19.702	9.580	143.0 K=0.95	2.559	-23419.301	28256.801	0.829 ¹

¹ P_u / ΦP_u controls

Horizontal Design Data (Compression)

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	2055-OH-219401 - North Ridgeville	Page	32 of 36
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	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	
T17	13.3333 - 0	L4x4x5/16	27.667	13.031	179.2 K=0.91	2.400	-7097.960	16876.100	0.421 ¹

¹ P_u / ΦP_u controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	
T1	300 - 280	L2x2x1/8	5.000	4.469	134.9 K=1.00	0.484	-86.849	6009.560	0.014 ¹
T2	280 - 266	L2x2x1/8	5.000	4.469	134.9 K=1.00	0.484	-97.511	6009.560	0.016 ¹
T4	260 - 240	L2x2x1/8	5.000	4.469	134.9 K=1.00	0.484	-513.712	6009.560	0.085 ¹
T5	240 - 220	L2x2x1/8	5.000	4.427	133.6 K=1.00	0.484	-195.436	6113.680	0.032 ¹

¹ P_u / ΦP_u controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	
T17	13.3333 - 0	L3x3x1/4	6.917	6.385	129.4 K=1.00	1.438	-7084.880	19302.199	0.367 ¹

¹ P_u / ΦP_u controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	
T17	13.3333 - 0	L3x3x1/4	9.371	8.615	174.5 K=1.00	1.438	-4808.480	10661.700	0.451 ¹

¹ P_u / ΦP_u controls

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Section No.	Elevation	Size	L	L_n	Kl/r	A	P_n	ϕP_n	$\frac{Ratio}{P_n}$
	ft		ft	ft		in^2	lb	lb	$\frac{\phi P_n}{P_n}$
T17	13.3333 - 0	L3x3x1/4	13.833	13.833	280.2 K=1.00	1.438	-28.426	4135.470	0.007 ¹
KL/R > 250 (C) - 339									

Tension Checks

Section No.	Elevation	Size	L	L _m	KI/r	A	P _n	Q P _n	Ratio P _n
	<i>f_i</i>		<i>f_i</i>	<i>f_i</i>		<i>in</i> ²	<i>lb</i>	<i>lb</i>	$\frac{Q P_n}{P_n}$
T1	300 - 280	Sabre 2.375"x0.154"	20.000	5.000	76.2	1.075	3665.740	48353.898	0.076
T2	280 - 266	Sabre 2.375"x0.154"	14.000	4.667	71.1	1.075	13750.500	48353.898	0.284
T3	266 - 260	Sabre 2.375"x0.154"	6.000	6.000	91.5	1.075	17828.199	48353.898	0.369
T4	260 - 240	Sabre 2.875" x 0.276"	20.000	5.000	64.9	2.254	34422.898	101409.000	0.428
T5	240 - 220	Sabre 3.5" x 0.2160"	20.033	5.008	51.7	2.228	58101.000	100281.000	0.579
T6	220 - 200	Sabre 3.5" x 0.3"	20.033	5.008	52.9	3.016	70517.703	135717.000	0.520
T7	200 - 180	Sabre 4.5" x 0.337"	20.033	6.678	54.3	4.407	86701.898	198335.000	0.437
T8	180 - 160	Sabre 5.5625" x 0.375"	20.033	6.678	43.6	6.111	109467.000	275012.000	0.398
T9	160 - 140	Sabre 5.5625" x 0.375"	20.033	6.678	43.6	6.111	138102.000	275012.000	0.502
T10	140 - 120	Sabre 8.625" x 0.322"	20.033	10.017	40.9	8.399	163647.000	377967.000	0.433
T11	120 - 100	Sabre 8.625" x 0.322"	20.033	10.017	40.9	8.399	194917.000	377967.000	0.516
T12	100 - 80	Sabre 8.625"x0.5"	20.033	10.017	41.8	12.763	227855.000	574322.000	0.397
T13	80 - 60	Sabre 8.625"x0.5"	20.033	10.017	41.8	12.763	261632.000	574322.000	0.456
T14	60 - 40	Sabre 8.625"x0.5"	20.033	10.017	41.8	12.763	295374.000	574322.000	0.514
T15	40 - 20	Sabre 12.75"x0.375"	20.033	10.017	27.5	14.579	329331.000	656053.000	0.502
T16	20 - 13.3333	Sabre 12.75"x0.375"	6.678	6.678	18.3	14.579	345972.000	656053.000	0.527
T17	13.3333 - 0	Sabre 12.75"x0.375"	13.356	6.678	18.3	14.579	343623.000	656053.000	0.524

Section No.	Elevation	Size	L	L _s	Kl/r	A	P _s	ΦP _s	Ratio P _s
	ft		ft	ft		in ²	lb	lb	ΦP _s
T1	300 ~ 280	L2x2x1/8	7.071	3.229	65.1	0.293	1137.720	12744.100	0.089 ¹
T2	280 ~ 266	L2x2x1/8	6.839	3.118	62.9	0.293	2228.690	12744.100	0.175 ¹
T3	266 ~ 260	L2x2x1/8	7.810	3.584	71.9	0.293	2781.090	12744.100	0.218 ¹
T4	260 ~ 240	L2x2x1/8	7.011	3.199	64.5	0.293	3763.400	12744.100	0.295 ¹
T5	240 ~ 220	L2x2x1/8	7.621	3.628	72.7	0.293	2172.700	12744.100	0.170 ¹
T6	220 ~ 200	L2x2x1/8	10.079	4.489	96.1	0.293	2343.570	12744.100	0.184 ¹
T7	200 ~ 180	L2 1/2x2 1/2x3/16	12.020	5.823	92.3	0.571	3432.580	24851.100	0.175 ¹
T8	180 ~ 160	L2 1/2x2 1/2x3/16	14.315	6.917	109.2	0.571	6439.960	24851.100	0.259

Section No.	Elevation	Size	L	L_a	KI/r	A	P_u	ϕP_n	$\frac{Ratio}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T17	13.3333 - 0	L4x4x5/16	27.667	13.031	128.7	1.595	7097.960	69379.102	0.102 ¹

Section No.	Elevation	Size	L	L_m	Kl/r	A	P_n	ϕP_n	Ratio $\frac{P_n}{P_c}$
	ft		ft	ft		in ²	lb	lb	$\frac{\phi P_n}{P_c}$
T1	300 - 280	L2x2x1/8	5.000	4.469	92.0	0.293	75.955	12744.100	0.006 ¹
T2	280 - 266	L2x2x1/8	5.000	4.469	92.0	0.293	82.755	12744.100	0.006 ¹
T4	260 - 240	L2x2x1/8	5.000	4.469	92.0	0.293	459.316	12744.100	0.036 ¹
T5	240 - 220	L2x2x1/8	5.000	4.427	91.2	0.293	102.326	12744.100	0.008 ¹

Section No.	Elevation	Size	L	L_n	KI/r	A	P_n	ΦP_n	$\frac{P_n}{\Phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T17	13.3333 - 0	L3x3x1/4	6.917	6.385	82.4	1.438	7084.880	46575.000	0.152 ¹

¹ $P_u / \phi P_n$ controls

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	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L _o	Kl/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	
T17	13.3333 - 0	L3x3x1/4	9.371	8.615	111.1	1.438	4808.480	46575.000	0.103 ¹

¹ $P_u / \Phi P_u$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ΦP _{u,allow} lb	% Capacity	Pass Fail
T1	300 - 280	Leg	Sabre 2.375"x0.154"	2	-4471.590	31617.199	14.1	Pass
T2	280 - 266	Leg	Sabre 2.375"x0.154"	31	-16029.200	33396.699	48.0	Pass
T3	266 - 260	Leg	Sabre 2.375"x0.154"	55	-20545.900	26226.400	78.3	Pass
T4	260 - 240	Leg	Sabre 2.875" x 0.276"	65	-49255.602	74507.203	66.1	Pass
T5	240 - 220	Leg	Sabre 3.5" x 0.2160"	95	-66058.898	82509.500	80.1	Pass
T6	220 - 200	Leg	Sabre 3.5" x 0.3"	125	-80583.000	110613.000	72.9	Pass
T7	200 - 180	Leg	Sabre 4.5" x 0.337"	152	-101101.000	159914.000	63.2	Pass
T8	180 - 160	Leg	Sabre 5.5625" x 0.375"	173	-129482.000	239358.000	54.1	Pass
T9	160 - 140	Leg	Sabre 5.5625" x 0.375"	193	-161925.000	239358.000	67.6	Pass
T10	140 - 120	Leg	Sabre 8.625" x 0.322"	214	-191396.000	334421.000	57.2	Pass
T11	120 - 100	Leg	Sabre 8.625" x 0.322"	229	-229704.000	334421.000	68.7	Pass
T12	100 - 80	Leg	Sabre 8.625"x0.5"	244	-268424.000	505551.000	53.1	Pass
T13	80 - 60	Leg	Sabre 8.625"x0.5"	261	-308066.000	505555.000	60.9	Pass
T14	60 - 40	Leg	Sabre 8.625"x0.5"	276	-348422.000	505555.000	68.9	Pass
T15	40 - 20	Leg	Sabre 12.75"x0.375"	291	-390096.000	620860.000	62.8	Pass
T16	20 - 13.3333	Leg	Sabre 12.75"x0.375"	306	-409290.000	640172.000	63.9	Pass
T17	13.3333 - 0	Leg	Sabre 12.75"x0.375"	318	-408536.000	640172.000	63.8	Pass
T1	300 - 280	Diagonal	L2x2x1/8	10	-1241.680	8830.220	14.1	Pass
							19.8 (b)	
T2	280 - 266	Diagonal	L2x2x1/8	44	-2162.080	9063.620	23.9	Pass
							38.7 (b)	
T3	266 - 260	Diagonal	L2x2x1/8	59	-3036.550	8089.900	37.5	Pass
							48.3 (b)	
T4	260 - 240	Diagonal	L2x2x1/8	70	-3999.670	8892.010	45.0	Pass
							65.4 (b)	
T5	240 - 220	Diagonal	L2x2x1/8	100	-2182.040	7201.600	30.3	Pass
							37.7 (b)	
T6	220 - 200	Diagonal	L2x2x1/8	127	-2346.300	5108.100	45.9	Pass
T7	200 - 180	Diagonal	L2 1/2x2 1/2x3/16	154	-4313.200	9321.010	46.3	Pass
T8	180 - 160	Diagonal	L2 1/2x2 1/2x3/16	175	-6519.560	7245.580	90.0	Pass
T9	160 - 140	Diagonal	L3x3x3/16	196	-7401.720	9938.710	74.5	Pass
T10	140 - 120	Diagonal	L3 1/2x3 1/2x1/4	217	-8744.670	14628.700	59.8	Pass
T11	120 - 100	Diagonal	L4x3 1/2x1/4 (SLV)	232	-11100.100	14680.900	75.6	Pass
T12	100 - 80	Diagonal	L4x4x1/4	248	-11724.100	15593.600	75.2	Pass
T13	80 - 60	Diagonal	L4x4x5/16	266	-12555.900	16318.600	76.9	Pass
T14	60 - 40	Diagonal	L4x4x5/16	281	-13464.300	17258.301	78.0	Pass
T15	40 - 20	Diagonal	L4x4x3/8	297	-14327.000	18576.699	77.1	Pass
T16	20 - 13.3333	Diagonal	L4x4x5/16	315	-18333.600	17482.600	104.9	Fail
T17	13.3333 - 0	Diagonal	L 5 x 3.5 x 5/16 (SLV)	331	-23419.301	28256.801	82.9	Pass
T17	13.3333 - 0	Horizontal	L4x4x5/16	313	-7097.960	16876.100	42.1	Pass
T1	300 - 280	Top Girt	L2x2x1/8	4	-86.849	6009.560	1.4	Pass
T2	280 - 266	Top Girt	L2x2x1/8	36	-97.511	6009.560	1.6	Pass
T4	260 - 240	Top Girt	L2x2x1/8	68	-513.712	6009.560	8.5	Pass
T5	240 - 220	Top Girt	L2x2x1/8	99	-195.436	6113.680	3.2	Pass
T17	13.3333 - 0	Redund Horz 1	L3x3x1/4	332	-7084.880	19302.199	36.7	Pass

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	Project	TEP #66353.230474	Date	15:26:02 02/26/19
	Client	GrainComm, LLC	Designed by	G. Hunter Morrow, E.I.

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ΦP _{u,allow} lb	% Capacity	Pass Fail
T17	13.3333 - 0	Bracing Redund Diag 1	L3x3x1/4	330	-4808.480	10661.700	45.1	Pass
T17	13.3333 - 0	Bracing Inner Bracing	L3x3x1/4	339	-28.426	4135.470	0.8	Pass
							Summary	
							Leg (T5) Diagonal (T16)	80.1 104.9 Pass Fail
							Horizontal (T17)	42.1 Pass
							Top Girt (T4)	8.5 Pass
							Redund Horz 1 Bracing (T17)	36.7 Pass
							Redund Diag 1 Bracing (T17)	45.1 Pass
							Inner Bracing (T17)	0.8 Pass
							Bolt Checks	65.5 Pass
							RATING =	104.9 Fail

Program Version 8.0.5.0 - 11/28/2018 File:T:/66353/P-178429_L-230474_2055-OH-219401_North Ridgeville_Tower SA/tnx/2055-OH-219401.cri

APPENDIX B

ADDITIONAL CALCULATIONS



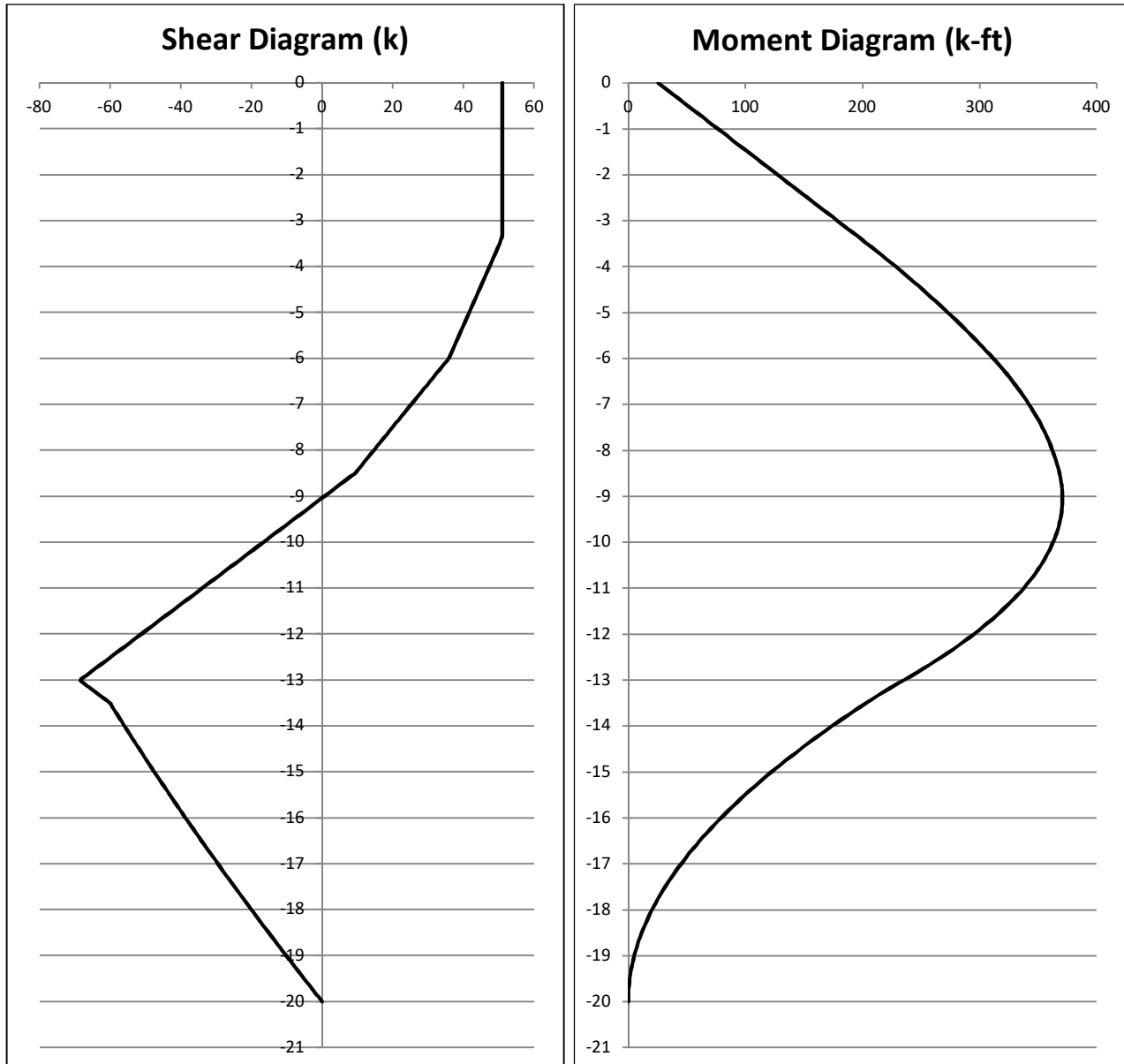
2055-OH-219401 - North Ridgeville

TEP #: 66353.23047

Analysis: GHM 2/26/2019

Check: JHJ 2/26/2019

Soil Interaction: LC1



Max Unfactored Moment: 370.7 kip-ft

@ 9.04 ft below grade

Additional Factor of Safety: 18.66

Capacity = 7.1% PASS



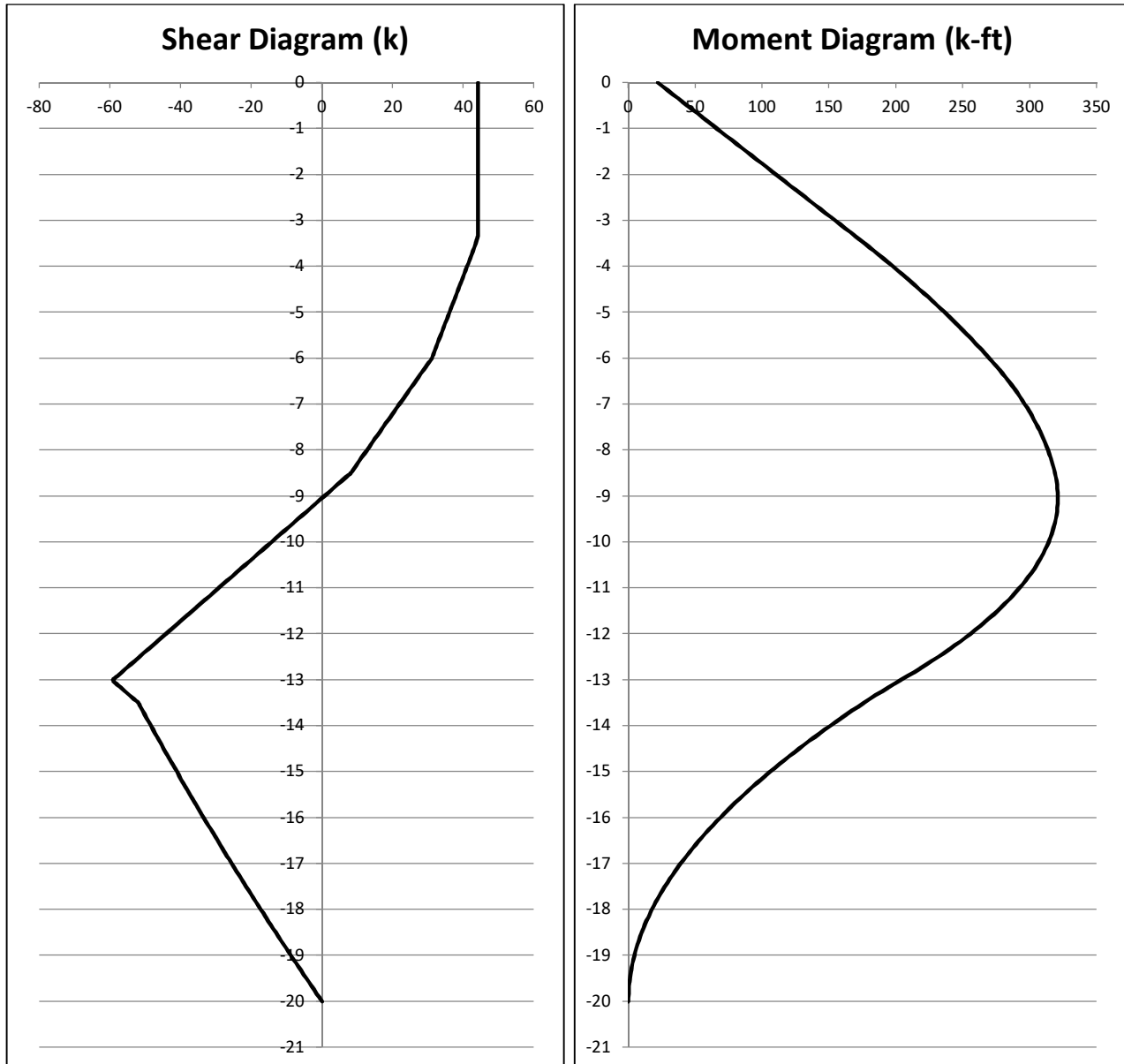
2055-OH-219401 - North Ridgeville

TEP #: 66353.23047

Analysis: GHM 2/26/2019

Check: JHJ 2/26/2019

Soil Interaction: LC2



Max Unfactored Moment: 320.9 kip-ft
@ 9.04 ft below grade
Additional Factor of Safety: 21.56
Capacity = 6.2% PASS

Soil Interaction: Uplift/Download Capacity

[illegible]

	LC1	LC2	
Pu =	452.6	14.3	kip
ϕPn =	685.1	685.1	kip
Uu =	0.0	315.0	kip
ϕUn =	455.4	455.4	kip

Download Capacity =	66.1%	2.1%
Uplift Capacity =	0.0%	69.2%
	PASS	PASS



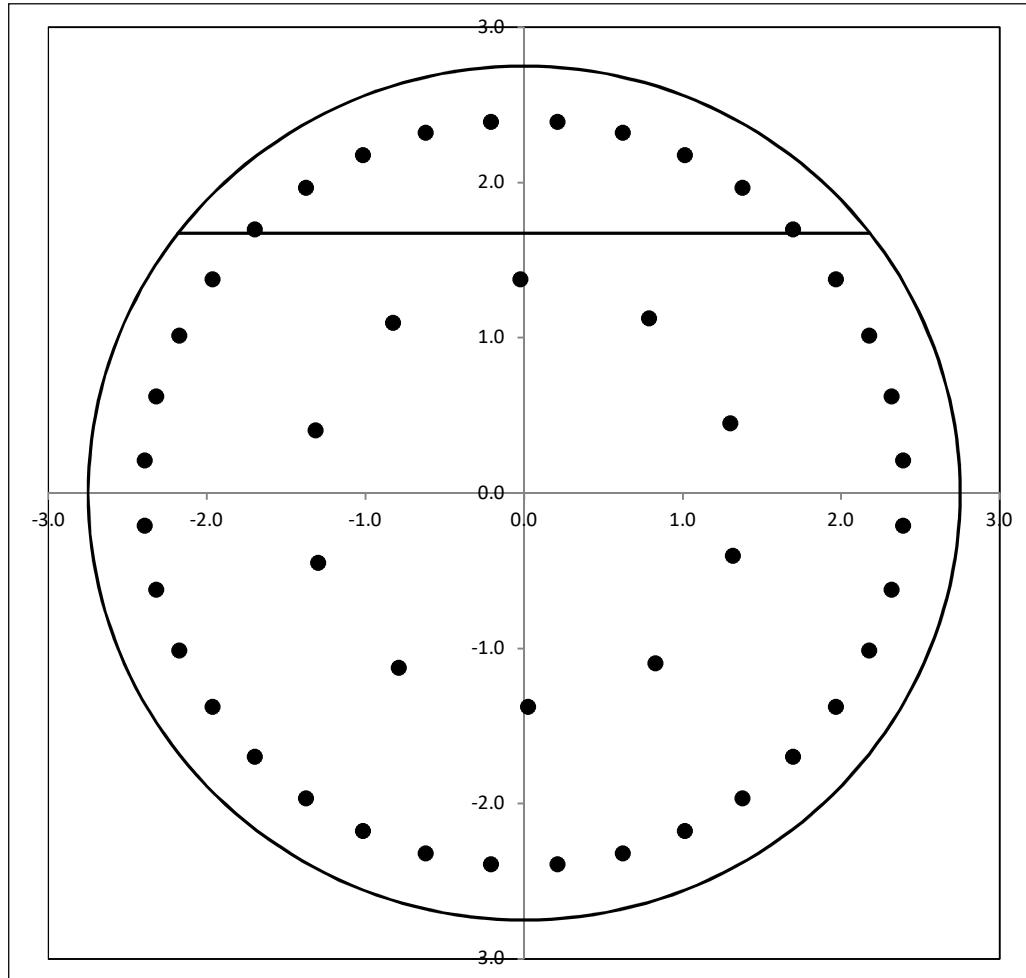
2055-OH-219401 - North Ridgeville

TEP #: 66353.23047

Analysis: GHM 2/26/2019

Check: JHJ 2/26/2019

Reinforcement Capacity



	LC1	LC2
$V_u =$	68.6	59.3 kip
$V_c =$	460.5	339.5 kip
$f_y, tie = 60.0$ $V_s =$	127.5	127.5 kip
$\phi V_n =$	441.0	350.2 kip
Capacity =	15.5%	16.9%
	PASS	PASS

	LC1	LC2
$M_u =$	370.7	320.9 kip-ft
$\phi M_n =$	5770.2	4505.9 kip-ft
Capacity =	6.4%	7.1%
	PASS	PASS



