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www.oshtemo.org

**NOTICE
OSHTEMO CHARTER TOWNSHIP
PLANNING COMMISSION**

REGULAR MEETING – VIRTUAL

Participate through this Zoom link:
<https://us02web.zoom.us/j/84037319703>

Or by calling: 1-929-205-6099

Meeting ID: 840 3731 9703

(Refer to the www.oshtemo.org home page or the third page of this packet for additional virtual meeting information)

THURSDAY, OCTOBER 14, 2021

6:00 P.M.

AGENDA

- a) Call to Order
- b) Roll Call and Remote Location Identification
- c) Pledge of Allegiance
- d) Approval of Agenda
- e) Approval of Minutes: September 30th, 2021
- f) **Public Hearing – Communication Tower, KCCDA Oshtemo**
Pyramid Network Services, LLC, on behalf of the Kalamazoo County Consolidated Dispatch Authority (KCCDA), is requesting Special Use and Site Plan approval to construct a 199-foot-tall unmanned communication tower on the back half of Parcel 05-10-155-011 along N 6th Street.
- g) **Public Hearing – Communication Tower, KCCDA WMU**
Pyramid Network Services, LLC, on behalf of the Kalamazoo County Consolidated Dispatch Authority (KCCDA), is requesting Special Use and Site Plan approval to construct a 199-foot-tall unmanned communication tower on 5010 S Drake Road.
- h) Public Comment
- i) Other Updates and Business
- j) Adjournment

**Policy for Public Comment
Township Board Regular Meetings, Planning Commission & ZBA Meetings**

All public comment shall be received during one of the following portions of the Agenda of an open meeting:

a. Citizen Comment on Non-Agenda Items or Public Comment – while this is not intended to be a forum for dialogue and/or debate, if a citizen inquiry can be answered succinctly and briefly, it will be addressed or it may be delegated to the appropriate Township Official or staff member to respond at a later date. More complicated questions can be answered during Township business hours through web contact, phone calls, email (oshtemo@oshtemo.org), walk-in visits, or by appointment.

b. After an agenda item is presented by staff and/or an applicant, public comment will be invited.

At the close of public comment there will be Board discussion prior to call for a motion. While comments that include questions are important, depending on the nature of the question, whether it can be answered without further research, and the relevance to the agenda item at hand, the questions may not be discussed during the Board deliberation which follows.

Anyone wishing to make a comment will be asked to come to the podium to facilitate the audio/visual capabilities of the meeting room. Speakers will be invited to provide their name, but it is not required.

All public comment offered during public hearings shall be directed, and relevant, to the item of business on which the public hearing is being conducted. Comment during the Public Comment Non-Agenda Items may be directed to any issue.

All public comment shall be limited to four (4) minutes in duration unless special permission has been granted in advance by the Supervisor or Chairperson of the meeting.

Public comment shall not be repetitive, slanderous, abusive, threatening, boisterous, or contrary to the orderly conduct of business. The Supervisor or Chairperson of the meeting shall terminate any public comment which does not follow these guidelines.

(adopted 5/9/2000)
(revised 5/14/2013)
(revised 1/8/2018)

Questions and concerns are welcome outside of public meetings during Township Office hours through phone calls, stopping in at the front desk, by email, and by appointment. The customer service counter is open from Monday-Thursday 8:00 am- 5:00 pm, and on Friday 8:00 am-1:00 pm. Additionally, questions and concerns are accepted at all hours through the website contact form found at www.oshtemo.org, email, postal service, and voicemail. Staff and elected official contact information is provided below. If you do not have a specific person to contact, please direct your inquiry to oshtemo@oshtemo.org and it will be directed to the appropriate person.

Oshtemo Township Board of Trustees		
<u>Supervisor</u>		
Libby Heiny-Cogswell	216-5220	libbyhc@oshtemo.org
<u>Clerk</u>		
Dusty Farmer	216-5224	dfarmer@oshtemo.org
<u>Treasurer</u>		
Clare Buszka	216-5221	cbuszka@oshtemo.org
<u>Trustees</u>		
Cheri L. Bell	372-2275	cbell@oshtemo.org
Kristin Cole	375-4260	kcole@oshtemo.org
Zak Ford	271-5513	zford@oshtemo.org
Kizzy Bradford	375-4260	kbradford@oshtemo.org

Township Department Information			
<u>Assessor:</u>			
Kristine Biddle	216-5225	assessor@oshtemo.org	
<u>Fire Chief:</u>			
Mark Barnes	375-0487	mbarnes@oshtemo.org	
<u>Ordinance Enf:</u>			
Rick Suwarsky	216-5227	rsuwarsky@oshtemo.org	
<u>Parks Director:</u>			
Karen High	216-5233	khigh@oshtemo.org	
Rental Info	216-5224	oshtemo@oshtemo.org	
<u>Planning Director:</u>			
Iris Lubbert	216-5223	ilubbert@oshtemo.org	
<u>Public Works:</u>			
Marc Elliott	216-5236	melliott@oshtemo.org	

Zoom Instructions for Participants

Before a videoconference:

1. You will need a computer, tablet, or smartphone with a speaker or headphones. You will have the opportunity to check your audio immediately upon joining a meeting.
2. If you are going to make a public comment, please use a microphone or headphones with a microphone to cut down on feedback, if possible.
3. Details, phone numbers, and links to videoconference or conference call are provided below. The details include a link to “**Join via computer**” as well as phone numbers for a conference call option. It will also include the 11-digit Meeting ID.

To join the videoconference:

1. At the start time of the meeting, click on this link to [join via computer](#). You may be instructed to download the Zoom application.
2. You have an opportunity to test your audio at this point by clicking on “Test Computer Audio.” Once you are satisfied that your audio works, click on “Join audio by computer.”

You may also join a meeting without the link by going to [join.zoom.us](#) on any browser and entering this **Meeting ID: 840 3731 9703**

If you are having trouble hearing the meeting or do not have the ability to join using a computer, tablet, or smartphone then you can join via conference call by following instructions below.

To join the conference by phone:

1. On your phone, dial the teleconferencing number: **1-929-205-6099**
2. When prompted using your touchtone (DTMF) keypad, enter the Meeting ID number: **840 3731 9703#**

Participant controls in the lower-left corner of the Zoom screen:



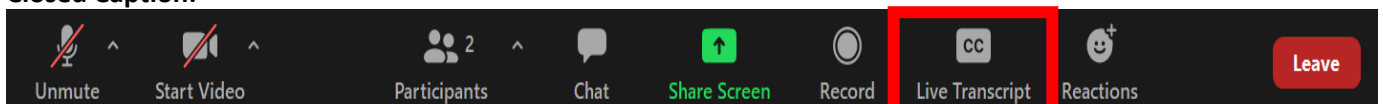
Using the icons at the bottom of the Zoom screen, you can (some features will be locked to participants during the meeting):

- Participants – opens a pop-out screen that includes a “Raise Hand” icon that you may use to raise a virtual hand. **This will be used to indicate that you want to make a public comment.**
- Chat – opens pop-up screen that allows participants to post comments during the meeting.

If you are attending the meeting by phone, to use the “Raise Hand” feature **press *9 on your touchtone keypad.**

Public comments will be handled by the “Raise Hand” method as instructed above within Participant Controls.

Closed Caption:



Turn on Closed Caption:

Using the icons at the bottom of the Zoom screen:

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2. Then select “Show Subtitle”.

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**OSHTEMO CHARTER TOWNSHIP
PLANNING COMMISSION**

DRAFT MINUTES OF A VIRTUAL MEETING HELD SEPTEMBER 30, 2021

Agenda

PUBLIC HEARING: TEMPORARY OUTDOOR EVENT, COUNTRY FRESH FARMS

Country Fresh Farms, on behalf of the owner, Menards, Inc., requested Special Exception Use approval to host a temporary outdoor meat sale event in the southwest corner of the Menards parking lot located at 6800 W. Main Street. The temporary outdoor event was proposed to take place in the first two weeks of October over a series of four days each week.

PUBLIC HEARING: PUD AMENDMENT, PHASE I OF WEST PORT VILLAGE

Jeff Scheffers, on behalf of Visser Developers of Kalamazoo LLC, requested Site Plan and Special Use approval to amend the West Port Village Planned Unit Development to eliminate Unit 22 in order to enlarge Units 19, 20, and 21.

PUBLIC HEARING: SITE PLAN AMENDMENT, STEENSMA LAWN AND POWER

Steensma Lawn and Power sought site plan approval to add 5,700 square feet of outdoor storage to their previously approved site located at 7561 Stadium Drive. They also sought site plan approval to allow outdoor storage on previously developed property they own to the south, located at 4100 South 7th Street.

A virtual meeting of the Oshtemo Charter Township Planning Commission was held Thursday, September 30, 2021, commencing at approximately 6:00 p.m.

ALL MEMBERS WERE PRESENT

Bruce VanderWeele, Chair
Micki Maxwell, Vice Chair
Kizzy Bradford
Deb Everett
Alistair Smith
Anna VerSalle
Chetan Vyas

LOCATION

Oshtemo
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Also present were Iris Lubbert, Planning Director, James Porter, Township Attorney, Karen High, Zoning Administrator, Colten Hutson, Zoning Administrator, Martha Coash, Recording Secretary and several guests.

Call to Order and Pledge of Allegiance

Chairperson VanderWeele called the meeting to order at approximately 6:00 p.m. and invited those in attendance to join in reciting the Pledge of Allegiance.

Approval of Agenda

Hearing no changes, the Chair let the agenda stand as published.

Approval of the Minutes of the Meeting of September 9, 2021

The Chair asked if there were additions, deletions, or corrections to the Minutes of the Meeting of September 9, 2021. Hearing none, he asked for a motion.

Ms. VerSalle **made a motion** to approve the Minutes of September 9, 2021, as presented. Mr. Vyas **seconded the motion**. The **motion was approved** unanimously by roll call vote.

Chairperson VanderWeele moved to the next agenda item and asked Mr. Hutson for his presentation.

PUBLIC HEARING: TEMPORARY OUTDOOR EVENT, COUNTRY FRESH FARMS
Country Fresh Farms, on behalf of the owner, Menards, Inc., requested Special Exception Use approval to host a temporary outdoor meat sale event in the southwest corner of the Menards parking lot located at 6800 W. Main Street. The temporary outdoor event was proposed to take place in the first two weeks of October over a series of four days each week.

Mr. Hutson explained Country Fresh Farms, on behalf of the owner, Menards, Inc., was requesting Special Exception Use approval to host a temporary outdoor meat sale event in the southwest corner of the Menards parking lot located at 6800 W Main Street. The temporary outdoor event is proposed to take place in the first two weeks of October over a series of four days each week.

He said Menards, Inc. is a commercial development located just west of US-131 in the northwest quadrant of the W Main Street/N 9th Street intersection. The site is zoned C: Local Business District. The setup for the outdoor meat sale event is proposed to be in the third parking aisle from the southwest corner of the development. The request is to allow customers to purchase a wide variety of meats in which are not found in local stores. The meat sale event is proposed to take place from Wednesday, October 06, 2021, to Saturday, October 09, 2021, and Wednesday, October 13, 2021, to Saturday, October 16, 2021, all from 9am to 7pm.

Temporary outdoor events which last more than one day are identified as a Special Exception Use within said code section. When reviewing a Special Exception Use, there are two sets of criteria that need to be considered: 1) the general Special Use review criteria outlined in Section 65.30, and 2) the specific requirements for the use in question outlined under Section 49.260. He provided the following analysis of the proposal against these two Sections.

Section 65.30: Special Use Review Criteria

- 1. Master Plan/Zoning Ordinance: The proposed use will be consistent with the purpose and intent of the Master Plan and Zoning Ordinance, including the district in which the use is located.**

Oshtemo's adopted Future Land Use Plan illustrates the property in question is within a commercial area. From a zoning standpoint, the subject property is classified as C: Local Business District, within which temporary outdoor events lasting more than one day are permissible with Special Exception Use approval from the Planning Commission.

B. Site Plan Review: The Site Plan Review Criteria of Section 64.80

An engineered site plan is not required for a temporary outdoor event and therefore this criterion is not applicable. However, a plan showing the general layout of the location for the special event has been provided. The layout plan illustrates that four parking spaces will be blocked off in order to adequately fit the necessary equipment for the event as a 21' truck will occupy two of the four spaces while the tent area where purchases are made will take up the remaining two parking spaces. It is anticipated that six more parking spaces will be utilized for when customers are waiting in line to purchase such goods, making a total of ten parking spots to be utilized. Each parking space utilized is 10' x 20'. An existing parking lot light in proximity to the project area will serve as lighting for the outdoor event.

C. Impacts:

- 1. The proposed use would be compatible, harmonious and appropriate with the existing or planned character and uses of adjacent properties; meaning the proposed use can coexist with neighboring uses in a stable fashion over time such that no neighboring use is unduly negatively impacted.**

Other uses in the surrounding C: Local Business District zoning classification include Subway, Pizza Hut, Supercuts, D'Nicio's Parlour, Belle Tire, McDonald's, T-Mobile, etc. Due to there being many commercial users already established in the area, and this use being in accordance with both the Master Plan and the Zoning Ordinance, staff has no concerns that the proposed use will negatively impact neighboring uses.

- 2. Potentially adverse effects arising from the proposed use on adjacent properties would be minimized through the provision of adequate parking, the placement of buildings, structures and entrances, as well as the location of screening, fencing, landscaping, buffers or setbacks.**

Menards possesses approximately 560 parking spaces on-site. Ample parking exists for Menard's customers as well as for those visiting the temporary outdoor event. Use of a portion of the parking lot for a meat sale event should have no adverse effect on parking for adjacent properties. In addition, the proposed event location does not

impact drive aisles, fire lanes, or emergency vehicle turning areas. All setbacks for the equipment being proposed have been met.

3. The proposed use would not be detrimental, hazardous, or disturbing to existing or future adjacent uses or to the public welfare by reason of excessive traffic, noise, smoke, odors, glare, or visual clutter.

Though the applicant is proposing a generator to service the chest freezers, the sound levels are not expected to be exceed what is commonly found for a commercial area. The meat sale event will not be visible from W Main Street due to the existing multi-tenant buildings abutting W. Main Street nor N. 9th Street due to its distance. Staff does not foresee any negative impacts occurring from this use.

D. Environment: The natural features of the subject property shall only be cleared or altered to the extent necessary to accommodate site design elements, particularly where the natural features assist in preserving the general character of the area.

Not applicable, as this is an existing site with paved surfaces.

E. Public Facilities: Adequate public and/or private infrastructure and services already exist or would be provided, and will safeguard the health, safety, and general welfare of the public.

The temporary outdoor event will be served by public restroom facilities within the Menards store on-site. All other available public infrastructure such as water and sewer were provided during the development of the site.

F. Specific Use Requirements: The Special Use development requirements of Article 49.

All of the specific use requirements outlined in Section 49.260 Temporary Outdoor Events (Lasting More Than One Day) have been met. The Fire Marshal is satisfied with the proposed plan as fire apparatus will be maintained. Mr. Hutson listed the requirements for reference:

49.260 TEMPORARY OUTDOOR EVENTS (LASTING MORE THAN ONE DAY).

- A. May last more than one day.
- B. Use is incidental to the principal use of the property.
- C. A Site Plan shall be submitted for administrative review indicating the following:
 - 1. Traffic lanes and on-site parking.
 - 2. Fire lanes and emergency vehicle turning areas.
 - 3. Restrooms provided (in building or portable facilities).
 - 4. Placement of vehicles, trailers, and all other equipment is away from adjoining residentially used properties and complies with all applicable setbacks.
 - 5. All activity takes place on subject property.

- D. The Fire Chief, or his designee, has approved the placement of vehicles, trailers, and all other equipment associated with the event.
- E. All signs directed off-site must receive a temporary sign permit and comply with all applicable sign ordinances.
- F. Property owner must approve and acknowledge the use of the property for the event.

Mr. Hutson said all requirements have been met and the Fire Marshal is satisfied with the request. He noted the actual event request dates submitted after the fact are for October 6-9 and October 13-16, from 9:00 a.m. to 7:00 p.m.

He indicated Planning Department staff were recommending the approval of the proposed Special Use for the temporary outdoor event with the following conditions.

1. The applicant shall submit a temporary sign permit application to be reviewed and approved by Township staff if any type of signage is to be added.
2. If Country Fresh Farms wishes to have the same temporary outdoor event in the future at 6800 W Main Street, the Planning Commission will allow such a request to be reviewed and approved administratively.

The Chairperson asked whether Commissioners had questions for Mr. Hutson.

Mr. Smith was concerned about restroom accessibility and sufficiency, noting they were 200-300 feet from the temporary event.

Ms. Lubbert said staff felt the restrooms inside Menard's were sufficient and accessible enough as proposed. She added that if the Commissioners are concerned about restroom accessibility a porta potty could be requested from the applicant.

The Chair commented that within the store the requirement is within 500 feet. He had no concerns with restroom accessibility for this event as proposed.

Ms. Maxwell asked what types of meat would be sold.

The applicant indicated they would be selling USDA frozen steaks, chicken, pork, and seafood, all individually portioned, vacuum sealed and sold by the box, often used for camping or by those with specific portion control needs. Most customers stop by either coming or going from Menards, which will be having a related sale on freezers and grills. The average time a customer is at the event sale is three to four minutes.

The Chair opened a public hearing; hearing no comments, he closed it and moved to Board Deliberations. As members had no comments, he requested a motion.

Ms. VerSalle **made a motion** to approve the special exception use approval for Country Fresh Farms to hold a temporary outdoor meat sale as requested for October

6-9 and October 13-16, from 9:00 a.m. to 7:00 p.m. as presented, with the two staff conditions:

1. The applicant shall submit a temporary sign permit application to be reviewed and approved by Township staff if any type of signage is to be added.
2. If Country Fresh Farms wishes to have the same temporary outdoor event in the future at 6800 W Main Street, the Planning Commission will allow such a request to be reviewed and approved administratively.

Ms. Maxwell **seconded the motion**. The **motion was approved 6 - 1** by roll call vote, with Mr. Smith voting against.

Chairperson VanderWeele moved to the next agenda item and asked Mr. Hutson for his presentation.

PUBLIC HEARING: PUD AMENDMENT, PHASE I OF WEST PORT VILLAGE

Jeff Scheffers, on behalf of Visser Developers of Kalamazoo LLC, requested Site Plan and Special Use approval to amend the West Port Village Planned Unit Development to eliminate Unit 22 in order to enlarge Units 19, 20, and 21 at 5401 W H Avenue, Parcel numbers 05-12-200-022, 05-12-200-021, 05-12-200-020, & 05-12-200-019.

Mr. Hutson reported Jeff Scheffers, on behalf of the owner, Visser Developers of Kalamazoo LLC, was requesting Site Plan and Special Use approval to amend the West Port Village Planned Unit Development (PUD) to eliminate Unit 22 in order to enlarge Units 19, 20, and 21. The nature of the request stems from these three sites not being large enough to accommodate the applicant's desired floor plans for their residential buildings.

Currently, the subject Planned Unit Development possesses 129 residential units along with one nonresidential unit (sales and recreational amenities). If approved, the amendment under consideration would reduce the total number of residential units within the development from 129 to 128.

The West Port Village Planned Unit Development falls within the R-2: Residence District zoning classification. A residential Planned Unit Development is permitted as a Special Use within the R-2: Residence District. Any proposed Special Uses or amendments to approved Special Uses require review and approval from the Oshtemo Township Planning Commission.

Mr. Hutson explained when reviewing this Special Use request, two sets of criteria need to be considered: the general Site Plan review criteria outlined in Section 64, and the general Special Use review criteria outlined in Section 65.30. He provided the following analysis of the proposal against these two Sections. Overall, he noted most of the requirements of Section 64 and Section 65.30 have been met.

Section 64: Site Plan Review

General Zoning Compliance:

The proposed amendment to the West Port Village Planned Unit Development is in keeping with the zoning of the property.

Access and Circulation

The Fire Marshal reviewed the site plan and found it adequate to service emergency vehicle circulation.

Parking: This portion of the review is not applicable.

Easements: No changes to the current easements on-site are proposed. This portion of the review is not applicable.

Sidewalks: There are no proposed changes to the approved sidewalks. This part of the review is not applicable.

Shared Use Path: The Township's Non-Motorized Action Plan does identify a bike lane adjacent to the subject site on the south side of W H Avenue. This stretch of W H Avenue offers 4' wide bike lane on the north and south side of the traveled way. With said non-motorized facility already having been installed, no further action on this item is required.

Building Design

Building Information: Most of the existing buildings throughout the development range between 2,400 SF and 2,800 SF, which includes basement area. All the residential structures on-site possess either a walk-out patio or decking and a porch entrance. The exterior materials for the units within the Planned Unit Development consist of vinyl siding with a brick finish for the façade. The future residential buildings will match the existing façade and architectural features of the existing residential buildings on-site, colors vary between beige and gray.

Setbacks: A dimensional deviation was approved on June 09, 2005, to reduce the side yard setback of 5' from the side yard property line to the foundation when 10' from the side yard property line to the leading edge of the building was required. This applied for all units within Phases I and II of the development. Further setback information for individual building sites along with the standard setbacks for the overall Planned Unit Development were not provided. **The applicant will need to provide such information on setbacks as a condition of approval.**

Lot Dimensions: Dimensional deviations for site area and width were previously granted by the Planning Commission on June 09, 2005, for each building site within Phases I and II within the subject development. The area of each site was approved to range from a minimum of 3,532 SF to a maximum of 13,270 SF while 10,560 SF was the minimum area required by code for single family dwellings serviced by water and sewer. The width at building setback was

approved to range between 41.56' to 160' while 80' was the minimum width required by code. The proposed configuration for Lots 19, 20, and 21 meet the minimum property area (3,532 SF) and width (41.56') requirements that were established when the dimensional deviations were granted at time of the Planned Unit Development's approval and brings them closer to the adopted code standard.

Fencing: No changes to the current on-site fencing are proposed. This portion of the review is not applicable.

Lighting: No changes to current on-site lighting are proposed. This portion of the review is not applicable.

Signs: No changes to the current on-site signage are proposed. This portion of the review is not applicable.

Landscaping

No changes to the current on-site landscaping are proposed. This portion of the review is not applicable.

Engineering

Prein & Newhof and the Oshtemo Public Works Department reviewed the project site plan and are satisfied with the proposal.

Fire Department

The Fire Marshal reviewed the proposal and is content with the site plan.

Section 65.30: Special Use Review Criteria

Master Plan/Zoning Ordinance: The proposed use will be consistent with the purpose and intent of the Master Plan and Zoning Ordinance, including the district in which the use is located.

This subject Planned Unit Development is presently zoned R-2: Residence District. All units within the West Port Village Planned Unit Development are single family homes. Residential Planned Unit Developments are allowable uses within the R-2: Residence District through Special Exception Use approval. The proposal meets the intent of the Township's Master Plan documents for this area and complies with the Township's Zoning Ordinance.

Mr. Hutson said the Planning Department staff recommended approval of the proposed Special Use and Site Plan to amend the Planned Unit Development in order to eliminate Unit 22 and enlarge Units 19, 20, and 21 within Phase I of West Port Village with the following conditions.

1. An updated Master Deed and Bylaws shall be provided for review by Staff and the Township Attorney and recorded.

2. An updated site plan providing a vicinity map on the Cover Sheet to display the current zoning of the site and the zoning districts surrounding the site.
3. An updated site plan providing the percentage of land reserved for open space and the percentage of land covered by buildings.
4. An updated site plan providing building setback information for the development as well as illustrating all setback measurements from the development's north, south, east, and west boundary lines.
5. An updated site plan, adding pavement width measurements for all circulation aisles within the site as well as providing the location of existing and proposed sidewalk throughout Phases I and II.
6. Provide an additional page to the site plan which captures both Phases I and II on one sheet.

Chairperson VanderWeele thanked Mr. Hutson for his report and asked if there were questions from Commissioners. Hearing none, he asked if the applicant wished to speak.

Mr. Scheffers, Visser Construction, noted Lot 22 was too small and the request was a better step for the overall development.

The Chair opened a public hearing. As there were no comments from the public, he moved to Board Deliberations. There were no comments from Commissioners.

Chairperson VanderWeele asked for a motion.

Ms. Maxwell **made a motion** to approve the request to amend the existing PUD to eliminate Unit 22 in order to enlarge Units 19, 20, and 21 in Phase I of West Port Village as presented, to include the six conditions recommended by staff:

1. An updated Master Deed and Bylaws shall be provided for review by Staff and the Township Attorney and recorded.
2. An updated site plan providing a vicinity map on the Cover Sheet to display the current zoning of the site and the zoning districts surrounding the site.
3. An updated site plan providing the percentage of land reserved for open space and the percentage of land covered by buildings.
4. An updated site plan providing building setback information for the development as well as illustrating all setback measurements from the development's north, south, east, and west boundary lines.
5. An updated site plan, adding pavement width measurements for all circulation aisles within the site as well as providing the location of existing and proposed sidewalk throughout Phases I and II.
6. Provide an additional page to the site plan which captures both Phases I and II on one sheet.

Ms. VerSalle seconded the motion. The motion was approved unanimously by roll call vote.

Chairperson VanderWeele moved to the next agenda item and asked Ms. Karen High for her presentation.

PUBLIC HEARING: SITE PLAN AMENDMENT, STEENSMA LAWN AND POWER
Steensma Lawn and Power sought site plan approval to add 5,700 square feet of outdoor storage to their previously approved site located at 7561 Stadium Drive. They also sought site plan approval to allow outdoor storage on previously developed property they own to the south, located at 4100 South 7th Street.

Ms. High explained Steensma Lawn and Power was seeking site plan approval from the Planning Commission to add 5,700 square feet of outdoor storage to their previously approved site located at 7561 Stadium Drive. They were also seeking site plan approval to allow outdoor storage on previously developed property that they own to the south, located at 4100 South 7th Street. Both properties are zoned I-1: Industrial District, Manufacturing/Service.

OVERVIEW FOR 7561 STADIUM DRIVE:

Ms. High reported Steensma Lawn and Power, 7561 Stadium Drive, Parcel number 05-34-185-036, is located on a 4.53-acre parcel on the south side of Stadium Drive and the west side of South 7th Street. The site has two buildings: a 14,460 square foot facility used for showroom, offices, parts and service, and a 5,400 square foot storage building. In addition to the buildings, the site includes parking, two outdoor storage areas, and two equipment display areas.

Site plan and special use approval to allow the sale of lawn and power equipment at 7561 Stadium Drive was first granted in 1995. Between 2000 and 2008, the Planning Commission approved four site plan amendments to allow building, outdoor storage, and display area expansion. Site plan amendments were granted in 2015 to construct additional parking and in 2019 to allow construction of a driveway connection to the adjacent property to the south.

According to the applicant, the existing approved outdoor storage areas are not large enough to meet the needs of the business. Palleted lawn and power equipment is currently stored in parking areas, which does not comply with the zoning ordinance. To bring the site into compliance, the applicant proposes to add 5,700 square feet of outdoor storage at the southeast corner of the property and construct an additional connector drive to the adjacent property to the south. This will require the removal of four existing parking spaces. The proposed connector drive will mainly be used by a forklift to move deliveries of lawn equipment and snow plows that arrive in crates. Outdoor storage requires site plan review and approval by the Planning Commission.

OVERVIEW FOR 4100 SOUTH 7TH STREET

Ms. High said the property at 4100 South 7th Street, Parcel number 05-34-185-035, acquired by Steensma Lawn and Power in 2019, is located on a 5.42-acre parcel with two buildings: a 19,872 square foot building used by Steensma for storage and shop space and a 7,150 square foot building leased for office and storage. The site also includes a loading dock and parking. Site plan approval was granted in 2003 to Marketing Technology Service Inc., a company that performed research, development, and testing for the paper industry.

The applicant proposed to add 7,600 square feet of outdoor storage along the north property line, construct a connecting drive to the north, and add a paved circulation area south of the existing driveway from 7th Street. Crated tractors and snowplows will be temporarily stored in this outdoor area while awaiting unpacking, so stock will be constantly rotating. The connector drive will mainly be used by a forklift moving crated materials. Approximately 125 linear feet of six-foot-tall privacy fence was proposed along the east property line to screen the adjacent residence. Special use approval is not required because no outdoor display of lawn and power equipment is proposed. The outdoor storage requires Planning Commission review and approval.

Ms. High provided the following analysis for Section 64: Site Plan Review

General Zoning Compliance:

Zoning: 7561 Stadium Drive and 4100 S 7th Street are zoned I-1 Industrial. Properties to the north, east, and west are also in the I-1 District. Property to the south of 4100 S 7th Street is in the RR: Rural Residential District. Farm machinery and other equipment sales lots are permitted as a Special Use within this district. Offices and warehouses are permitted uses. Outdoor storage is permitted in this district in connection with any permitted uses.

Lot Dimensions: Parcels within the I-1 Zoning District require a minimum area of 50,000 square feet and frontage of 200 feet (Section 50.10 (A)). Both subject parcels exceed these requirements, with 197,500 square feet of area and 444 feet of frontage at 7561 Stadium Drive and 235,900 square feet of area and 314 feet of frontage at 4100 S 7th Street.

Setbacks: Required setbacks in the I-1 District are 70 feet from the front and 20 feet from the side and rear. The existing developments and proposed expansion areas meet all setback requirements for this district.

Outdoor Storage: Outdoor storage in connection with Permitted and Special Uses is allowed in the side and rear yard areas except within the area required for setbacks from side and rear lot lines. ***Such storage may not exceed 100 percent of the square foot area of the principal building upon the premises,*** and no outdoor storage of damaged or inoperable vehicles or equipment is allowed. She provided a table showing existing and proposed outdoor storage on each property. The proposal appears to meet all outdoor storage requirements for both area and location. The outdoor storage areas and connecting drive are

proposed to be surfaced with gravel. Pavement is not required for outdoor storage or circulation within outdoor storage areas in the I-1 district.

	Area of the principal building on the premises	Maximum area of outdoor storage permitted per code	Area of existing outdoor storage	Area of proposed outdoor storage	Total existing and proposed outdoor storage
5761 Stadium Drive	14,460 square feet	14,460 square feet	8,100 square feet	5,700 square feet	13,800 square feet
4100 S 7 th Street	19,872 square feet	19,872 square feet	0	7,600 square feet	7,600 square feet

Access and Circulation

Access: 7561 Stadium Drive has one existing access point onto Stadium Drive. 4100 S 7th Street has one existing access point onto S 7th Street. No street access changes were proposed. The two properties are currently connected with a driveway on the west side of the sites. An additional connecting driveway was proposed on the east side of the sites. Per recommendation of the Township Engineer, if the proposal is approved, a cross access easement agreement should be required as a condition of approval.

Parking: Per code, the parking requirements for industrial uses is based on the type of facility.

- Manufacturing, Assembly, Processing & Research Facilities require 1.5 parking space per each 1,000 square feet of net floor area plus the required parking devoted to other uses, or one per employee whichever is greater.
- Warehouse and Distribution Facilities require one parking space per each 1,500 square feet of net floor area plus the required parking devoted to other uses or one per employee, whichever is greater.
- Office uses require one per each 150 square feet of net floor area.
- Showrooms for Furniture, Appliances, Household Equipment, Motor Vehicle, and Machinery Sales require one space per each 400 square feet of net floor area used for sales and/or display.

Based upon these requirements, the existing building areas, types of uses, and number of employees, the development at 7561 Stadium Drive requires 42 parking spaces. 60 are existing and four were proposed to be removed, leaving 56 spaces on site if this proposal is approved. Since all of the parking is existing, staff concluded that either the parking requirements or quantity of each facility has changed over time. No details are included in previous staff reports to aid in confirming this conclusion. At 4100 S 7th Street, 19 parking spaces are required and 20 are existing.

No outdoor storage was proposed within the setback area, per ordinance requirements.

Sidewalk: Construction of sidewalks is not required per Section 57.90, because this site plan review falls into the exempt category of 'Accessory Structures and Site Improvements' in the Table under Section 64.20 Applicability.

Building Design

No new buildings or changes to the buildings were proposed. This criterion is not applicable.

Dumpster

No new dumpsters or changes to the dumpsters were proposed. This criterion is not applicable.

Landscaping

No new landscaping was proposed or required, per Article 53.150: Landscape Provisions for Existing Sites. However, a six-foot-tall privacy fence is proposed to screen the adjacent residence on S 7th Street. The residential property is zoned I-1 Industrial.

Signage

No new signs were proposed. This criterion is not applicable.

Engineering

Prein & Newhof, the Township's civil engineering agent, reviewed the project site plan and found grading and drainage to be satisfactory. Per standard practice, they recommended an access easement be required for the proposed driveway, which was listed as a proposed condition of approval.

Fire Department

The Township Fire Marshal reviewed the project site plan. A final review was recommended as a condition of approval.

RECOMMENDATION:

Ms. High said Staff recommended the Planning Commission approve the proposed outdoor storage at 5761 Stadium Drive and 4100 S 7th Street, with the following conditions:

1. Per ordinance, no outdoor storage of damaged or inoperable vehicles or equipment is allowed.
2. An access easement shall be required for the proposed driveway.
3. Fire Department shall review the site for emergency access.

Chairperson VanderWeele thanked Ms. High for her report and asked whether commissioners had questions for her.

Mr. Vyas was concerned nearby residents would be disturbed by noise from heavy equipment use.

The Chair noted only one forklift was involved.

Mr. Steensma, the applicant, indicated open hours are from 8 a.m. to 6 p.m. Noise from the forklift is minimal and would be operated between 8:00 a.m. and 5:00 p.m. Similar equipment is already being used onsite. The neighboring homeowner has not complained about noise so far.

Ms. High noted the neighbors already live next door to the industrial property.

Hearing no further questions, the Chair opened a public hearing. There were no comments from the public, so he closed the hearing and moved to Deliberations. Hearing no comments from Commissioners, he asked for a motion.

Ms. Maxwell **made a motion** to approve the request from Steensma Lawn and Power to approve the site plan as presented for outdoor storage facilities at 7651 Stadium Drive and 4100 South 7th Street including the three staff recommendations:

1. Per ordinance, no outdoor storage of damaged or inoperable vehicles or equipment is allowed.
2. An access easement shall be required for the proposed driveway.
3. Fire Department shall review the site for emergency access.

Ms. VerSalle seconded the motion. The motion was approved unanimously by roll call vote.

PUBLIC COMMENT ON NON-AGENDA ITEMS

As there were no public comments, Chairperson VanderWeele moved to the next agenda item.

OTHER UPDATES AND BUSINESS

Ms. Lubbert shared the good news that the Township Board approved the Housing Action Plan. The consultant will be beginning work soon. She said she would keep the Commission updated.

Ms. Maxwell asked if that means we are getting closer to progress on the Maple Hill Sub Area plan.

Ms. Lubbert said she is working with a developer on options and that we are moving forward.

Ms. Bradford said she had spoken with someone about the possibility of holding a Gus Macker tournament in Oshtemo Township for area youth next summer and wondered how to pursue that possibility.

Ms. Lubbert said it could be treated like a temporary/special event and suggested Ms. Bradford direct the tournament coordinator to talk with her. Ms. High said she would be happy to interface with the Planning Department and that the Township would love to act as host.

ADJOURNMENT

With no further business to consider, Chairperson VanderWeele adjourned the meeting at approximately 6:49 p.m.

Minutes prepared:
October 1, 2021

Minutes approved:
_____, 2021

DRAFT

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October 7, 2021



Mtg Date: October 14, 2021

To: Planning Commission

From: Iris Lubbert, Planning Director

Applicant: Pyramid Network Services, LLC

Owner: City of Kalamazoo

Property: No address, Parcel Number 05-10-155-011

Zoning: RR, Rural Residential

Request: Special Use and Site Plan approval for a 199-foot-tall Communication Tower to service the Kalamazoo County Consolidated Dispatch Authority

Section(s): Section 5.40: Communication Towers in RR, Rural Residential
Section 65.30: Special Use Review Criteria
Section 49.80: Special Use Requirements for Communication Towers

PROPOSAL:

Pyramid Network Services, LLC, on behalf of the Kalamazoo County Consolidated Dispatch Authority (KCCDA), is requesting Special Use and Site Plan approval to construct a 199-foot-tall unmanned communication tower on the back half of Parcel 05-10-155-011 along N 6th Street. The property in question is outlined in yellow in the map to the right; the approximate location of the proposed tower is starred.

OVERVIEW:

Parcel 05-10-155-011 is located on the east side of N 6th Street, south of the H Avenue and 6th Street intersection. The property in question is zoned RR, Rural Residential and is owned by the City of Kalamazoo. The site currently houses a water tower. The applicant is proposing to lease a portion of this property from the City of Kalamazoo to construct the proposed tower on. The tower will purely serve the KCCDA. The



KCCDA provides public safety dispatch operations to Kalamazoo County and operates a central communications system for participating Local Governmental Units, the County, and other supporting agencies or entities. Communication towers are permitted in the RR zoning district as a special use. The notice of public hearing was mailed to all property owners within 300 feet of Parcel Number 05-10-155-011 on September 16th and published in the paper on September 21st.

ANALYSIS:

The entirety of the property in question is zoned RR, Rural Residential. Uses permitted in the RR zoning district are outlined in Article 5 of the Township's Zoning Code. *Communication towers* are identified as a Special Use within this section and require review and approval of the Planning Commission. When reviewing a Special Use there are two sets of criteria that need to be considered: the general Special Use review criteria outlined in Section 65.30 and the specific requirements for the use in question outlined under Section 49.80. Below is an analysis of the proposal against these two Sections.

Section 65.30: Special Use Review Criteria

A. Master Plan/Zoning Ordinance: The proposed use will be consistent with the purpose and intent of the Master Plan and Zoning Ordinance, including the District in which the use is located.

Zoning is purely a state and local issue except in two areas where Congress has imposed federal regulations: religious uses and telecommunications. Communication towers have special protections from the Federal Government and although the Federal Government dictates some of what can be done, municipalities have been granted a level of control over the placement, construction, and modification of wireless service facilities. As such, the Township's Zoning Ordinance allows for the construction of communication towers within the Township as long as "a need" for the tower is demonstrated. The code also provides legal tools and criteria to review the proposal against.

The applicant provided a letter explaining that this proposed tower addresses an identified need to improve KCCDA's coverage and service to the County. This criterion has been met.

B. Site Plan Review: The Site Plan Review Criteria of Section 64.80.

Pyramid Network Services, LLC is proposing to lease a 75 foot by 50 foot area within Parcel 05-10-155-011 to hold their 199-foot-tall communication tower and supporting equipment. The proposed location of the tower is over 500 feet from the right-of-way line of N 6th Street, over 350 feet from the eastern property line, 162 feet from the southern property line, and 39 feet from the northern property line. A deviation from the setback requirements will be needed. Required setbacks for communication towers will be addressed under the review of Section 49.80: Communication Towers of this report.

The existing dirt and gravel drive through the property will be used to access this proposed use. An unmanned tower does not require any onsite parking. No lighting is proposed on the tower; however, two lights are proposed on the equipment shelter within the tower enclosure. These two lights are cut off fixtures and meet ordinance requirements.

The tower and its equipment will be surrounded by a 9 foot tall, barbed wire fence. In the RR district a maximum fence height of 6 feet is permitted. The Planning Commission is authorized

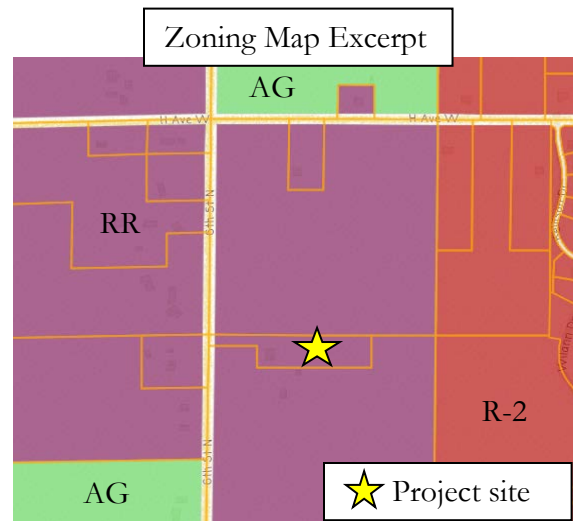
to grant height exemptions. The applicant has requested this taller fence for security reasons, stating “we have found higher fences help control any trespassing that might occur. KCCDA is also matching the existing fence at the water tank.” Security fences with barbed wire in the RR district require Special Use approval. Staff finds this request reasonable. The Planning Commission is requested to grant a deviation and special use approval to allow the proposed 9 foot tall, barbed wire fence at this site as proposed.

A site plan for the proposed tower has been submitted, see attached. This site plan has been reviewed by Township’s Fire, Public Works, and Planning Department. All site plan requirements and comments have been addressed.

C. Impacts:

- 1. The proposed use would be compatible, harmonious, and appropriate with the existing or planned character and uses of adjacent properties; meaning the proposed use can coexist with neighboring uses in a stable fashion over time such that no neighboring use is unduly negatively impacted.**

The property hosting the proposed tower and all surrounding properties are zoned RR, Rural Residential. Generally towers are not considered harmonious in residential areas, however the RR district lists communication towers as a permitted special use if there is a demonstrated need. A need has been demonstrated. This tower will improve safety dispatch services to surrounding residents and the County overall. This criterion has been met.



- 2. Potentially adverse effects arising from the proposed use on adjacent properties would be minimized through the provision of adequate parking, the placement of buildings, structures and entrances, as well as the location of screening, fencing, landscaping, buffers or setbacks.**

The proposed communication tower meets site plan requirements. The Planning Commission will need to consider a deviation for both the tower setbacks and the proposed fencing. No adverse effects are anticipated in this area.

- 3. The proposed use would not be detrimental, hazardous, or disturbing to existing or future adjacent uses or to the public welfare by reason of excessive traffic, noise, smoke, odors, glare, or visual clutter.**

The proposed use would not be detrimental, hazardous, or disturbing to adjacent uses by reason of excessive traffic, noise, smoke, glare, or odors. No lights are proposed on the tower itself.

- D. Environment: The natural features of the subject property shall only be cleared or altered to the extent necessary to accommodate site design elements, particularly where the natural features assist in preserving the general character of the area.**
Aside from the trees that will be cleared to accommodate the 75 foot by 50 foot lease area for the tower, all natural features of the site will remain.
- E. Public Facilities: Adequate public and/or private infrastructure and services already exist or would be provided, and will safeguard the health, safety, and general welfare of the public.**
Adequate public facilities are in place to support the proposed use.
- F. Specific Use Requirements: The Special Use development requirements of Article 49.**
All of the specific use requirements in Section 49.80 are outlined below.

Section 49.80: Communication Towers

A communication tower shall be erected, constructed, located, or established in compliance with the following:

- 1. Justification. A proposed tower shall not be established unless the communications equipment/antenna(s) planned for the proposed location cannot be accommodated on an existing or approved tower within the area of the proposed tower due to the following reasons (*the code then outlines four exceptions*).**
The applicant has provided a letter explaining that this proposed tower addresses an identified need to improve KCCDA's coverage and services to the County. Staff is satisfied with the applicant's justification.
- 2. Design of tower.**
 - a. Any proposed or modified tower shall be designed and constructed to accommodate future co-locations. Towers shall be designed to allow for future rearrangement of antennas upon the tower and to accept antennas mounted at varying heights.**
The proposed tower will support public safety dispatch operations to Kalamazoo County. For security reasons the proposed tower will not accommodate co-locations. This is standard practice for communication towers of this type.
 - b. A proposed or modified tower shall be designed to blend into the surrounding environment through the use of color and camouflaging architectural treatment, except in instances where the color is dictated by federal or state authorities and located on the site so as to minimize its visibility from the public right-of-way and residentially zoned properties.**
The proposed tower is a galvanized gray color and screened by the existing vegetation that surrounds the property. Criterion met.
- 3. Height. The height of a tower shall be determined by measuring the vertical distance from the tower's point of contact with the ground or rooftop to the highest point of the tower, including all antennas or other attachments. When towers are mounted upon other structures, the height shall be considered with the combined height of the structure and tower.**
The proposed tower is 190 feet tall with a 9-foot tall lightning rod; the total height of the tower is 199 feet.

4. Tower setbacks.

- a. A tower shall be located so that the setback from all property lines is equal to or greater than the height of the tower. The reviewing body may deviate from such requirements if the deviation is consistent with the spirit and intent of the Ordinance.**

The proposed tower will be a total of 199 feet tall. The location of the proposed tower is over 500 feet from the right-of-way line of N 6th Street, over 350 feet from the eastern property line, 162 feet from the southern property line, and 39 feet from the northern property line. A deviation is requested from the Planning Commission for the northern and southern setback. It should be noted that due to the shape and size of Parcel 05-10-155-011 the proposed tower would need a deviation for setbacks no matter where it is placed on the property. The tower is designed to collapse in on itself if it were to fall, so granting a deviation will not create a safety hazard. The location of the tower is fairly isolated and as the tower is providing a needed service to both the Township and County approving the deviation would be consistent with the spirit and intent of the ordinance.

- b. Towers shall not be located between a principal structure and a public street.**

The proposed tower is located behind the water tower onsite.

- c. A tower's setback may be reduced or its location to a public street varied to allow the integration of a tower into an existing or proposed structure, such as a church steeple, utility pole, power line support device or other similar structure.**

Not applicable.

- d. Towers shall be set back at least 150 feet from any adjacent residences, residentially zoned property or a public street.**

The only property line that the proposed tower does not meet this requirement for is the northern property line; with a proposed setback is 39 feet. The property to the north is classified as vacant by the Assessor's website. The nearest building to the north is over 900 feet away and buffered by established foliage. Staff has no concerns with the towers proposed location. As noted above, the Planning Commission is requested to grant a deviation for the proposed tower setbacks.

5. Accessory structures. Structures accessory to a tower, including utility buildings, shall be designed and located on the site to blend in with the surrounding environment and shall meet the minimum setback requirements of the underlying zoning district.

Equipment supporting the structure (equipment shelter and propane tank) will all be located within the proposed fenced compound. See page A-1/2 of the site plan for more details.

6. Landscaping/screening.

- a. Landscaping/screening at the site shall be designed and maintained to minimize visibility of the tower and related equipment from the public right-of-way and residentially zoned properties.**

Existing landscaping on the site will be utilized. There are wooded areas to the north, south, east, and west. The existing landscaping will help lessen the visibility of the tower from the public right of way and neighboring residentially zoned properties.

- b. **Ground-mounted equipment and accessory buildings and structures may be required to be screened from view by suitable vegetation, except where a design of non-vegetative screening better reflects and compliments the architectural character of the surrounding area.**

The proposed tower enclosure will not be visible from the road or neighboring properties. The requirement for additional landscaping of this nature is not required.

- 7. **Security fencing. Security fencing of at least six feet (unless other height is required by state or federal regulations) shall be required to prevent access to the tower, accessory building/structure and/or guyed wires. The reviewing body may deviate from such requirements if the deviation is consistent with the spirit and intent of the Ordinance.**

The tower and its equipment will be surrounded by a 9 foot tall barbed wire fence (a continuation of the fencing surrounding the water tower). As noted under site plan review, the Planning Commission will need to grant a deviation for this fence to be installed as proposed.

- 8. **Lighting. Towers shall not be illuminated by artificial means and shall not display strobe lights unless such lighting is specifically required by the Federal Aviation Administration or other federal or state authority for a particular tower. Site lighting shall comply with Article 54.**

No lighting is proposed or required on the tower per the Federal Aviation Administration.

- 9. **Signs and advertising. The use of any portion of a tower for signs other than warning or equipment information signs is prohibited.**

No signage is being proposed.

- 10. **Interference with public safety telecommunications. No new or existing telecommunications service shall interfere with public safety telecommunications. All applications for new service shall be accompanied by an intermodulation study by a qualified and licensed professional engineer which provides a technical evaluation of existing and proposed transmissions and indicates all potential interference problems.**

The proposed tower will service public safety telecommunications. This criterion is not applicable.

- 11. **Site access and parking. The reviewing body may allow deviation from the Access Management Guidelines, paving and/or parking standards of the Zoning Ordinance.**

The proposed compound is accessed using the site's existing gravel and dirt drives. No parking spaces are required for an unmanned facility.

- 12. **Inspections. All towers shall be inspected at regular intervals, no less than once a year, and serviced as frequently as may be necessary, to maintain the tower in a safe and weather-withstanding condition. Reports as to all inspections and servicing shall be made available to the Township upon written request.**

The Michigan's Public Safety Communications System (MPSCS) will maintain the proposed tower. The tower will be inspected every quarter.

- 13. **Updated information. The tower owner or representative shall annually update the Township with the following information:**

- a. **Name, address, phone number of tower owner; name, address and phone number of contact persons for engineering, maintenance and other notice purposes.**

- b. Organization name, address, phone number, and contact person of each co-locator and the operational status of the equipment.**
- c. Notification of date of lease expiration and/or cessation of operation of any equipment and date of removal.**

The applicant has noted that the tower will be inspected every quarter. The tower will be owned by Kalamazoo County Consolidated Dispatch Authority (KCCDA) in perpetuity with no colocations occurring at this site.

14. Abandonment or Unused towers, portions of towers, tower mounted equipment, and associated facilities. Abandoned or unused towers, portions of towers, tower mounted equipment and associated facilities shall be removed as follows:

- a. All abandoned or unused towers, portions of towers, tower mounted equipment, and associated facilities shall be removed within 12 months of the cessation of operations at the site unless a time extension is approved by the reviewing body.**
- b. In the event that a tower, portions of towers, tower mounted equipment, and/or associated facilities are not removed within 12 months of cessation of operations at a site, the subject facilities may be removed by the Township and the costs of removal assessed against the property.**
- c. A copy of a signed lease, which includes a requirement that the applicant shall remove the tower, portion of tower, tower mounted equipment and associated facilities upon cessation of operations at the site shall be submitted at the time of application, if applicable.**

A copy of the lease with the City of Kalamazoo is needed.

In addition to the information required for the Site Plan review and Special Use review, applications for towers shall include the following supplemental information:

1. Tower plans and a report from a qualified and licensed professional engineer which:

- a. Describes the tower height and design, including a cross section and elevation;**
Provided. See page A-2/2 of the plan set for details.
- b. Documents the height above grade for all potential mounting positions for co-located antennas and the minimum separation distance between antennas;**
Not applicable as no colocations will occur on this tower.
- c. Describes the tower's capacity, including the number and type of antennas/equipment that it can accommodate;**
The proposed tower is designed to support KCCDA equipment. A total of 6 antenna/dishes are proposed. See page A-2/2 of the plan set for details.
- d. Documents what steps the applicant will take to avoid interference with established public safety telecommunications;**
Not applicable.
- e. Includes an engineer's stamp and registration number;**
Engineer's stamp is included: David W Harper, engineer number 43418.

f. Indicates that the proposed tower complies with regulations administered by the Federal Communications Commission and the Federal Aviation Administration.

A letter from the Federal Aviation Administration is provided from the applicant indicating that the tower will meet their regulations.

g. Includes information necessary to allow determination of compliance with Building Code, Electrical Code and other applicable Township Ordinances.

If approved by the Planning Commission, any additional information regarding the construction of the communication tower will be determined at the time of the building permit.

h. Includes other information necessary to evaluate the request.

All necessary information has been provided.

2. A letter of intent committing the tower owner and his or her successors to allow the shared use of the tower if an additional user agrees in writing to meet reasonable terms and conditions for shared use. Further, a request to co-locate antennas on a tower shall not be unreasonably refused. No provider or lessee or agent thereof shall unreasonably fail to cooperate to accommodate co-location.

Not applicable.

RECOMMENDATION:

The Planning Department recommends the Planning Commission approve the proposed 199 foot tall communication tower at Parcel 05-10-155-011 with the following stipulations.

1. The tower will service the Kalamazoo County Consolidated Dispatch Authority.
2. The Planning Commission grant a deviation and special use approval to allow a 9 foot tall barbed wire fence onsite as proposed.
3. The Planning Commission grant a deviation for the northern and southern setbacks to allow the tower can be built as shown.
4. A copy of the lease agreement with the City of Kalamazoo shall be provided prior to building permit issuance.

Attachments:

Township Application Form

Site Plan

Letter justifying tower location

Letter to address inspections

Letter from the Federal Aviation Administration

Letter from the Michigan Department of Transportation



7275 W. Main Street, Kalamazoo, Michigan 49009-9334
Phone: 269-216-5223 Fax: 269-375-7180

PLEASE PRINT

PROJECT NAME & ADDRESS 5111 Oshtemo - KCCDA Communications Tower (N. 6th Street)

PLANNING & ZONING APPLICATION

Applicant Name : Ben Varney

Company Pyramid Network Services, LLC

Address 6615 Towpath Rd

East Syracuse New York 13057

E-mail bvarney@pyramidns.com

989-670-2000

Telephone _____ Fax _____

Interest in Property Project Manager

OWNER*:

City of Kalamazoo owns the property and
Kalamazoo County Consolidated Dispatch Authority
will erect the tower on the property.

Name _____

Address 241 W South Street

Kalamazoo, MI 49007

Email jtroyer@kccda911.org

Phone & Fax 269-488-6616

THIS
SPACE
FOR
TOWNSHIP
USE
ONLY

Fee Amount _____

Escrow Amount _____

NATURE OF THE REQUEST: (Please check the appropriate item(s))

- ☒ Planning Escrow-1042
☒ Site Plan Review-1088
☐ Administrative Site Plan Review-1086
☒ Special Exception Use-1085
☐ Zoning Variance-1092
☐ Site Condominium-1084
☐ Accessory Building Review-1083

- ☐ Land Division-1090
☐ Subdivision Plat Review-1089
☐ Rezoning-1091
☐ Interpretation-1082
☐ Text Amendment-1081
☐ Sign Deviation-1080
☐ Other: _____

BRIEFLY DESCRIBE YOUR REQUEST (Use Attachments if Necessary):

Installation of self-support tower

with foundation. Install pre-fabricated shelter with propane generator on a concrete foundation with a propane

tank on concrete slab. Ice bridge, antennas and all associated radios and cabling. Install chain link fence

with barbed wire, and gravel compound. Install associated fuel line, power, and alarm conduits

LEGAL DESCRIPTION OF PROPERTY *(Use Attachments if Necessary):*

See site plans

PARCEL NUMBER: 3905- 05-10-155-011

ADDRESS OF PROPERTY: N. 6th Street

PRESENT USE OF THE PROPERTY: Water Tank

PRESENT ZONING Rural Residential **SIZE OF PROPERTY** 3.46 Acres

**NAME(S) & ADDRESS(ES) OF ALL OTHER PERSONS, CORPORATIONS, OR FIRMS
HAVING A LEGAL OR EQUITABLE INTEREST IN THE PROPERTY:**

Name(s)

Kalamazoo County Consolidated Dispatch Authority

Address(es)

7040 Stadium Dr. Kalamazoo, MI 49009

SIGNATURES

I (we) the undersigned certify that the information contained on this application form and the required documents attached hereto are to the best of my (our) knowledge true and accurate. I (we) acknowledge that we have received the Township's Disclaimer Regarding Sewer and Water Infrastructure. By submitting this Planning & Zoning Application, I (we) grant permission for Oshtemo Township officials and agents to enter the subject property of the application as part of completing the reviews necessary to process the application.

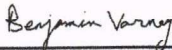
City of Kalamazoo
Deputy City Manager



06/01/2021

Owner's Signature (* If different from Applicant)

Date



5/27/2021

Applicant's Signature



Date

Copies to:
Planning -1
Applicant -1
Clerk -1
Deputy Clerk -1
Attorney-1
Assessor -1
Planning Secretary - Original

PLEASE ATTACH ALL REQUIRED DOCUMENTS

PROJECT DESCRIPTION CONSISTS OF, BUT IS NOT LIMITED TO:

THE INSTALLATION OF A CHAIN LINK FENCE WITH BARBED WIRE, ACCESS GATE AND GRAVEL COMPOUND

THE INSTALLATION OF A SELF SUPPORT TOWER WITH FOUNDATIONS

THE INSTALLATION OF A PRE-FAB EQUIPMENT SHELTER WITH A PROPANE GENERATOR ON A CONCRETE FOUNDATION, A PROPANE TANK ON A CONCRETE SLAB ICE BRIDGE, ANTENNAS, AND ALL ASSOCIATED RADIOS AND CABLING

THE INSTALLATION OF ASSOCIATED UNDERGROUND PROPANE FUEL LINE, POWER, FIBER/TELCO AND ALARM CONDUITS AND GROUNDING

SITE NAME: 5111 OSHTEMO

SITE ADDRESS: N. 6TH STREET
KALAMAZOO, MI 49009

SITE COORDINATES
AND ELEV.: LATITUDE: N. 42° 18' 49.7"
LONGITUDE: W. 85° 42' 16.5"
GROUND ELEV.: 1038.8' AMSL APPROX.

PROPERTY OWNER: CITY OF KALAMAZOO
241 W. SOUTH STREET
KALAMAZOO, MI 49007

TOWER OWNER: KALAMAZOO COUNTY CONSOLIDATED
DISPATCH AUTHORITY
7040 STADIUM DRIVE
KALAMAZOO, MI 49009
JEFFERY TROYER (269) 488-6615
EMAIL: JTroyer@kccda911.org

CONTACT: MOTOROLA SOLUTIONS
500 W. MONROE STREET STE 4400
CHICAGO, IL 60661
DEREK SONKSEN (616) 498-9020
EMAIL: derek.sonksenr@motorolasolutions.com

PROJECT MANAGER: PYRAMID NETWORK SERVICES , LLC
6615 TOWPATH ROAD
EAST SYRACUSE, NY 13057
EVERETT OZBAT (989) 737-2954
EMAIL: EOzbat@pyramidns.com

SURVEYOR: MIDWESTERN CONSULTING
3815 PLAZA DRIVE
ANN ARBOR, MI 48108
PAUL KOVACS, PS (734) 995-0200
EMAIL: pk@midwesternconsulting.com

ENGINEER: HARPER ENGINEERING, INC.
815 SUPERIOR AVENUE SUITE 1514
CLEVELAND, OH 44114
DAVID W. HARPER (216) 344-3855
EMAIL: dwharper@harperengineering.org

<u>KALAMAZOO COUNTY CONSOLIDATED DISPATCH AUTHORITY:</u>	<u>RECEIVED:</u>
	<u>ACCEPTED:</u>
<u>MOTOROLA:</u>	<u>RECEIVED:</u>
	<u>ACCEPTED:</u>
<u>PROPERTY OWNER:</u>	<u>RECEIVED:</u>
	<u>ACCEPTED:</u>

FROM DOWNTOWN KALAMAZOO: TAKE W. KALAMAZOO AVENUE WEST TO DOUGLAS AVENUE. TURN LEFT ONTO DOUGLAS AVENUE. MERGE RIGHT ONTO W. MAIN STREET. CONTINUE WEST TO N. 6TH STREET. TURN RIGHT ONTO N. 6TH STREET. SITE IS LOCATED NEXT TO THE WATER TANK ON THE RIGHT HAND SIDE.

RAW LAND SELF SUPPORT TOWER SITE

A map of Kalamazoo, Michigan, showing the location of the proposed site. The map includes major roads like I-131, I-69, and I-22, and landmarks such as Walmart Supercenter, Western Michigan University, and Bronson Methodist Hospital. A red pin marks the 'SITE' location near the intersection of W Main St and I-131.

SHEET	DESCRIPTION	REV.
T-1	TITLE SHEET	2
SURV-1	SITE SURVEY (BY OTHERS)	2
C-1	OVERALL SITE PLAN	2
CD-1	CIVIL DETAILS	2
A-1	COMPOUND SITE PLAN	2
A-2	TOWER ELEVATION AND ANTENNA INFO	2
A-3	ANTENNA DETAILS	1
A-4	ANTENNA DETAILS	1
S-1	FOUNDATION DETAILS	1
S-2	SHELTER ELEVATIONS	1
S-3	SHELTER INSTALLATION DETAILS	1
E-1	UTILITY DETAILS	1
E-2	LP TANK & ELECTRICAL DETAILS	1
G-1	GROUNDING PLAN	1
G-2	GROUNDING DETAILS	1
G-3	GROUNDING DETAILS	1
G-4	GROUNDING DETAILS	1
GN-1	GENERAL NOTES	1
GN-2	GENERAL NOTES AND LEGEND	1



2	09/01/21	REVISED DRAWINGS C-1, CD-1, A-1 & A-2	GJB
1	06/25/21	FOR CONSTRUCTION	GJB
0	05/25/21	FOR ZONING	GJB
C	05/03/21	RELOCATED UTILITY TRANSFORMER	GJB
B	03/30/21	FOR APPROVAL	GJB
A	03/18/21	FOR APPROVAL	GJB
Rev.	Date:	Description:	Mgr.



HARPER
ENGINEERING, INC.
TELECOM GROUP

815 Superior Ave. Suite 1514
Cleveland, OH. 44114

Phone: (216)344-3855
Fax: (216)344-3856

TITLE SHEET		
SCALE: AS NOTED	<div>5111 OSHTEMO</div> <div>N. 6TH STREET</div> <div>KALAMAZOO, MI 49009</div>	Drawing / Rev.
DRAWN BY: GJB		<div>T-1/2</div>
CHECKED BY: GJB		
DATE: 03/02/21		
FILE: 20-216-005		

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KEYNOTE LEGEND:

- 1

FABRIC: 9 GA, 2" MESH, ASTM-A392 (SEE FENCE SECTION FOR HEIGHT)
- 2

BARBED WIRE: 12 GAUGE WIRE (3 RUNS) FINISH TO MATCH FABRIC ASTM A121.
- 3

EXTENSION ARMS: STAMPED STEEL WITH MALLEABLE IRON BASE, FINISH TO MATCH FENCE FRAMEWORK, ASTM F626.
- 4

END AND CORNER POSTS: 3" DIA. PIPE, SCHED. 40 (GALV) ASTM F1083.
- 5

CONCRETE FOUNDATION: 42"x12" DIA. (3000 PSI).
- 6

LINE POSTS: 2" DIA. PIPE SCHED. 40 (GALV.) ASTM F1083.
- 7

CONCRETE FOUNDATION: 42"x10" DIA. (3000 PSI).
- 8

GATE POSTS: 4" DIA. PIPE SCHED. 40 (GALV.) ASTM F1083.
- 9

CONCRETE FOUNDATION: 48"x12" DIA. (3000 PSI).
- 10

TOP RAIL AND BRACE RAIL: 1 1/2" DIA. PIPE SCHED. 40 (GALV.) ASTM F1083.
- 11

MIDDLE RAIL: 1 1/2" DIA. PIPE SCHED. 40 (GALV.) ASTM F1083.
- 12

BOTTOM TENSION WIRE: 0.177" DIA. METALLIC-COATED STEEL(GALV.) MARCELLED ASTM A824.
- 13

TENSION BARS: 3/16"x3/4", FULL HEIGHT OF FABRIC, FINISH TO MATCH FENCE FRAMEWORK.
- 14

TENSION ROD: 3/8" DIA. WITH ADJ. TIGHTENER, FINISH TO MATCH FENCE FRAMEWORK.
- 15

GATE FRAME: 2" DIA. SCHED. 40 (GALV.) ASTM F1083.
- 16

POST CAPS: PER POST DIAMETER.
- 17

GATE HINGES: NON-LIFT-OFF TYPE, OFFSET TO PERMIT 180 DEGREE SWING.
- 18

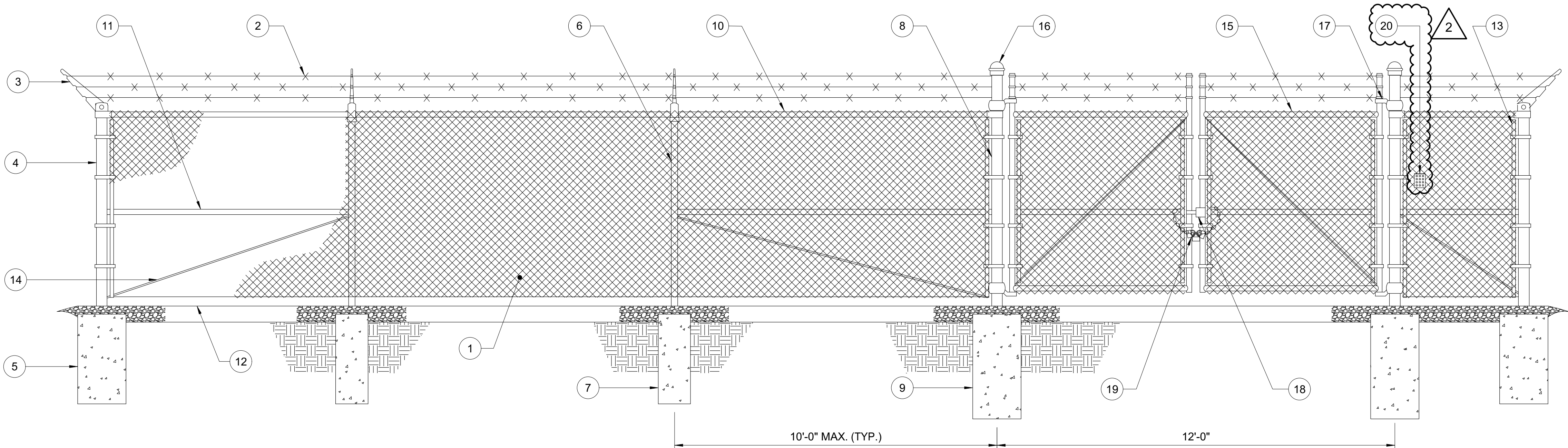
DOUBLE GATE LATCH: COMMERCIAL STRONG ARM EQUAL TO: DAC INDUSTRIES, 615-C, ELEVENTH STREET, GRAND RAPIDS MI, 49504.
- 19

LOCK CHAIN: 3/8" SIZE 36" LONG, HOT DIPPED (GALV.) ZINC COATED, W/ KEY LOCK
- 20

CONTRACTOR TO INSTALL KNOX BOX 3200 SERIES WITH ZIP CODE COMBINATION # 49009 NEAR THE ACCESS GATE (FIELD LOCATE). KNOX BOX SHALL CONTAIN (1) KEY FOR ACCESS GATE AND (1) KEY FOR SHELTER.

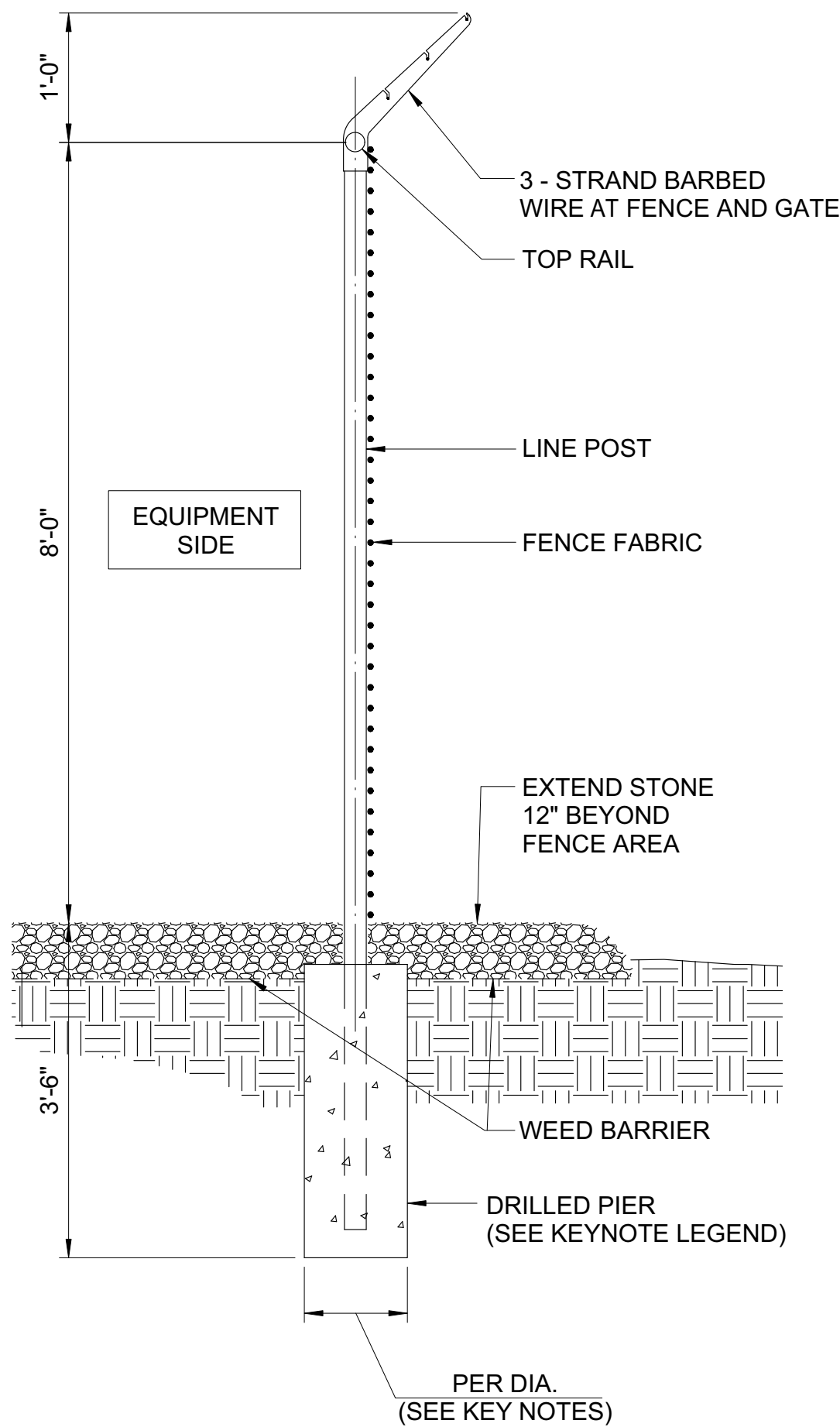
NOTES:

1. REFER TO PROJECT SPECIFICATIONS FOR INFORMATION NOT SHOWN IN THE DRAWING.
2. FENCE FABRIC SHALL CONFORM TO CHAIN LINK FENCE MANUFACTURERS INSTITUTE (CLFMI) PRODUCT MANUAL.
3. INSTALL FENCE IN COMPLIANCE W/ ASTM F567.
4. INSTALL SWING GATES IN COMPLIANCE W/ ASTM F900.
5. DO NOT BEGIN INSTALLATION AND ERECTION BEFORE FINAL GRADING IS COMPLETED UNLESS OTHERWISE PERMITTED. INSTALL FENCING AND GATES AS SHOWN ON PLANS.
6. DRILL OR HAND-EXCAVATE (USING POST - HOLE DIGGERS) HOLES FOR POSTS TO DIAMETERS AND SPACING INDICATED. IN FIRM, UNDISTURBED OR COMPACTED SOIL. IF NOT INDICATED ON DRAWINGS, EXCAVATE HOLES FOR EACH POST TO MINIMUM DIAMETER RECOMMENDED BY FENCE MANUFACTURER, BUT NOT LESS THAN FOUR (4) TIMES LARGEST CROSS-SECTION OF POST.
7. REMOVE POST HOLE SPOILS FROM SITE. DO NOT SET SPOILS ON AGGREGATE WITHOUT ADEQUATE PROTECTION.
8. PROTECT PORTION OF POSTS ABOVE GROUND FROM CONCRETE SPLATTER. PLACE CONCRETE AROUND POSTS AND VIBRATE OR TAMP FOR CONSOLIDATION. CHECK EACH POST FOR VERTICAL AND TOP ALIGNMENT AND HOLD IN POSITION DURING PLACEMENT AND FINISHING OPERATIONS. UNLESS OTHERWISE SHOWN, EXTEND CONCRETE FOOTING TWO (2) INCHES ABOVE GRADE AND TROWEL TO A CROWN TO SHED WATER.
9. INSTALL BARBED WIRE IN ACCORDANCE W/ MANUFACTURERS INSTRUCTIONS.
10. APPLY FABRIC TO OUTSIDE OF FRAMEWORK.