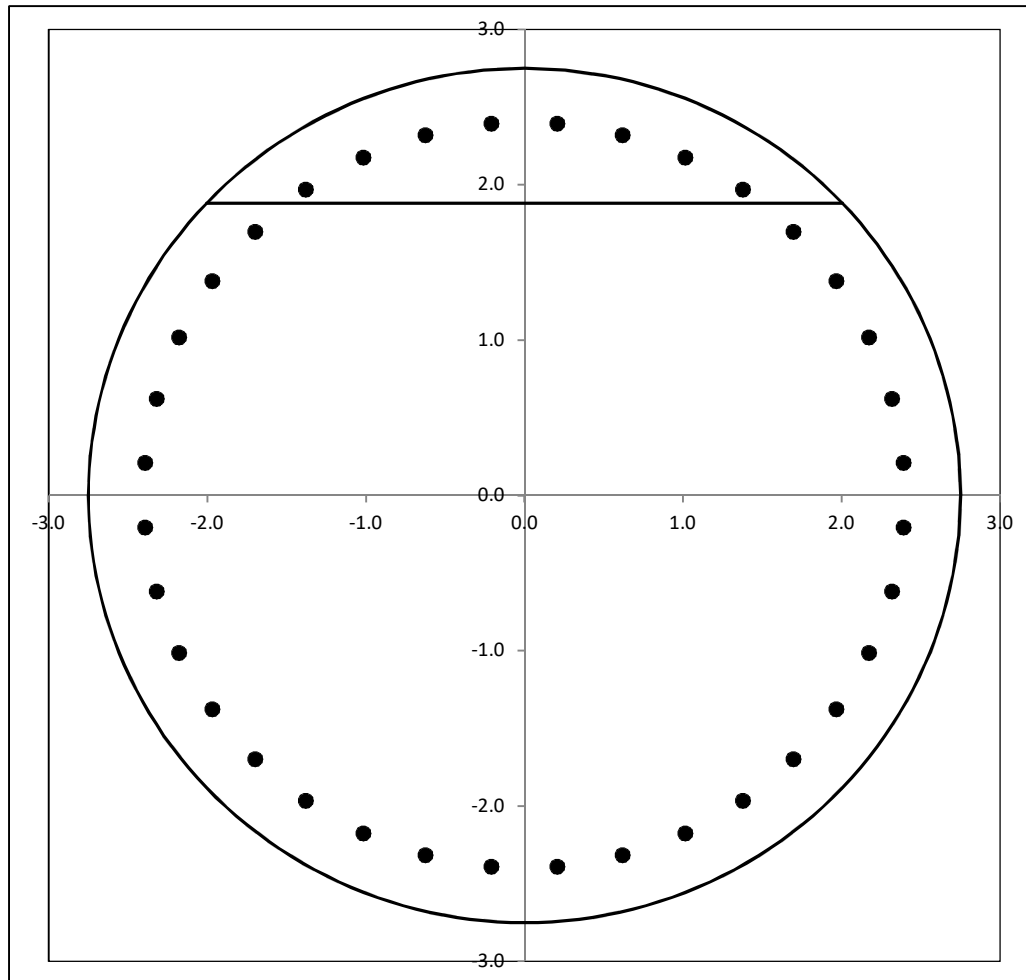
2055-OH-219401 - North Ridgeville

TEP #: 66353.23047

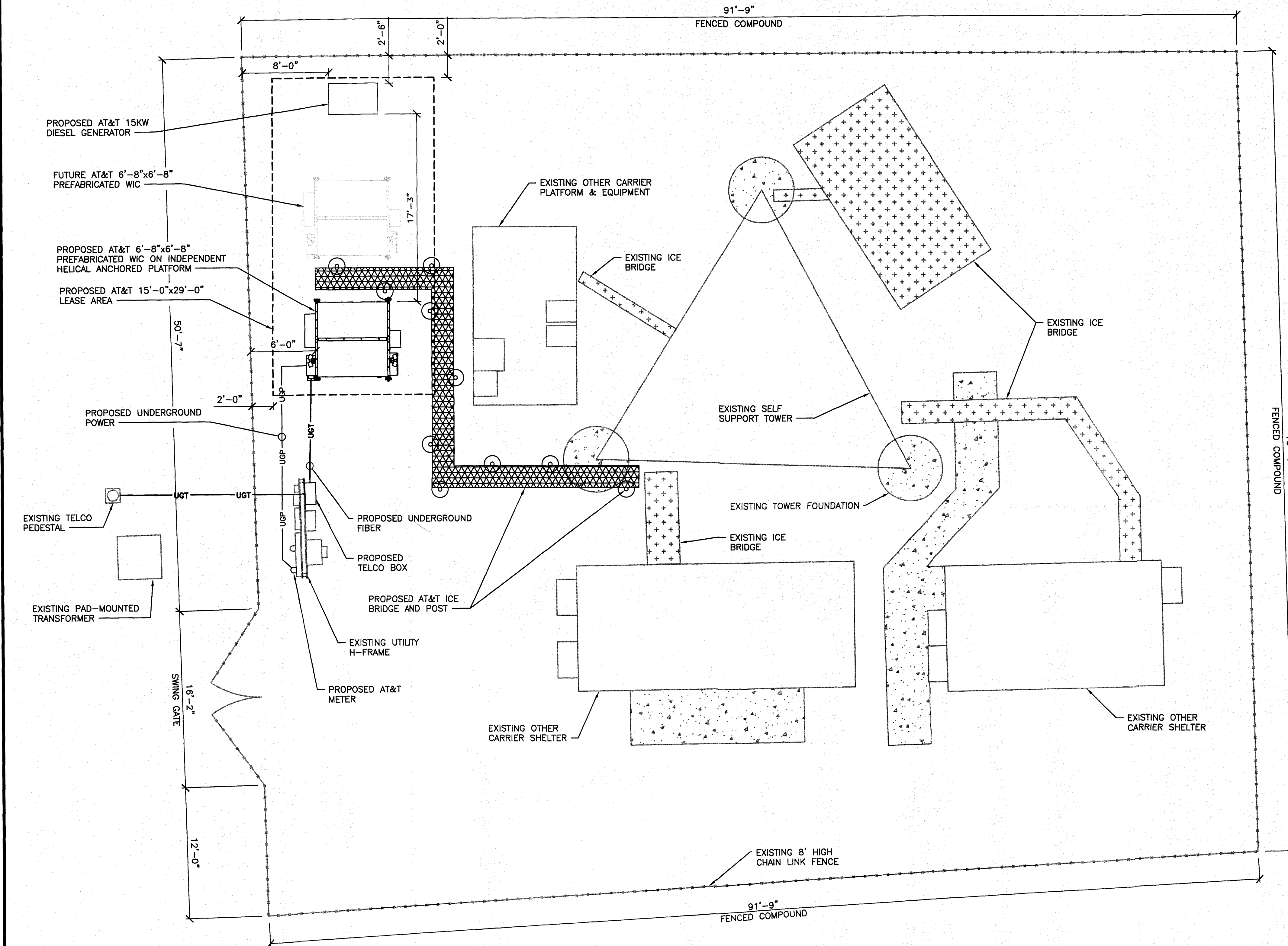
Analysis: GHM 2/26/2019

Check: JHJ 2/26/2019

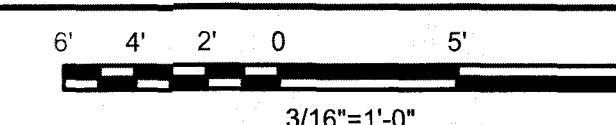
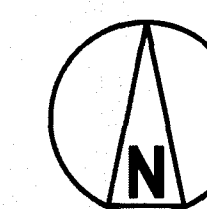
Reinforcement Capacity, continued



	LC1	LC2	
Mu =	348.2	301.4	kip-ft
ϕM_n =	4988.0	3534.7	kip-ft
Capacity =	7.0%	8.5%	
	PASS	PASS	



"This submittal is for general informational purposes only and is preliminary in nature. As such, any other use or reliance is strictly prohibited."



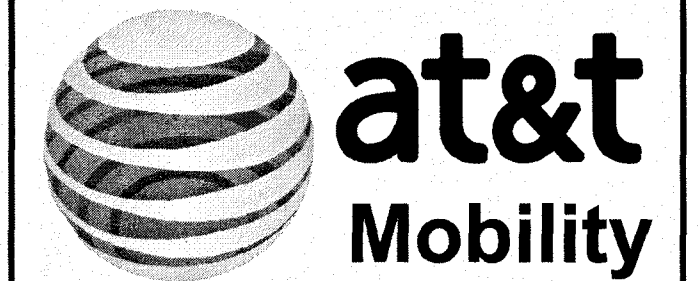
DETAILED COMPOUND PLAN

1

LEGEND

3

APPLICANT/OWNER:



8372 EAST BROAD STREET
FLOOR 2 - SOUTH (83)
REYNOLDSBURG, OHIO 43068



BLACK & VEATCH
4449 EASTON WAY
SUITE 150
COLUMBUS OH, 43219

PREPARED BY:



GPD GROUP®
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

LEONARDO A.
SFERRA
E-71842

REGISTERED PROFESSIONAL ENGINEER
03/22/19

IT IS A VIOLATION OF LAW FOR ANY PERSON,
UNLESS THEY ARE ACTING UNDER THE DIRECTION
OF A LICENSED PROFESSIONAL ENGINEER,
TO ALTER THIS DOCUMENT.

PROJECT NO: 2018750.70

DRAWN BY: MRB

CHECKED BY: EAB

LANDLORD/PROPERTY OWNER SIGNATURE:

REV	DATE	DESCRIPTION
A	03/01/19	ISSUED FOR REVIEW

PROJECT LOCATION:

NOH6223
OHL06223
7307 AVON BELDEN ROAD
NORTH RIDGEVILLE, OH 44039

SHEET TITLE:

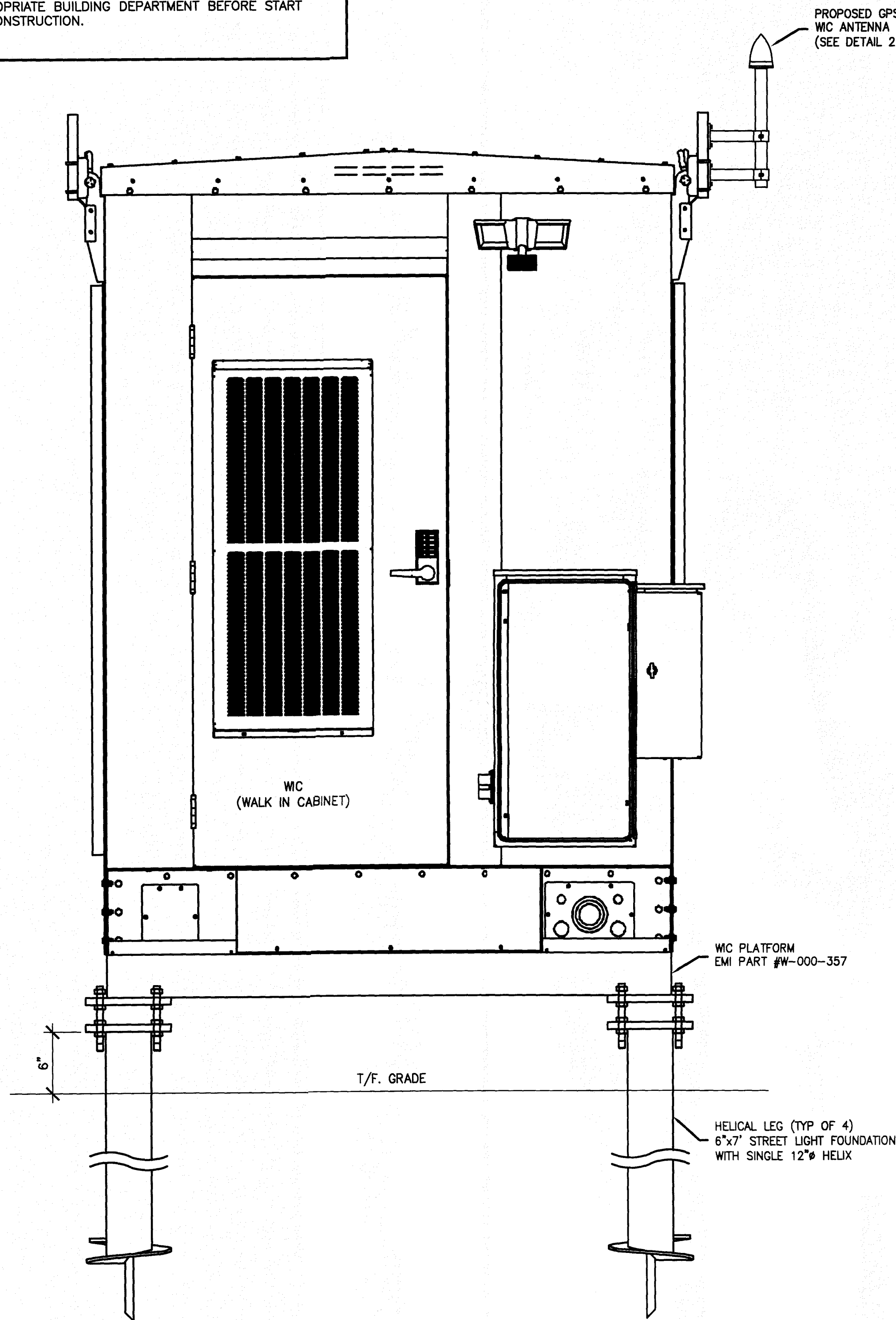
DETAILED
COMPOUND PLAN

SHEET NUMBER:

C-1

CONTRACTOR - NOTE:

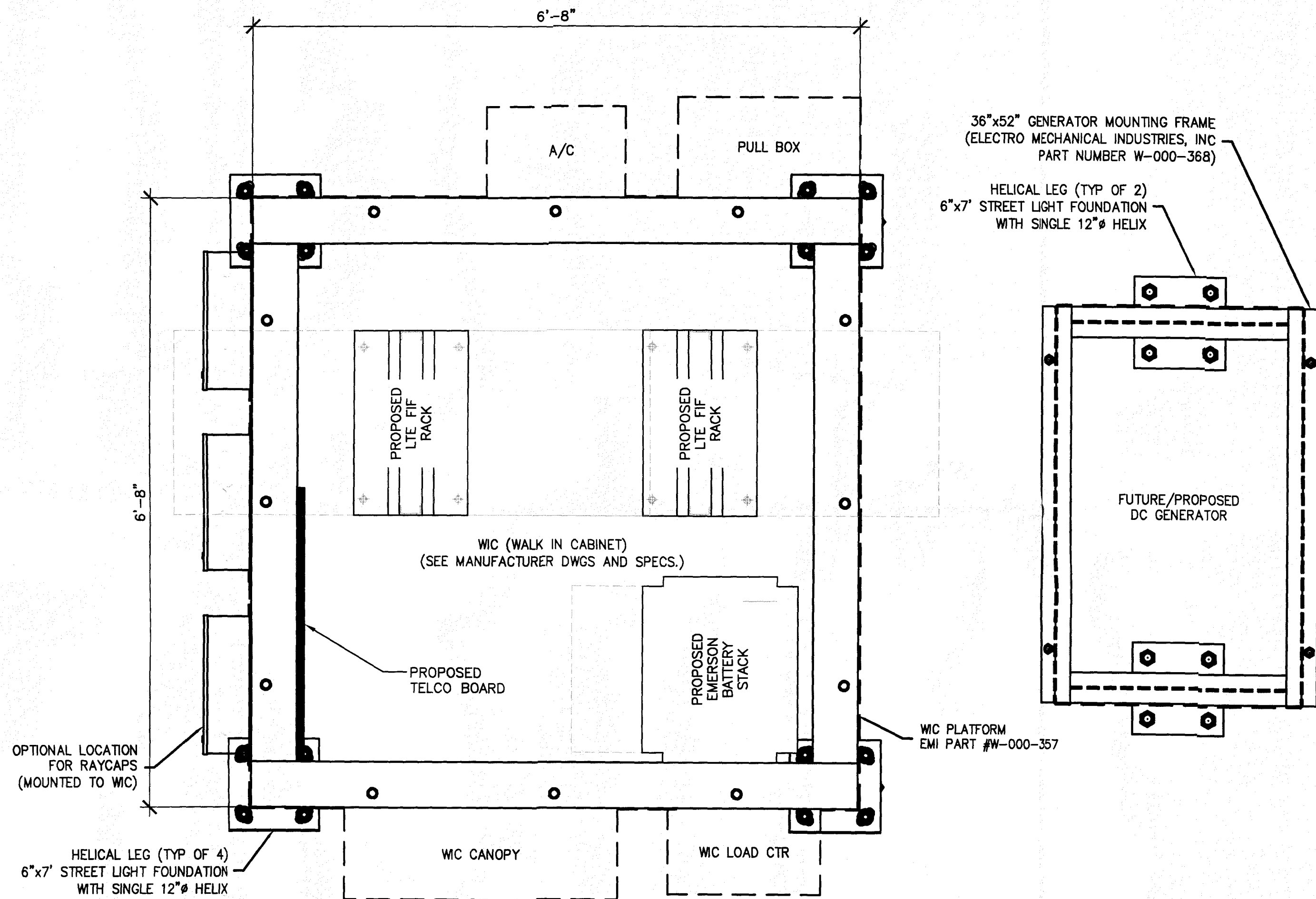
THIS DRAWING IS A SCHEMATIC REPRESENTATION OF THE CABINET'S EQUIPMENT LAYOUT INITIAL DESIGN. THE FINAL CONFIGURATION IS DEPENDANT ON THE OWNER'S ACTUAL FINAL RF EQUIPMENT SELECTION. THE CONTRACTOR SHALL PROVIDE THE ACTUAL CABINET EQUIPMENT LAYOUT DRAWINGS TO THE APPROPRIATE BUILDING DEPARTMENT BEFORE START OF CONSTRUCTION.



EQUIPMENT ELEVATION 1

SCALE: N. T. S.

PROPOSED GPS ANTENNA MOUNTED TO WIC ANTENNA MOUNT (SEE DETAIL 2 SHEET C-8)



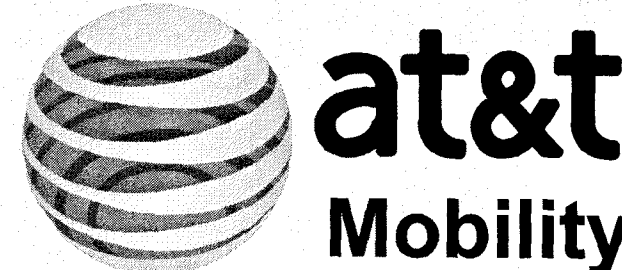
EQUIPMENT LAYOUT 2

SCALE: N. T. S.

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS ANTENNA AND TRANSMITTING ANTENNAS.
3. CONTRACTOR SHALL INSTALL ALL CABINET PARTS SHIPPED LOOSE. (SEE CABINET MANUFACTURER DRAWINGS & SPECS)
4. CABINET SHIPPED WITH INTERIOR COMPLETE. FIELD VERIFY UPON DELIVERY TO SITE AND CONTACT CONSTRUCTION MANAGER IF ANY INTERIOR ITEMS ARE NOT PRESENT.

APPLICANT/OWNER:

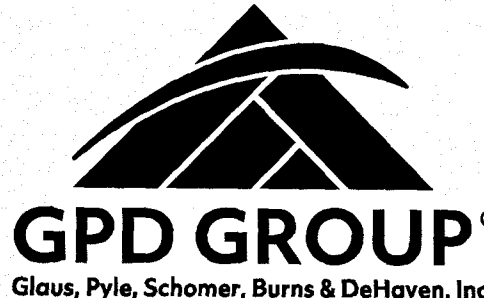


8372 EAST BROAD STREET
FLOOR 2 - SOUTH (83)
REYNOLDSBURG, OHIO 43068



BLACK & VEATCH
4449 EASTON WAY
SUITE 150
COLUMBUS OH, 43219

PREPARED BY:



GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

Copyright: Glaus, Schomer, Burns & DeHaven, Inc. 2019

SEAL:

FOR
REFERENCE
ONLY

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

PROJECT NO: 2018750.70

DRAWN BY: MRB

CHECKED BY: EAB

LANDLORD/PROPERTY OWNER SIGNATURE:

REV	DATE	DESCRIPTION
A	03/01/19	ISSUED FOR REVIEW

PROJECT LOCATION:

NOH6223
OHL06223
7307 AVON BELDEN ROAD
NORTH RIDGEVILLE, OH 44039

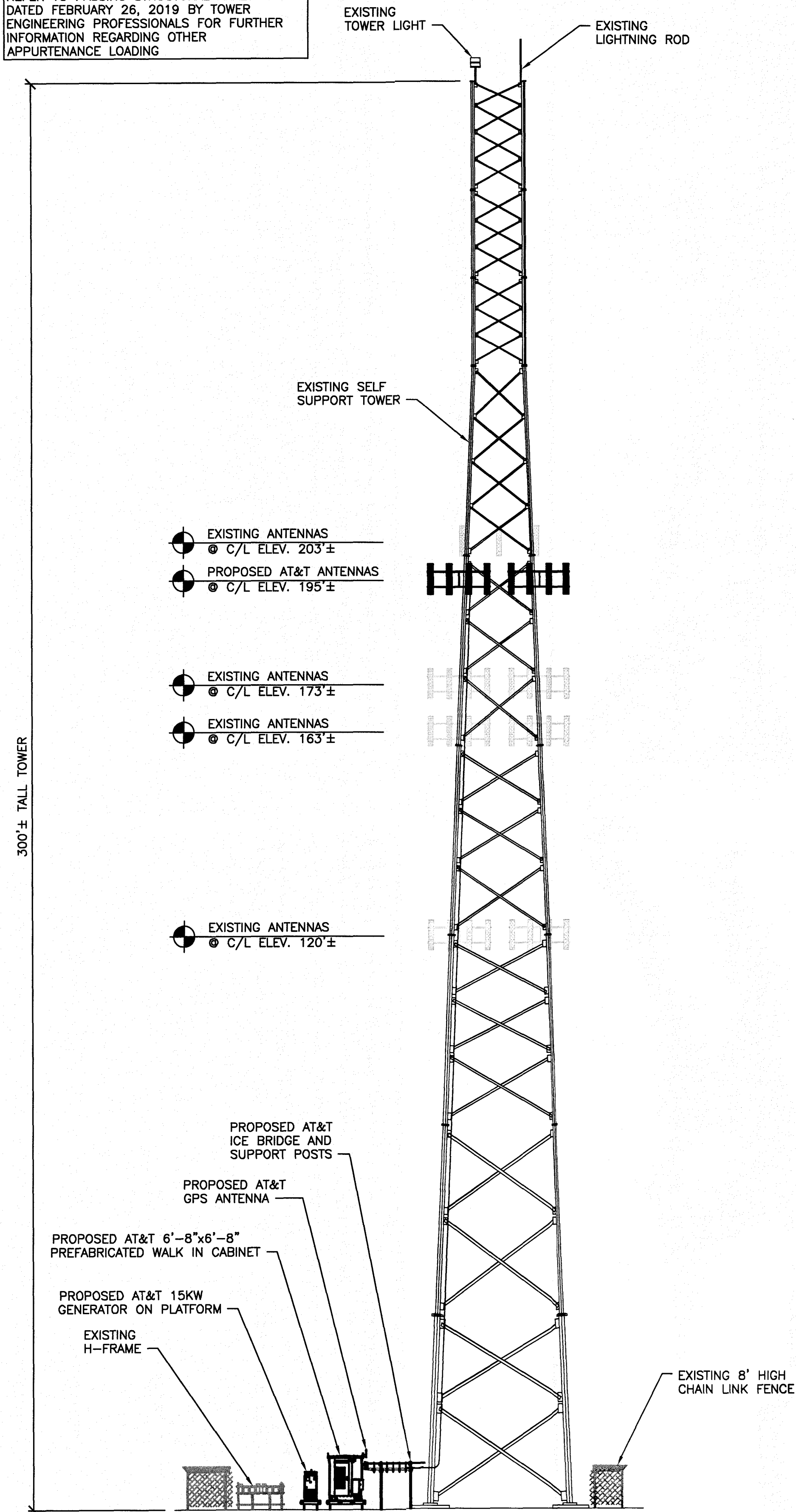
SHEET TITLE:

EQUIPMENT LAYOUT

SHEET NUMBER:

C-3

REFER TO PASSING STRUCTURAL ANALYSIS
DATED FEBRUARY 26, 2019 BY TOWER
ENGINEERING PROFESSIONALS FOR FURTHER
INFORMATION REGARDING OTHER
APPURTENANCE LOADING

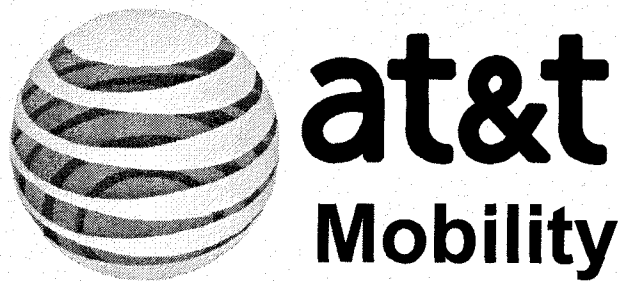


"This submittal is for general informational purposes only and is preliminary in nature. As such, any other use or reliance is strictly prohibited."

NOT USED

4

APPLICANT/OWNER:

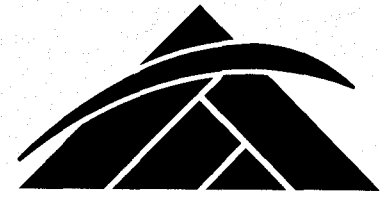


8372 EAST BROAD STREET
FLOOR 2 - SOUTH (83)
REYNOLDSBURG, OHIO 43068



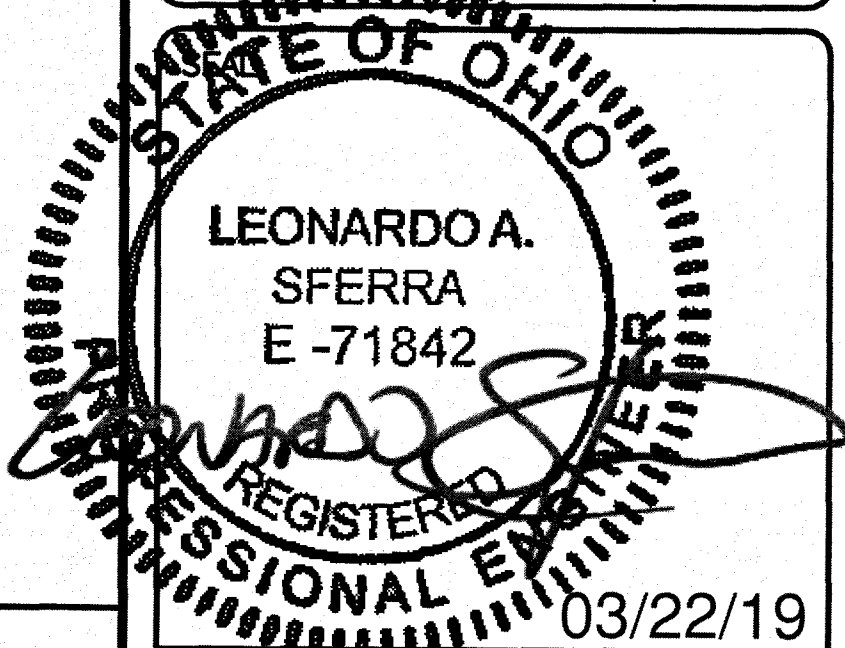
BLACK & VEATCH
4449 EASTON WAY
SUITE 150
COLUMBUS OH, 43219

PREPARED BY:



GPD GROUP®
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

Copyright © 2019 by Glaus, Pyle, Schomer, Burns & DeHaven, Inc. 2019



NOT USED

NO SCALE

2

NOT USED

5

PROJECT NO: 2018750.70

DRAWN BY: MRB

CHECKED BY: EAB

LANDLORD/PROPERTY OWNER SIGNATURE:

REV	DATE	DESCRIPTION
A	03/01/19	ISSUED FOR REVIEW

PROJECT LOCATION:

NOH6223
OHL06223
7307 AVON BELDEN ROAD
NORTH RIDGEVILLE, OH 44039

SHEET TITLE:

**TOWER ELEVATION,
ANTENNA & COAX PLANS**

SHEET NUMBER:

T-1

TOWER ELEVATION

NO SCALE

1

NOT USED

NO SCALE

3

NOT USED

6

Engineering Fee Paid: \$ 1,125.00
receipt 487000

Planning Commission & Bldg. Admin. Fees : \$ 114.00
Receipt No. 271146
See attached for description of fees



RECEIVED

**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
REQUEST FOR ACTION**



Received: APR 17 2019 Date released to Planning Commission: _____
Date of Planning Commission meeting: _____ (unless otherwise notified)

APPLICANT INFORMATION AND REQUEST:

APPLICANT:	<u>John Reyes</u>	PROPERTY OWNER:	<u>Patton's Five Star Towing</u>
COMPANY NAME:	<u>Star Builders</u>	ADDRESS:	<u>P.O. Box 450784</u>
ADDRESS:	<u>46405 Telegraph Road</u>	CITY/STATE:	<u>Westlake / Ohio</u> ZIP <u>44145</u>
CITY/STATE:	<u>Amherst / Ohio</u> ZIP <u>44001</u>	PHONE NO:	<u>440-777-4070</u>
PHONE NO.:	<u>440-986-8022</u>	SIGNATURE:	<u>[Signature]</u>
SIGNATURE:	<u>[Signature]</u>	(Owner's original signature must be submitted with application)	

Applicant: please provide an email address, fax number or mailing address to send Administrative comments in advance of the Planning meeting: johnr@starinc.cc

LOCATION OF PROPERTY/ADDRESS: 31684 Cook Rd. North Ridgeville, Ohio
PERMANENT PARCEL NO: 0700004110037 **ZONING OF PROPERTY:** B-3
ZONING OF ADJACENT PROPERTY TO: NORTH N/A EAST B-3 SOUTH B-3 WEST N/A
DESCRIPTION OF REQUEST: Proposed 6,000 SF building to be used for the day to day operations of a towing and impound company.

Have the Planning Commission or Board of Zoning and Building Appeals considered any prior request concerning this property? Yes No. If yes, list dates and nature of each: _____

On the attached form, list the current record title owners(s) adjacent to the property of request. Include on this list the record title owner(s) name, permanent parcel number and mailing address. Adjacent properties shall include those properties bordering to the north, south, east, west, across a street from the property involved and those properties meeting corners of the property involved.

In the event of property transfers, the applicant shall be responsible for providing an updated list of current adjacent record title owner(s) to the office of the Clerk of Council twenty-five days prior to the date of any public hearing when the applicant will appear on the agenda.

PLANNING COMMISSION USE ONLY: ☐ APPROVED ☐ DISAPPROVED

All approvals are conditional until applicant fully meets the requirements of applicable City ordinances enforced by the Chief Building Official, City Engineer, Fire Department and Police Department with respect to safety and design.

- ☐ Board of Building & Zoning Appeals approval required
☐ Conditions as set forth by the Commission on this date are _____

Date: _____ Signature: _____
(Presiding officer at meeting)

Return completed form to Building Dept., 7307 Avon Belden Road, North Ridgeville, Ohio, after Commission action.

TO BE FILLED OUT BY APPLICANT

I, John Reyes

(Print Name)

(Signature)

verify that the following are the names, mailing addresses and permanent parcel numbers of the current record title owners adjacent to the property of request for:

Applicant: John Reyes

Owner: Jacob Patton

Project address: 31684 Cook Road North Ridgeville, OH

Permanent parcel no. 0700004110037

**THE FOLLOWING INFORMATION MAY BE OBTAINED AT THE LORAIN COUNTY AUDITOR'S OFFICE,
ADMINISTRATION BUILDING., 226 MIDDLE AVENUE, ELYRIA, OHIO.
PHONE: 440-329-5207 WEBSITE: WWW.LORAINCOUNTY.COM/AUDITOR**

	<u>ADJACENT PROPERTY OWNER/ADDRESS</u>	<u>PARCEL NUMBER</u>
1	SEE ATTACHED SHEET L2.1 FOR ADJACENT PROPERTY OWNERS.	
2	CHARLES STELLA 31740 COOK RD. N.R. OH. 44039	0700004110038
3	STATE OF OHIO 906 N CLARK ST ASHLAND, OH. 44805	0700004110031
4	RICHARD & SUSAN KENNEDY 31615 COOK RD. N.R. OH. 44039	0700003102012
5	MARIE WICHMANN 31735 COOK RD. N.R. OH. 44039	0700003102034
6		
7		
8		
9		
10		

SEE REVERSE SIDE FOR ADDITIONAL LISTINGS.

OFFICE USE ONLY

CBO verification by:

BZA/PC verification by:

Date/time stamp:

**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
RECOMMENDATIONS**

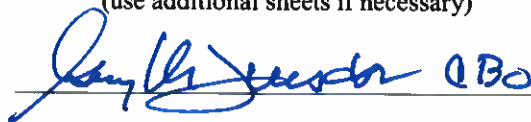
Name of Applicant:	John Reyes
Name of Owner:	Patton's Five Star Towing
Date Submitted for Consideration:	4-17-19
Date to Return to Planning Commission:	4-24-19
Regarding: Towing Business at 31684 Cook Road	

RECOMMENDATIONS:

1. Like use determination was approved by the BZA 9-27-18.
2. No city sidewalk is indicated on plans.
3. Everything else appears to be code compliant.

(use additional sheets if necessary)

Department Head Signature & Title: _____

 **JB**

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 12-13-2005.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter. (Planning Commission By-Laws, Article V, Section 3)
Comments received after the deadline will be distributed to the Members the night of the meeting.

**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
RECOMMENDATIONS**

Name of Applicant:	John Reyes; Star Builders 46405 Telegraph Rd, Amherst, OH 44001
Name of Owner:	Patton's Five Star Towing P.O. Box 450784, Westlake, OH 44145
Date of Planning Commission Meeting:	Tuesday, May 14, 2019
Date to Return to Deputy Clerk of Council:	Thursday, May 02, 2019
Regarding:	New construction of 6,000-square-foot building for towing and impound company. Property located at 31684 Cook Road, west of the Cuyahoga-Lorain County, in a B-3 zoning district. Permanent Parcel No. 07-00-004-110-037

Recommendations:

1. A complete wetlands delineation report shall be submitted.
2. An approved USACE permit shall be submitted to the City.
3. Complete detailed improvement plans, and storm water management and water quality calculations need to be submitted to the Engineering Department for review and approval.
4. Trip Generation Report needs to be provided by a licensed engineer which shows that the peak hour trips are less than 100. Otherwise, a traffic impact study per NRCO 1210.06 is required.
5. Offsite drainage shall be accommodated.
5. Check James Brewer, of Engineering, for new building backflow requirements.
6. A variance must be obtained for gravel lot.
7. Commercial aprons are required to be eight inches of concrete on four inches of aggregate base.
8. A Tree Planting plan is required for new commercial developments.
9. Sidewalk to be installed, along frontage, per Codified Ordinances.

(Use additional sheets if necessary.)

Department Head Signature:  Title: City Engineer

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 03-22-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
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Recommendations:

(Use additional sheets if necessary.)

Department Head Signature: _____

Title: [Select Title...]

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 03-22-2019.

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Permanent Parcel No. 07-00-004-110-037

Recommendations:

Please contact Asst. Chief Mike Uhnak to discuss the following code requirements of the Ohio Fire Code.
North Ridgeville Fire Department
Fire Prevention
(440)653-6362

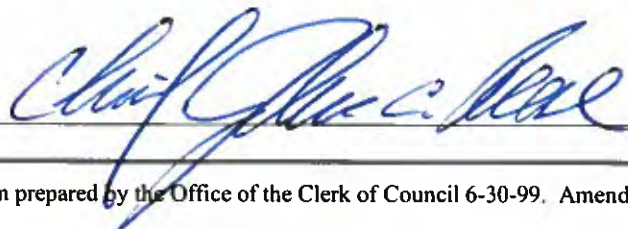
1-OFC Rule 5 Fire Service Features
Section 503 Fire Access Roads
Section 506 Key Boxes
Section 507 Fire Protection Water Supply

2-OFC Rule 33 Fire Safety During Construction And Demolition

Thanks for your cooperation.

(Use additional sheets if necessary.)

Department Head Signature: _____



Title: Fire Chief

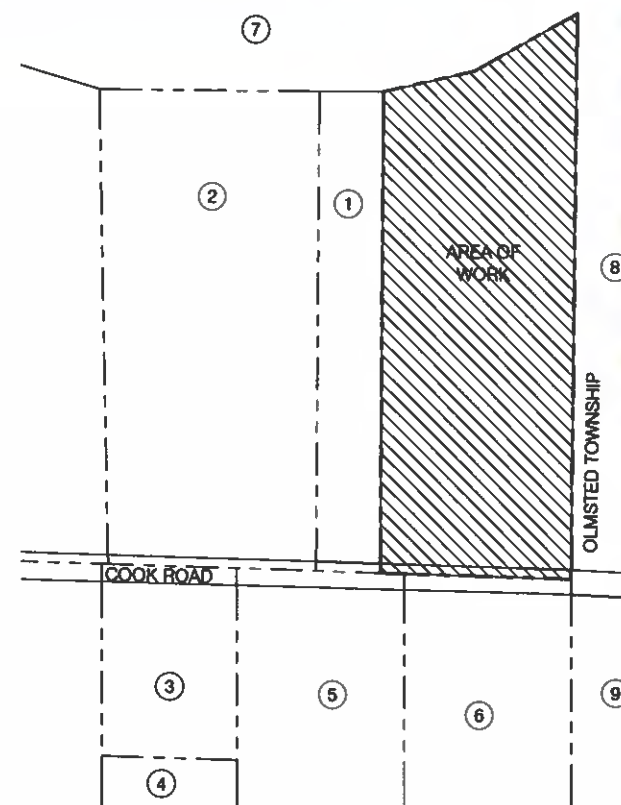
Form prepared by the Office of the Clerk of Council 6-30-99. Amended 03-22-2019.

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(Planning Commission By-Laws, Article V, Section 3)

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SITE LOCATOR MAP



Adjoining Properties
1" = 100'-0"

SITE DATA:

P.P.N. 0700004110037

SITE AREA 3.12 ACRES

ZONING CLASSIFICATION.
THE SUBJECT PREMISES IS LOCATED WITHIN ZONE (B-3) 'HIGHWAY
COMMERCIAL DISTRICT' AS SHOWN ON THE ZONE MAP FOR THE CITY
OF NORTH RIDGEVILLE.

LOT REQUIREMENTS:
1.00 ACRE MINIMUM
150 FEET OF FRONTAGE MINIMUM
25% LOT COVERAGE MAXIMUM

BUILDING REQUIREMENTS:
65 FEET MAXIMUM BUILDING HEIGHT
50 FEET MINIMUM BUILDING FRONT YARD SETBACK
WITH 10 FOOT UNOBTSTRUCTED BUFFER STRIP
35 FEET TOTAL MINIMUM BUILDING SIDE YARD SETBACK
EACH SIDE YARD SHALL NOT BE LESS THAN 15 FEET
40 FEET MINIMUM BUILDING REAR YARD SETBACK

PARKING REQUIREMENTS:
0 FEET MINIMUM FRONT YARD SETBACK
0 FEET MINIMUM SIDE & REAR YARD SETBACK
10 FEET BY 20 FEET PARKING SPACE DIMENSION
25 FEET DRIVE ISLE
1 SPACE PER 2 EMPLOYEES ON MAX WORKING SHIFT
PLUS ENOUGH SPACES FOR VEHICLES USED IN
CONNECTION THEREWITH

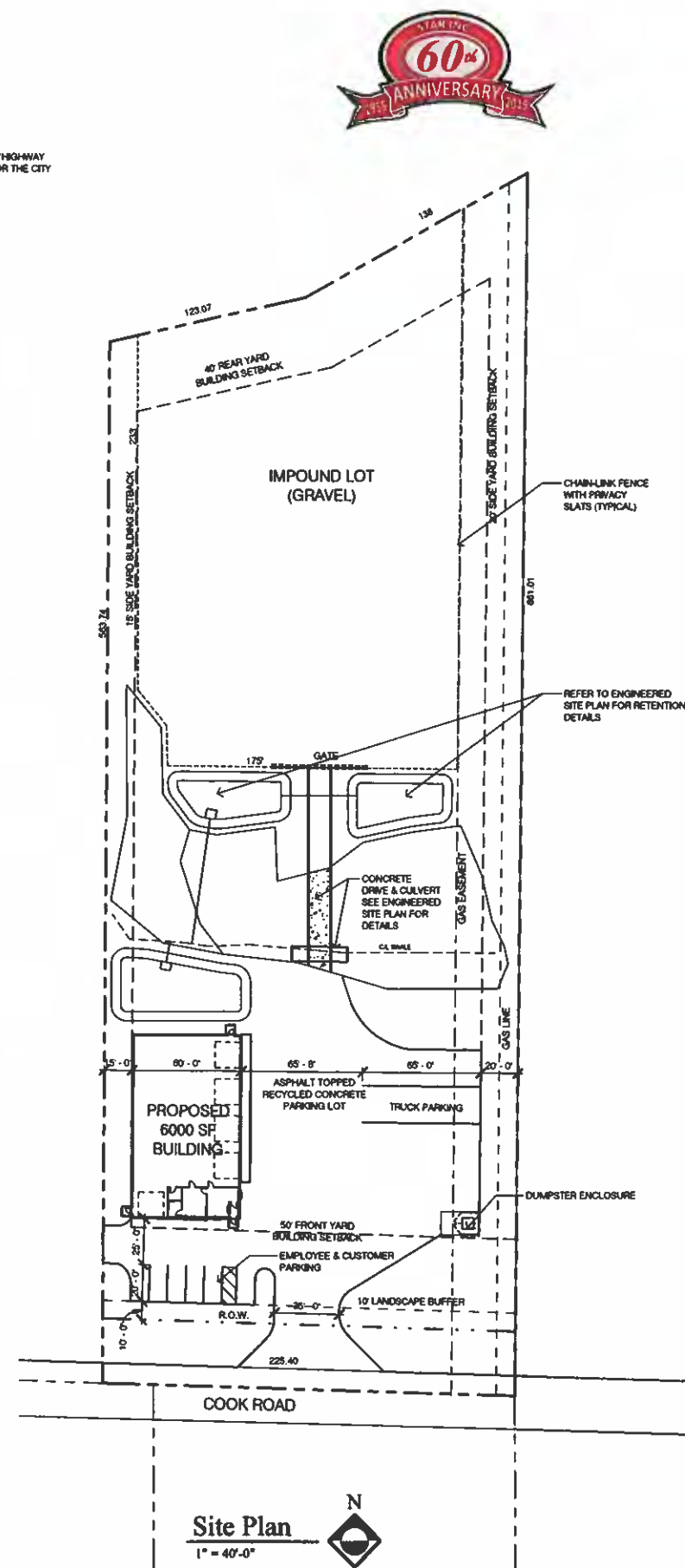
2 TRUCK SPACES PROVIDED
6 EMPLOYEE/CUSTOMER SPACES PROVIDED

AREA SUMMARY

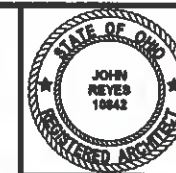
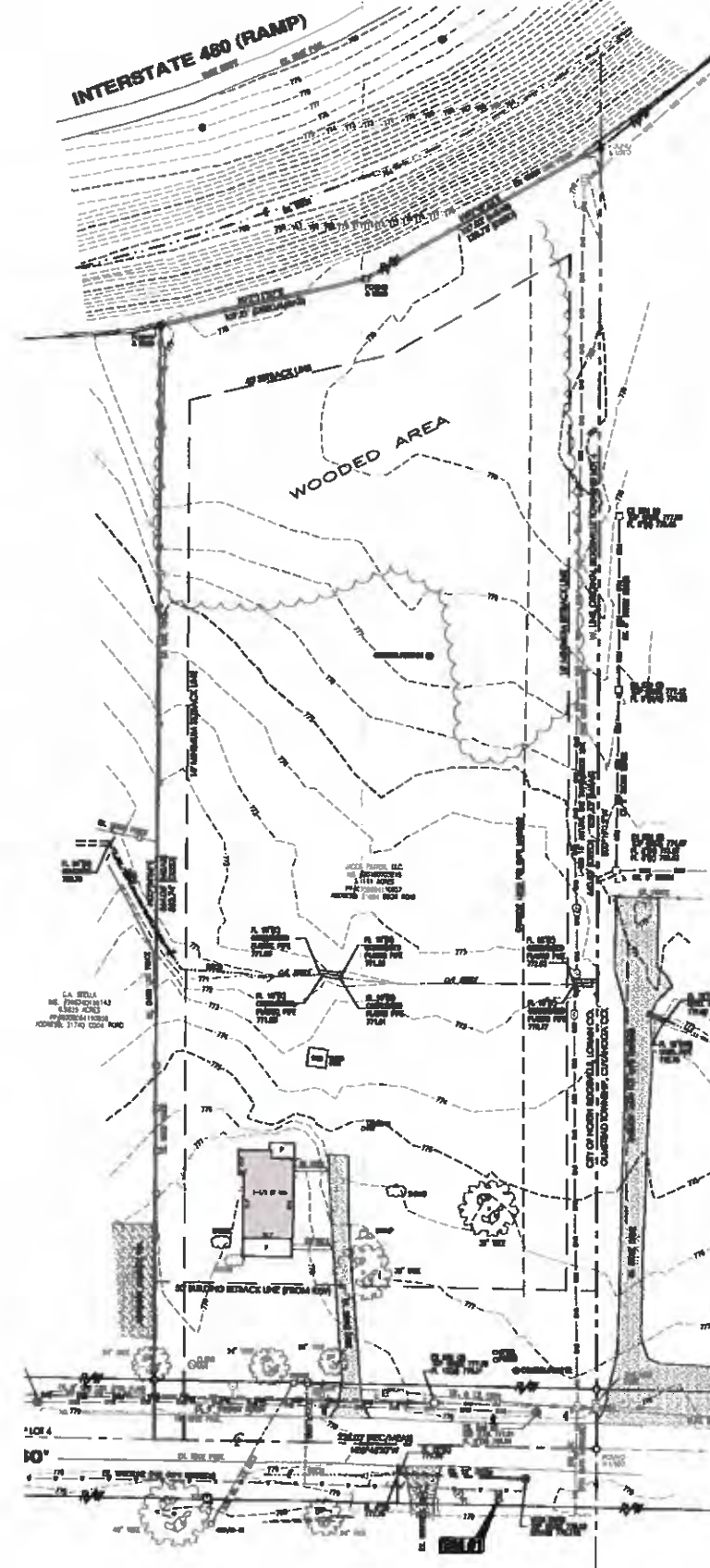
BUILDING	6,000 SF
----------	----------

Adjoining Property Owner:

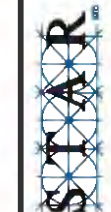
- ✓ **Cherie A. Stalla**
31740 Clark Street
North Ridgeville, OH 44039
0700004110038
- ~~**William Robert Taylor**
31828 Woodbridge Way
Avon Lake, OH 44012
0700004110028~~
- ~~**31819 Cook Road**
North Ridgeville, OH 44039
0700003102044~~
- ~~**31728 Cook Road**
North Ridgeville, OH 44039
0700003102043~~
- ✓ **Marie Wichmann**
31735 Cook Road
North Ridgeville, OH 44039
0700003102034
- ✓ **Richard & Susan Kennedy**
31615 Cook Road
North Ridgeville, OH 44039
0700003102018
- State of Ohio Right of Way**
906 N. Clark Street
Ashland, OH 44805
0700004110027
0700004110029
0700004110051
0700004110053
8. **Cook Road Investments, LLC**
23375 Commerce Park Rd.
Beachwood, OH 44122
28405002
(Elimated) Township Jurisdiction
9. **Alan Martin**
6100 Rockdale Woods Blvd.
Unit # 225
Independence, OH 44131
28405002
(Elimated) Township Jurisdiction



TOPOGRAPHIC SURVEY
PART OF ORIGINAL RIDGEFIELD TOWNSHIP LOT NO. 4
CITY OF NORTH RIDGEVILLE, LORAIN COUNTY, OHIO
ADDRESS: 31684 COOK ROAD



John Reyes, #0410842
Expiration Date: 12/31/201



P.O. Box 1477
4405 T. Douglas Road
Lumbert, Okla 44001
Phone (405) 966-2222
Fax (405) 966-2069



100

Pattons Towing
Proposed New Building
3131 684 Cook Rd. North Ridgeville, OH

100

Site Plan

Architect
John Reyes
Designer

Matter Project Number 18-10005

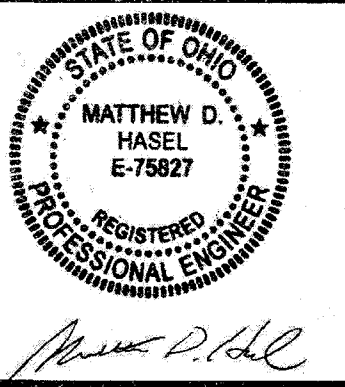
2019-03-19

L2.1

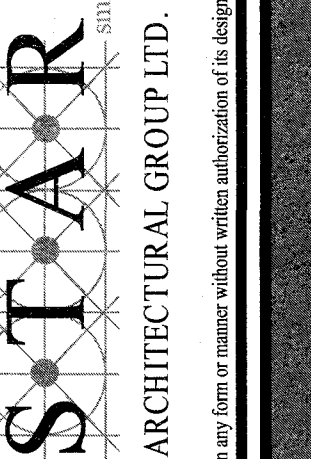
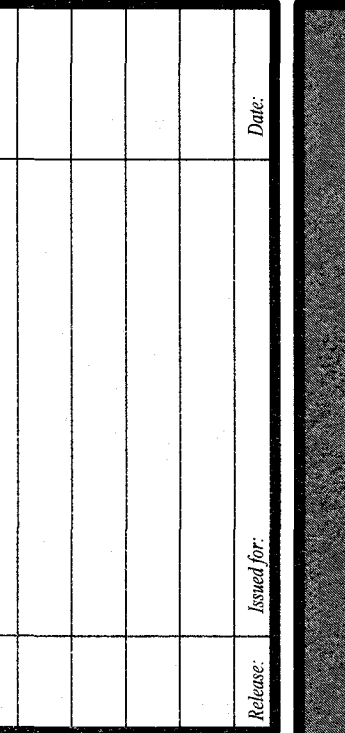
PROJECT DESCRIPTION
CONSTRUCTION OF A 6,000 SF BUILDING WITH AN ASPHALT
PARKING LOT, CONCRETE DRIVE, GRAVEL IMPOUND LOT, AND
ACCOMPANYING DETENTION BASINS.



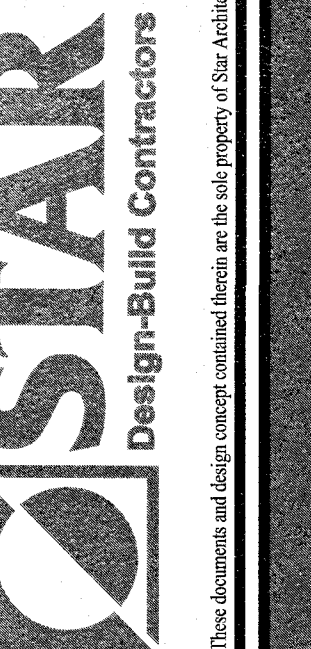
NOT FOR CONSTRUCTION OR FINAL ENGINEERING
REVIEW - FOR PURPOSE OF OBTAINING PLANNING
APPROVAL AND USACE PERMITTING



Matthew D. Hasel, #75827
Expiration Date: 12/31/2019



P.O. Box 109
46405 Telegraph Road
Amherst, Ohio 44001-0109
phone (440) 986-8022
fax (440) 986-3360
<http://www.startinc.cc>



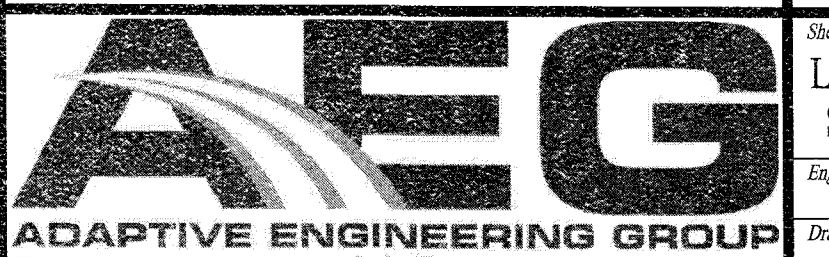
Know what's below.
Call before you dig.

SURVEY COMPLETED BY:
F.E. KROCKA & ASSOCIATES, INC.
44 EAST MAIN STREET
SHELBY, OHIO 44875
(419) 342-4556

NATHAN W. SAUTTER: OHIO
REGISTERED SURVEYOR NO. 8252

DATE: MARCH 4, 2019

ENGINEERING PROVIDED BY:



260 SOUTH MAIN STREET, SUITE 218
AMHERST, OHIO 44001
TEL: 440-984-3536 WWW.ADAPTIVEENG.COM

Pattons Iowing
Proposed New Building
31684 Cook Rd., North Ridgeville

Information Map

Site Plan

er DH	C1.1
627 AB	
Number 10005	
-03-08	

SEE ARCHITECTURAL SITE PLAN SHEET L2.1 FOR ADDITIONAL SITE DETAILS

INDEX OF CIVIL SHEETS	
SITE LOCATION PLAN	C1.1
CIVIL GENERAL NOTES AND DETAILS	OMITTED FROM SET
EXISTING CONDITIONS SITE PLAN	C3.1
SURVEY SITE PLAN	C4.1
UTILITY SITE PLAN	C5.1
PROPOSED CONDITIONS SITE PLANS	C6.1-C6.2
PROPOSED ELEVATION SITE PLANS	OMITTED FROM SET
DETENTION BASIN SITE PLANS AND OUTLET STRUCTURE DETAILS	OMITTED FROM SET
STORMWATER POLLUTION PREVENTION PLAN	C8.7-C8.8 (C8.1-8.8 OMITTED FROM SET)
TOPOGRAPHICAL SURVEY AS COMPLETED BY F.E. KROCKA AND ASSOCIATES, INC.	