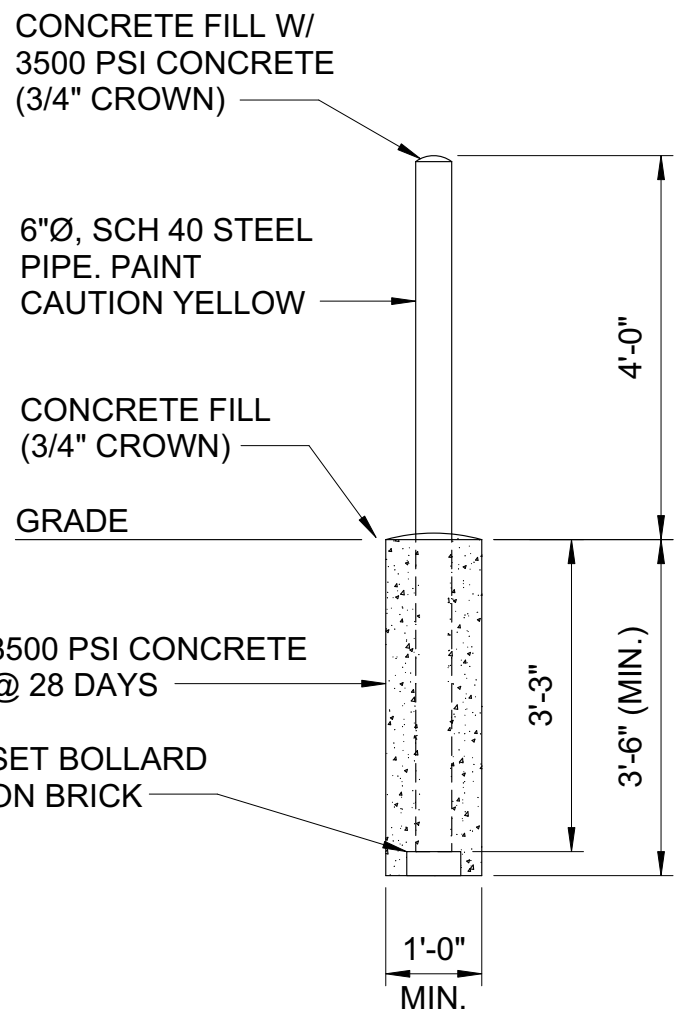
TYPICAL FENCE ELEVATION

SCALE: NONE



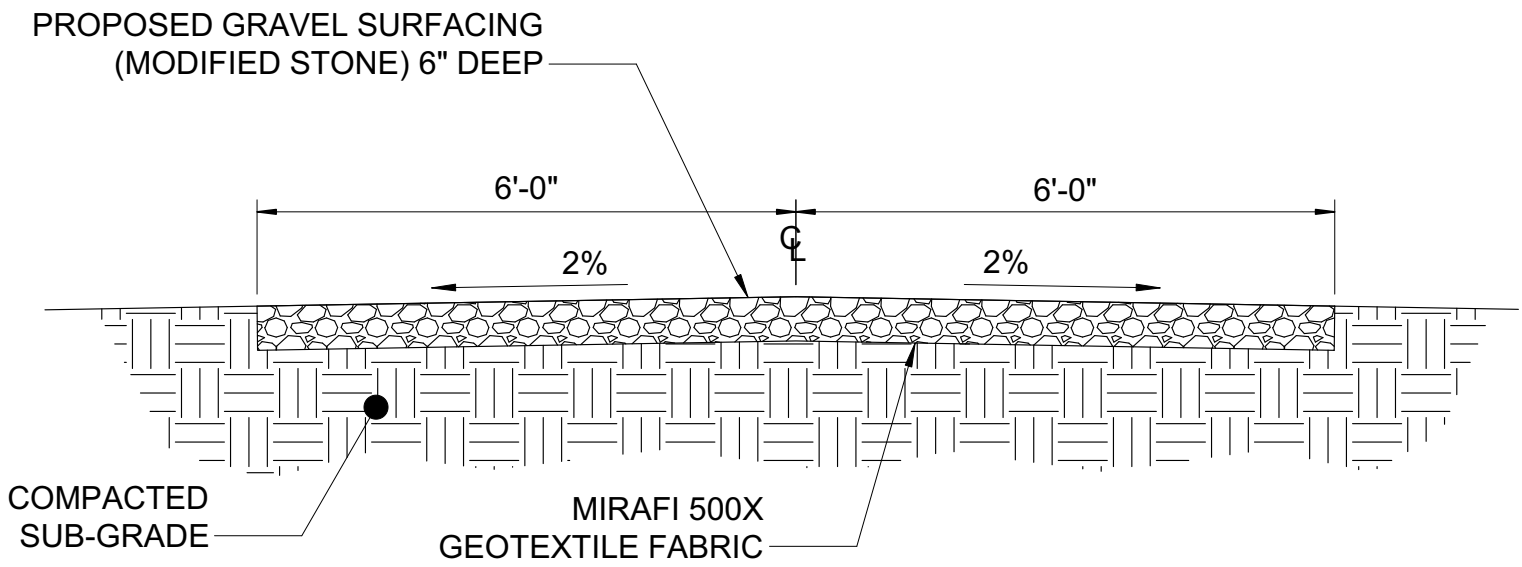
TYPICAL FENCE SECTION

SCALE: NONE



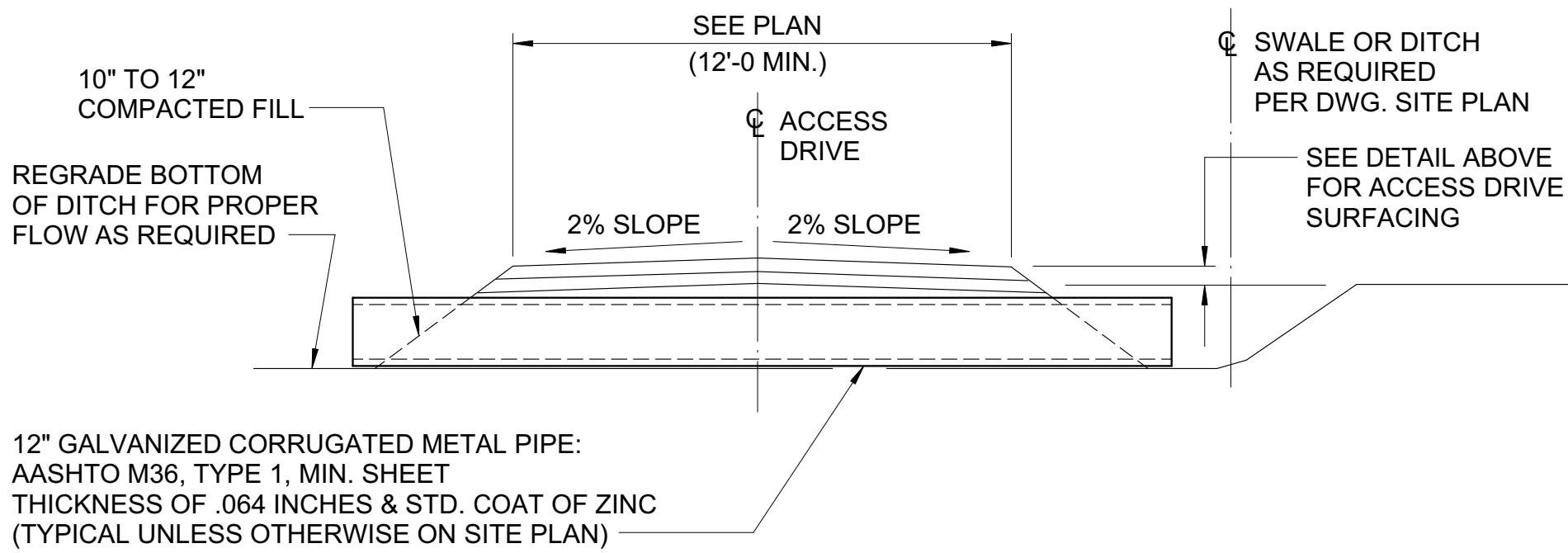
BOLLARD DETAIL

SCALE: NONE



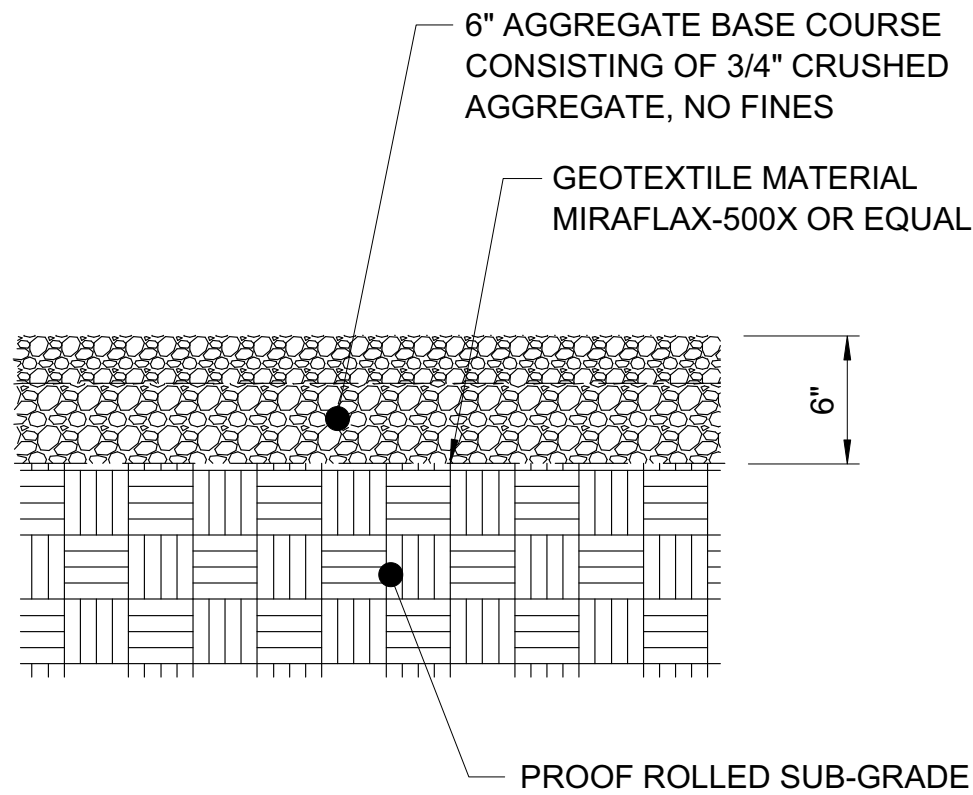
GRAVEL DRIVEWAY TYPICAL SECTION

SCALE: NONE



TYPICAL ACCESS DRIVE & CULVERT DETAIL

SCALE: NONE (IF APPLICABLE)



AGGREGATE BASE DETAIL

SCALE: NONE



09/01/21

2	09/01/21	ADDED KNOX BOX (ITEM 12)	GJB
1	06/25/21	FOR CONSTRUCTION	GJB
0	05/25/21	FOR ZONING	GJB
B	03/30/21	FOR APPROVAL	GJB
A	03/18/21	FOR APPROVAL	GJB
Rev.	Date:	Description:	Mgr.



MOTOROLA
SOLUTIONS



6615 TOWPATH ROAD, SUITE 200
EAST SYRACUSE, NY 13057
PHONE: (315) 701-1300



5130 WEST 6TH STREET
CLEVELAND, OH. 44141

HARPER
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CHECKED BY: GJB
DATE: 03/02/21
FILE: 20-216-005

CIVIL DETAILS

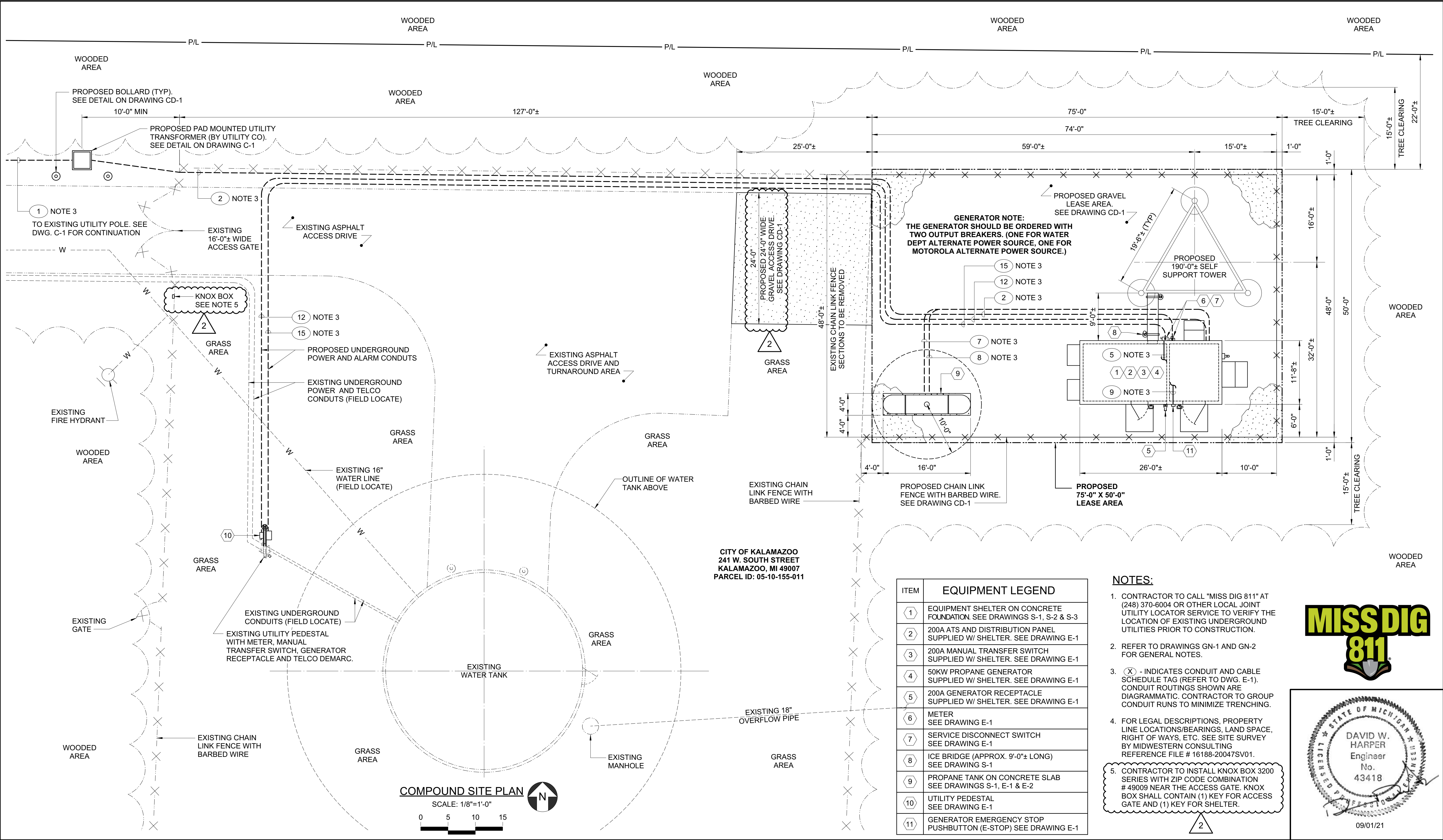
5111 OSHTOMO
N. 6TH STREET
KALAMAZOO, MI 49009

Drawing / Rev.

CD-1/2

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2	09/01/21	ADDED KNOX BOX & REVISED GRAVEL DRIVE	GJB
1	06/25/21	FOR CONSTRUCTION	GJB
0	05/25/21	FOR ZONING	GJB
C	05/03/21	RELOCATED UTILITY TRANSFORMER	GJB
B	03/30/21	FOR APPROVAL	GJB
A	03/18/21	FOR APPROVAL	GJB
Rev.	Date:	Description:	Mgr.

MOTOROLA
SOLUTIONS

PYRAMID
Network Services, LLC
6615 TOWPATH ROAD, SUITE 200
EAST SYRACUSE, NY 13057
PHONE: (315) 701-1300

EMERALD
DESIGN & CONSTRUCTION
5130 WEST 6TH STREET
CLEVELAND, OH. 44141

HARPER
ENGINEERING, INC.
TELECOM GROUP
815 Superior Ave. Suite 1514
Cleveland, OH. 44114
Phone: (216) 344-3855
Fax: (216) 344-3856

COMPOUND SITE PLAN

5111 OSHTOMO
N. 6TH STREET
KALAMAZOO, MI 49009

SCALE: AS NOTED
DRAWN BY: GJB
CHECKED BY: GJB
DATE: 03/02/21
FILE: 20-216-005

Drawing / Rev.
A-1/2

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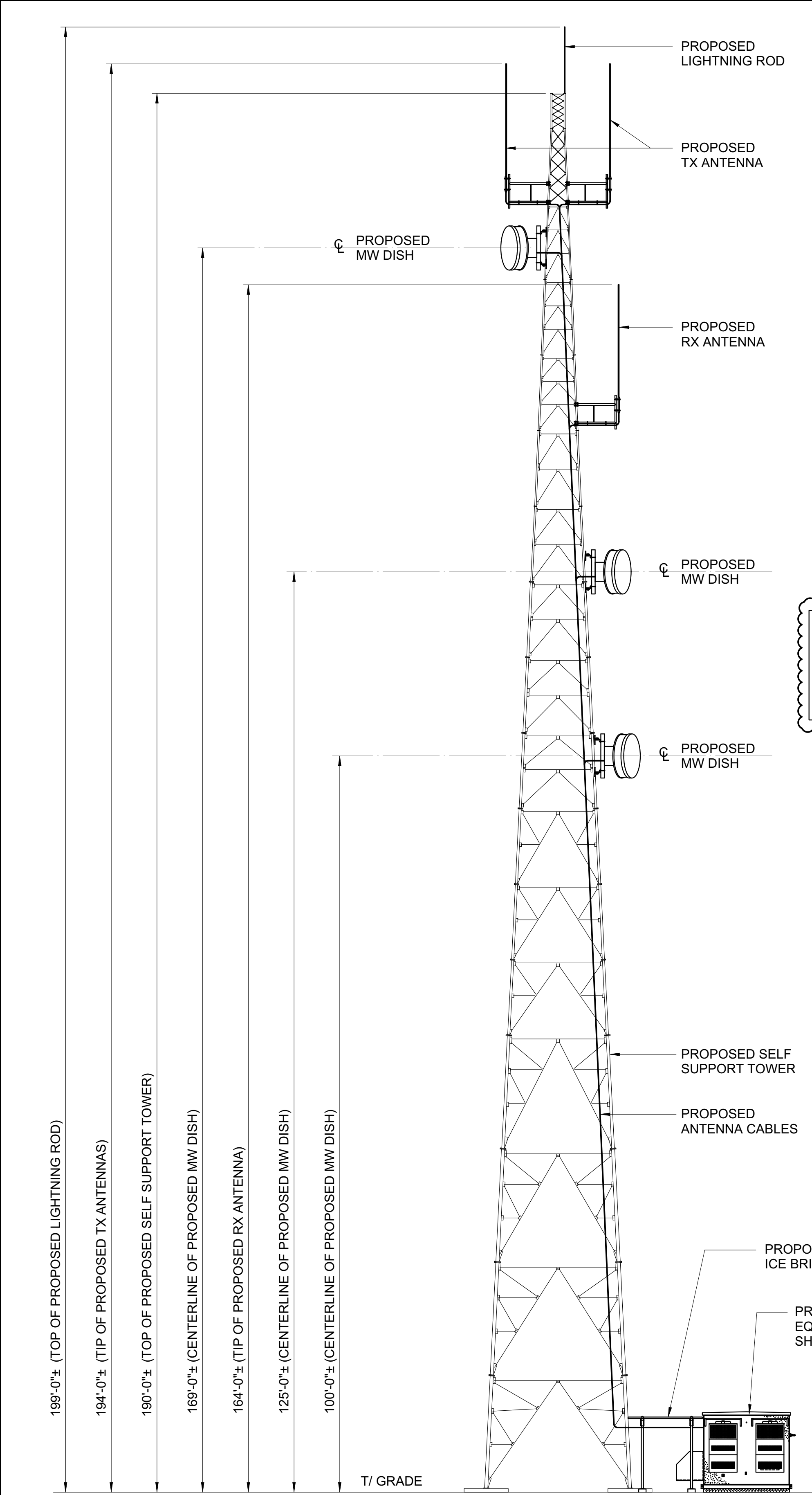
CITY OF KALAMAZOO
241 W. SOUTH STREET
KALAMAZOO, MI 49007
PARCEL ID: 05-10-155-011

ITEM	EQUIPMENT LEGEND
1	EQUIPMENT SHELTER ON CONCRETE FOUNDATION. SEE DRAWINGS S-1, S-2 & S-3
2	200A ATS AND DISTRIBUTION PANEL SUPPLIED W/ SHELTER. SEE DRAWING E-1
3	200A MANUAL TRANSFER SWITCH SUPPLIED W/ SHELTER. SEE DRAWING E-1
4	50KW PROPANE GENERATOR SUPPLIED W/ SHELTER. SEE DRAWING E-1
5	200A GENERATOR RECEPTACLE SUPPLIED W/ SHELTER. SEE DRAWING E-1
6	METER SEE DRAWING E-1
7	SERVICE DISCONNECT SWITCH SEE DRAWING E-1
8	ICE BRIDGE (APPROX. 9'-0"± LONG) SEE DRAWING S-1
9	PROPANE TANK ON CONCRETE SLAB SEE DRAWINGS S-1, E-1 & E-2
10	UTILITY PEDESTAL SEE DRAWING E-1
11	GENERATOR EMERGENCY STOP PUSHBUTTON (E-STOP) SEE DRAWING E-1

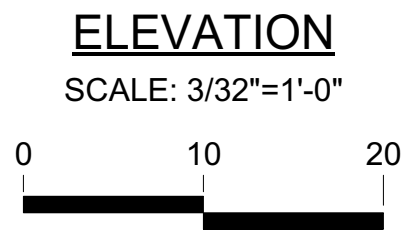
NOTES:

- CONTRACTOR TO CALL "MISS DIG 811" AT (248) 370-6004 OR OTHER LOCAL JOINT UTILITY LOCATOR SERVICE TO VERIFY THE LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
- REFER TO DRAWINGS GN-1 AND GN-2 FOR GENERAL NOTES.
- (X) - INDICATES CONDUIT AND CABLE SCHEDULE TAG (REFER TO DWG. E-1). CONDUIT ROUTINGS SHOWN ARE DIAGRAMMATIC. CONTRACTOR TO GROUP CONDUIT RUNS TO MINIMIZE TRENCHING.
- FOR LEGAL DESCRIPTIONS, PROPERTY LINE LOCATIONS/BEARINGS, LAND SPACE, RIGHT OF WAYS, ETC. SEE SITE SURVEY BY MIDWESTERN CONSULTING REFERENCE FILE # 16188-20047SV01.
- CONTRACTOR TO INSTALL KNOX BOX 3200 SERIES WITH ZIP CODE COMBINATION # 49009 NEAR THE ACCESS GATE. KNOX BOX SHALL CONTAIN (1) KEY FOR ACCESS GATE AND (1) KEY FOR SHELTER.





NOTE:
TOWER WILL HAVE NO LIGHTS
AND WILL BE GALVANIZED
STEEL (GRAY IN COLOR)



SITE: 5111 OSHTEMO										ANTENNA / APPURTENANCE LOCATION CHART					<div>E = EXISTING</div>
LATITUDE: N. 42° 18' 49.7"															<div>N = NEW</div>
LONGITUDE: W. 85° 42' 16.5"															<div>F = FUTURE</div>
GROUND ELEV.: 1038.8' AMSL APPROX.															
ANTENNA INFORMATION										FEEDLINE NFORMATION					
ANTENNA ID	MANUFACTURER	MODEL	TYPE	LENGTH	BOTTOM ELEV.	RAD CENTER	TOP ELEV.	AZIMUTH	QTY.	TYPE	MANUFACTURER	MODEL	SIZE	QTY.	
TX1	dbSPECTRA	DSDS7C12P36UD	OMNI	20'-6"	XXX'	XXX'	194'	XX	1	COAX	COMMSCOPE	AVA7-50	1 5/8"	1	
TX2	dbSPECTRA	DSDS7C12P36UD	OMNI	20'-6"	XXX'	XXX'	194'	XX	1	COAX	COMMSCOPE	AVA7-50	1 5/8"	1	
RX1	dbSPECTRA	DSDS7C12P36UD	OMNI	20'-6"	XXX'	XXX'	164'	XX	1	COAX	COMMSCOPE	AVA5-50	7/8"	1	
MW1	COMMSCOPE	VHLP6-6W	MW	6'	XXX'	169'	XXX'	240.28° TO 5102	1	CAT5	COMMSCOPE	EW52	2.2"x1.3"	1	
MW2	COMMSCOPE	VHLP6-6W	MW	6'	XXX'	125'	XXX'	240.28° TO 5102	1	CAT5	COMMSCOPE	EW52	2.2"x1.3"	1	
MW3	COMMSCOPE	VHLP6-6W	MW	6'	XXX'	100'	XXX'	142.23° TO 5112	1	CAT5	COMMSCOPE	EW52	2.2"x1.3"	1	

REFER TO TOWER MANUFACTURER DRAWINGS FOR BEACON AND OBSTRUCTION LIGHTING HEIGHTS (IF REQUIRED)

GENERAL NOTES:

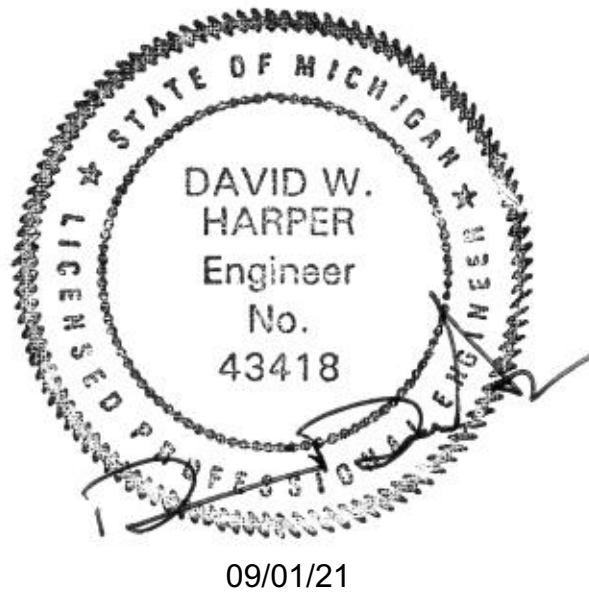
HARPER ENGINEERING, INC. HAS NOT COMPLETED A STRUCTURAL ANALYSIS FOR THE EXISTING OR PROPOSED LOADING OF ANY STRUCTURES AT THIS TIME. FINAL STRUCTURAL ANALYSIS TO BE COMPLETED BY OTHERS PRIOR TO CONSTRUCTION ACTIVITIES COMMENCE.

ALL VERTICAL TRANSMISSION LINE RUNS FROM THE ANTENNAS SHALL BE GROUNDED NEAR TO THE TOP AND BOTTOM OF THE TOWER (BEFORE THE CABLE MAKES HORIZONTAL TRANSITION & NEAR ENTRY PORT ON THE EQUIPMENT ROOM WALL). ADDITIONAL TRANSMISSION LINE GROUND KITS SHALL BE INSTALLED AS NEEDED TO LIMIT THE DISTANCE BETWEEN GROUND KITS TO 75 FEET.

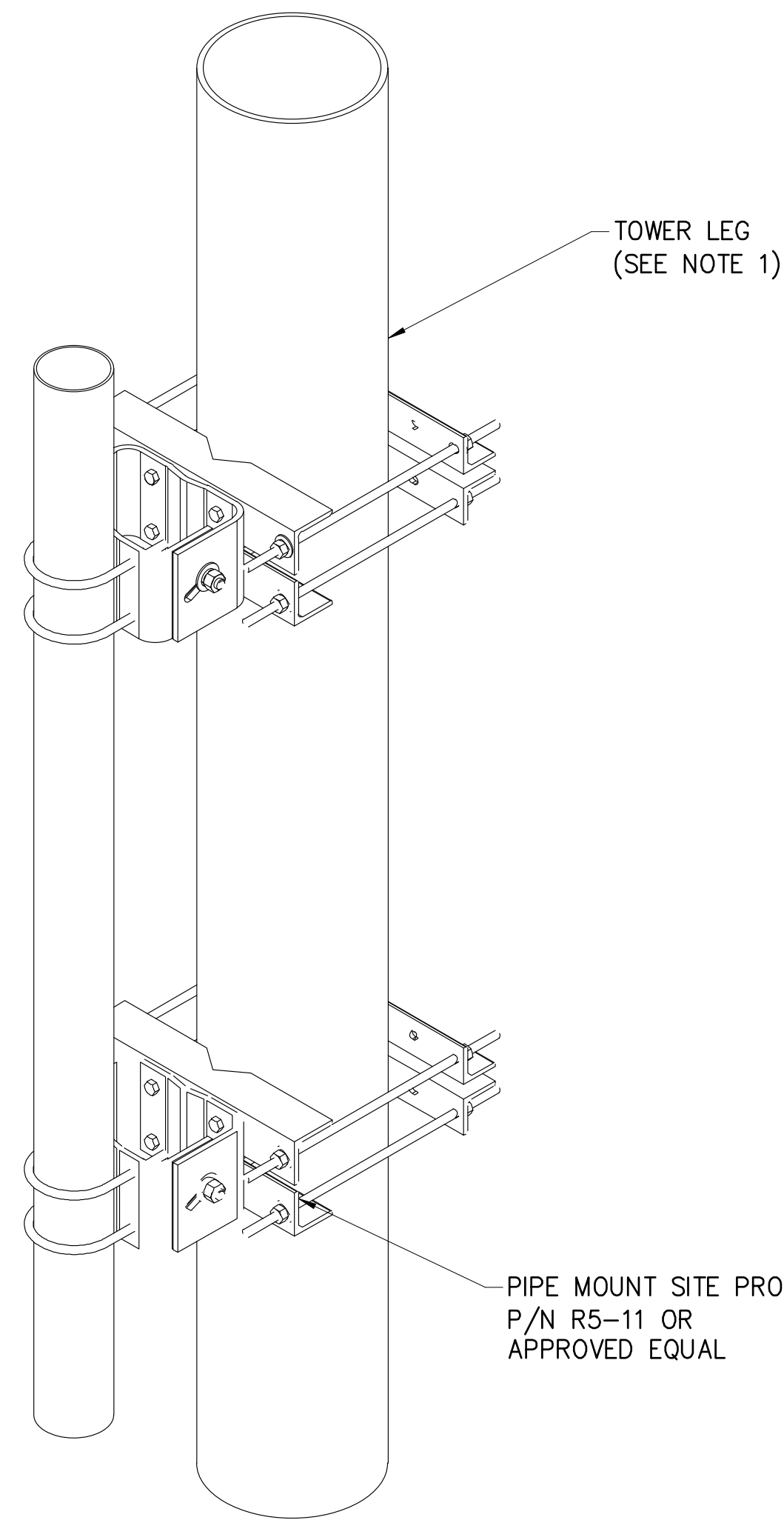
THE CONTRACTORS SHALL CONDUCT TESTING TO MOTOROLA SPECIFICATIONS WITH PERSONNEL TRAINED IN THE EQUIPMENT AND METHODS. RESULTS TO BE SUBMITTED TO MOTOROLA.

DRIP LOOPS SHALL BE INCORPORATED IN CABLE RUNS TO PREVENT WATER FROM TRICKLING DOWN THE LINES INTO THE EQUIPMENT ROOM.

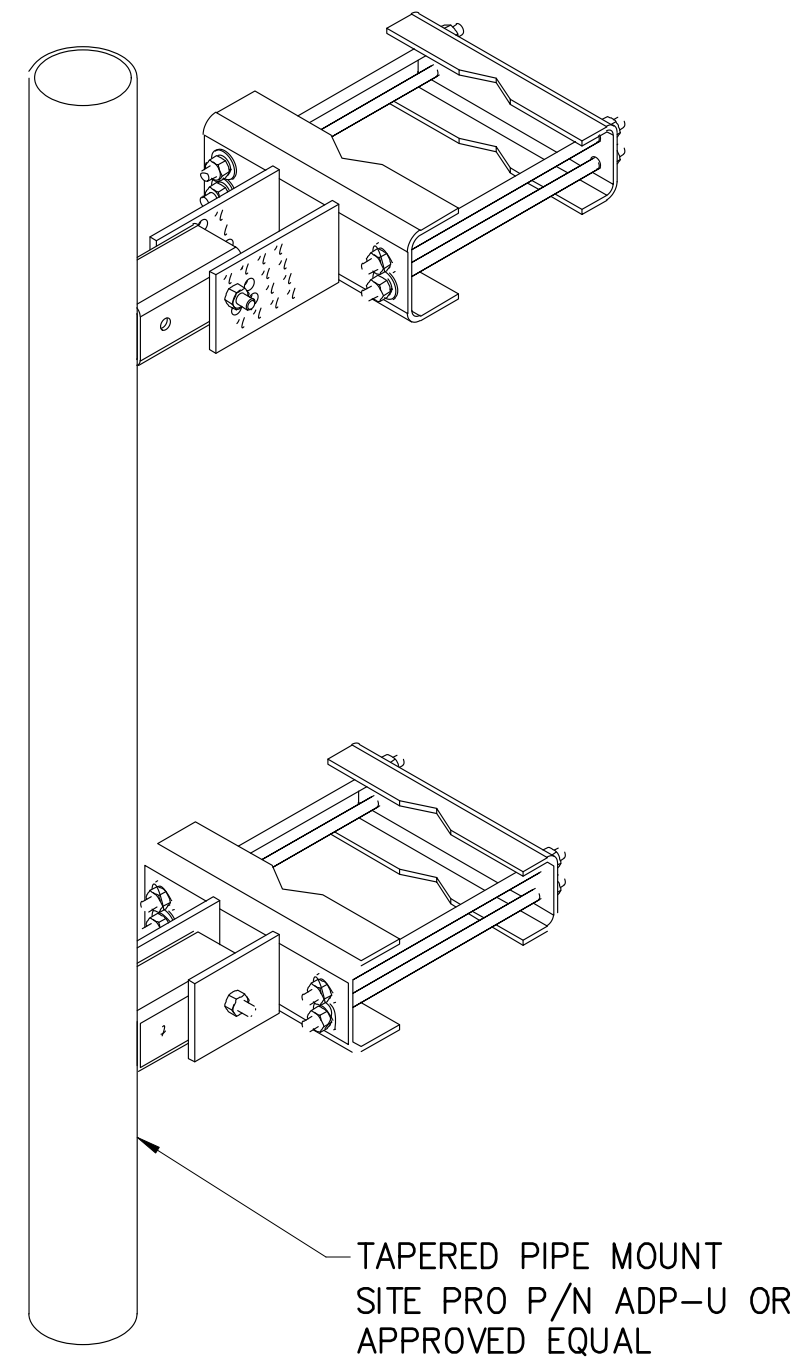
ALL TRANSMISSION LINES SHALL BE MARKED WITH APPROPRIATE COLOR TAPE BANDS (ONE INCH WIDE COLOR TAPE) FOR IDENTIFICATION NEAR THE ANTENNA. JUST BEFORE ENTERING THE EQUIPMENT ROOM AS WELL AS INSIDE THE EQUIPMENT ROOM, BEFORE CONNECTING TO THE SURGE SUPPRESSORS. SEE MOTOROLA SPECS FOR COLOR CODING SCHEME.



										<div>HARPER ENGINEERING, INC. TELECOM GROUP 215 Superior Ave. Suite 1514 Cleveland, OH. 44114 Phone: (216)344-3855 Fax: (216)344-3856</div>		TOWER ELEVATION AND ANTENNA INFO			THIS DRAWING IS COPYRIGHTED AND IS THE SOLE PROPERTY OF THE OWNER. IT IS PRODUCED SOLELY FOR USE BY THE OWNER AND ITS AFFILIATES. REPRODUCTION OR USE OF THIS DRAWING AND/OR THE INFORMATION CONTAINED IN IT IS FORBIDDEN WITHOUT THE WRITTEN PERMISSION OF THE OWNER. 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.		
2	09/01/21	ADDED TOWER NOTE	GJB									SCALE: AS NOTED		5111 OSHTEMO N. 6TH STREET KALAMAZOO, MI 49009		Drawing / Rev. A-2/2	
1	06/25/21	FOR CONSTRUCTION	GJB									DRAWN BY: GJB					
0	05/25/21	FOR ZONING	GJB									CHECKED BY: GJB					
A	03/18/21	FOR APPROVAL	GJB									DATE: 03/02/21					
Rev.	Date:	Description:	Mgr.									FILE: 20-216-005					

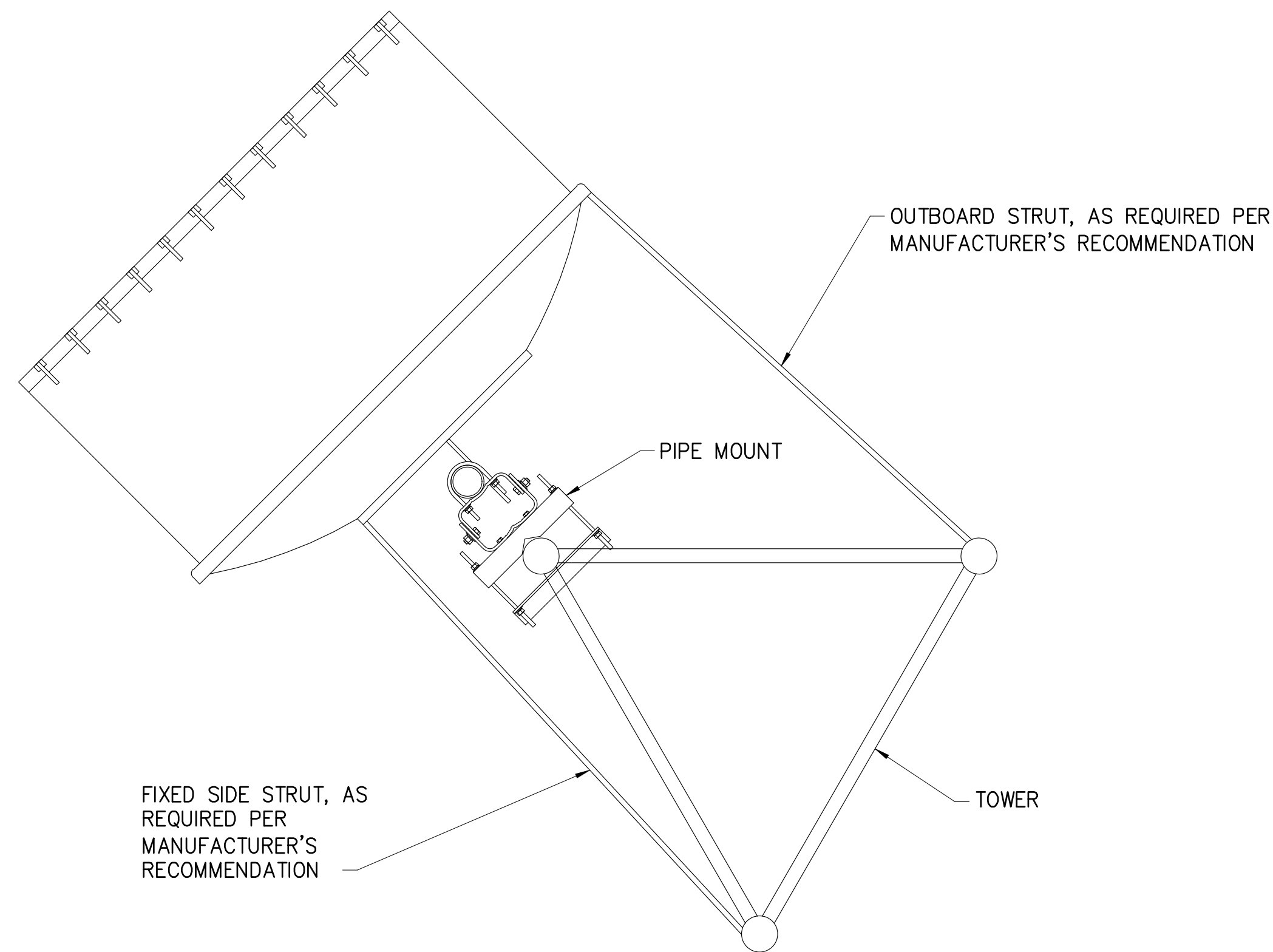
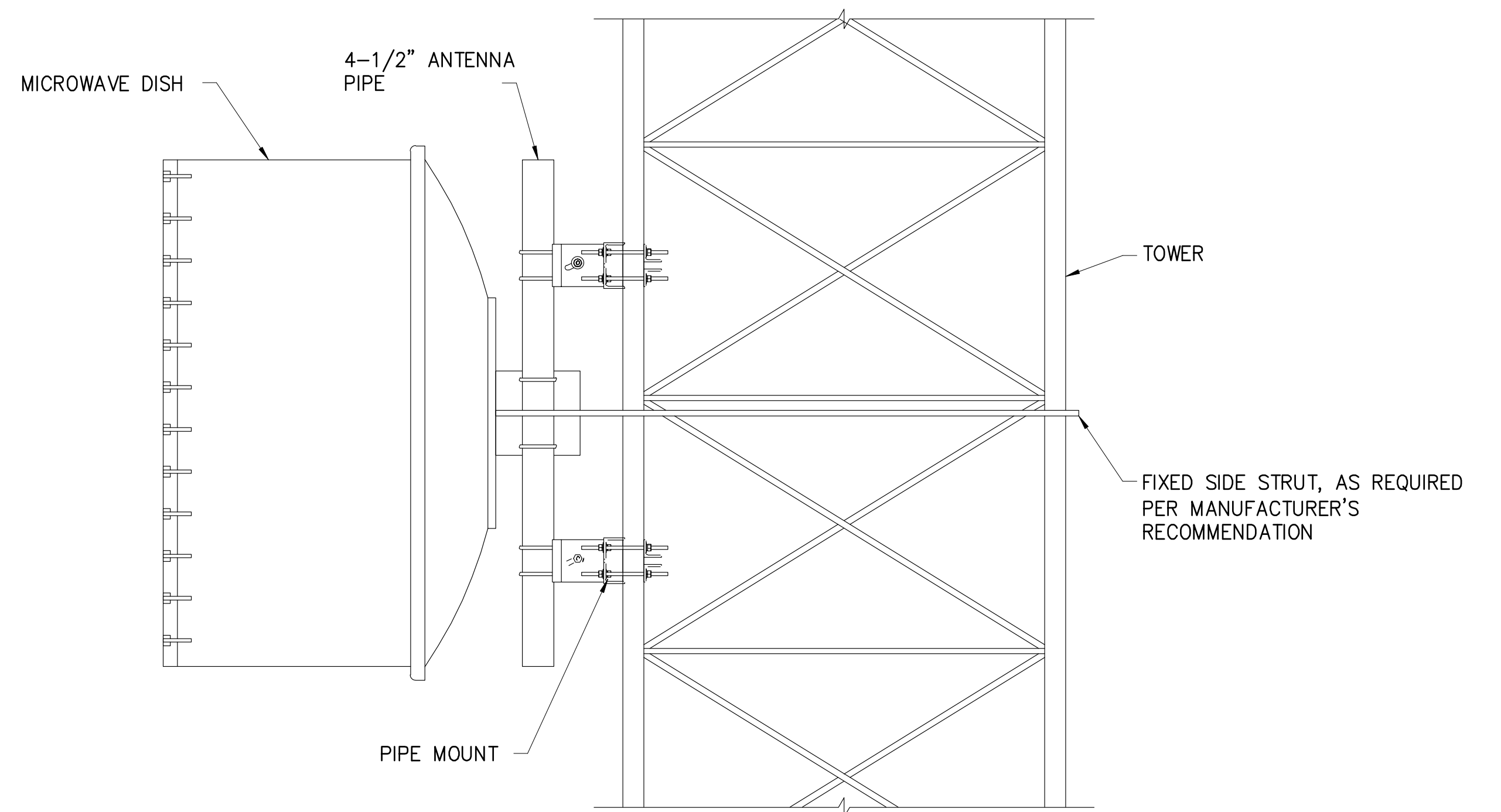


- NOTES:
1. VERIFY IN FIELD OR REVIEW THE TOWER STRUCTURAL ANALYSIS FOR MEMBER SIZE PRIOR TO ORDERING ANTENNA MOUNTS.
 2. CONTRACTOR SHALL VERIFY THE RF CONFIGURATION & STRUCTURAL ANALYSIS BEFORE INSTALLATION.



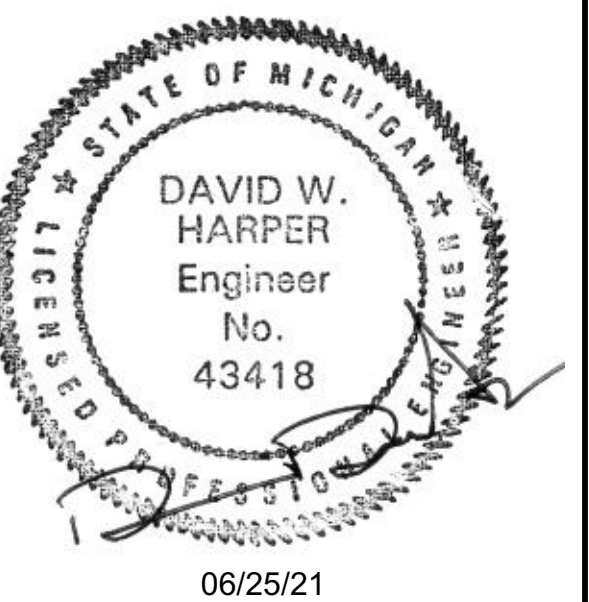
1 Microwave Dish Mounts

NOT TO SCALE

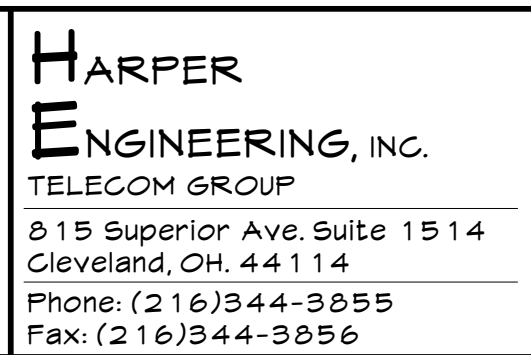


2 Microwave Dish Mounting

NOT TO SCALE



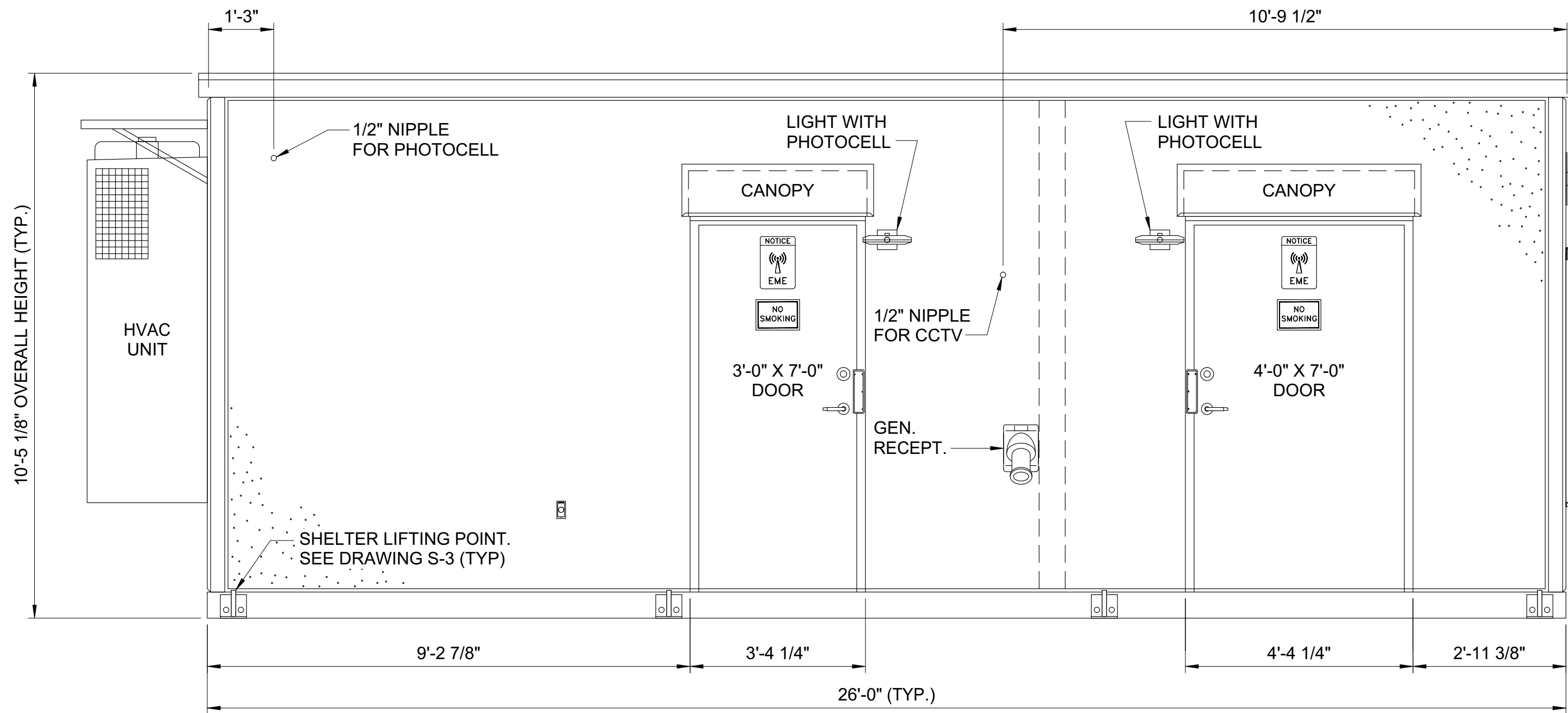
Rev.	Date:	Description:	Mgr.
1	06/25/21	FOR CONSTRUCTION	GJB
0	05/25/21	FOR ZONING	GJB
B	03/30/21	FOR APPROVAL	GJB
A	03/18/21	FOR APPROVAL	GJB



ANTENNA DETAILS		
SCALE: AS NOTED	5111 OSHTEMO N. 6TH STREET KALAMAZOO, MI 49009	Drawing / Rev.
DRAWN BY: GJB		A-4/1
CHECKED BY: GJB		
DATE: 03/02/21		
FILE: 20-216-005		

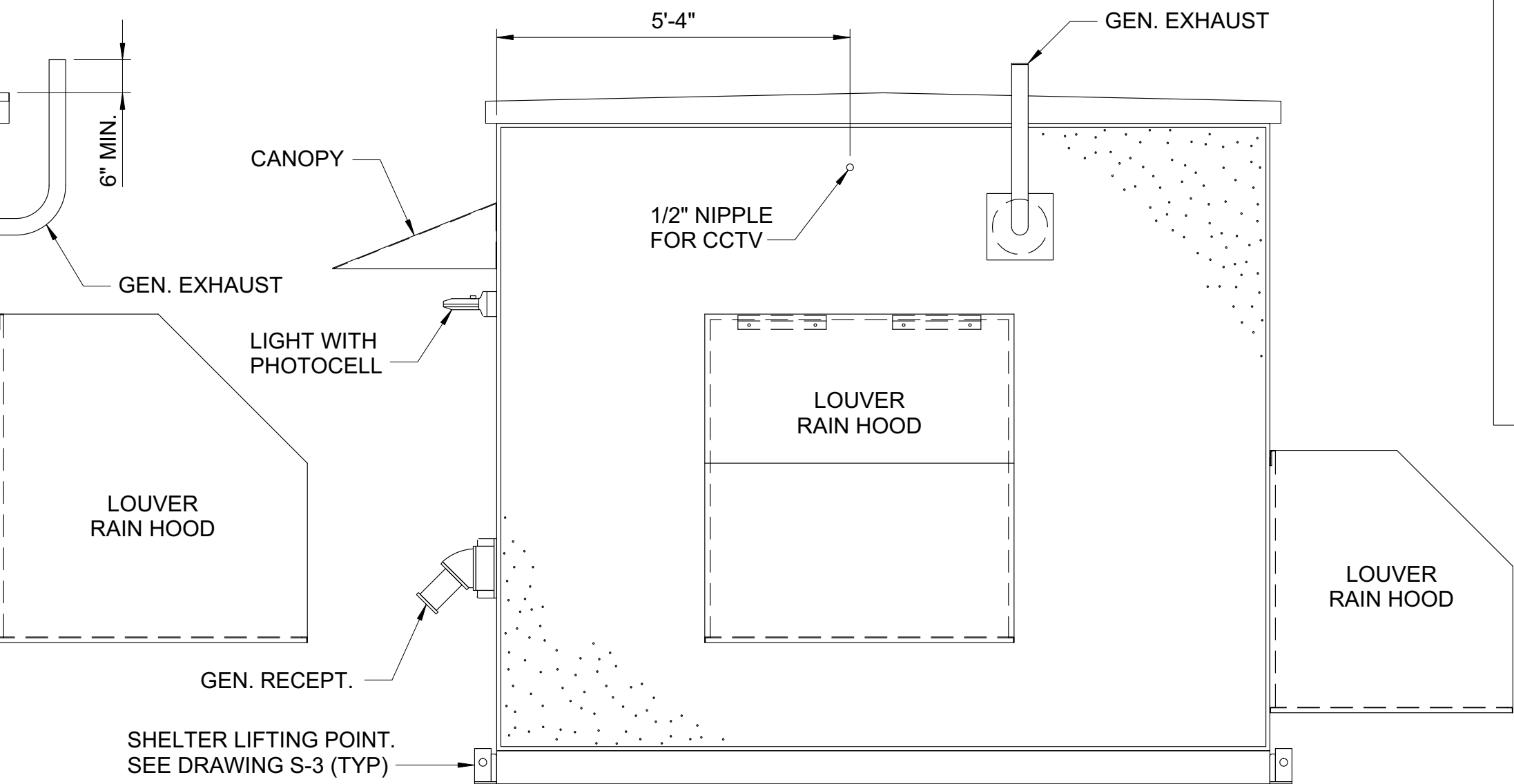
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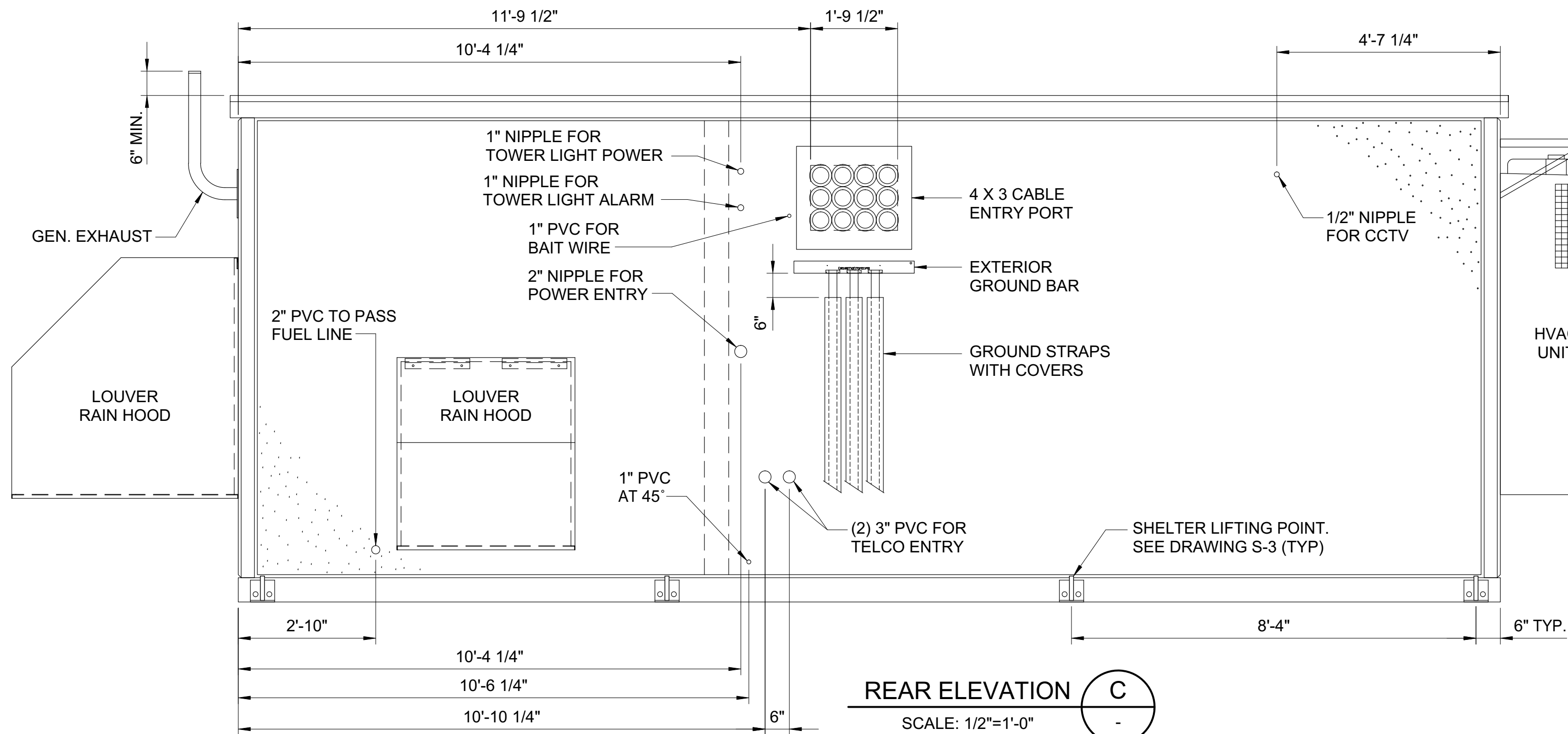
FRONT ELEVATION A

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



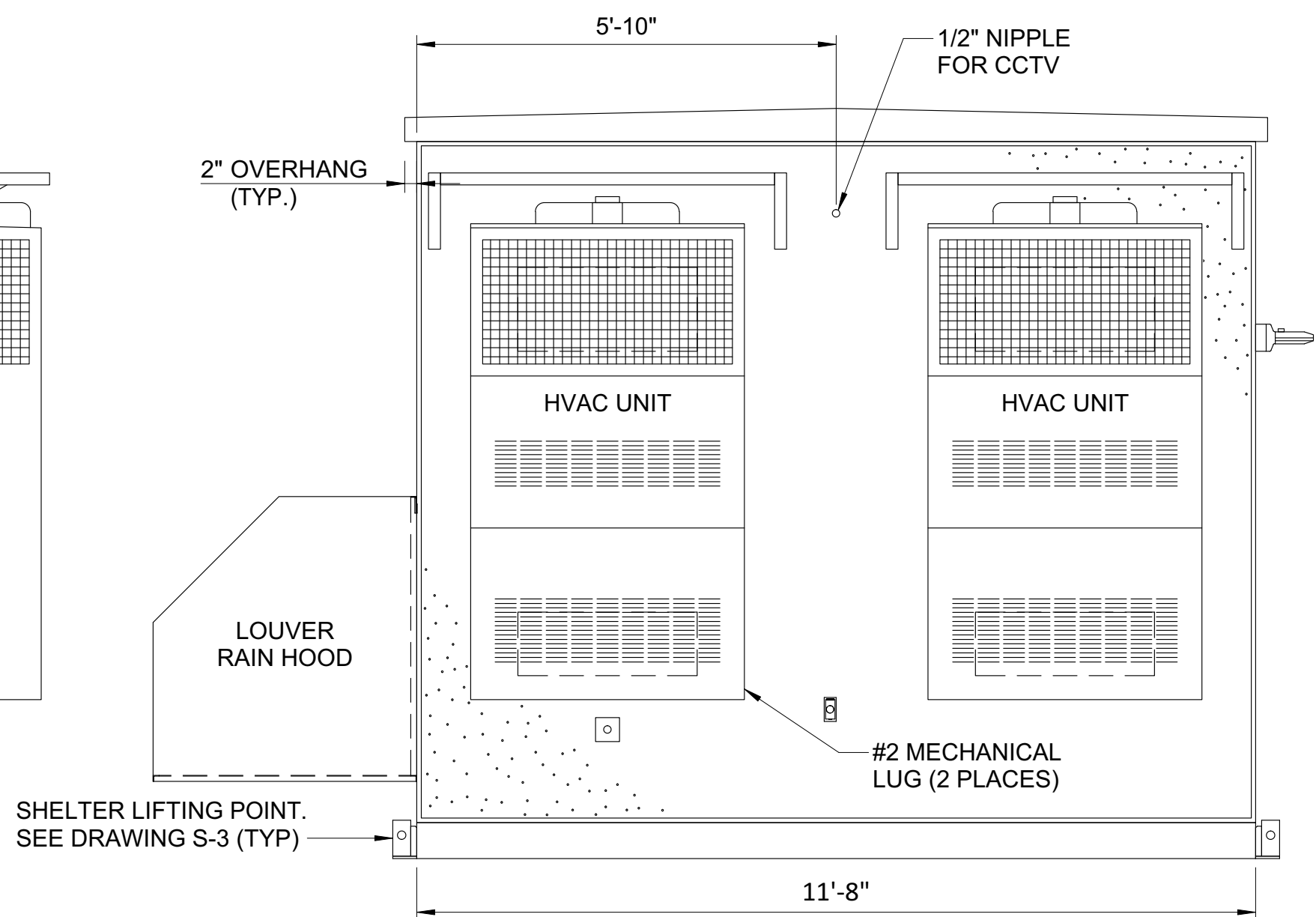
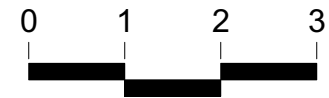
RIGHT ELEVATION B

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



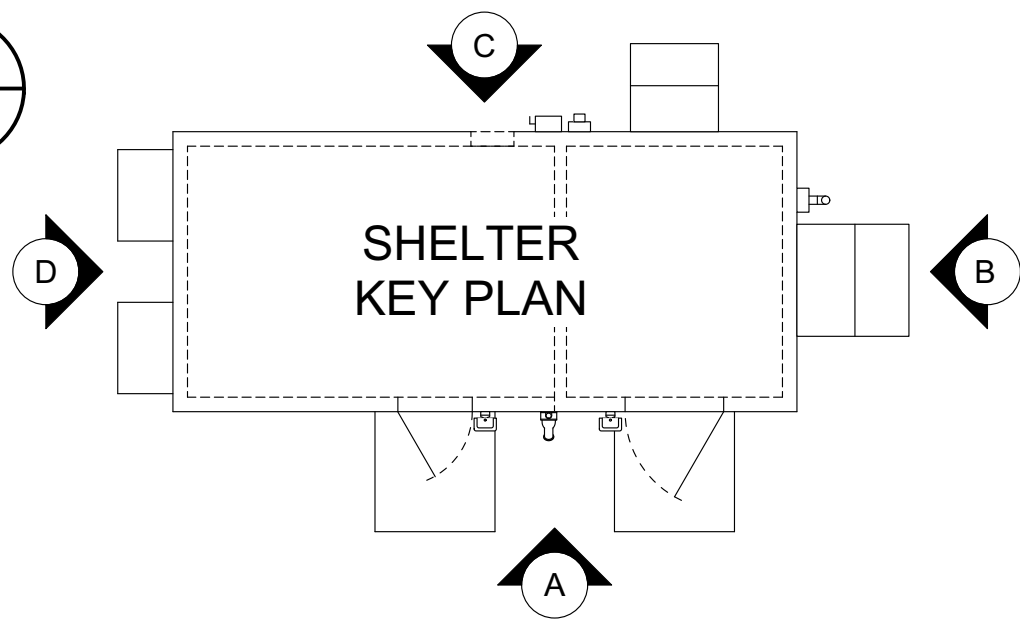
REAR ELEVATION C

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



LEFT ELEVATION D

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



NOTES:

1. INFORMATION CONTAINED IN THESE DRAWINGS REFERRING TO THE PROPOSED EQUIPMENT SHELTER WERE OBTAINED FROM STANDARD EQUIPMENT SHELTER DRAWINGS PROVIDED BY MOTOROLA AND PRODUCED BY THE SHELTER MANUFACTURER. THE INFORMATION CONTAINED IN THESE PLANS SHOULD BE CONSIDERED AS A GUIDE & THE CONTRACTOR IS SPECIFICALLY DIRECTED TO OBTAIN & USE THE SPECIFIED SHELTER MANUFACTURER'S PLANS PROVIDED BY MOTOROLA SPECIFIC FOR THIS SITE.
2. GENERAL CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EXTERIOR LOOSE SHIP ITEMS (DOOR, CANOPY, SECURITY LIGHTS, ETC).

DESIGN LOADS

OCCUPANCY TYPE (RISK CAT.): IV	
FLOOR LIVE LOAD: 300 psf	
ROOF LICE LOAD: 150 psf	
$Pf = (0.7) \times (Ce) \times (Is) \times (Ct) \times (Pg)$	
EXPOSURE FACTOR	Ce = 1.0
IMPORTANCE FACTOR	Is = 1.20
THERMAL FACTOR	Ct = 1.2
GROUND SNOW LOAD	Pg = 60

WIND DESIGN

WIND SPEED: 120 MPH 3 SECOND GUST	
EXPOSURE D	
a = 3ft	
GCpi = ± 0.18 (PER ASCE 7)	
SHIPPING WEIGHT: 77,000 LBS	
BUILDING FOOT PRINT: 304 SQ. FT.	

SPECIAL CONDITIONS / LIMITATIONS

1. THIS STRUCTURE IS NOT DESIGNED FOR INSTALLATION IN A FLOOD HAZARD AREA.
2. THIS STRUCTURE IS NOT DESIGNED FOR HUMAN OCCUPANCY EXCEPT FOR SHORT TIME PERIODS FOR EQUIPMENT MAINTENANCE.
3. THERMOBOND WILL NOT BE RESPONSIBLE FOR INSTALLATION OF ANY SPRINKLER SYSTEM, WHICH MAY BE REQUIRED BY LOCAL BUILDING OFFICIAL.
4. THERMOBOND WILL NOT BE RESPONSIBLE FOR ANY ANTENNA INSTALLATION ASSOCIATED WITH THIS BUILDING.
5. THIS BUILDING SHALL NOT BE LOCATED AT A SITE THAT EXCEEDS THE LISTED DESIGN LOADS.
6. IF BATTERIES WITH AN ELECTROLYTE CAPACITY OF MORE THAN 50 GAL. ARE TO BE INSTALLED IN THIS BUILDING, ONE OF THE FOLLOWING MUST BE INSTALLED BY OTHERS ON SITE:
 - A. AN EXHAUST FAN WITH A HYDROGEN LIMIT SWITCH THAT LIMITS THE HYDROGEN TO 1% OF THE TOTAL VOLUME OF THE ROOM.
 - B. CONTINUOUS VENTILATION SHALL BE PROVIDED AT A RATE NOT LESS THAN 1 CU. FT. PER MINUTE PER SQ. FT. OF FLOOR AREA OF THE ROOM.

GENERATOR NOTE:

THE GENERATOR SHOULD BE ORDERED WITH TWO OUTPUT BREAKERS. (ONE FOR WATER DEPT ALTERNATE POWER SOURCE, ONE FOR MOTOROLA ALTERNATE POWER SOURCE.)

Rev.	Date:	Description:	Mgr.
1	06/25/21	FOR CONSTRUCTION	GJB
0	05/25/21	FOR ZONING	GJB
A	03/18/21	FOR APPROVAL	GJB



5130 WEST 6TH STREET
CLEVELAND, OH. 44141

HARPER
ENGINEERING, INC.
TELECOM GROUP
815 Superior Ave. Suite 1514
Cleveland, OH. 44114
Phone: (216) 344-3855
Fax: (216) 344-3856

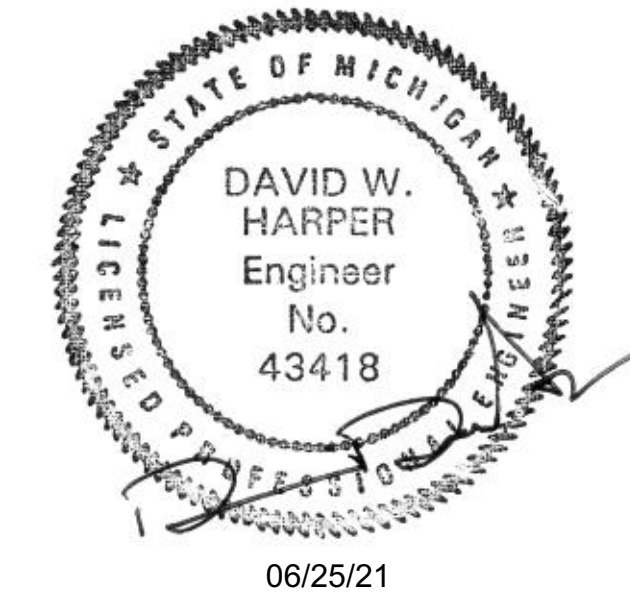
SHELTER ELEVATIONS

SCALE: AS NOTED
DRAWN BY: GJB
CHECKED BY: GJB
DATE: 03/02/21
FILE: 20-216-005

5111 OSHTOMO
N. 6TH STREET
KALAMAZOO, MI 49009

Drawing / Rev.