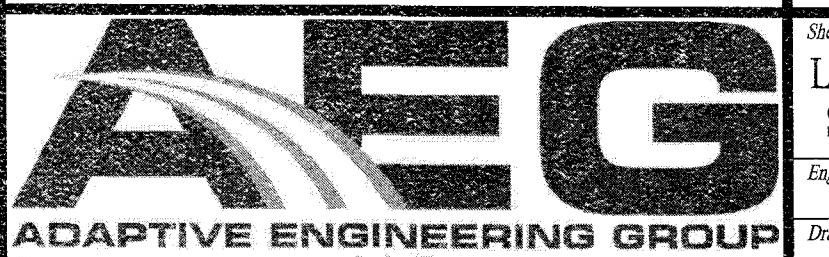
UNDERGROUND UTILITIES

CONTACT BOTH SERVICES TWO WORKING DAYS
BEFORE YOU DIG.

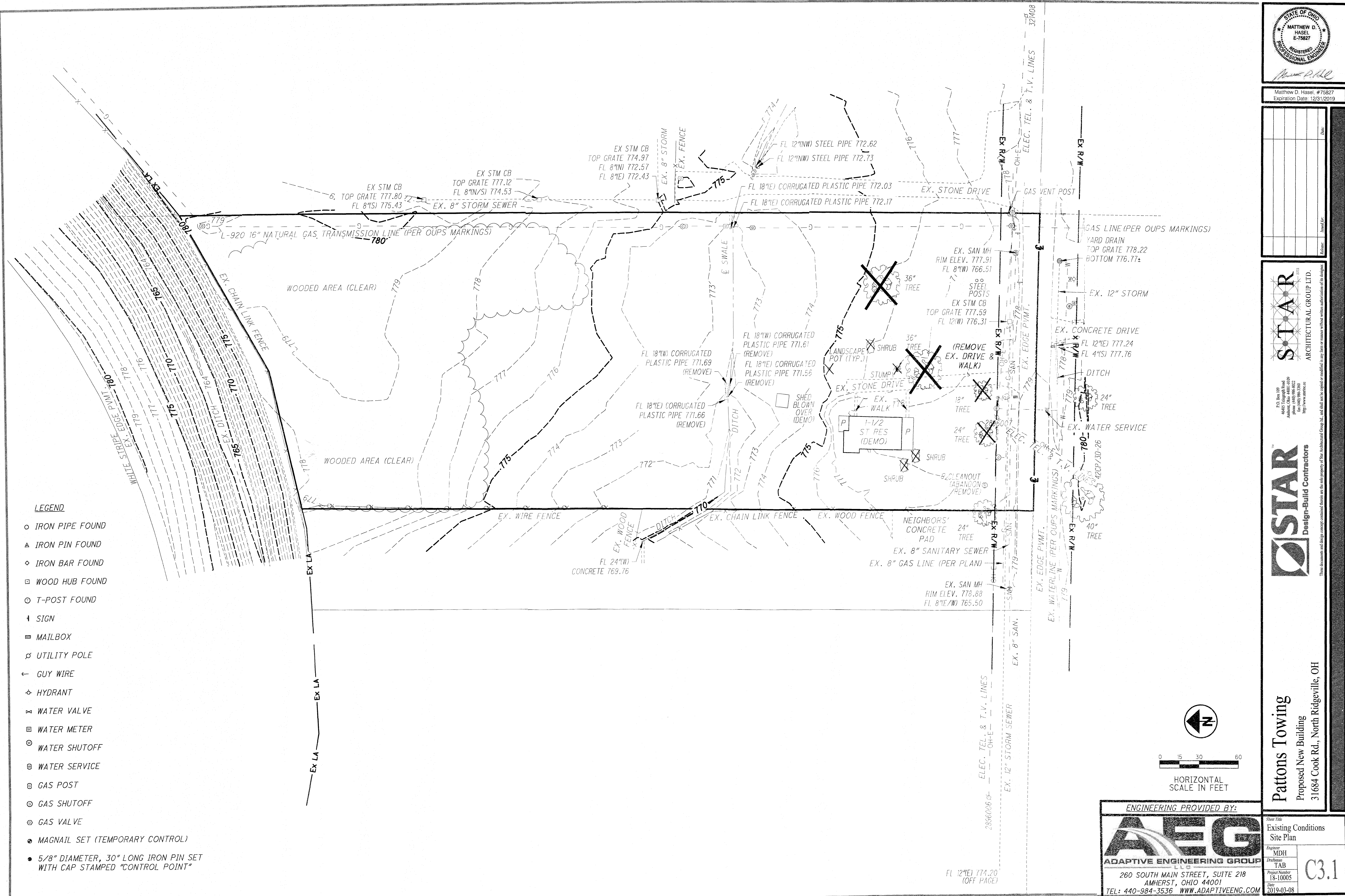


Call Before You Dig
1-800-362-2764

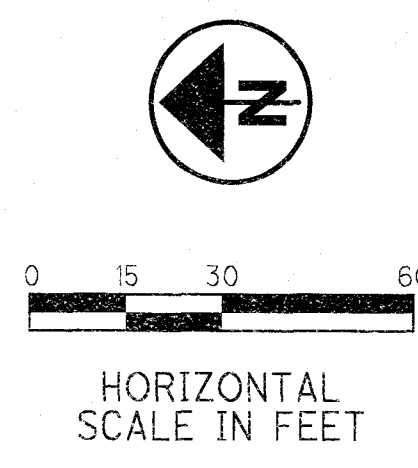
6	(Non-members must be called directly)
7	OIL & GAS PRODUCERS
	UNDERGROUND PROTECTION SERVICE
	1-800-925-0988



260 SOUTH MAIN STREET, SUITE 218
AMHERST, OHIO 44001
TEL: 440-984-3536 WWW.ADAPTIVEENG.COM



- LEGEND**
- IRON PIPE FOUND
 - ▲ IRON PIN FOUND
 - ◇ IRON BAR FOUND
 - ▣ WOOD HUB FOUND
 - T-POST FOUND
 - ↑ SIGN
 - ▣ MAILBOX
 - ⊙ UTILITY POLE
 - ← GUY WIRE
 - ⊕ HYDRANT
 - ⊗ WATER VALVE
 - ⊗ WATER METER
 - ⊗ WATER SHUTOFF
 - ⊗ WATER SERVICE
 - ⊗ GAS POST
 - ⊗ GAS SHUTOFF
 - ⊗ GAS VALVE
 - MAGNAIL SET (TEMPORARY CONTROL)
 - 5/8" DIAMETER, 30" LONG IRON PIN SET WITH CAP STAMPED "CONTROL POINT"



ENGINEERING PROVIDED BY:

AEG
ADAPTIVE ENGINEERING GROUP LLC

260 SOUTH MAIN STREET, SUITE 218
AMHERST, OHIO 44001
TEL: 440-984-3536 WWW.ADAPTIVEENG.COM

Sheet Title Existing Conditions Site Plan	
Engineer MDH	C3.1
Draftsman TAB	
Project Number 18-10005	
Date 2019-03-08	

STATE OF OHIO
MATTHEW D. HASEL
E-19827
REGISTERED PROFESSIONAL ENGINEER

Matthew D. Hasel, #75827
Expiration Date: 12/31/2019

Author	Drawn By	Check By

STAR
ARCHITECTURAL GROUP LTD.

170 E. 1st St.
44605 Amherst, Ohio 44001-0109
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fax: (440) 984-8222
http://www.starinc.co

STAR
Design-Build Contractors

Pattons Towing
Proposed New Building
31684 Cook Rd., North Ridgeville, OH



STATE OF OHIO
MATTHEW D. HASSEL
E-75827
REGISTERED PROFESSIONAL ENGINEER

Matthew D. Hasel

[illegible]

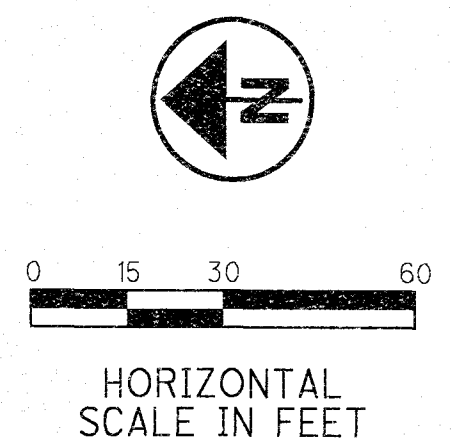
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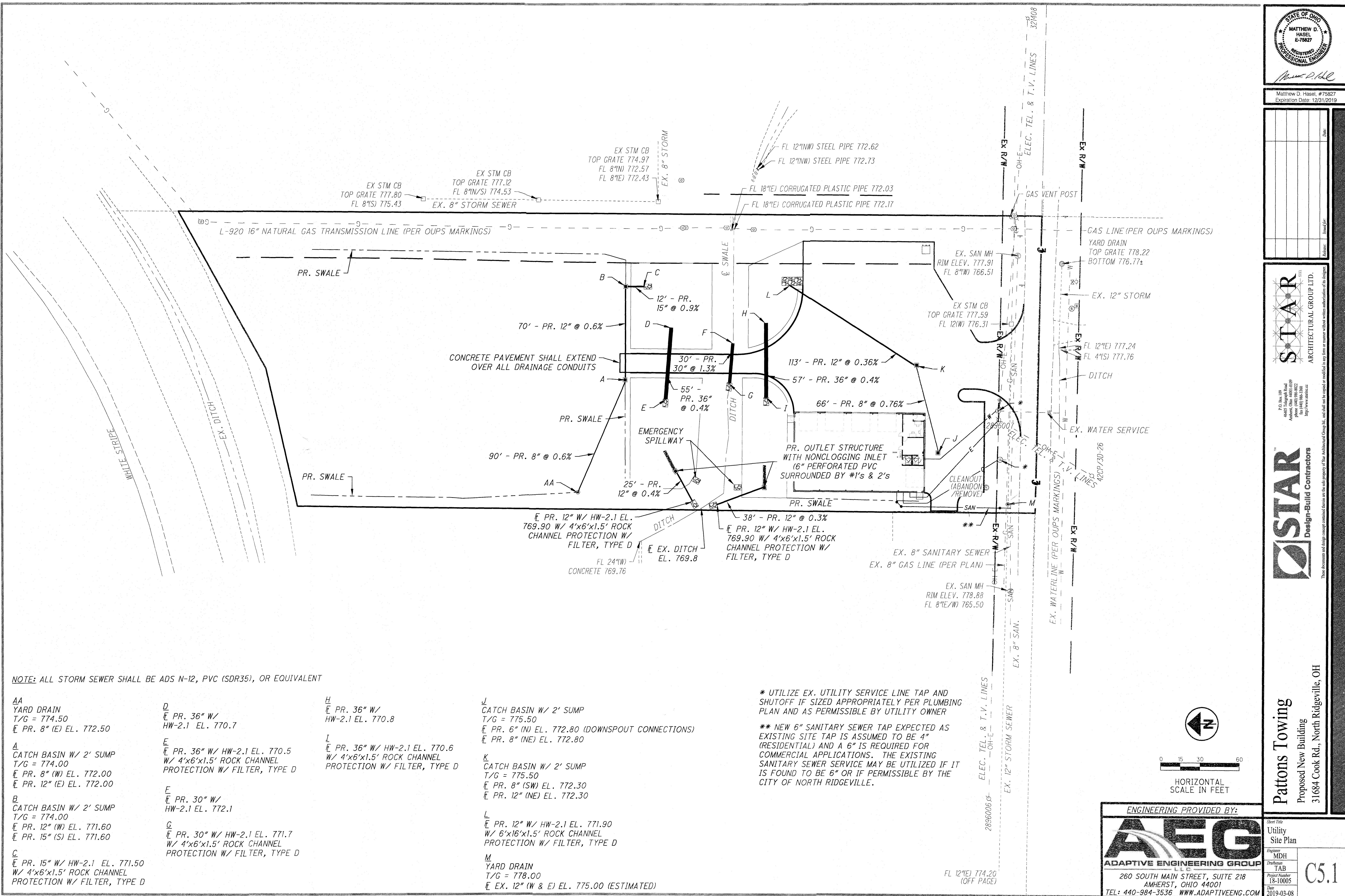
Pattons' Lowing
Proposed New Building
31684 Cook Rd., North Ridgeville, OH

Title	
Survey White Plan	
Author MDH	C4.1
Editor TAB	
Contract Number -10005	
Date 9-03-08	



AEG
ADAPTIVE ENGINEERING GROUP
 260 SOUTH MAIN STREET, SUITE 218
 AMHERST, OHIO 44001
 TEL: 440-984-3536 WWW.ADAPTIVEENG.COM

SYNAP	C4.1
TAB	
ct Number -10005	
9-03-08	



NOTE: ALL STORM SEWER SHALL BE ADS N-12, PVC (SDR35), OR EQUIVALENT

- AA**
YARD DRAIN
T/G = 774.50
E PR. 8" (E) EL. 772.50
- A**
CATCH BASIN W/ 2' SUMP
T/G = 774.00
E PR. 8" (W) EL. 772.00
E PR. 12" (E) EL. 772.00
- B**
CATCH BASIN W/ 2' SUMP
T/G = 774.00
E PR. 12" (W) EL. 771.60
E PR. 15" (S) EL. 771.60
- C**
E PR. 15" W/ HW-2.1 EL. 771.50
W/ 4'x6'x1.5' ROCK CHANNEL
PROTECTION W/ FILTER, TYPE D

- D**
E PR. 36" W/
HW-2.1 EL. 770.7
- E**
E PR. 36" W/ HW-2.1 EL. 770.5
W/ 4'x6'x1.5' ROCK CHANNEL
PROTECTION W/ FILTER, TYPE D
- F**
E PR. 30" W/
HW-2.1 EL. 772.1
- G**
E PR. 30" W/ HW-2.1 EL. 771.7
W/ 4'x6'x1.5' ROCK CHANNEL
PROTECTION W/ FILTER, TYPE D

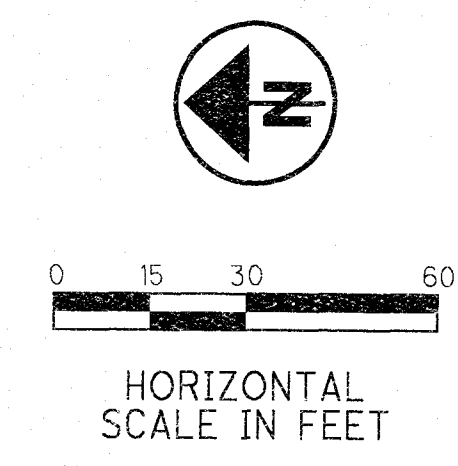
- H**
E PR. 36" W/
HW-2.1 EL. 770.8
- I**
E PR. 36" W/ HW-2.1 EL. 770.6
W/ 4'x6'x1.5' ROCK CHANNEL
PROTECTION W/ FILTER, TYPE D

- J**
CATCH BASIN W/ 2' SUMP
T/G = 775.50
E PR. 6" (N) EL. 772.80 (DOWNSPOUT CONNECTIONS)
E PR. 8" (NE) EL. 772.80
- K**
CATCH BASIN W/ 2' SUMP
T/G = 775.50
E PR. 8" (SW) EL. 772.30
E PR. 12" (NE) EL. 772.30

- L**
E PR. 12" W/ HW-2.1 EL. 771.90
W/ 6'x16'x1.5' ROCK CHANNEL
PROTECTION W/ FILTER, TYPE D
- M**
YARD DRAIN
T/G = 778.00
E EX. 12" (W & E) EL. 775.00 (ESTIMATED)

* UTILIZE EX. UTILITY SERVICE LINE TAP AND SHUTOFF IF SIZED APPROPRIATELY PER PLUMBING PLAN AND AS PERMISSIBLE BY UTILITY OWNER

** NEW 6" SANITARY SEWER TAP EXPECTED AS EXISTING SITE TAP IS ASSUMED TO BE 4" (RESIDENTIAL) AND A 6" IS REQUIRED FOR COMMERCIAL APPLICATIONS. THE EXISTING SANITARY SEWER SERVICE MAY BE UTILIZED IF IT IS FOUND TO BE 6" OR IF PERMISSIBLE BY THE CITY OF NORTH RIDGEVILLE.



ENGINEERING PROVIDED BY:

AEG

ADAPTIVE ENGINEERING GROUP

260 SOUTH MAIN STREET, SUITE 218
AMHERST, OHIO 44001
TEL: 440-984-3536 WWW.ADAPTIVEENG.COM

Sheet Title

Utility
Site Plan

Engineer	MDH
Draftsman	TAB
Project Number	18-10005
Date	2019-03-08

C5.1

STATE OF OHIO

MATTHEW D. HASEL
E-75827

REGISTERED
PROFESSIONAL ENGINEER

Matthew D. Hasel, #75827
Expiration Date: 12/31/2019

Date:	
Issued For:	
Revised:	

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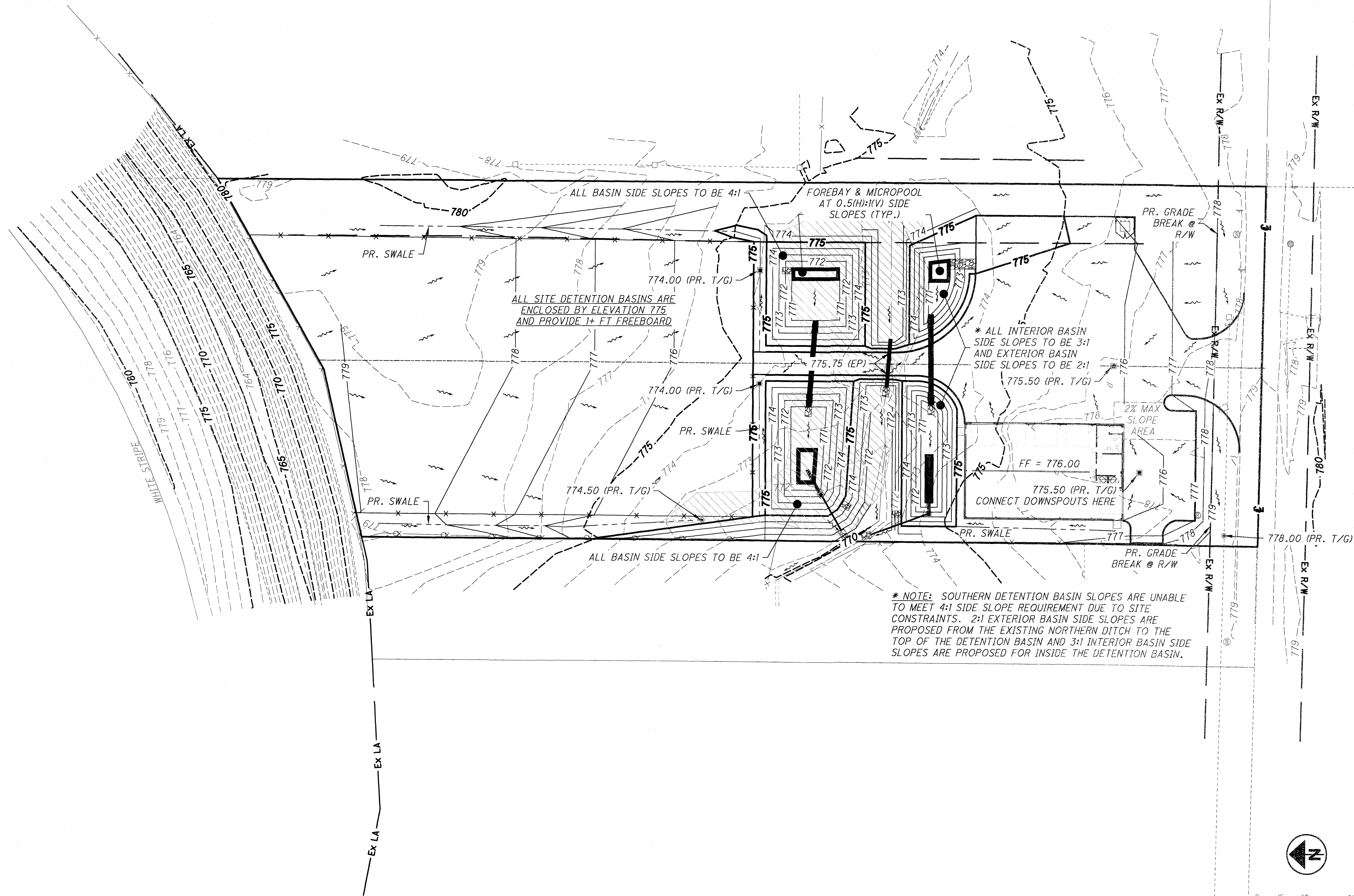
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Phone: (440) 984-8022
Fax: (440) 984-8022
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Design-Build Contractors

These documents and design concepts contained herein are the sole property of Star Architectural Group Ltd. and shall not be copied or modified in any form or manner without written authorization of its designers.

Pattons Towing
Proposed New Building
31684 Cook Rd., North Ridgeville, OH



Matthew D. Hasel, #75827
Expiration Date: 12/31/2019

DATE	REVISION

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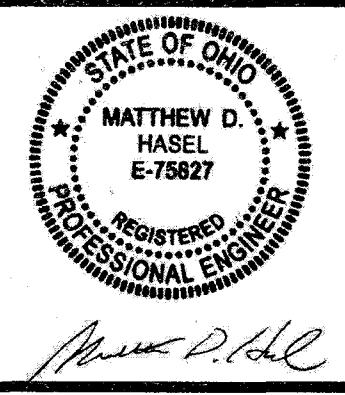
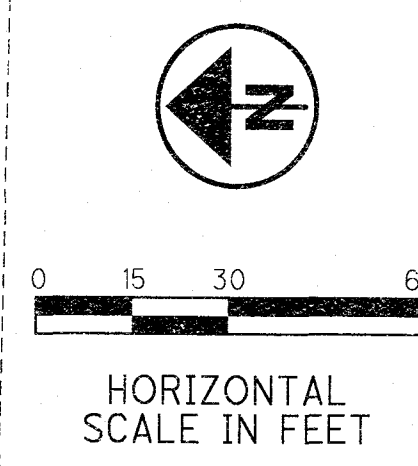
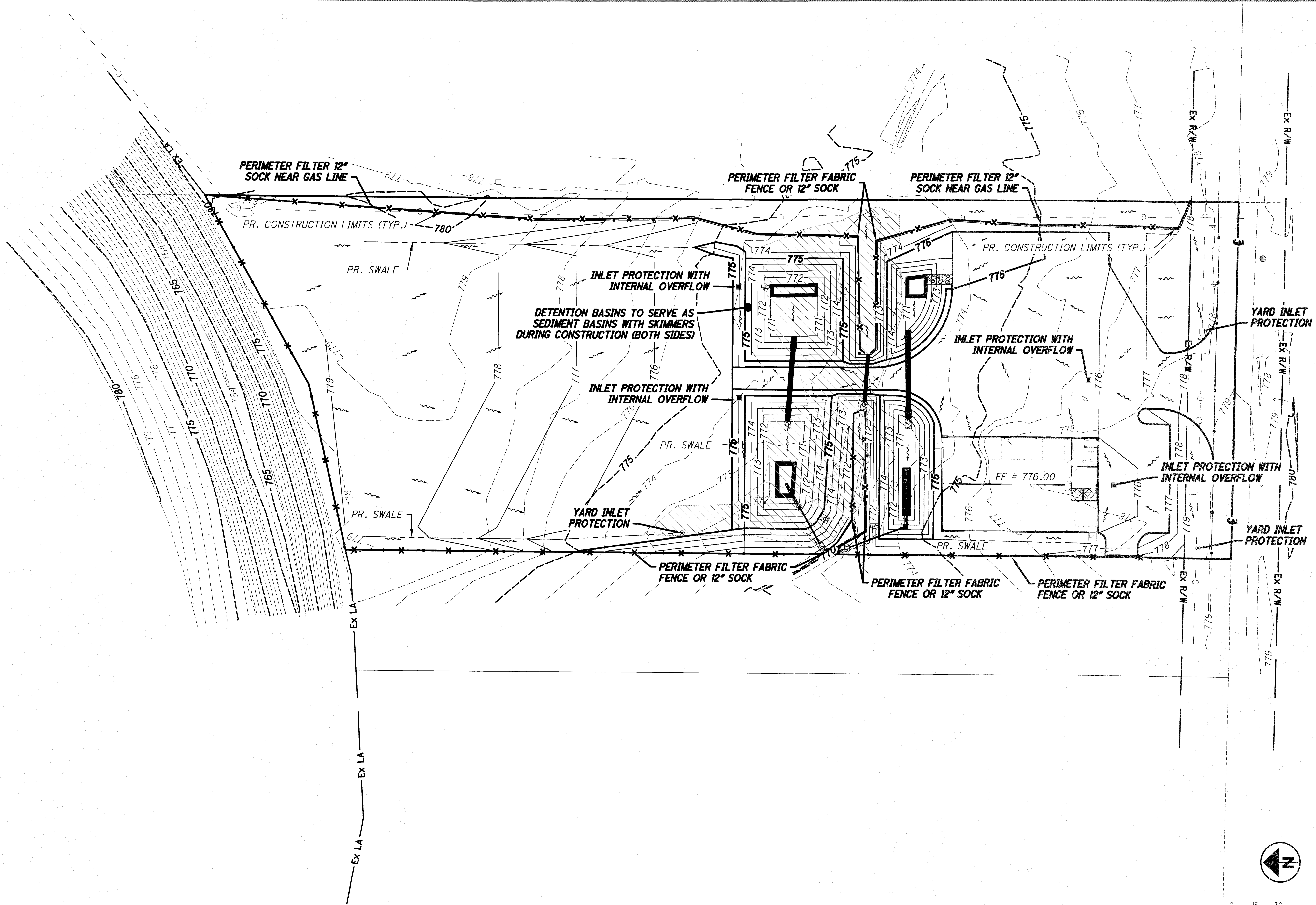
P.O. Box 199
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STAR
Design-Build Contractors

Pattons Towing
Proposed New Building
31684 Cook Rd., North Ridgeville, OH

ENGINEERING PROVIDED BY:
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ADAPTIVE ENGINEERING GROUP
260 SOUTH MAIN STREET, SUITE 218
AMHERST, OHIO 44001
TEL: 440-984-3536 WWW.ADAPTIVEENG.COM

Sheet Title
Proposed Conditions
Site Plan (Contours)
Engineer
MDH
Draftsman
TAB
Project Number
18-10005
Date
2019-03-08
C6.2



Matthew D. Hasel #75827
Expiration Date: 12/31/2019

Date	Revised For

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Pattons Towing
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31684 Cook Rd., North Ridgeville, OH

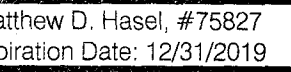
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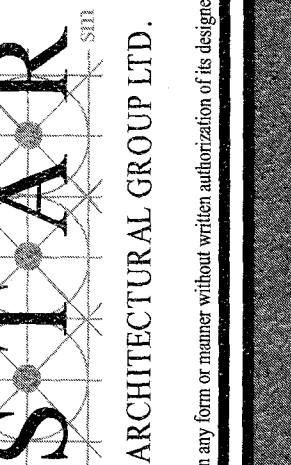
260 SOUTH MAIN STREET, SUITE 218
AMHERST, OHIO 44001
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Sheet Title	Stormwater Pollution Prevention Plan
Engineer	MDH
Draftsman	TAB
Project Number	18-10005
Date	2019-03-08