S-2/1



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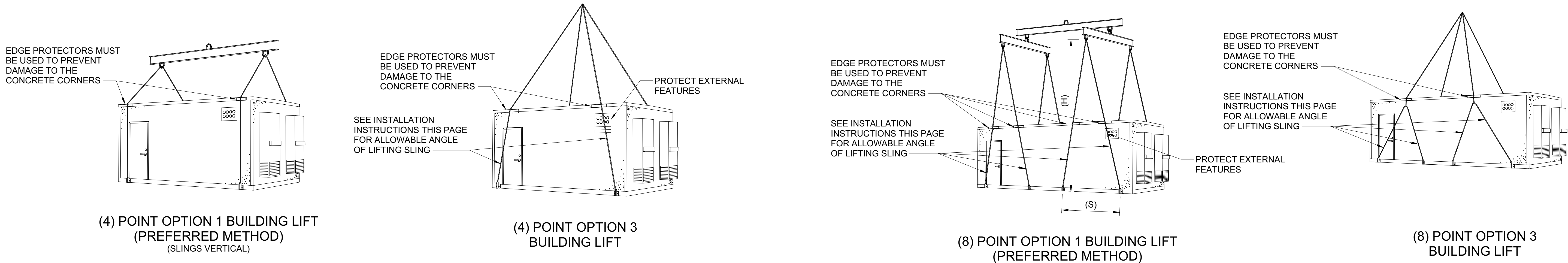
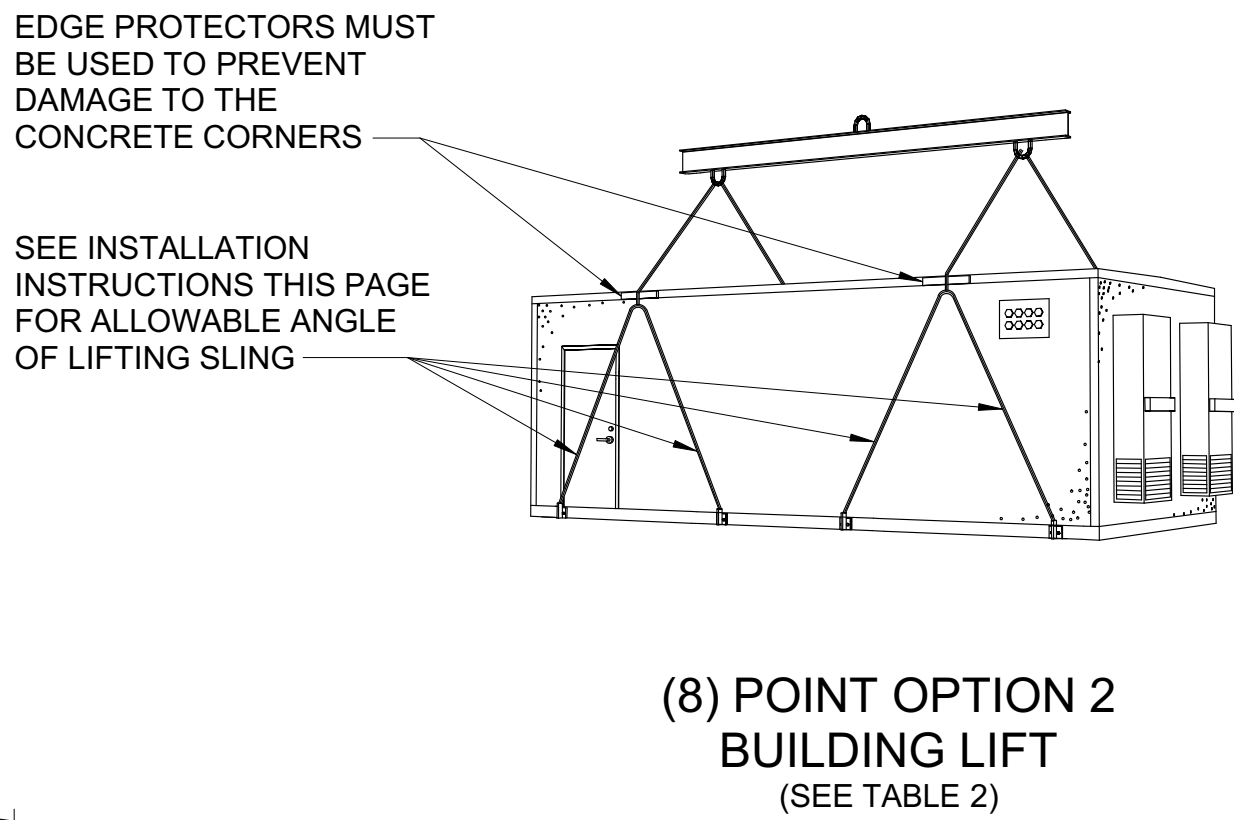
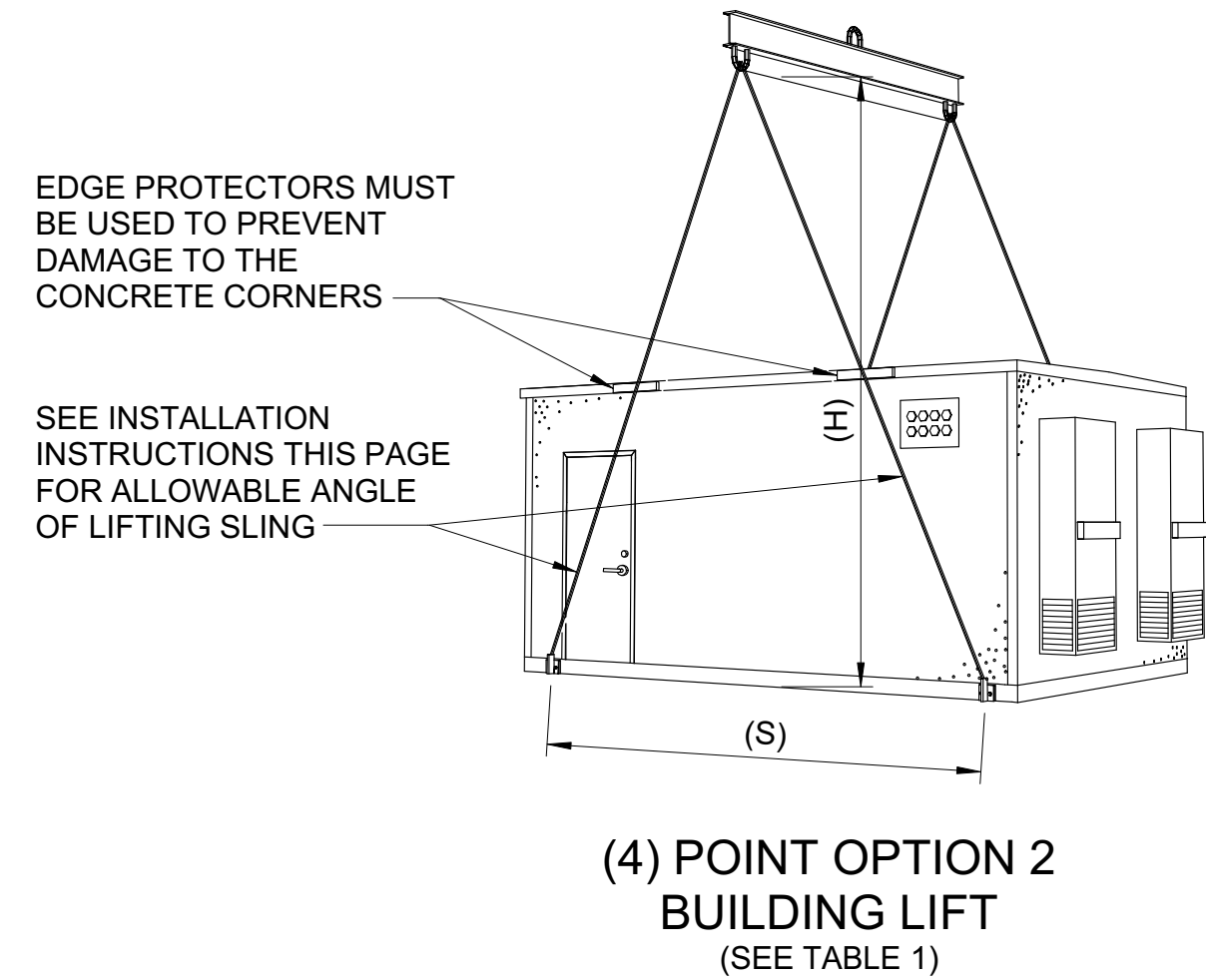


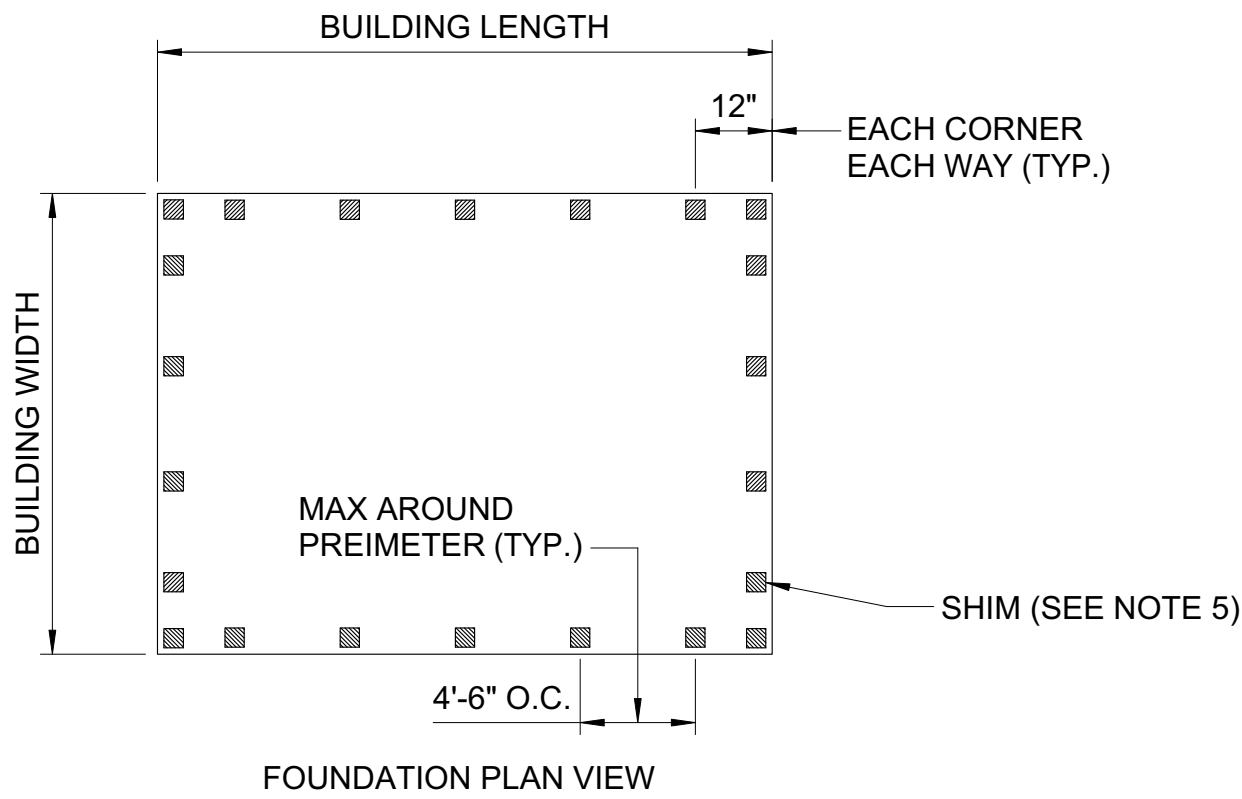
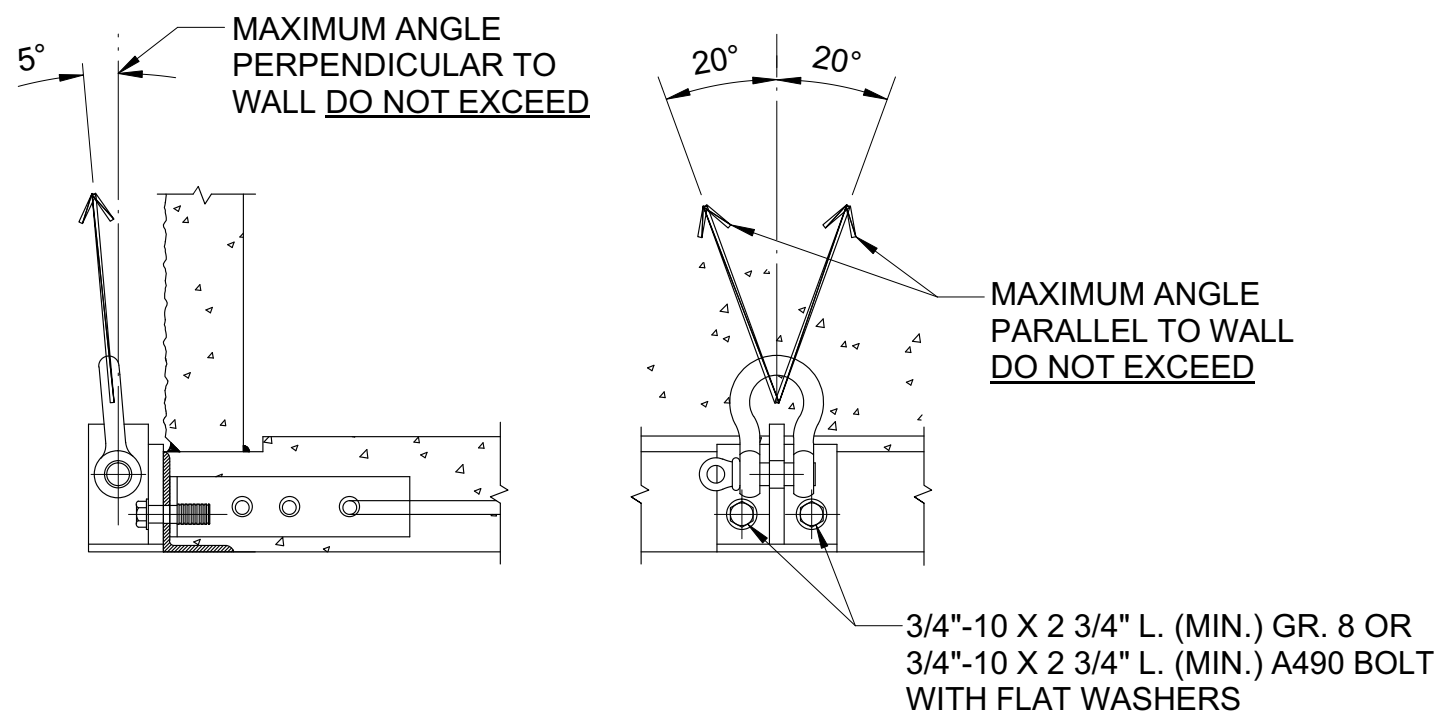
TABLE 1 (4) POINT LIFT OPTION 2	
LIFT DEVICE SEPARATION (S)	MINIMUM HOOK HEIGHT (H)
10'-0"	13'-9"
11'-0"	15'-2"
12'-0"	16'-6"
13'-0"	17'-10"
14'-0"	19'-3"
15'-0"	20'-8"
16'-0"	22'-0"
17'-0"	23'-5"
18'-0"	24'-9"
19'-0"	26'-2"
20'-0"	27'-6"

TABLE 2 (8) POINT LIFT OPTION 1	
LIFT DEVICE SEPARATION (S)	MINIMUM HOOK HEIGHT (H)
6'-0"	13'-9"
7'-0"	15'-2"
8'-0"	16'-6"
9'-0"	17'-10"
10'-0"	19'-3"
11'-0"	20'-8"
12'-0"	22'-0"



4 POINT LIFT OPTIONS A

8 POINT LIFT OPTIONS B



SHELTER MUST BE SHIMMED

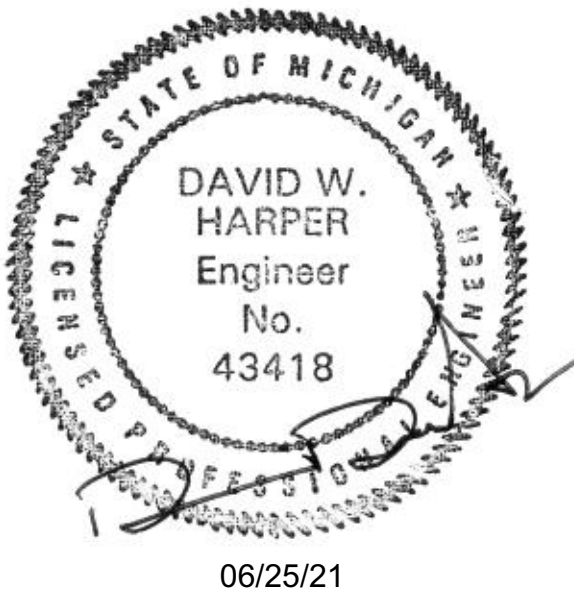
SHELTER SHIMMING SCALE: N.T.S

- BOLT INSTALLATION:**
1. SNUG (NO PLAY) PLUS 1/8 TURN MAX.
 2. DO NOT DRIVE WITH HIGH PRESSURE IMPACT WRENCH.

- INSTALLATION NOTES:**
1. ALL FOUNDATION WORK IS BY OTHERS AND SUBJECT TO LOCAL INSPECTION.
 2. FOUNDATION SURFACE SHALL BE LEVEL TO WITHIN +/- 1/8" PER 10 LINEAL FEET IN ANY DIRECTION.
 3. FOUNDATION SHALL BE SQUARE TO WITHIN +/- 1/4".
 4. TIE DOWN PLATES, IF USED, MUST BE ENTIRELY ABOVE GRADE.
 5. SHELTER MUST BE SHIMMED TO LEVEL ABOVE IRREGULARITIES IN THE SLAB AND BUILDING FLOOR SYSTEM. SHIM HARDNESS NOT LESS THAN 60 DUROMETER. OR COMPRESSIVE STRENGTH 9,000 PSI MINIMUM. SHIMS NOT LESS THAN 3" SQUARE, THICKNESS AS REQUIRED.
 6. INSPECT FOUNDATION FOR DEBRIS AND REMOVE BEFORE SETTING SHELTER.

- RIGGING NOTES:**
1. SHELTER MUST BE LIFTED ONLY AT POINTS PROVIDED, USING APPROPRIATE SPREADER BARS AND SLINGS, AND WITHIN THE LIMITS SHOWN ON THIS DRAWING.
 2. UNLESS OTHERWISE APPROVED OR INDICATED, LIFT ONLY THE SHELTER SELF-WEIGHT. DO NOT LIFT THE SHELTER WITH ADDITIONAL EQUIPMENT INSIDE.
 3. INSPECT EACH LIFT DEVICE FOR CRACKS, WARPING OR OTHER DEFECTS BEFORE INSTALLING ON SHELTER. DO NOT USE A LIFTING DEVICE THAT HAS ANY CRACKS, QUESTIONABLE WELDS, IRREGULAR OR ELONGATED HOLES, OR IS BENT OUT OF SHAPE.
 4. INSPECT BOLTS BEFORE INSTALLATION. DO NOT USE ANY BOLTS THAT HAVE DAMAGED THREADS, ARE BENT, APPEAR ELONGATED OR ARE MALFORMED IN ANY WAY.
 5. DO NOT ROUTE SLING NEAR HVAC SYSTEMS.
 6. REMOVE OR PROTECT DOOR HARDWARE AND OTHER PROTRUSIONS FROM DAMAGE.
 7. RIGGER IS TO PROVIDE ALL EQUIPMENT ABOVE THE THERMOBOND EXTERIOR LIFTING DEVICE. THE RIGGER IS RESPONSIBLE FOR ENSURING THAT THE SAFETY REQUIREMENTS LISTED HEREIN ARE MET.
 8. RIGGING SHALL CONFORM TO APPLICABLE LOCAL, STATE AND FEDERAL REQUIREMENTS.
 9. IF SHELTER IS DELIVERED WITH TEMPORARY SHIPPING WALLS OR ANY OTHER TEMPORARY STRUCTURE INSTALLED FOR TRANSPORT, DO NOT REMOVE BEFORE SHELTER PLACEMENT.
 10. DO NOT USE SINGLE HOLE POSITIONS FOR LIFTING.
 11. DO NOT SET THE SHELTER ON AN UNEVEN OR UNSTABLE SURFACE.

END INSTALLATION AND SLING LIMITS C



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MOTOROLA
SOLUTIONS



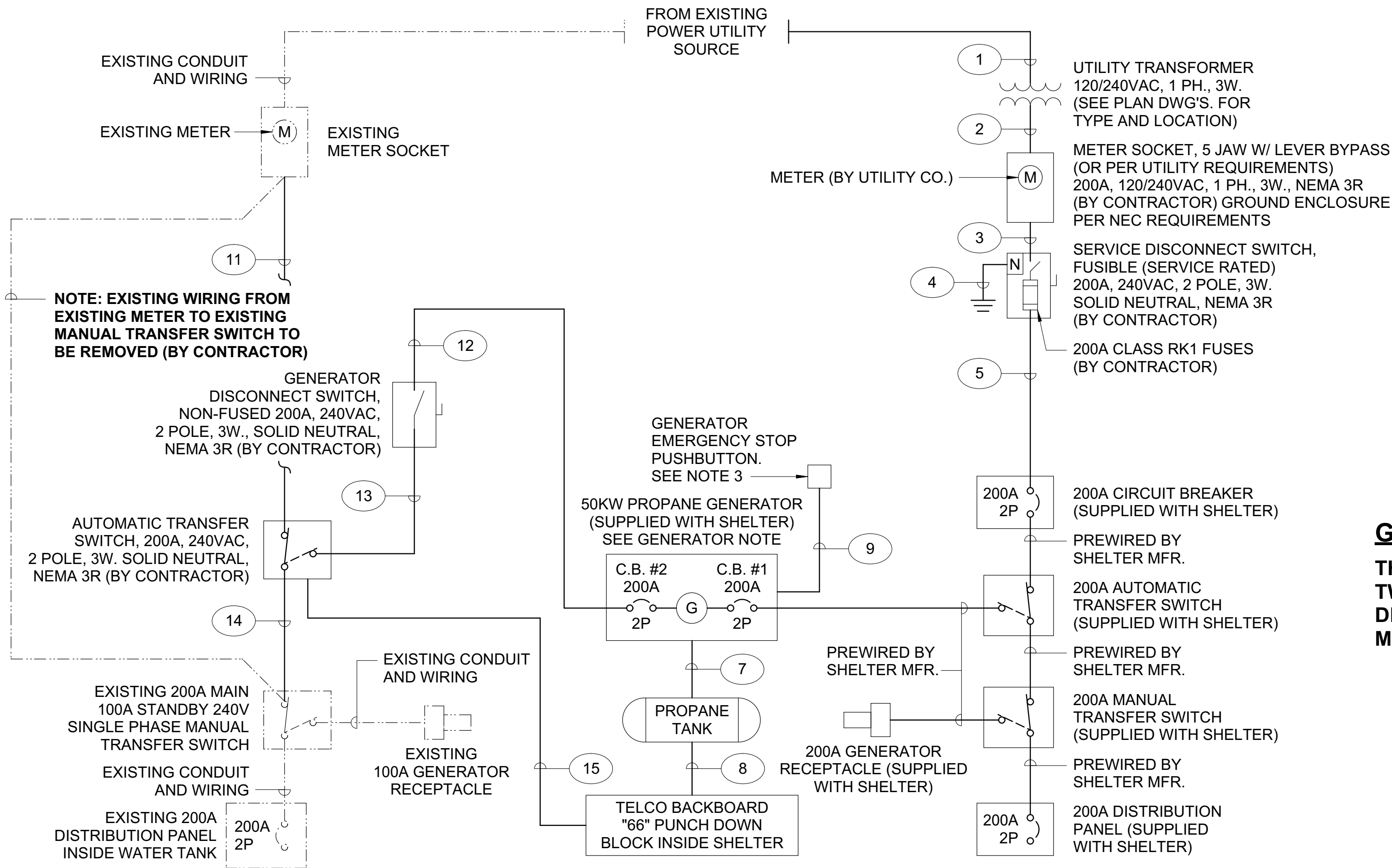
6615 TOWPATH ROAD, SUITE 200
EAST SYRACUSE, NY 13057
PHONE: (315) 701-1300



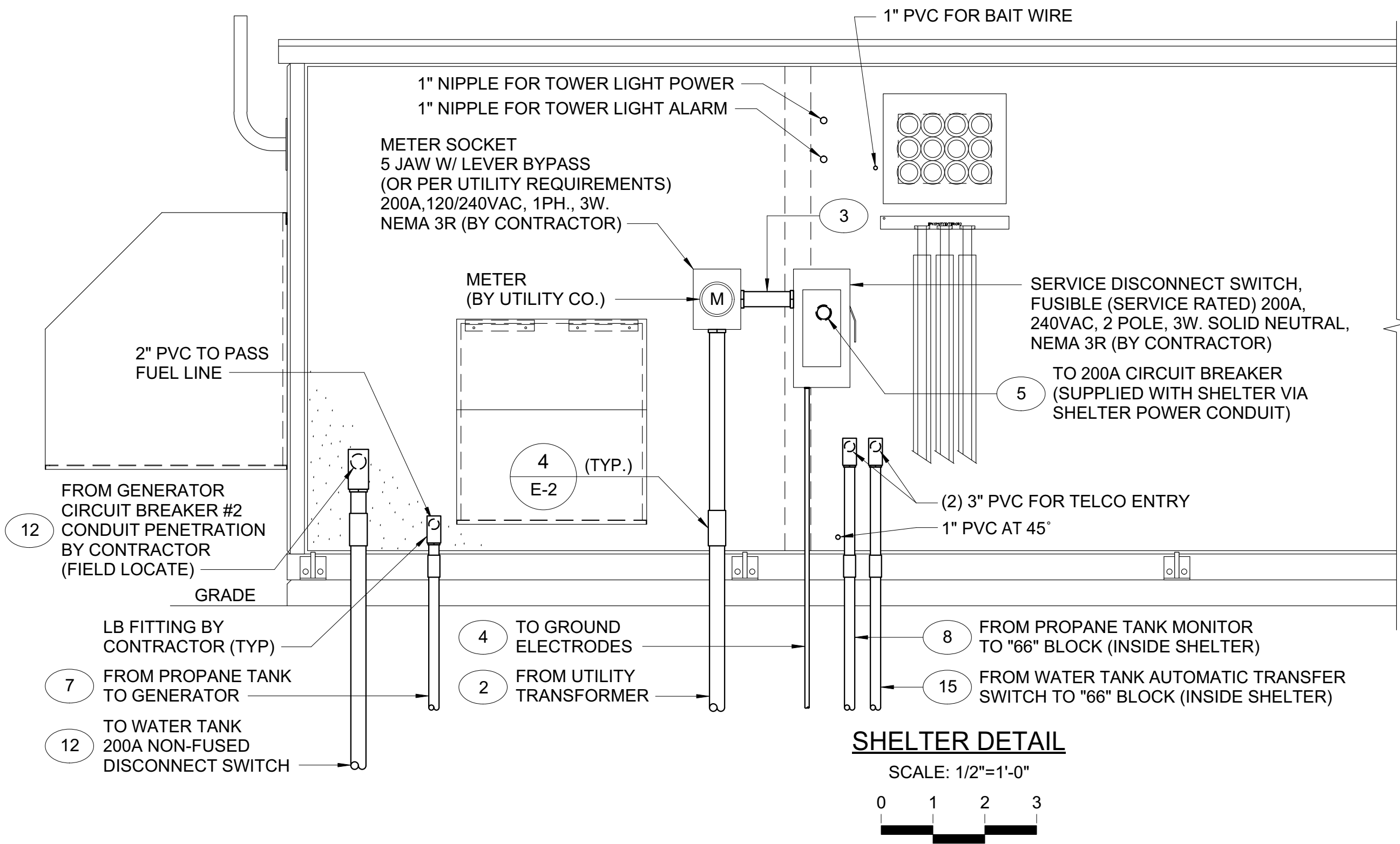
5130 WEST 6TH STREET
CLEVELAND, OH. 44141

HARPER
ENGINEERING, INC.
TELECOM GROUP

815 Superior Ave. Suite 1514
Cleveland, OH. 44114
Phone: (216) 344-3855
Fax: (216) 344-3856



SINGLE LINE DIAGRAM
SCALE: NONE



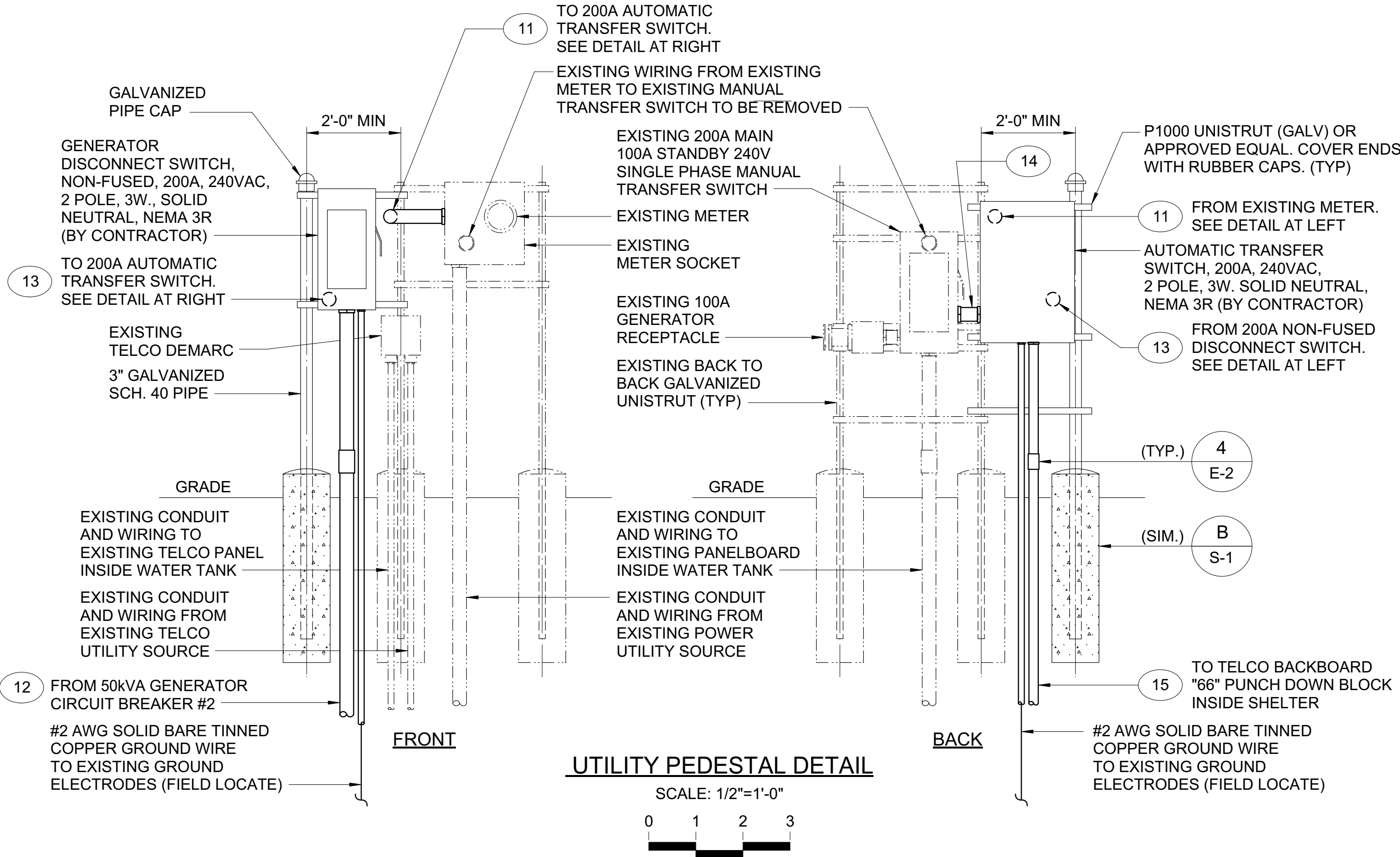
SHELTER DETAIL
SCALE: 1/2"=1'-0"
0 1 2 3

GENERAL NOTES:

1. IN CASE OF CONFLICT BETWEEN THIS DRAWING, PLAN DRAWINGS OR MANUFACTURER SPEC., CONTRACTOR SHALL NOTIFY ENGINEER OR MOTOROLA REPRESENTATIVE.
2. CONTRACTOR SHALL FURNISH AND INSTALL ENGRAVED PLASTIC LABELS "MOTOROLA" ON THE FACE OF EACH PIECE OF EQUIPMENT AND ABOVE THE ELECTRIC METER.
3. CONTRACTOR SHALL FURNISH AND INSTALL REMOTE GENERATOR EMERGENCY STOP PUSH BUTTON PER NEC 445.18 (B) AND GENERATOR MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL FURNISH AND INSTALL ENGRAVED PLASTIC LABEL "GENERATOR EMERGENCY STOP". LOCATION OF EMERGENCY STOP PUSHBUTTON TO BE DETERMINED BY CONSTRUCTION MANAGER.

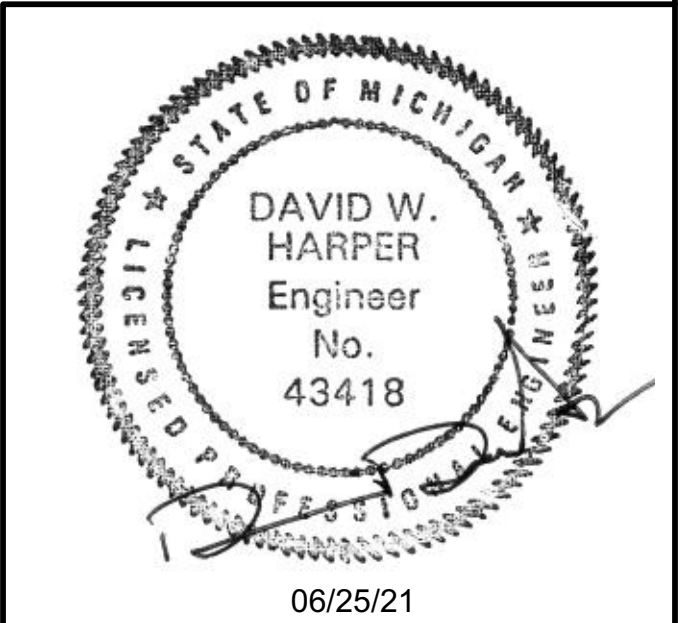
GENERATOR NOTE:

THE GENERATOR SHOULD BE ORDERED WITH TWO OUTPUT BREAKERS. (ONE FOR WATER DEPT ALTERNATE POWER SOURCE, ONE FOR MOTOROLA ALTERNATE POWER SOURCE.)



UTILITY PEDESTAL DETAIL
SCALE: 1/2"=1'-0"
0 1 2 3

UTILITIES TO BE INSTALLED PER LOCAL UTILITY REQUIREMENTS. CONTRACTOR TO VERIFY WIRE, PULL STRING, CONDUIT SCHEDULE AND ROUTING WITH TOWER OWNER AND MOTOROLA REPRESENTATIVE PRIOR TO COMMENCING ANY/ALL UTILITY WORK.			
CONDUIT	CABLE/CONDUIT	FROM	TO
1	INCOMING PRIMARY CABLE (SEE DWG. A-1 AND/OR C-1) FOR UNDERGROUND SERVICE: CONTRACTOR TO INSTALL (2) 4" PVC SCHEDULE 40 CONDUITS WITH NYLON PULL ROPES, CABLE FURNISHED AND INSTALLED BY UTILITY. FOR OVERHEAD SERVICE: POLES AND CABLE FURNISHED AND INSTALLED BY UTILITY.	EXISTING POWER UTILITY SOURCE	UTILITY TRANSFORMER
2	3#4/0 AWG CU. (TYPE USE-2) 3" RMC OR IMC CONDUIT	UTILITY TRANSFORMER	METER BASE
3	3#3/0 AWG CU. & 1#2 AWG CU. GND. (TYPE THWN-2) 3" RMC OR IMC CONDUIT	METER BASE	200A SERVICE DISCONNECT SWITCH (NORM SERVICE)
4	1#2 AWG CU. GND. (TYPE THWN-2) 3/4" LFMC CONDUIT	NEUTRAL BUS - SERVICE DISCONNECT SWITCH	GROUND ELECTRODES
5	3#3/0 AWG CU. & 1#2 AWG CU. GND. (TYPE THWN-2) VIA EXISTING 2" NIPPLE THROUGH SHELTER WALL	200A SERVICE DISCONNECT SWITCH (NORM SERVICE)	200A CIRCUIT BREAKER (ATS - NORMAL) VIA SHELTER POWER ENTRY
6	NOT USED	N/A	N/A
7	PROPANE FUEL LINE 2" PVC SCHEDULE 40 CONDUIT	PROPANE TANK	50KW PROPANE GENERATOR
8	TANK LEVEL & ALARM WIRING PER MANUFACTURER'S SPECIFICATIONS 1" RMC OR IMC CONDUIT	PROPANE TANK	TO TELCO BACKBOARD "66" PUNCH DOWN BLOCK INSIDE SHELTER
9	2#12 AWG CU & 1#12 AWG CU GND (TYPE THWN) 3/4" RMC OR IMC CONDUIT	50KW PROPANE GENERATOR	GEN. EMERGENCY STOP PUSHBUTTON (E-STOP)
10	NOT USED	N/A	N/A
11	3#3/0 AWG CU. & 1#2 AWG CU. GND. (TYPE THWN-2) 3" RMC OR IMC CONDUIT	EXISTING METER BASE	200A AUTOMATIC TRANSFER SWITCH (ATS - NORMAL)
12	3#4/0 AWG CU. & 1#2 AWG CU. GND. (TYPE THWN-2) 3" RMC OR IMC CONDUIT	50KW PROPANE GENERATOR (CIRCUIT BREAKER #2)	200A NON-FUSED DISCONNECT SWITCH (BACK UP SERVICE)
13	3#4/0 AWG CU. & 1#2 AWG CU. GND. (TYPE THWN-2) 3" RMC OR IMC CONDUIT	200A NON-FUSED DISCONNECT SWITCH (BACK UP SERVICE)	200A AUTOMATIC TRANSFER SWITCH (ATS - BACK UP)
14	3#4/0 AWG CU. & 1#2 AWG CU. GND. (TYPE THWN-2) 3" RMC OR IMC CONDUIT	200A AUTOMATIC TRANSFER SWITCH (ATS - LOAD)	EXISTING 200A MANUAL TRANSFER SWITCH
15	ALARM WIRING (TYPE THWN) 2" RMC OR IMC CONDUIT	200A AUTOMATIC TRANSFER SWITCH (ATS - ALARMS)	TO TELCO BACKBOARD "66" PUNCH DOWN BLOCK INSIDE SHELTER



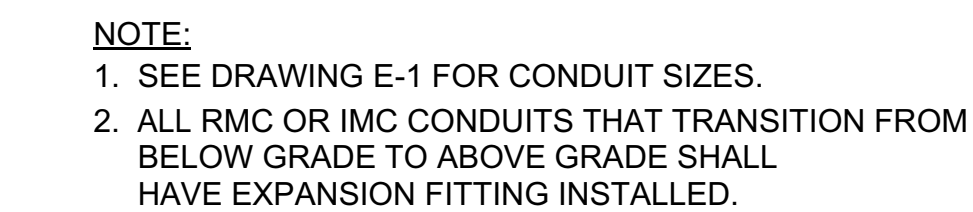
1	06/25/21	FOR CONSTRUCTION	GJB	 MOTOROLA SOLUTIONS	 PYRAMID Network Services, LLC 6615 TOWPATH ROAD, SUITE 200 EAST SYRACUSE, NY 13057 PHONE: (315) 701-1300	 EMERALD DESIGN & CONSTRUCTION 5130 WEST 6TH STREET CLEVELAND, OH. 44141	HARPER ENGINEERING, INC. TELECOM GROUP 815 Superior Ave. Suite 1514 Cleveland, OH. 44114 Phone: (216)344-3855 Fax: (216)344-3856	UTILITY DETAILS			THIS DRAWING IS COPYRIGHTED AND IS THE SOLE PROPERTY OF THE OWNER. IT IS PRODUCED SOLELY FOR USE BY THE OWNER AND ITS AFFILIATES. REPRODUCTION OR USE OF THIS DRAWING AND/OR THE INFORMATION CONTAINED IN IT IS FORBIDDEN WITHOUT THE WRITTEN PERMISSION OF THE OWNER. 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.	
0	05/25/21	FOR ZONING	GJB					5111 OSHTIMO				
C	05/03/21	REVISED CONDUIT 2 WIRE SIZE	GJB					N. 6TH STREET				
B	03/30/21	FOR APPROVAL	GJB					KALAMAZOO, MI 49009				
A	03/18/21	FOR APPROVAL	GJB					Drawing / Rev.				
Rev.	Date:	Description:	Mgr.	E-1/1				SCALE: AS NOTED DRAWN BY: GJB CHECKED BY: GJB DATE: 03/02/21 FILE: 20-216-005				

G.C. TO SUPPLY MONITOR UNIT

G.C. TO SUPPLY CAT 5 FROM MONITOR UNIT TO ALARM UNIT IN SHELTER

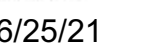
G.C. TO SUPPLY CAT 5 FROM ALARM UNIT IN SHELTER TO ALARM PUNCH DOWN

UNIT TO BE POWERED FROM RECEPTACLE IN SHELTER

[illegible]

CONDUIT PENETRATION DETAIL

SCALE: NONE

[illegible]

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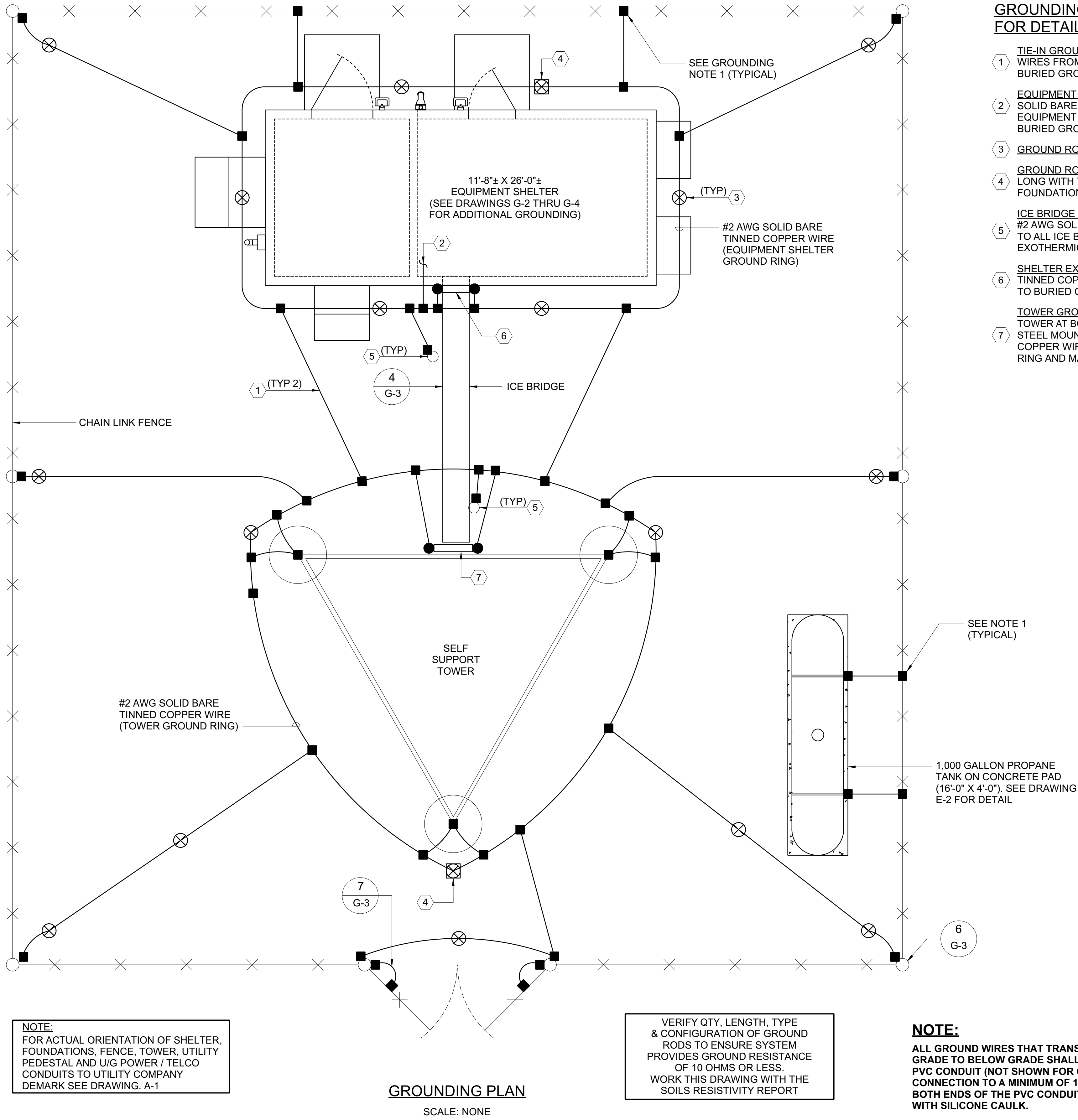
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

GROUNDING NOTES:

- 1. ALL FENCE POSTS WITHIN 6' OF ANY METALLIC ITEMS INCLUDING EQUIPMENT, UTILITY PEDESTAL / ICE BRIDGE SUPPORT POSTS, ETC. SHALL BE BONDED TO THE GROUND RING.
- 2. FENCE FABRIC TO BE BONDED PER MOTOROLA R-56 STANDARDS REV C.
- 3. FENCE FABRIC RUNS LESS THAN 40' SHALL BE BONDED ON ONE END. FENCE FABRIC RUNS GREATER THAN 40' SHALL BE BONDED ON BOTH ENDS.
- 4. FENCE TOP RAIL TO BE BONDED TO CORNER POSTS ON BOTH ENDS
- 5. ANY DISCREPANCIES BETWEEN THIS DRAWING PACKAGE AND EXISTING FIELD CONDITIONS MUST BE REPORTED TO THE ENGINEER OF RECORD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- 6. ALL GROUND WIRES THAT TRANSITION FROM ABOVE GRADE TO BELOW GRADE SHALL BE ROUTED IN A 3/4" PVC CONDUIT FROM THE CONNECTION TO A MINIMUM OF 18" BELOW GRADE. BOTH ENDS OF THE PVC CONDUIT SHALL BE SEALED WITH SILICONE CAULK.
- 7. TAMPER PROOF HARDWARE SHALL BE USED FOR ALL EXPOSED GROUND BARS INSTALLED AT COMPOUND LEVEL.

TYPICAL GROUNDING NOTES

- 1. ALL GROUND CABLE IN CONCRETE OR THROUGH WALL SHALL BE IN 3/4" PVC CONDUIT. NO METALLIC CONDUIT SHALL BE USED FOR GROUNDING CONDUCTOR SLEEVES.
- 2. GROUND ALL EXPOSED METALLIC OBJECTS USING A TWO-HOLE NEMA DRILLED CONNECTOR SUCH AS THOMAS & BETTS #32207 OR APPROVED EQUAL
- 3. THE CONTRACTOR SHALL NOTIFY THE PYRAMID NETWORK SERVICES, LLC REPRESENTATIVE WHEN THE GROUND RING IS INSTALLED SO THAT THE REPRESENTATIVE CAN INSPECT GROUND RING BEFORE IT IS CONCEALED.
- 4. ALL EXTERIOR GROUND CONDUCTORS INCLUDING GROUND RING SHALL BE #2 AWG SOLID BARE TINNED COPPER. MAKE ALL GROUND CONNECTIONS AS SHORT AND DIRECT AS POSSIBLE. AVOID SHARP BENDS. THE RADIUS OF ANY BEND SHALL NOT BE LESS THAN 8" AND THE INCLUSIVE ANGLE OF ANY BEND SHALL NOT EXCEED 90'. GROUNDING CONDUCTORS SHALL BE ROUTED DOWNWARD TOWARD THE BURIED GROUND RING.
- 5. ALL BELOW GROUND EXTERNAL CONNECTIONS SHALL BE EXOTHERMICALLY WELDED. ALL EXOTHERMIC WELDS TO BURIED GROUND RING SHALL BE THE PARALLEL-TYPE. EXCEPT FOR THE GROUND RODS WHICH ARE TEE-TYPE EXOTHERMIC WELDS. REPAIR ALL GALVANIZED SURFACES THAT HAVE BEEN DAMAGED BY EXOTHERMIC WELDING. USE SPRAY GALVANIZED SUCH AS HOLUB LECTROSOL #15-501.
- 6. WHERE MECHANICAL CONNECTORS (TWO-HOLE OR CLAMP) ARE USED, APPLY A LIBERAL PROTECTIVE COATING OF A CONDUCTIVE ANTI-OXIDE COMPOUND ON ALL CONNECTORS. PROVIDE LOCK WASHERS ON ALL MECHANICAL CONNECTORS. USE STAINLESS STEEL HARDWARE THROUGHOUT. THOROUGHLY REMOVE ALL PAINT AND CLEAN ALL DIRT FROM SURFACES REQUIRING GROUND CONNECTORS, REPAINT TO MATCH EXISTING AFTER CONNECTION IS MADE TO MAINTAIN CORROSION RESISTANCE. ALL GROUND CONNECTIONS SHALL BE APPROVED FOR THE TYPES OF METALS BEING ATTACHED TO.
- 7. A RESISTANCE TO GROUND OF (10) OHMS OR LESS IS REQUIRED FOR ALL MOTOROLA SITES. THE CONTRACTOR SHOULD RETAIN HIS OWN TESTER AT HIS OWN EXPENSE. IN ADDITION, A THIRD PARTY SHOULD BE HIRED TO OBTAIN MEGGER AND SWEEP RESULTS ON ALL SITES INCLUSIVE OF WHAT RESULTS THE CONTRACTOR SUBMITS, TO INSURE PROPER QUALITY CONTROL ON ALL SITES. SCHEDULE FINAL MEGGER TEST SUCH THAT THE PYRAMID NETWORK SERVICES, LLC REPRESENTATIVE CAN BE PRESENT FOR FIELD VERIFICATION. REFER TO THE MOTOROLA MASTER SPECIFICATION FOR MEGGER TESTING PROCEDURES. IF THE FINAL GROUNDING RESISTANCE MEASUREMENT EXCEEDS 10 (TEN) OHMS, THE CONTRACTOR SHALL NOTIFY THE PYRAMID NETWORK SERVICES, LLC REPRESENTATIVE.
- 8. ALL MOUNTING HARDWARE SHALL BE STAINLESS STEEL
- 9. THE GROUND CONDUCTORS SHALL BE RUN STRAIGHT FOR MINIMUM INDUCTANCE AND VOLTAGE DROP. SINCE CABLE BENDS INCREASE INDUCTANCE, THE MINIMUM REQUIRED BENDING RADIUS IS 8 INCHES WHEN BENDS ARE UNAVOIDABLE. ALL METAL WORK WITHIN 10 FEET OF THE GROUND RING SHALL BE DIRECTLY BONDED TO THIS GROUND SYSTEM, WITHOUT USING SERIES OR DAISY CHAIN CONNECTION ARRANGEMENTS.
- 10. PAINT, ENAMEL, LACQUER AND OTHER ELECTRICALLY NON-CONDUCTIVE COATINGS SHALL BE REMOVED FROM THREADS AND SURFACE AREAS WHERE CONNECTIONS ARE MADE TO ENSURE GOOD ELECTRICAL CONTINUITY.
- 11. CONNECTIONS BETWEEN DISSIMILAR METALS SHALL NOT BE MADE UNLESS THE CONDUCTORS ARE SEPARATED BY A SUITABLE MATERIAL. THAT IS A PART OF THE ATTACHMENT DEVICE LISTED AND APPROVED FOR USE WITH THE SPECIFIC DISSIMILAR METALS MAY BE USED FOR THE PURPOSE.
- 12. ALL BELOW GRADE GROUND SYSTEM CONDUCTORS SHALL BE A MINIMUM DEPTH OF 30".



GROUNDING LEGEND
FOR DETAILS SEE DRAWING G-2, G-3 & G-4

- 1 **TIE-IN GROUNDING:** EXTEND (2) #2 AWG SOLID BARE TINNED COPPER WIRES FROM EQUIPMENT SHELTER BURIED GROUND RING TO TOWER BURIED GROUND RING AND MAKE EXOTHERMIC CONNECTIONS.
- 2 **EQUIPMENT SHELTER CIRCUIT BREAKER GROUNDING:** EXTEND #2 AWG SOLID BARE TINNED COPPER WIRE (SUPPLIED WITH SHELTER) FROM EQUIPMENT SHELTER 200A CIRCUIT BREAKER TO EQUIPMENT SHELTER BURIED GROUND RING AND MAKE APPROVED CONNECTIONS AT EACH END.
- 3 **GROUND ROD:** COPPERCLAD STEEL, 3/4" DIA. TEN (10) FEET LONG.
- 4 **GROUND ROD W/ACCESS:** COPPERCLAD STEEL, 3/4" DIA. TEN (10) FEET LONG WITH TEST ACCESS WELL. (1) REQUIRED AT FURTHEST CORNER OF FOUNDATION AWAY FROM TOWER.
- 5 **ICE BRIDGE / UTILITY PEDESTAL SUPPORT POST GROUNDING:** EXTEND #2 AWG SOLID BARE TINNED COPPER WIRE FROM BURIED GROUND RING TO ALL ICE BRIDGE / UTILITY PEDESTAL SUPPORT POSTS AND EXOTHERMICALLY WELD.
- 6 **SHELTER EXTERIOR GROUND BAR:** EXTEND (2) #2 AWG SOLID BARE TINNED COPPER WIRES FROM THE SHELTER EXTERIOR GROUND BAR TO BURIED GROUND RING AND MAKE EXOTHERMIC CONNECTIONS.
- 7 **TOWER GROUND BAR (BOTTOM):** MOUNT GROUND BAR DIRECTLY TO TOWER AT BOTTOM OF CABLE RUNS. SECURE TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL. EXTEND (2) #2 AWG SOLID BARE TINNED COPPER WIRES FROM THE TOWER GROUND BAR TO BURIED GROUND RING AND MAKE EXOTHERMIC CONNECTIONS.

GROUNDING SYMBOLS LEGEND

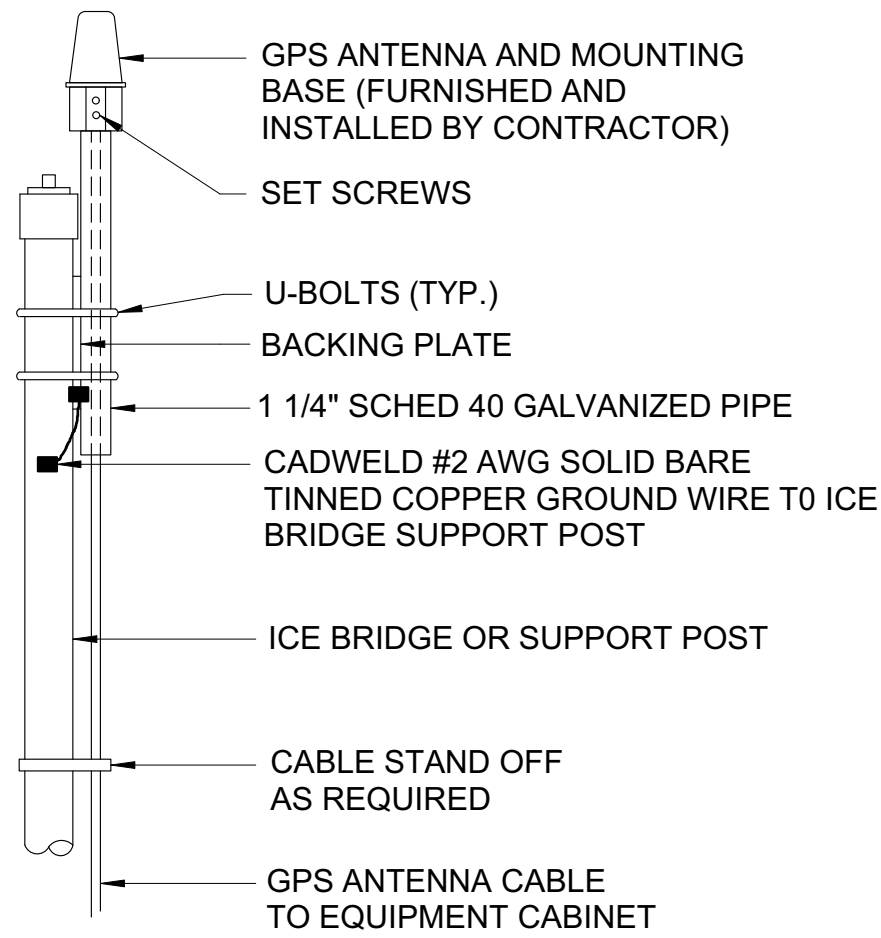
- GROUND ROD WITH ACCESS (INSPECTION WELL)
- GROUND ROD
- CADWELD TYPE CONNECTION
- MECHANICAL TYPE CONNECTION
- REPRESENTS DETAIL NUMBER
- REFERENCE DRAWING NUMBER
- #2 AWG SOLID BARE TINNED COPPER GROUND WIRE 42" BELOW GRADE



NOTE:
ALL GROUND WIRES THAT TRANSITION FROM ABOVE GRADE TO BELOW GRADE SHALL BE ROUTED IN A 3/4" PVC CONDUIT (NOT SHOWN FOR CLARITY) FROM THE CONNECTION TO A MINIMUM OF 18" BELOW GRADE. BOTH ENDS OF THE PVC CONDUIT SHALL BE SEALED WITH SILICONE CAULK.

				GROUNDING PLAN				THIS DRAWING IS COPYRIGHTED AND IS THE SOLE PROPERTY OF THE OWNER. IT IS PRODUCED SOLELY FOR USE BY THE OWNER AND ITS AFFILIATES. REPRODUCTION OR USE OF THIS DRAWING AND/OR THE INFORMATION CONTAINED IN IT IS FORBIDDEN WITHOUT THE WRITTEN PERMISSION OF THE OWNER.	
				5111 OSHTOMO N. 6TH STREET KALAMAZOO, MI 49009				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.	
				Drawing / Rev.					
				G-1/1					
				SCALE: AS NOTED					
				DRAWN BY: GJB					
				CHECKED BY: GJB					
				DATE: 03/02/21					
				FILE: 20-216-005					

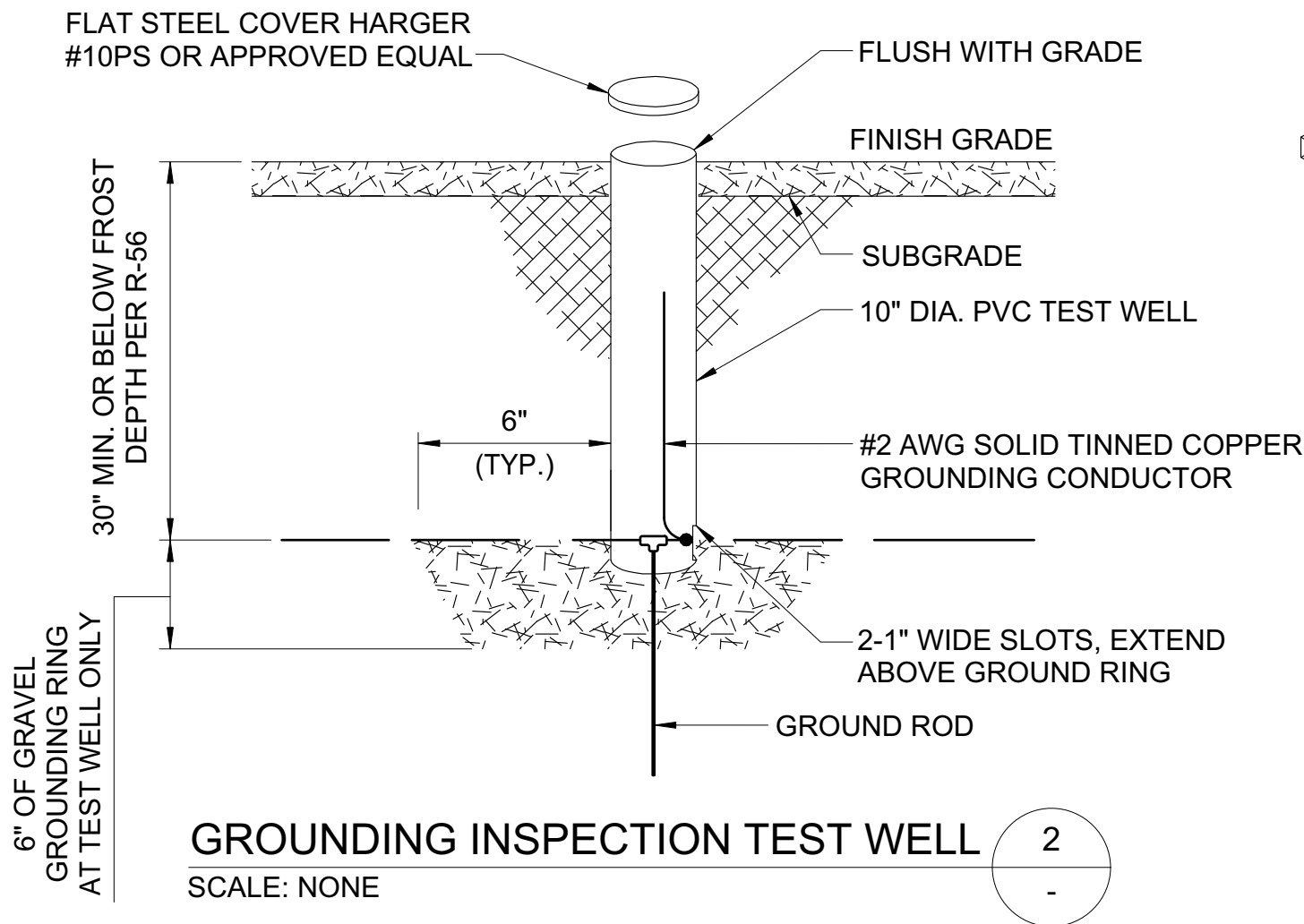
NOTE:
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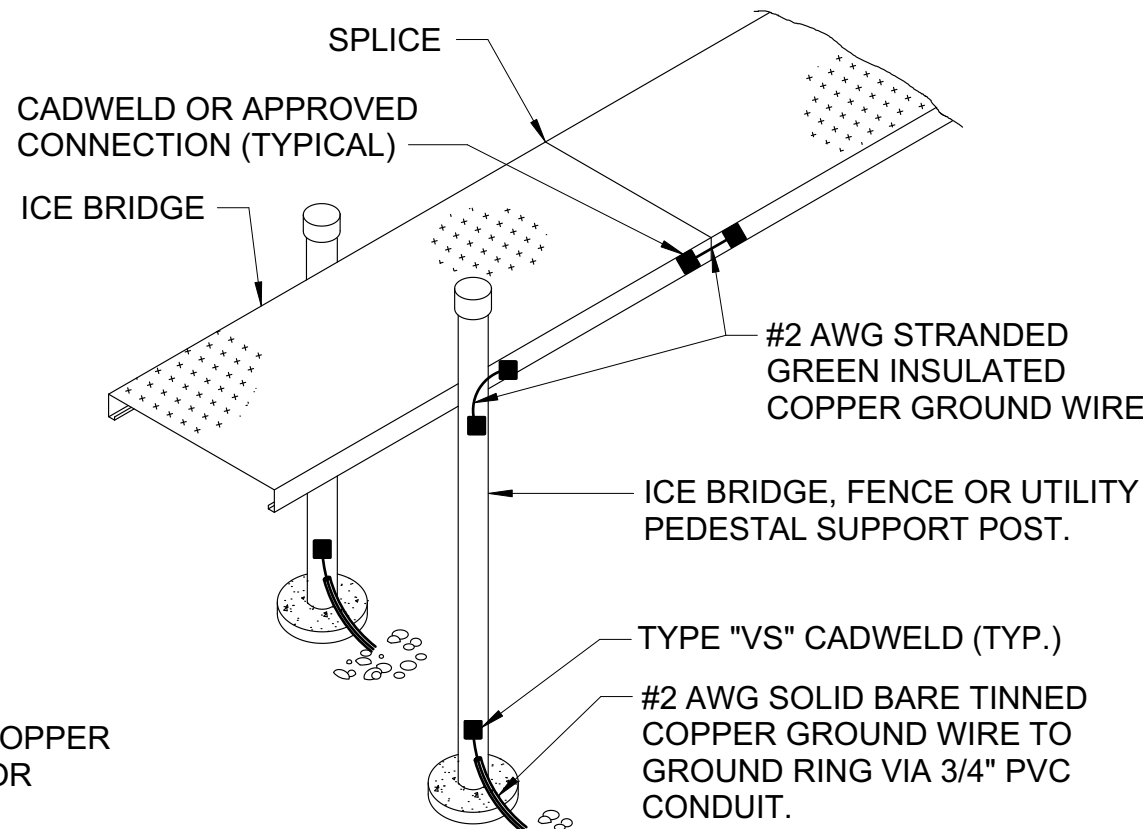
NOTE:
GPS SHOULD HAVE CLEAR VIEW OF THE SOUTHERN HORIZON

GPS ANTENNA INSTALLATION

DETAIL 1
SCALE: NONE

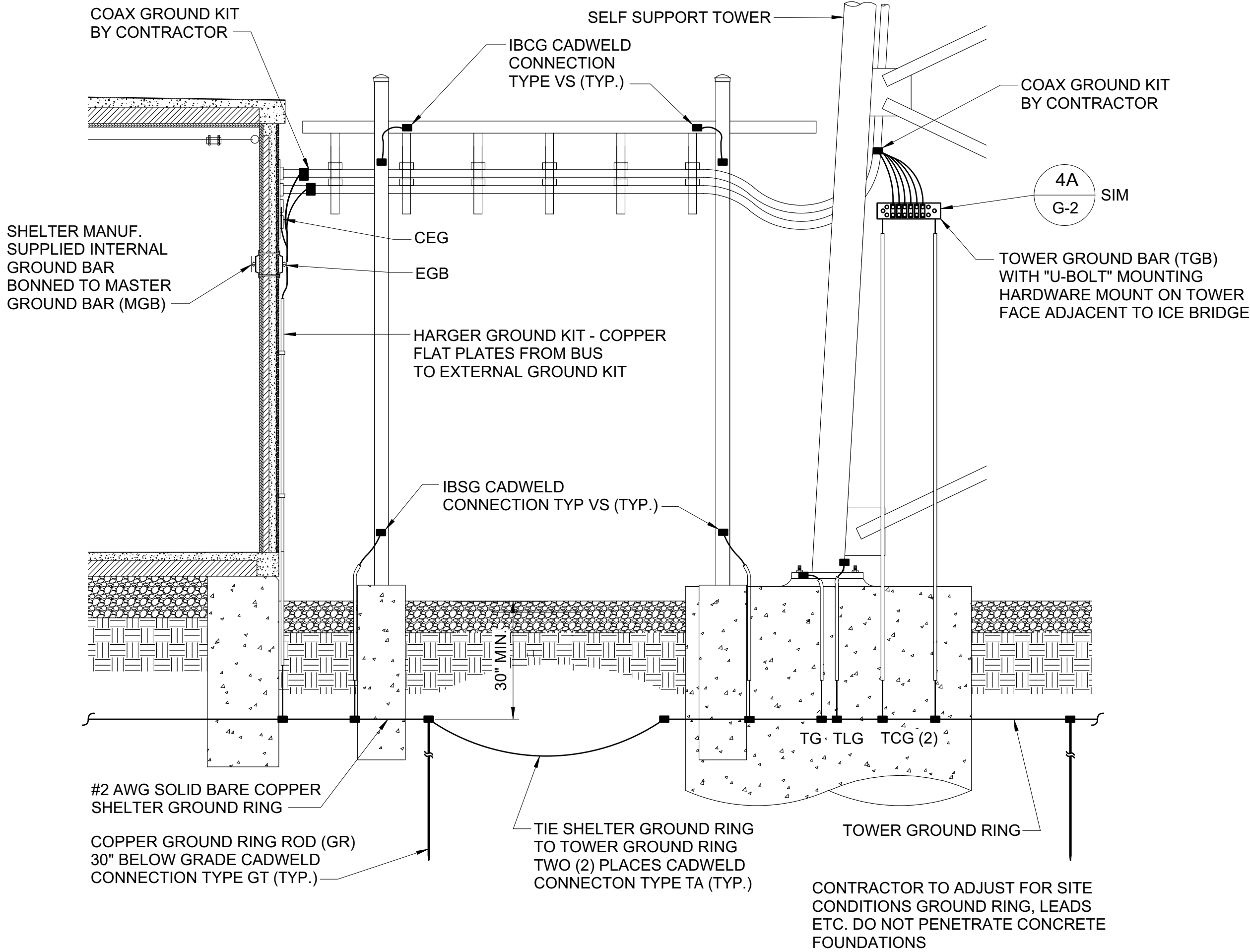


GROUNDING INSPECTION TEST WELL 2
SCALE: NONE

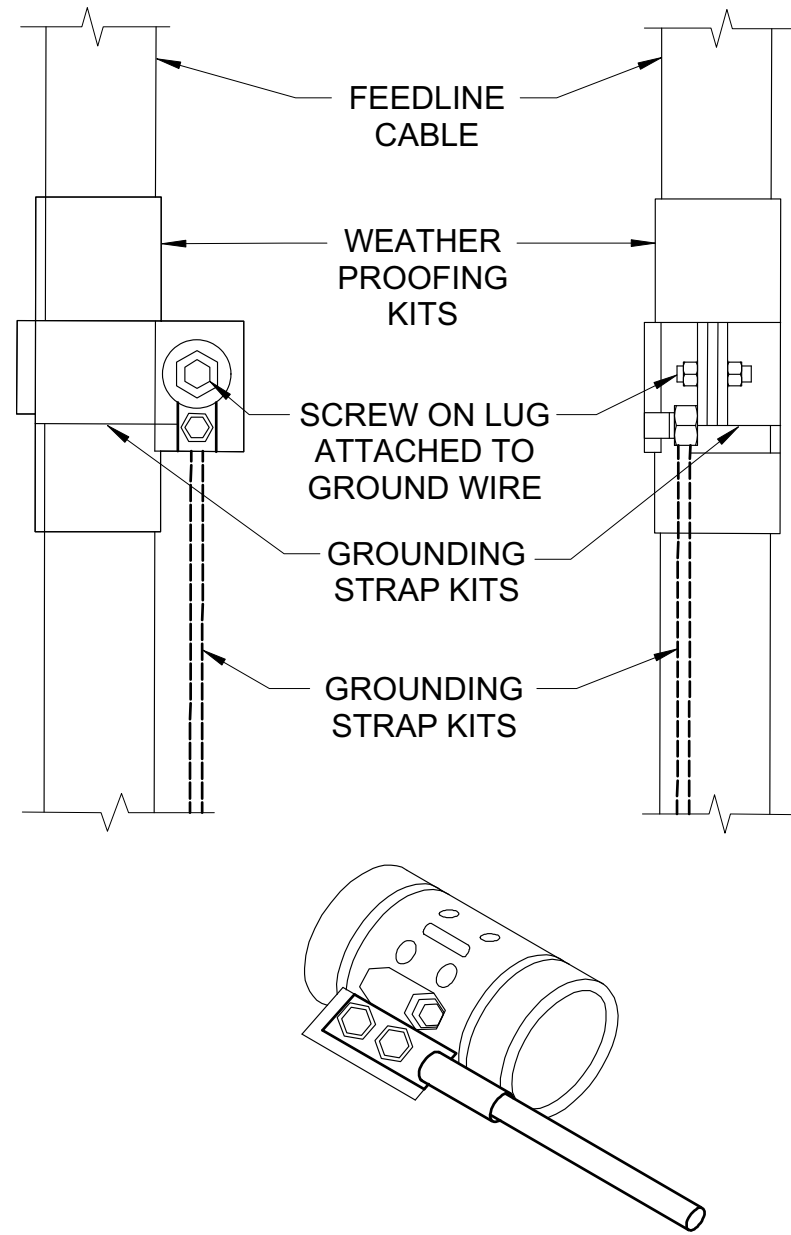


GROUNDING - STANDARD DETAIL
ICEBRIDGE & POSTS

DETAIL 3
SCALE: NONE



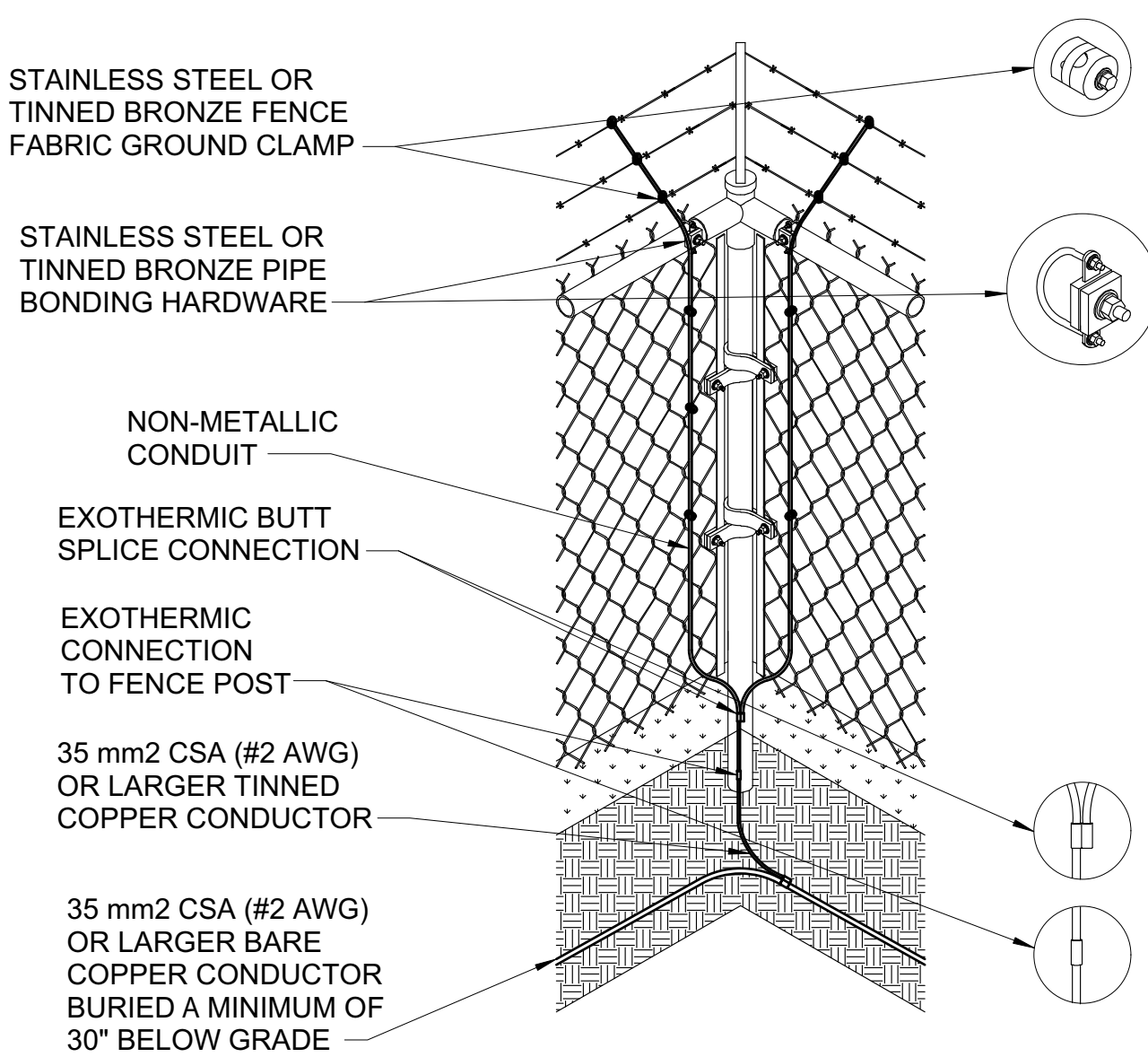
ICE BRIDGE AND TOWER GROUNDING ELEVATION 4
SCALE: NONE



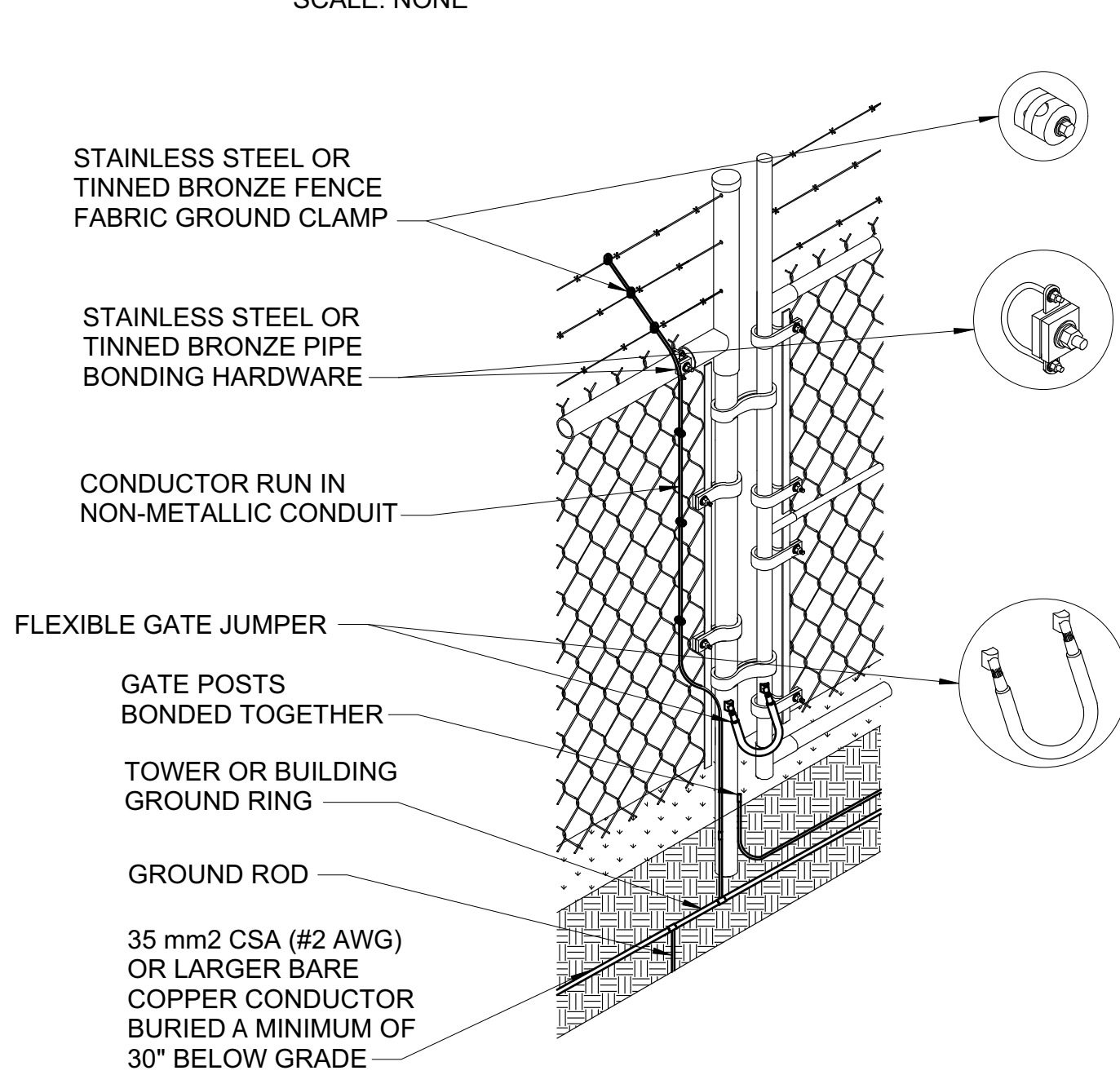
COAX CABLE GROUND KIT DETAIL 5
SCALE: NONE

NOTES:

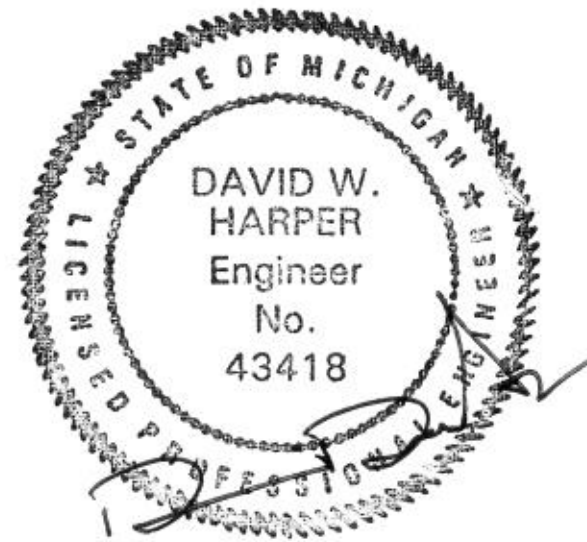
- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR
- THIS DETAIL IS TYPICAL FOR EACH COAX CABLE WHERE IT IS SPECIFIED TO BE GROUNDED
- CABLE TO BE GROUNDED AT ANTENNA LEVEL AND PRIOR TO ENTERING SHELTER ENTRY PANEL
- CABLE ALSO TO BE GROUNDED TO GROUND BAR AT TOWER BASE



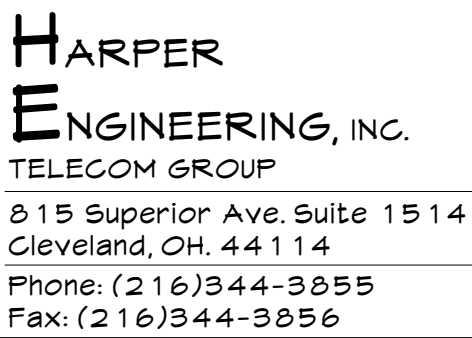
FENCE FABRIC AND DETERRENT WIRING BONDING 6
SCALE: NONE



GATE BONDING 7
SCALE: NONE



Rev.	Date:	Description:	Mgr.
1	06/25/21	FOR CONSTRUCTION	GJB
0	05/25/21	FOR ZONING	GJB
A	03/18/21	FOR APPROVAL	GJB



SCALE: AS NOTED
DRAWN BY: GJB
CHECKED BY: GJB
DATE: 03/02/21
FILE: 20-216-005

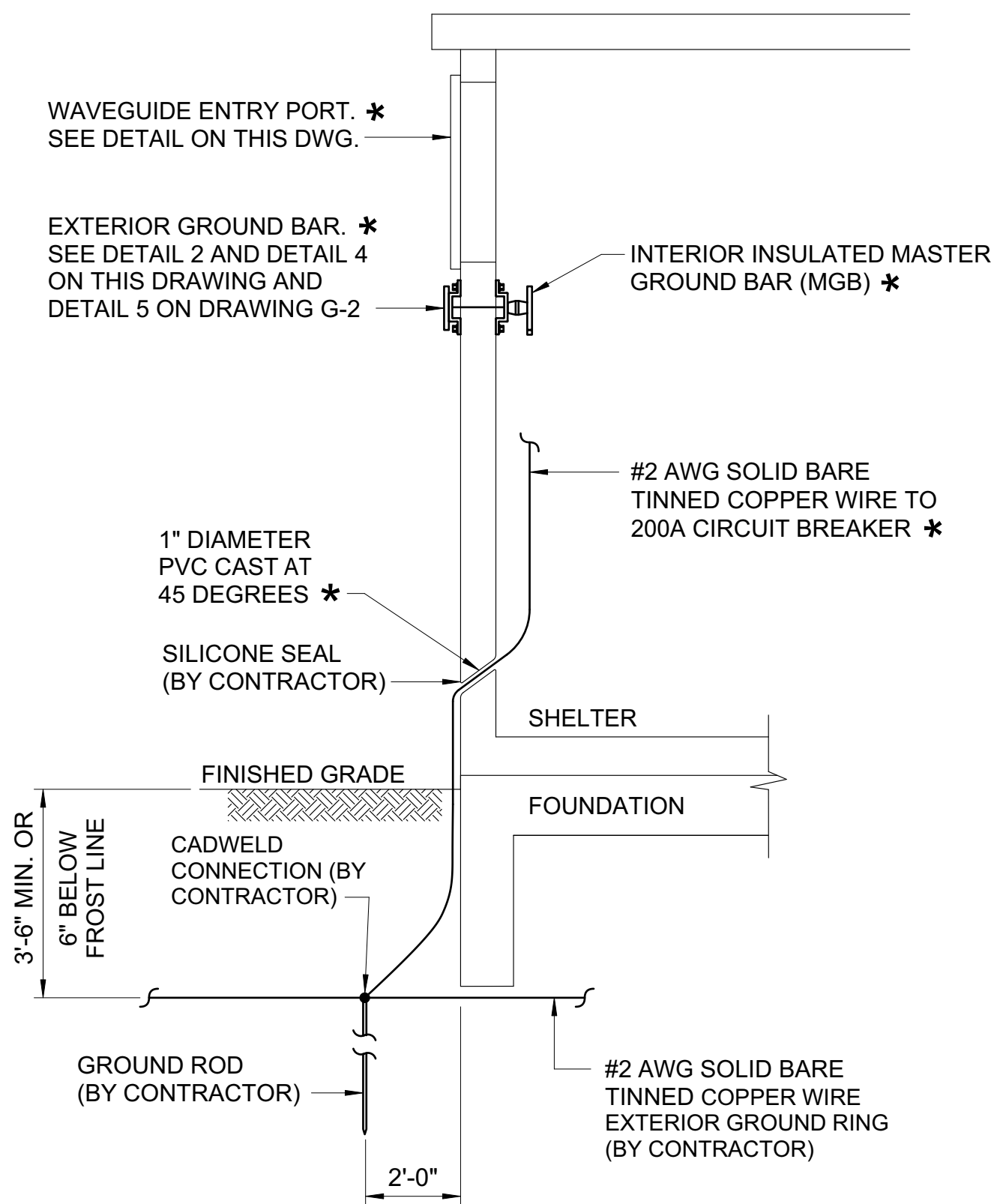
GROUNDING DETAILS

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KALAMAZOO, MI 49009

Drawing / Rev.