C8.7



Matthew D. Hasel, #75827
Expiration Date: 12/31/2019

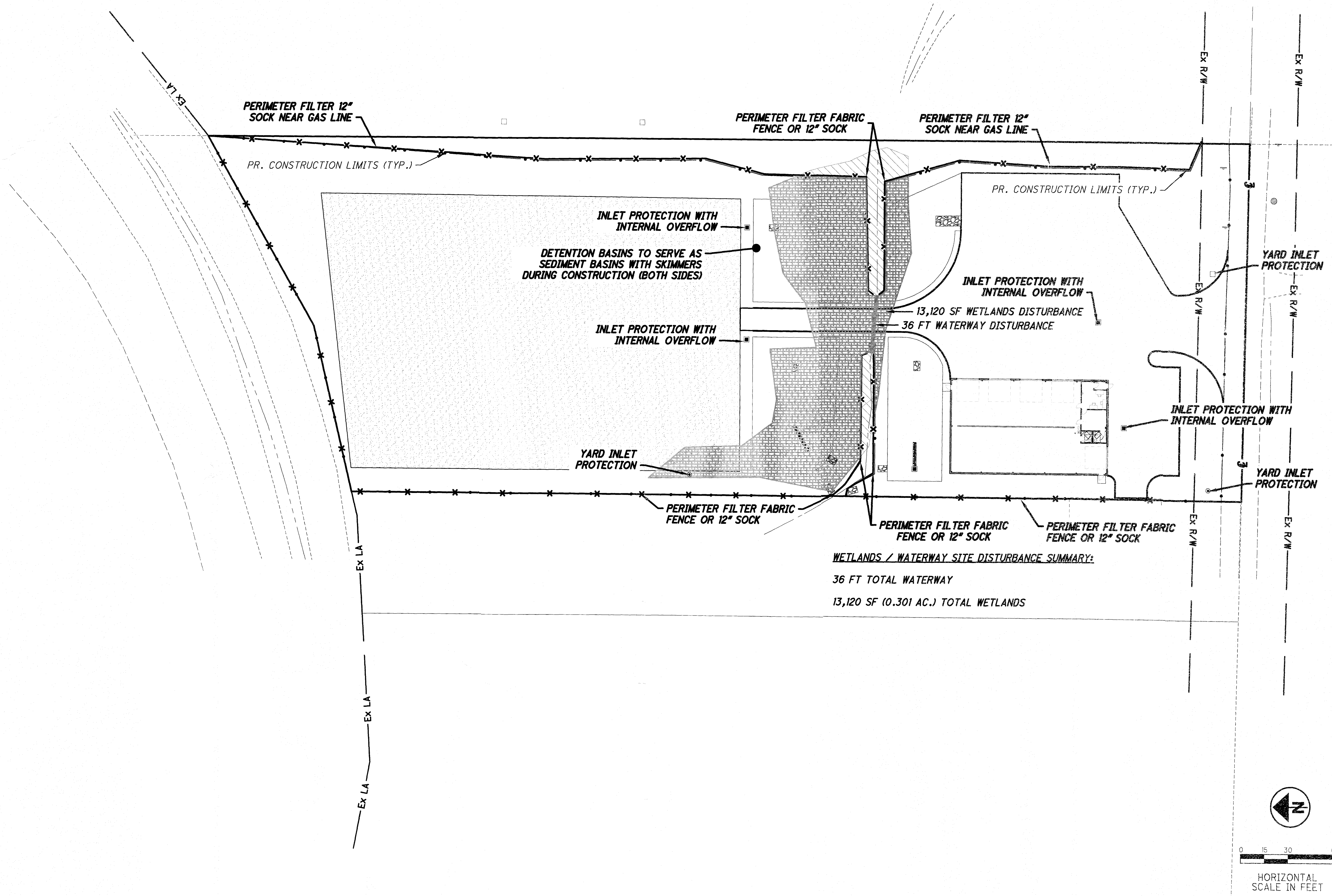


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Proposed New Building
31684 Cook Rd., North Ridgeville, OH

Number	C8.7
Year	2005
Month	03-08



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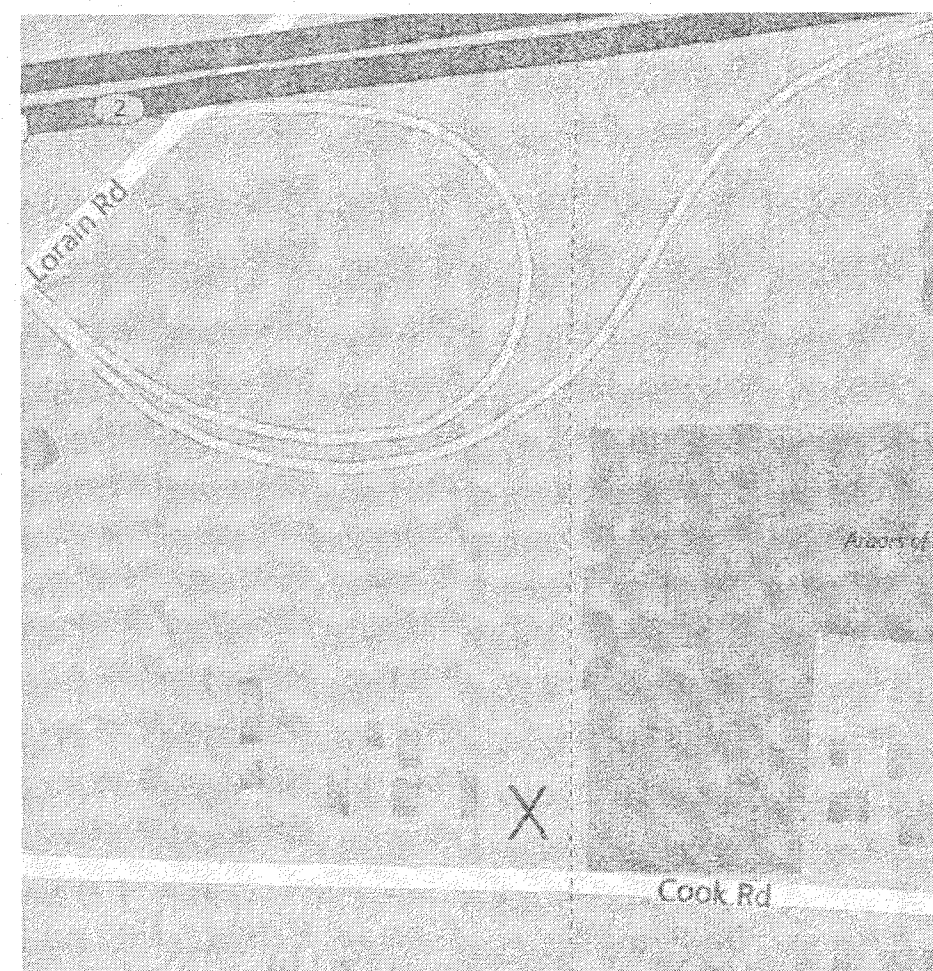
ADAPTIVE ENGINEERING GROUP
LLC

260 SOUTH MAIN STREET, SUITE 218
ANWERS, OHIO 44001

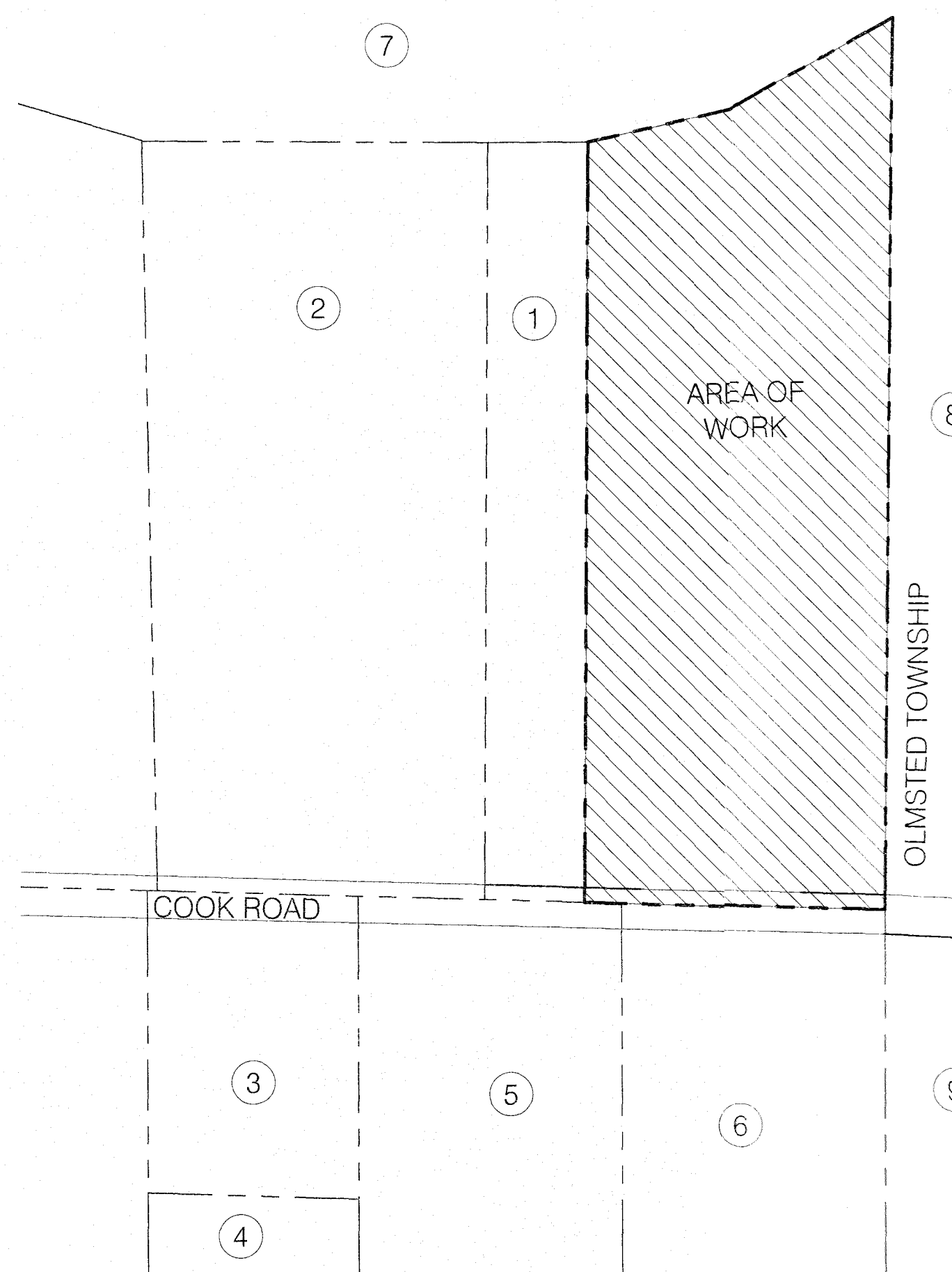
TEL: 440-984-3536 WWW.ADAPTIVEENG.COM



BOTTOM OF SIGN TO BE MOUNTED 5'-0" ABOVE GRADE



SITE LOCATOR MAP



Adjoining Properties

1" = 100'-0"

SITE DATA:

P.P.N. 0700004110037
SITE AREA 3.12 ACRES

ZONING CLASSIFICATION:
THE SUBJECT PREMISES IS LOCATED WITHIN ZONE (B-3) "HIGHWAY COMMERCIAL DISTRICT" AS SHOWN ON THE ZONE MAP FOR THE CITY OF NORTH RIDGEVILLE.

LOT REQUIREMENTS:
1.00 ACRE MINIMUM
150 FEET OF FRONTAGE MINIMUM
25% LOT COVERAGE MAXIMUM

BUILDING REQUIREMENTS:
65 FEET MAXIMUM BUILDING HEIGHT
60 FEET MINIMUM BUILDING FRONT YARD SETBACK
WITH 10 FOOT UNOBSTRUCTED BUFFER STRIP
35 FEET TOTAL MINIMUM BUILDING SIDE YARD SETBACK
EACH SIDE YARD SHALL NOT BE LESS THAN 15 FEET
40 FEET MINIMUM BUILDING REAR YARD SETBACK

PARKING REQUIREMENTS:
0 FEET MINIMUM FRONT YARD SETBACK
0 FEET MINIMUM SIDE & REAR YARD SETBACK
10 FEET BY 20 FEET PARKING SPACE DIMENSION
25 FEET DRIVE ISLE
1 SPACE PER 2 EMPLOYEES ON MAX WORKING SHIFT
PLUS ENOUGH SPACES FOR VEHICLES USED IN CONNECTION THEREWITH

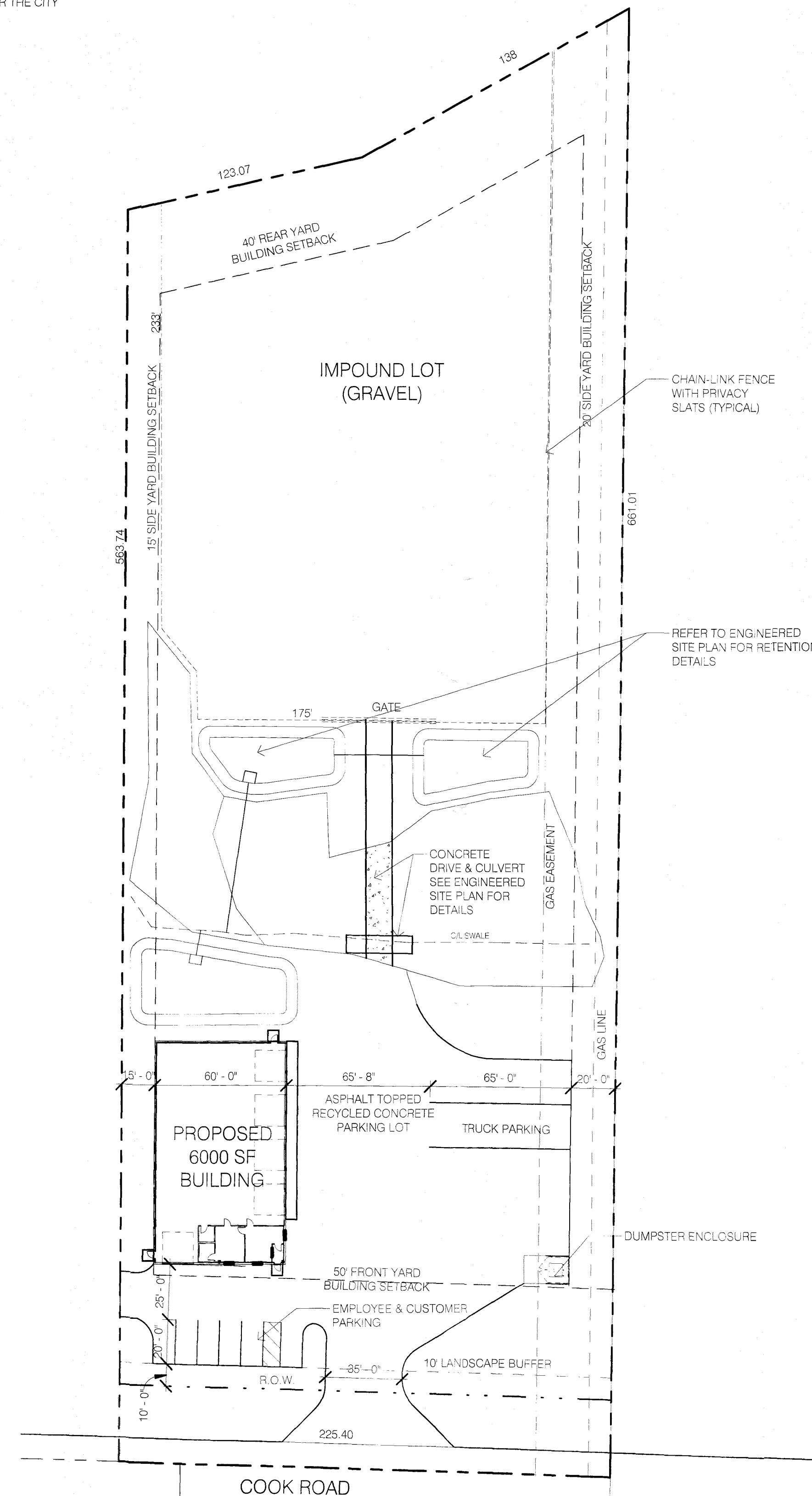
2 TRUCK SPACES PROVIDED
6 EMPLOYEE/CUSTOMER SPACES PROVIDED

AREA SUMMARY:

BUILDING 6,000 SF

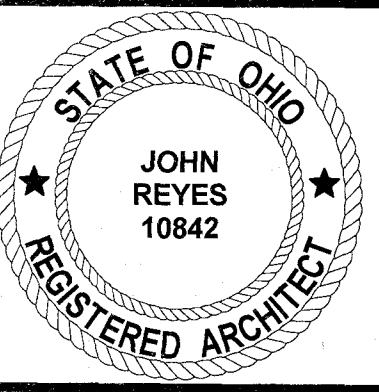
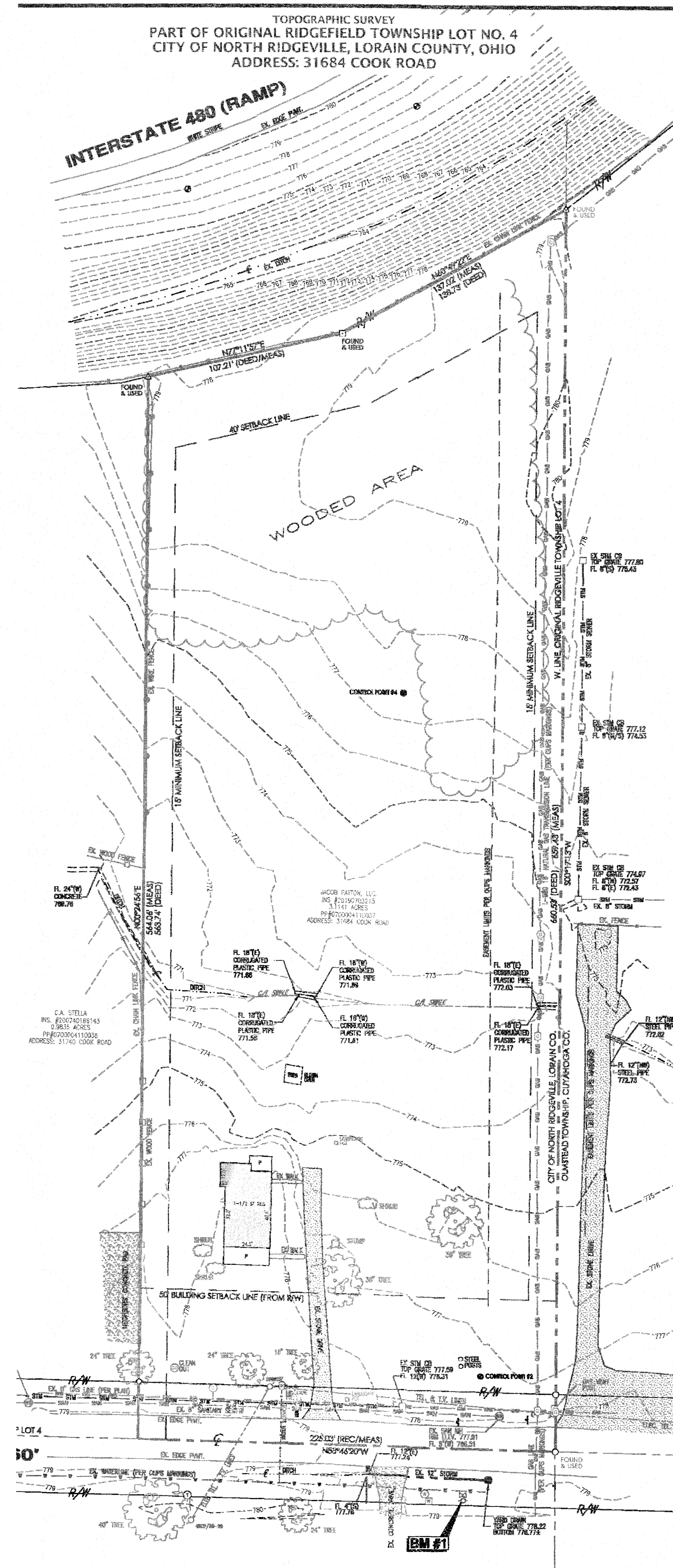
Adjoining Property Owners:

- Charles A. Stella
31740 Cook Road
North Ridgeville, OH 44039
0700004110038
- Michael & Mary Kay Turner
31828 Woodbridge Way
Avon Lake, OH 44012
0700004110028
- Steven & Anna Michel
31819 Cook Road
North Ridgeville, OH 44039
0700003102044
- Marie Wichmann
31735 Cook Road
North Ridgeville, OH 44039
0700003102043
- Marie Wichmann
31735 Cook Road
North Ridgeville, OH 44039
0700003102034
- Richard & Susan Kennedy
31815 Cook Road
North Ridgeville, OH 44039
0700003102018
- State of Ohio Right of Way
936 N. Clark Street
Ashland, OH 44805
0700004110027
0700004110029
0700004110031
0700004110033
- Cook Road Investments, LLC
23775 Commerce Park Rd.
Beachwood, OH 44122
26405002
(Crimsted Township Jurisdiction)
- Alan Martin
6100 Rockside Woods Blvd.
Unit # 225
Independence, OH 44131
26405003
(Olmsted Township Jurisdiction)



Site Plan

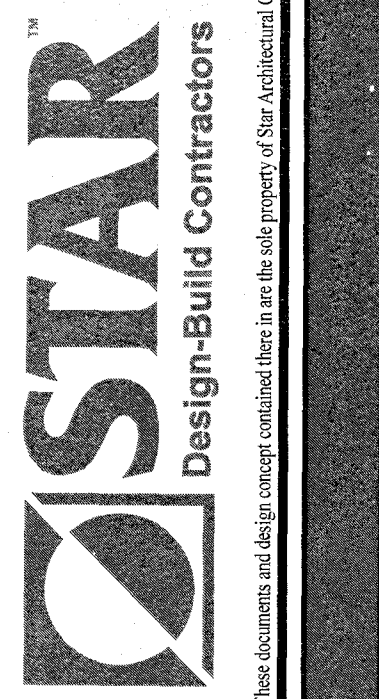
1" = 40'-0"



John Reyes, #9410842
Expiration Date: 12/31/2019

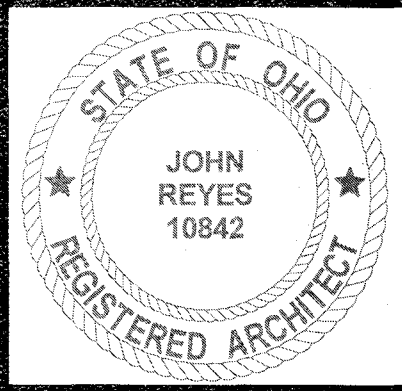
Project No.	Sheet No.	Date

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Pattons Towing
Proposed New Building
31684 Cook Rd. North Ridgeville, OH

Site Title	Sheet Title
Site Plan	L2.1
Architect John Reyes	
Designer Mitter	
Project Number 18-10005	
Date 2019-03-19	



John Reyes, #9410842
Expiration Date: 12/31/2019

	Drawn
	Checked
	Reviewed
	Approved

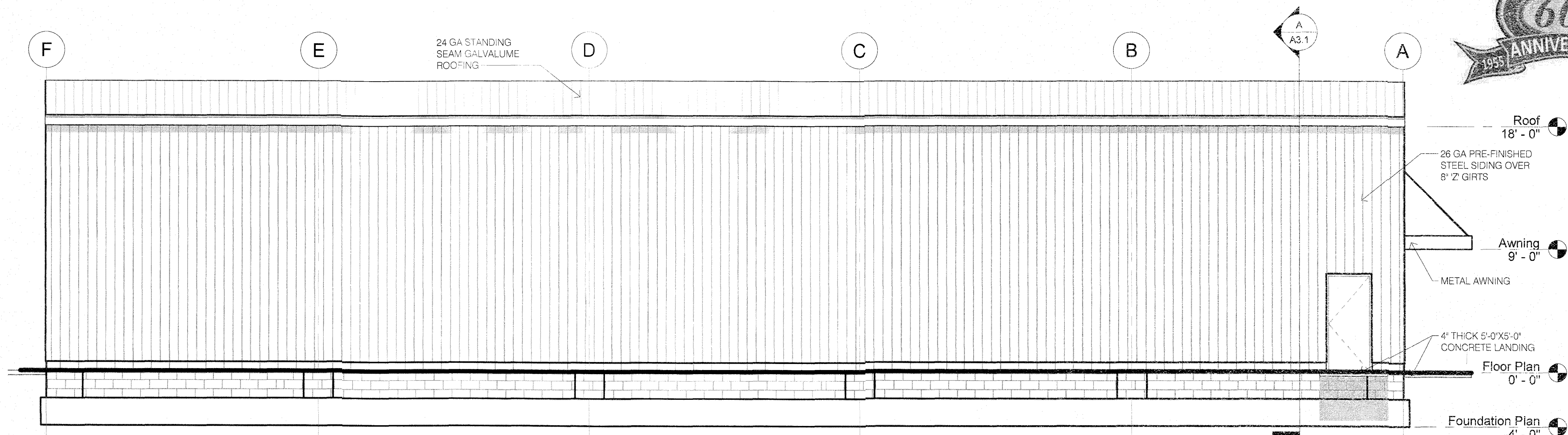
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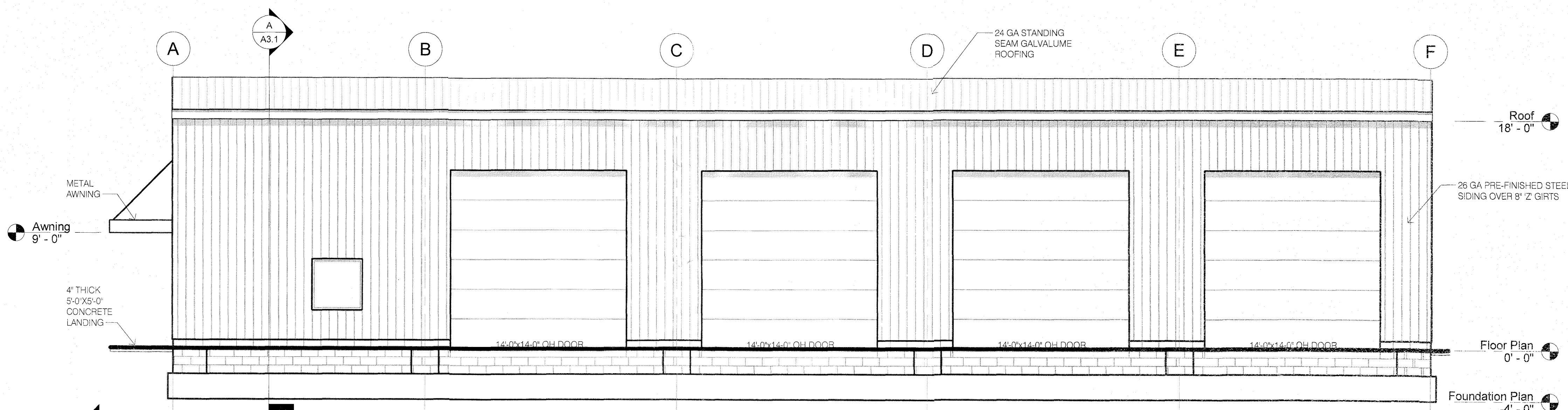
Pattons Towing
Proposed New Building
31684 Cook Rd. North Ridgeville, OH