G-3/1

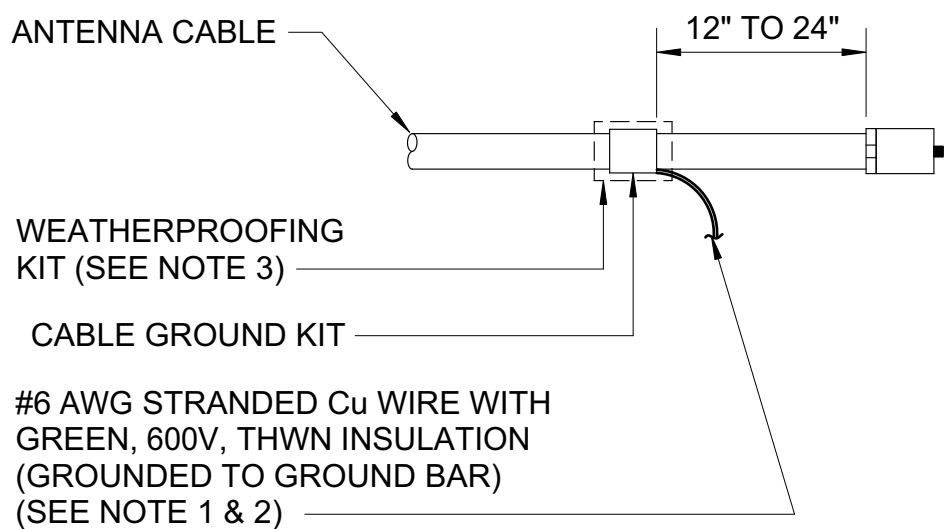
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* SUPPLIED BY SHELTER MFR.

MASTER GROUND BAR DETAIL

DETAIL 1
SCALE: NONE

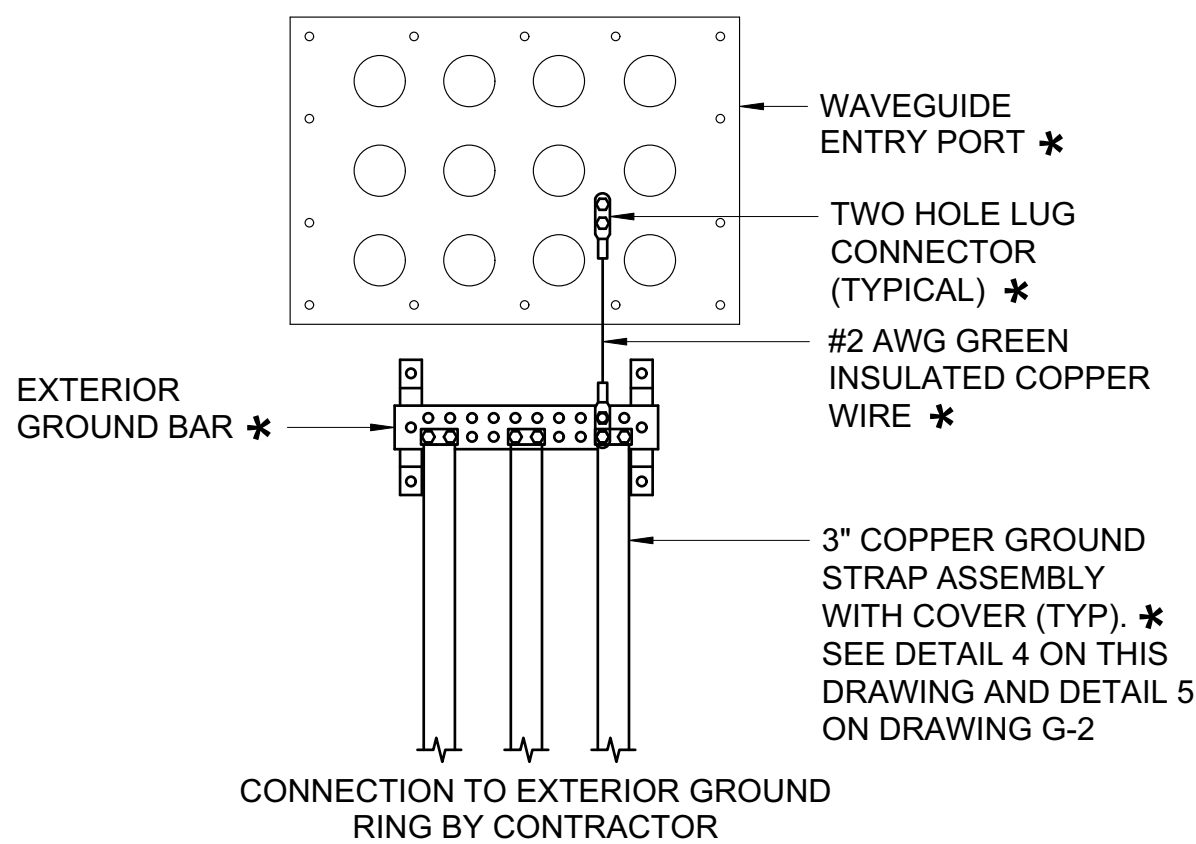


NOTES:

- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
- GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
- WEATHERPROOFING SHALL BE (TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.)

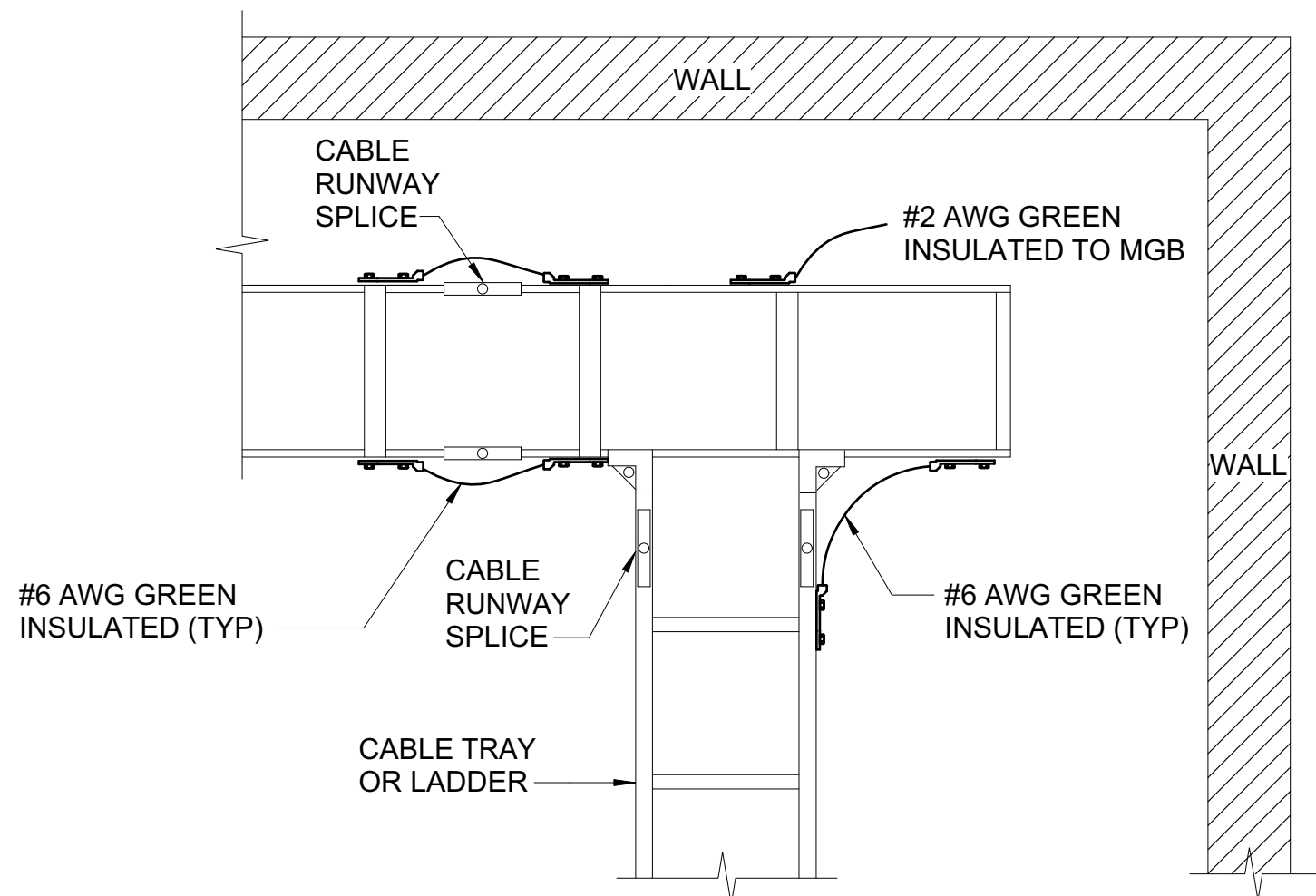
CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

DETAIL 5
SCALE: NONE



WAVEGUIDE ENTRY PORT GROUND DETAIL

DETAIL 2
SCALE: NONE

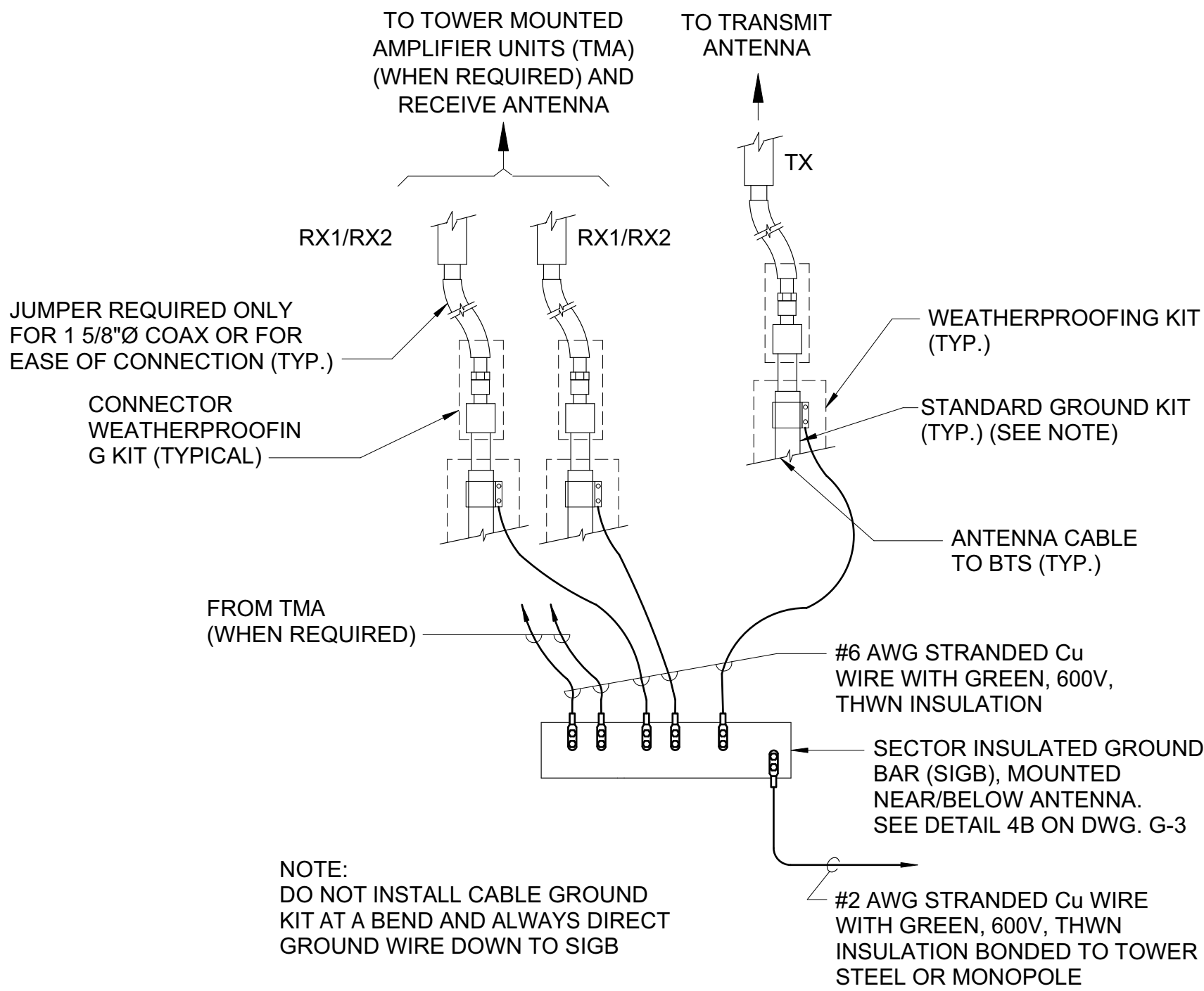


OVERHEAD VIEW - BONDING DETAIL

NOTE:

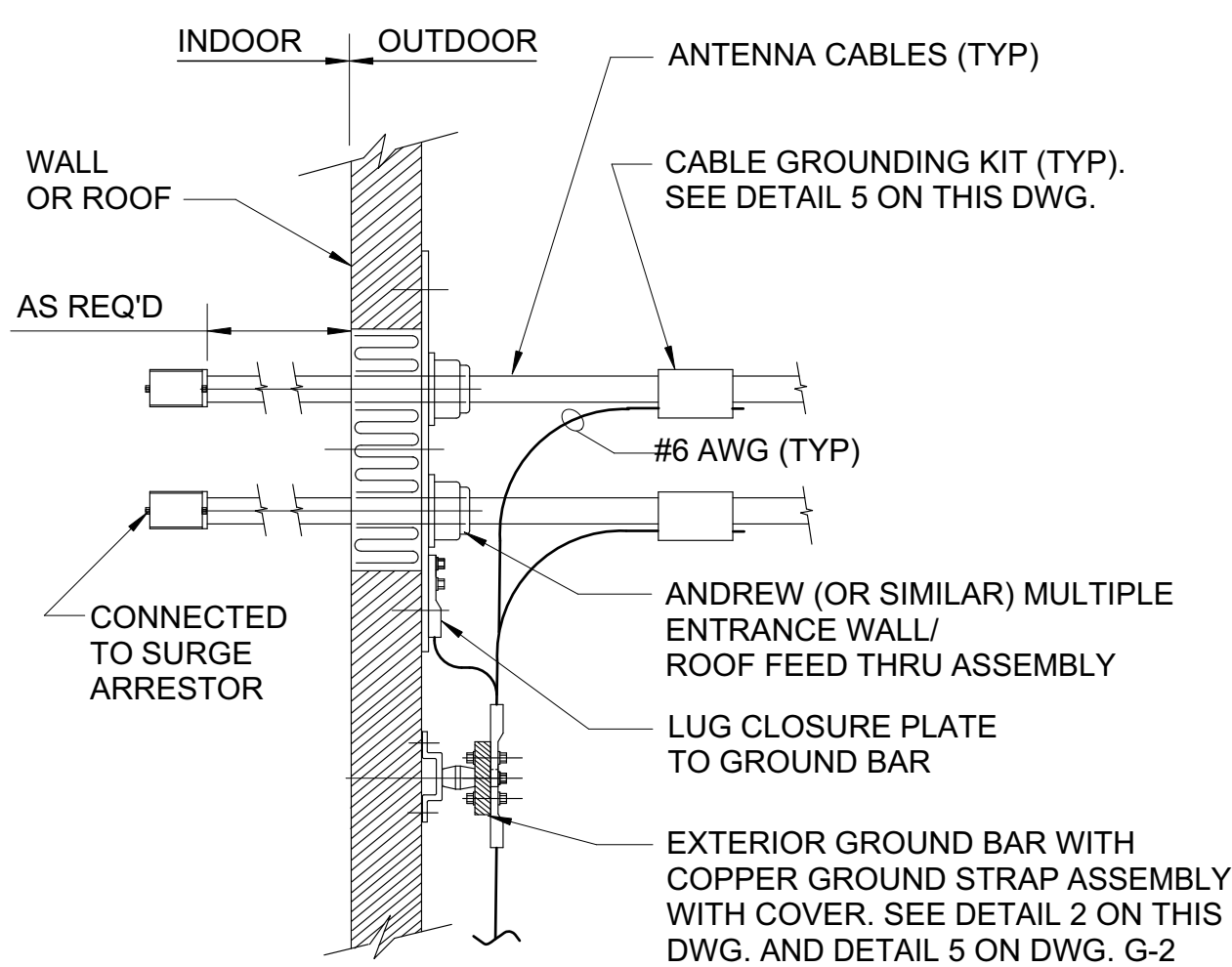
STRAPS (ON STRAIGHT RUNS) SHOULD BE AS SHORT AND STRAIGHT AS POSSIBLE.

CABLE RUNWAY BONDING DETAIL 6
SCALE: NONE



CONNECTION OF GROUND WIRE TO GROUNDING BAR (SIGB)

DETAIL 3
SCALE: NONE



DETAIL 4
SCALE: NONE

NOTE:

ALL GROUND WIRES THAT TRANSITION FROM ABOVE GRADE TO BELOW GRADE SHALL BE ROUTED IN A 3/4" PVC CONDUIT (NOT SHOWN FOR CLARITY) FROM THE CONNECTION TO A MINIMUM OF 18" BELOW GRADE. BOTH ENDS OF THE PVC CONDUIT SHALL BE SEALED WITH SILICONE CAULK.

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MOTOROLA SOLUTIONS



6615 TOWPATH ROAD, SUITE 200
EAST SYRACUSE, NY 13057
PHONE: (315) 701-1300



5130 WEST 6TH STREET
CLEVELAND, OH. 44141

HARPER ENGINEERING, INC.
TELECOM GROUP
815 Superior Ave. Suite 1514
Cleveland, OH. 44114
Phone: (216) 344-3855
Fax: (216) 344-3856

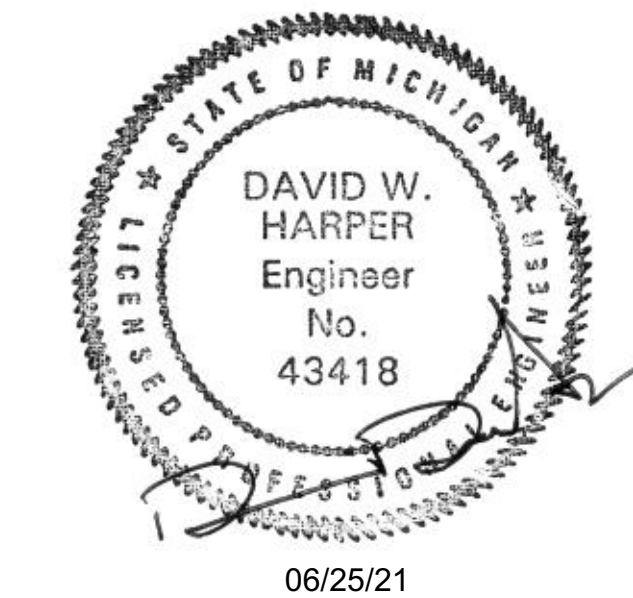
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GENERAL NOTES:

1. GENERAL

1.1. SUMMARY OF WORK

A. THE WORK MAY CONSIST OF BUT NOT BE LIMITED TO, THE INSTALLATION OF EQUIPMENT CABINETS, ANTENNAS ,AND LINES. FUEL TANKS, GROUNDING, ELECTRICAL WORK, ETC., ASSOCIATED WITH THE MOTOROLA EQUIPMENT AS INDICATED ON DRAWINGS AND AS SPECIFIED HEREIN. CONTRACTOR SHALL SUPPLY ALL PERMANENT MATERIALS/EQUIPMENT REQUIRED AND ALL LABOR, EQUIPMENT, TOOLS, UTILITIES, MINOR HARDWARE/MATERIALS, TRANSPORTATION AND FACILITIES NECESSARY FOR PROPER EXECUTION AND COMPLETION OF SERVICES AND INSTALL WORK, WHETHER TEMPORARY OR PERMANENT. CONTRACTOR SHALL BE OBLIGATED TO PERFORM ALL THE WORK OUTLINED IN THESE DRAWINGS IN ACCORDANCE WITH THE CONTRACT AGREEMENT, FEDERAL REGULATIONS, STATE REQUIREMENTS, LOCAL CODES, COMMERCIAL/INDUSTRY STANDARDS, DETAILED SCOPE OF WORK AND THE DOCUMENTS IDENTIFIED BELOW. IN CASE OF A CONFLICT BETWEEN THE ABOVE LISTED DOCUMENTS REGARDING STANDARDS OF WORK, THE MORE STRINGENT CRITERIA SHALL APPLY. ANY ADDITIONAL COSTS OR DELAYS RESULTING FROM CORRECTION OF THE WORK TO COMPLY WITH THE ABOVE REQUIREMENT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

1.2. SITE VISIT

CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE ITSELF WITH THE SCOPE OF WORK REQUIRED PER THE DRAWINGS AND ALL LOCAL CONDITIONS AND LAWS AND REGULATIONS THAT MAY IN ANY MANNER AFFECT THE PRICE, PROGRESS AND PERFORMANCE OF WORK, INCLUDING ANY COSTS ASSOCIATED WITH IT. THE CONTRACTOR SHALL ALSO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND NOTIFY THE MOTOROLA REPRESENTATIVE OF ANY DISCREPANCIES OR INTERFERENCES WHICH AFFECT THE WORK OF THIS CONTRACT.

1.3. STANDARDS AND CODES

THE FOLLOWING DOCUMENTS (ATEST REVISION) SHALL BE CONSIDERED TO BE SPECIFICATION AND ARE INCORPORATED HEREIN BY REFERENCE. IN THE EVENT OF CONFLICT BETWEEN THE REQUIREMENTS OF THIS SPECIFICATION AND THE REQUIREMENTS OF THE REFERENCED DOCUMENTS, THE STRICTER SPECIFICATION SHALL GOVERN. WHERE PROVISIONS OF THE CODES AND STANDARDS ARE IN CONFLICT WITH THE BUILDING CODE IN FORCE FOR THIS PROJECT, THE BUILDING CODE SHALL GOVERN.

A. AMERICAN CONCRETE INSTITUTE:

ACI 301 – "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS".
ACI 305 "HOT WEATHER CONCRETING".
ACI 306 "COLD WEATHER CONCRETING".
ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE."
ACI 614 "RECOMMENDED PRACTICE FOR MEASURING, MIXING AND PLACING CONCRETE".
ACI 311 "RECOMMENDED PRACTICE FOR CONCRETE INSPECTION".
ACI 315 "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
ACI 613 "RECOMMENDED PRACTICE FOR SELECTING PROPORTIONS FOR CONCRETE".

B. AMERICAN NATIONAL STANDARDS INSTITUTE:

ANSI Z359 REQUIREMENTS FOR PERSONAL FALL ARREST SYSTEMS, SUBSYSTEMS AND COMPONENTS
ANSI Z87.1 OCCUPATIONAL AND EDUCATIONAL EYE AND FACE PROTECTION
ANSI Z89.1 PROTECTIVE HEADWEAR FOR INDUSTRIAL WORKERS – REQUIREMENTS
ANSI/IEEE C95.1 SAFETY LEVELS WITH RESPECT TO HUMAN EXPOSURE TO RADIO FREQUENCY ENERGY
ANSI/TIA/EIA STANDARD 222: STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

C. AMERICAN INSTITUTE OF STEEL CONSTRUCTION⁷

AISC MANUAL OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION: LATEST EDITION

D. AMERICAN SOCIETY FOR TESTING AND MATERIALS:

ASTM A615 – "SPECIFICATION FOR DEFORMED AND PLAIN BILLET STEEL BARS FOR CONCRETE REINFORCEMENT".
ASTM C94-80 – "SPECIFICATION FOR READY-MIX CONCRETE".
ASTM C39-77 – "SPECIFICATION FOR TEST FOR COMPREHENSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMEN".
ASTM 33 – "SPECIFICATION FOR CONCRETE AGGREGATES".
ASTM C150 – "SPECIFICATION FOR PORTLAND CEMENT".
ASTM C172 – "SAMPLING FRESH CONCRETE".
ASTM C143 – "SLUMP OF PORTLAND CEMENT CONCRETE".
ASTM D698-91 – "TEST METHOD FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT".
ASTM D1556-84 – "DENSITY OF SOIL IN PLACE BY THE SAND-CONE METHOD".
ASTM D1557 – "TEST FOR MOISTURE-UNIT WEIGHT RELATIONS OF SOILS AND SOIL-AGGREGATE MIXTURES USING 10-LB. HAMMER AND 18-IN. DROP". (PROCEDURE C)
ASTM D2487 – "STANDARD CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOIL CLASSIFICATION SYSTEM)".
ASTM D2922 – "DENSITY OF SOIL AND SOIL AGGREGATE IN PLACE BY NUCLEAR METHODS SHALLOW DEPTH".
ASTM D2940 – "STANDARD SPECIFICATION FOR GRADED AGGREGATE MATERIAL FOR BASES OR SUB-BASES FOR HIGHWAYS OR AIRPORTS".

E. AMERICAN WELDING SOCIETY:

AWS D12.1 – "RECOMMENDED PRACTICES FOR WELDING REINFORCING STEEL, METAL INSERTS AND CONNECTIONS IN REINFORCED CONCRETE CONSTRUCTION".

F. CONCRETE REINFORCING STEEL INSTITUTE:

"MANUAL OF STANDARD PRACTICE"

G. FEDERAL AVIATION ADMINISTRATION:

DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR, AC 70/7460-1L: OBSTRUCTION MARKING AND LIGHTING.

DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR, 150-5345-43, FAA/DOD SPECIFICATION L-856: HIGH INTENSITY OBSTRUCTION LIGHTING SYSTEMS.

H. FEDERAL COMMUNICATIONS COMMISSION.

FEDERAL COMMUNICATIONS COMMISSION – RULES AND REGULATIONS PART 17, CONSTRUCTION, MARKING, AND LIGHTING OF ANTENNA STRUCTURES.

I. STRUCTURAL STEEL PAINTING COUNCIL:

SSPC-SP-1-63: SPECIFICATION FOR PAINTING STEEL STRUCTURES.

J. MOTOROLA R56 STANDARDS AND GUIDELINES FOR COMMUNICATIONS SITES (LATEST REVISION).

K. MOTOROLA'S CIVIL WORKS BID SPECIFICATIONS

L. NATIONAL FIRE PROTECTION ASSOCIATION:

NFPA 1 – FIRE PREVENTION CODE
NFPA 54 – NATURAL GAS FUEL CODE
NFPA 58 – LP GAS CODE
NFPA 70 – NATIONAL ELECTRICAL CODE
NFPA 101 – LIFE SAFETY CODE
NFPA 110 – EMERGENCY/STANDBY POWER SYSTEMS
NFPA 111 – STANDARD ON STORED ELECTRICAL ENERGY, EMERGENCY AND STANDBY POWER SYSTEMS
NFPA 780 – STANDARD FOR THE INSTALLATION OF LIGHTNING PROTECTION SYSTEMS

M. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

OSHA 1926
OSHA DIRECTIVES CPL 2-1.29 - INTERIM INSPECTION PROCEDURES DURING COMMUNICATION TOWER CONSTRUCTION
ACTIVITIES.

N. MICHIGAN BUILDING CODE LATEST REVISION.

1.4. NOTICE TO PROCEED

WHEN THE SITE IS READY FOR INSTALLATION, MOTOROLA SHALL ISSUE A NOTICE TO PROCEED TO THE CONTRACTOR. UPON RECEIPT OF THE NOTICE OF PROCEED, THE CONTRACTOR SHALL SUBMIT TO MOTOROLA A SCHEDULE REFLECTING THE WORK PLAN. THE CONTRACTOR SHALL ADVISE THE MOTOROLA REPRESENTATIVE IMMEDIATELY OF ANY SCHEDULE CHANGES. THE CONTRACTOR SHALL ADJUST HIS WORK, AS REQUIRED, TO COORDINATE WITH THE MOTOROLA INSTALLATION TEAM IF THE SCHEDULES OVERLAP.

1.5. MOTOROLA REPRESENTATIVE

MOTOROLA SHALL DESIGNATE REPRESENTATIVE. THIS PERSON IS THE ONLY CONTACT POINT AUTHORIZED TO MAKE ANY CHANGES TO THE CONTRACT PROVISIONS OR THE PLANS AND SPECIFICATIONS. ANY CHANGES MADE BY THE CONTRACTOR ARE AT THE CONTRACTOR'S RESPONSIBILITY AND RISK.

1.6. CONTRACTORS FIELD REPRESENTATIVE

CONTRACTOR SHALL ASSIGN A FIELD REPRESENTATIVE WHO IS FAMILIAR WITH THESE SPECIFICATIONS AND WILL REPRESENT THE CONTRACTOR AND HAVE THE AUTHORITY TO ACT FOR THE CONTRACTOR AND SUPERVISE ALL CONSTRUCTION ACTIVITIES. THE REPRESENTATIVE SHALL BE AVAILABLE WHEN CONSTRUCTION ACTIVITIES BEGIN. THE FIELD REPRESENTATIVE SHALL BE THE PRIMARY POINT OF CONTACT FOR MOTOROLA DURING THE CONSTRUCTION PHASE OF THE WORK.

1.7. PROJECT MEETINGS

THE CONTRACTOR SHALL CONDUCT THE INITIAL (PRE-CONSTRUCTION) MEETING (INCLUDING ALL SUB-CONTRACTORS) WITH THE MOTOROLA REPRESENTATIVE WITHIN TWO WEEKS AFTER AWARD OF THE CONTRACT. SUBSEQUENTLY, THE CONTRACTOR SHALL PROVIDE PROGRESS SCHEDULE UPDATES TO MOTOROLA ON A WEEKLY BASIS.

1.8. MATERIALS

CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AS REQUIRED FOR COMPLETE SYSTEMS INCLUDING: ALL PARTS OBVIOUSLY OR REASONABLY INCIDENTAL TO A COMPLETE INSTALLATION, WHETHER SPECIFICALLY INDICATED OR NOT. ALL SYSTEMS SHALL BE COMPLETELY ASSEMBLED, TESTED, ADJUSTED, AND DEMONSTRATED TO BE READY FOR OPERATION PRIOR TO MOTOROLA'S ACCEPTANCE.

MATERIALS AND WORKMANSHIP SHALL BE THE BEST OF THEIR RESPECTIVE KINDS (AS DEFINED BY INDUSTRY STANDARDS), FREE OF DEFECTS AND ALL MATERIALS SHALL BE NEW AND UNUSED IN ALL CASES, UNLESS OTHERWISE SPECIFIED. WHERE THE NAME OF A CONCERN OR MANUFACTURER IS MENTIONED ON DRAWINGS OR IN SPECIFICATIONS IN REFERENCE TO A REQUIRED SERVICE OR PRODUCT, AND NO QUALIFICATIONS OR SPECIFICATION OF SUCH IS INCLUDED, THEN THE MATERIAL SPECIFICATIONS, DETAILS OF MANUFACTURE, FINISH, ETC., SHALL BE IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICE, DIRECTION OR SPECIFICATIONS. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

1.9. VERIFICATION OF EXISTING CONDITIONS

BEFORE STARTING ANY OPERATION, THE CONTRACTOR SHALL EXAMINE EXISTING WORK, OR WORK PERFORMED BY OTHERS, TO WHICH ITS WORK IS TO ADJOIN OR BE APPLIED AND SHALL REPORT TO MOTOROLA PROJECT MANAGER ANY CONDITIONS THAT WILL PREVENT SATISFACTORY ACCOMPLISHMENT OF HIS WORK. PRIOR TO COMMENCING ANY EXCAVATION OR GRADING, THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF ALL SURVEY DATA AS INDICATED IN THE PLANS AND SPECIFICATIONS AND/OR AS PROVIDED BY MOTOROLA. SHOULD THE CONTRACTOR DISCOVER ANY INACCURACIES, ERRORS, OR OMISSIONS IN THE SURVEY DATA, HE SHALL IMMEDIATELY NOTIFY THE MOTOROLA REPRESENTATIVE IN ORDER THAT PROPER ADJUSTMENTS CAN BE ANTICIPATED AND ORDERED. FAILURE TO NOTIFY THE MOTOROLA REPRESENTATIVE OF DEFICIENCIES, ERRORS OR FAULTS PRIOR TO COMMENCEMENT OF WORK SHALL CONSTITUTE ACCEPTANCE THEREOF AND WAIVER OF ANY CLAIMS OF UNSUITABILITY, ERRORS, OMISSIONS OR INACCURACIES.

THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PRESERVING ALL ESTABLISHED SURVEY CONTROL POINTS. IF THE CONTRACTOR OR ANY OF HIS SUB-CONTRACTORS MOVE OR DESTROY ANY SURVEY CONTROL POINTS, THE COST INCURRED BY THE LAND OWNER OR MOTOROLA TO RE-ESTABLISH THEM WILL BE BORNE BY THE CONTRACTOR.

[illegible]

1.10. PERMITS

THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. THE CONTRACTOR SHALL MEET ALL OF THE REGULATORY REQUIREMENTS OF THE JURISDICTION GOVERNING CONSTRUCTION.

1.11. SITE INSPECTION

THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY FOR ARRANGING WITH MOTOROLA FOR AN INSPECTION PRIOR TO COVERING UP ALL WORK THAT WILL BE COVERED IN FINISHED CONDITION. IT IS THE SITE GENERAL CONTRACTOR'S RESPONSIBILITY TO MANAGE THE SEQUENCE OF WORK AND REQUEST THE INSPECTIONS IN A TIMELY MANNER. THE SITE GENERAL CONTRACTOR SHALL NOT REQUEST AN INSPECTION UNLESS ALL OF THE RELATED WORK HAS BEEN COMPLETED. WORK SHALL NOT PROCEED TO THE NEXT STEP UNTIL THE PREVIOUS STEP HAS BEEN INSPECTED AND APPROVED BY THE LOCAL INSPECTORS AND THE MOTOROLA REPRESENTATIVE. THE PRESENCE OF THE OWNER OR MOTOROLA REPRESENTATIVE ON THE JOB SITE IN NO WAY RELIEVES THE SITE GENERAL CONTRACTOR OF THE ASSOCIATED RESPONSIBILITIES OF THE JOB. ANY WORK WHICH DOES NOT MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS WILL BE CORRECTED OR REMOVED SOLELY AT THE SITE GENERAL CONTRACTOR'S EXPENSE.

THE FOLLOWING INFORMATION IS INCLUDED AS A GUIDE TO THE CONTRACTOR TO ASSIST IN DETERMINING THE TYPE AND FREQUENCY OF INSPECTIONS. THE LISTED INSPECTIONS REPRESENT THOSE REQUIRED FOR SMALL OR SIMPLE PROJECTS. LARGE OR COMPLEX PROJECTS MAY REQUIRE ADDITIONAL INSPECTIONS DEPENDING ON THE SEQUENCE OF WORK.

FOUNDATION EXCAVATIONS AND REBAR: TO BE MADE AFTER TRENCHES ARE EXCAVATED AND FORMS ERECTED, REINFORCEMENT PLACED, COMPACTION TESTED, SOIL TREATED, VAPOR BARRIER PLACED, AND ESSENTIALLY READY FOR CONCRETE PLACEMENT.

GROUNDING: TO BE MADE AFTER THE BELOW GROUND CADWELD CONNECTIONS HAVE BEEN COMPLETED, PRIOR TO COVERING UP THE TRENCHES.

ELECTRICAL WORK WITHIN WALLS: TO BE MADE AFTER THE ROOF, FRAMING, FIRE BLOCKING AND BRACING IS IN PLACE PRIOR TO THE INSTALLATION OF INSULATION OR WALL/CEILING MEMBRANES.

AS A GENERAL RULE, THE CONTRACTOR SHALL PROVIDE ADVANCE NOTICE TO MOTOROLA FOR INSPECTION OF ALL WORK PRIOR TO CONCEALMENT. THE CONTRACTOR HAS RESPONSIBILITIES RELATIVE TO ALL TYPES OF INSPECTIONS AND IS RESPONSIBLE FOR CONTACTING ALL OF THE INSPECTING ENTITIES TO DETERMINE HIS RESPONSIBILITIES. ALL OF THESE INSPECTING ENTITIES HAVE UNIQUE AND SEPARATE RESPONSIBILITIES. ONE INSPECTION FROM AN ENTITY WILL NOT SUBSTITUTE FOR AN INSPECTION FROM ANOTHER ENTITY.

1.12. SAFETY

THE CONTRACTOR, HIS EMPLOYEES, ANY SUB-CONTRACTORS, VENDORS, THEIR RESPECTIVE EMPLOYEES AND CONTRACTOR'S VISITORS SHALL COMPLY WITH ALL SAFETY STANDARDS, ACCIDENT PREVENTION REGULATIONS AND ENVIRONMENTAL REGULATIONS PROMULGATED BY FEDERAL, STATE OR LOCAL AUTHORITIES HAVING JURISDICTION AND SHALL AT ALL TIMES CONDUCT ALL OPERATIONS UNDER THE CONTRACT IN A MANNER TO AVOID THE RISK OF BODILY HARM TO ANY PERSONS AND THE RISK OF DAMAGE TO ANY PROPERTY, EQUIPMENT OR MATERIAL SUCH PARTIES SHALL ALSO COMPLY WITH ANY SAFETY PROGRAMS AND/OR RULES PROMULGATED BY OWNER AND/OR MOTOROLA.

1.13. ELECTRO MAGNETIC EMISSIONS

THE CONTRACTOR SHALL ACKNOWLEDGE ALL OR PORTIONS OF THE WORK MAY INVOLVE POSSIBLE EXPOSURE OF CONTRACTOR, SUB-CONTRACTORS, AND THEIR RESPECTIVE EMPLOYEES, AGENTS, INVITEES, LICENSEES AND OTHER VISITORS TO THE JOBSITE AND/OR MOTOROLA PREMISES TO ELECTRO-MAGNETIC ENERGY ("EME") WHILE PERFORMING WORK UNDER THIS CONTRACT, ESPECIALLY IF WORK IS PERFORMED ON EXISTING ANTENNA TOWERS WHERE ANTENNAS ARE LOCATED. THE CONTRACTOR REPRESENTS THAT CONTRACTOR, SUBCONTRACTORS, AND ALL OF THEIR RESPECTIVE EMPLOYEES, AGENTS, INVITEES, LICENSEES, AND OTHER AUTHORIZED REPRESENTATIVES WHO ARE PERFORMING SERVICES UNDER THIS AGREEMENT WILL COMPLY WITH ALL ANSI AND ANY OTHER APPLICABLE EME STANDARDS, RULES OR REGULATIONS, INCLUDING, BUT NOT LIMITED TO THOSE RULES OR REGULATIONS IMPOSED OR SUGGESTED BY MOTOROLA, IF ANY.

THE CONTRACTOR SHALL ADHERE TO ALL OSHA RULES, REGULATIONS AND ADOPTED POLICIES. ALL CONTRACTOR PERSONNEL SHALL HAVE UNDERGONE ELECTROMAGNETIC ENERGY (EME) TRAINING FOR PERSONNEL WORKING IN THE VICINITY OF ACTIVE ANTENNAS. AS SUCH IT IS RECOMMENDED THAT RF MONITORS BE USED BY THE TOWER PERSONNEL TO MONITOR EXPOSURE LEVELS. IF EME LEVELS AT THE SITE EXCEED THE MAXIMUM PERMISSIBLE EXPOSURE LIMITS, THE CONTRACTOR SHALL COORDINATE WITH THE INDIVIDUALS RESPONSIBLE FOR USE OF THE TRANSMITTER TO MAKE SURE THAT THE EQUIPMENT IS DEACTIVATED BEFORE WORK CAN BE RESUMED, WITHOUT CAUSING A SERIOUS DISRUPTION OF THE SERVICE.

1.14. SITE CLEANUP

THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE AT ALL TIMES DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, VEGETATION, AND RUBBISH, AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. WHENEVER THE WORK-SITE IS LEFT UNATTENDED, THE CONTRACTOR SHALL BLOCK THE OPENING WITH WARNING TAPE TO DISCOURAGE TRESPASSING. THE PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE AT THE CONCLUSION OF SITE WORK.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LANDSCAPE GRADING AND SEEDING OF THE DISTURBED SOIL. THE CONTRACTOR SHALL USE LOCAL GRASS SEED TO STABILIZE SOIL AND SHALL COVER DISTURBED AREAS WITH HAY MULCH TO REDUCE RUNOFF OF SEDIMENT TO DOWNSTREAM AREAS. THE CONTRACTOR SHALL RESTORE THE SITE TO ITS ORIGINAL CONDITION. ALL SLOPES AND DISTURBED AREAS NOT RECEIVING AGGREGATE SURFACING ARE TO BE PREPARED AND BROADCAST SEEDING AND FERTILIZED FOR EROSION PROTECTION. SEEDING FOR AREAS DISTURBED SHALL BE ESTABLISHED SEASONALLY AS REQUIRED BY LOCAL CODES.

THE CONTRACTOR SHALL EXERCISE ALL CARE TO AVOID DAMAGE OR INTERRUPTION OF EXISTING UNDERGROUND OR OVERHEAD ELECTRIC SERVICES, UNDERGROUND GROUNDING AND FUEL LINES, EQUIPMENT AND BUILDINGS ON THE SITE, PLUS OFF SITE SERVICES, BURIED OR OVERHEAD, SURROUNDING THE EXISTING OR EXPANDED COMPOUND. ANY PROPERTY DAMAGE CAUSED BY THE CONTRACTOR OR HIS OPERATIONS SHALL BE CORRECTED AND/OR RESTORED TO THE SATISFACTION OF THE PROPERTY OWNER(S) AND MOTOROLA AT NO ADDITIONAL COST TO THE PROPERTY OWNER OR MOTOROLA. BURNING WILL NOT BE PERMITTED.

1.15. FACILITY STARTUP & COMMISSIONING

THE CONTRACTOR AND/OR SUB CONTRACTORS SHALL DEMONSTRATE TO MOTOROLA THAT ALL SYSTEMS AND SUB-SYSTEMS INSTALLED UNDER THIS CONTRACT, OPERATE PROPERLY PRIOR TO THE FINAL ACCEPTANCE INSPECTION AND PROVIDE THE OPERATIONS AND MAINTENANCE MANUALS AT THIS TIME.

1.16. SHOP DRAWINGS/AS-BUILT DRAWINGS

THE MODIFICATIONS TO THE DRAWINGS AFTER CONSTRUCTION START SHALL RECEIVE ENGINEERING AND MOTOROLA APPROVAL PRIOR TO ANY CHANGES BEING MADE. THE ENGINEER OF RECORD SHALL MAKE THE REQUIRED CHANGE AND WILL SUBMIT CHANGES TO MOTOROLA AND ANY JURISDICTION HAVING AUTHORITY.

THE CONTRACTOR SHALL KEEP UP-TO-DATE MARKED-UP PRINTS OF THE PROJECT DRAWINGS. UPON COMPLETION OF WORK AT THE SITE, THE CONTRACTOR SHALL REVIEW THE COMPLETED AS-BUILT DRAWINGS, AND ASCERTAIN THAT ALL DATA FURNISHED ON THE DRAWINGS IS ACCURATE AND TRULY REPRESENTS THE WORK IS ACTUALLY INSTALLED. MARKINGS INDICATING CHANGES TO THE DRAWINGS SHALL BE RED OR GREEN AND CLEARLY VISIBLE. TWO (2) SETS OF "AS-BUILT" DRAWINGS SHALL BE FURNISHED TO THE MOTOROLA REPRESENTATIVE WITHIN 5 DAYS OF THE COMPLETION OF THE PROJECT. THESE DRAWINGS SHALL ALSO SHOW THE FOLLOWING:

MODIFICATIONS TO SITE LAYOUT.
GROUNDING SYSTEM LAYOUT.
UNDERGROUND FUEL LINE RUN.
UNDERGROUND TELCO CABLE RUN.
UNDERGROUND ELECTRICAL RUN.

WHERE THE CONTRACTOR IS RESPONSIBLE FOR SUPPLYING THE SITE EQUIPMENT ROOM, ISOLATION TRANSFORMER, GENERATOR, ETC.) THAT REQUIRES PERIODIC MAINTENANCE, THE CONTRACTOR SHALL INCLUDE ALL OPERATION AND MAINTENANCE MANUALS AND ALL AS-BUILT DRAWINGS WHICH FULLY DESCRIBE THE ACTUAL INSTALLED EQUIPMENT.

1.17. TEST PROCEDURES AND RESULTS

CONTRACTOR WILL CONTRACT WITH A THIRD PARTY "INDEPENDENT" TESTING FIRM TO PERFORM & SUBMIT THE RESULTS OF A TESTS REQUIRED BY THE PROJECT SPECIFICATIONS AND DRAWINGS THAT FALL WITHIN THE SCOPE OF WORK. THESE RESULTS SHALL BE SUBMITTED TO THE DESIGNATED MOTOROLA REPRESENTATIVE. IN GENERAL, THE "INDEPENDENT" TESTING FIRM SHALL SUBMIT THE FOLLOWING TEST RESULTS:

MIX DESIGN/CONCRETE COMPRESSION TEST FOR ALL CONCRETE WORK.
FREQUENCY DOMAIN REFLECTOMETER (FDR) WITH PRECISION LOAD / SWEEP TEST FOR ANTENNA AND TRANSMISSION LINE
INSTALLATION WORK. ALL SWEEP AND TEST MUST BE WITHIN THE GUIDELINES OUTLINED IN MOTOROLA MOP.
FUEL LINE LEAKAGE TEST FOR FUEL TANK AND PIPING INSTALLATION WORK.
SLUMP TEST FOR CONCRETE WORK.
GROUNDING RESISTANCE TEST FOR GROUNDING WORK.
STRUCTURAL STEEL FABRICATION DRAWINGS.
STRUCTURAL (TOWER) STEEL MATERIALS, FINISH, ASSEMBLY, AND PROPER ASSEMBLY AND INSTALLATION OF ANTENNAS AND
TRANSMISSION LINES. ("THIRD PARTY CLIMB" AND REPORT INCLUDING PHOTO DOCUMENTATION)
ANY OTHER TEST THAT MAY BE REQUIRED.

1.18. CONTRACT CLOSEOUT – IN ACCORDANCE WITH MOTOROLA'S SUBCONTRACT AGREEMENT TERMS AND CONDITIONS

THE MOTOROLA REPRESENTATIVE WILL PROVIDE A CERTIFICATE OF COMPLETION AND APPROVE FINAL PAYMENT WHEN ALL PUNCH-LIST ITEMS HAVE BEEN CORRECTED, RECORD DRAWINGS SUBMITTED, AND ALL SYSTEMS ARE ACCEPTABLE. THE CONTRACTOR MUST ALSO RECEIVE A CERTIFICATE OF COMPLETION FROM THE MUNICIPALITY. AFTER FINAL PAYMENT, CONTRACTOR WILL SIGN A RELEASE OF LIEN.

1.19. WARRANTY

ALL WORK PERFORMED BY THE CONTRACTOR IN COMPLETING THE SCOPE IDENTIFIED ON THE DRAWINGS SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL COMPLETION OF THE PROJECT. THIS GUARANTEE SHALL COVER ALL MATERIALS, EQUIPMENT OR WORKMANSHIP WHICH IN THE OPINION OF MOTOROLA IS RENDERED DEFECTIVE OR INFERIOR OR NOT IN ACCORDANCE WITH THE TERMS OF THE CONTRACT DURING THE GUARANTEE PERIOD. IF, WITHIN THE GUARANTEE PERIOD, REPAIRS OR CHANGES ARE REQUIRED TO CORRECT THE GUARANTEE WORK. THEN UPON RECEIPT OF NOTICE, THE CONTRACTOR SHALL PROMPTLY AND WITHOUT EXPENSE TO MOTOROLA OR THE OWNER, PROCEED TO

PLACE IN SATISFACTORY CONDITION ALL OF SUCH GUARANTEED WORK AND CORRECT ALL DEFECTS THEREIN.
MAKE GOOD ALL DAMAGES TO THE STRUCTURE OR SITE OR EQUIPMENT OR CONTENTS THEREOF, WHICH, IN THE OPINION OF
THE MOTOROLA REPRESENTATIVE, IS THE RESULT OF THE USE OF MATERIALS, EQUIPMENT, OR WORKMANSHIP WHICH ARE INFER-
DEFECTIVE, OR NOT IN ACCORDANCE WITH THE TERMS OF THE CONTRACT;
MAKE GOOD ANY WORK, MATERIALS OR EQUIPMENT AND ADJACENT STRUCTURES DISTURBED IN FULFILLING THE GUARANTEE.

1.20. RELATED DOCUMENTS

CONTRACTOR SHALL BECOME FAMILIAR WITH THE INFORMATION AND REQUIREMENTS CONTAINED
IN THE FOLLOWING DOCUMENTS RELATED TO THE PROJECT:

A. TOWER AND TOWER FOUNDATION DRAWINGS BY THE MANUFACTURER.








B. R-56 STANDARDS AND GUIDELINES FOR COMMUNICATIONS SITES BY MOTOROLA.

C. ALL OTHER PERTINENT DOCUMENTS.

ABBREVIATIONS:

ADJ/C	AIR CONDITIONING	N	NORTH
ADJ	ADJUSTABLE	N/A	NOT APPLICABLE
AFF	ABOVE FINISH FLOOR	NIC	NOT IN CONTRACT
APPROX	APPROXIMATELY	NTS	NOT TO SCALE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS		
AWG	AMERICAN WIRE GAUGE	O/C,O.C.	ON CENTER
		OD	OUTSIDE DIAMETER
BLDG	BUILDING	OPG	OPENING
BLK	BLOCK	OPP	OPPOSITE
BMR	BASE MOBILE RADIO	PLYWD	PLYWOOD
B/S	BUILDING STANDARD	PR	PAIR
		PROJ	PROJECT
CLG	CEILING	PROP	PROPERTY
CLR	CLEAR	PT	PRESSURE TREATED
CND,C	CONDUIT		
CONC	CONCRETE	REQ'D	REQUIRED
CONST	CONSTRUCTION	RM	ROOM
CONT	CONTINUOUS	RO	ROUGH OPENING
DBL	DOUBLE	S	SOUTH
DIA,Ø	DIAMETER	SHT	SHEET
DIAG	DIAGONAL	SIM	SIMILAR
DIM	DIMENSION	SPEC	SPECIFICATION
DN	DOWN	SQ	SQUARE
DTL,DETL	DETAIL	SS	STAINLESS STEEL
DWG	DRAWING	STL	STEEL
		STRUCT	STRUCTURAL
E	EAST	SUSP	SUSPENDED
EA	EACH	SV	SHEET VINYL
ELE,ELEV	ELEVATION		
ELECT	ELECTRICAL	THRU	THROUGH
EQ	EQUAL	TNND	TINNED
EQUIP	EQUIPMENT	TOC	TOP OF CONCRETE
EW	EACH WAY	TOM	TOP OF MASONRY
EXIST	EXISTING	TYP	TYPICAL
EXT	EXTERIOR		
		UBC	UNIFORM BUILDING CODE
FIN	FINISH	UNO	UNLESS NOTED OTHERWISE
FLUOR	FLUORESCENT		
FLR	FLOOR		
FT	FOOT		
		VERT	VERTICAL
GA	GAUGE	VIF	VERIFY IN FIELD
GALV	GALVANIZE(D)	VT	VINYL TILE
GC	GENERAL CONTRACTOR		
GRND	GROUND	W	WEST
GWB	GYP SUM WALL BOARD	W/	WITH
GYP BD	GYP SUM BOARD	WIN	WINDOW
		W/O	WITHOUT
HARD'WD	HARDWOOD	WP	WATERPROOF
HORIZ	HORIZONTAL		
HR	HOUR		
HT	HEIGHT		
HVAC	HEATING, VENTING & AIR CONDITIONING		
		⌵	ANGLE
ID	INSIDE DIA.	&	AND
IN	INCH	℄	CENTER LINE
INFO	INFORMATION	℄	PROPERTY LINE
INSUL.	INSULATION	⊙	AT
INT	INTERIOR	#	NUMBER
LB(S)	POUND(S)		
MAX	MAXIMUM		
MECH	MECHANICAL		
MET,MTL	METAL		
MFR	MANUFACTURER		
MGR	MANAGER		
MIN	MINIMUM		
MISC	MISCELLANEOUS		

SYMBOLS:

	REVISION		DETAIL REFERENCE
	KEY NOTE		ELEVATION REFERENCE
	ROOM NUMBER		SECTION REFERENCE
	KEYED NOTE		

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To: Oshtemo Township Planning Commission

In the initial conversations with KCCDA, coverage requirements for the county were provided. Taking into account the existing ASR (antenna structure registration) sites, it was determined that four additional new (“Green”) sites were needed by doing a coverage analysis (maps) of the county. These four “Green” sites are required in the Northwest, Northeast, Central and Western parts of the county. KCCDA provided candidate locations for these four sites based on availability and accessibility of existing land parcels that could be acquired and provided the best additional use of those locations, one of those sites being an existing water tower, and another used as a sub-station and battery farm. Based on these locations, Motorola ran coverage maps to determine their viability. The result was that these four sites, along with three existing sites, would provide an optimum seven-site simulcast cell, with a proposed coverage design of 95% Portable-In-Street coverage, and in turn meeting the design request for the Public Safety radio system.

Derek Sonksen
Project Manager



m: +1.616.498.9020

For more information on how and why we collect your personal information, please visit our [Privacy Policy](#).

1. The request for a fence higher than 6’ is for security reason. We have found higher fences help control any trespassing that might occur. KCCDA is also matching the existing fence at the water tank.
2. As this tower does not meet setbacks KCCDA will request a variance to allow this tower to be built at the proposed location

Inspection of Tower

The Michigan's Public Safety Communications System (MPSCS) will maintain the proposed tower. An inquiry was made of them on how frequently the towers will be inspected. Their response is as follows:

The tower is inspected every quarter from the ground looking up. As far as climbing the tower for an inspection it depends. We climb to inspect anytime a new antenna is added to the tower. If there is a bad antenna that needs to be replaced, we will inspect the tower at the same time. If we see something from the ground inspection that needs to be looked at, we will inspect by climbing the tower. In a perfect world the tower would be climbed once a year for an inspection, but I would say if no maintenance is required, we will climb the tower about every 2 to 3 years for an inspection

Some years we could climb the tower 6 times or more in a year and other years never climb it once

As for fire ladder trucks up to the tower to aid in rescue. Everyone at MPSCS is trained in tower rescue and we make sure contractors that work for us are also trained in tower rescue. If they are unable to reach the top of the tower from outside the fence compound making the driveway big enough for a ladder truck is a waste of money for the county to put into this site. The best way to perform a tower rescue is to do it by the use of rope.

Any more questions let me know.

Rodney Anway

Site Maintenance Southern Supervisor

State of Michigan-DTMB-Center for Shared Solutions

Michigan's Public Safety Communications System

Michigan State Police Headquarters, 2nd floor Wing A

7150 Harris Dr., Dimondale, MI 48821

Mobile: 517-242-0575

anwayr@michigan.gov

DTMB
HELP. CONNECT. SOLVE.





Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2021-AGL-5762-OE

Issued Date: 04/06/2021

Pyramid Network Services, LLC c/o Everett Ozba
Kalamazoo County
6615 Towpath Road
East Syracuse, NY 13057

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Antenna Tower Oshtemo
Location:	Kalamazoo, MI
Latitude:	42-18-49.70N NAD 83
Longitude:	85-42-16.50W
Heights:	1039 feet site elevation (SE)
	194 feet above ground level (AGL)
	1233 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 10/06/2022 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (404) 305-6337, or nick.goodly@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-AGL-5762-OE.

Signature Control No: 473522529-476834198

(DNE)

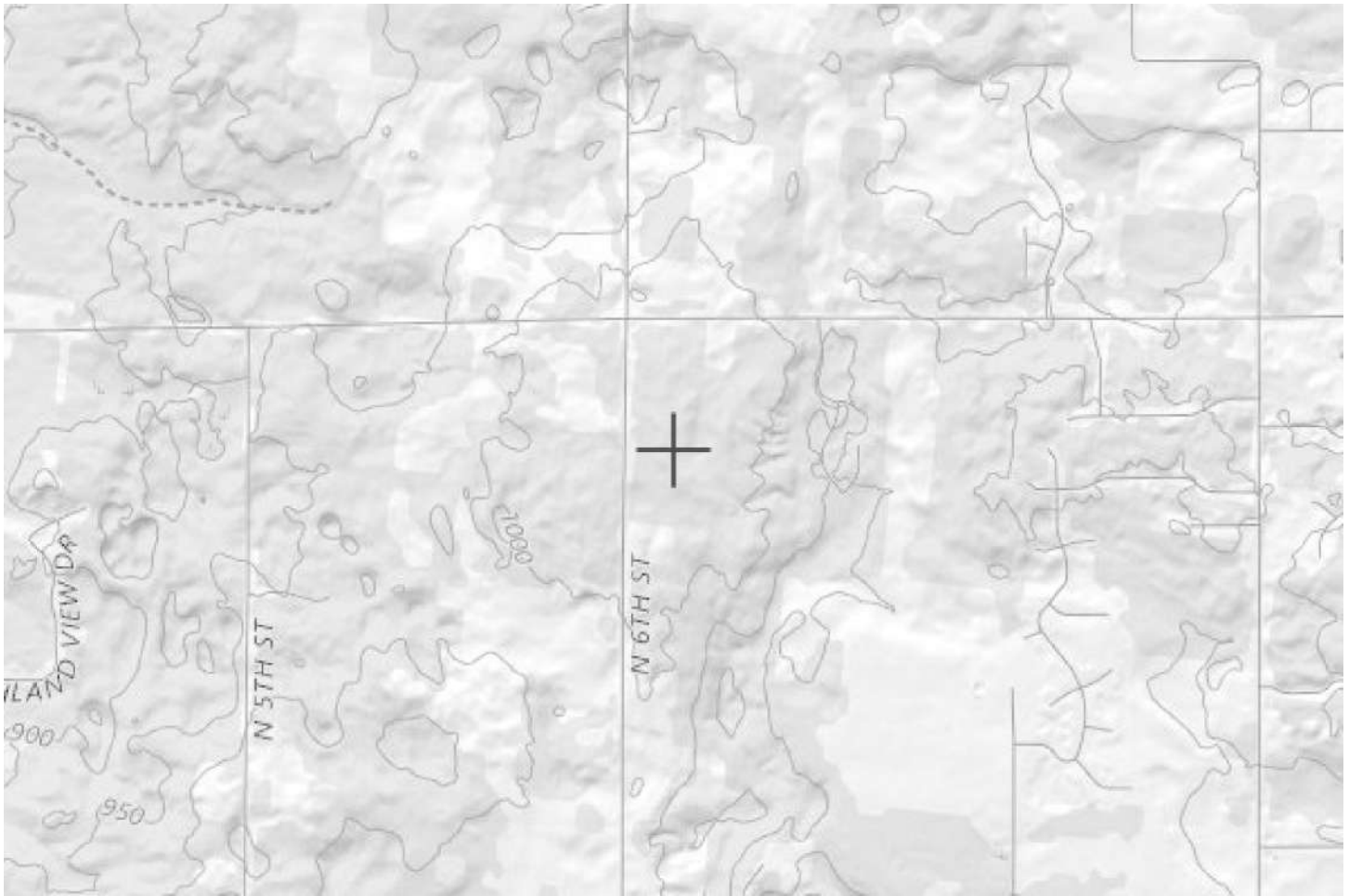
Nick Goodly
Technician

Attachment(s)
Frequency Data
Map(s)

cc: FCC

Frequency Data for ASN 2021-AGL-5762-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
6	7	GHz	55	dBW
6	7	GHz	42	dBW
10	11.7	GHz	55	dBW
10	11.7	GHz	42	dBW
17.7	19.7	GHz	55	dBW
17.7	19.7	GHz	42	dBW
21.2	23.6	GHz	55	dBW
21.2	23.6	GHz	42	dBW
614	698	MHz	1000	W
614	698	MHz	2000	W
698	806	MHz	1000	W
806	901	MHz	500	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
929	932	MHz	3500	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1670	1675	MHz	500	W
1710	1755	MHz	500	W
1850	1910	MHz	1640	W
1850	1990	MHz	1640	W
1930	1990	MHz	1640	W
1990	2025	MHz	500	W
2110	2200	MHz	500	W
2305	2360	MHz	2000	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W
2496	2690	MHz	500	W



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MG Paul D Rogers
Daniel Eichinger
Mike Trout, Commission Director

STATE OF MICHIGAN

Gretchen Whitmer, Governor

Michigan Department of Transportation

2700 Port Lansing Rd Lansing, MI 48906
Phone: 517-335-9949 Fax: 517-886-0366

April 16, 2021

Pyramid
Kalamazoo County
6615 Towpath Road
East Syracuse, NY 13057

Re: The Michigan Department of Transportation review of the following proposal:

The Michigan Department of Transportation has conducted a review of the following proposal:

FAA Airspace Case #:	2021-AGL-5762-OE
Description:	Antenna Tower
Height Above Ground:	194
Overall Height:	1233
Geographic Coordinates:	42d18m49.7sN / 85d42m16.5sW

Michigan's Tall Structure Act (Act 259, P.S. 1959, as amended by Act 28 P.A. 2016), places authority for review of construction proposals which may affect Michigan airspace with the Michigan Aeronautics Commission (MAC). The Michigan Aeronautics Commission has delegated its authority for airspace reviews and approvals to the Michigan Department of Transportation's Office of Aeronautics.

After review of the study listed above, it has been determined that No Permit is required for the referenced application. However, this notice concerns the effect on air navigation specific to the Michigan Tall Structure Act and does not relieve the proponent of any compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If any changes are made to either the location or overall height, the application must be re-submitted or re-evaluation.

I can be contacted at 517-335-9282 or via email at MDOT_Tall_Structures@michigan.gov if you have any questions or comments.

Sincerely,

Kelly Badra

Kelly Badra
Michigan Department of Transportation

October 7, 2021



Mtg Date: October 14, 2021

To: Planning Commission

From: Iris Lubbert, Planning Director

Applicant: Pyramid Network Services, LLC

Owner: Western Michigan University

Property: 5010 S Drake Road, Parcel Number 05-25-430-010

Zoning: BRP, Business and Research Park

Request: Special Use and Site Plan approval for a 199-foot-tall Communication Tower to service the Kalamazoo County Consolidated Dispatch Authority

Section(s): Section 20.40: Communication towers in BRP, Business and Research Park
Section 65.30: Special Use Review Criteria
Section 49.80: Special Use Requirements for Communication Towers

PROPOSAL:

Pyramid Network Services, LLC, on behalf of the Kalamazoo County Consolidated Dispatch Authority (KCCDA), is requesting Special Use and Site Plan approval to construct a 199-foot-tall unmanned communication tower on 5010 S Drake Road. The property in question is outlined in yellow on the map excerpt to the right; the approximate location of the proposed tower is starred.

OVERVIEW:

5010 S Drake Road is located on the north side of Parkview Avenue, west of the Parkview Avenue and S Drake Road intersection. The property in question is zoned BRP, Business and Research Park and is owned by Western Michigan University (WMU). The site currently houses a battery farm to the south and WMU's BTR 2.0, 53-acre business, technology, and research park to the north. The applicant is proposing to purchase a portion of this property from WMU to construct the proposed tower on. If approved, a Land Division Application will be required. The tower will purely serve the KCCDA. The



KCCDA provides public safety dispatch operations to Kalamazoo County and operates a central communications system for participating Local Governmental Units, the County, and other supporting agencies or entities. Communication towers are permitted in the BRP zoning district as a special use. The notice of public hearing was mailed to all property owners within 300 feet of 5010 S Drake Road on September 16th and published in the paper on September 21st.

ANALYSIS:

The entirety of the property in question is zoned BRP, Business and Research Park. Uses permitted in the BRP zoning district are outlined in Article 20 of the Township's Zoning Code. *Communication towers* are identified as a Special Use within this section and require review and approval of the Planning Commission. When reviewing a Special Use there are two sets of criteria that need to be considered: the general Special Use review criteria outlined in Section 65.30 and the specific requirements for the use in question outlined under Section 49.80. Below is an analysis of the proposal against these two Sections.

Section 65.30: Special Use Review Criteria

A. Master Plan/Zoning Ordinance: The proposed use will be consistent with the purpose and intent of the Master Plan and Zoning Ordinance, including the District in which the use is located.

Zoning is purely a state and local issue except in two areas where Congress has imposed federal regulations: religious uses and telecommunications. Communication towers have special protections from the Federal Government and although the Federal Government dictates some of what can be done, municipalities have been granted a level of control over the placement, construction, and modification of wireless service facilities. As such, the Township's Zoning Ordinance allows for the construction of communication towers within the Township as long as "a need" for the tower is demonstrated. The code also provides legal tools and criteria to review the proposal against.

The applicant provided a letter explaining that this proposed tower addresses an identified need to improve KCCDA's coverage and services to the County. This criterion has been met.

B. Site Plan Review: The Site Plan Review Criteria of Section 64.80.

Pyramid Network Services, LLC is proposing to create a new parcel within 5010 S Drake Road to hold their 199-foot-tall communication tower and supporting equipment. The proposed parcel will be approximately 1.2 acres and has no frontage to either Parkview Avenue or Drake Road. Frontage, width, and area requirements outlined in the Township's Zoning Schedule of Regulations do not apply to any parcel, lot, or building site with buildings or regulator stations for essential service (Section 50.10 F). A new 12 foot wide gravel drive and an access easement is proposed from S Drake Road to provide access to this parcel. If approved, a copy of the recorded access easement will be needed.

The proposed tower is 153 feet from the right-of-way line of S Drake Road and is placed within a 65 foot by 65 foot compound. Within the newly proposed parcel, the tower is 156 feet from the western property line and under 30 feet from the north, east, and southern property lines. A deviation from the setback requirements will be needed. Required setbacks for communication towers will be addressed under the review of Section 49.80: Communication Towers of this report.

An unmanned tower does not require any onsite parking. No lighting is proposed on the tower; however, two lights are proposed on the equipment shelter within the tower enclosure. These two lights are cut off fixtures and meet ordinance requirements. Although the additional development standards outlined within the BRP district are not applicable to this project the ordinance still requires that the WMU Design Committee review and approve all submitted site plans. A letter from the WMU Design Committee is needed.

The tower and its equipment will be surrounded by a 9-foot-tall barbed wire fence. The Planning Commission is authorized to grant height exemptions for fences exceeding 6 feet in height. Security fences six feet high and above in industrial-zoned districts are permitted to include an additional 18 inches of barbed wire (the proposed fence is 8 feet with 12 inches of barbed wire). The proposed fence has been designed to match the existing fence surrounding the battery farm on the site. The applicant has requests this taller fence for security reasons. Staff finds this request reasonable. The Planning Commission is requested to grant a deviation to allow the proposed 9 foot tall, barbed wire fence at this site as proposed.

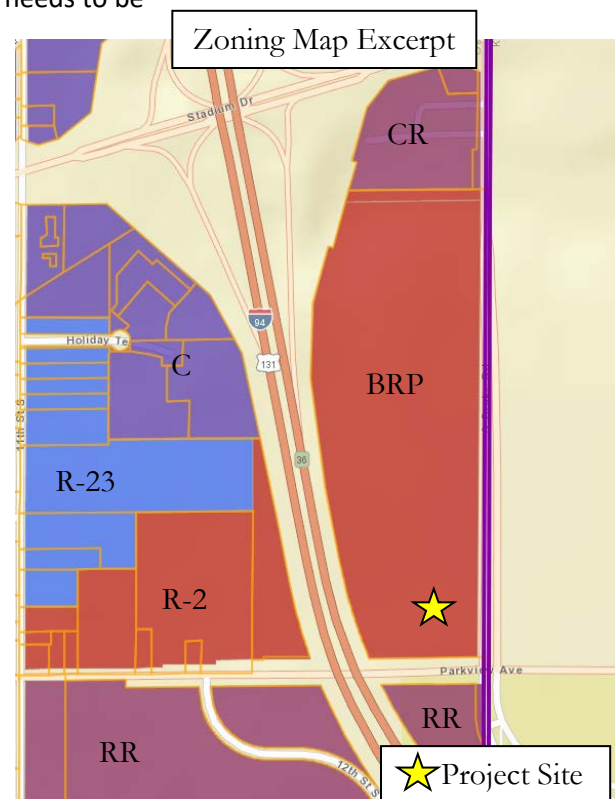
A site plan for the proposed tower has been submitted, see attached. This site plan has been reviewed by Township's Fire, Public Works, and Planning Departments. All but some site plan requirements and comments have been addressed. The following are items that need to be addressed and will be listed as conditions of approval at the end of the staff report:

- The access drive width needs to reflect the 30/50 turning radius required for fire apparatus. A site plan needs to be resubmitted with a 1"= 20' scale to confirm the proper turning radius.
- The proposed transformer shown in the drive isle needs to be moved to the north approximately four foot to accommodate the length of the fire apparatus.
- The 'proposed overhead power and fiber lines' shown on the site plan shall be placed underground.

C. Impacts:

- 1. The proposed use would be compatible, harmonious and appropriate with the existing or planned character and uses of adjacent properties; meaning the proposed use can coexist with neighboring uses in a stable fashion over time such that no neighboring use is unduly negatively impacted.**

The property that will host the proposed tower is zoned BRP, Business and Research Park. This zoning designation is considered light industrial. The BRP district lists communication towers as a permitted special use if there is a demonstrated need. A need has been demonstrated. This tower will improve safety dispatch services to surrounding residents and the county overall. This criterion has been met.



- 2. Potentially adverse effects arising from the proposed use on adjacent properties would be minimized through the provision of adequate parking, the placement of buildings, structures and entrances, as well as the location of screening, fencing, landscaping, buffers or setbacks.**

The proposed communication tower meets site plan requirements. The Planning Commission will need to consider a deviation for both the tower setbacks and the proposed fence. No adverse effects are anticipated in this area.

- 3. The proposed use would not be detrimental, hazardous, or disturbing to existing or future adjacent uses or to the public welfare by reason of excessive traffic, noise, smoke, odors, glare, or visual clutter.**

The proposed use would not be detrimental, hazardous, or disturbing to adjacent uses by reason of excessive traffic, noise, smoke, glare, or odors. No lights are proposed on the tower itself.

- D. Environment: The natural features of the subject property shall only be cleared or altered to the extent necessary to accommodate site design elements, particularly where the natural features assist in preserving the general character of the area.**

Aside from the trees that will be cleared to accommodate the 65 foot by 65 foot tower area for the tower, all natural features of the site will remain.

- E. Public Facilities: Adequate public and/or private infrastructure and services already exist or would be provided, and will safeguard the health, safety, and general welfare of the public.**

Adequate public facilities are in place to support the proposed use.

- F. Specific Use Requirements: The Special Use development requirements of Article 49. -**

All of the specific use requirements in Section 49.80 are outlined below.

Section 49.80: Communication Towers

A communication tower shall be erected, constructed, located, or established in compliance with the following:

- 1. Justification. A proposed tower shall not be established unless the communications equipment/antenna(s) planned for the proposed location cannot be accommodated on an existing or approved tower within the area of the proposed tower due to the following reasons *(the code then outlines four exceptions)*.**

The applicant has provided a letter explaining that this proposed tower addresses an identified need to improve KCCDA's coverage and services to the County. Staff is satisfied with the applicant's justification.

- 2. Design of tower.**

- a. Any proposed or modified tower shall be designed and constructed to accommodate future co-locations. Towers shall be designed to allow for future rearrangement of antennas upon the tower and to accept antennas mounted at varying heights.**

The proposed tower will support public safety dispatch operations to Kalamazoo County. For security reasons the proposed tower will not accommodate co-locations. This is standard practice for towers of this type.

- b. A proposed or modified tower shall be designed to blend into the surrounding environment through the use of color and camouflaging architectural treatment, except in instances where the color is dictated by federal or state authorities and located on the site so as to minimize its visibility from the public right-of-way and residentially zoned properties.**

The proposed tower is a galvanized gray color. Between the tower's compound and Drake Road there is 100 feet of preserved woodland that is part of the BTR.2 Park. However, there is not much, if any, landscaping between the proposed tower and Parkview Avenue. The applicant has agreed to plant trees and shrubs for further screening where practical. A landscaping plan shall be coordinated with Township Staff prior to building permit issuance.

- 3. Height. The height of a tower shall be determined by measuring the vertical distance from the tower's point of contact with the ground or rooftop to the highest point of the tower, including all antennas or other attachments. When towers are mounted upon other structures, the height shall be considered with the combined height of the structure and tower.**

The proposed tower is 190 feet tall with a 9-foot tall lightning rod; the total height of the tower is 199 feet.

4. Tower setbacks.

- a. A tower shall be located so that the setback from all property lines is equal to or greater than the height of the tower. The reviewing body may deviate from such requirements if the deviation is consistent with the spirit and intent of the Ordinance.**

The proposed tower will be a total of 199 feet tall. Within the newly proposed parcel, the tower is 156 feet from the western property line and under 30 feet from the north, east, and southern property lines. A deviation is requested from the Planning Commission for the northern, southern, eastern, and western setbacks. It should be noted that due to the shape and size of the proposed parcel the proposed tower would need a deviation for setbacks no matter where it is placed. The tower is designed to collapse in on itself if it were to fall, so granting a deviation will not create a safety hazard. The placement of the tower is within a light industrial district within the WMU BTR.2 Park. Although the property across the road to the south is zoned RR, Rural Residential the property is owned by WMU and contains a "Fluid Processing Building". The highway is immediately to the West. As the tower is providing a needed service to both the Township and County approving the deviation would be consistent with the spirit and intent of the ordinance.

- b. Towers shall not be located between a principal structure and a public street.**

The proposed tower is located behind the battery farm onsite.

- c. A tower's setback may be reduced or its location to a public street varied to allow the integration of a tower into an existing or proposed structure, such as a church steeple, utility pole, power line support device or other similar structure.**

Not applicable.

- d. Towers shall be set back at least 150 feet from any adjacent residences, residentially zoned property or a public street.**

The proposed tower is over 150 feet from both Parkview Avenue and S Drake Road. Staff has no concerns with the towers proposed location.

- 5. Accessory structures. Structures accessory to a tower, including utility buildings, shall be designed and located on the site to blend in with the surrounding environment and shall meet the minimum setback requirements of the underlying zoning district.**

Equipment supporting the structure (equipment shelter and propane tank) will all be located within the proposed fenced compound. See page A-1/2 of the site plan for more details.

- 6. Landscaping/screening.**

- a. Landscaping/screening at the site shall be designed and maintained to minimize visibility of the tower and related equipment from the public right-of-way and residentially zoned properties.**

Between the tower's compound and Drake Road there is 100 feet of preserved woodland. However, there is not much, if any, landscaping between the proposed tower and Parkview Avenue. The applicant has agreed to plant trees and shrubs for further screening where practical. A landscaping plan shall be coordinated with Township Staff prior to building permit issuance.

- b. Ground-mounted equipment and accessory buildings and structures may be required to be screened from view by suitable vegetation, except where a design of non-vegetative screening better reflects and compliments the architectural character of the surrounding area.**

The proposed equipment shelter is placed behind the proposed tower. The applicant has agreed to plant trees and shrubs for further screening where practical. A landscaping plan shall be coordinated with Township Staff prior to building permit issuance.

- 7. Security fencing. Security fencing of at least six feet (unless other height is required by state or federal regulations) shall be required to prevent access to the tower, accessory building/structure and/or guyed wires. The reviewing body may deviate from such requirements if the deviation is consistent with the spirit and intent of the Ordinance.**

The tower and its equipment will be surrounded by a 9 foot tall barbed wire fence (mirroring the fencing currently surrounding the battery farm). As noted under site plan review, the Planning Commission will need to grant a deviation for this fence to be installed as proposed.

- 8. Lighting. Towers shall not be illuminated by artificial means and shall not display strobe lights unless such lighting is specifically required by the Federal Aviation Administration or other federal or state authority for a particular tower. Site lighting shall comply with Article 54.**

No lighting is proposed or required on this tower per the Federal Aviation Administration.

- 9. Signs and advertising. The use of any portion of a tower for signs other than warning or equipment information signs is prohibited.**

No signage is being proposed.

- 10. Interference with public safety telecommunications. No new or existing telecommunications service shall interfere with public safety telecommunications. All applications for new service shall be accompanied by an intermodulation study by a qualified and licensed professional engineer which provides a technical evaluation of existing and proposed transmissions and indicates all potential interference problems.**

The proposed tower will service public safety telecommunications. This criterion is not applicable.

- 11. Site access and parking. The reviewing body may allow deviation from the Access Management Guidelines, paving and/or parking standards of the Zoning Ordinance.**

The proposed compound will be accessed using a gravel drive. No parking spaces are required for an unmanned facility.

- 12. Inspections. All towers shall be inspected at regular intervals, no less than once a year, and serviced as frequently as may be necessary, to maintain the tower in a safe and weather-withstanding condition. Reports as to all inspections and servicing shall be made available to the Township upon written request.**

The Michigan's Public Safety Communications System (MPSCS) will maintain the proposed tower. The tower will be inspected every quarter.

- 13. Updated information. The tower owner or representative shall annually update the Township with the following information:**

- a. Name, address, phone number of tower owner; name, address and phone number of contact persons for engineering, maintenance and other notice purposes.
- b. Organization name, address, phone number, and contact person of each co-locator and the operational status of the equipment.
- c. Notification of date of lease expiration and/or cessation of operation of any equipment and date of removal.

The applicant has noted that the tower will be inspected every quarter. The tower will be owned by Kalamazoo County Consolidated Dispatch Authority (KCCDA) in perpetuity with no colocations occurring on this site.

- 14. Abandonment or Unused towers, portions of towers, tower mounted equipment, and associated facilities. Abandoned or unused towers, portions of towers, tower mounted equipment and associated facilities shall be removed as follows:**

- a. All abandoned or unused towers, portions of towers, tower mounted equipment, and associated facilities shall be removed within 12 months of the cessation of operations at the site unless a time extension is approved by the reviewing body.
- b. In the event that a tower, portions of towers, tower mounted equipment, and/or associated facilities are not removed within 12 months of cessation of operations at a site, the subject facilities may be removed by the Township and the costs of removal assessed against the property.
- c. A copy of a signed lease, which includes a requirement that the applicant shall remove the tower, portion of tower, tower mounted equipment and associated facilities upon cessation of operations at the site shall be submitted at the time of application, if applicable.

KCCDA will own the property – a lease is not applicable. A letter agreement indicating that KCCDA will comply with this Section is needed.

In addition to the information required for the Site Plan review and Special Use review, applications for towers shall include the following supplemental information:

1. Tower plans and a report from a qualified and licensed professional engineer which:

- a. Describes the tower height and design, including a cross section and elevation;**
Provided. See page A-2/2 of the plan set for details.
- b. Documents the height above grade for all potential mounting positions for co-located antennas and the minimum separation distance between antennas;**
Not applicable as no colocations will occur on this tower.
- c. Describes the tower's capacity, including the number and type of antennas/equipment that it can accommodate;**
The proposed tower is designed to support KCCDA equipment. A total of 5 antenna/dishes are proposed. See page A-2/2 of the plan set for details.
- d. Documents what steps the applicant will take to avoid interference with established public safety telecommunications;**
Not applicable.
- e. Includes an engineer's stamp and registration number;**
Engineer's stamp is included: David W Harper, engineer number 43418.
- f. Indicates that the proposed tower complies with regulations administered by the Federal Communications Commission and the Federal Aviation Administration.**
A letter from the Federal Aviation Administration is provided from the applicant indicating that the tower will meet their regulations.
- g. Includes information necessary to allow determination of compliance with Building Code, Electrical Code and other applicable Township Ordinances.**
If approved by the Planning Commission, any additional information regarding the communication tower's construction will be determined at time of the building permit.
- h. Includes other information necessary to evaluate the request.**
All necessary information has been provided.

- 2. A letter of intent committing the tower owner and his or her successors to allow the shared use of the tower if an additional user agrees in writing to meet reasonable terms and conditions for shared use. Further, a request to co-locate antennas on a tower shall not be unreasonably refused. No provider or lessee or agent thereof shall unreasonably fail to cooperate to accommodate co-location.**
Not applicable.

RECOMMENDATION:

The Planning Department recommends the Planning Commission approve the proposed 199 foot tall communication tower at 5010 S Drake Road with the following stipulations.

1. The tower will service the Kalamazoo County Consolidated Dispatch Authority.
2. The Planning Commission grant a deviation for setbacks to allow the tower can be built as shown.
3. The Planning Commission grant a deviation to allow a 9-foot-tall barbed wire fence onsite as proposed.
4. A letter from WMU Design Committee shall be provided prior to building permit issuance.
5. A Land Division Application is submitted and approved prior to building permit issuance.
6. A copy of the recorded access easement is submitted prior to building permit issuance.
7. A letter agreement shall be provided indicating that KCCDA will comply with Section 49.80, C, 14.
8. A landscaping plan shall be coordinated with Township Staff prior to building permit issuance.
9. An updated site plan shall be submitted prior to building permit issuance addressing the following comments:
 - a. The access drive width needs to reflect the 30/50 turning radius required for fire apparatus. A site plan needs to be resubmitted with a 1"= 20' scale to confirm the proper turning radius.
 - b. The proposed transformer shown in the drive isle needs to be moved to the north approximately four foot to accommodate the length of our fire apparatus.
 - c. The 'proposed overhead power and fiber lines' shall be placed underground.

Attachments:

Township Application Form

Site Plan

Letter justifying tower location

Letter to address inspections

Letter from the Federal Aviation Administration

Letter from the Michigan Department of Transportation

This page has been intentionally left blank for printing purposes.



7275 W. Main Street, Kalamazoo, Michigan 49009-9334
Phone: 269-216-5223 Fax: 269-375-7180

PLEASE PRINT

PROJECT NAME & ADDRESS WMU BTR2 - KCCDA Communications Tower (Parkview Ave)

PLANNING & ZONING APPLICATION

Applicant Name : Ben Varney

Company Pyramid Network Services, LLC

Address 6615 Towpath Rd

East Syracuse New York 13057

E-mail bvarney@pyramidns.com

989-670-2000

Telephone _____ Fax _____

Interest in Property Project Manager

OWNER*:

WMU owns the property but KCCDA intends on purchasing this property from WMU if the project/application is approved

Name _____

Address WMU: 1903 W Michigan Ave, Kalamazoo MI 49008

KCCDA: 7040 Stadium Drv, Kalamazoo, MI 49009

Email David.dakin@wmich.edu / jtroyer@kccda911.org

WMU: 269-387-8834

Phone & Fax KCCDA: 269-488-6616 _____

THIS
SPACE
FOR
TOWNSHIP
USE
ONLY

Fee Amount _____

Escrow Amount _____

NATURE OF THE REQUEST: (Please check the appropriate item(s))

- ☒ Planning Escrow-1042
☒ Site Plan Review-1088
☐ Administrative Site Plan Review-1086
☒ Special Exception Use-1085
☐ Zoning Variance-1092
☐ Site Condominium-1084
☐ Accessory Building Review-1083

- ☐ Land Division-1090
☐ Subdivision Plat Review-1089
☐ Rezoning-1091
☐ Interpretation-1082
☐ Text Amendment-1081
☐ Sign Deviation-1080
☐ Other: _____

BRIEFLY DESCRIBE YOUR REQUEST (Use Attachments if Necessary): Installation of self-support

tower with foundation. Install prefabricated shelter with NG generator on a concrete foundation. Install ice bridge
antenna and all associated radios and cabling. Install iron fence, access gate and gravel compound. Install
associated fuel line, power, fiber and alarm conduits.

LEGAL DESCRIPTION OF PROPERTY *(Use Attachments if Necessary):*

See site plans

PARCEL NUMBER: 3905- 05-25-430-010

ADDRESS OF PROPERTY: Parkview Ave

PRESENT USE OF THE PROPERTY: Agriculture

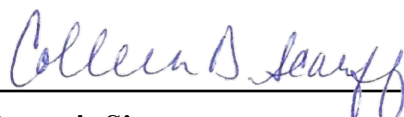
PRESENT ZONING Business & Research Park **SIZE OF PROPERTY** 53.16 Acres

**NAME(S) & ADDRESS(ES) OF ALL OTHER PERSONS, CORPORATIONS, OR FIRMS
HAVING A LEGAL OR EQUITABLE INTEREST IN THE PROPERTY:**

Name(s)	Address(es)
Kalamazoo County Consolidated Dispatch Authority	7040 Stadium Drv. Kalamazoo, MI. 49009

SIGNATURES

I (we) the undersigned certify that the information contained on this application form and the required documents attached hereto are to the best of my (our) knowledge true and accurate. I (we) acknowledge that we have received the Township's Disclaimer Regarding Sewer and Water Infrastructure. By submitting this Planning & Zoning Application, I (we) grant permission for Oshtemo Township officials and agents to enter the subject property of the application as part of completing the reviews necessary to process the application.


Owner's Signature (* If different from Applicant)

05-19-2021

Date


Applicant's Signature

5/11/2021

Date

Copies to:
Planning -1
Applicant -1
Clerk -1
Deputy Clerk -1
Attorney-1
Assessor -1
Planning Secretary - Original

PLEASE ATTACH ALL REQUIRED DOCUMENTS

SITE INFORMATION

PROJECT DESCRIPTION CONSISTS OF, BUT IS NOT LIMITED TO:

THE INSTALLATION OF A DECORATIVE FENCE, ACCESS GATE AND GRAVEL COMPOUND

THE INSTALLATION OF A SELF SUPPORT TOWER WITH FOUNDATIONS

THE INSTALLATION OF A PRE-FAB EQUIPMENT SHELTER WITH A NATURAL GAS GENERATOR ON A CONCRETE FOUNDATION, ICE BRIDGE, ANTENNAS, AND ALL ASSOCIATED RADIOS AND CABLING

THE INSTALLATION OF ASSOCIATED UNDERGROUND NATURAL GAS FUEL LINE, POWER, FIBER/TELCO AND ALARM CONDUITS AND GROUNDING

SITE NAME: 5112 WMU BTR2

SITE ADDRESS: PARKVIEW AVENUE
KALAMAZOO, MI 49009

SITE COORDINATES AND ELEV.: LATITUDE: N. 42° 15' 37.9"
LONGITUDE: W. 85° 38' 56.7"
GROUND ELEV.: 941.4' AMSL APPROX.

5112 WMU BTR2

KCCDA COMMUNICATIONS TOWER

PARKVIEW AVENUE

KALAMAZOO, MI 49009

OSHTEMO TOWNSHIP

KALAMAZOO COUNTY

CONSULTANT TEAM

PROPERTY OWNER: WESTERN MICHIGAN UNIVERSITY
1903 W. MICHIGAN UNIVERSITY
KALAMAZOO, MI 49009

TOWER OWNER: KALAMAZOO COUNTY CONSOLIDATED
DISPATCH AUTHORITY
7040 STADIUM DRIVE
KALAMAZOO, MI 49009
JEFFERY TROYER (269) 488-6615
EMAIL: JTroyer@kccda911.org

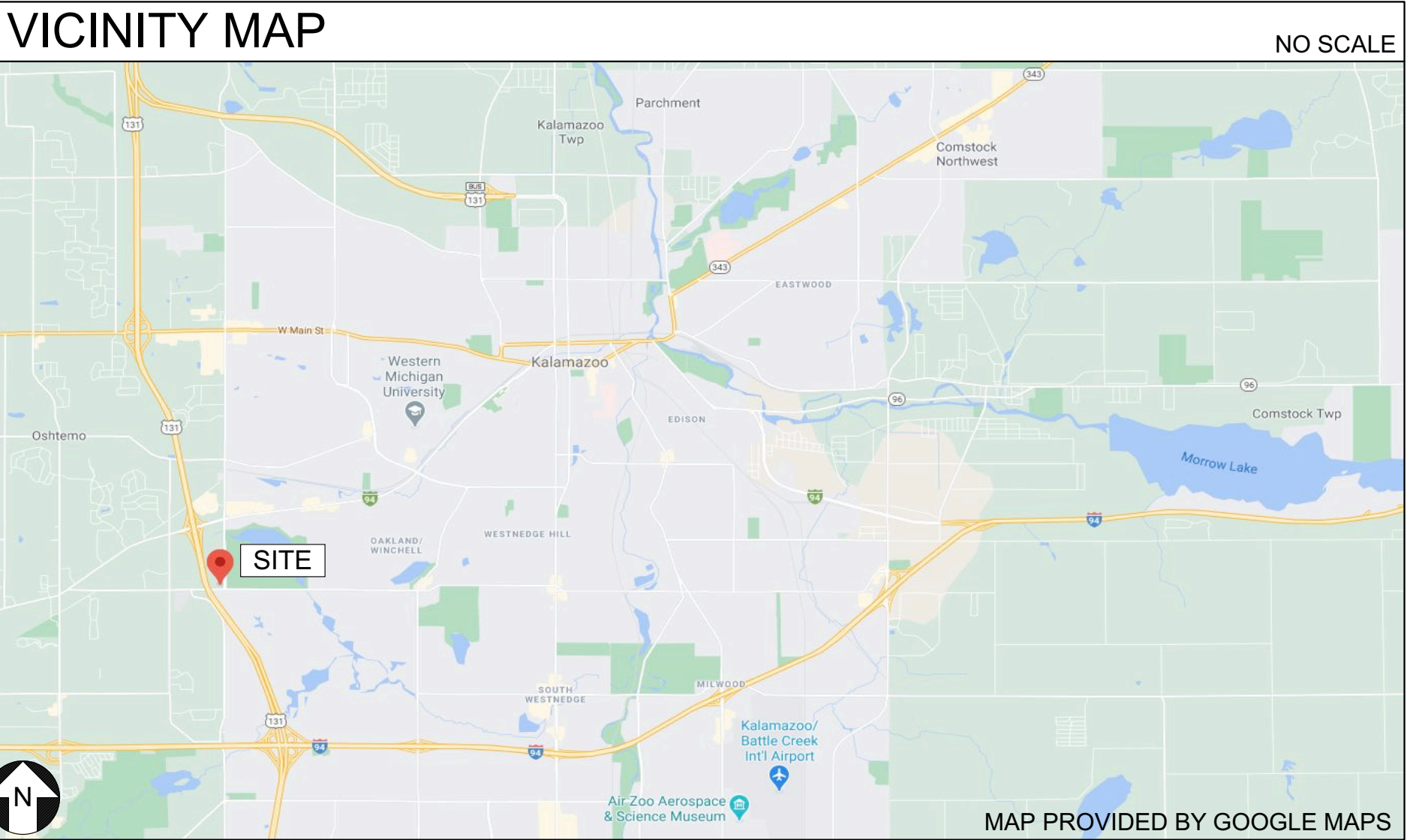
CONTACT: MOTOROLA SOLUTIONS
500 W. MONROE STREET STE 4400
CHICAGO, IL 60661
DEREK SONKSEN (616) 498-9020
EMAIL: derek.sonksenr@motorolasolutions.com

PROJECT MANAGER: PYRAMID NETWORK SERVICES , LLC
6615 TOWPATH ROAD
EAST SYRACUSE, NY 13057
EVERETT OZBAT (989) 737-2954
EMAIL: EOzbat@pyramidns.com

SURVEYOR: MIDWESTERN CONSULTING
3815 PLAZA DRIVE
ANN ARBOR, MI 48108
PAUL KOVACS, PS (734) 995-0200
EMAIL: pk@midwesternconsulting.com

ENGINEER: HARPER ENGINEERING, INC
815 SUPERIOR AVENUE SUITE 1514
CLEVELAND, OH 44114
DAVID W. HARPER (216) 344-3855
EMAIL: dwharper@harperengineering.org

RAW LAND SELF SUPPORT TOWER SITE



DRAWING INDEX

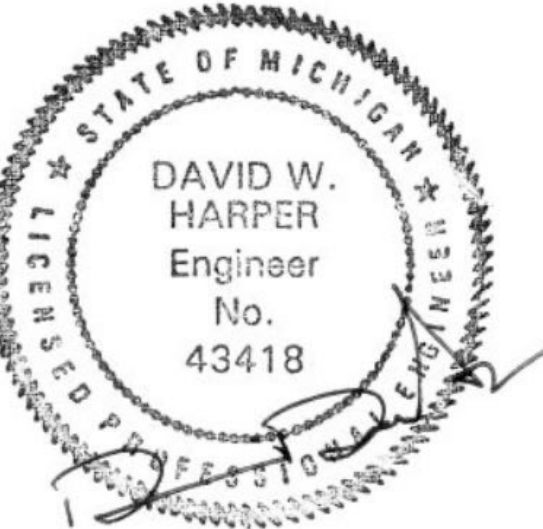
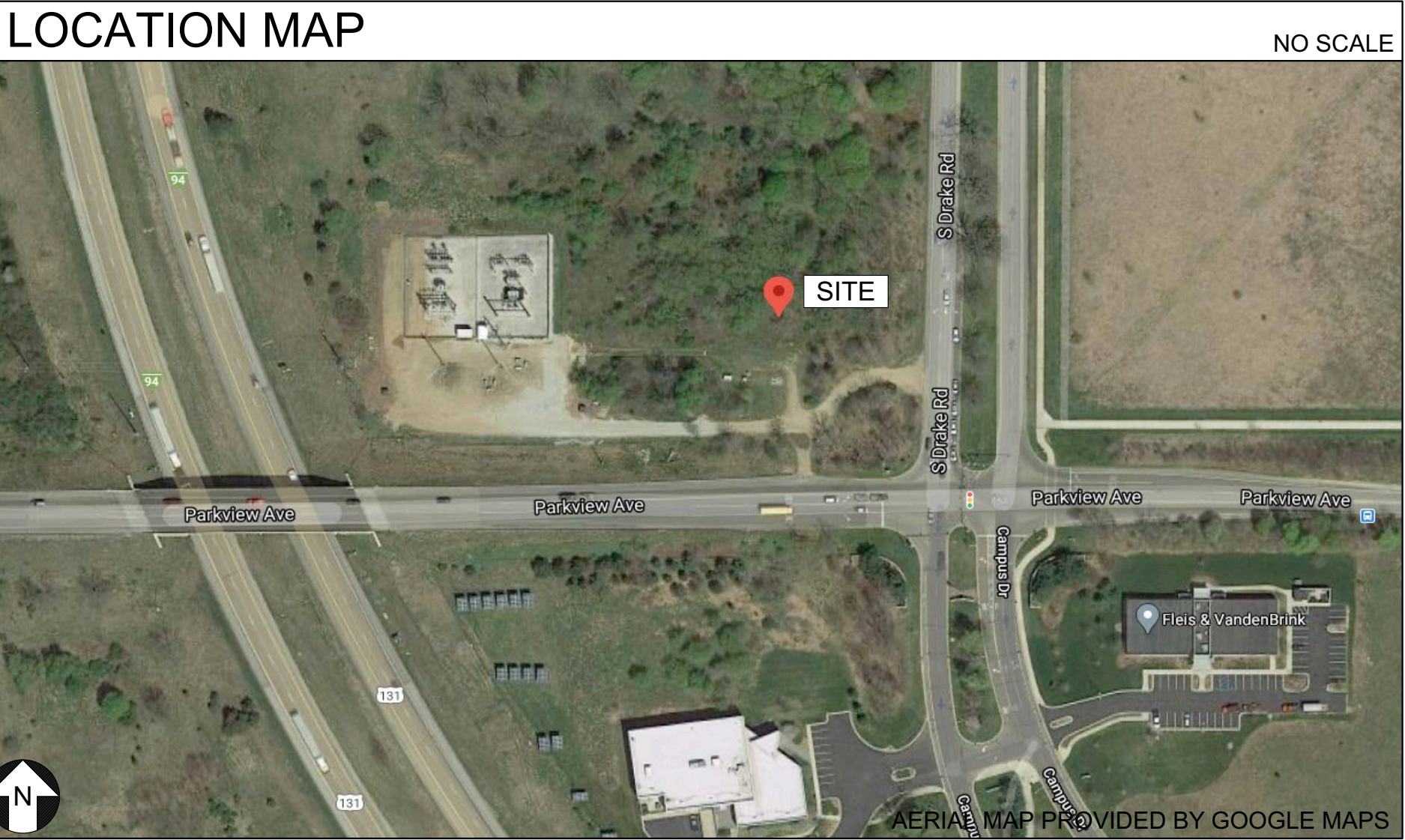
SHEET	DESCRIPTION	2	REV.
T-1	TITLE SHEET	2	
SURV-1	SITE SURVEY (BY OTHERS)		
C-1	OVERALL SITE PLAN	2	
CD-1	CIVIL DETAILS	1	
A-1	COMPOUND SITE PLAN	2	
A-2	TOWER ELEVATION AND ANTENNA INFO	2	
A-3	ANTENNA DETAILS	0	
A-4	ANTENNA DETAILS	0	
S-1	FOUNDATION DETAILS	0	
S-2	SHELTER ELEVATIONS	0	
S-3	SHELTER INSTALLATION DETAILS	0	
E-1	UTILITY DETAILS	0	
G-1	GROUNDING PLAN	0	
G-2	GROUNDING DETAILS	0	
G-3	GROUNDING DETAILS	0	
G-4	GROUNDING DETAILS	0	
GN-1	GENERAL NOTES	0	
GN-2	GENERAL NOTES AND LEGEND	0	

RECEIVED AND ACCEPTED

KALAMAZOO COUNTY CONSOLIDATED DISPATCH AUTHORITY:	RECEIVED:
	ACCEPTED:
MOTOROLA:	RECEIVED:
	ACCEPTED:
PROPERTY OWNER:	RECEIVED:
	ACCEPTED:

DRIVING DIRECTIONS

FROM DOWNTOWN KALAMAZOO: TAKE W. KALAMAZOO AVENUE WEST TOWARD COOLEY STREET. USE THE 2ND FROM THE LEFT LANE TO TURN SLIGHTLY LEFT ONTO MICHIKAL STREET / BUSINESS ROUTE 131 / I-94 TOWARD BENTON HARBOR / THREE RIVERS. CONTINUE ONTO W. MICHIGAN AVE / BUSINESS ROUTE 131 / I-94. ROAD NAME CHANGES TO STADIUM DRIVE / BUSINESS ROUTE 131 / I-94. CONTINUE TO S. DRAKE ROAD. TURN LEFT ONTO S. DRAKE ROAD. CONTINUE TO PARKVIEW AVENUE. TURN RIGHT ONTO PARKVIEW AVENUE. SITE IS LOCATED IMMEDIATELY ON THE RIGHT HAND SIDE.

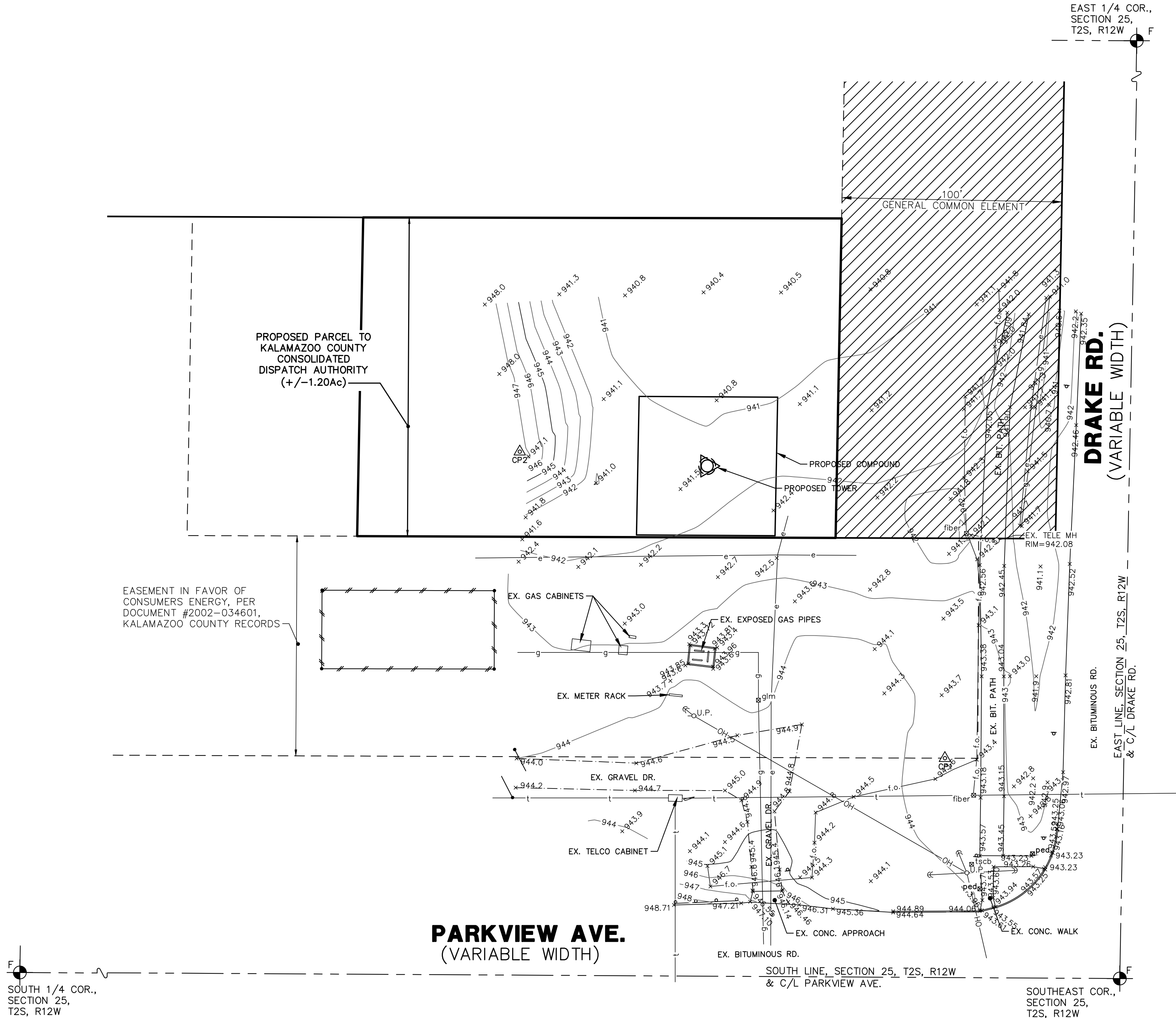


09/01/21

09/01/21	REVISED DRAWINGS C-1, CD-1, A-1 & A-2	GJB					TITLE SHEET			THIS DRAWING IS COPYRIGHTED AND IS THE SOLE PROPERTY OF THE OWNER. IT IS PRODUCED SOLELY FOR USE BY THE OWNER AND ITS AFFILIATES. REPRODUCTION OR USE OF THIS DRAWING AND/OR THE INFORMATION CONTAINED IN IT IS FORBIDDEN WITHOUT THE WRITTEN PERMISSION OF THE OWNER. 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.
07/12/21	REVISED GRAVEL DRIVE & MW DISH INFO	GJB					5112 WMU BTR2 PARKVIEW AVENUE KALAMAZOO, MI 49009	Drawing / Rev. T-1/2		
05/25/21	FOR ZONING	GJB								
05/06/21	FOR APPROVAL	GJB								
04/15/21	FOR APPROVAL	GJB								
03/31/21	FOR APPROVAL	GJB								
Rev.	Date:	Description:	Mgr.							

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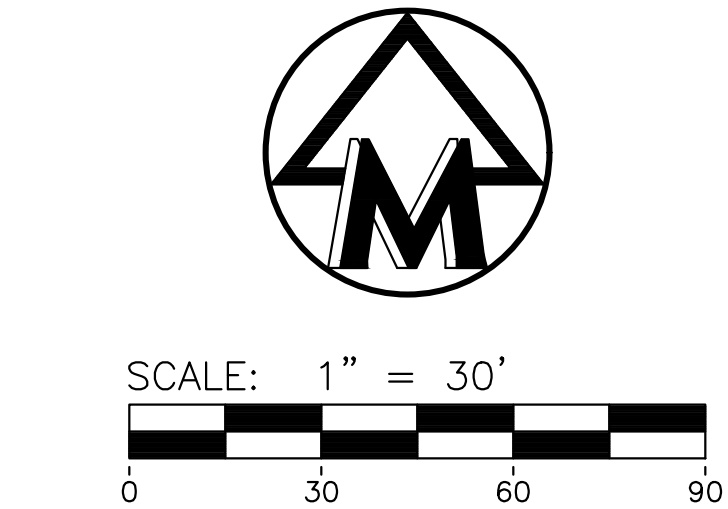
SOUTH 1/4 COR.,
SECTION 25,
T2S, R12W

EAST 1/4 COR.,
SECTION 25,
T2S, R12W

DRAKE RD.
(VARIABLE WIDTH)

EAST LINE, SECTION 25, T2S, R12W
& C/L DRAKE RD.

SOUTHEAST COR.,
SECTION 25,
T2S, R12W



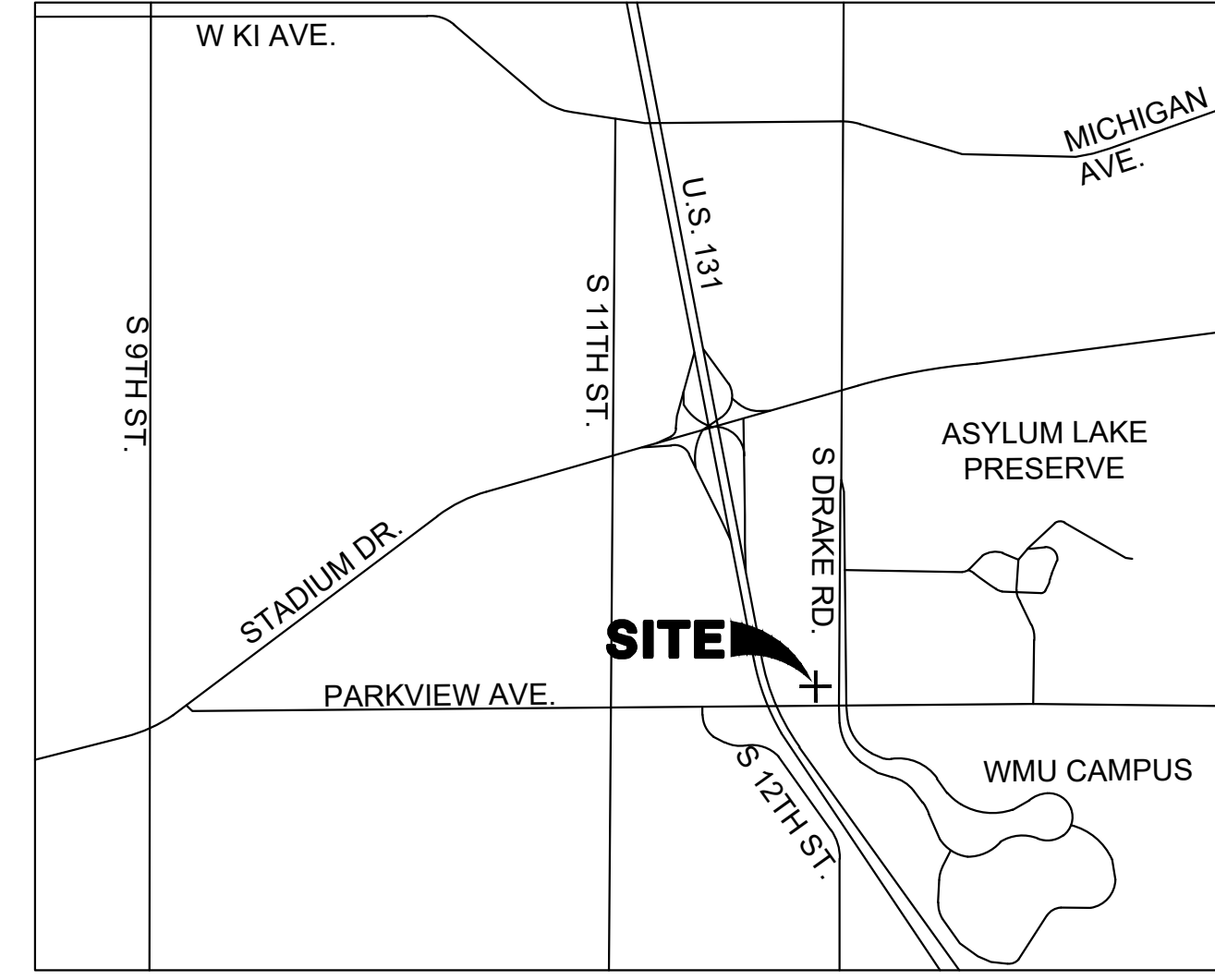
LEGEND	
838	EXIST. CONTOUR
x836.2	EXIST. SPOT ELEVATION
o-u.p.	EXIST. UTILITY POLE
guy	GUY WIRE
oh	EXIST. OVERHEAD UTILITY LINE
t	EXIST. TELEPHONE LINE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
f.o.	EXIST. FIBER OPTIC LINE
sign	SIGN
glim	GAS LINE MARKER
fiber	FIBER OPTIC MARKER
ped	PEDESTRIAN CROSSING SIGNAL
tscb	TRAFFIC SIGNAL CONTROL BOX
post	POST
fence	FENCE
guardrail	GUARDRAIL
sc	SECTION CORNER
cp	CONTROL PT.

LEGAL DESCRIPTION OF PROPOSED PARCEL

LEGAL DESCRIPTION OF A PROPOSED PARCEL OF LAND LOCATED IN THE SE 1/4 SECTION 25, T2S, R12W, OSHTIMO TOWNSHIP, KALAMAZOO COUNTY, MICHIGAN

Beginning at a point 199.95 feet North and 133.01 feet West of the SE corner of Section 25, T2S, R12W, Oshtemo Township, Kalamazoo County, Michigan,

- thence Westerly parallel with the North right-of-way of Parkview Avenue 217.59 feet, also being the North line of an Easement in favor of Consumers Energy Company recorded in Docket 2001-034956, Kalamazoo County Records;
- thence Northerly parallel with the West right-of-way line of Drake Road 145 feet;
- thence Easterly parallel with the North right-of-way line of Parkview Avenue 217.60 feet to the a line 133.01 feet West of the West right-of-way line of Drake Road;
- thence Southerly parallel with the west right-of-way line of Drake Road and 133.01 feet West of the West right-of-way line of Drake Road a distance of 145 feet to the Point of Beginning. Being a part of the SE 1/4 of said Section 25 and containing 0.73 acres of land, more or less. Being subject to easements and restrictions of record, if any.



VICINITY SKETCH
NOT TO SCALE

LOCATION
LONGITUDE 85° 38' 56.7"
LATITUDE 42° 15' 37.9"
GROUND ELEV. @ TOWER BASE = 941.4

LEGAL DESCRIPTION OF OVERALL PARCEL

LEGAL DESCRIPTION OF A PARCEL OF LAND LOCATED IN THE SOUTHEAST 1/4 OF SECTION 25, TOWN 2 SOUTH, RANGE 12 WEST, OSHTIMO TOWNSHIP, KALAMAZOO COUNTY, MICHIGAN

All that part of the Southeast 1/4 of Section 25, Town 2 South, Range 12 West, Oshtemo Township, Kalamazoo County, Michigan and the South 62 feet of the East 1/2 of the Northeast 1/4 of said Section 25 lying East of the Easterly right-of-way line of US Highway 131. Being a part of the East 1/2 of Section 25, Town 2 South, Range 12 West, Oshtemo Township, Kalamazoo County, Michigan and containing 53.16 acres of land, more or less. Subject to the rights of the public as occupied by Parkview Avenue (variable width) and Drake Road (variable width). Also subject to easements and restrictions of record, if any.

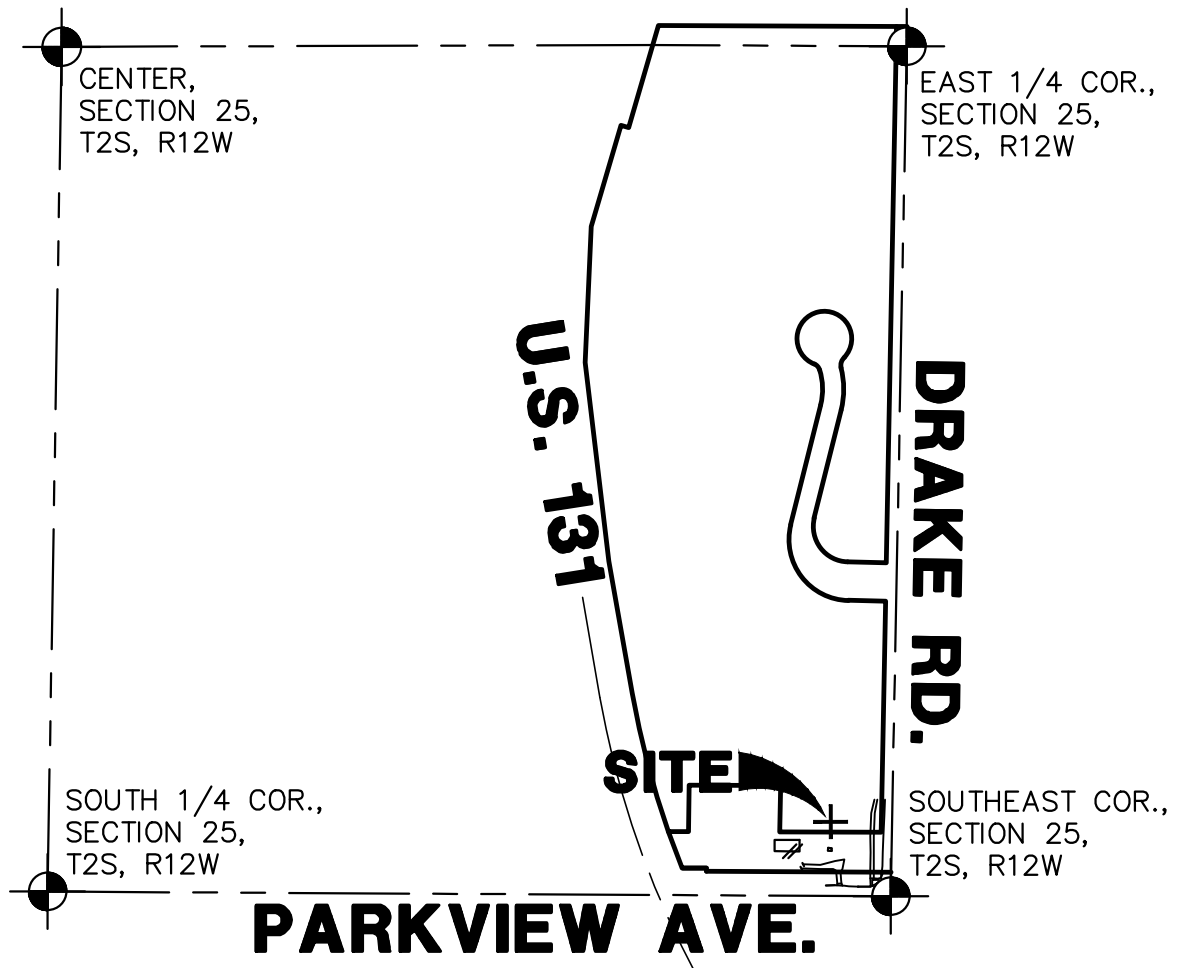
BENCH MARK
TOP OF BENCHTIE IN THE NORTHEAST FACE OF A UTILITY POLE LOCATED +/- 120 FEET NORTH OF THE CENTERLINE OF PARKVIEW AVENUE; +/- 196 FEET WEST OF THE CENTERLINE OF DRAKE ROAD; +/- 14 FEET NORTH OF A GRAVEL DRIVE; +/- 95 FEET EAST OF THE SOUTHEAST CORNER OF A FENCED COMPOUND;

ELEVATION = 945.58' (NAVD88 DATUM)

PROPERTY INFORMATION

TAX PARCEL: #05-25-430-010

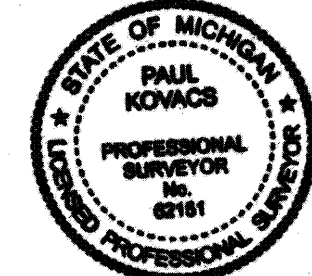
OWNER: WESTERN MICHIGAN UNIVERSITY
1903 W MICHIGAN UNIVERSITY
KALAMAZOO, MI 49009



OVERALL PARCEL SKETCH
SCALE: 1"=600'

PREPARED BY:
MIDWESTERN CONSULTING, L.L.C.

PAUL E. KOVACS, P.S. #62151



SITE #MPSCS 5112
WMU

OSHTIMO TOWNSHIP
KALAMAZOO COUNTY
MICHIGAN

REV.	DATE	DESCRIPTION
1	4/27/21	Initial Survey
2	4/27/21	Added Proposed KCCOA Parcel
3	4/27/21	Revised Proposed KCCOA Parcel
4	6/08/21	Revised Proposed KCCOA Parcel

MIDWESTERN CONSULTING

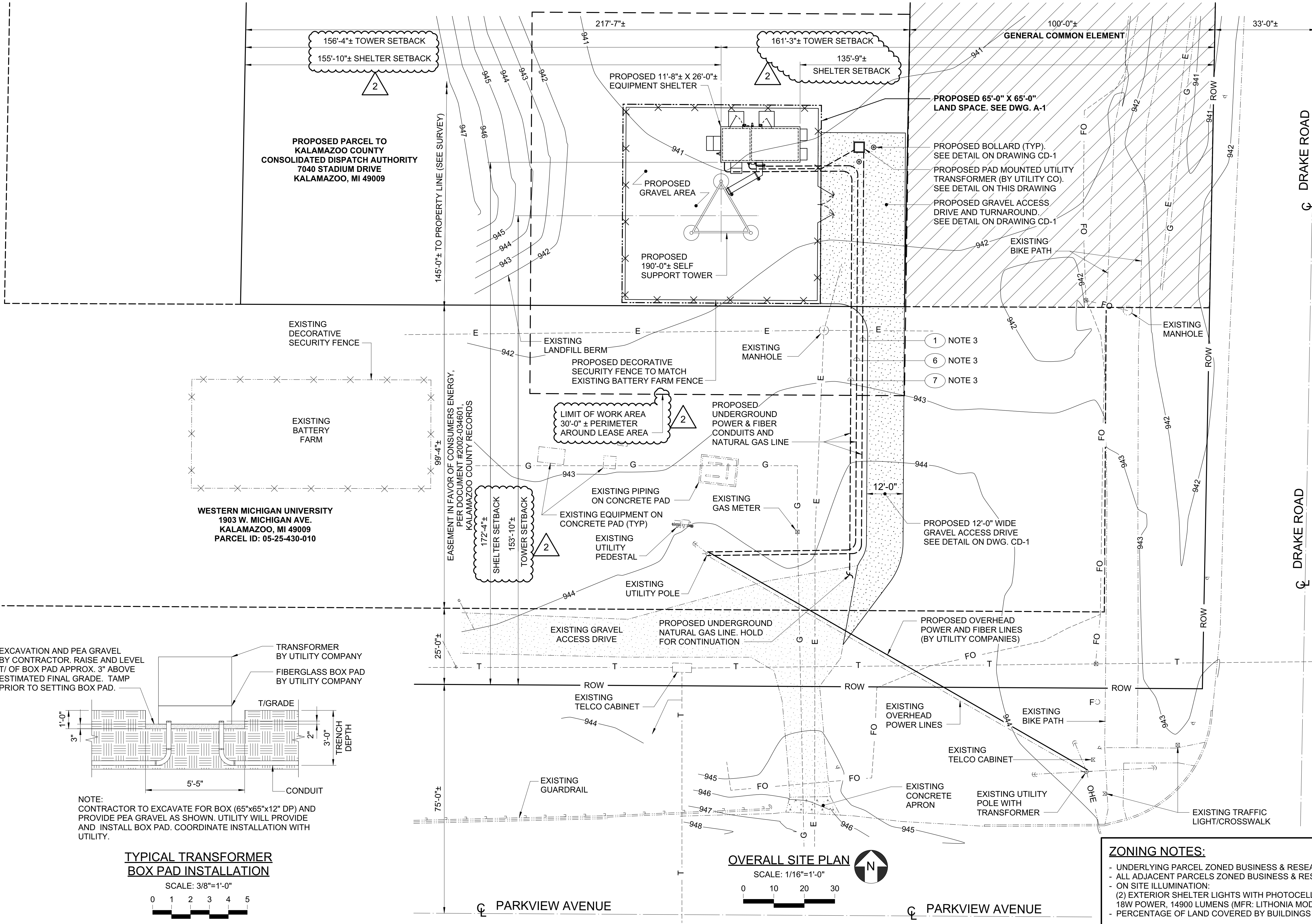
3845 Plaza Drive
Ann Arbor, Michigan 48108
(734) 995-0200
www.midwesternconsulting.com

Land Development • Land Survey
Institutional • Municipal
Wireless Communications
Transportation • Landfill Services

JOB No. 16188-20047
DATE: 02-22-2021
CADD: pk
ENG:
PM: pk
TECH: ssh
FILE: 16188-20047SV01
FB#: 552B8

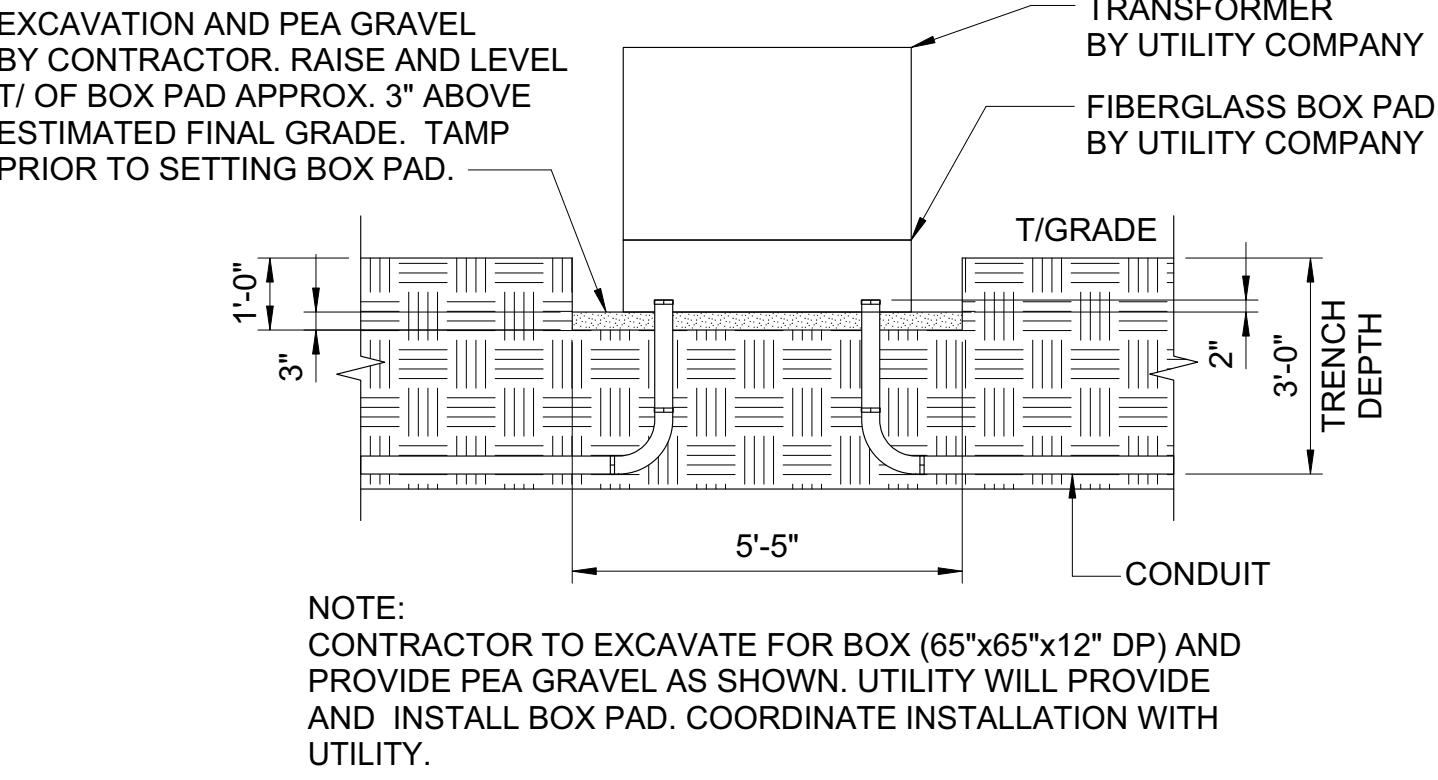
SITE SURVEY

1



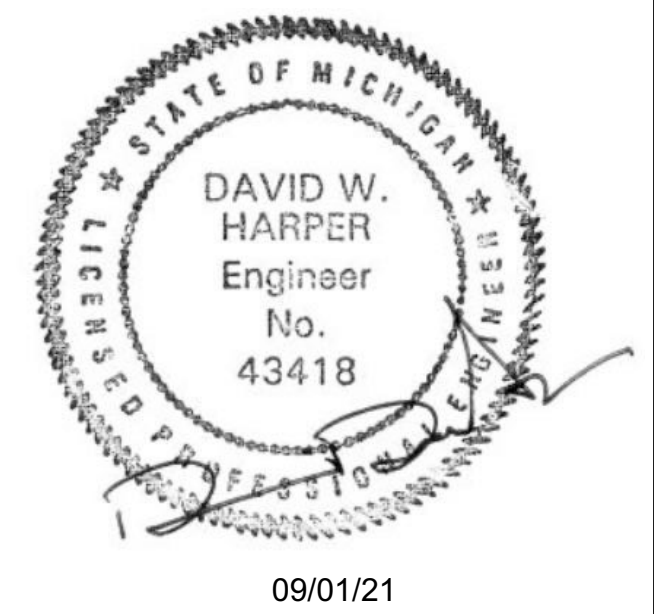
- GENERAL NOTES:**
1. PROPERTY OFFSETS ARE APPROXIMATE. FINAL LOCATION OF COMPOUND TO BE DEVELOPED FROM TOWER ϕ .
 2. THE LOCATION, SIZE & TYPE OF MATERIAL OF EXISTING UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING THE SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS & SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION & ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES & THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY SUCH MAINS & SERVICES SHALL BE RESORTED TO SERVICE AT ONCE & PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.
 3. ALL PROPOSED CONSTRUCTION ACTIVITIES & MODIFICATIONS SHALL COMPLY WITH MOTOROLA R-56 STANDARDS, MOST CURRENT REVISION.
 4. ANY DISCREPANCIES BETWEEN THIS DRAWING PACKAGE AND EXISTING FIELD CONDITIONS MUST BE REPORTED TO THE ENGINEER OF RECORD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

- NOTES:**
1. CONTRACTOR TO CALL "MISS DIG 811" AT (248) 370-6004 OR OTHER LOCAL JOINT UTILITY LOCATOR SERVICE TO VERIFY THE LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
 2. REFER TO DRAWINGS GN-1 AND GN-2 FOR GENERAL NOTES.
 3. (X) - INDICATES CONDUIT AND CABLE SCHEDULE TAG (REFER TO DWG. E-1). CONDUIT ROUTINGS SHOWN ARE DIAGRAMMATIC. CONTRACTOR TO GROUP CONDUIT RUNS TO MINIMIZE TRENCHING.
 4. FOR LEGAL DESCRIPTIONS, PROPERTY LINE LOCATIONS/BEARINGS, LAND SPACE, RIGHT OF WAYS, ETC. SEE SITE SURVEY BY MIDWESTERN CONSULTING REFERENCE FILE # 16188-20047SV01.



TYPICAL TRANSFORMER BOX PAD INSTALLATION
SCALE: 3/8"=1'-0"

- ZONING NOTES:**
- UNDERLYING PARCEL ZONED BUSINESS & RESEARCH PARK DISTRICT
 - ALL ADJACENT PARCELS ZONED BUSINESS & RESEARCH PARK DISTRICT
 - ON SITE ILLUMINATION:
(2) EXTERIOR SHELTER LIGHTS WITH PHOTOCELL
18W POWER, 14900 LUMENS (MFR: LITHONIA MODEL No. OLW-14
 - PERCENTAGE OF LAND COVERED BY BUILDINGS <10%



2	09/01/21	ADDED SETBACKS	GJB
1	07/12/21	REVISED GRAVEL DRIVE	GJB
0	05/25/21	FOR ZONING	GJB
C	05/06/21	FOR APPROVAL	GJB
B	04/15/21	FOR APPROVAL	GJB
A	03/31/21	FOR APPROVAL	GJB
Rev.	Date:	Description:	Mgr.



SCALE: AS NOTED
DRAWN BY: GJB
CHECKED BY: GJB
DATE: 03/04/21
FILE: 20-216-006

OVERALL SITE PLAN

5112 WMU BTR2
PARKVIEW AVENUE
KALAMAZOO, MI 49009

Drawing / Rev.

C-1/2

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KEYNOTE LEGEND:

- 1

END AND CORNER POSTS: 3"± SQUARE, (MATCH EXISTING)
- 2

CONCRETE FOUNDATION: 42"x12" DIA. (3000 PSI).
- 3

LINE POSTS: 2"± SQUARE, (MATCH EXISTING)
- 4

CONCRETE FOUNDATION: 42"x10" DIA. (3000 PSI).
- 5

GATE POSTS: 4"± SQUARE, (MATCH EXISTING)
- 6

CONCRETE FOUNDATION: 48"x12" DIA. (3000 PSI).
- 7

HORIZONTAL RAIL: 1 1/2"± SQUARE, (MATCH EXISTING)
- 8

GATE FRAME: 2"± SQUARE, (MATCH EXISTING)
- 9

GATE HINGES: NON-LIFT-OFF TYPE, OFFSET TO PERMIT 180 DEGREE SWING.
- 10

DOUBLE GATE LATCH: MATCH EXISTING
- 11

LOCK CHAIN: 3/8" SIZE 36" LONG, HOT DIPPED (GALV.) ZINC COATED, W/ KEY LOCK
- 12

CONTRACTOR TO INSTALL KNOX BOX 3200 SERIES WITH ZIP CODE COMBINATION # 49009 NEAR THE ACCESS GATE (FIELD LOCATE). KNOX BOX SHALL CONTAIN (1) KEY FOR ACCESS GATE AND (1) KEY FOR SHELTER.

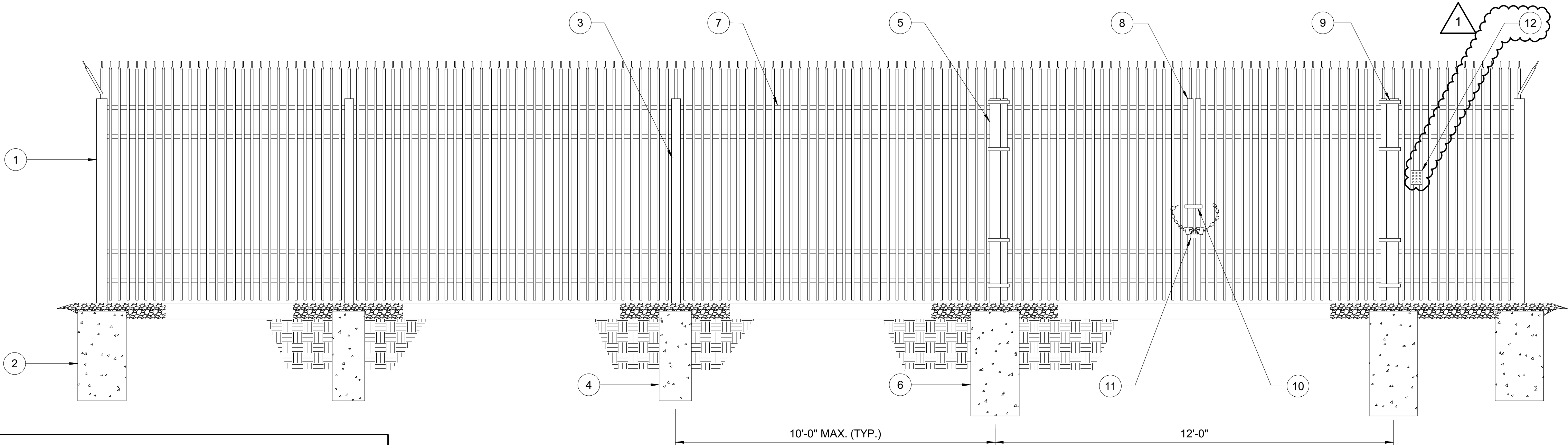
NOTES:

1. REFER TO PROJECT SPECIFICATIONS FOR INFORMATION NOT SHOWN IN THE DRAWING.
2. DO NOT BEGIN INSTALLATION AND ERECTION BEFORE FINAL GRADING IS COMPLETED UNLESS OTHERWISE PERMITTED. INSTALL FENCING AND GATES AS SHOWN ON PLANS.
3. DRILL OR HAND-EXCAVATE (USING POST - HOLE DIGGERS) HOLES FOR POSTS TO DIAMETERS AND SPACING INDICATED. IN FIRM, UNDISTURBED OR COMPACTED SOIL. IF NOT INDICATED ON DRAWINGS, EXCAVATE HOLES FOR EACH POST TO MINIMUM DIAMETER RECOMMENDED BY FENCE MANUFACTURER, BUT NOT LESS THAN FOUR (4) TIMES LARGEST CROSS-SECTION OF POST.
4. REMOVE POST HOLE SPOILS FROM SITE. DO NOT SET SPOILS ON AGGREGATE WITHOUT ADEQUATE PROTECTION.
5. PROTECT PORTION OF POSTS ABOVE GROUND FROM CONCRETE SPLATTER. PLACE CONCRETE AROUND POSTS AND VIBRATE OR TAMP FOR CONSOLIDATION. CHECK EACH POST FOR VERTICAL AND TOP ALIGNMENT AND HOLD IN POSITION DURING PLACEMENT AND FINISHING OPERATIONS. UNLESS OTHERWISE SHOWN, EXTEND CONCRETE FOOTING TWO (2) INCHES ABOVE GRADE AND TROWEL TO A CROWN TO SHED WATER.