Sheet Title
Elevations
Architect: John Reyes
Designer: Mitter
Project Number: 19-00017
Date: 2019-03-23
A1.1



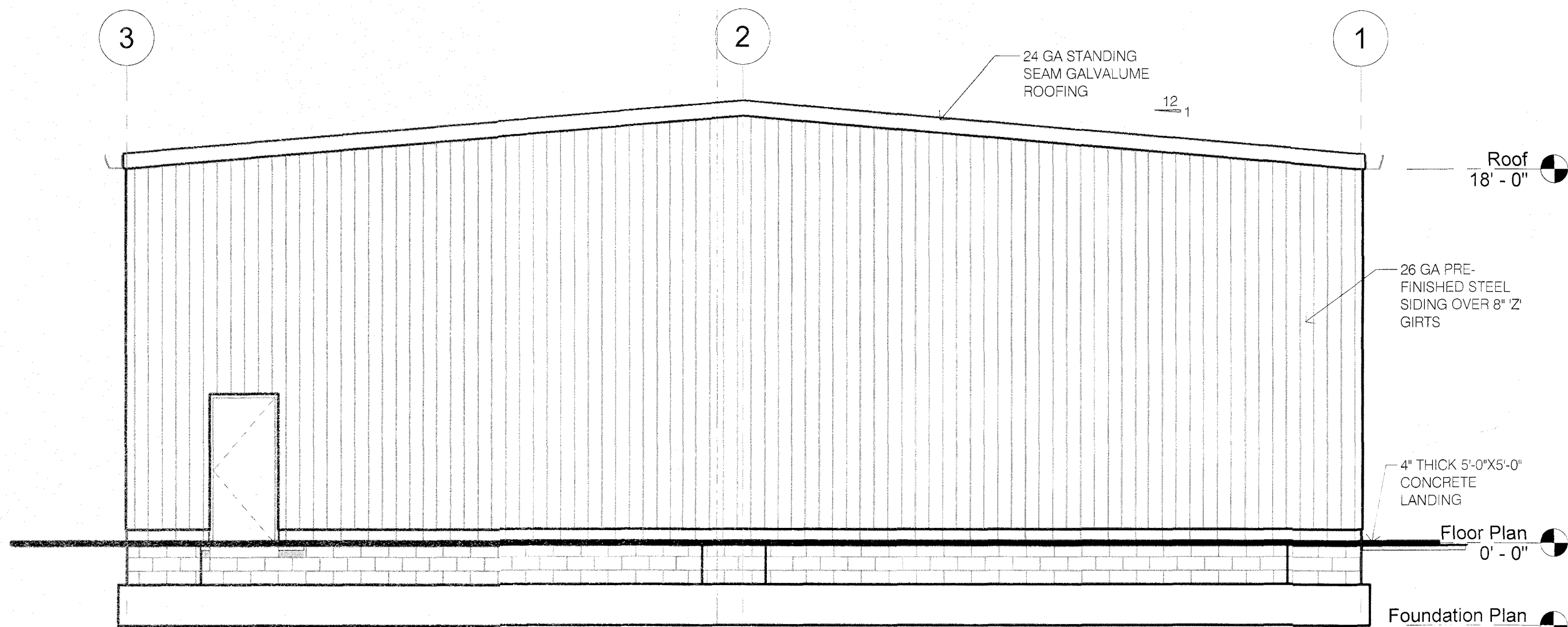
West Elevation

3/16" = 1'-0"



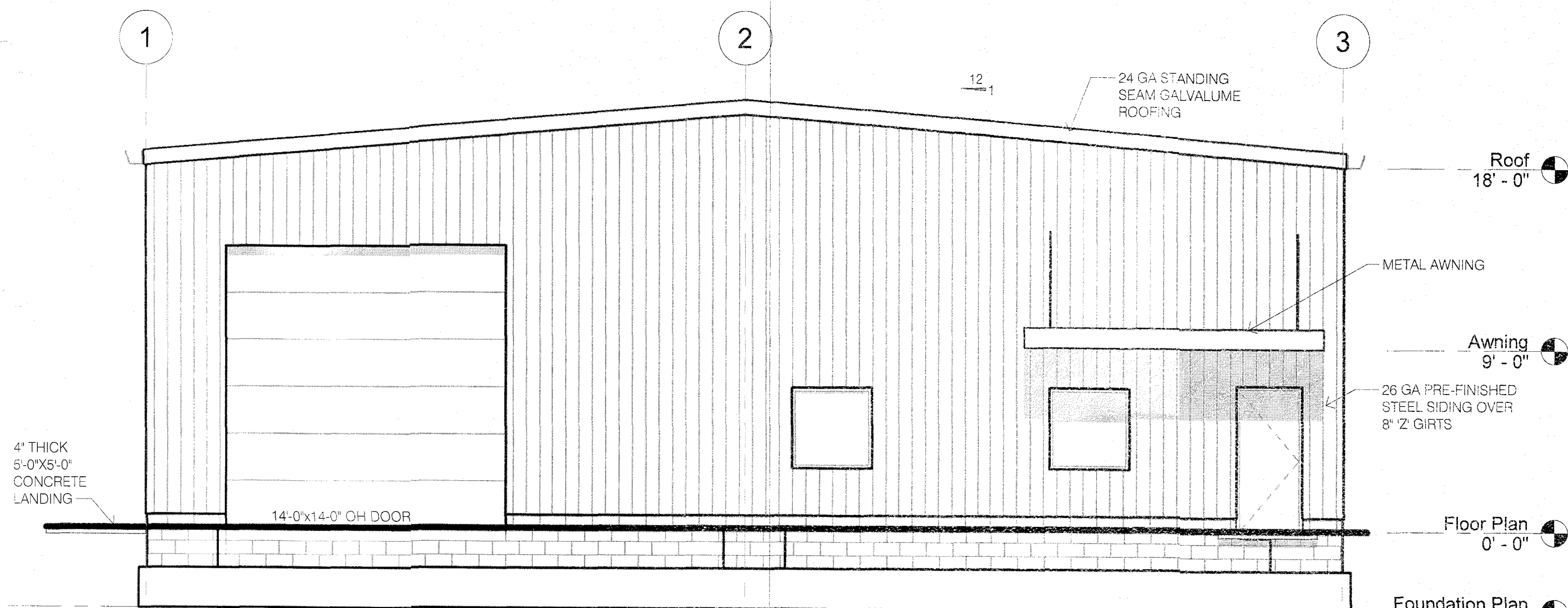
East Elevation

3/16" = 1'-0"



North Elevation

3/16" = 1'-0"



South Elevation

3/16" = 1'-0"



Window Schedule							
Type Mark	Count	Manufacturer	Model	Width	Height	Head Height	Comments
A	3			4'-0"	4'-0"	7'-0"	
B	1			4'-0"	3'-8"	7'-0"	Transaction Window
Grand total: 4							

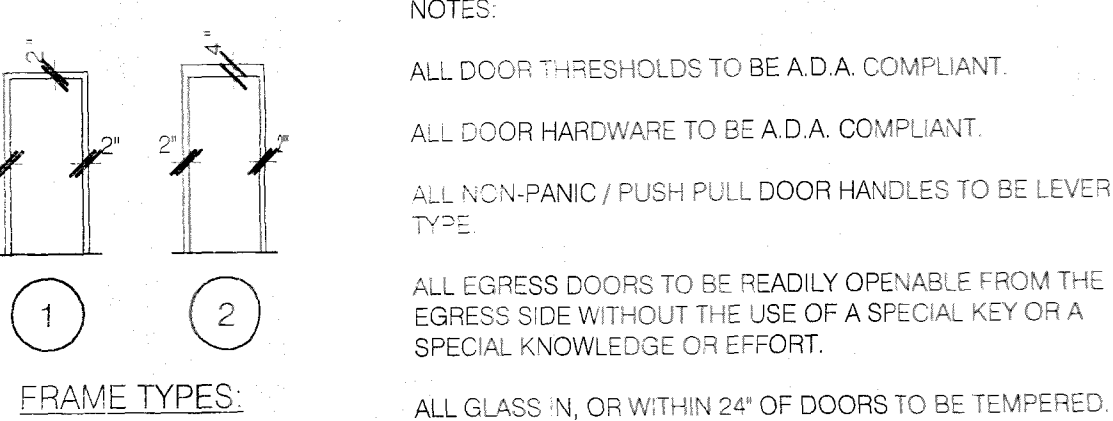
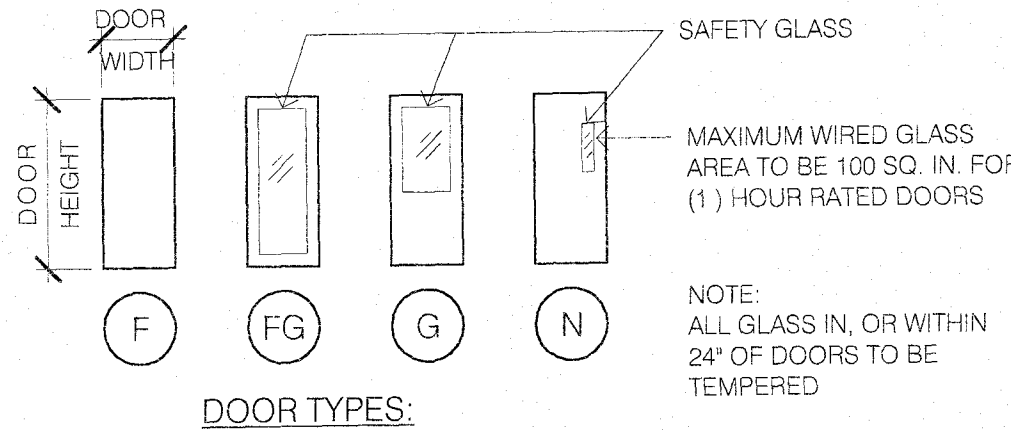
ALL GLASS 1/8" ABOVE FINISH FLOOR AND LOWER, OR WITHIN 24" OF DOORS, TO BE TEMPERED. ALL WINDOW FRAMES TO BE 2" U.N.O.

Window Schedule Notes

NTS

Door Schedule

Mark	Room Name	Width	Height	Door Material	Door Type	Door Swing	Frame Material	Frame Type	Frame Size	Fire Rating	Panic	Entrance	Passage	Privacy	Store Room	Dummy	Deadbolt	Closer	Push/Pull	Wall Stop	Floor Stop	Kick Plate	Weather Strip	ADA Threshold	Hold Open	Pocket Door	Comments
101a	Vestibule	3'-0"	7'-0"	HM	F	RHR	HM	1	6"			X					X										
101b	Vestibule	3'-0"	7'-0"	HM	F	RHR	HM	1	4'-7/8"			X					X										
102	Office	3'-0"	7'-0"	HM	F	LH	HM	1	4'-7/8"				X				X	X					X	X			
103a	Conference	3'-0"	7'-0"	HM	F	RH	HM	1	4'-7/8"				X				X										
103b	Conference	3'-0"	7'-0"	HM	F	LH	HM	1	4'-7/8"				X				X										
104	Restroom	3'-0"	7'-0"	HM	F	LH	HM	1	4'-7/8"					X			X										
105	Garage Restroom	3'-0"	7'-0"	HM	F	RH	HM	1	4'-7/8"						X		X										
106a	Towing Garage	14'-0"	14'-0"	HM	F	LHR	HM	1	6"			X					X										
106b	Towing Garage	3'-0"	7'-0"	HM	F	LHR	HM	1	6"			X					X										
106c	Towing Garage	3'-0"	7'-0"	HM	F	LHR	HM	1	6"				X				X										
106d	Towing Garage	14'-0"	14'-0"	STEEL	OH	-	STEEL	-	-								-										
106e	Towing Garage	14'-0"	14'-0"	STEEL	OH	-	STEEL	-	-								-										
106f	Towing Garage	14'-0"	14'-0"	STEEL	OH	-	STEEL	-	-								-										
106g	Towing Garage	14'-0"	14'-0"	STEEL	OH	-	STEEL	-	-								-										



Door Schedule Notes

NTS

Room Schedule

Number	Name	Area	Perimeter	Floor Finish	Base Finish	Wall Finish	Ceiling Finish	Room Height	Comments
101	Vestibule	38 SF	25' - 7"	VCT	4" VINYL COVE	PAINTED DRYWALL	2X4 SUSP. ACCOUST.	8' - 0"	
102	Office	233 SF	67' - 9"	VCT	4" VINYL COVE	PAINTED DRYWALL	2X4 SUSP. ACCOUST.	9' - 4"	
103	Conference	211 SF	60' - 4"	VCT	4" VINYL COVE	PAINTED DRYWALL	2X4 SUSP. ACCOUST.	9' - 4"	
104	Restroom	60 SF	31' - 2"	VCT	6" VINYL COVE	PAINTED DRYWALL	2X4 SUSP. ACCOUST.	8' - 0"	
105	Garage Restroom	49 SF	28' - 2"	VCT	6" VINYL COVE	PAINTED DRYWALL	2X4 SUSP. ACCOUST.	8' - 0"	
106	Towing Garage	5135 SF	314' - 8"	SEALED CONCRETE	-	EXPOSED	EXPOSED	18' - 0"	
107	Garage Restroom	Not Placed	Not Placed	VCT	6" VINYL COVE	PAINTED DRYWALL	2X4 SUSP. ACCOUST.	8' - 0"	
Grand total: 7		5727 SF	527' - 7"						

CERMIC TILE REQUIREMENTS:

ASTM C 1027 - GROUP V
Glaze Hardness - 8.0 MOHS
ASTM C 648 - 385 LBS

ACOUSTICAL CEILING TILE REQUIREMENTS:

All ceiling tile in food prep areas to be vinyl faced. Class A. Flame spread 25, smoke developed 10 (per ASTM E-84).

PAINT REQUIREMENTS:

All painted walls to be washable enamel with egg shell finish texture.

FRP REQUIREMENTS:

All FRP to meet USDA/FSIS requirements. Class A. Flame spread 25, smoke developed 450 (per ASTM E-84). FRP not to support mold or mildew (per ASTM D3273 and ASTM D3274).

INTERIOR FINISH REQUIREMENTS:

All interior wall and ceiling finish materials shall be classified in accordance with ASTM E-84 or UL 723. Class A. Flame spread 25, smoke developed 450.

All interior floor finish and floor coverings shall be classified in accordance with NFPA 253 and shall comply with the DCC FF-1 "pill test" or with ASTM D 2859.

CURE/SEAL/HARDENER:

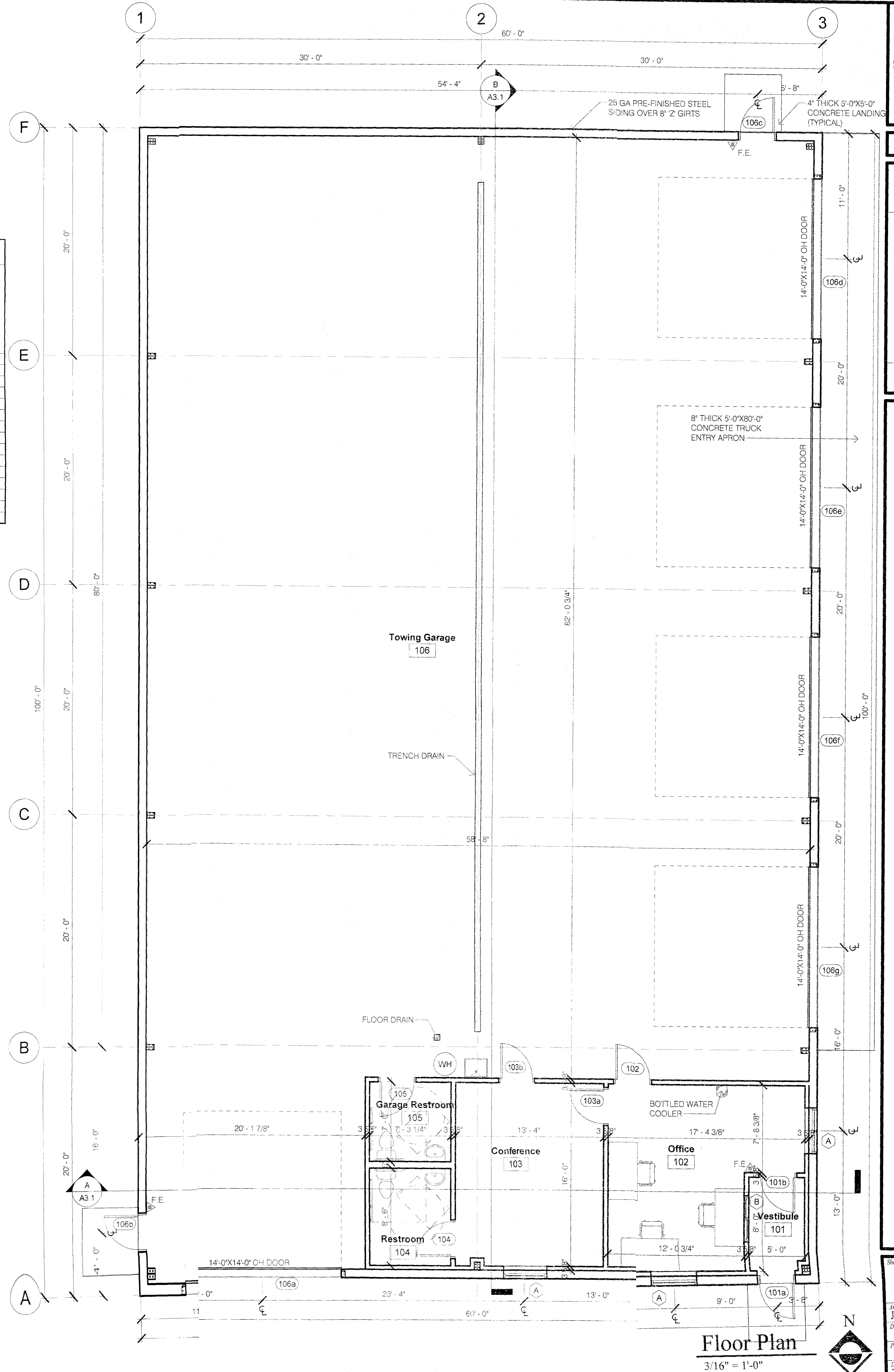
Ashford Formula - water-based chemically-reactive penetrating sealer and hardener, that seals by densifying concrete so that water molecules cannot pass through but air and water vapor can, while allowing concrete to achieve full compressive strength, minimizing surface crazing, and eliminating dusting. Colorless, transparent, odorless, non-toxic, non-flammable. Containing no solvents or volatile organic compounds. USDA approved for food handling facilities.

Room Schedule Notes

NTS

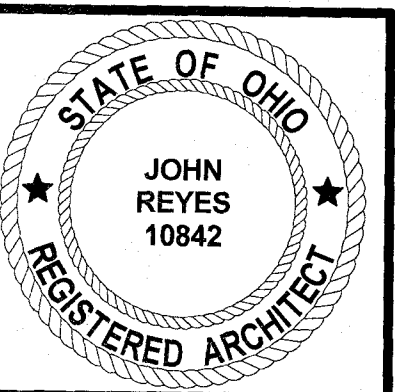
Building Area

Area	Square Footage	Level
Office Area	688 SF	Floor Plan
Towing Garage Area	5312 SF	Fk
Floor Plan	6000 SF	
Grand Total	6000 SF	



Floor Plan

3/16" = 1'-0"



John Reyes, #9410842
Expiration Date: 12/31/2019

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Fax: (440) 986-5369
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Design-Build Contractors

Pattons Towing
Proposed New Building
31684 Cook Rd. North Ridgeville, OH

Floor Plan

Architect
John Reyes

Designer
Mitter

Project Number
19-00017

Date
2019-03-23

A2.1

Engineering Fee Paid: \$ 750.00
Receipt No.: 486111
☐ Cash ☒ Check - Check No.: _____

(See attached for description of fees.)



Planning Commission & Bldg. Admin. Fees: \$ 116.00
Receipt No.: 271147
☒ Cash ☐ Check - Check No.: _____

(See attached for description of fees.)

RECEIVED

**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
REQUEST FOR ACTION**

Received: APR 18 2019 Date Released to Planning Commission: _____

Date of Planning Commission Meeting: _____ (Unless otherwise notified.)

APPLICANT INFORMATION AND REQUEST

APPLICANT: GAVRIL BUDAI PROPERTY OWNER: G+S PROPERTY INVESTMENTS LLC
COMPANY NAME: G+S PROPERTY INVESTMENTS LLC ADDRESS: 1960 RADCLIFFE DRIVE
ADDRESS: 1960 RADCLIFFE DRIVE CITY / STATE: WEST LAKE, OH ZIP: 44145
CITY / STATE: WEST LAKE, OH ZIP: 44145 PHONE NO.: (440) 327-3077
PHONE NO.: (440) 327-3077 SIGNATURE: [Signature]
SIGNATURE: _____ (Owner's original signature must be submitted with application.)
EMAIL ADDRESS: G.BUDAI@NSANATURALSTONE.COM

Please provide an email address, fax number or mailing address to send Administrative comments in advance of the meeting.

LOCATION OF PROPERTY/ADDRESS: 34515/34555 MILLS ROAD
PERMANENT PARCEL NO.: 07-00-018-101-280 + -020 ZONING OF PROPERTY: I2
ZONING OF ADJACENT PROPERTY TO: NORTH N/A EAST I2 SOUTH R1 WEST I2
DESCRIPTION OF REQUEST: PRELIMINARY PLAN APPROVAL FOR COMMERCIAL STORAGE UNITS

Have the Planning Commission or Board of Zoning and Building Appeals considered any prior request concerning this property? Yes ☐ No ☒

If yes, list dates and nature of each: _____

On the attached form, list the current record title owners(s) adjacent to the property of request. Include on this list the record title owner(s) name(s), permanent parcel number(s) and mailing address(es). Adjacent properties shall include those properties bordering to the north, south, east, west, across a street from the property involved and those properties meeting corners of the property involved.

In the event of property transfers, the applicant shall be responsible for providing an updated list of current adjacent record title owner(s) to the office of the Clerk of Council twenty-five days prior to the date of any public hearing when the applicant will appear on the agenda.

PLANNING COMMISSION USE ONLY: ☐ APPROVED ☐ DISAPPROVED

All approvals are conditional until applicant fully meets the requirements of applicable City ordinances enforced by the Chief Building Official, City Engineer, Fire Department and Police Department with respect to safety and design.

- ☐ Board of Building & Zoning Appeals Approval Required
☐ Conditions as set forth by the Commission on this date are: _____

Date: _____ Signature: _____

(Presiding Officer at Meeting)

Return completed form to Building Dept., 7307 Avon Belden Road, North Ridgeville, Ohio, 44039 after Commission action.

TO BE FILLED OUT BY APPLICANT

I, GAVRIL BUDAI

(Print Name)



(Signature)

verify that the following are the names, mailing addresses and permanent parcel numbers of the current record title owners adjacent to the property of request for:

Applicant: GAVRIL BUDAI

Owner: G & S PROPERTY INVESTMENTS LLC

Project Address: 34515 / 34555 MILLS ROAD, NORTH RIDGEVILLE, OH 44039

THE FOLLOWING INFORMATION MAY BE OBTAINED AT THE LORAIN COUNTY AUDITOR'S OFFICE,
ADMINISTRATION BUILDING, 226 MIDDLE AVENUE, ELYRIA, OHIO 44035.

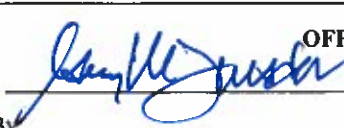
PHONE: 440-329-5207

WEBSITE: WWW.LORAINCOUNTY.COM/AUDITOR

	ADJACENT PROPERTY OWNER / ADDRESS	PARCEL NUMBER
✓1	SPACE TRACER INC. 32667 CARRIAGE LANE AVON LAKE, OH 44012	07-00-018-101-023
✓2	RLG CLEVELAND II LLC 6494 LATCHA ROAD WALBRIDGE, OH 43465	✓07-00-018-101-198 + ✓07-00-018-101-219
✓3	Z J'S PROPERTY MANAGEMENT LLC 500 MILLS INDUSTRIAL PKWY NORTH RIDGEVILLE, OH 44039	✓07-00-018-101-218 + ✓07-00-018-101-206
✓4	BRUCE C. & DEBORAH A. LUBINSKI 18345 BOONE RD COLUMBIA STATION, OH 44028	07-00-018-101-278
✓5	C+S INDUSTRIAL LTD 5120 MILLS INDUSTRIAL PKWY NORTH RIDGEVILLE, OH 44039	07-00-018-101-281
✓6	RICHARD W. & PATTI MARIE FRIEDEL 34670 HIGHLAND DR NORTH RIDGEVILLE, OH 44039	07-00-018-101-048
✓7	ROBERT M. & CAROL A. BECKA 34688 HIGHLAND DR NORTH RIDGEVILLE, OH 44039	07-00-018-101-047
✓8	DANIEL J. ORIENT & LAURA A. MIKISZ 34704 HIGHLAND DR NORTH RIDGEVILLE, OH 44039	07-00-018-101-046
✓9	TILLERY HOLDINGS LLC PO BOX 128 AVON LAKE, OH 44012	07-00-018-101-019
✓10	BRAD SNYDER 33834 CROWN COLONY DRIVE AVON, OH 44011	04-00-024-116-231

SEE REVERSE SIDE FOR ADDITIONAL LISTINGS.

OFFICE USE ONLY

CBO Verification By: 

Date / Time Stamp:

BZA / PC Verification By: _____

	<u>ADJACENT PROPERTY OWNER/ADDRESS</u>	<u>PARCEL NUMBER</u>
✓11	AVON HOLDINGS LLC 21079 WESTWOOD DR STRONGSVILLE, OH 44149	04-00-024-116-206
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		

PLEASE COPY THIS PAGE FOR ADDITIONAL LISTINGS OF ADJACENT PROPERTY OWNERS.