PHOTO OF EXISTING FENCE (FOR REFERENCE ONLY)

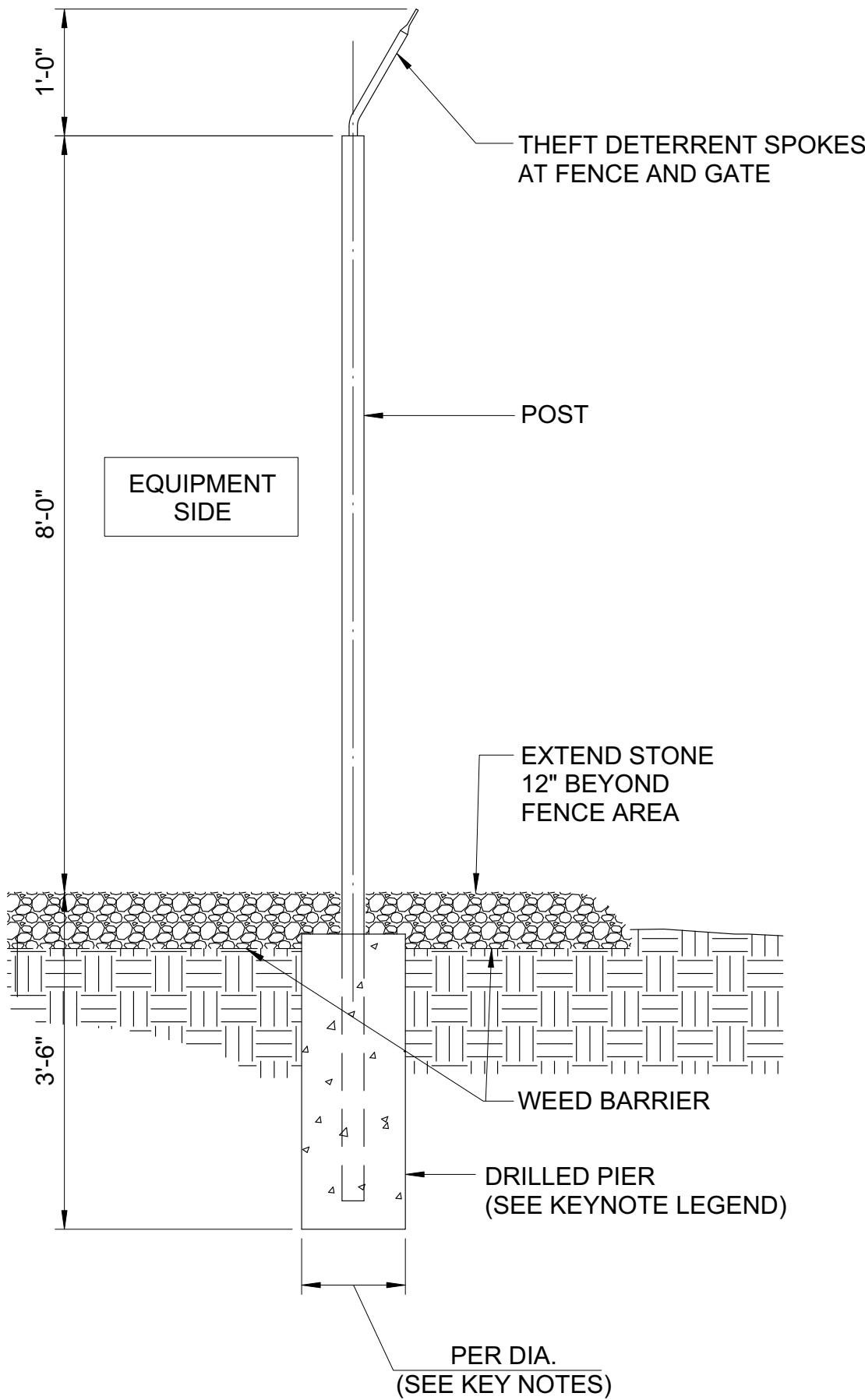
SCALE: NONE



TYPICAL FENCE ELEVATION

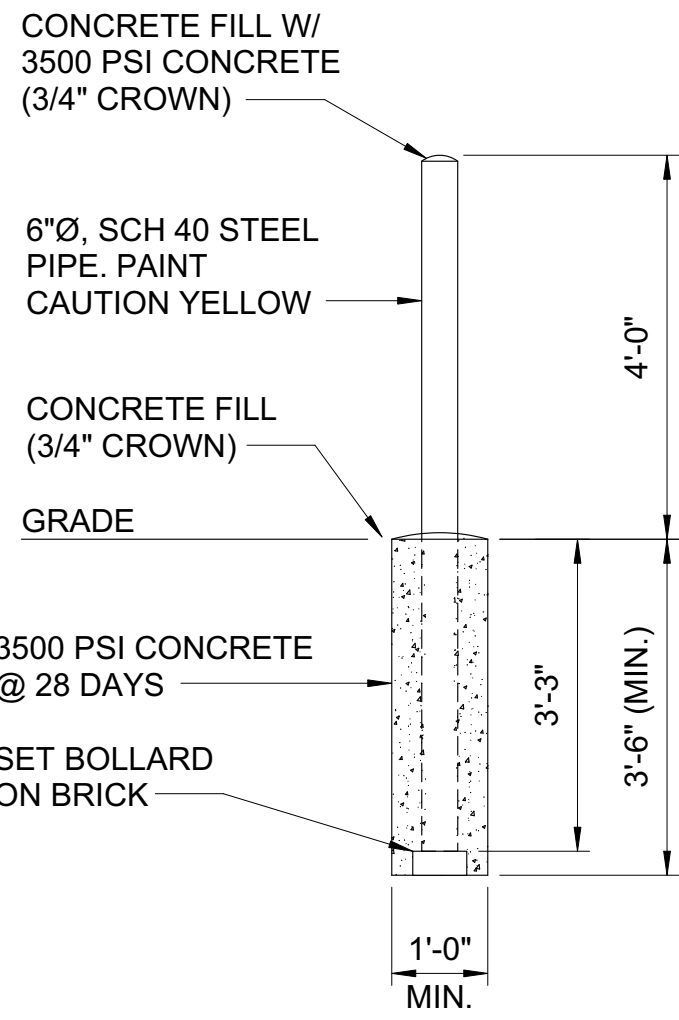
SCALE: NONE

NOTE:
NEW FENCE TO MATCH EXISTING FENCE ON
WESTRN MICHIGAN UNIVERSITY PROPERTY



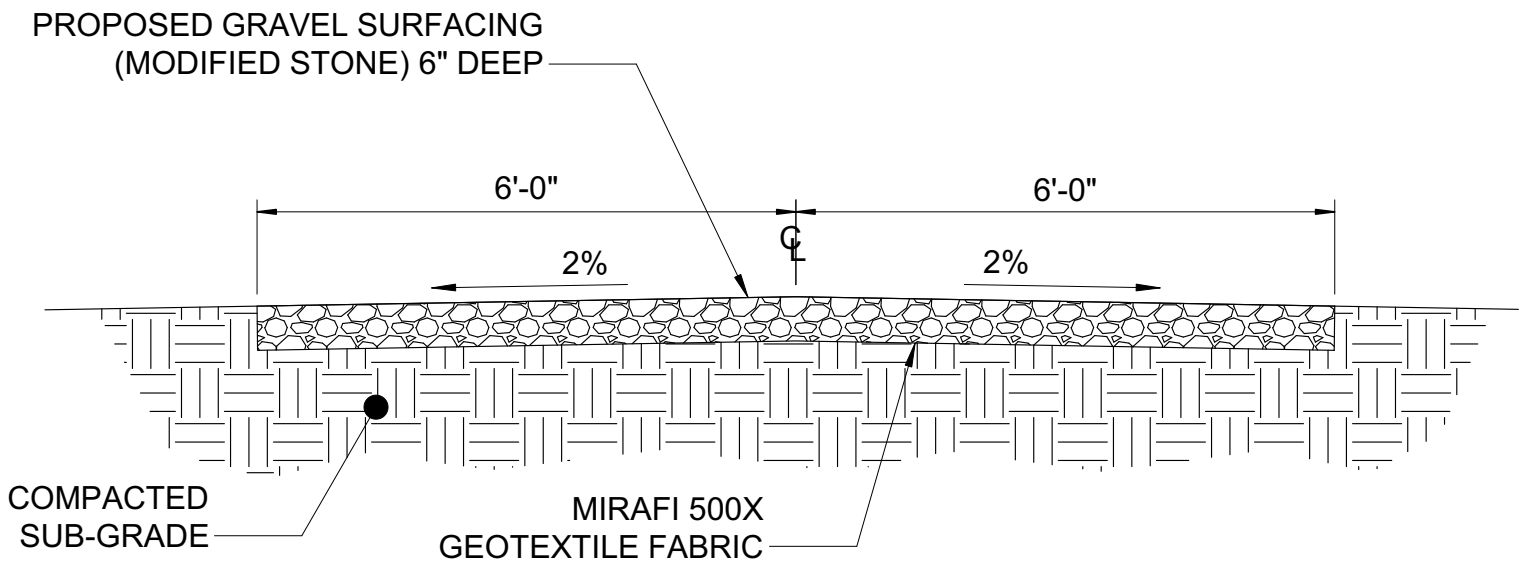
TYPICAL FENCE SECTION

SCALE: NONE



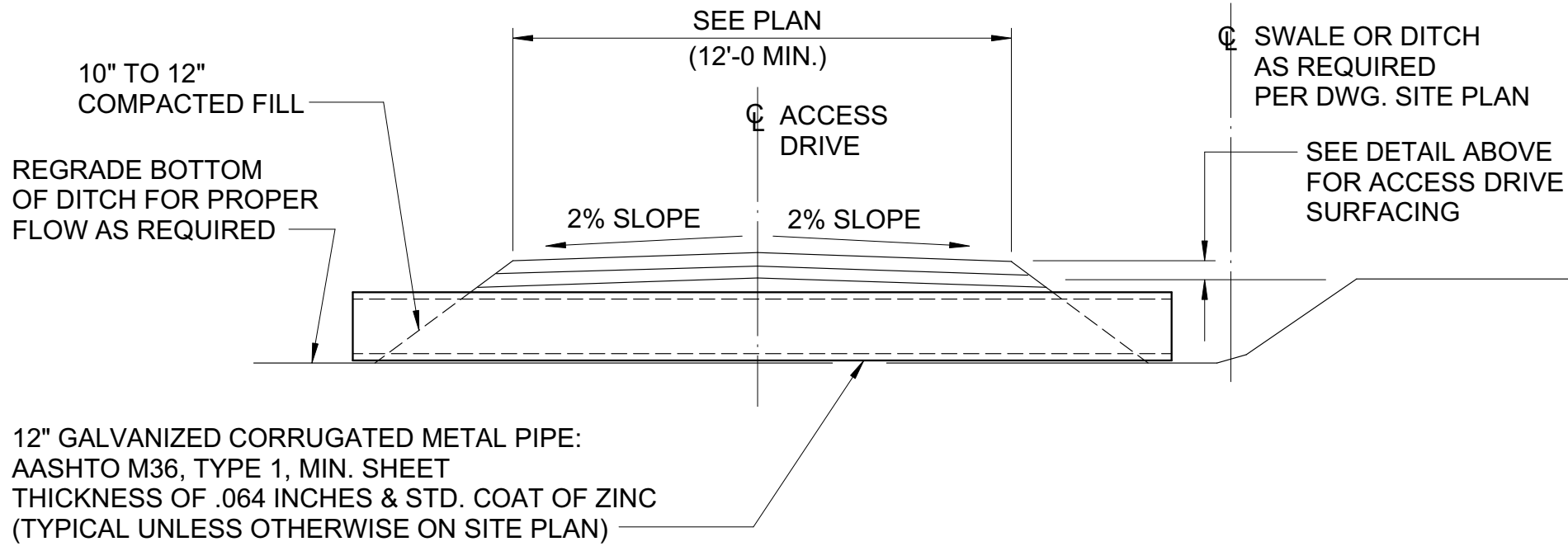
BOLLARD DETAIL

SCALE: NONE



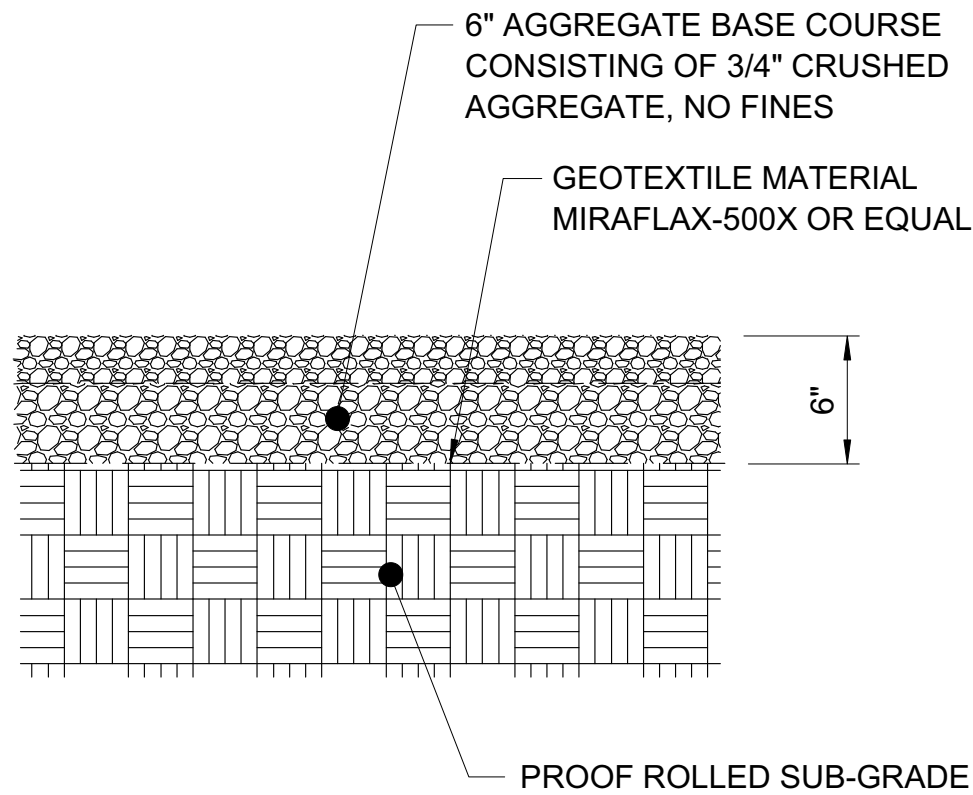
GRAVEL DRIVEWAY TYPICAL SECTION

SCALE: NONE



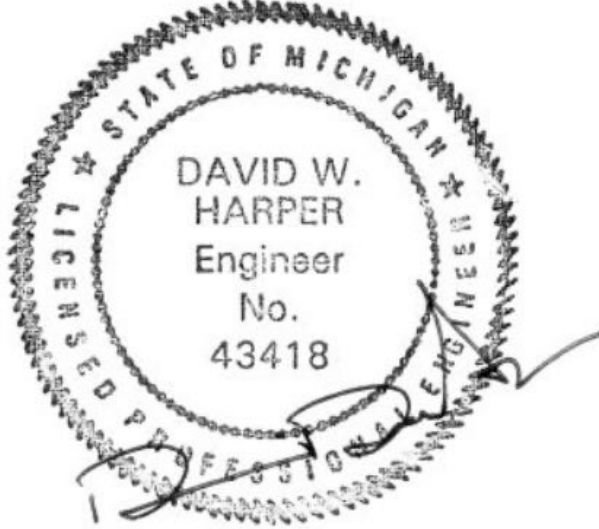
TYPICAL ACCESS DRIVE & CULVERT DETAIL

SCALE: NONE (IF APPLICABLE)



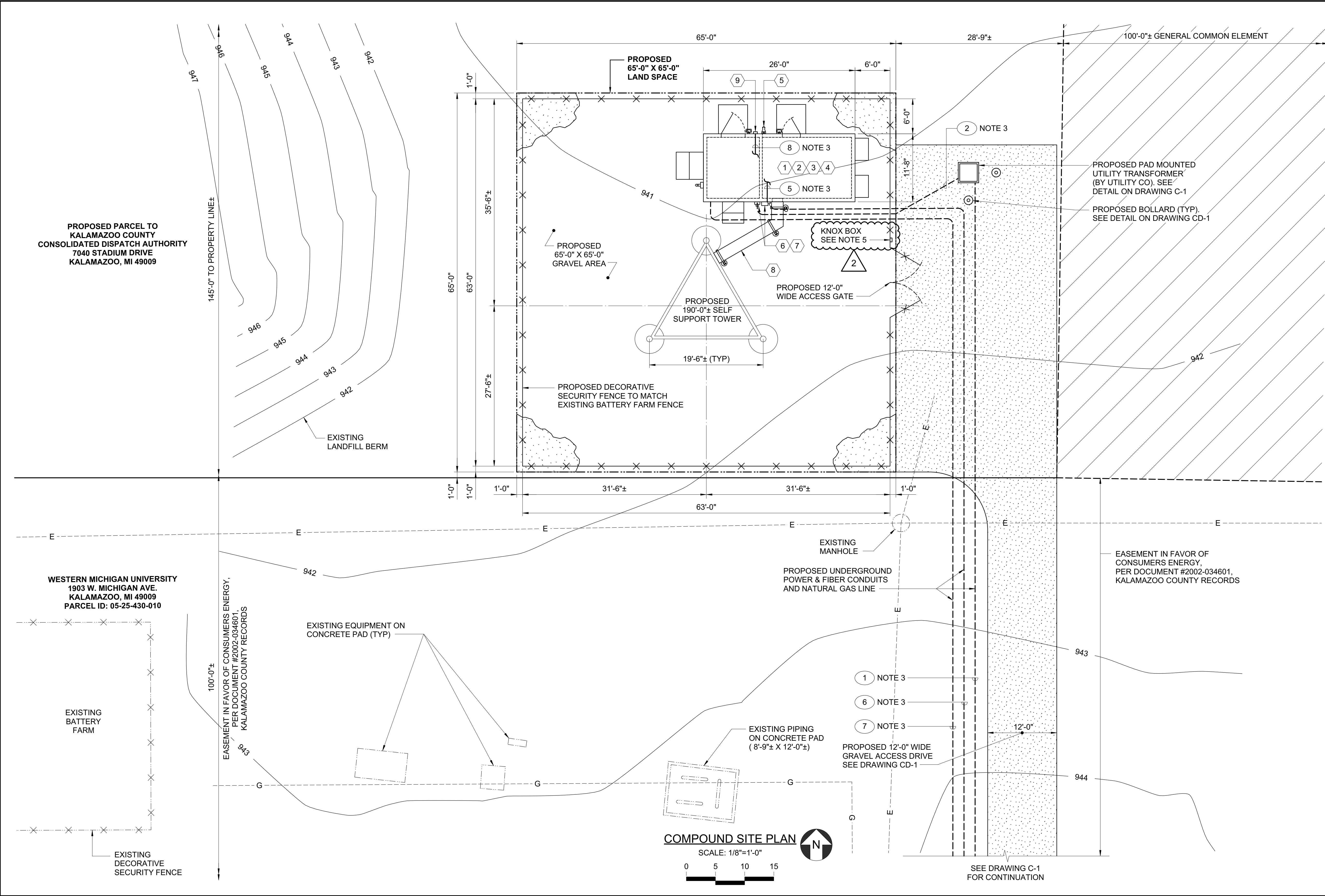
AGGREGATE BASE DETAIL

SCALE: NONE



09/01/21

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1	09/01/21	ADDED KNOX BOX (ITEM 12)	GJB	 MOTOROLA SOLUTIONS	 PYRAMID Network Services, LLC 6615 TOWPATH ROAD, SUITE 200 EAST SYRACUSE, NY 13057 PHONE: (315) 701-1300	 EMERALD DESIGN & CONSTRUCTION 5130 WEST 6TH STREET CLEVELAND, OH. 44141	HARPER ENGINEERING, INC. TELECOM GROUP 815 Superior Ave. Suite 1514 Cleveland, OH. 44114 Phone: (216)344-3855 Fax: (216)344-3856	SCALE: AS NOTED	5112 WMU BTR2 PARKVIEW AVENUE KALAMAZOO, MI 49009	Drawing / Rev.
0	05/25/21	FOR ZONING	GJB					CHECKED BY: GJB		CD-1/1
B	04/15/21	FOR APPROVAL	GJB					DATE: 03/04/21		
A	03/31/21	FOR APPROVAL	GJB					FILE: 20-216-006		
Rev.	Date:	Description:	Mgr.					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.		

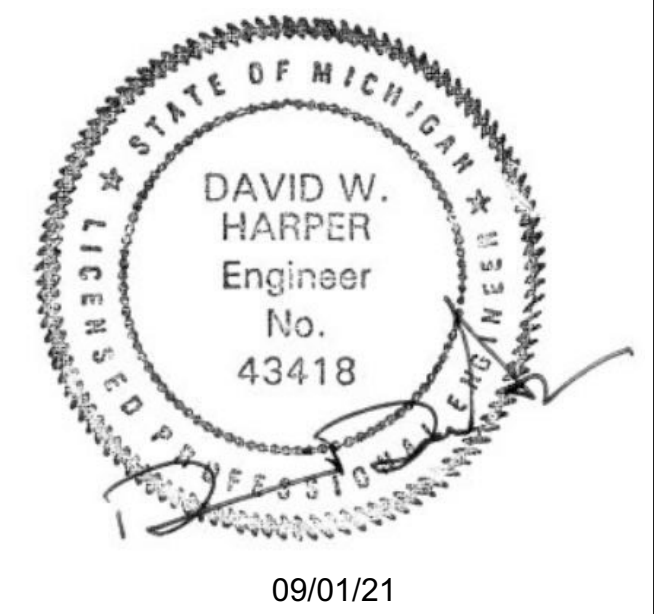


ITEM	EQUIPMENT LEGEND
1	EQUIPMENT SHELTER ON CONCRETE FOUNDATION. SEE DRAWINGS S-1, S-2 & S-3
2	200A ATS AND DISTRIBUTION PANEL SUPPLIED W/ SHELTER. SEE DRAWING E-1
3	200A MANUAL TRANSFER SWITCH SUPPLIED W/ SHELTER. SEE DRAWING E-1
4	50KW NATURAL GAS GENERATOR SUPPLIED W/ SHELTER. SEE DRAWING E-1
5	200A GENERATOR RECEPTACLE SUPPLIED W/ SHELTER. SEE DRAWING E-1
6	METER SEE DRAWING E-1
7	SERVICE DISCONNECT SWITCH SEE DRAWING E-1
8	ICE BRIDGE (APPROX. 17'-0"± LONG) SEE DRAWING S-1
9	GENERATOR EMERGENCY STOP PUSHBUTTON (E-STOP) SEE DRAWING E-1

NOTES:

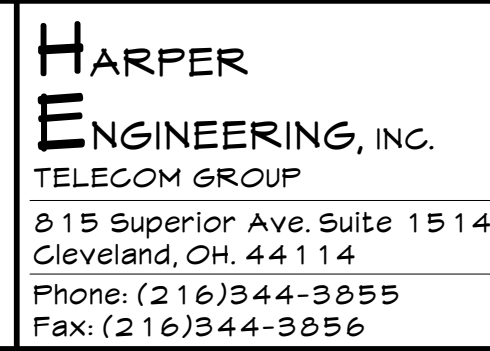
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2. REFER TO DRAWINGS GN-1 AND GN-2 FOR GENERAL NOTES.
3. (X) - INDICATES CONDUIT AND CABLE SCHEDULE TAG (REFER TO DWG. E-1). CONDUIT ROUTINGS SHOWN ARE DIAGRAMMATIC. CONTRACTOR TO GROUP CONDUIT RUNS TO MINIMIZE TRENCHING.
4. FOR LEGAL DESCRIPTIONS, PROPERTY LINE LOCATIONS/BEARINGS, LAND SPACE, RIGHT OF WAYS, ETC. SEE SITE SURVEY BY MIDWESTERN CONSULTING REFERENCE FILE # 16188-20047SV01.
5. CONTRACTOR TO INSTALL KNOX BOX 3200 SERIES WITH ZIP CODE COMBINATION # 49009 NEAR THE ACCESS GATE. KNOX BOX SHALL CONTAIN (1) KEY FOR ACCESS GATE AND (1) KEY FOR SHELTER.

2



09/01/21

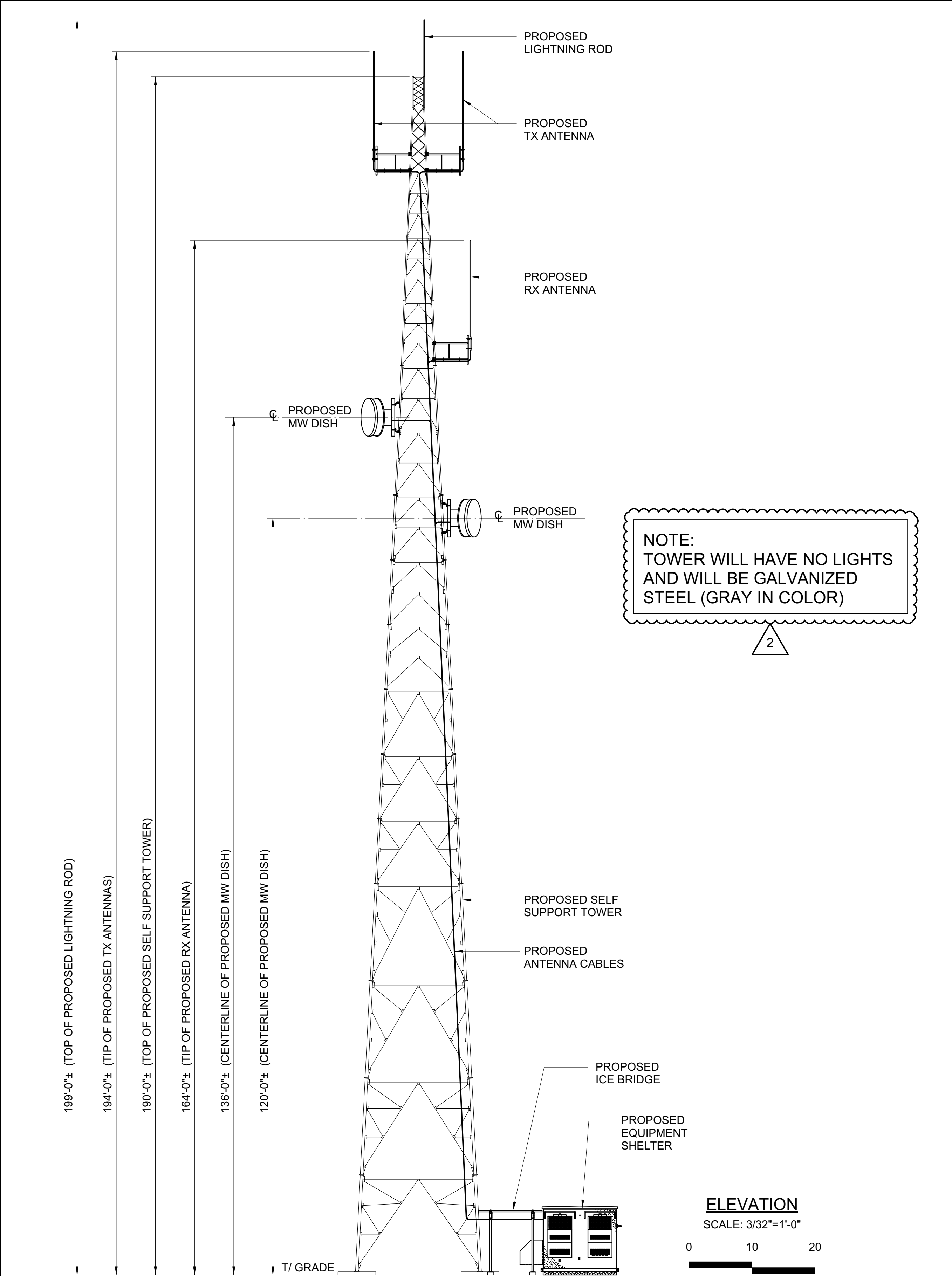
2	09/01/21	ADDED KNOX BOX	GJB
1	07/12/21	REVISED GRAVEL DRIVE	GJB
0	05/25/21	FOR ZONING	GJB
C	05/06/21	FOR APPROVAL	GJB
B	04/15/21	FOR APPROVAL	GJB
A	03/31/21	FOR APPROVAL	GJB
Rev.	Date:	Description:	Mgr.



COMPOUND SITE PLAN	
5112 WMU BTR2 PARKVIEW AVENUE KALAMAZOO, MI 49009	
SCALE: AS NOTED DRAWN BY: GJB CHECKED BY: GJB DATE: 03/04/21 FILE: 20-216-006	Drawing / Rev. A-1/2

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SITE: 5112 WMU										ANTENNA / APPURTENANCE LOCATION CHART				
LATITUDE: N. 42° 15' 37.8"														
LONGITUDE: W. 85° 38' 56.7"														
GROUND ELEV.: 941.6' AMSL APPROX.														
ANTENNA INFORMATION										FEEDLINE NFORMATION				
ANTENNA ID	MANUFACTURER	MODEL	TYPE	LENGTH	BOTTOM ELEV.	RAD CENTER	TOP ELEV.	AZIMUTH	QTY.	TYPE	MANUFACTURER	MODEL	SIZE	QTY.
TX1	dbSPECTRA	DSDS7C12P36UD	OMNI	20'-6"	XXX'	XXX'	194'	XX	1	COAX	COMMSCOPE	AVA7-50	1 5/8"	1
TX2	dbSPECTRA	DSDS7C12P36UD	OMNI	20'-6"	XXX'	XXX'	194'	XX	1	COAX	COMMSCOPE	AVA7-50	1 5/8"	1
RX1	dbSPECTRA	DSDS7C12P36UD	OMNI	20'-6"	XXX'	XXX'	164'	XX	1	COAX	COMMSCOPE	AVA5-50	7/8"	1
MW1	COMMSCOPE	VHLP6-6W	MW	6'	XXX'	136'	XXX'	179.16° TO 5113	1	CAT5	COMMSCOPE	EW52	2.2"x1.3"	1
MW2	COMMSCOPE	VHLP6-6W	MW	6'	XXX'	120'	XXX'	322.27° TO 5111	1	CAT5	COMMSCOPE	EW52	2.2"x1.3"	1
												EW52		

REFER TO TOWER MANUFACTURER DRAWINGS FOR BEACON AND OBSTRUCTION LIGHTING HEIGHTS (IF REQUIRED)

GENERAL NOTES:

HARPER ENGINEERING, INC. HAS NOT COMPLETED A STRUCTURAL ANALYSIS FOR THE EXISTING OR PROPOSED LOADING OF ANY STRUCTURES AT THIS TIME. FINAL STRUCTURAL ANALYSIS TO BE COMPLETED BY OTHERS PRIOR TO CONSTRUCTION ACTIVITIES COMMENCE.

ALL VERTICAL TRANSMISSION LINE RUNS FROM THE ANTENNAS SHALL BE GROUNDED NEAR TO THE TOP AND BOTTOM OF THE TOWER (BEFORE THE CABLE MAKES HORIZONTAL TRANSITION & NEAR ENTRY PORT ON THE EQUIPMENT ROOM WALL). ADDITIONAL TRANSMISSION LINE GROUND KITS SHALL BE INSTALLED AS NEEDED TO LIMIT THE DISTANCE BETWEEN GROUND KITS TO 75 FEET.

THE CONTRACTORS SHALL CONDUCT TESTING TO MOTOROLA SPECIFICATIONS WITH PERSONNEL TRAINED IN THE EQUIPMENT AND METHODS. RESULTS TO BE SUBMITTED TO MOTOROLA.

DRIP LOOPS SHALL BE INCORPORATED IN CABLE RUNS TO PREVENT WATER FROM TRICKLING DOWN THE LINES INTO THE EQUIPMENT ROOM.

ALL TRANSMISSION LINES SHALL BE MARKED WITH APPROPRIATE COLOR TAPE BANDS (ONE INCH WIDE COLOR TAPE) FOR IDENTIFICATION NEAR THE ANTENNA. JUST BEFORE ENTERING THE EQUIPMENT ROOM AS WELL AS INSIDE THE EQUIPMENT ROOM, BEFORE CONNECTING TO THE SURGE SUPPRESSORS. SEE MOTOROLA SPECS FOR COLOR CODING SCHEME.

2

09/01/21

ADDED TOWER NOTE

GJB

1

07/12/21

REVISED MW RAD CENTERS & AZIMUTHS

GJB

0

05/25/21

FOR ZONING

GJB

B

05/06/21

FOR APPROVAL

GJB

A

03/31/21

FOR APPROVAL

GJB

Rev.

Date:

Description:

Mgr.

HARPER
ENGINEERING, INC.
TELECOM GROUP
815 Superior Ave. Suite 1514
Cleveland, OH 44114
Phone: (216)344-3855
Fax: (216)344-3856

TOWER ELEVATION AND ANTENNA INFO

SCALE: AS NOTED

DRAWN BY: GJB

CHECKED BY: GJB

DATE: 03/04/21

FILE: 20-216-006

5112 WMU BTR2

PARKVIEW AVENUE

KALAMAZOO, MI 49009

Drawing / Rev.

A-2/2

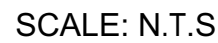
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SCALE: N.T.S

1. ANTENNAS, CONNECTORS, JUMPERS, TRANSMISSION LINES, TO BE FURNISHED BY MOTOROLA, AND INSTALLED BY CONTRACTOR.
2. CONTRACTOR TO USE STRAIN RELIEF EVERY 200 FEET (MIN.) FOR TRANSMISSION LINES. TO BE INSTALLED BEFORE INSTALLATION OF TRANSMISSION LINES.
3. CONTRACTOR TO WATERPROOF ALL EXTERNAL CONNECTORS.
4. CONTRACTOR TO INSTALL GALVANIZED OR STAINLESS STEEL MOUNTING HARDWARE.
5. CONTRACTOR TO ATTACH CABLES TO TOWER EVERY 3 FOOT (MAX.)
6. CONTRACTOR SHALL PERFORM A SWEEP TEST ON TRANSMISSION AND TEST LINES PRIOR TO INSTALLATION. IMMEDIATELY NOTIFY MOTOROLA OF ANY LINE DEFICIENCIES.
7. ALL VERTICAL TRANSMISSION LINE RUNS FROM THE ANTENNAS WILL BE GROUNDED NEAR THE TOP & BOTTOM OF THE TOWER (BEFORE THE CABLE MAKES HORIZONTAL TRANSITION & NEAR ENTRY PORT ON THE EQUIPMENT ROOM). TRANSMISSION LINE GROUND KITS WILL BE INSTALLED EVERY 50 TO 75 FEET.
8. VERIFY IN FIELD OR REVIEW THE TOWER STRUCTURAL ANALYSIS FOR MEMBER SIZE PRIOR TO ORDERING ANTENNA MOUNTS.
9. CONTRACTOR SHALL VERIFY THE RF CONFIGURATION & STRUCTURAL ANALYSIS BEFORE INSTALLATION.

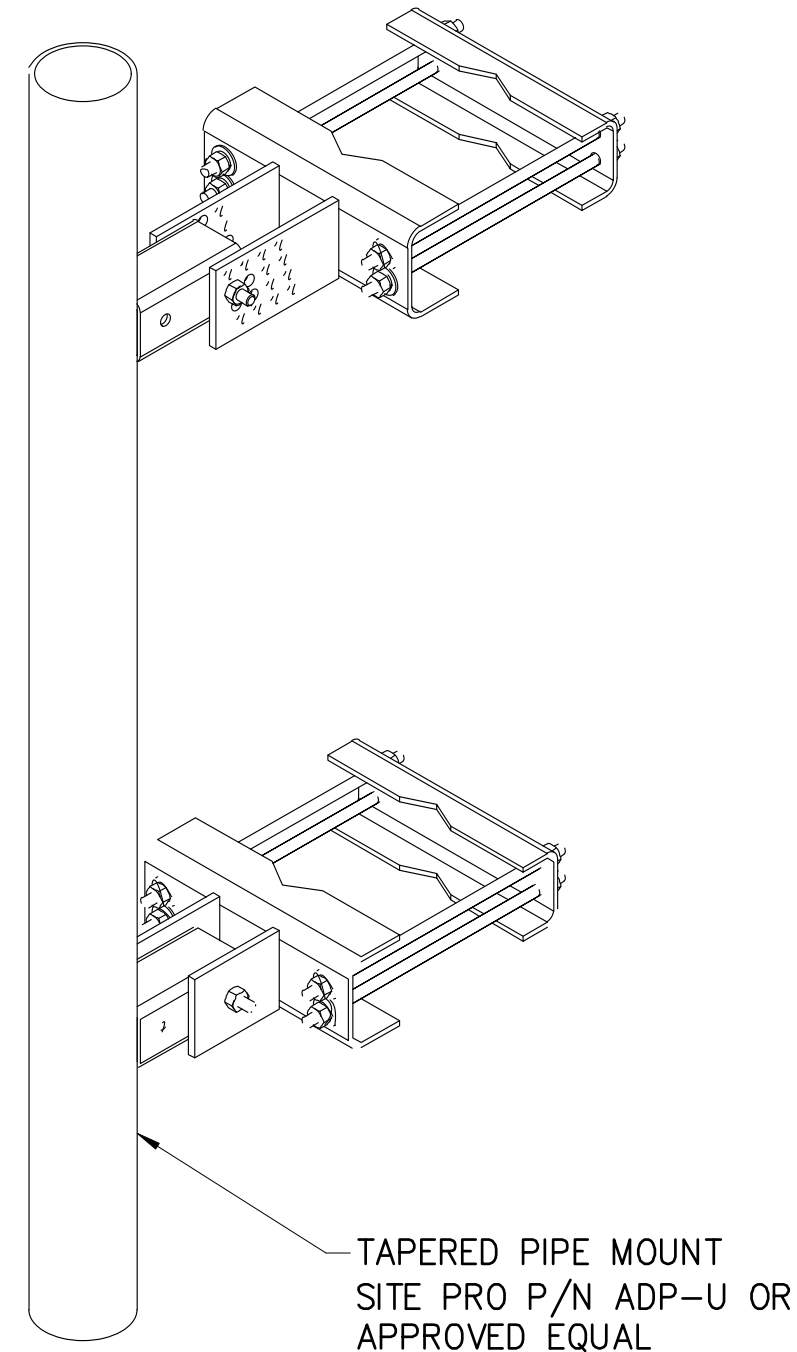
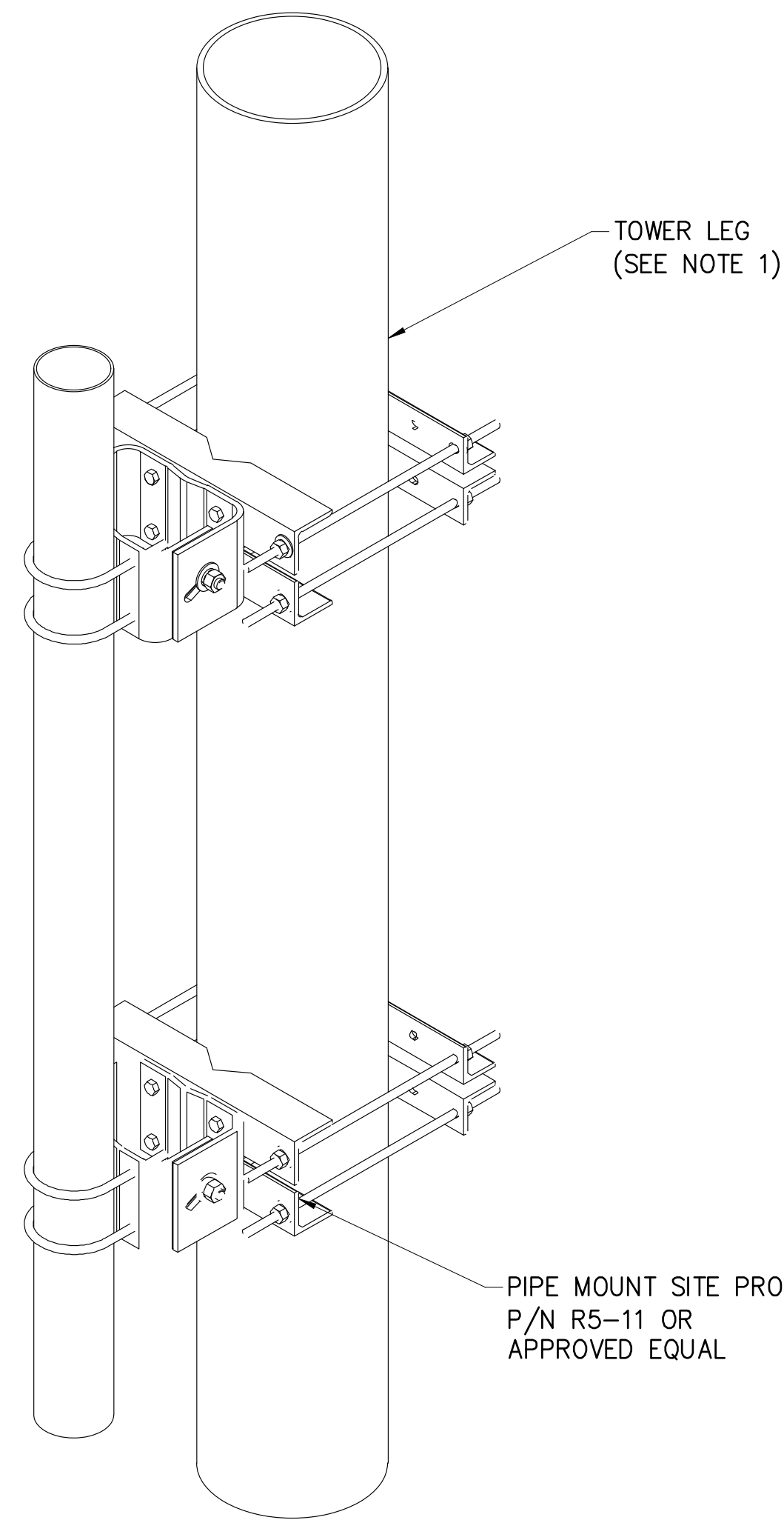


A-3/0

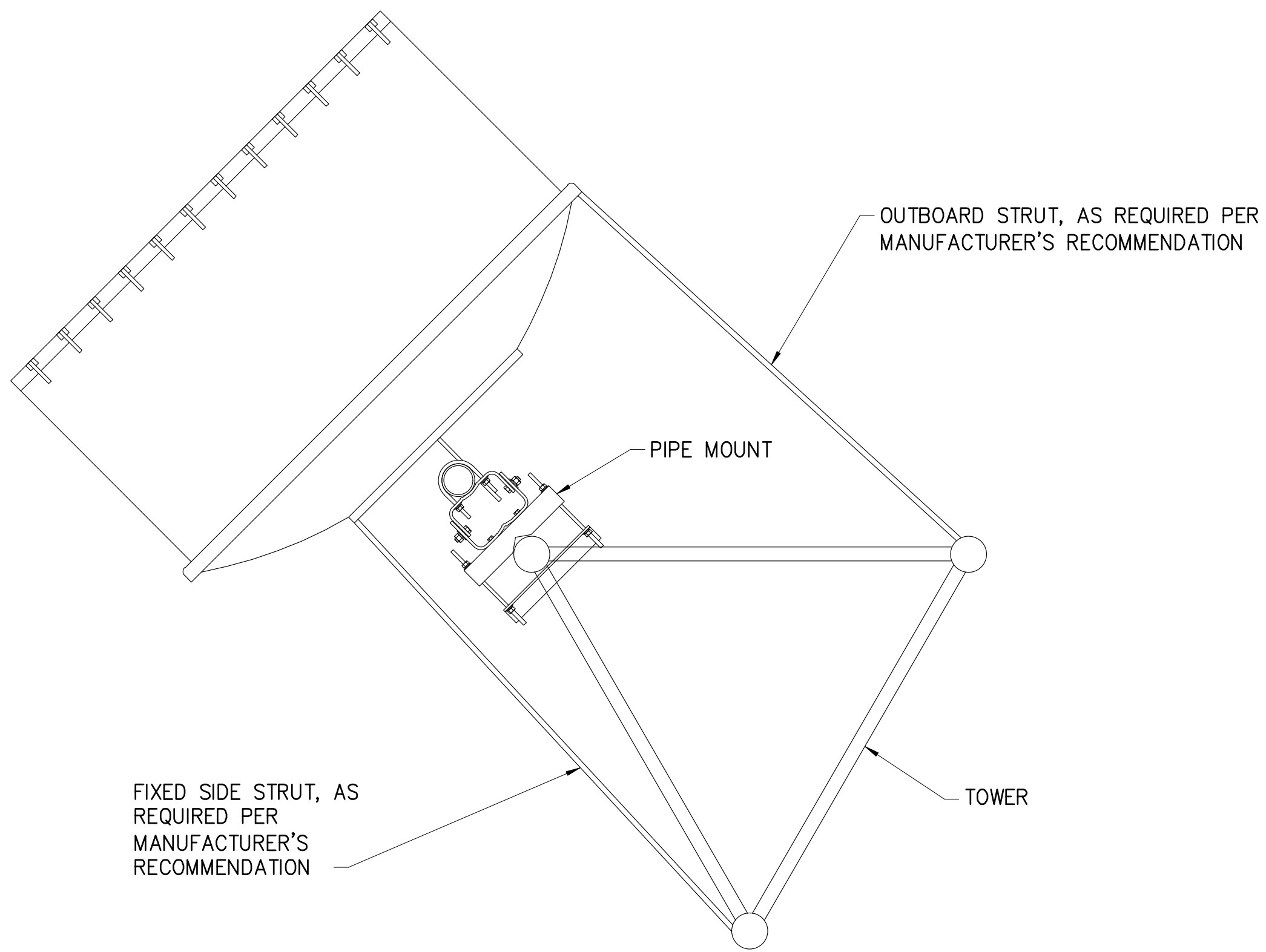
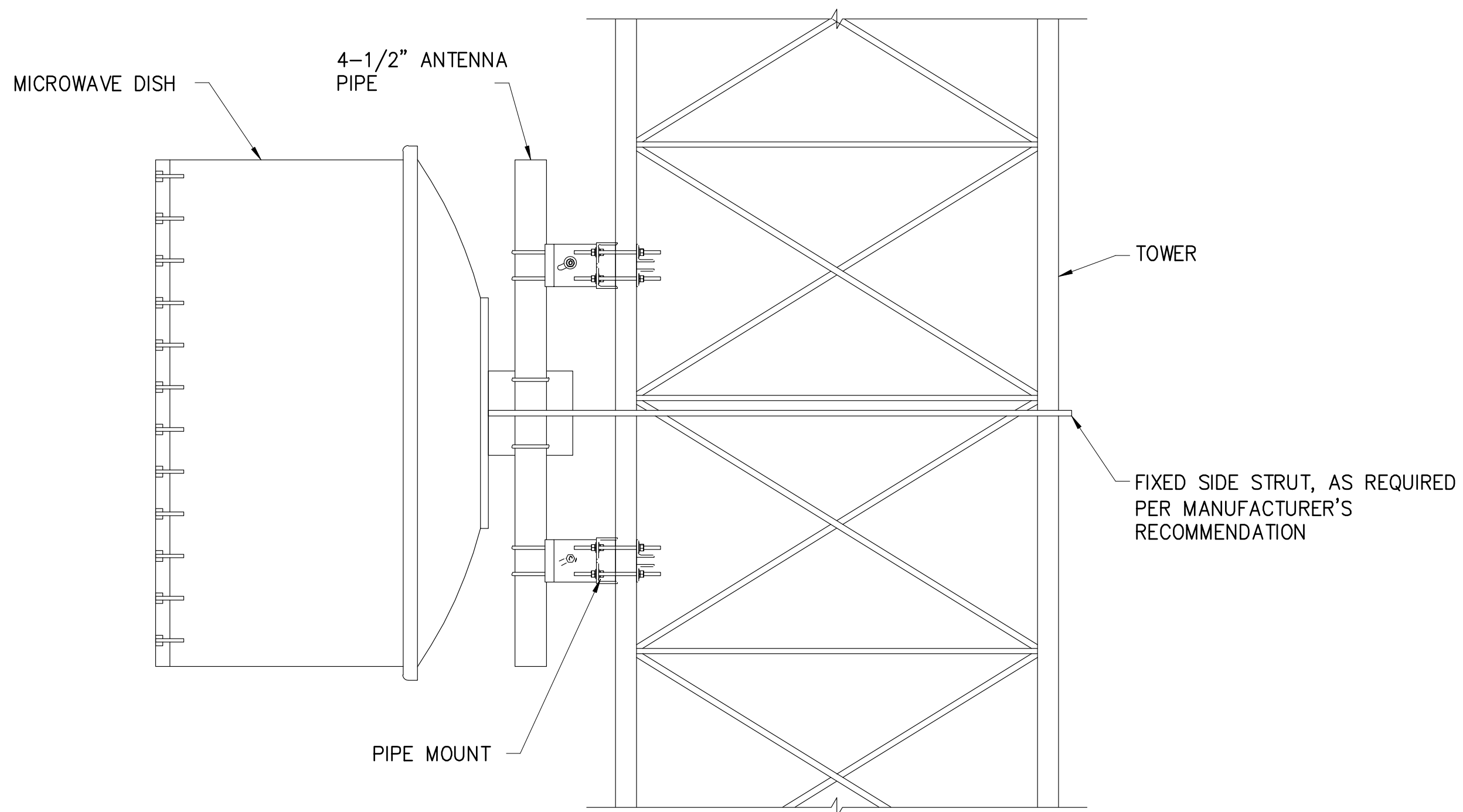
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- NOTES:
1. VERIFY IN FIELD OR REVIEW THE TOWER STRUCTURAL ANALYSIS FOR MEMBER SIZE PRIOR TO ORDERING ANTENNA MOUNTS.
 2. CONTRACTOR SHALL VERIFY THE RF CONFIGURATION & STRUCTURAL ANALYSIS BEFORE INSTALLATION.

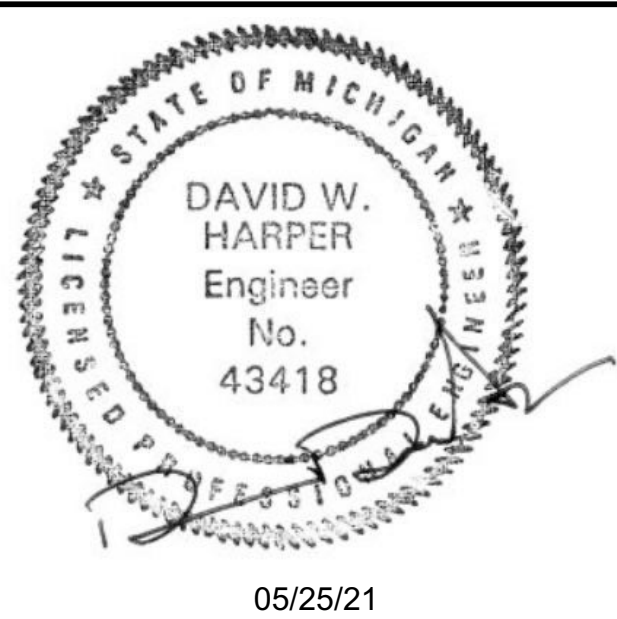


1 Microwave Dish Mounts

NOT TO SCALE

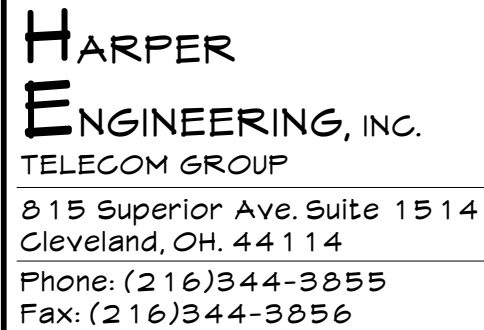
2 Microwave Dish Mounting

NOT TO SCALE



05/25/21

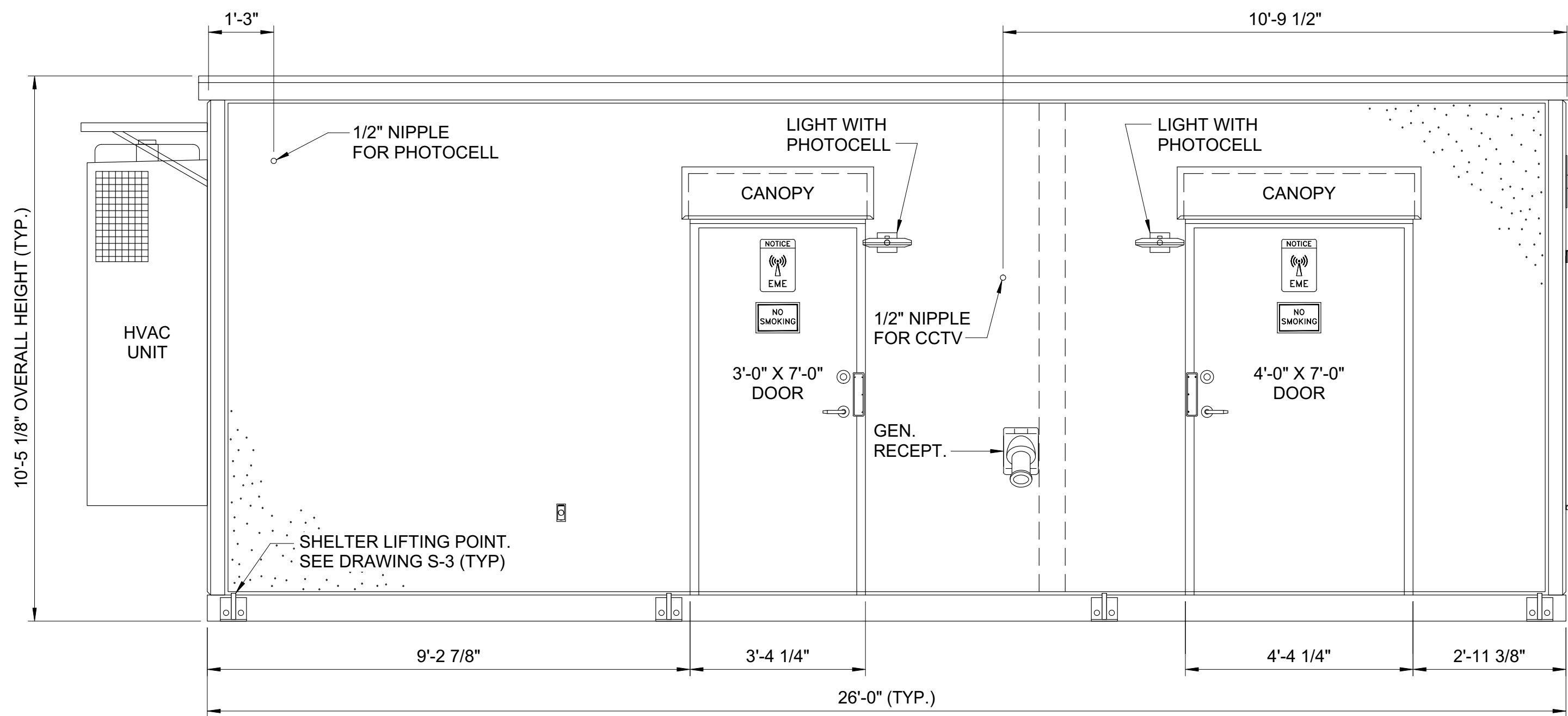
Rev.	Date:	Description:	Mgr.
0	05/25/21	FOR ZONING	GJB
A	03/31/21	FOR APPROVAL	GJB



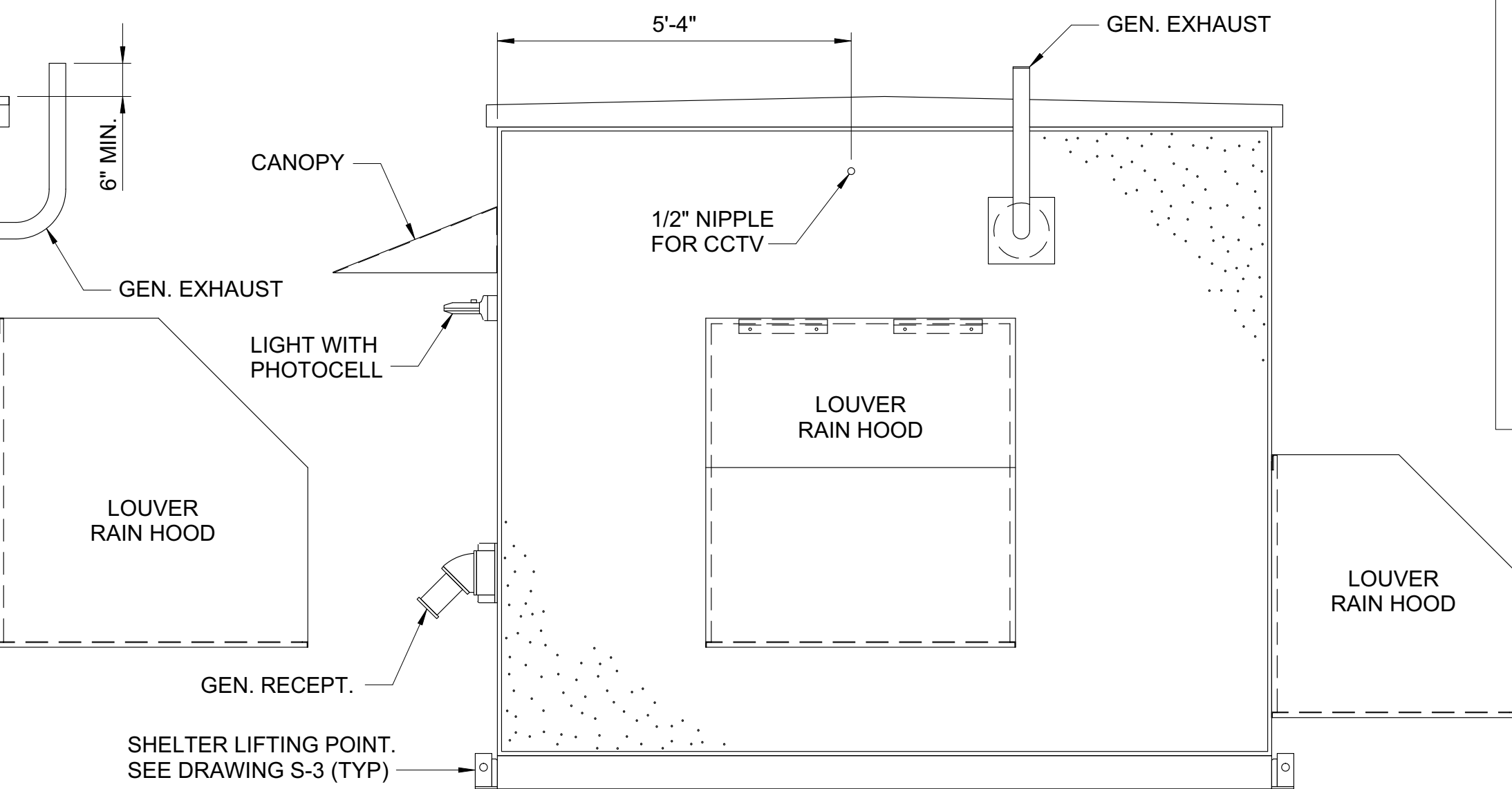
ANTENNA DETAILS		
SCALE: AS NOTED	5112 WMU BTR2 PARKVIEW AVENUE KALAMAZOO, MI 49009	Drawing / Rev.
DRAWN BY: GJB		A-4/0
CHECKED BY: GJB		
DATE: 03/04/21		
FILE: 20-216-006		

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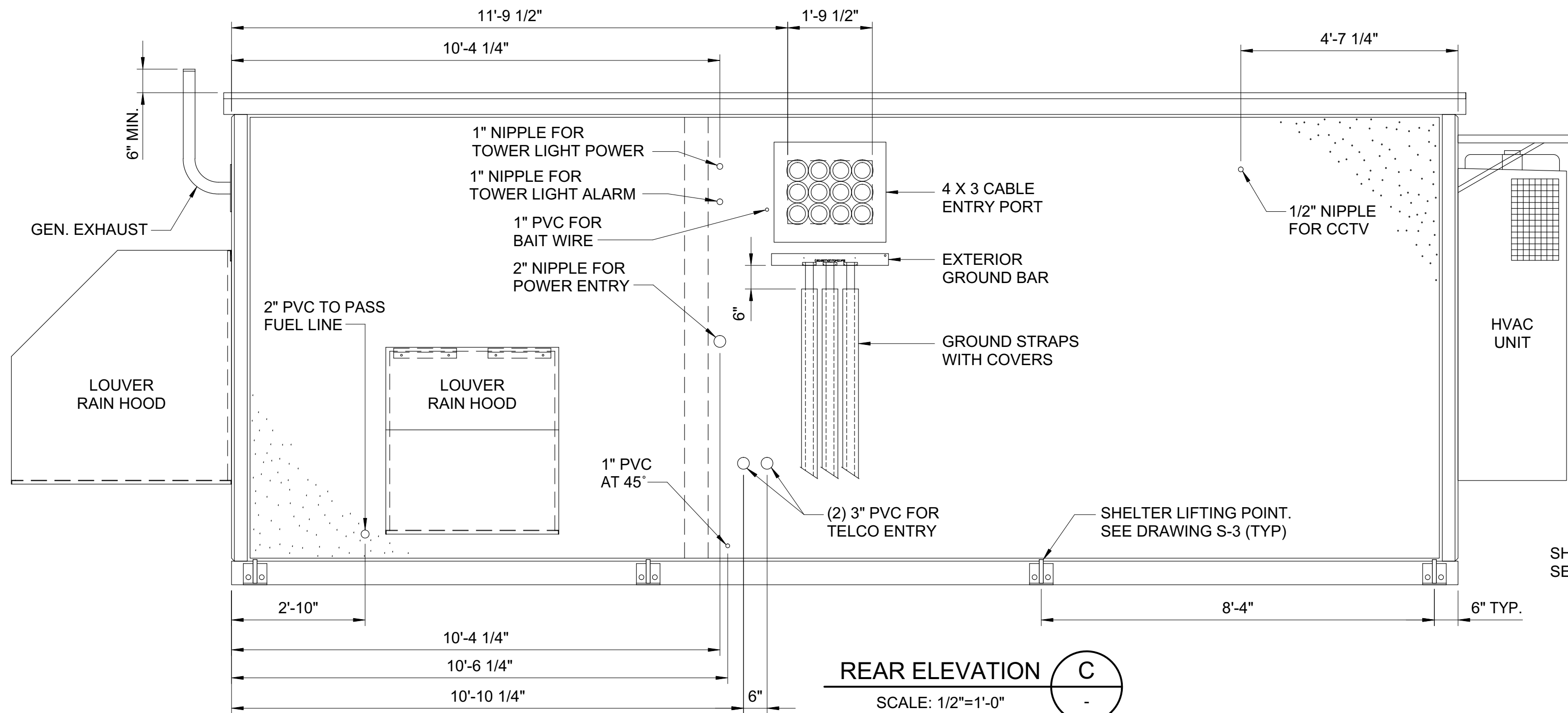
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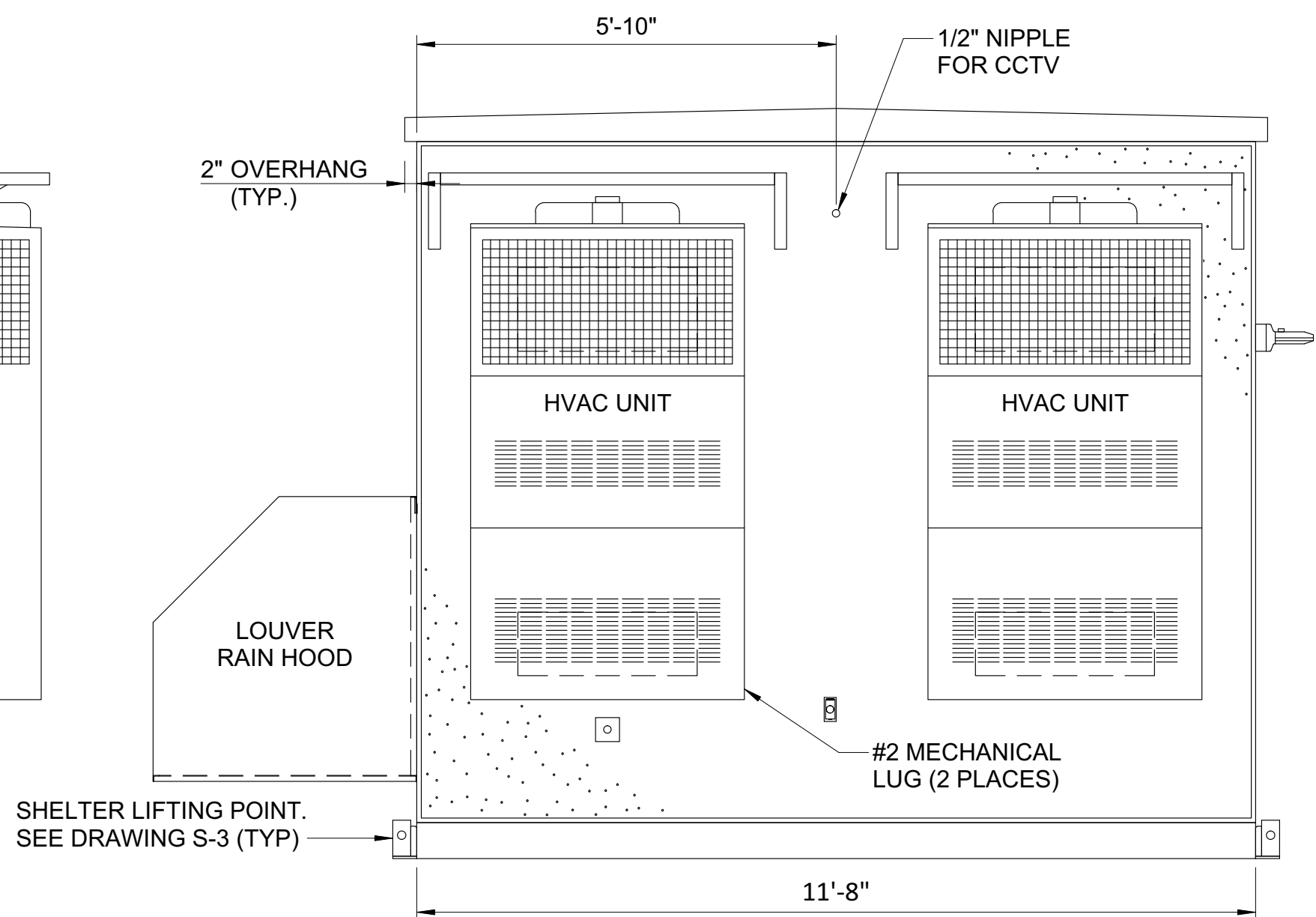
FRONT ELEVATION A
SCALE: 1/2"=1'-0"
0 1 2 3



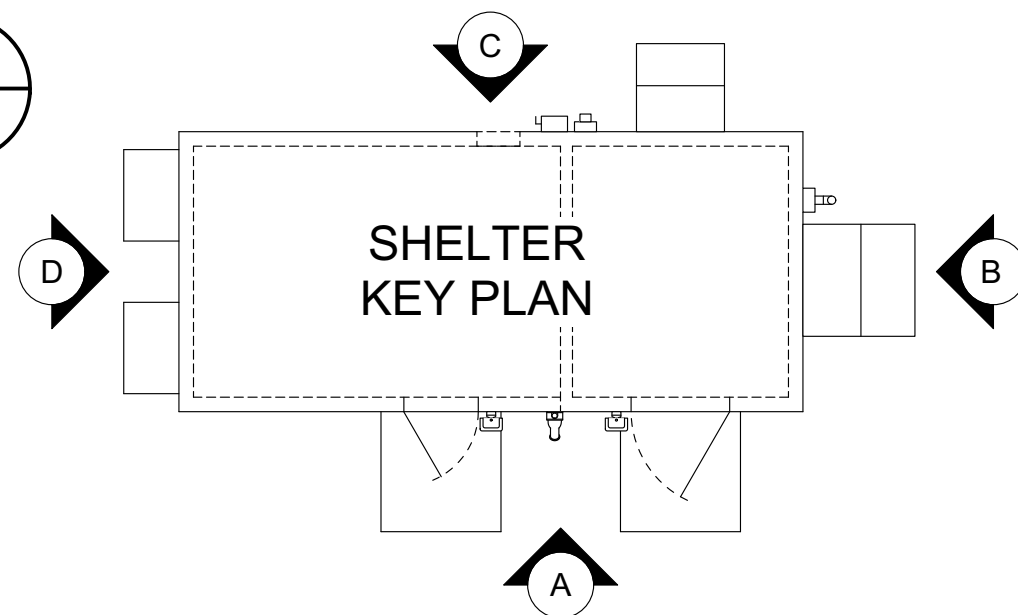
RIGHT ELEVATION B
SCALE: 1/2"=1'-0"
0 1 2 3



REAR ELEVATION C
SCALE: 1/2"=1'-0"
0 1 2 3



LEFT ELEVATION D
SCALE: 1/2"=1'-0"
0 1 2 3



NOTES:

1. INFORMATION CONTAINED IN THESE DRAWINGS REFERRING TO THE PROPOSED EQUIPMENT SHELTER WERE OBTAINED FROM STANDARD EQUIPMENT SHELTER DRAWINGS PROVIDED BY MOTOROLA AND PRODUCED BY THE SHELTER MANUFACTURER. THE INFORMATION CONTAINED IN THESE PLANS SHOULD BE CONSIDERED AS A GUIDE & THE CONTRACTOR IS SPECIFICALLY DIRECTED TO OBTAIN & USE THE SPECIFIED SHELTER MANUFACTURER'S PLANS PROVIDED BY MOTOROLA SPECIFIC FOR THIS SITE.
2. GENERAL CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EXTERIOR LOOSE SHIP ITEMS (DOOR, CANOPY, SECURITY LIGHTS, ETC).

DESIGN LOADS

OCCUPANCY TYPE (RISK CAT.): IV

FLOOR LIVE LOAD: 300 psf

ROOF LICE LOAD: 150 psf

$P_f = (0.7) \times (C_e) \times (I_s) \times (C_t) \times (P_g)$

EXPOSURE FACTOR $C_e = 1.0$

IMPORTANCE FACTOR $I_s = 1.20$

THERMAL FACTOR $C_t = 1.2$

GROUND SNOW LOAD $P_g = 60$

WIND DESIGN

WIND SPEED: 120 MPH 3 SECOND GUST

EXPOSURE D

$a = 3\text{ft}$

$G_{Cpi} = \pm 0.18$ (PER ASCE 7)

SHIPPING WEIGHT: 77,000 LBS

BUILDING FOOT PRINT: 304 SQ. FT.

SPECIAL CONDITIONS / LIMITATIONS

1. THIS STRUCTURE IS NOT DESIGNED FOR INSTALLATION IN A FLOOD HAZARD AREA.
2. THIS STRUCTURE IS NOT DESIGNED FOR HUMAN OCCUPANCY EXCEPT FOR SHORT TIME PERIODS FOR EQUIPMENT MAINTENANCE.
3. THERMOBOND WILL NOT BE RESPONSIBLE FOR INSTALLATION OF ANY SPRINKLER SYSTEM, WHICH MAY BE REQUIRED BY LOCAL BUILDING OFFICIAL.
4. THERMOBOND WILL NOT BE RESPONSIBLE FOR ANY ANTENNA INSTALLATION ASSOCIATED WITH THIS BUILDING.
5. THIS BUILDING SHALL NOT BE LOCATED AT A SITE THAT EXCEEDS THE LISTED DESIGN LOADS.
6. IF BATTERIES WITH AN ELECTROLYTE CAPACITY OF MORE THAN 50 GAL. ARE TO BE INSTALLED IN THIS BUILDING, ONE OF THE FOLLOWING MUST BE INSTALLED BY OTHERS ON SITE:
 - A. AN EXHAUST FAN WITH A HYDROGEN LIMIT SWITCH THAT LIMITS THE HYDROGEN TO 1% OF THE TOTAL VOLUME OF THE ROOM.
 - B. CONTINUOUS VENTILATION SHALL BE PROVIDED AT A RATE NOT LESS THAN 1 CU. FT. PER MINUTE PER SQ. FT. OF FLOOR AREA OF THE ROOM.



05/25/21

Rev.	Date:	Description:	Mgr.
0	05/25/21	FOR ZONING	GJB
A	03/31/21	FOR APPROVAL	GJB



MOTOROLA
SOLUTIONS



PYRAMID
Network Services, LLC

6615 TOWPATH ROAD, SUITE 200
EAST SYRACUSE, NY 13057
PHONE: (315) 701-1300



EMERALD
DESIGN & CONSTRUCTION

5130 WEST 6TH STREET
CLEVELAND, OH. 44141

HARPER
ENGINEERING, INC.
TELECOM GROUP

815 Superior Ave. Suite 1514
Cleveland, OH. 44114
Phone: (216) 344-3855
Fax: (216) 344-3856

SHELTER ELEVATIONS

SCALE: AS NOTED

DRAWN BY: GJB

CHECKED BY: GJB

DATE: 03/04/21

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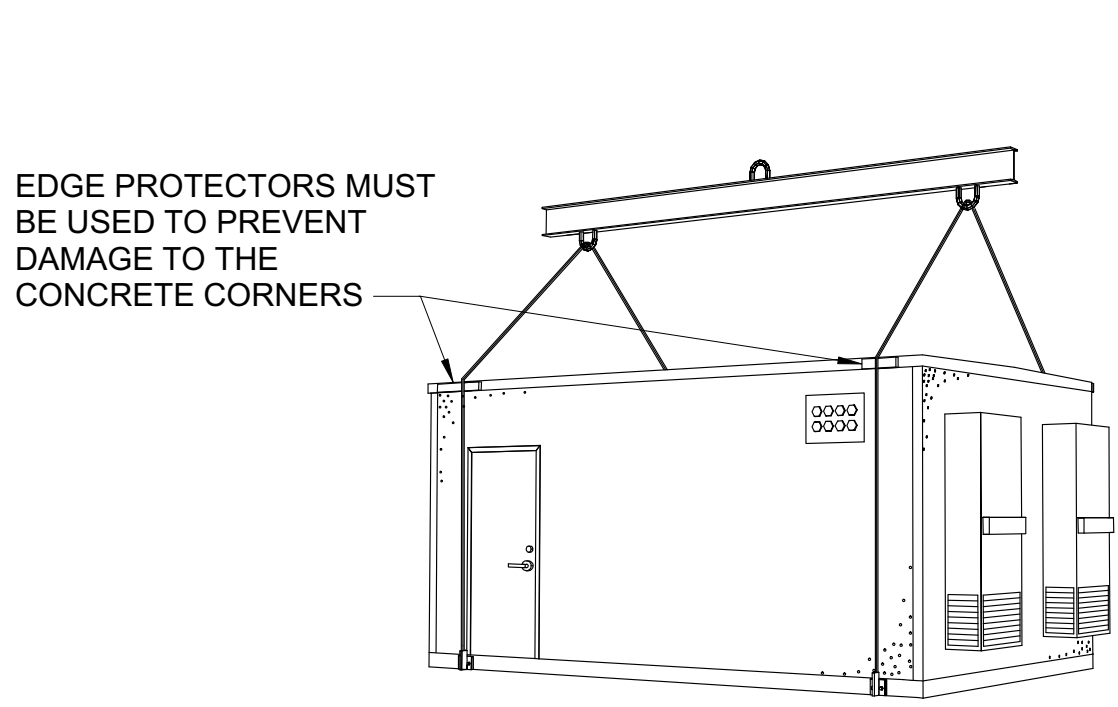
5112 WMU BTR2
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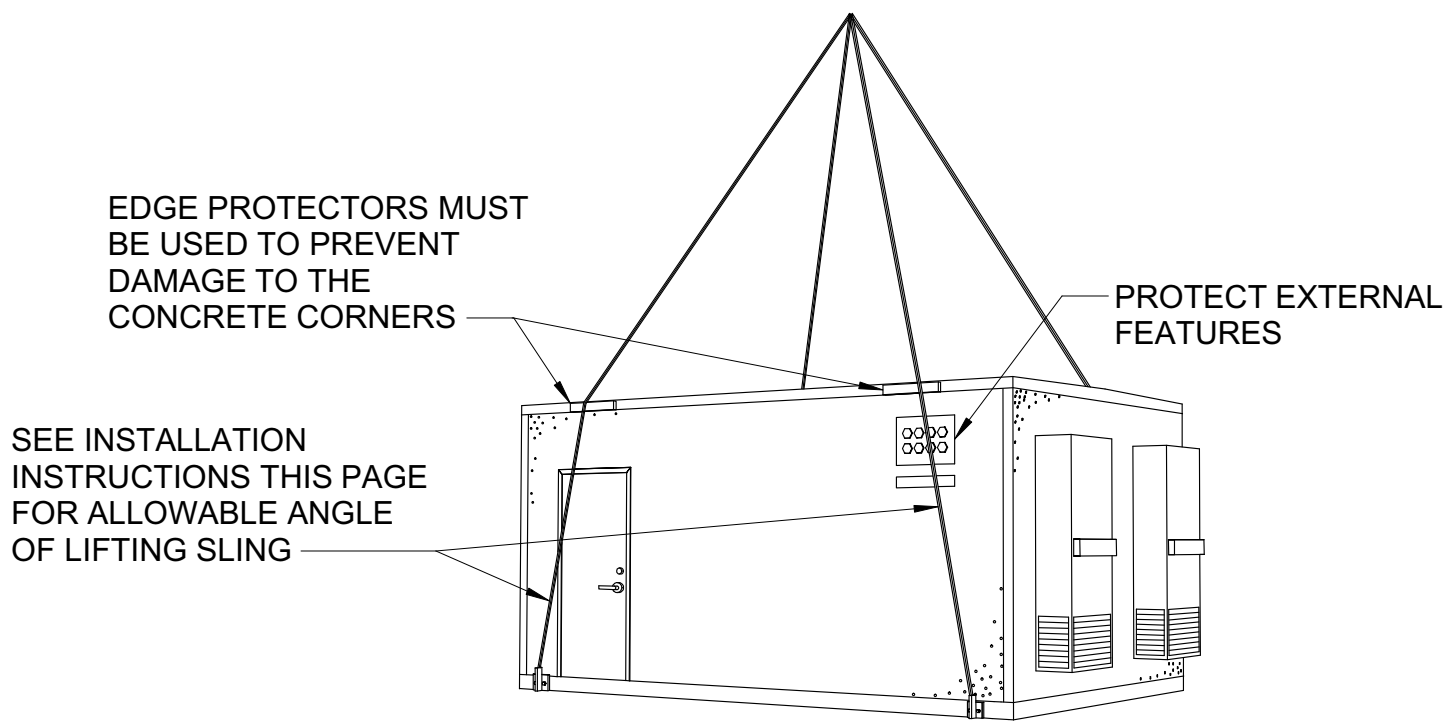
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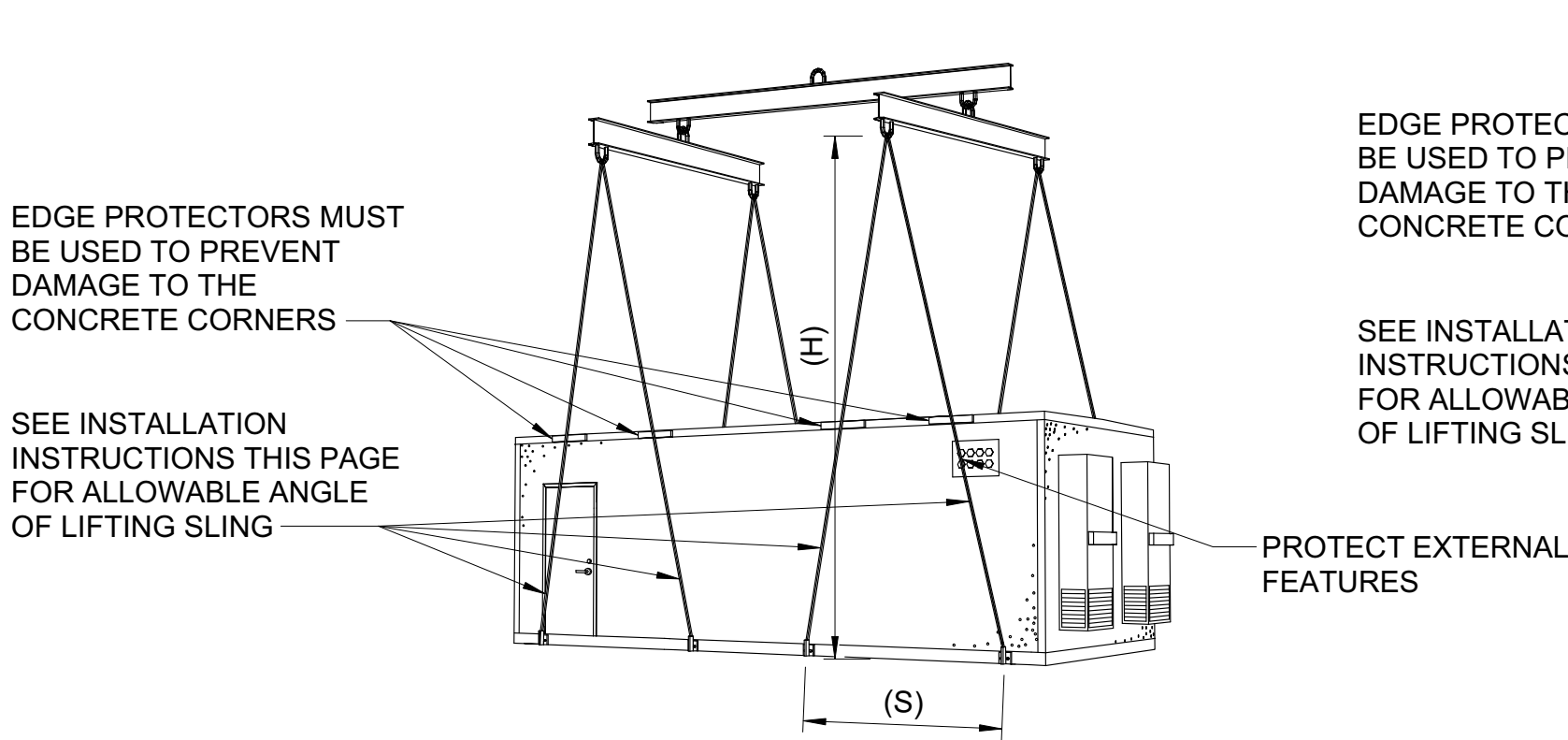
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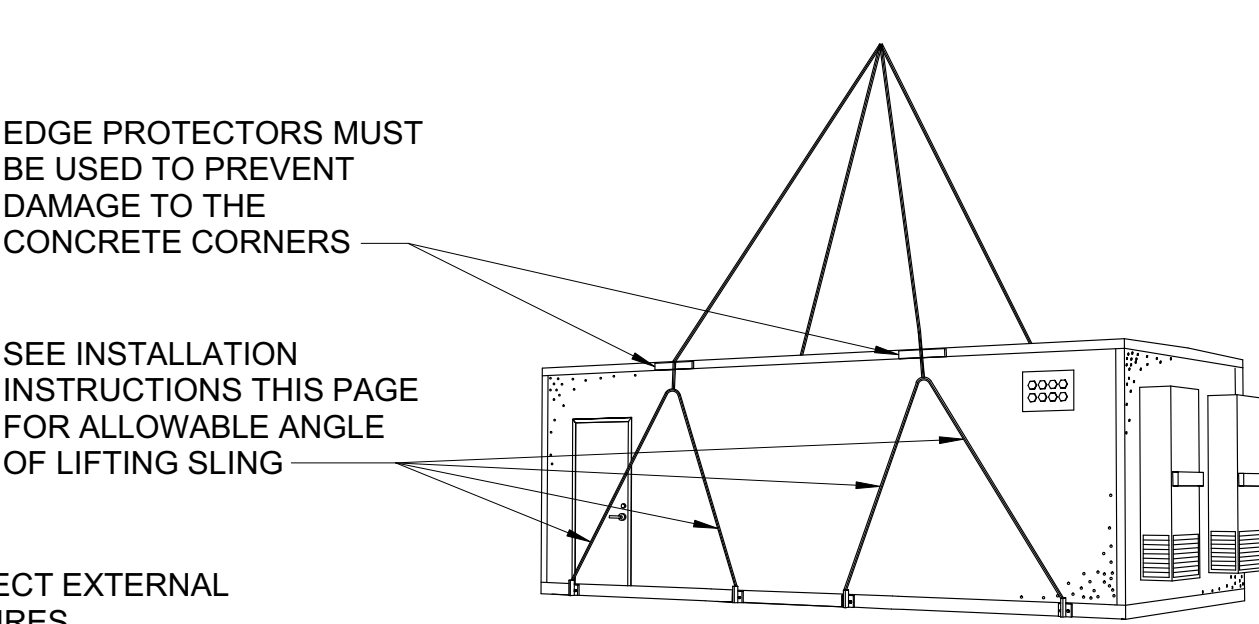
(4) POINT OPTION 1 BUILDING LIFT
(PREFERRED METHOD)
(SLINGS VERTICAL)



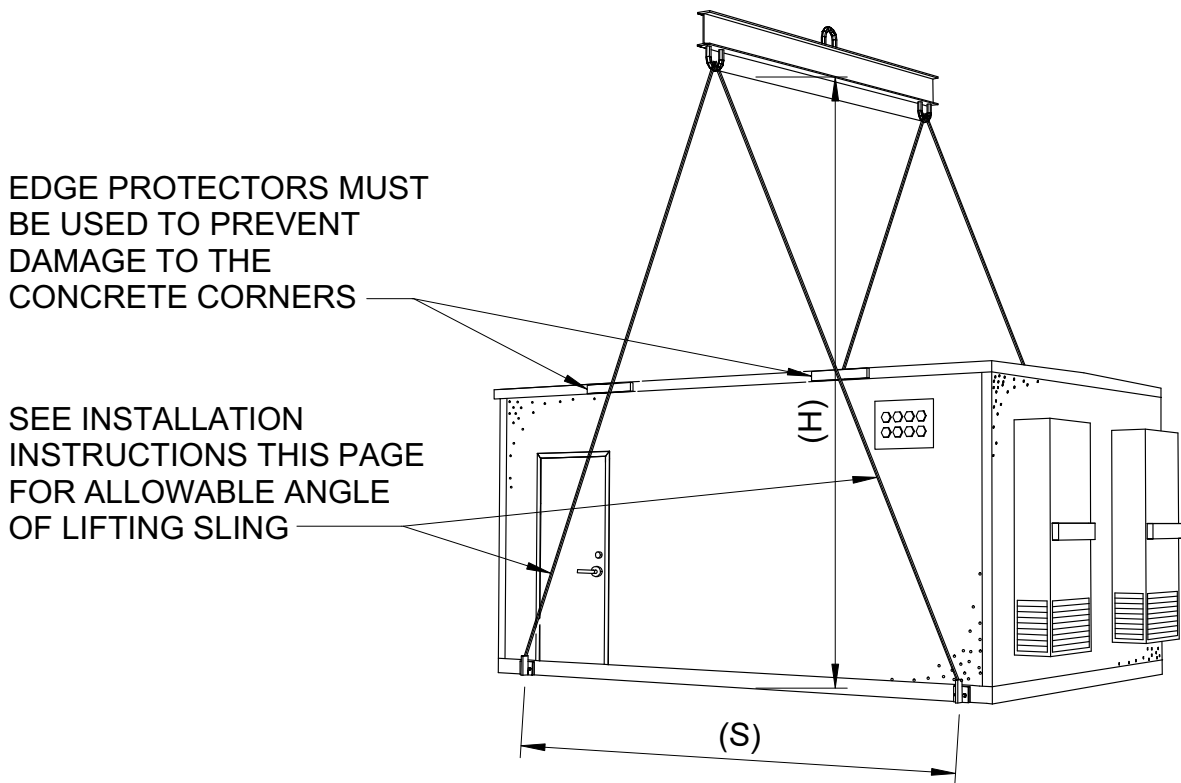
(4) POINT OPTION 3
BUILDING LIFT



(8) POINT OPTION 1 BUILDING LIFT
(PREFERRED METHOD)



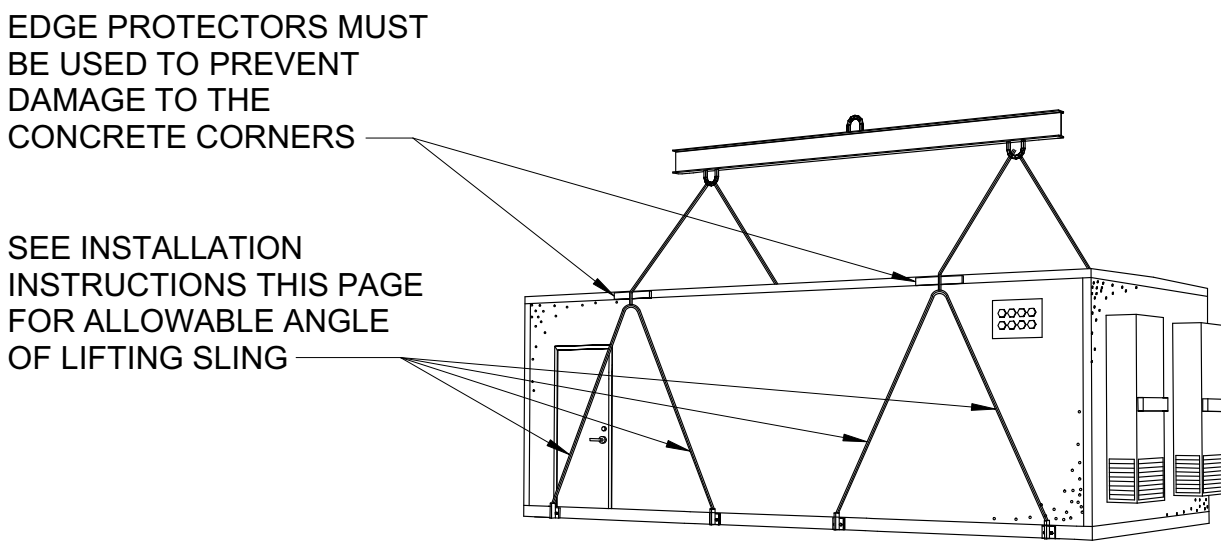
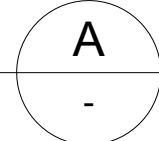
(8) POINT OPTION 3
BUILDING LIFT



(4) POINT OPTION 2
BUILDING LIFT
(SEE TABLE 1)

TABLE 1 (4) POINT LIFT OPTION 2	
LIFT DEVICE SEPARATION (S)	MINIMUM HOOK HEIGHT (H)
10'-0"	13'-9"
11'-0"	15'-2"
12'-0"	16'-6"
13'-0"	17'-10"
14'-0"	19'-3"
15'-0"	20'-8"
16'-0"	22'-0"
17'-0"	23'-5"
18'-0"	24'-9"
19'-0"	26'-2"
20'-0"	27'-6"

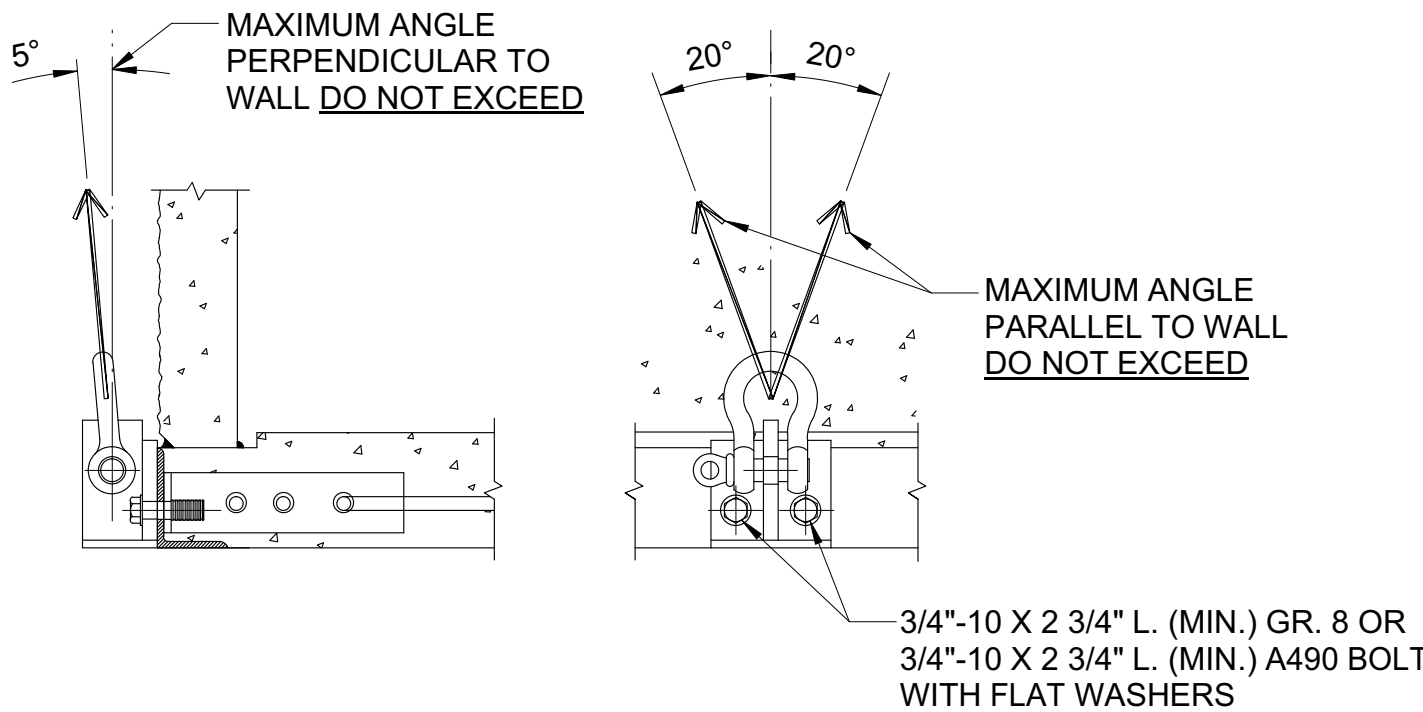
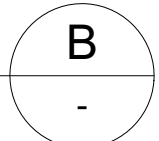
4 POINT LIFT OPTIONS
SCALE: N.T.S



(8) POINT OPTION 2
BUILDING LIFT
(SEE TABLE 2)

TABLE 2 (8) POINT LIFT OPTION 1	
LIFT DEVICE SEPARATION (S)	MINIMUM HOOK HEIGHT (H)
6'-0"	13'-9"
7'-0"	15'-2"
8'-0"	16'-6"
9'-0"	17'-10"
10'-0"	19'-3"
11'-0"	20'-8"
12'-0"	22'-0"

8 POINT LIFT OPTIONS
SCALE: N.T.S

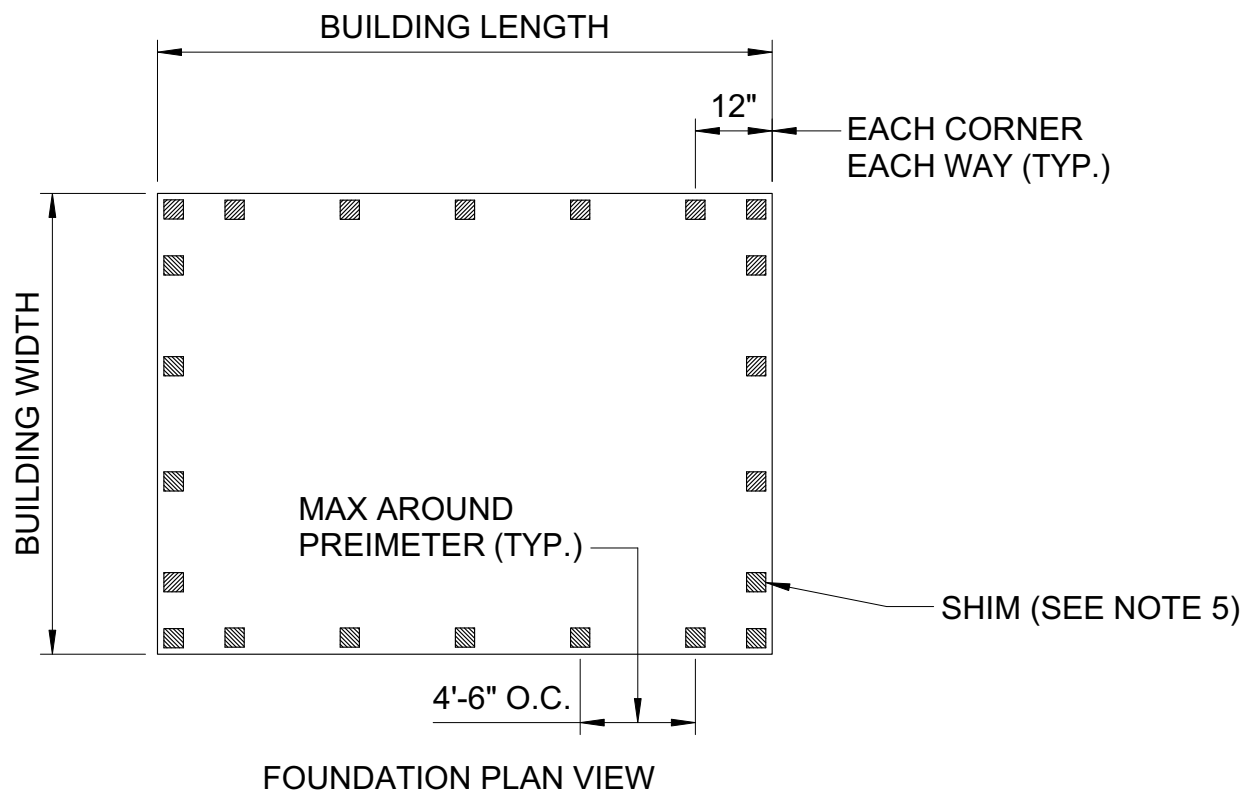
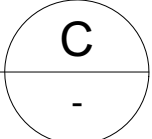


BOLT INSTALLATION:

1. SNUG (NO PLAY) PLUS 1/8 TURN MAX.
2. DO NOT DRIVE WITH HIGH PRESSURE IMPACT WRENCH.

END INSTALLATION AND SLING LIMITS

SCALE: N.T.S



SHELTER MUST BE SHIMMED

SHELTER SHIMMING

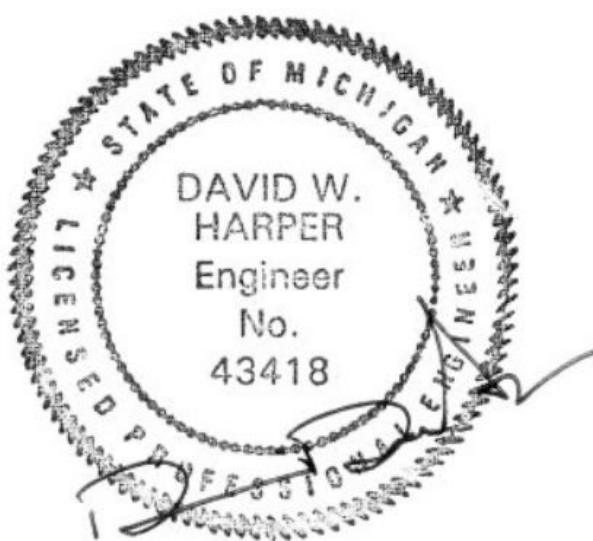
SCALE: N.T.S

INSTALLATION NOTES:

1. ALL FOUNDATION WORK IS BY OTHERS AND SUBJECT TO LOCAL INSPECTION.
2. FOUNDATION SURFACE SHALL BE LEVEL TO WITHIN +/- 1/8" PER 10 LINEAL FEET IN ANY DIRECTION.
3. FOUNDATION SHALL BE SQUARE TO WITHIN +/- 1/4".
4. TIE DOWN PLATES, IF USED, MUST BE ENTIRELY ABOVE GRADE.
5. SHELTER MUST BE SHIMMED TO LEVEL ABOVE IRREGULARITIES IN THE SLAB AND BUILDING FLOOR SYSTEM. SHIM HARDNESS NOT LESS THAN 60 DUROMETER. OR COMPRESSIVE STRENGTH 9,000 PSI MINIMUM. SHIMS NOT LESS THAN 3" SQUARE, THICKNESS AS REQUIRED.
6. INSPECT FOUNDATION FOR DEBRIS AND REMOVE BEFORE SETTING SHELTER.

RIGGING NOTES:

1. SHELTER MUST BE LIFTED ONLY AT POINTS PROVIDED, USING APPROPRIATE SPREADER BARS AND SLINGS, AND WITHIN THE LIMITS SHOWN ON THIS DRAWING.
2. UNLESS OTHERWISE APPROVED OR INDICATED, LIFT ONLY THE SHELTER SELF-WEIGHT. DO NOT LIFT THE SHELTER WITH ADDITIONAL EQUIPMENT INSIDE.
3. INSPECT EACH LIFT DEVICE FOR CRACKS, WARPING OR OTHER DEFECTS BEFORE INSTALLING ON SHELTER. DO NOT USE A LIFTING DEVICE THAT HAS ANY CRACKS, QUESTIONABLE WELDS, IRREGULAR OR ELONGATED HOLES, OR IS BENT OUT OF SHAPE.
4. INSPECT BOLTS BEFORE INSTALLATION. DO NOT USE ANY BOLTS THAT HAVE DAMAGED THREADS, ARE BENT, APPEAR ELONGATED OR ARE MALFORMED IN ANY WAY.
5. DO NOT ROUTE SLING NEAR HVAC SYSTEMS.
6. REMOVE OR PROTECT DOOR HARDWARE AND OTHER PROTRUSIONS FROM DAMAGE.
7. RIGGER IS TO PROVIDE ALL EQUIPMENT ABOVE THE THERMOBOND EXTERIOR LIFTING DEVICE. THE RIGGER IS RESPONSIBLE FOR ENSURING THAT THE SAFETY REQUIREMENTS LISTED HEREIN ARE MET.
8. RIGGING SHALL CONFORM TO APPLICABLE LOCAL, STATE AND FEDERAL REQUIREMENTS.
9. IF SHELTER IS DELIVERED WITH TEMPORARY SHIPPING WALLS OR ANY OTHER TEMPORARY STRUCTURE INSTALLED FOR TRANSPORT, DO NOT REMOVE BEFORE SHELTER PLACEMENT.
10. DO NOT USE SINGLE HOLE POSITIONS FOR LIFTING.
11. DO NOT SET THE SHELTER ON AN UNEVEN OR UNSTABLE SURFACE.



05/25/21

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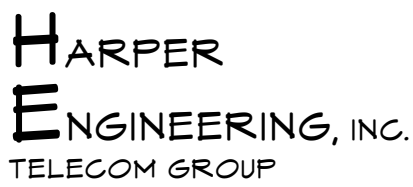
**MOTOROLA
SOLUTIONS**



6615 TOWPATH ROAD, SUITE 200
EAST SYRACUSE, NY 13057
PHONE: (315) 701-1300



5130 WEST 6TH STREET
CLEVELAND, OH. 44141



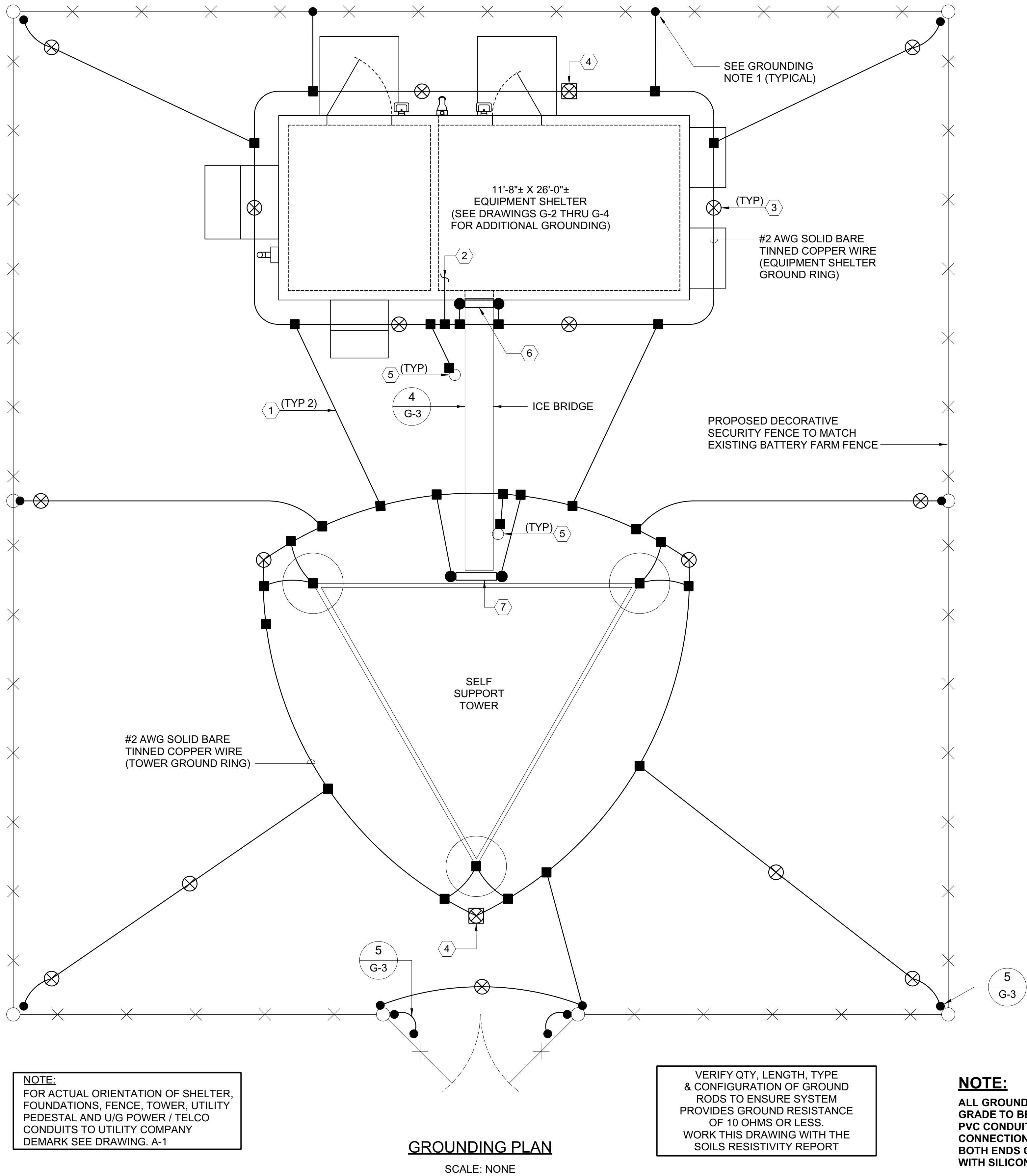
815 Superior Ave. Suite 1514
Cleveland, OH. 44114
Phone: (216) 344-3855
Fax: (216) 344-3856

GROUNDING NOTES:

- 1. ALL FENCE POSTS WITHIN 6' OF ANY METALLIC ITEMS INCLUDING EQUIPMENT, UTILITY PEDESTAL / ICE BRIDGE SUPPORT POSTS, ETC. SHALL BE BONDED TO THE GROUND RING.
- 2. FENCE TOP RAIL TO BE BONDED TO CORNER POSTS ON BOTH ENDS
- 3. ANY DISCREPANCIES BETWEEN THIS DRAWING PACKAGE AND EXISTING FIELD CONDITIONS MUST BE REPORTED TO THE ENGINEER OF RECORD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- 4. ALL GROUND WIRES THAT TRANSITION FROM ABOVE GRADE TO BELOW GRADE SHALL BE ROUTED IN A 3/4" PVC CONDUIT FROM THE CONNECTION TO A MINIMUM OF 18" BELOW GRADE. BOTH ENDS OF THE PVC CONDUIT SHALL BE SEALED WITH SILICONE CAULK.
- 5. TAMPER PROOF HARDWARE SHALL BE USED FOR ALL EXPOSED GROUND BARS INSTALLED AT COMPOUND LEVEL.

TYPICAL GROUNDING NOTES

- 1. ALL GROUND CABLE IN CONCRETE OR THROUGH WALL SHALL BE IN 3/4" PVC CONDUIT. NO METALLIC CONDUIT SHALL BE USED FOR GROUNDING CONDUCTOR SLEEVES.
- 2. GROUND ALL EXPOSED METALLIC OBJECTS USING A TWO-HOLE NEMA DRILLED CONNECTOR SUCH AS THOMAS & BETTS #32207 OR APPROVED EQUAL
- 3. THE CONTRACTOR SHALL NOTIFY THE PYRAMID NETWORK SERVICES, LLC REPRESENTATIVE WHEN THE GROUND RING IS INSTALLED SO THAT THE REPRESENTATIVE CAN INSPECT GROUND RING BEFORE IT IS CONCEALED.
- 4. ALL EXTERIOR GROUND CONDUCTORS INCLUDING GROUND RING SHALL BE #2 AWG SOLID BARE TINNED COPPER. MAKE ALL GROUND CONNECTIONS AS SHORT AND DIRECT AS POSSIBLE. AVOID SHARP BENDS. THE RADIUS OF ANY BEND SHALL NOT BE LESS THAN 8" AND THE INCLUSIVE ANGLE OF ANY BEND SHALL NOT EXCEED 90°. GROUNDING CONDUCTORS SHALL BE ROUTED DOWNWARD TOWARD THE BURIED GROUND RING.
- 5. ALL BELOW GROUND EXTERNAL CONNECTIONS SHALL BE EXOTHERMICALLY WELDED. ALL EXOTHERMIC WELDS TO BURIED GROUND RING SHALL BE THE PARALLEL-TYPE. EXCEPT FOR THE GROUND RODS WHICH ARE TEE-TYPE EXOTHERMIC WELDS. REPAIR ALL GALVANIZED SURFACES THAT HAVE BEEN DAMAGED BY EXOTHERMIC WELDING. USE SPRAY GALVANIZED SUCH AS HOLUB LECTROSOL #15-501.
- 6. WHERE MECHANICAL CONNECTORS (TWO-HOLE OR CLAMP) ARE USED, APPLY A LIBERAL PROTECTIVE COATING OF A CONDUCTIVE ANTI-OXIDE COMPOUND ON ALL CONNECTORS. PROVIDE LOCK WASHERS ON ALL MECHANICAL CONNECTORS. USE STAINLESS STEEL HARDWARE THROUGHOUT. THOROUGHLY REMOVE ALL PAINT AND CLEAN ALL DIRT FROM SURFACES REQUIRING GROUND CONNECTORS, REPAINT TO MATCH EXISTING AFTER CONNECTION IS MADE TO MAINTAIN CORROSION RESISTANCE. ALL GROUND CONNECTIONS SHALL BE APPROVED FOR THE TYPES OF METALS BEING ATTACHED TO.
- 7. A RESISTANCE TO GROUND OF (10) OHMS OR LESS IS REQUIRED FOR ALL MOTOROLA SITES. THE CONTRACTOR SHOULD RETAIN HIS OWN TESTER AT HIS OWN EXPENSE. IN ADDITION, A THIRD PARTY SHOULD BE HIRED TO OBTAIN MEGGER AND SWEEP RESULTS ON ALL SITES INCLUSIVE OF WHAT RESULTS THE CONTRACTOR SUBMITS, TO INSURE PROPER QUALITY CONTROL ON ALL SITES. SCHEDULE FINAL MEGGER TEST SUCH THAT THE PYRAMID NETWORK SERVICES, LLC REPRESENTATIVE CAN BE PRESENT FOR FIELD VERIFICATION. REFER TO THE MOTOROLA MASTER SPECIFICATION FOR MEGGER TESTING PROCEDURES. IF THE FINAL GROUNDING RESISTANCE MEASUREMENT EXCEEDS 10 (TEN) OHMS, THE CONTRACTOR SHALL NOTIFY THE PYRAMID NETWORK SERVICES, LLC REPRESENTATIVE.
- 8. ALL MOUNTING HARDWARE SHALL BE STAINLESS STEEL
- 9. THE GROUND CONDUCTORS SHALL BE RUN STRAIGHT FOR MINIMUM INDUCTANCE AND VOLTAGE DROP. SINCE CABLE BENDS INCREASE INDUCTANCE, THE MINIMUM REQUIRED BENDING RADIUS IS 8 INCHES WHEN BENDS ARE UNAVOIDABLE. ALL METAL WORK WITHIN 10 FEET OF THE GROUND RING SHALL BE DIRECTLY BONDED TO THIS GROUND SYSTEM, WITHOUT USING SERIES OR DAISY CHAIN CONNECTION ARRANGEMENTS.
- 10. PAINT, ENAMEL, LACQUER AND OTHER ELECTRICALLY NON-CONDUCTIVE COATINGS SHALL BE REMOVED FROM THREADS AND SURFACE AREAS WHERE CONNECTIONS ARE MADE TO ENSURE GOOD ELECTRICAL CONTINUITY.
- 11. CONNECTIONS BETWEEN DISSIMILAR METALS SHALL NOT BE MADE UNLESS THE CONDUCTORS ARE SEPARATED BY A SUITABLE MATERIAL. THAT IS A PART OF THE ATTACHMENT DEVICE LISTED AND APPROVED FOR USE WITH THE SPECIFIC DISSIMILAR METALS MAY BE USED FOR THE PURPOSE.
- 12. ALL BELOW GRADE GROUND SYSTEM CONDUCTORS SHALL BE A MINIMUM DEPTH OF 30".

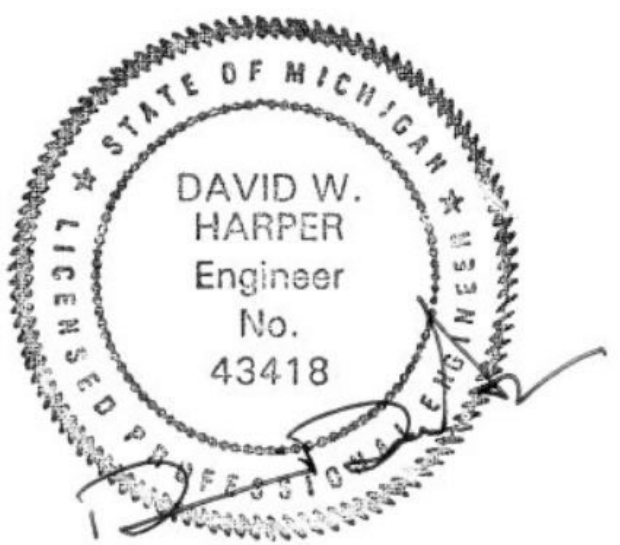


GROUNDING LEGEND
FOR DETAILS SEE DRAWING G-2, G-3 & G-4

- 1 **TIE-IN GROUNDING:** EXTEND (2) #2 AWG SOLID BARE TINNED COPPER WIRES FROM EQUIPMENT SHELTER BURIED GROUND RING TO TOWER BURIED GROUND RING AND MAKE EXOTHERMIC CONNECTIONS.
- 2 **EQUIPMENT SHELTER CIRCUIT BREAKER GROUNDING:** EXTEND #2 AWG SOLID BARE TINNED COPPER WIRE (SUPPLIED WITH SHELTER) FROM EQUIPMENT SHELTER 200A CIRCUIT BREAKER TO EQUIPMENT SHELTER BURIED GROUND RING AND MAKE APPROVED CONNECTIONS AT EACH END.
- 3 **GROUND ROD:** COPPERCLAD STEEL, 3/4" DIA. TEN (10) FEET LONG.
- 4 **GROUND ROD W/ACCESS:** COPPERCLAD STEEL, 3/4" DIA. TEN (10) FEET LONG WITH TEST ACCESS WELL. (1) REQUIRED AT FURTHEST CORNER OF FOUNDATION AWAY FROM TOWER.
- 5 **ICE BRIDGE / UTILITY PEDESTAL SUPPORT POST GROUNDING:** EXTEND #2 AWG SOLID BARE TINNED COPPER WIRE FROM BURIED GROUND RING TO ALL ICE BRIDGE / UTILITY PEDESTAL SUPPORT POSTS AND EXOTHERMICALLY WELD.
- 6 **SHELTER EXTERIOR GROUND BAR:** EXTEND (2) #2 AWG SOLID BARE TINNED COPPER WIRES FROM THE SHELTER EXTERIOR GROUND BAR TO BURIED GROUND RING AND MAKE EXOTHERMIC CONNECTIONS.
- 7 **TOWER GROUND BAR (BOTTOM):** MOUNT GROUND BAR DIRECTLY TO TOWER AT BOTTOM OF CABLE RUNS. SECURE TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL. EXTEND (2) #2 AWG SOLID BARE TINNED COPPER WIRES FROM THE TOWER GROUND BAR TO BURIED GROUND RING AND MAKE EXOTHERMIC CONNECTIONS.

GROUNDING SYMBOLS LEGEND

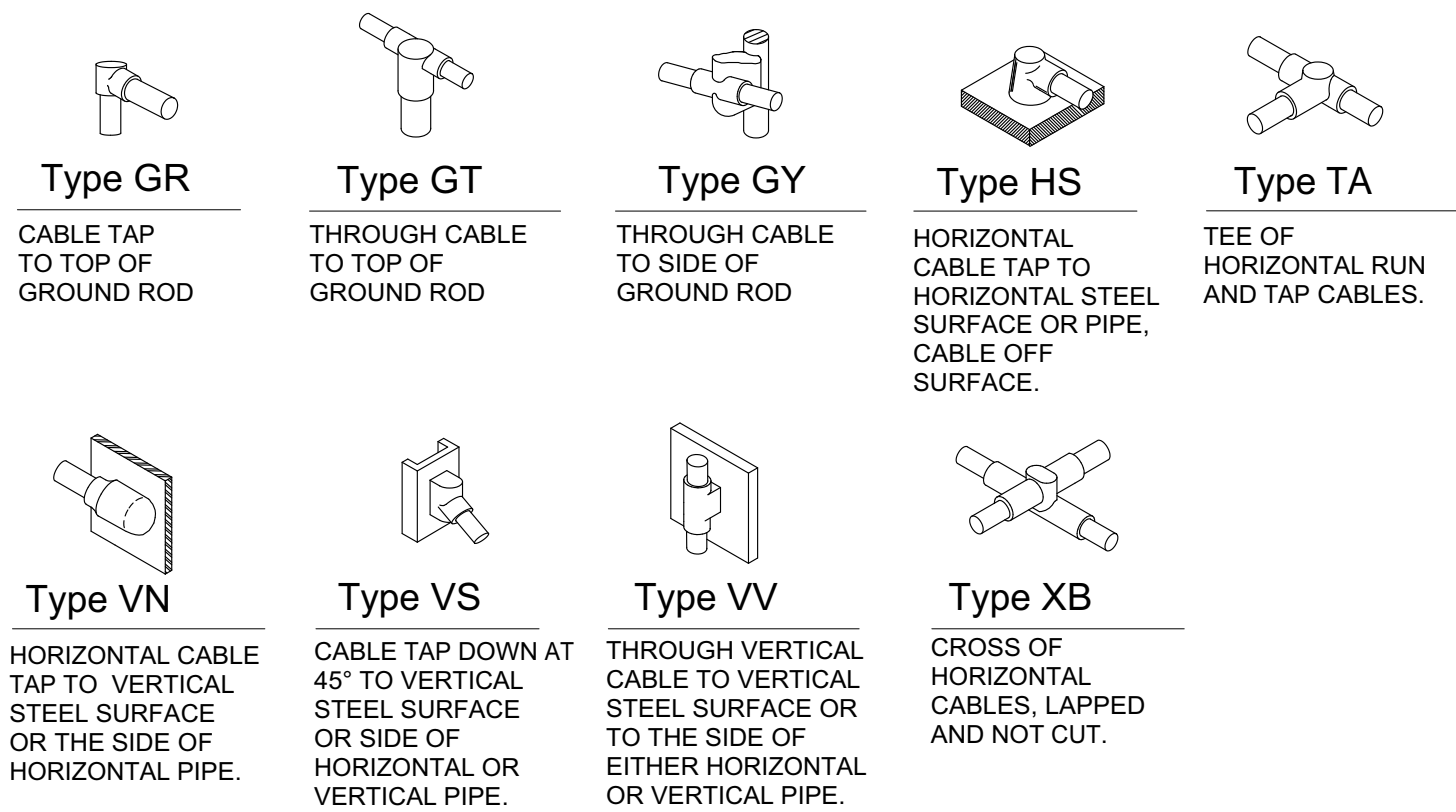
- GROUND ROD WITH ACCESS (INSPECTION WELL)
- GROUND ROD
- CADWELD TYPE CONNECTION
- MECHANICAL 2 HOLE LUG TYPE CONNECTION
- REPRESENTS DETAIL NUMBER
- REFERENCE DRAWING NUMBER
- #2 AWG SOLID BARE TINNED COPPER GROUND WIRE 42" BELOW GRADE



05/25/21
11/05/20

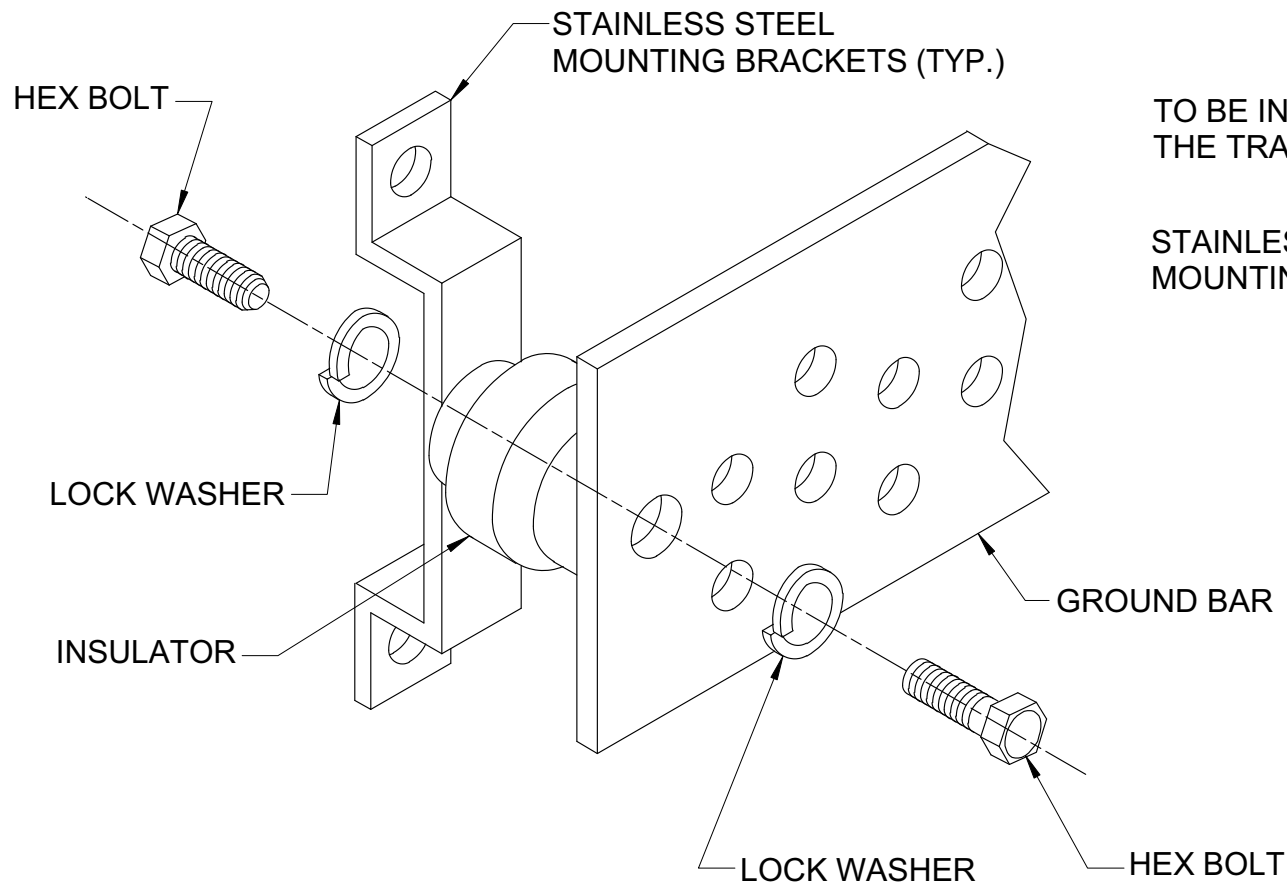
NOTE:
ALL GROUND WIRES THAT TRANSITION FROM ABOVE GRADE TO BELOW GRADE SHALL BE ROUTED IN A 3/4" PVC CONDUIT (NOT SHOWN FOR CLARITY) FROM THE CONNECTION TO A MINIMUM OF 18" BELOW GRADE. BOTH ENDS OF THE PVC CONDUIT SHALL BE SEALED WITH SILICONE CAULK.

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CADWELD DETAILS

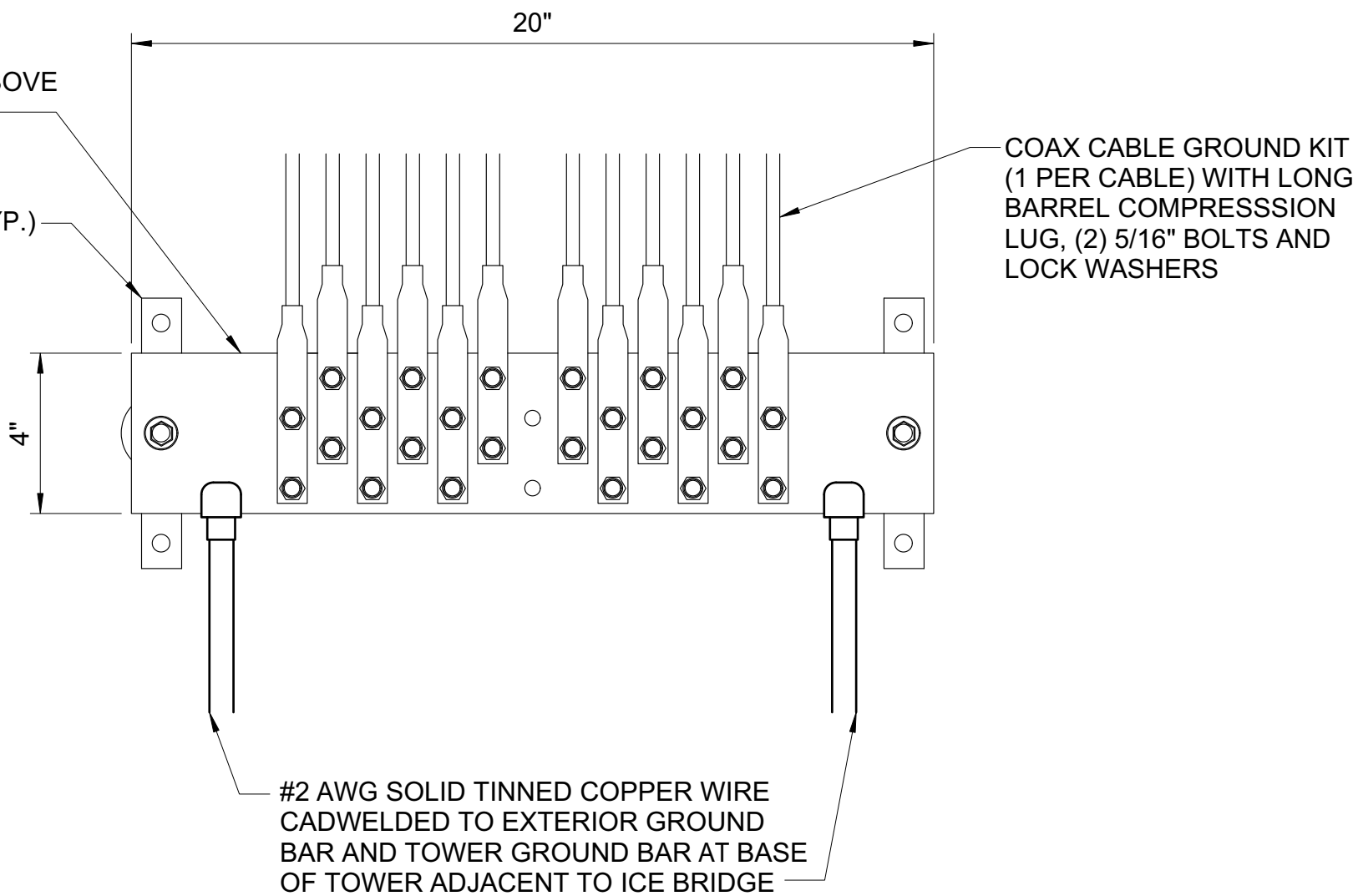
DETAIL 1
SCALE: NONE



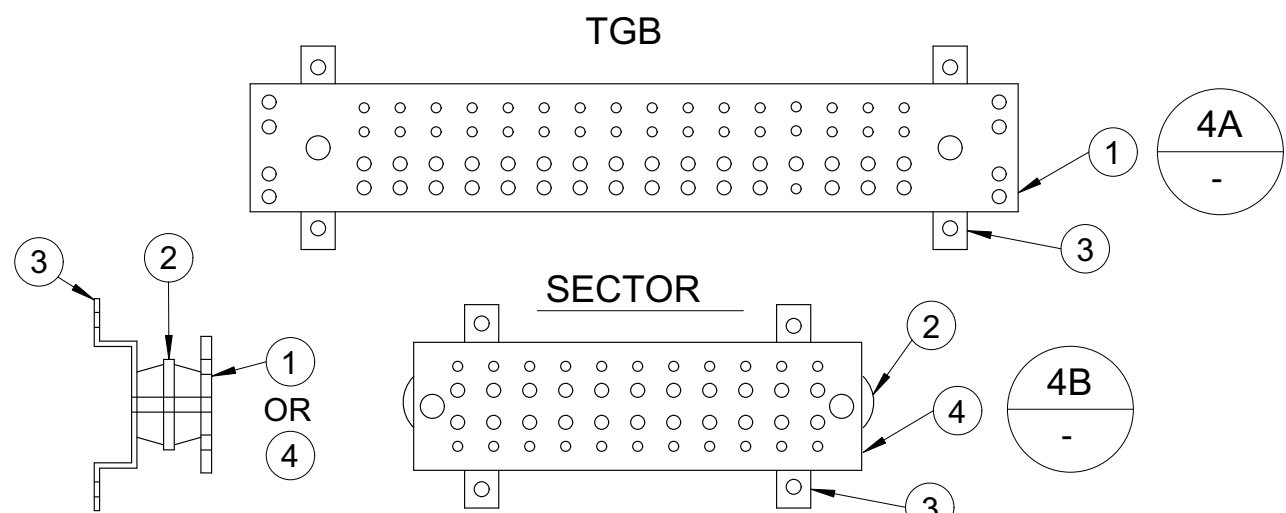
NOTE:

ISOLATORS TO BE USED ON GROUND BAR AT TOWER BASE ADJACENT TO ICE BRIDGE ONLY. GROUND BAR AT ANTENNA ELEVATION TO BE ATTACHED DIRECTLY TO TOWER STEEL.

GROUND BAR INSTALLATION 2
SCALE: NONE



TOWER GROUND BAR (TGB) 3
SCALE: NONE

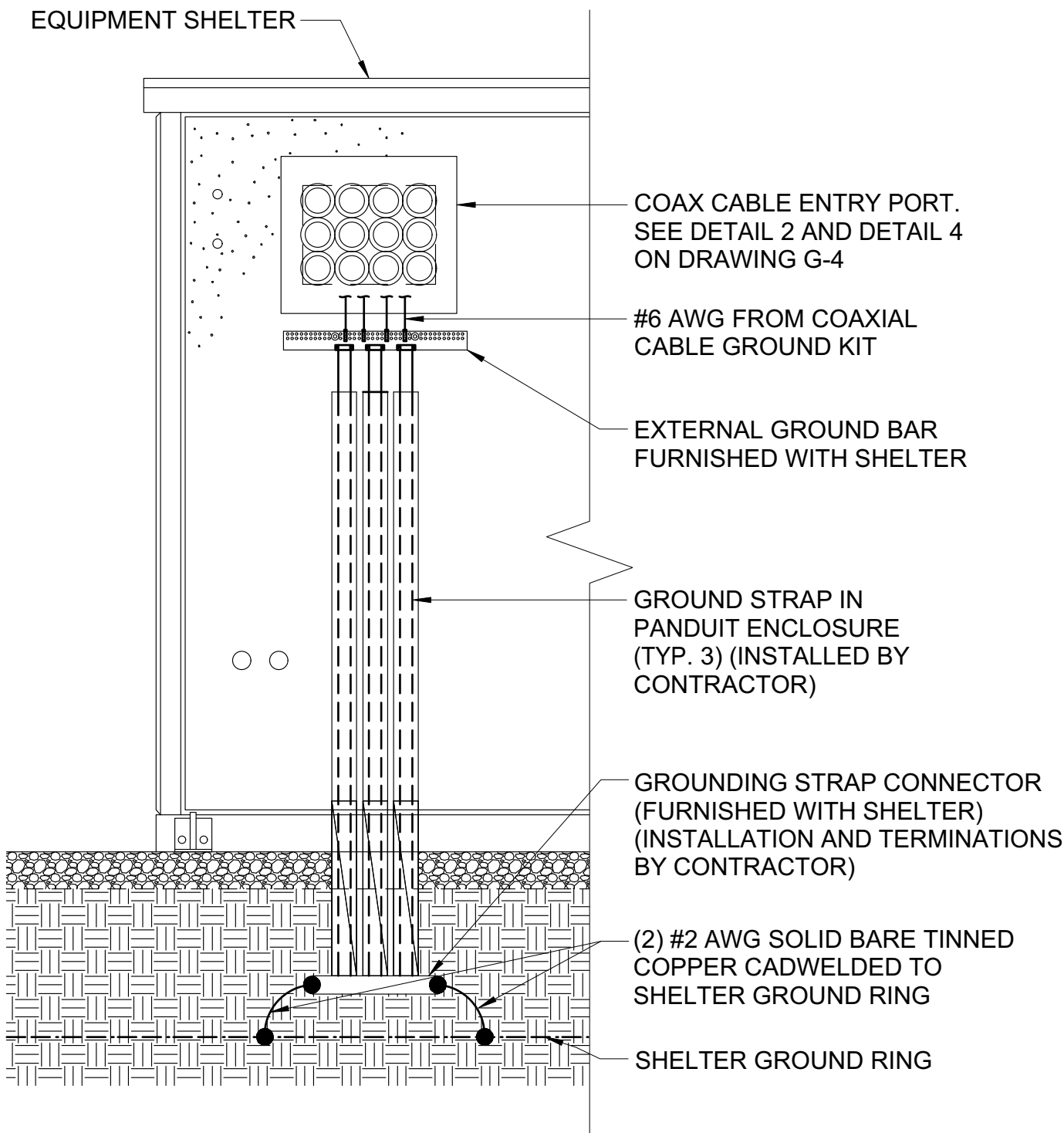


MATERIAL LIST

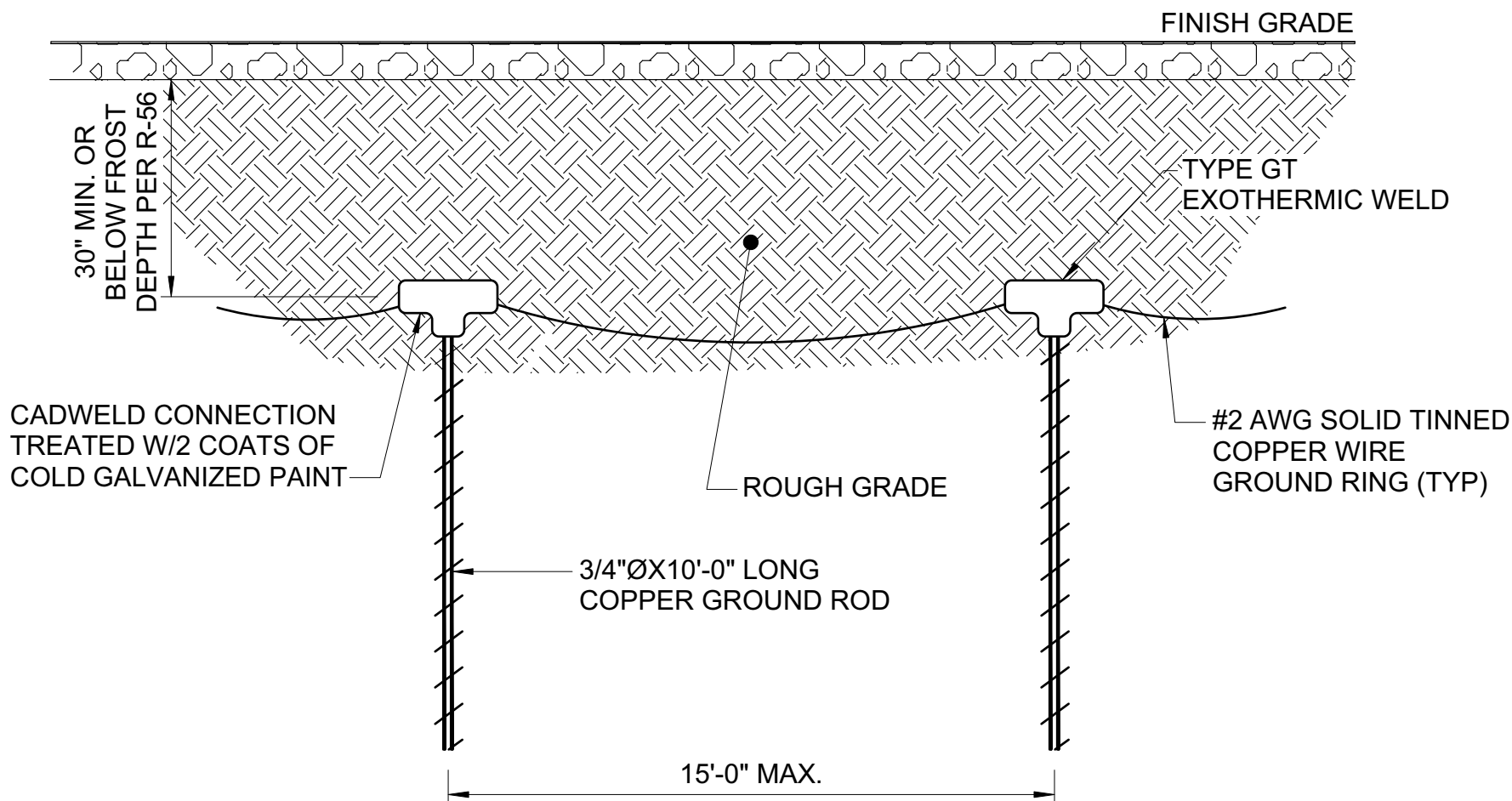
- TINNED COPPER GROUND BAR, 1/4"X 4"X 24" TESSCO CAT. NO. 482415 WITH THEFT DETERRENT HARWARE WALL MOUNTING KIT CAT. NO. 390980 OR APPROVED EQUAL.
- INSULATORS, TESSCO (PROVIDED WITH MOUNTING KIT) OR APPROVED EQUAL.
- WALL MOUNTING BRACKET, TESSCO (PROVIDED WITH MOUNTING KIT) OR APPROVED EQUAL.
- TINNED COPPER GROUND BAR, 1/4"X 4"X 12" TESSCO CAT. NO. 422409 WITH THEFT DETERRENT HARDWARE WALL MOUNTING KIT CAT. NO. 390980 OR APPROVED EQUAL.