**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
RECOMMENDATIONS**

Name of Applicant:	Gavril Budai
Name of Owner:	G&S Property Investments LLC
Date Submitted for Consideration:	4-18-19
Date to Return to Planning Commission:	4-25-19
Regarding: Mills Road Storage Units	

RECOMMENDATIONS:

1. The plans show 128 storage units with 2 occupants per unit noted on plans indicating 256 possible parking spaces. No parking is shown on plans.
2. City sidewalks are not indicated on plans.
3. All else appears code compliant.

(use additional sheets if necessary)

Department Head Signature & Title: _____

 CBO

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 12-13-2005.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter. (Planning Commission By-Laws, Article V, Section 3)
Comments received after the deadline will be distributed to the Members the night of the meeting.

**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
RECOMMENDATIONS**

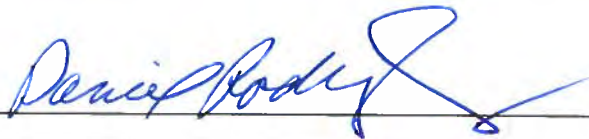
Name of Applicant:	Gavril Budai; G & S Property Investments, LLC. 1960 Radcliffe Dr, Westlake, OH 44145
Name of Owner:	Gavril Budai; G & S Property Investments, LLC. 1960 Radcliffe Dr, Westlake, OH 44145
Date of Planning Commission Meeting:	Tuesday, May 14, 2019
Date to Return to Deputy Clerk of Council:	Thursday, May 02, 2019
Regarding:	Preliminary approval for commercial storage units. To be located on Mills Road, east of Jaycox Road and west of Mills Industrial Parkway, in an I-2 zoning district. Permanent Parcel Nos. 07-00-018-101-280 & 07-00-018-101-020

Recommendations:

1. Complete detailed improvement plans, and storm water management, and water quality calculations need to be submitted to the Engineering Department for review and approval.
2. Trip Generation Report needs to be provided by a licensed engineer which shows that the peak hour trips are less than 100. Otherwise, a traffic impact study per NRCO 1210.06 is required.
3. Offsite drainage shall be accomodated.
4. Check with James Brewer, of Engineering, for new building backflow requirements.
5. A variance must be obtained for gravel lot.
6. Commercial aprons are required to be eight inches of concrete on four inches of aggregate base.
7. A Tree Planting plan is required for new commercial developments.
8. Sidewalk to be installed, along frontage, per Codified Ordinances.
9. Pavement is shown to be extending into riparian setback for Krebs Ditch, engineering will review with detailed plans submission.

(Use additional sheets if necessary.)

Department Head Signature: _____



Title: City Engineer

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 03-22-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
(Planning Commission By-Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
RECOMMENDATIONS**

Name of Applicant:	Gavril Budai; G & S Property Investments, LLC. 1960 Radcliffe Dr, Westlake, OH 44145
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Recommendations:

(Use additional sheets if necessary.)

Department Head Signature: _____

Title: [Select Title...]

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 03-22-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
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**CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
RECOMMENDATIONS**

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Recommendations:

Please contact Asst. Chief Mike Uhnak to discuss the following code requirements of the Ohio Fire Code.
North Ridgeville Fire Department
Fire Prevention
(440)653-6362

1-OFC Rule 5 Fire Service Features

Section 503 Fire Access Roads

Section 506 Key Boxes

Section 507 Fire Protection Water Supply

2-OFC Rule 33 Fire Safety During Construction And Demolition

Thanks for your cooperation.

(Use additional sheets if necessary.)

Department Head Signature:



Title: Fire Chief

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 03-22-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
(Planning Commission By-Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

SUBDIVISION PRELIMINARY APPROVAL

COMMERCIAL AND INDUSTRIAL DEVELOPMENTS:

§1224.01(10)(b) Subdividers or developers of shopping centers and other commercial and industrial uses must comply with the same requirements as residential developers, with the exception of paragraph (a)(9). Plans or written and signed statements regarding planted or open areas may be required where applicable.

SUBDIVISION/DEVELOPMENT NAME: MILLS ROAD STORAGE UNITS

DATE: 04 - 18 - 19

PRELIMINARY APPROVAL: §1224; §1228; §1282 and §1210

The following item(s) are included with your application and conform to the requirements of the North Ridgeville City Subdivision Regulations. Those items not conforming or that are not included with the application are explained why they are not included or conforming on the final page.

	Included	Not Included	Item
1			Application with names of adjacent parcel owners, parcel numbers and addresses: §1210.04
2			Title of the subdivision (no duplication permitted) to be recorded and the names of the owner, subdivider and surveyor as noted on plan: §1224.01(a)(5)
3			Location description to include city, township, county, legally established districts, streets, watercourses, topography and other features within the area to be subdivided and similar facts regarding conditions of land immediately adjacent thereto to be shown on plan: §1224.01(a)(1)
4			Location and proposed width of streets, lots, crosswalks and easements and a plan for all land owned to be shown on plan: §1224.01(a)(2)
5			Existing sanitary and storm sewers, water mains, culverts and other underground structures within the tract and adjacent thereto to be shown on plans
6			The general location and size of the nearest water main and sanitary or storm sewer or outlet: §1224.01(a)(4)
7			Names of the owners or large tract, or the subdivision title abutting the boundary of the proposed subdivision to be shown on plan: §1224.0 (a)(6)
8			A north point scale and date shown on plan: §1224.01(a)(7)
9			Zoning classification of the property to be subdivided and adjacent property shown on plan: §1224.01(a)(8)
10			Location description includes the following dwellings: Single Family ____ Cluster Single Family ____ Single Family detached/Cluster Family
11			Plans or written and signed statements regarding planted areas, parks and playgrounds where applicable: §1224.01(a) (9)
12			Topographic information shown on drawing itself. Elevations shown thereon must be based on sea level datum or as determined by the United States Coast and Geodetic Survey. Contours at an interval of not more than 2 feet shall be required to include property lines, easements, street right-of-ways and structures, trees and landscape features existing hereon, together with a certificate by a registered engineer: §1224.01(a)(10)
13			A key map shown on drawing: §1224.01(a)(11)
14			The subdivider shall have prepared plan, preliminary title report and preliminary plans and specifications of improvements: §1228; §1224.05(a)(1)
15			10 copies of the plan and 10 copies of attachments required with application: §1224.05(a)(2)

	Included	Not Included	Item
16			Proposed vehicular and pedestrian traffic patterns, including the proposed location of the public and private streets and the location of off-street parking and service areas: §1282.04(b)
17			Proposed assignment of use including detached single family lots and single family cluster areas and subdivisions of all land, including private land and common land with a certificate by a registered engineer or surveyor of the gross area of each use of the development area in acres and square feet: §1282.04(c)
18			A copy of the proposed forms of covenants running with the land, deed restrictions (including those with respect to the use of the common land), restrictions or easements proposed to be recorded; covenants proposed for maintenance; and homeowner's association by-laws; and such other relevant information as the Commission may require: §1282.04(d)
19			A copy of the City Planner review. All preliminary residential subdivision designs of greater than 15 sublots shall require a review by the City Planner: §1210.05
20			Traffic Impact study required: §1210.06 <u>Traffic Generation Rate</u> Restaurant (Peak hour trips = 150) Convenience market (Peak hour trips = 150) Convenience market and gas station (Peak hour trips = 150) Supermarket (Peak hour trips = 150) Shopping center (Peak hour trips = 150) Residential and all other use (Peak hour trips = 100)

***SUBDIVISIONS WITH LESS THAN 5 LOTS** - Whenever a division of parcel of land shown as a unit on the last preceding tax roll (duplicate) is proposed along an existing public street, not involving the opening, widening or extension of any street or road and involving no more than 5 lots, the division shall be submitted to the Planning Commission for action without a plat. If the Commission, acting through a designated official, is satisfied that such proposed division is not contrary to applicable platting, subdividing or zoning regulations, it shall, within 7 working days after submission, approve such proposed division. On presentation of a conveyance of such parcel, the same shall be stamped, "Approved, City of North Ridgeville Planning Commission," and signed by the authorized official: §1224.04

A drawing, based on a survey showing the location of the property and giving such other information as may be necessary shall be required.

PLEASE NOTE THAT THIS CHECK LIST DOES NOT SUPERSEDE CITY ORDINANCES. PLEASE MAKE SURE YOU UNDERSTAND WHAT IS REQUIRED TO BE SUBMITTED TO PLANNING COMMISSION. THE APPLICATION MAY NOT BE ACCEPTED BY PLANNING COMMISSION IF ALL REQUIRED INFORMATION, PURSUANT TO CITY ORDINANCES, IS NOT SUBMITTED WITH THE APPLICATION.



RAFTER A, LTD

LAND SURVEYING & ENGINEERING

Office: (440) 458-6294

FAX: (440) 458-4483

Email: info@raftera.com

Web: www.raftera.com

700 Oberlin-Elyria Road
Elyria, Ohio 44035

Letter of Transmittal

Job Number: 2131-18
Date: 4-18-2019

To: *City of N. Ridgerville*
planning commission

JOB NAME:

Quantity	Description
10	<i>Copies - Preliminary Plan - Mills Road Star. Units</i>
1	<i>Request for action form</i>
1	<i>Public Notice list</i>
1	<i>Check for planning commission fee</i>
1	<i>check for engineering deposit fee</i>
1	<i>preliminary approval form</i>

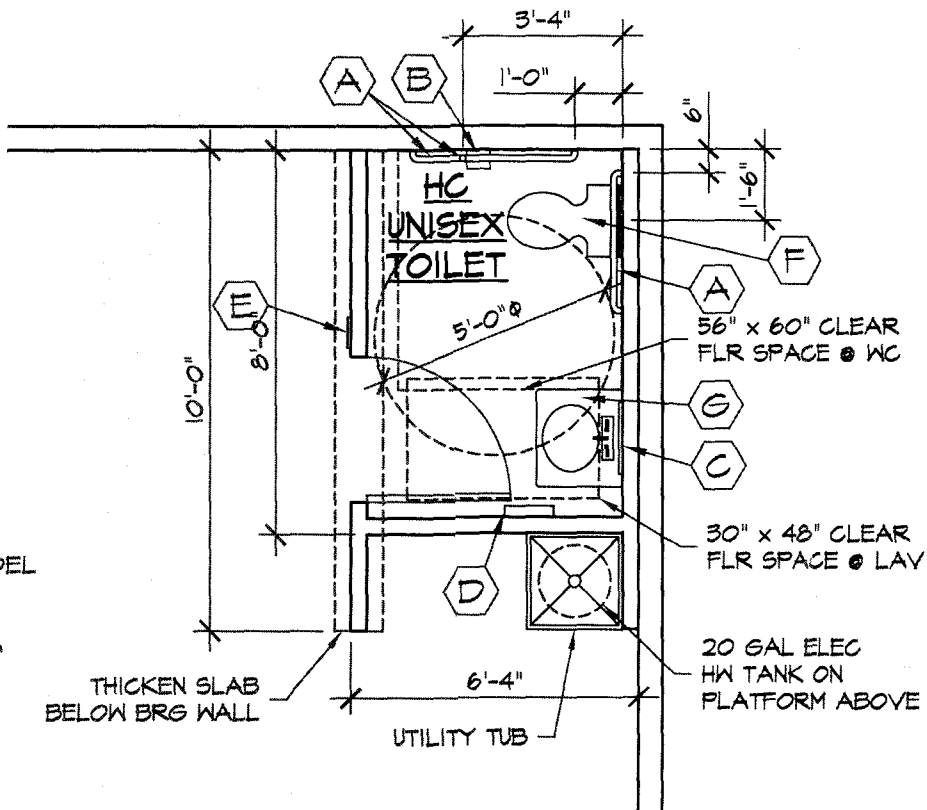
Memo: _____

CC: _____

Signed: *Rick A. Frazier*

H.C. ACCESSORY SCHEDULE

- (A) 36" AND 42" LONG STAINLESS STEEL GRAB BARS, MOUNT WITH ϕ 3/8" A.F.F. 4 1/8" VERT GRAB BAR WITH BOTTOM ϕ 40" A.F.F.; INSTALL USING CONCEALED HOOD BLKS. IN STUD WALLS; INSTALL WITH ANCHORS CAPABLE OF SUPPORTING 250# POINT LOAD AT ANY POINT ON BAR
- (B) TOILET PAPER HOLDER - SINGLE ROLL, SURFACE MOUNTED ϕ 19" A.F.F.
- (C) SURFACE MOUNTED MIRROR, 24" X 42", MOUNT WITH BOT. ϕ 40" A.F.F.
- (D) PAPER TOWEL DISPENSER, SURFACE MOUNTED WITH BOTTOM ϕ 40" A.F.F.
- (E) ENGRAVED ADA, HANDICAPPED ACCESSIBLE UNISEX TOILET ROOM SIGN (WITH BRAILLE PLATE) MOUNT WITH ϕ 60" A.F.F.
- (F) H.C. WATERCLOSET W/ RIM ϕ 17" A.F.F. GERBER MODEL #2116 TANK TYPE W/ OPEN FRONT (OR EQUAL)
- (G) H.C. LAVATORY W/ RIM ϕ 34" MAX. AND MIN. OF 29" CLR. BELOW TO BE EQUIPPED W/ LEVER HANDLES OR OTHER APPROVED CONTROLS. ALL EXPOSED PIPES TO BE INSULATED.



ENLARGED H.C. TOILET ROOM PLAN
SCALE: 1/4" = 1'-0"

DOOR SCHEDULE

NO.	MATL.	W.	H.	TH.	FRAME	HDW.	REMARKS
D1	STL	3'-0"	6'-8"	1 3/4"	HM	LOCKSET CLOSER	INSUL 6 PANEL STL DOOR TO BE READILY OPENABLE FROM EGRESS SIDE W/O KEY OR SPECIAL KNOWLEDGE/
D2	STL	12'-0"	14'-0"	1 3/8"	-	-	INSUL OH DOOR EQUIPPED W/ AUTOMATIC OPENER
D3	STL	3'-0"	6'-8"	1 3/4"	HM	PRIVACY	H.C. ACCESSIBLE LEVER HANDLES.

FINISH SCHEDULE

NO.	ROOM NAME	BASE	FLOOR	WALLS	CEILING	HGT.	REMARKS
	TYP UNIT	-	CONC	GYP BD PAINT	21 GA MTL	16'-0"	CONC FLOOR W/ SEALER
	UNISEX TOILET	6" VINYL	VCT	GYP BD PAINT	TEXTURED GYP BD	8'-0"	

DESIGN LOADS

TRUSS DESIGN LOADS (FOR 4'-0" SPACINGS)	
TOP CHORD	LL
DL	25 P.S.F.
BOTTOM CHORD	DL
TOTAL LOAD	10 P.S.F.
	5 P.S.F.
	40 P.S.F.
FIRST FLOOR LIVE LOAD	
ROOF LIVE LOAD	125 PSF (PER OBC TABLE 1607.1)
(SNOW LOAD)	25 P.S.F. + DRIFTING
GROUND SNOW LOAD	
FLAT ROOF SNOW LOAD	PS = 20 PSF (NOT USED)
MINIMUM RAIN ON SNOW SURCHARGE	PF = 18 PSF (NOT USED)
	25 PSF (NOT USED)
SNOW EXPOSURE FACTOR C_e	
SNOW IMPORTANCE I	= 1.0
THERMAL FACTOR C_t	= 1.0
BASIC WIND SPEED	90 MPH
WIND EXPOSURE CLASSIFICATION	EXPOSURE 'B'
WIND IMPORTANCE FACTOR	1.0
GLASSING WIND PRESSURES	15.9 PSF (INWARD)
WINDWARD LEeward	18.2 PSF (SUCTION)
SEISMIC USE GROUP	
	GROUP 1
SITE CLASS	
	D
BASIC SEISMIC FORCE RESISTING SYSTEM	
	BRACED FRAME
DESIGN CATEGORY	
	B
ANALYSIS PER	
	OBC 1613.5
DESIGN SOIL PRESSURE	
	2,000 P.S.F. (ASSUMED)

CODE REVIEW

USE GROUP : S-1
CONSTRUCTION TYPE : V B
BUILDING AREA : 20,640 S.F.
OCCUPANCY : 48 OCC.

DRAWING INDEX

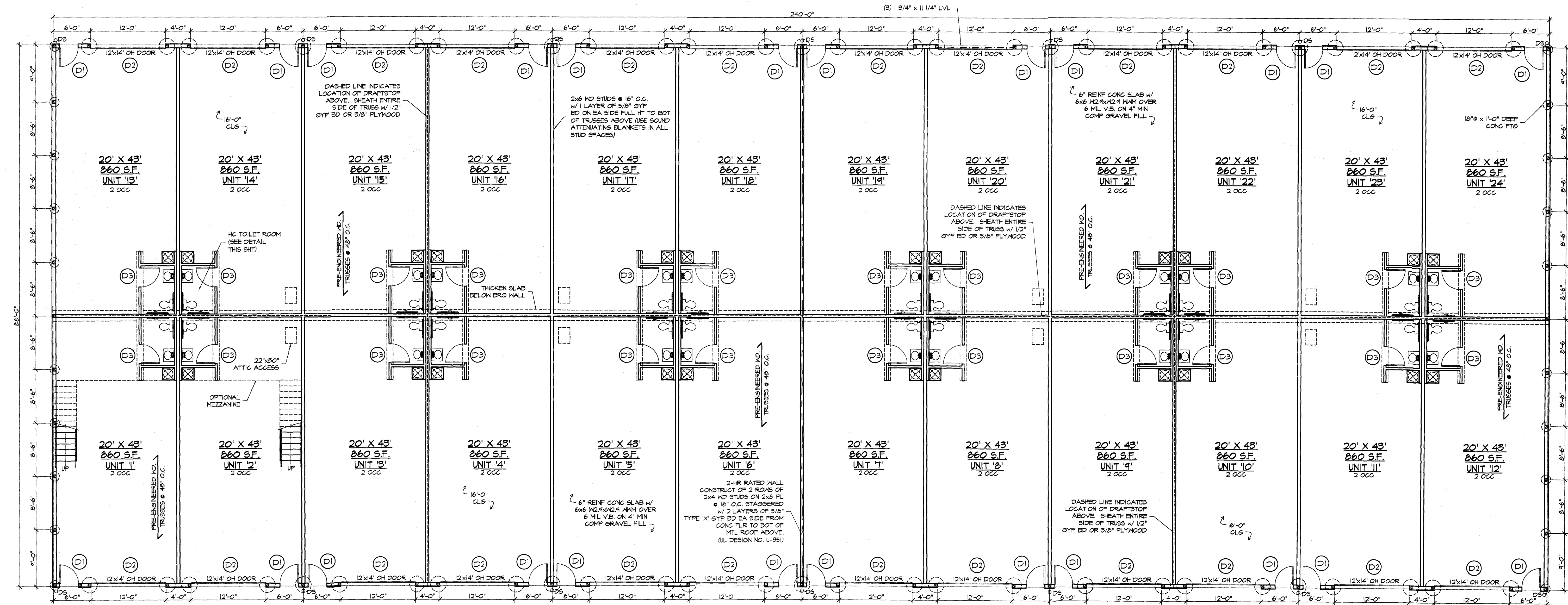
A-1	CODE REVIEW, DRAWING INDEX, DESIGN LOADS, FLOOR PLAN, DOOR & FINISH SCHEDULE, FOUNDATION LEGEND, ENLARGED H.C. TOILET ROOM, PLAN, H.C. ACCESSORY SCHEDULE
A-2	FLOOR PLAN
A-3	BUILDING ELEVATIONS, WALL SECTION, MEZZANINE PLAN & SECTIONS

FOUNDATION LEGEND

- 18" ϕ X 1'-0" DEEP CONC FTG
30" ϕ X 1'-0" DEEP CONC FTG

FOUNDATION NOTES

CONCRETE IN FOUNDATIONS SHALL DEVELOP A COMPRESSIVE STRENGTH OF 5,000 PSI IN 28 DAYS. ALL OTHER CONCRETE SHALL BE 4,000 PSI IN 28 DAYS. EXTERIOR CONCRETE TO BE 4,000 PSI IN 28 DAYS WITH AIR ENTRAINMENT TO MEET ASTM C 260, SPECIFICALLY 6% AIR ENTRAINMENT $\pm$ 1%.



REVISIONS	BY

MARK W. RUBY
ARCHITECT

199 NORTH LEAVITT ROAD, SUITE 201
AMHERST, OH 44001
(440) 986-2091

NEW LOCATION FOR
MILLS ROAD STORAGE UNITS
34555 MILLS RD.
NORTH RIDGEVILLE, OH

TITLE

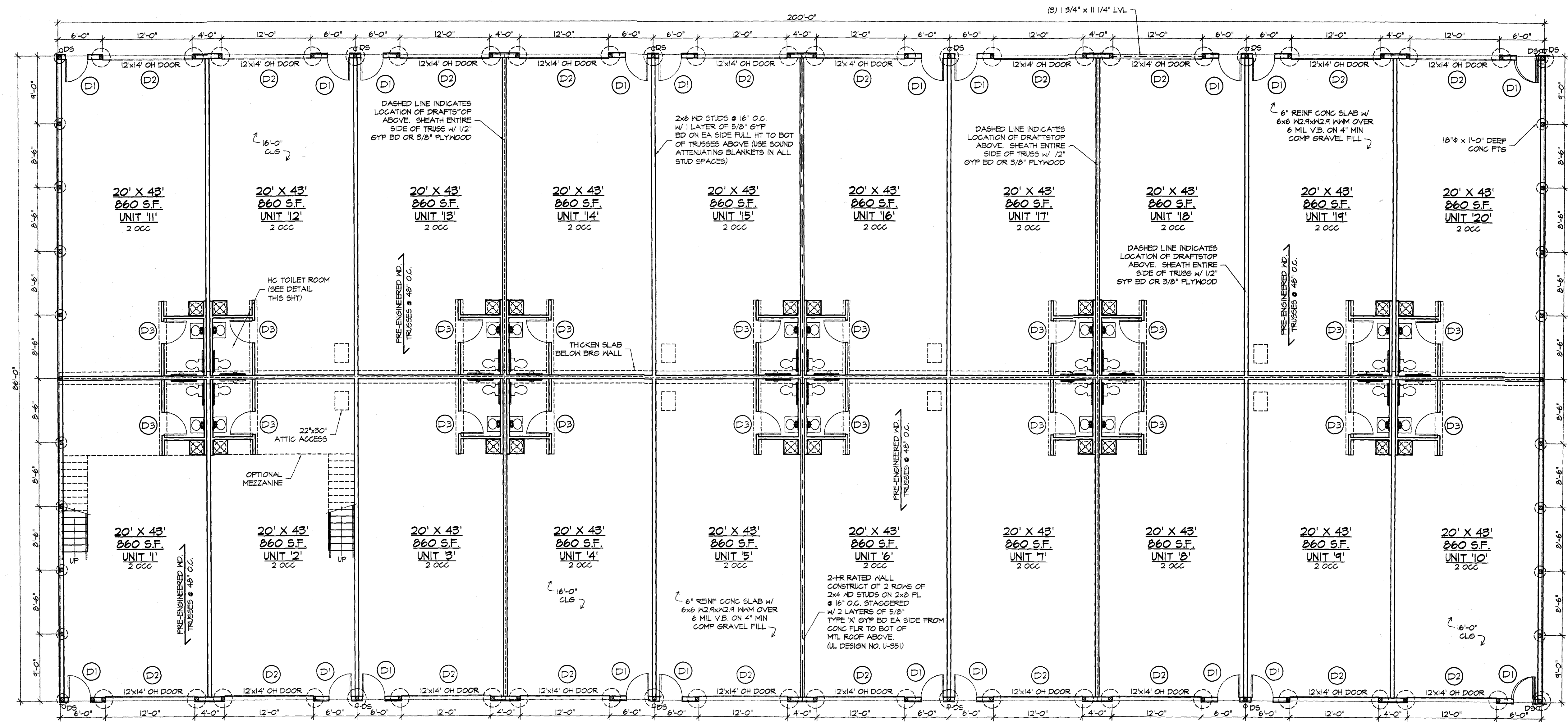


DATE 4/24/19
PROJ. 1924
SHEET

A-1

FLOOR PLAN
SCALE: 1/8" = 1'-0"





FLOOR PLAN
SCALE: 1/8" = 1'-0"

REVISIONS BY	

MARK W. RUBY
ARCHITECT

199 NORTH LEAVITT ROAD, SUITE 201
AMHERST, OH 44001
(440) 986-2091

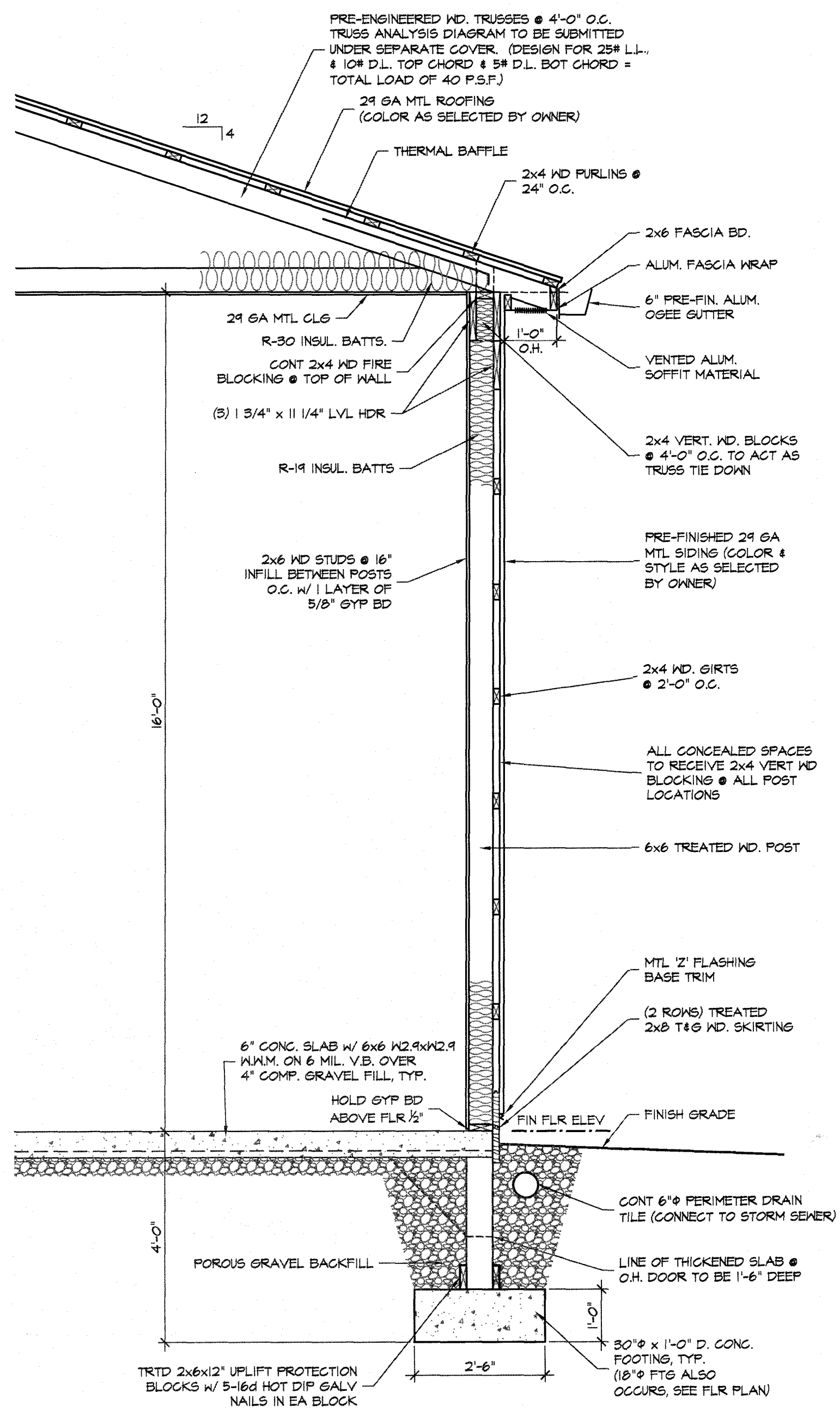
TITLE

NEW LOCATION FOR
MILLS ROAD STORAGE UNITS
34555 MILLS RD.
NORTH RIDGEVILLE, OH

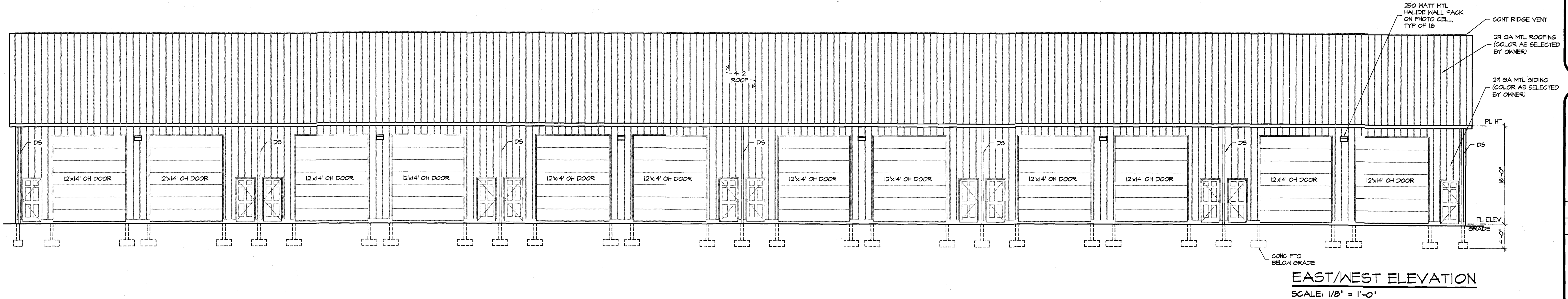
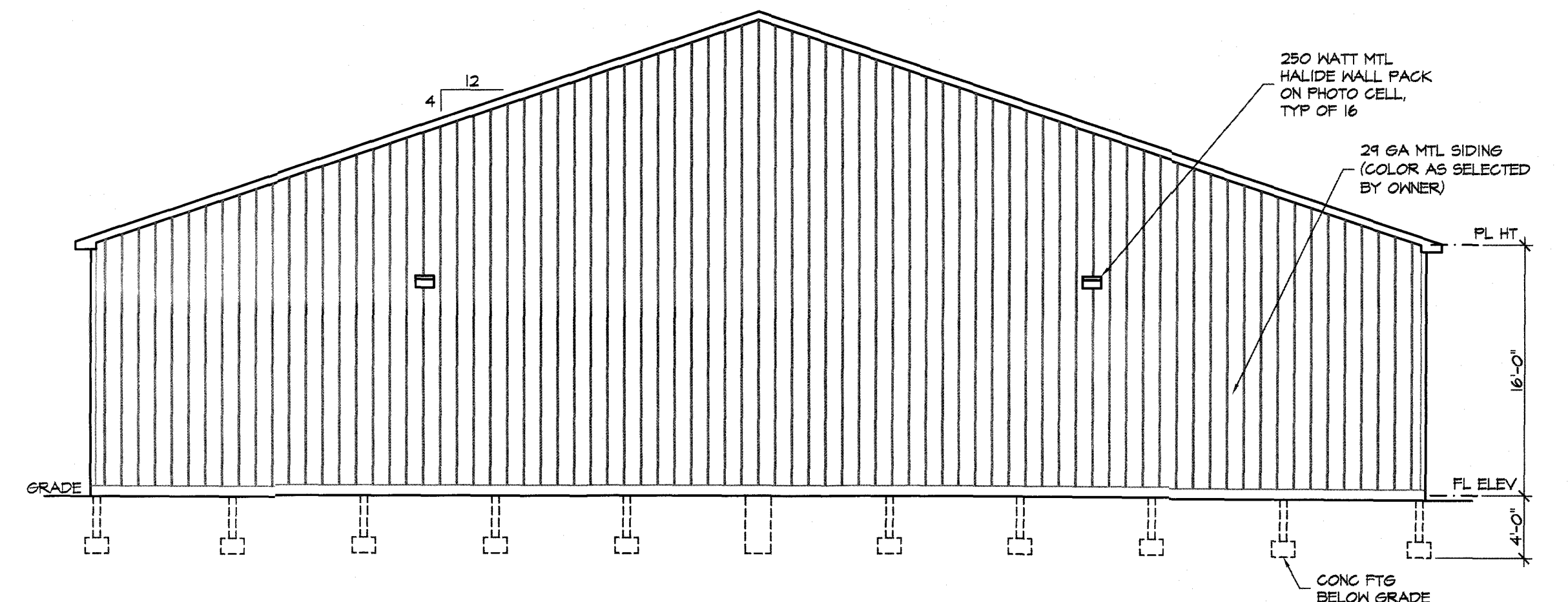
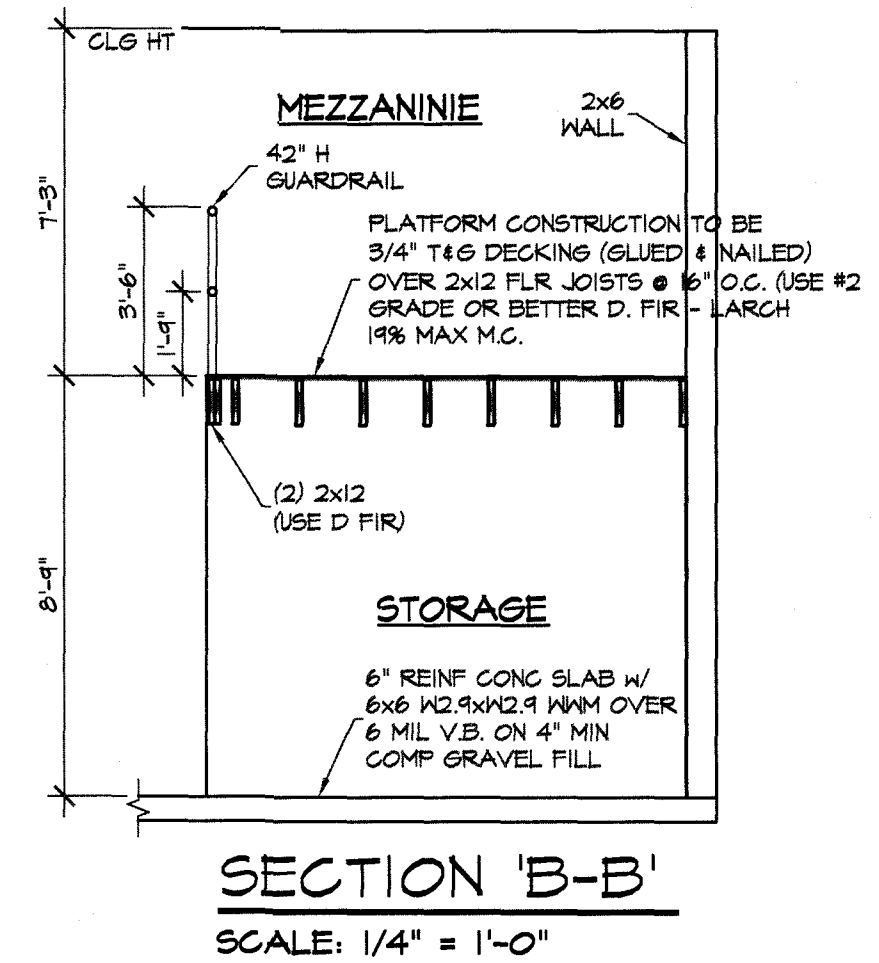
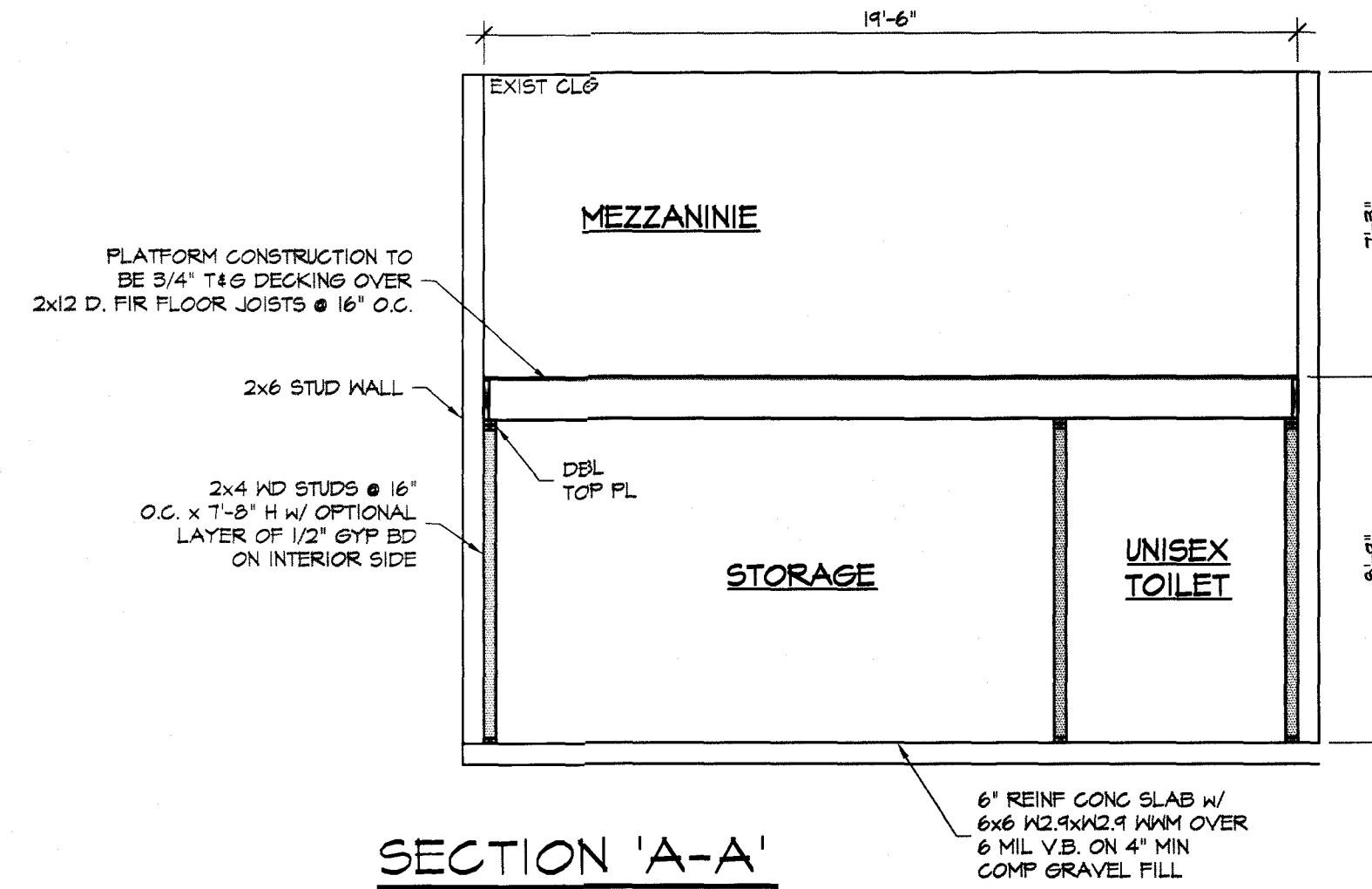
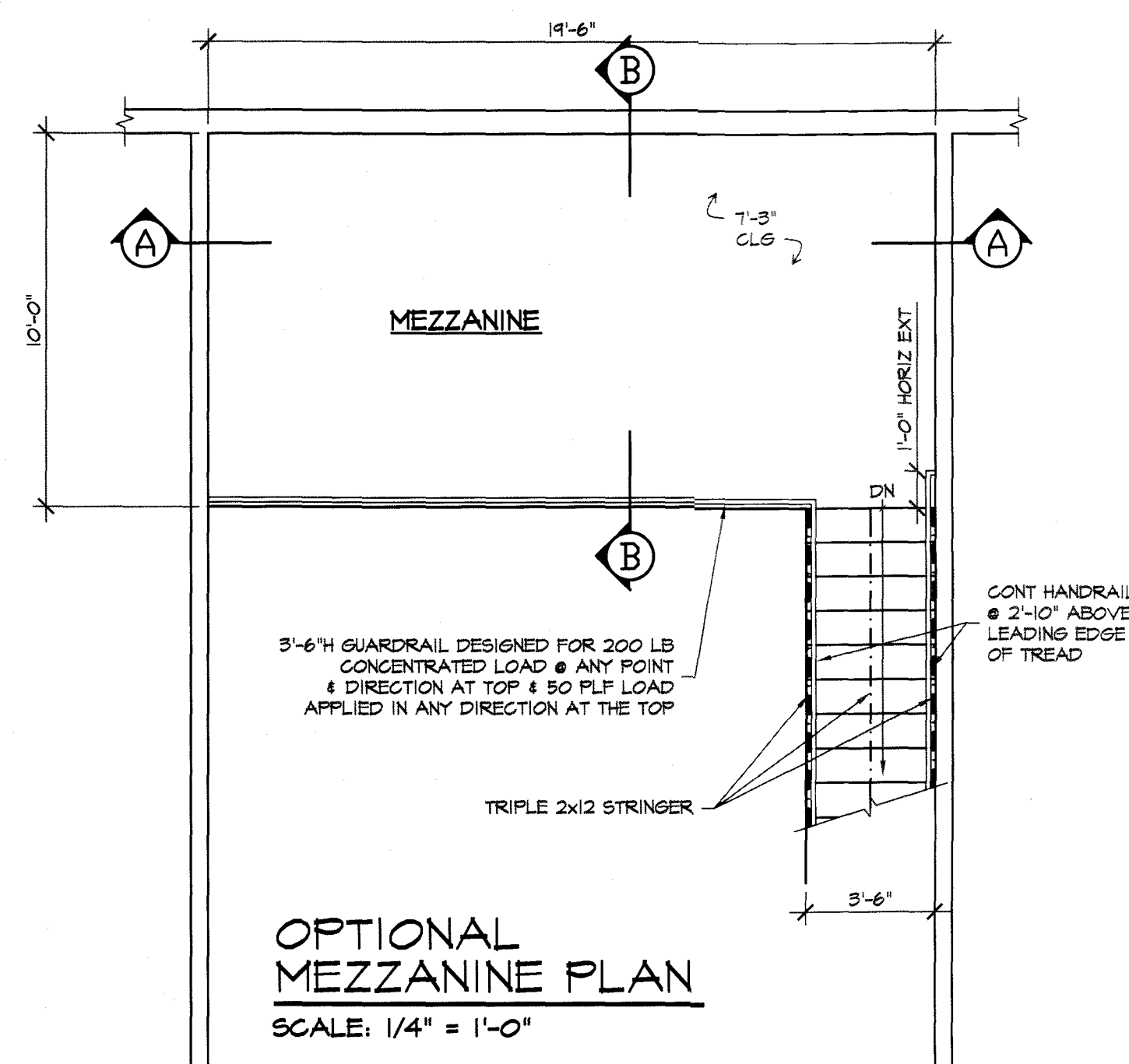
STATE OF OHIO
MARK W. RUBY
REGISTERED ARCHITECT
9199

DATE 4/24/19
PROJ. 1924
SHEET

A-2



WALL SECTION
SCALE: 1/2" = 1'-0"



REVISIONS BY

MARK W. RUBY
ARCHITECT

199 NORTH LEAVITT ROAD, SUITE 201
AMHERST, OH 44001
(440) 896-2091

NEW LOCATION FOR
MILLS ROAD STORAGE UNITS
34555 MILLS RD.
NORTH RIDGEVILLE, OH

TITLE



DATE 4/24/19

PROJ. 1924

SHEET

A-3

MILLS ROAD STORAGE UNITS

PRELIMINARY PLAN

SITUATED IN THE CITY OF NORTH RIDGEVILLE, COUNTY OF LORAIN, STATE OF OHIO

ZONING CLASSIFICATION

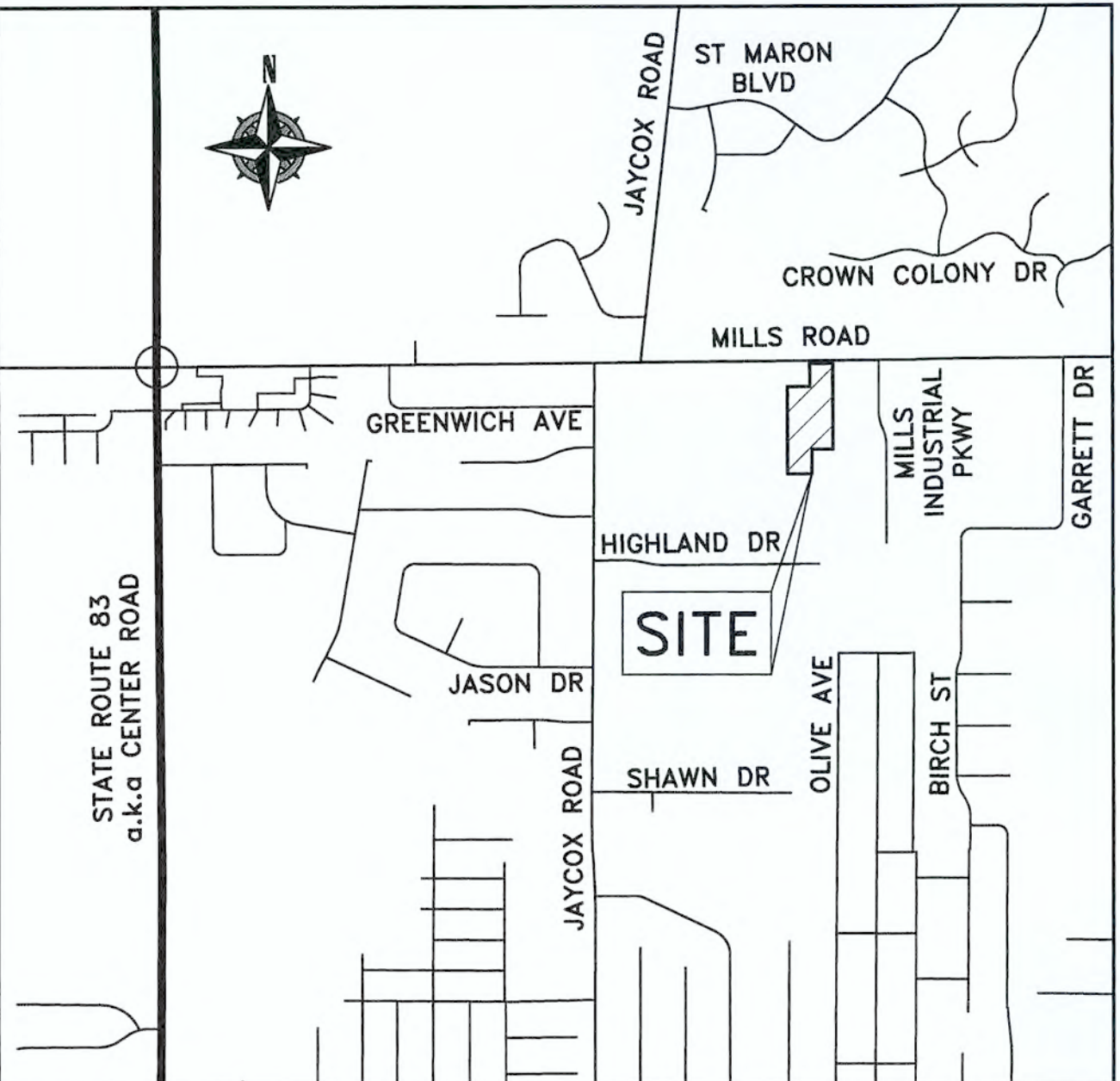
THE SUBJECT PREMISES IS LOCATED WITHIN ZONE "LIGHT INDUSTRIAL DISTRICT" (I-2) AS SHOWN ON THE ZONE MAP FOR THE CITY OF NORTH RIDGEVILLE.

BUILDING REQUIREMENTS:
BUILDING HEIGHT: 60 FEET MAXIMUM
FRONT YARD SETBACK: 75 FEET MINIMUM
SIDE YARD SETBACK: 25 FEET MINIMUM (ABUTTING NON-RESIDENTIAL)
75 FEET MINIMUM (ABUTTING RESIDENTIAL)
REAR YARD SETBACK: NONE (ABUTTING NON-RESIDENTIAL)
75 FEET MINIMUM (ABUTTING RESIDENTIAL)
LOT COVERAGE: NO MORE THAN 60% FOR BUILDINGS & ACCESSORY BUILDINGS

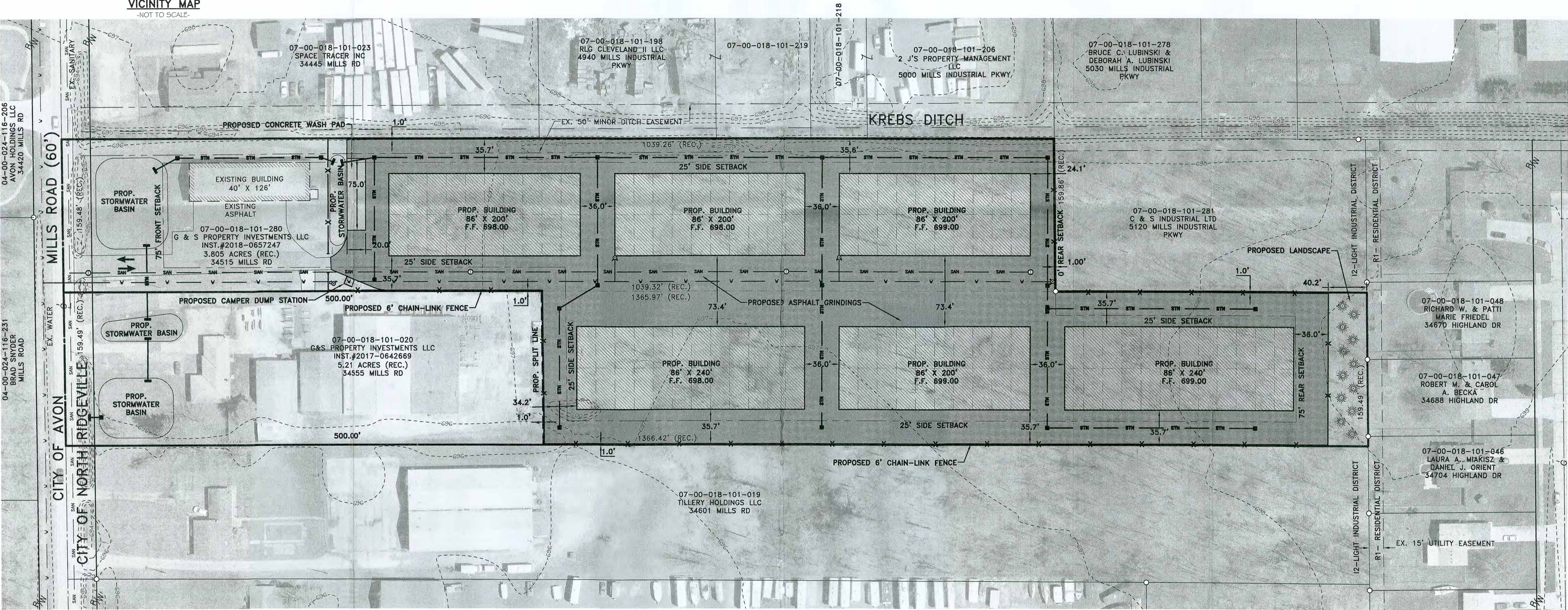
PARKING REQUIREMENTS:
WAREHOUSE & STORAGE: SUFFICIENT PARKING SPACE TO ACCOMMODATE EMPLOYEES AND THE LOADING AND UNLOADING OF MATERIALS.



GRAPHIC SCALE
0 50 100
(IN FEET)
SCALE: 1" = 50'



VICINITY MAP
-NOT TO SCALE-



-NOT FOR CONSTRUCTION-

REV.	BY	DATE	DESCRIPTION
1	RAF	04-18-2019	ISSUE TO CLIENT

UNDERGROUND UTILITIES
TWO WORKING DAYS BEFORE YOU DIG CALL 1-800-362-2764 (TOLL FREE) OHIO UTILITIES PROTECTION SERVICE NON-MEMBERS MUST BE CALLED DIRECTLY CALL 1-800-925-0988 (TOLL FREE) OIL & GAS PRODUCERS UNDERGROUND PROTECTION SERVICE

CONCEPTUAL PLAN NOTE:

THIS PLAN IS CONCEPTUAL ONLY. PROPOSED IMPROVEMENTS ARE SUBJECT TO FIELD SURVEY, FINAL ENGINEERING, AND JURISDICTIONAL REVIEW. THE SITE DESIGN MAY CHANGE. STORMWATER BASINS AND PROPOSED UTILITIES ARE SHOWN FOR INTENT ONLY. CONTOURS SHOWN BASED ON LORAIN COUNTY RECORD DATA.

EXISTING UNDERGROUND UTILITIES NOTE:

THE SIZE & LOCATION, BOTH HORIZONTAL AND VERTICAL, OF THE UNDERGROUND UTILITIES SHOWN HEREON, HAVE BEEN OBTAINED BY A SEARCH OF AVAILABLE RECORDS. VERIFICATION BY FIELD OBSERVATION HAS BEEN CONDUCTED WHERE PRACTICAL. HOWEVER, RAFTER A., LTD DOES NOT GUARANTEE THE COMPLETENESS NOR ACCURACY THEREOF.

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