TOWER GROUND BAR (TGB) OR SECTOR GROUND BAR DETAIL

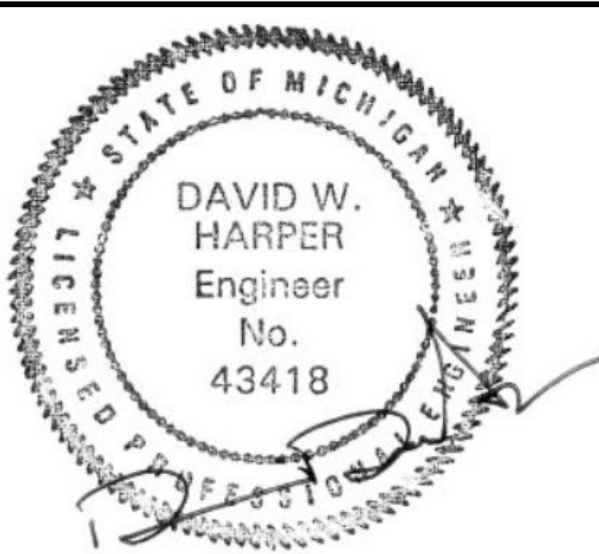
DETAIL 4A 4B
SCALE: NONE



SHELTER GROUNDING DETAIL 5
SCALE: NONE



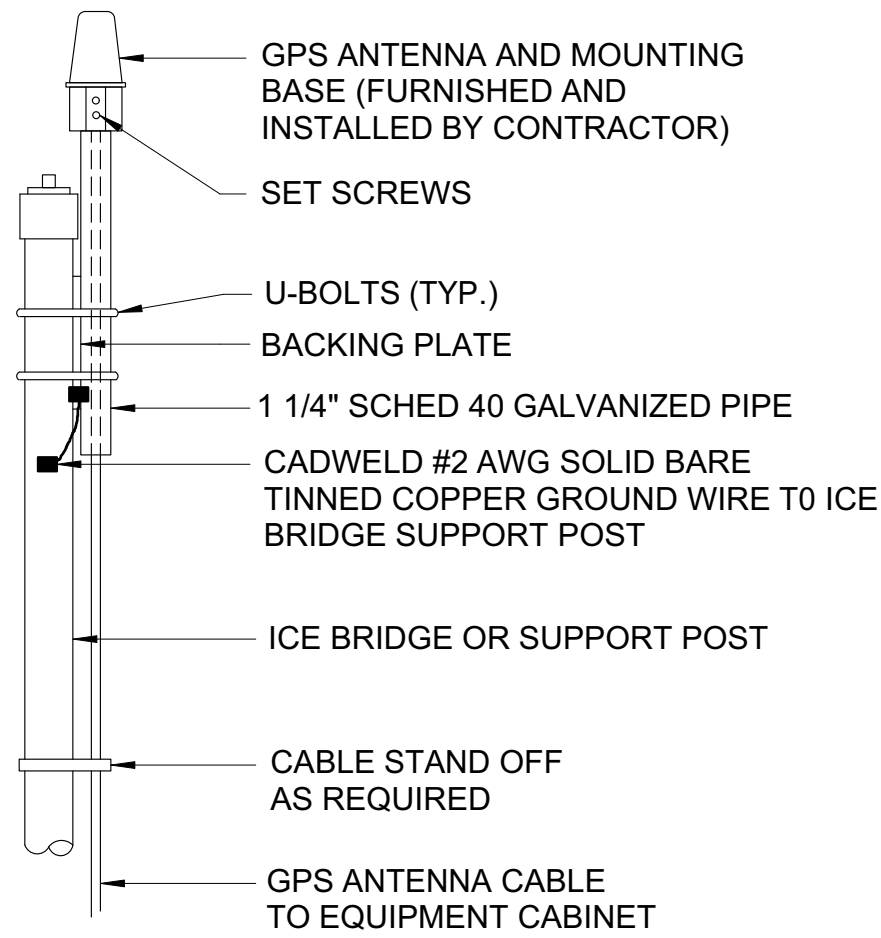
GROUNDING ROD DETAIL 6
SCALE: NONE



05/25/21

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0	05/25/21	FOR ZONING	GJB			6615 TOWPATH ROAD, SUITE 200 EAST SYRACUSE, NY 13057 PHONE: (315) 701-1300		5130 WEST 6TH STREET CLEVELAND, OH. 44141		815 Superior Ave. Suite 1514 Cleveland, OH. 44114 Phone: (216) 344-3855 Fax: (216) 344-3856		SCALE: AS NOTED		5112 WMU BTR2 PARKVIEW AVENUE KALAMAZOO, MI 49009	
A	03/31/21	FOR APPROVAL	GJB									DRAWN BY: GJB		Drawing / Rev.	
Rev.	Date:	Description:	Mgr.									CHECKED BY: GJB		G-2/0	
												DATE: 03/04/21		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.	
												FILE: 20-216-006			

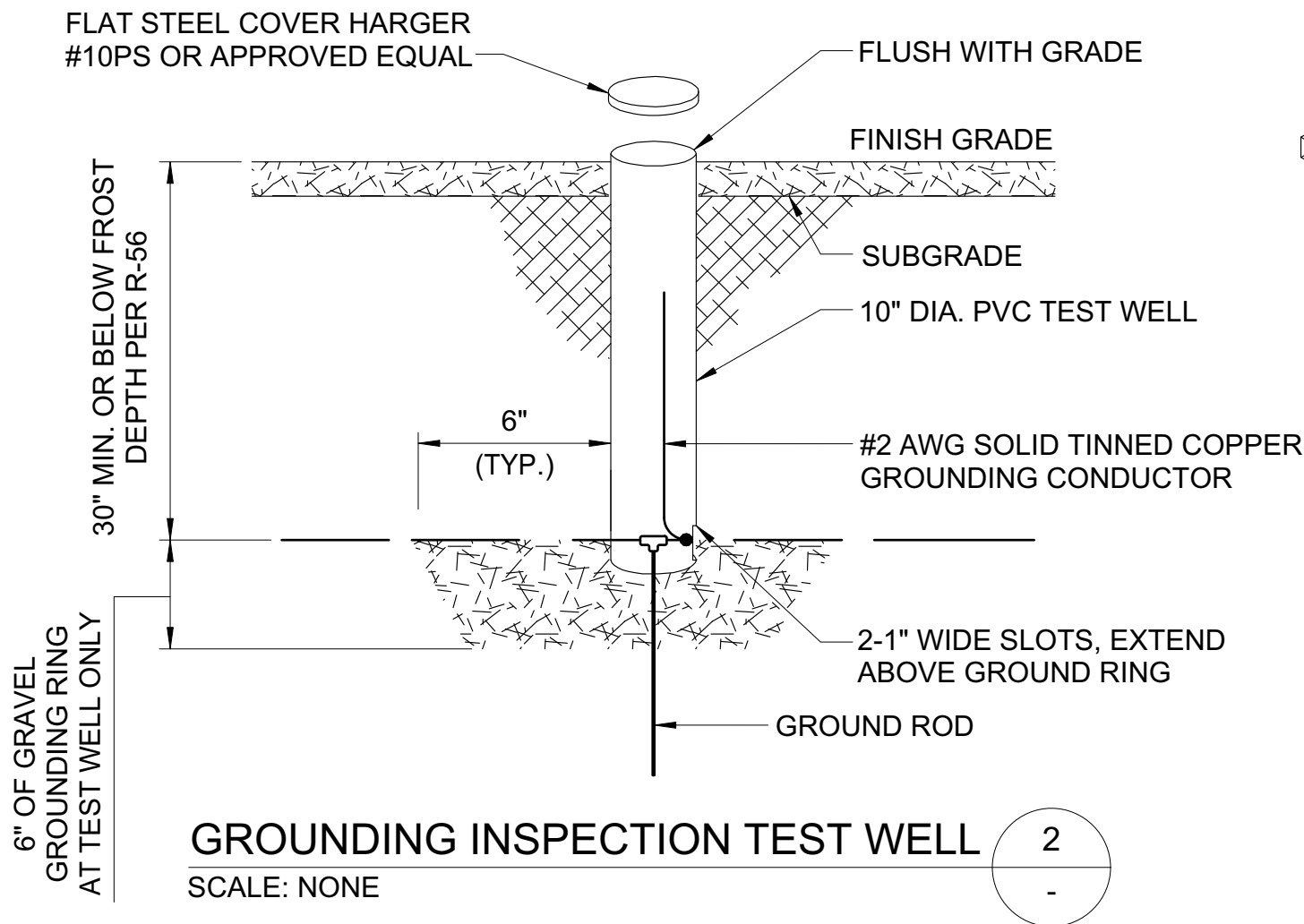
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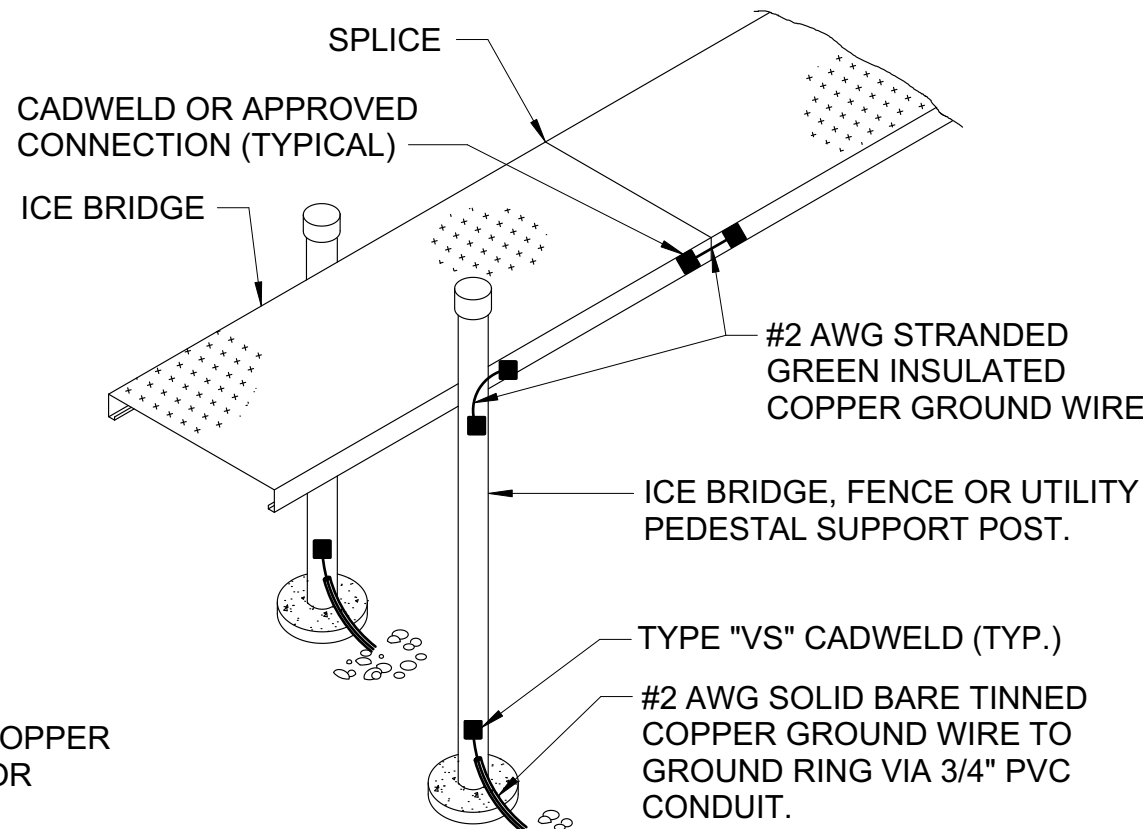
NOTE:
GPS SHOULD HAVE CLEAR VIEW OF THE SOUTHERN HORIZON

GPS ANTENNA INSTALLATION

DETAIL 1
SCALE: NONE

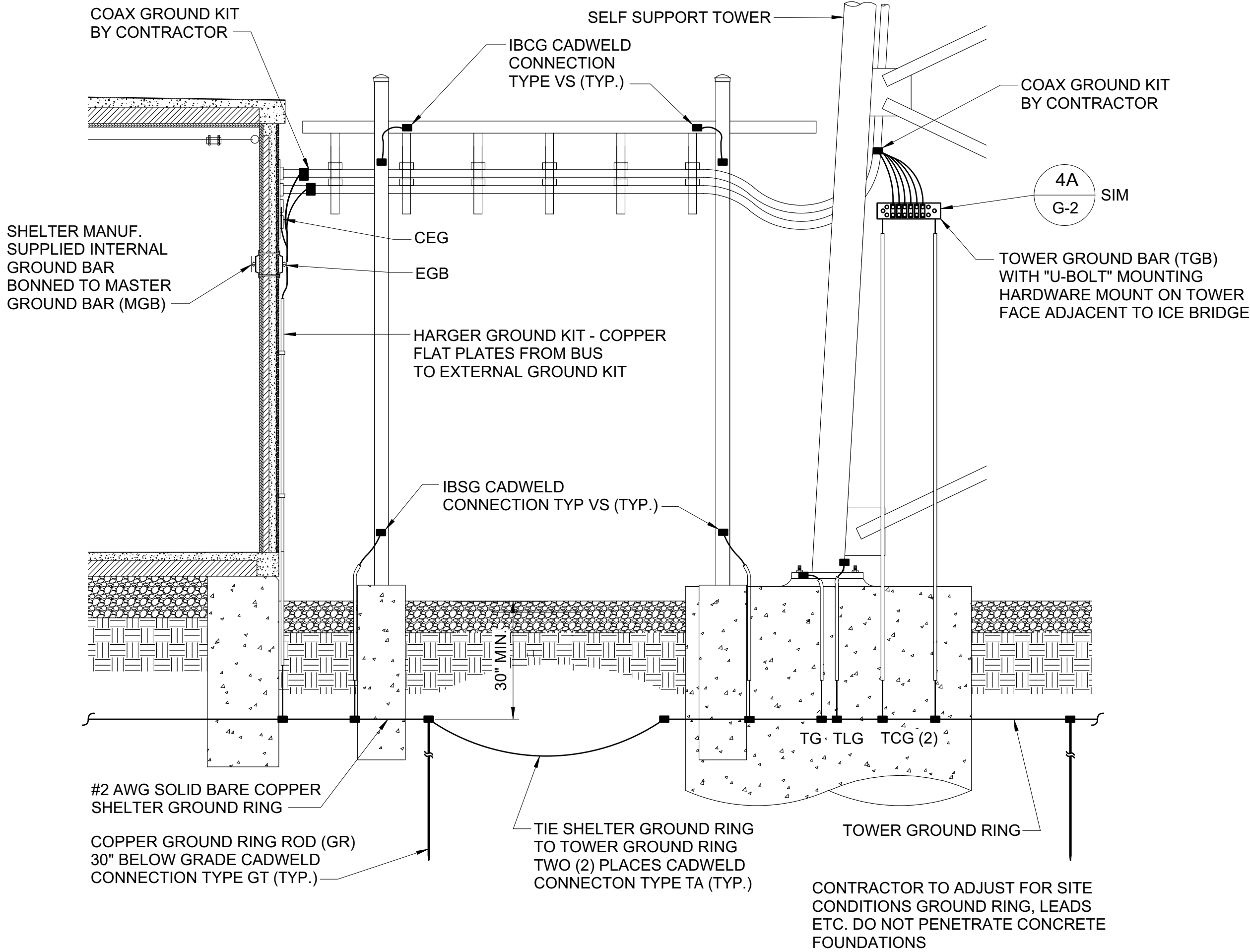


GROUNDING INSPECTION TEST WELL 2
SCALE: NONE

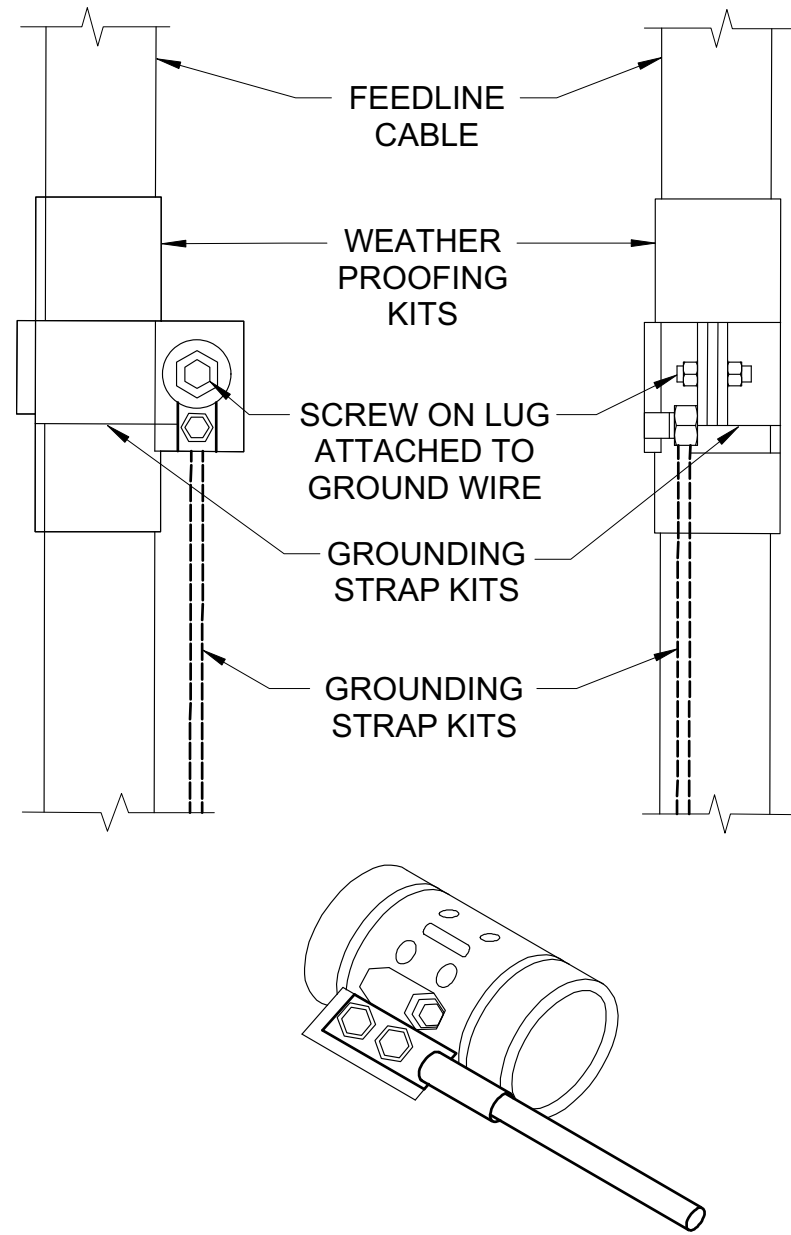


GROUNDING - STANDARD DETAIL
ICEBRIDGE & POSTS

DETAIL 3
SCALE: NONE



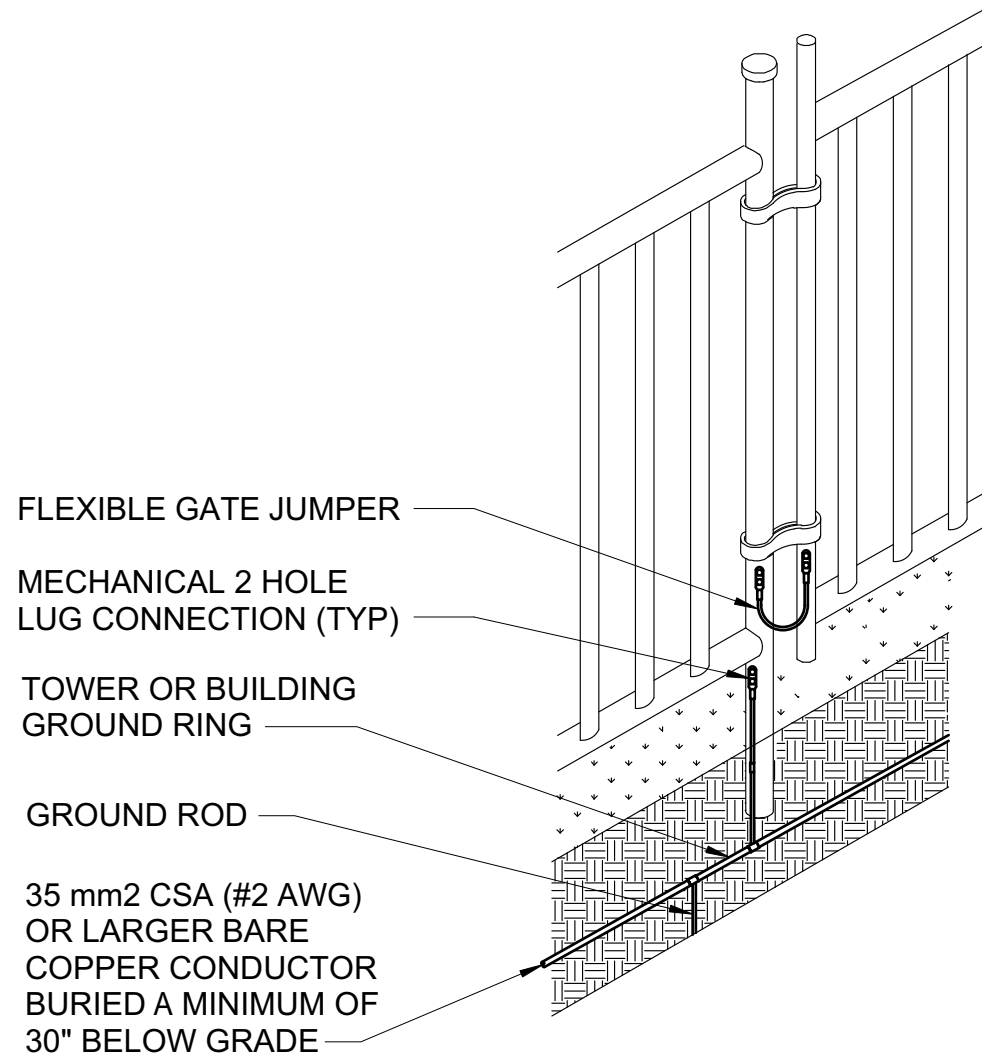
ICE BRIDGE AND TOWER GROUNDING ELEVATION 4
SCALE: NONE



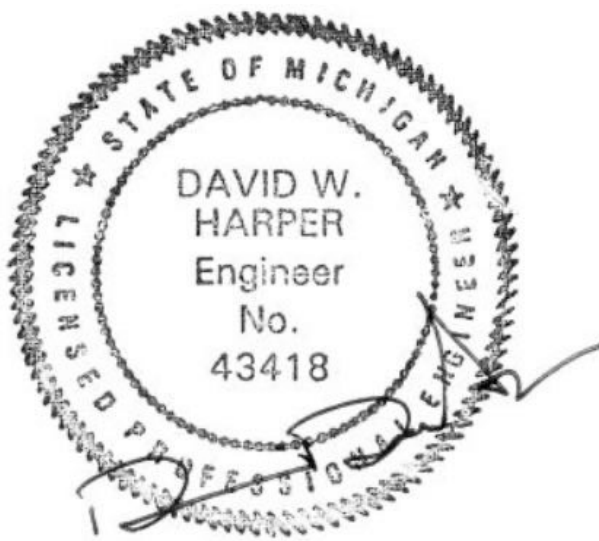
COAX CABLE GROUND KIT DETAIL 4
SCALE: NONE

NOTES:

- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR
- THIS DETAIL IS TYPICAL FOR EACH COAX CABLE WHERE IT IS SPECIFIED TO BE GROUNDED
- CABLE TO BE GROUNDED AT ANTENNA LEVEL AND PRIOR TO ENTERING SHELTER ENTRY PANEL
- CABLE ALSO TO BE GROUNDED TO GROUND BAR AT TOWER BASE



FENCE POST / GATE BONDING 5
SCALE: NONE



05/25/21

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B	04/15/21	FOR APPROVAL	GJB
A	03/31/21	FOR APPROVAL	GJB



5130 WEST 6TH STREET
CLEVELAND, OH. 44141

HARPER
ENGINEERING, INC.
TELECOM GROUP
815 Superior Ave. Suite 1514
Cleveland, OH. 44114
Phone: (216) 344-3855
Fax: (216) 344-3856

SCALE: AS NOTED
DRAWN BY: GJB
CHECKED BY: GJB
DATE: 03/04/21
FILE: 20-216-006

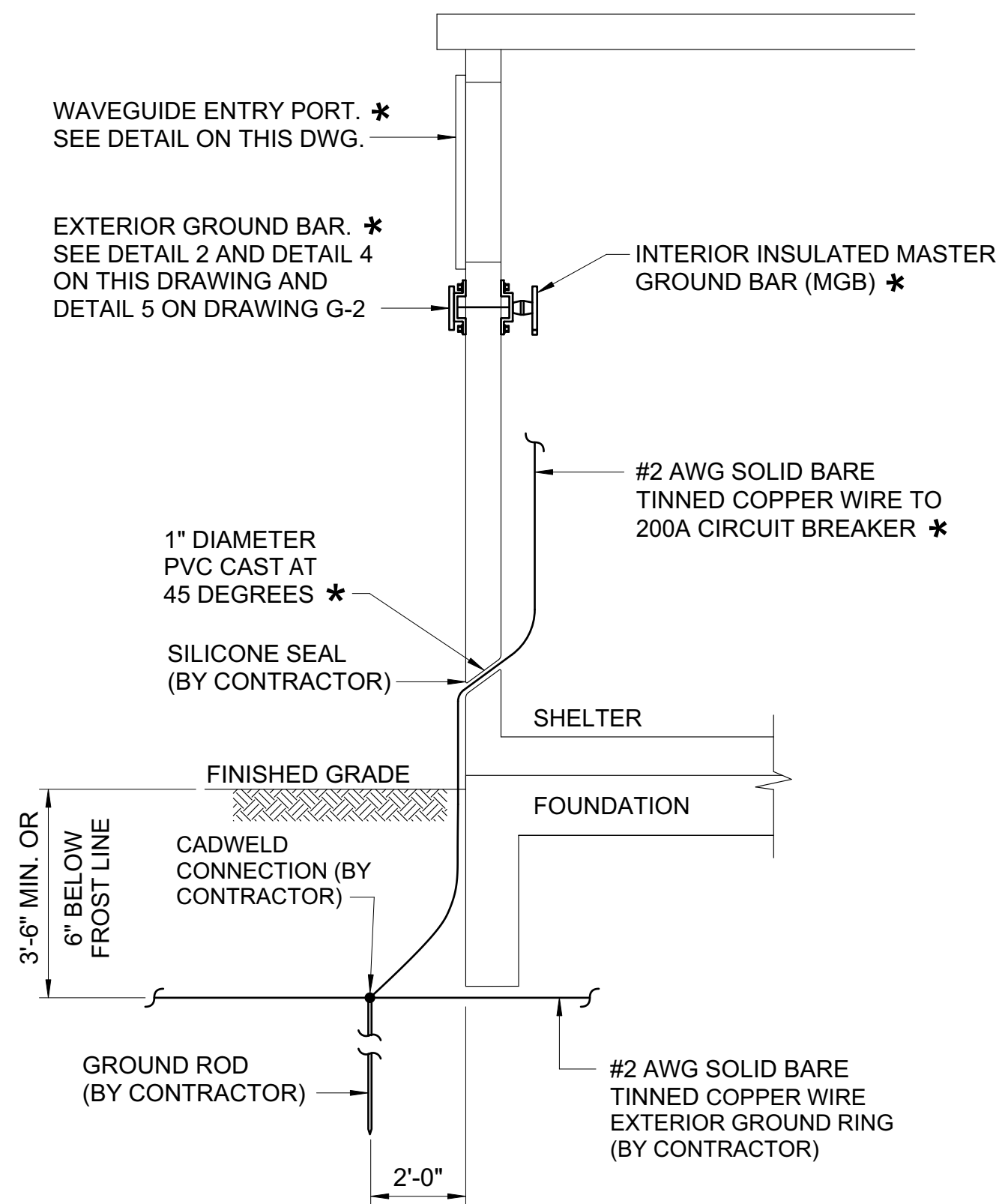
GROUNDING DETAILS

5112 WMU BTR2
PARKVIEW AVENUE
KALAMAZOO, MI 49009

Drawing / Rev.

G-3/0

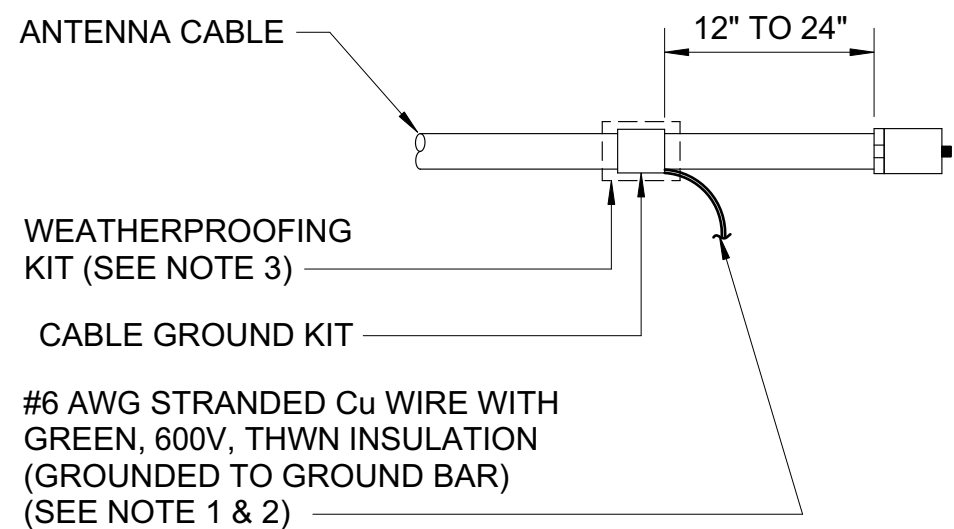
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* SUPPLIED BY SHELTER MFR.

MASTER GROUND BAR DETAIL

DETAIL 1
SCALE: NONE

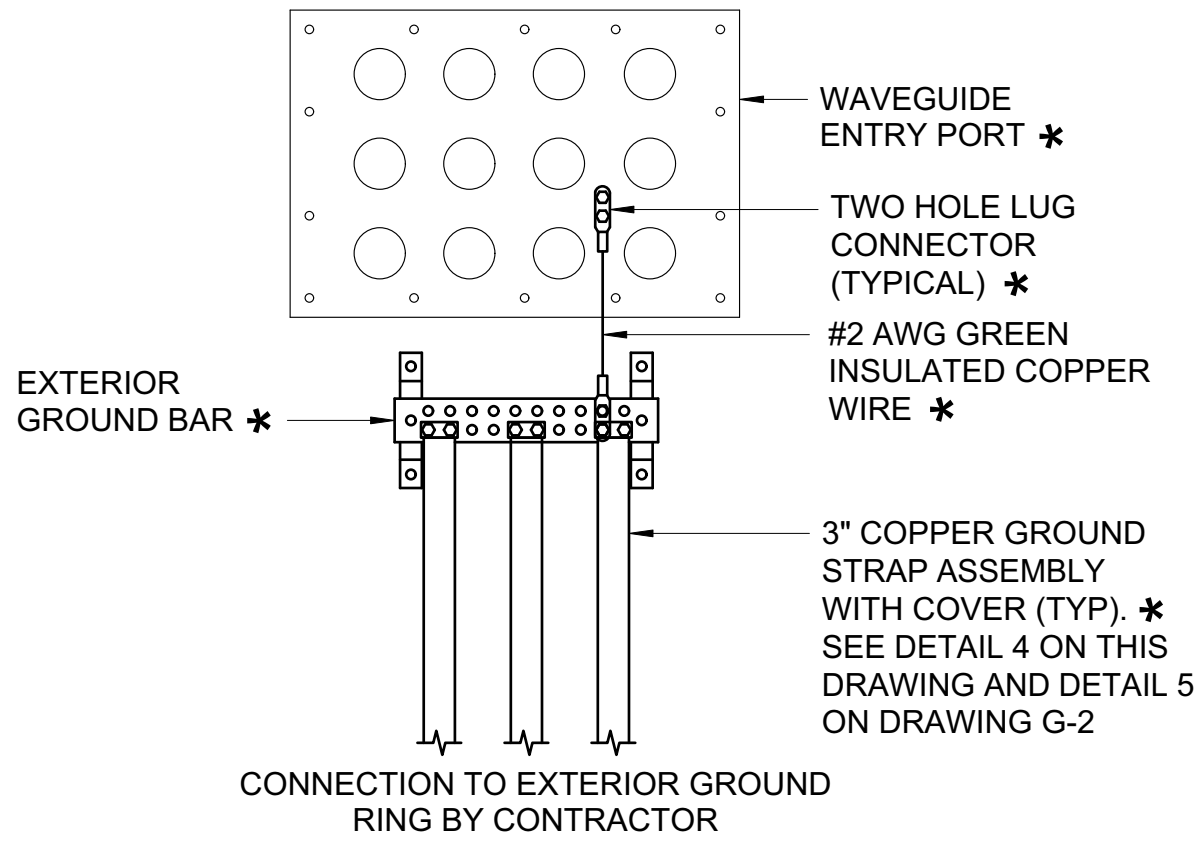


NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHERPROOFING SHALL BE (TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.)

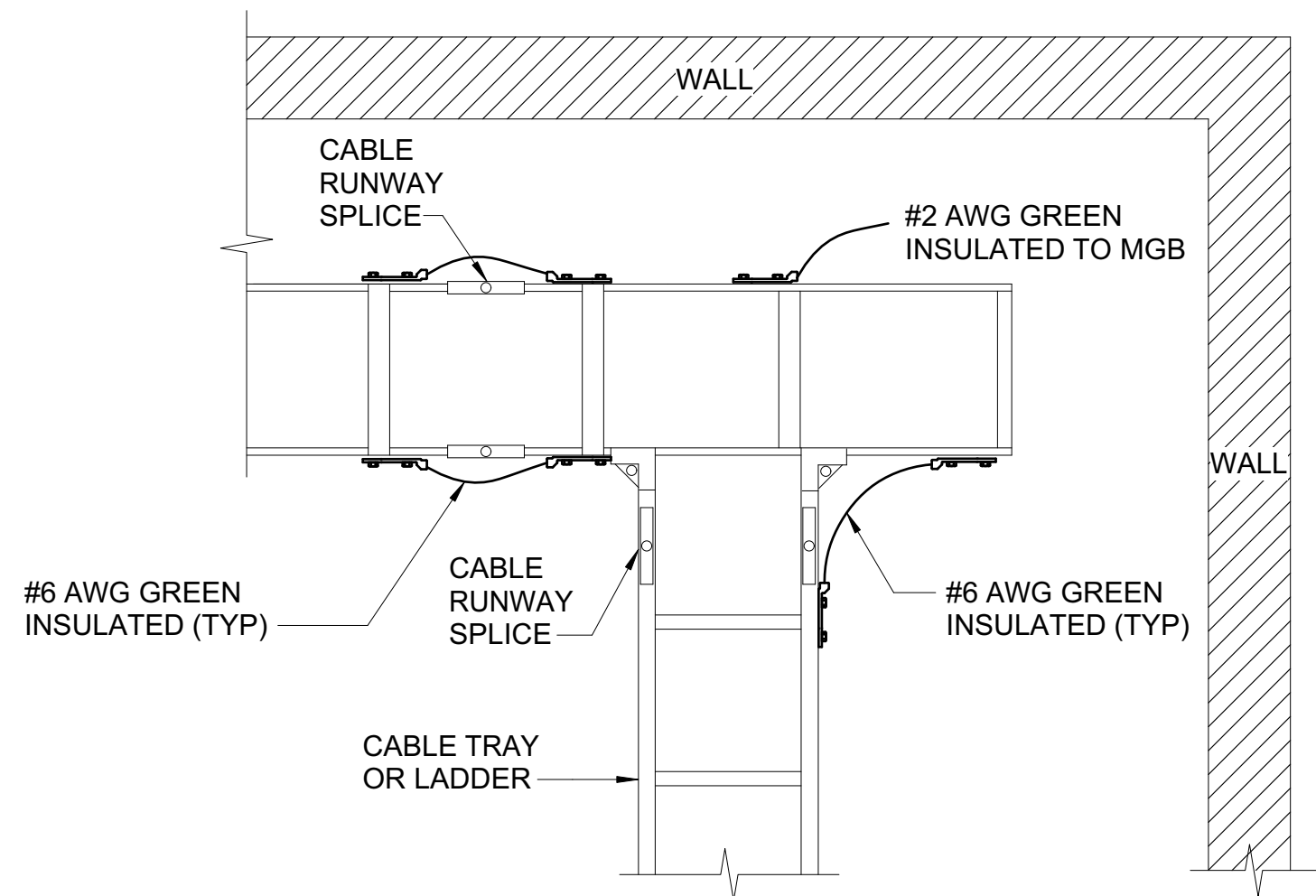
CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

DETAIL 5
SCALE: NONE



WAVEGUIDE ENTRY PORT GROUND DETAIL

DETAIL 2
SCALE: NONE

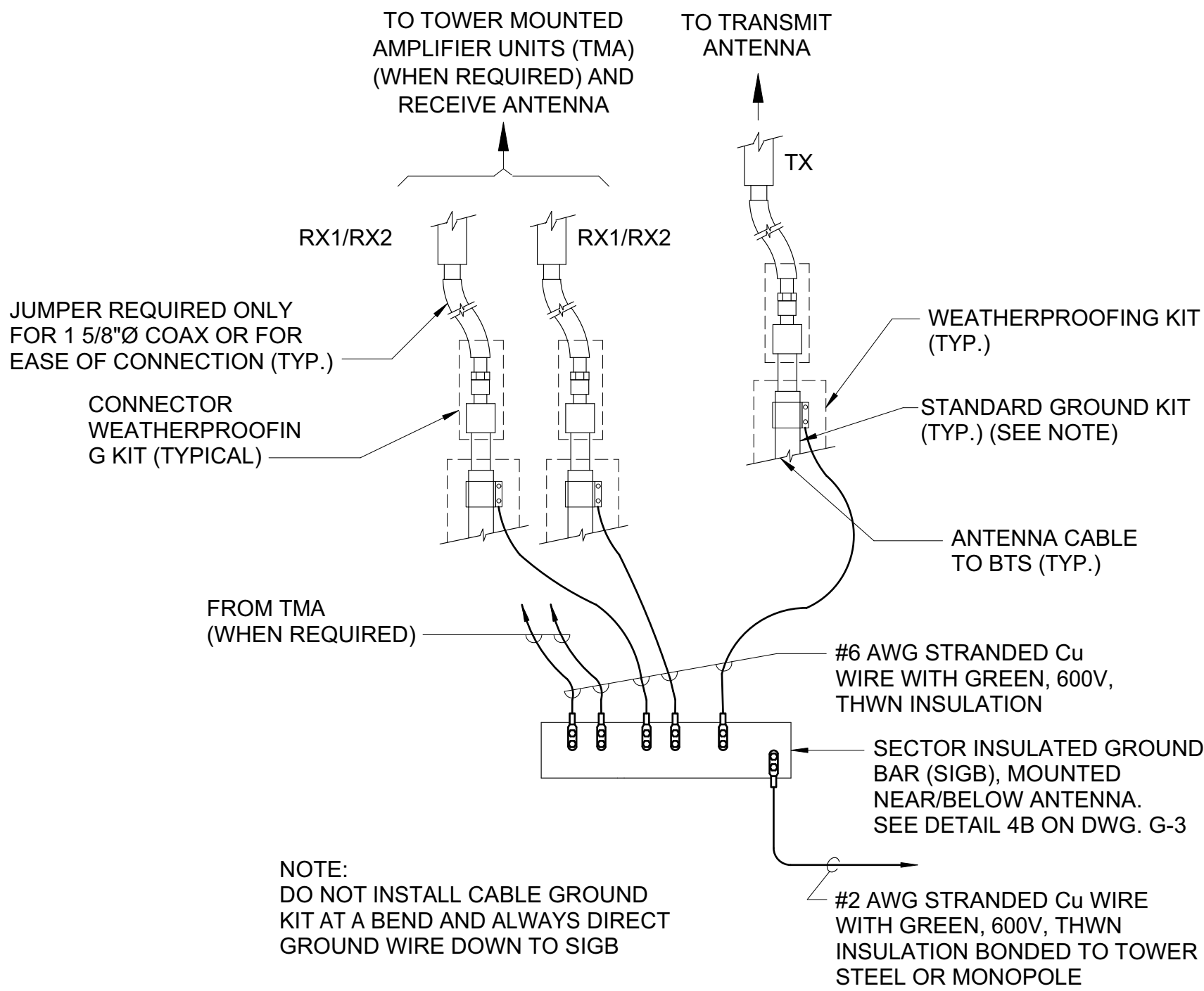


OVERHEAD VIEW - BONDING DETAIL

NOTE:

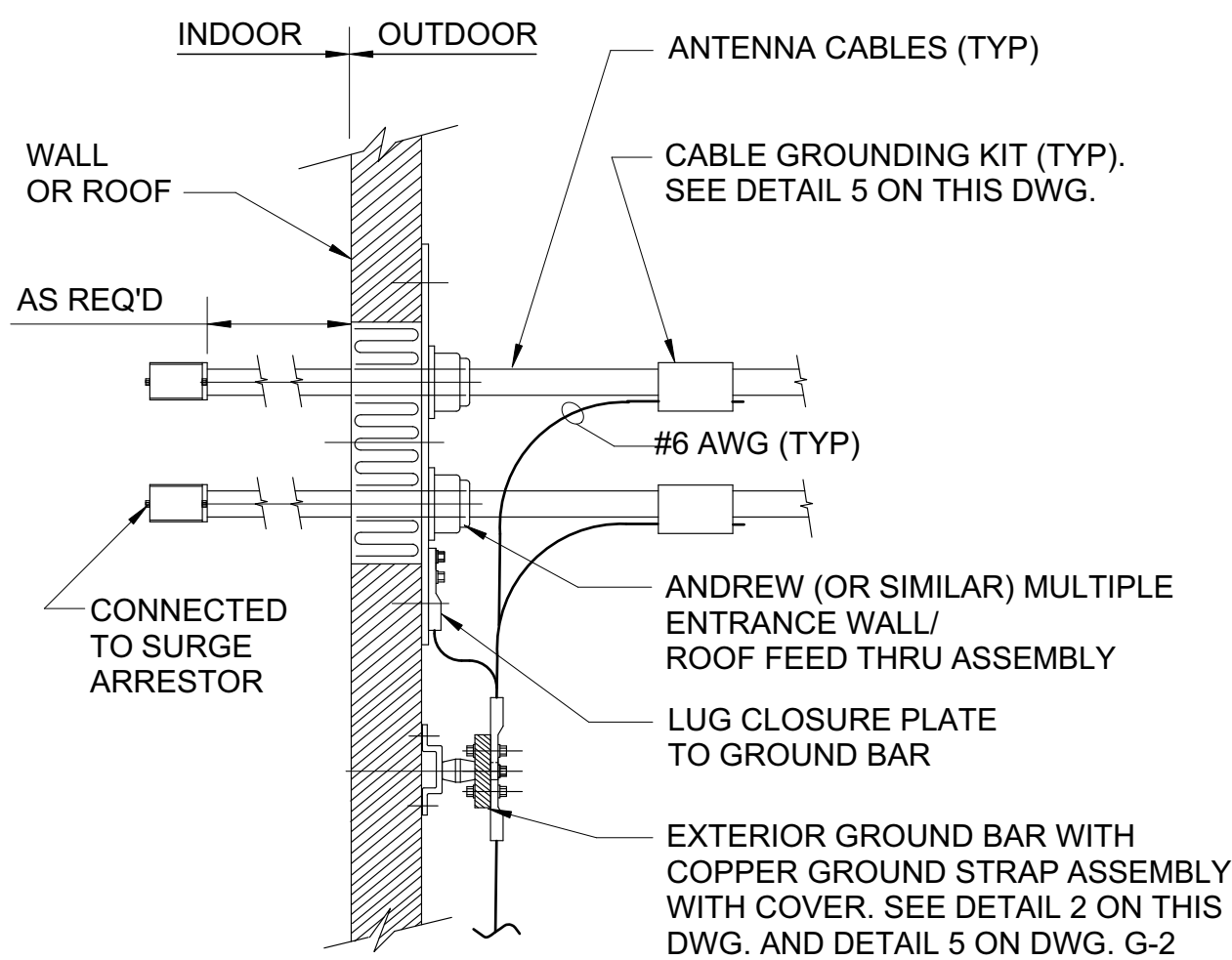
STRAPS (ON STRAIGHT RUNS) SHOULD BE AS SHORT AND STRAIGHT AS POSSIBLE.

CABLE RUNWAY BONDING DETAIL 6
SCALE: NONE



CONNECTION OF GROUND WIRE TO GROUNDING BAR (SIGB)

DETAIL 3
SCALE: NONE



DETAIL 4
SCALE: NONE

NOTE:

ALL GROUND WIRES THAT TRANSITION FROM ABOVE GRADE TO BELOW GRADE SHALL BE ROUTED IN A 3/4 inch PVC CONDUIT (NOT SHOWN FOR CLARITY) FROM THE CONNECTION TO A MINIMUM OF 18 inch BELOW GRADE. BOTH ENDS OF THE PVC CONDUIT SHALL BE SEALED WITH SILICONE CAULK.

Rev.	Date:	Description:	Mgr.
0	05/25/21	FOR ZONING	GJB
A	03/31/21	FOR APPROVAL	GJB



5130 WEST 6TH STREET
CLEVELAND, OH. 44141

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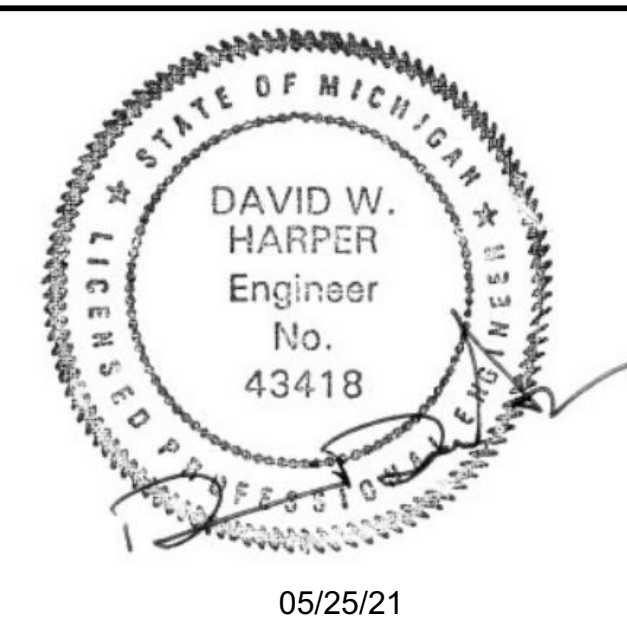
SCALE: AS NOTED
DRAWN BY: GJB
CHECKED BY: GJB
DATE: 03/04/21
FILE: 20-216-006

GROUNDING DETAILS

5112 WMU BTR2
PARKVIEW AVENUE
KALAMAZOO, MI 49009

Drawing / Rev.

G-4/0



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GENERAL NOTES:

1. GENERAL

1.1. SUMMARY OF WORK

A. THE WORK MAY CONSIST OF BUT NOT BE LIMITED TO, THE INSTALLATION OF EQUIPMENT CABINETS, ANTENNAS ,AND LINES. FUEL TANKS, GROUNDING, ELECTRICAL WORK, ETC., ASSOCIATED WITH THE MOTOROLA EQUIPMENT AS INDICATED ON DRAWINGS AND AS SPECIFIED HEREIN. CONTRACTOR SHALL SUPPLY ALL PERMANENT MATERIALS/EQUIPMENT REQUIRED AND ALL LABOR, EQUIPMENT, TOOLS, UTILITIES, MINOR HARDWARE/MATERIALS, TRANSPORTATION AND FACILITIES NECESSARY FOR PROPER EXECUTION AND COMPLETION OF SERVICES AND INSTALL WORK, WHETHER TEMPORARY OR PERMANENT. CONTRACTOR SHALL BE OBLIGATED TO PERFORM ALL THE WORK OUTLINED IN THESE DRAWINGS IN ACCORDANCE WITH THE CONTRACT AGREEMENT, FEDERAL REGULATIONS, STATE REQUIREMENTS, LOCAL CODES, COMMERCIAL/INDUSTRY STANDARDS, DETAILED SCOPE OF WORK AND THE DOCUMENTS IDENTIFIED BELOW. IN CASE OF A CONFLICT BETWEEN THE ABOVE LISTED DOCUMENTS REGARDING STANDARDS OF WORK, THE MORE STRINGENT CRITERIA SHALL APPLY. ANY ADDITIONAL COSTS OR DELAYS RESULTING FROM CORRECTION OF THE WORK TO COMPLY WITH THE ABOVE REQUIREMENT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

1.2. SITE VISIT

CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE ITSELF WITH THE SCOPE OF WORK REQUIRED PER THE DRAWINGS AND ALL LOCAL CONDITIONS AND LAWS AND REGULATIONS THAT MAY IN ANY MANNER AFFECT THE PRICE, PROGRESS AND PERFORMANCE OF WORK, INCLUDING ANY COSTS ASSOCIATED WITH IT. THE CONTRACTOR SHALL ALSO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND NOTIFY THE MOTOROLA REPRESENTATIVE OF ANY DISCREPANCIES OR INTERFERENCES WHICH AFFECT THE WORK OF THIS CONTRACT.

1.3. STANDARDS AND CODES

THE FOLLOWING DOCUMENTS (ATEST REVISION) SHALL BE CONSIDERED TO BE SPECIFICATION AND ARE INCORPORATED HEREIN BY REFERENCE. IN THE EVENT OF CONFLICT BETWEEN THE REQUIREMENTS OF THIS SPECIFICATION AND THE REQUIREMENTS OF THE REFERENCED DOCUMENTS, THE STRICTER SPECIFICATION SHALL GOVERN. WHERE PROVISIONS OF THE CODES AND STANDARDS ARE IN CONFLICT WITH THE BUILDING CODE IN FORCE FOR THIS PROJECT, THE BUILDING CODE SHALL GOVERN.

A. AMERICAN CONCRETE INSTITUTE:

ACI 301 – "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS".
ACI 305 "HOT WEATHER CONCRETING".
ACI 306 "COLD WEATHER CONCRETING".
ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE."
ACI 614 "RECOMMENDED PRACTICE FOR MEASURING, MIXING AND PLACING CONCRETE".
ACI 311 "RECOMMENDED PRACTICE FOR CONCRETE INSPECTION".
ACI 315 "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
ACI 613 "RECOMMENDED PRACTICE FOR SELECTING PROPORTIONS FOR CONCRETE".

B. AMERICAN NATIONAL STANDARDS INSTITUTE:

ANSI Z359 REQUIREMENTS FOR PERSONAL FALL ARREST SYSTEMS, SUBSYSTEMS AND COMPONENTS
ANSI Z87.1 OCCUPATIONAL AND EDUCATIONAL EYE AND FACE PROTECTION
ANSI Z89.1 PROTECTIVE HEADWEAR FOR INDUSTRIAL WORKERS – REQUIREMENTS
ANSI/IEEE C95.1 SAFETY LEVELS WITH RESPECT TO HUMAN EXPOSURE TO RADIO FREQUENCY ENERGY
ANSI/TIA/EIA STANDARD 222: STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

C. AMERICAN INSTITUTE OF STEEL CONSTRUCTION"

AISC MANUAL OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION: LATEST EDITION

D. AMERICAN SOCIETY FOR TESTING AND MATERIALS:

ASTM A615 — "SPECIFICATION FOR DEFORMED AND PLAIN BILLET STEEL BARS FOR CONCRETE REINFORCEMENT".
ASTM C94-80 — "SPECIFICATION FOR READY-MIX CONCRETE".
ASTM C39-77 — "SPECIFICATION FOR TEST FOR COMPREHENSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMEN".
ASTM 33 — "SPECIFICATION FOR CONCRETE AGGREGATES".
ASTM C150 — "SPECIFICATION FOR PORTLAND CEMENT".
ASTM C172 — "SAMPLING FRESH CONCRETE".
ASTM C143 — "SLUMP OF PORTLAND CEMENT CONCRETE".
ASTM D698-91 — "TEST METHOD FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT".
ASTM D1556-84 — "DENSITY OF SOIL IN PLACE BY THE SAND-CONE METHOD".
ASTM D1557 — "TEST FOR MOISTURE-UNIT WEIGHT RELATIONS OF SOILS AND SOIL-AGGREGATE MIXTURES USING 10-LB. HAMMER AND 18-IN. DROP". (PROCEDURE C)
ASTM D2487 — "STANDARD CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOIL CLASSIFICATION SYSTEM)"
ASTM D2922 — "DENSITY OF SOIL AND SOIL AGGREGATE IN PLACE BY NUCLEAR METHODS SHALLOW DEPTH".
ASTM D2940 — "STANDARD SPECIFICATION FOR GRADED AGGREGATE MATERIAL FOR BASES OR SUB-BASES FOR HIGHWAYS OR AIRPORTS"

E. AMERICAN WELDING SOCIETY:

AWS D12.1 – "RECOMMENDED PRACTICES FOR WELDING REINFORCING STEEL, METAL INSERTS AND CONNECTIONS IN REINFORCED CONCRETE CONSTRUCTION".

F. CONCRETE REINFORCING STEEL INSTITUTE:

"MANUAL OF STANDARD PRACTICE"

G. FEDERAL AVIATION ADMINISTRATION:

DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR, AC 70/7460-1L: OBSTRUCTION MARKING AND LIGHTING.

DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR, 150-5345-43, FAA/DOD SPECIFICATION L-856: HIGH INTENSITY OBSTRUCTION LIGHTING SYSTEMS.

H. FEDERAL COMMUNICATIONS COMMISSION:

FEDERAL COMMUNICATIONS COMMISSION – RULES AND REGULATIONS PART 17, CONSTRUCTION, MARKING, AND LIGHTING OF ANTENNA STRUCTURES.

I. STRUCTURAL STEEL PAINTING COUNCIL:

SSPC-SP-1-63: SPECIFICATION FOR PAINTING STEEL STRUCTURES.

J. MOTOROLA R56 STANDARDS AND GUIDELINES FOR COMMUNICATIONS SITES (LATEST REVISION).

K. MOTOROLA'S CIVIL WORKS BID SPECIFICATIONS

L. NATIONAL FIRE PROTECTION ASSOCIATION:

NFPA 1 – FIRE PREVENTION CODE
NFPA 54 – NATURAL GAS FUEL CODE
NFPA 58 – LP GAS CODE
NFPA 70 – NATIONAL ELECTRICAL CODE
NFPA 101 – LIFE SAFETY CODE
NFPA 110 – EMERGENCY/STANDBY POWER SYSTEMS
NFPA 111 – STANDARD ON STORED ELECTRICAL ENERGY, EMERGENCY AND STANDBY POWER SYSTEMS
NFPA 780 – STANDARD FOR THE INSTALLATION OF LIGHTNING PROTECTION SYSTEMS

M. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

OSHA 1926
OSHA DIRECTIVES CPL 2-1.29 - INTERIM INSPECTION PROCEDURES DURING COMMUNICATION TOWER CONSTRUCTION
ACTIVITIES.

N. MICHIGAN BUILDING CODE LATEST REVISION.

1.4. NOTICE TO PROCEED

WHEN THE SITE IS READY FOR INSTALLATION, MOTOROLA SHALL ISSUE A NOTICE TO PROCEED TO THE CONTRACTOR. UPON RECEIPT OF THE NOTICE OF PROCEED, THE CONTRACTOR SHALL SUBMIT TO MOTOROLA A SCHEDULE REFLECTING THE WORK PLAN. THE CONTRACTOR SHALL ADVISE THE MOTOROLA REPRESENTATIVE IMMEDIATELY OF ANY SCHEDULE CHANGES. THE CONTRACTOR SHALL ADJUST HIS WORK, AS REQUIRED, TO COORDINATE WITH THE MOTOROLA INSTALLATION TEAM IF THE SCHEDULES OVERLAP.

1.5. MOTOROLA REPRESENTATIVE

MOTOROLA SHALL DESIGNATE A REPRESENTATIVE. THIS PERSON IS THE ONLY CONTACT POINT AUTHORIZED TO MAKE ANY CHANGES TO THE CONTRACT PROVISIONS OR THE PLANS AND SPECIFICATIONS. ANY CHANGES MADE BY THE CONTRACTOR ARE AT THE CONTRACTOR'S RESPONSIBILITY AND RISK.

1.6. CONTRACTORS FIELD REPRESENTATIVE

CONTRACTOR SHALL ASSIGN A FIELD REPRESENTATIVE WHO IS FAMILIAR WITH THESE SPECIFICATIONS AND WILL REPRESENT THE CONTRACTOR AND HAVE THE AUTHORITY TO ACT FOR THE CONTRACTOR AND SUPERVISE ALL CONSTRUCTION ACTIVITIES. THE REPRESENTATIVE SHALL BE AVAILABLE WHEN CONSTRUCTION ACTIVITIES BEGIN. THE FIELD REPRESENTATIVE SHALL BE THE PRIMARY POINT OF CONTACT FOR MOTOROLA DURING THE CONSTRUCTION PHASE OF THE WORK.

1.7. PROJECT MEETINGS

THE CONTRACTOR SHALL CONDUCT THE INITIAL (PRE-CONSTRUCTION) MEETING (INCLUDING ALL SUB-CONTRACTORS) WITH THE MOTOROLA REPRESENTATIVE WITHIN TWO WEEKS AFTER AWARD OF THE CONTRACT. SUBSEQUENTLY, THE CONTRACTOR SHALL PROVIDE PROGRESS SCHEDULE UPDATES TO MOTOROLA ON A WEEKLY BASIS.

1.8. MATERIALS

CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AS REQUIRED FOR COMPLETE SYSTEMS INCLUDING: ALL PARTS OBVIOUSLY OR REASONABLY INCIDENTAL TO A COMPLETE INSTALLATION, WHETHER SPECIFICALLY INDICATED OR NOT. ALL SYSTEMS SHALL BE COMPLETELY ASSEMBLED, TESTED, ADJUSTED, AND DEMONSTRATED TO BE READY FOR OPERATION PRIOR TO MOTOROLA'S ACCEPTANCE.

MATERIALS AND WORKMANSHIP SHALL BE THE BEST OF THEIR RESPECTIVE KINDS (AS DEFINED BY INDUSTRY STANDARDS), FREE OF DEFECTS AND ALL MATERIALS SHALL BE NEW AND UNUSED IN ALL CASES, UNLESS OTHERWISE SPECIFIED. WHERE THE NAME OF A CONCERN OR MANUFACTURER IS MENTIONED ON DRAWINGS OR IN SPECIFICATIONS IN REFERENCE TO A REQUIRED SERVICE OR PRODUCT, AND NO QUALIFICATIONS OR SPECIFICATION OF SUCH IS INCLUDED, THEN THE MATERIAL SPECIFICATIONS, DETAILS OF MANUFACTURE, FINISH, ETC., SHALL BE IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICE, DIRECTION OR SPECIFICATIONS. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

1.9. VERIFICATION OF EXISTING CONDITIONS

BEFORE STARTING ANY OPERATION, THE CONTRACTOR SHALL EXAMINE EXISTING WORK, OR WORK PERFORMED BY OTHERS, TO WHICH ITS WORK IS TO ADJOIN OR BE APPLIED AND SHALL REPORT TO MOTOROLA PROJECT MANAGER ANY CONDITIONS THAT WILL PREVENT SATISFACTORY ACCOMPLISHMENT OF HIS WORK. PRIOR TO COMMENCING ANY EXCAVATION OR GRADING, THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF ALL SURVEY DATA AS INDICATED IN THE PLANS AND SPECIFICATIONS AND/OR AS PROVIDED BY MOTOROLA. SHOULD THE CONTRACTOR DISCOVER ANY INACCURACIES, ERRORS, OR OMISSIONS IN THE SURVEY DATA, HE SHALL IMMEDIATELY NOTIFY THE MOTOROLA REPRESENTATIVE IN ORDER THAT PROPER ADJUSTMENTS CAN BE ANTICIPATED AND ORDERED. FAILURE TO NOTIFY THE MOTOROLA REPRESENTATIVE OF DEFICIENCIES, ERRORS OR FAULTS PRIOR TO COMMENCEMENT OF WORK SHALL CONSTITUTE ACCEPTANCE THEREOF AND WAIVER OF ANY CLAIMS OF UNSUITABILITY, ERRORS, OMISSIONS OR INACCURACIES.

THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PRESERVING ALL ESTABLISHED SURVEY CONTROL POINTS. IF THE CONTRACTOR OR ANY OF HIS SUB-CONTRACTORS MOVE OR DESTROY ANY SURVEY CONTROL POINTS, THE COST INCURRED BY THE LAND OWNER OR MOTOROLA TO RE-ESTABLISH THEM WILL BE BORNE BY THE CONTRACTOR.

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1.10. PERMITS

THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. THE CONTRACTOR SHALL MEET ALL OF THE REGULATORY REQUIREMENTS OF THE JURISDICTION GOVERNING CONSTRUCTION.

1.11. SITE INSPECTION

THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY FOR ARRANGING WITH MOTOROLA FOR AN INSPECTION PRIOR TO COVERING UP ALL WORK THAT WILL BE COVERED IN FINISHED CONDITION. IT IS THE SITE GENERAL CONTRACTOR'S RESPONSIBILITY TO MANAGE THE SEQUENCE OF WORK AND REQUEST THE INSPECTIONS IN A TIMELY MANNER. THE SITE GENERAL CONTRACTOR SHALL NOT REQUEST AN INSPECTION UNLESS ALL OF THE RELATED WORK HAS BEEN COMPLETED. WORK SHALL NOT PROCEED TO THE NEXT STEP UNTIL THE PREVIOUS STEP HAS BEEN INSPECTED AND APPROVED BY THE LOCAL INSPECTORS AND THE MOTOROLA REPRESENTATIVE. THE PRESENCE OF THE OWNER OR MOTOROLA REPRESENTATIVE ON THE JOB SITE IN NO WAY RELIEVES THE SITE GENERAL CONTRACTOR OF THE ASSOCIATED RESPONSIBILITIES OF THE JOB. ANY WORK WHICH DOES NOT MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS WILL BE CORRECTED OR REMOVED SOLELY AT THE SITE GENERAL CONTRACTOR'S EXPENSE.

THE FOLLOWING INFORMATION IS INCLUDED AS A GUIDE TO THE CONTRACTOR TO ASSIST IN DETERMINING THE TYPE AND FREQUENCY OF INSPECTIONS. THE LISTED INSPECTIONS REPRESENT THOSE REQUIRED FOR SMALL OR SIMPLE PROJECTS. LARGE OR COMPLEX PROJECTS MAY REQUIRE ADDITIONAL INSPECTIONS DEPENDING ON THE SEQUENCE OF WORK.

FOUNDATION EXCAVATIONS AND REBAR: TO BE MADE AFTER TRENCHES ARE EXCAVATED AND FORMS ERECTED, REINFORCEMENT PLACED, COMPACTION TESTED, SOIL TREATED, VAPOR BARRIER PLACED, AND ESSENTIALLY READY FOR CONCRETE PLACEMENT.

GROUNDING: TO BE MADE AFTER THE BELOW GROUND CADWELD CONNECTIONS HAVE BEEN COMPLETED, PRIOR TO COVERING UP THE TRENCHES.

ELECTRICAL WORK WITHIN WALLS: TO BE MADE AFTER THE ROOF, FRAMING, FIRE BLOCKING AND BRACING IS IN PLACE PRIOR TO THE INSTALLATION OF INSULATION OR WALL/CEILING MEMBRANES.

AS A GENERAL RULE, THE CONTRACTOR SHALL PROVIDE ADVANCE NOTICE TO MOTOROLA FOR INSPECTION OF ALL WORK PRIOR TO CONCEALMENT. THE CONTRACTOR HAS RESPONSIBILITIES RELATIVE TO ALL TYPES OF INSPECTIONS AND IS RESPONSIBLE FOR CONTACTING ALL OF THE INSPECTING ENTITIES TO DETERMINE HIS RESPONSIBILITIES. ALL OF THESE INSPECTING ENTITIES HAVE UNIQUE AND SEPARATE RESPONSIBILITIES. ONE INSPECTION FROM AN ENTITY WILL NOT SUBSTITUTE FOR AN INSPECTION FROM ANOTHER ENTITY.

1.12. SAFETY

THE CONTRACTOR, HIS EMPLOYEES, ANY SUB-CONTRACTORS, VENDORS, THEIR RESPECTIVE EMPLOYEES AND CONTRACTOR'S VISITORS SHALL COMPLY WITH ALL SAFETY STANDARDS, ACCIDENT PREVENTION REGULATIONS AND ENVIRONMENTAL REGULATIONS PROMULGATED BY FEDERAL, STATE OR LOCAL. AUTHORITIES HAVING JURISDICTION AND SHALL AT ALL TIMES CONDUCT ALL OPERATIONS UNDER THE CONTRACT IN A MANNER TO AVOID THE RISK OF BODILY HARM TO ANY PERSONS AND THE RISK OF DAMAGE TO ANY PROPERTY, EQUIPMENT OR MATERIAL SUCH PARTIES SHALL ALSO COMPLY WITH ANY SAFETY PROGRAMS AND/OR RULES PROMULGATED BY OWNER AND/OR MOTOROLA.

1.13. ELECTRO MAGNETIC EMISSIONS

THE CONTRACTOR SHALL ACKNOWLEDGE ALL OR PORTIONS OF THE WORK MAY INVOLVE POSSIBLE EXPOSURE OF CONTRACTOR, SUB-CONTRACTORS, AND THEIR RESPECTIVE EMPLOYEES, AGENTS, INVITEES, LICENSEES AND OTHER VISITORS TO THE JOBSITE AND/OR MOTOROLA PREMISES TO ELECTRO-MAGNETIC ENERGY ("EME") WHILE PERFORMING WORK UNDER THIS CONTRACT, ESPECIALLY IF WORK IS PERFORMED ON EXISTING ANTENNA TOWERS WHERE ANTENNAS ARE LOCATED. THE CONTRACTOR REPRESENTS THAT CONTRACTOR, SUBCONTRACTORS, AND ALL OF THEIR RESPECTIVE EMPLOYEES, AGENTS, INVITEES, LICENSEES, AND OTHER AUTHORIZED REPRESENTATIVES WHO ARE PERFORMING SERVICES UNDER THIS AGREEMENT WILL COMPLY WITH ALL ANSI AND ANY OTHER APPLICABLE EME STANDARDS, RULES OR REGULATIONS, INCLUDING, BUT NOT LIMITED TO THOSE RULES OR REGULATIONS IMPOSED OR SUGGESTED BY MOTOROLA, IF ANY.

THE CONTRACTOR SHALL ADHERE TO ALL OSHA RULES, REGULATIONS AND ADOPTED POLICIES. ALL CONTRACTOR PERSONNEL SHALL HAVE UNDERGONE ELECTROMAGNETIC ENERGY (EME) TRAINING FOR PERSONNEL WORKING IN THE VICINITY OF ACTIVE ANTENNAS. AS SUCH IT IS RECOMMENDED THAT RF MONITORS BE USED BY THE TOWER PERSONNEL TO MONITOR EXPOSURE LEVELS. IF EME LEVELS AT THE SITE EXCEED THE MAXIMUM PERMISSIBLE EXPOSURE LIMITS, THE CONTRACTOR SHALL COORDINATE WITH THE INDIVIDUALS RESPONSIBLE FOR USE OF THE TRANSMITTER TO MAKE SURE THAT THE EQUIPMENT IS DEACTIVATED BEFORE WORK CAN BE RESUMED, WITHOUT CAUSING A SERIOUS DISRUPTION OF THE SERVICE.

1.14. SITE CLEANUP

THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE AT ALL TIMES DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, VEGETATION, AND RUBBISH, AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. WHENEVER THE WORK-SITE IS LEFT UNATTENDED, THE CONTRACTOR SHALL BLOCK THE OPENING WITH WARNING TAPE TO DISCOURAGE TRESPASSING. THE PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE AT THE CONCLUSION OF SITE WORK.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LANDSCAPE GRADING AND SEEDING OF THE DISTURBED SOIL THE CONTRACTOR SHALL USE LOCAL GRASS SEED TO STABILIZE SOIL AND SHALL COVER DISTURBED AREAS WITH HAY MULCH TO REDUCE RUNOFF OF SEDIMENT TO DOWNSTREAM AREAS. THE CONTRACTOR SHALL RESTORE THE SITE TO ITS ORIGINAL CONDITION. ALL SLOPES AND DISTURBED AREAS NOT RECEIVING AGGREGATE SURFACING ARE TO BE PREPARED AND BROADCAST SEEDED AND FERTILIZED FOR EROSION PROTECTION. SEEDING FOR AREAS DISTURBED SHALL BE ESTABLISHED SEASONALLY AS REQUIRED BY LOCAL CODES.

THE CONTRACTOR SHALL EXERCISE ALL CARE TO AVOID DAMAGE OR INTERRUPTION OF EXISTING UNDERGROUND OR OVERHEAD ELECTRIC SERVICES, UNDERGROUND GROUNDING AND FUEL LINES, EQUIPMENT AND BUILDINGS ON THE SITE, PLUS OFF SITE SERVICES, BURIED OR OVERHEAD, SURROUNDING THE EXISTING OR EXPANDED COMPOUND. ANY PROPERTY DAMAGE CAUSED BY THE CONTRACTOR OR HIS OPERATIONS SHALL BE CORRECTED AND/OR RESTORED TO THE SATISFACTION OF THE PROPERTY OWNER(S) AND MOTOROLA AT NO ADDITIONAL COST TO THE PROPERTY OWNER OR MOTOROLA. BURNING WILL NOT BE PERMITTED.

1.15. FACILITY STARTUP & COMMISSIONING

THE CONTRACTOR AND/OR SUB-CONTRACTORS SHALL DEMONSTRATE TO MOTOROLA THAT ALL SYSTEMS AND SUB-SYSTEMS INSTALLED UNDER THIS CONTRACT, OPERATE PROPERLY PRIOR TO THE FINAL ACCEPTANCE INSPECTION AND PROVIDE THE OPERATIONS AND MAINTENANCE MANUALS AT THIS TIME.

1.16. SHOP DRAWINGS/AS-BUILT DRAWINGS

THE MODIFICATIONS TO THE DRAWINGS AFTER CONSTRUCTION START SHALL RECEIVE ENGINEERING AND MOTOROLA APPROVAL PRIOR TO ANY CHANGES BEING MADE. THE ENGINEER OF RECORD SHALL MAKE THE REQUIRED CHANGE AND WILL SUBMIT CHANGES TO MOTOROLA AND ANY JURISDICTION HAVING AUTHORITY.

THE CONTRACTOR SHALL KEEP UP-TO-DATE MARKED-UP PRINTS OF THE PROJECT DRAWINGS. UPON COMPLETION OF WORK AT THE SITE, THE CONTRACTOR SHALL REVIEW THE COMPLETED AS-BUILT DRAWINGS, AND ASCERTAIN THAT ALL DATA FURNISHED ON THE DRAWINGS IS ACCURATE AND TRULY REPRESENTS THE WORK IS ACTUALLY INSTALLED. MARKINGS INDICATING CHANGES TO THE DRAWINGS SHALL BE RED OR GREEN AND CLEARLY VISIBLE. TWO (2) SETS OF "AS-BUILT" DRAWINGS SHALL BE FURNISHED TO THE MOTOROLA REPRESENTATIVE WITHIN 5 DAYS OF THE COMPLETION OF THE PROJECT. THESE DRAWINGS SHALL ALSO SHOW THE FOLLOWING:

MODIFICATIONS TO SITE LAYOUT.
GROUNDING SYSTEM LAYOUT.
UNDERGROUND FUEL LINE RUN.
UNDERGROUND TELCO CABLE RUN.
UNDERGROUND ELECTRICAL RUN.

WHERE THE CONTRACTOR IS RESPONSIBLE FOR SUPPLYING THE SITE EQUIPMENT ROOM. ISOLATION TRANSFORMER. GENERATOR, ETC.) THAT REQUIRES PERIODIC MAINTENANCE, THE CONTRACTOR SHALL INCLUDE ALL OPERATION AND MAINTENANCE MANUALS AND ALL AS-BUILT DRAWINGS WHICH FULLY DESCRIBE THE ACTUAL INSTALLED EQUIPMENT.

1.17. TEST PROCEDURES AND RESULTS

CONTRACTOR WILL CONTRACT WITH A THIRD PARTY "INDEPENDENT" TESTING FIRM TO PERFORM & SUBMIT THE RESULTS OF ALL TESTS REQUIRED BY THE PROJECT SPECIFICATIONS AND DRAWNGS THAT FALL WITHIN THE SCOPE OF WORK. THESE RESULTS SHALL BE SUBMITTED TO THE DESIGNATED MOTOROLA REPRESENTATIVE. IN GENERAL, THE "INDEPENDENT" TESTING FIRM SHALL SUBMIT THE FOLLOWING TEST RESULTS:

MIX DESIGN/CONCRETE COMPRESSION TEST FOR ALL CONCRETE WORK.
FREQUENCY DOMAIN REFLECTOMETER (FDR) WITH PRECISION LOAD / SWEEP TEST FOR ANTENNA AND TRANSMISSION LINE INSTALLATION WORK. ALL SWEEP AND TEST MUST BE WITHIN THE GUIDELINES OUTLINED IN MOTOROLA MOP.
FUEL LINE LEAKAGE TEST FOR FUEL TANK AND PIPING INSTALLATION WORK.
SLUMP TEST FOR CONCRETE WORK.
GROUNDING RESISTANCE TEST FUR GROUNDING WORK.
STRUCTURAL STEEL FABRICATION DRAWINGS.
STRUCTURAL (TOWER) STEEL MATERIALS, FINISH, ASSEMBLY, AND PROPER ASSEMBLY AND INSTALLATION OF ANTENNAS AND TRANSMISSION LINES. ("THIRD PARTY CLIMB" AND REPORT INCLUDING PHOTO DOCUMENTATION)
ANY OTHER TEST THAT MAY BE REQUIRED.

1.18. CONTRACT CLOSEOUT – IN ACCORDANCE WITH MOTOROLA’S SUBCONTRACT AGREEMENT TERMS AND CONDITIONS

THE MOTOROLA REPRESENTATIVE WILL PROVIDE A CERTIFICATE OF COMPLETION AND APPROVE FINAL PAYMENT WHEN ALL PUNCH-LIST ITEMS HAVE BEEN CORRECTED, RECORD DRAWNGS SUBMITTED, AND ALL SYSTEMS ARE ACCEPTABLE. THE CONTRACTOR MUST ALSO RECEIVE A CERTIFICATE OF COMPLETION FROM THE MUNICIPALITY. AFTER FINAL PAYMENT, CONTRACTOR WILL SIGN A RELEASE OF LIEN.

1.19. WARRANTY

ALL WORK PERFORMED BY THE CONTRACTOR IN COMPLETING THE SCOPE IDENTIFIED ON THE DRAWNGS SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL COMPLETION OF THE PROJECT. THIS GUARANTEE SHALL COVER ALL MATERIALS, EQUIPMENT OR WORKMANSHIP WHICH IN THE OPINION OF MOTOROLA IS RENDERED DEFECTIVE OR INFERIOR OR NOT IN ACCORDANCE WITH THE TERMS OF THE CONTRACT DURING THE GUARANTEE PERIOD. IF, WITHIN THE GUARANTEE PERIOD, REPAIRS OR CHANGES ARE REQUIRED TO CORRECT THE GUARANTEE WORK. THEN UPON RECEIPT OF NOTICE, THE CONTRACTOR SHALL PROMPTLY AND WITHOUT EXPENSE TO MOTOROLA OR THE OWNER, PROCEED TO:

PLACE IN SATISFACTORY CONDITION ALL OF SUCH GUARANTEED WORK AND CORRECT ALL DEFECTS THEREIN. MAKE GOOD ALL DAMAGES TO THE STRUCTURE OR SITE OR EQUIPMENT OR CONTENTS THEREOF, WHICH, IN THE OPINION OF THE MOTOROLA REPRESENTATIVE, IS THE RESULT OF THE USE OF MATERIALS, EQUIPMENT, OR WORKMANSHIP WHICH ARE INFERIOR, DEFECTIVE, OR NOT IN ACCORDANCE WITH THE TERMS OF THE CONTRACT; MAKE GOOD ANY WORK, MATERIALS OR EQUIPMENT AND ADJACENT STRUCTURES DISTURBED IN FULFILLING THE GUARANTEE.

1.20. RELATED DOCUMENTS

CONTRACTOR SHALL BECOME FAMILIAR WITH THE INFORMATION AND REQUIREMENTS CONTAINED IN THE FOLLOWING DOCUMENTS RELATED TO THE PROJECT:

A. TOWER AND TOWER FOUNDATION DRAWINGS BY THE MANUFACTURER.

B. R-56 STANDARDS AND GUIDELINES FOR COMMUNICATIONS SITES BY MOTOROLA.

C. ALL OTHER PERTINENT DOCUMENTS.

ABBREVIATIONS:

A/C	AIR CONDITIONING	N	NORTH
ADJ	ADJUSTABLE	N/A	NOT APPLICABLE
AFB	ABOVE FINISH FLOOR	NIC	NOT IN CONTRACT
APPROX	APPROXIMATELY	NTS	NOT TO SCALE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS		
AWG	AMERICAN WIRE GAUGE	O/C,O.C.	ON CENTER
		OD	OUTSIDE DIAMETER
		OPG	OPENING
		OPP	OPPOSITE
BLDG	BUILDING		
BLK	BLOCK		
BMR	BASE MOBILE RADIO	PLYWD	PLYWOOD
B/S	BUILDING STANDARD	PR	PAIR
		PROJ	PROJECT
CLG	CEILING	PROP	PROPERTY
CLR	CLEAR	PT	PRESSURE TREATED
CND,C	CONDUIT		
CONC	CONCRETE	REQ'D	REQUIRED
CONST	CONSTRUCTION	RM	ROOM
CONT	CONTINUOUS	RO	ROUGH OPENING
DBL	DOUBLE	S	SOUTH
DIA,Ø	DIAMETER	SHT	SHEET
DIAG	DIAGONAL	SIM	SIMILAR
DIM	DIMENSION	SPEC	SPECIFICATION
DN	DOWN	SQ	SQUARE
DTL,DETL	DETAIL	SS	STAINLESS STEEL
DWG	DRAWING	STL	STEEL
		STRUCT	STRUCTURAL
		SUSP	SUSPENDED
		SV	SHEET VINYL
E	EAST		
EA	EACH	THRU	THROUGH
EL,ELEV	ELEVATION	TNND	TINNED
ELECT	ELECTRICAL	TOC	TOP OF CONCRETE
EQ	EQUAL	TOM	TOP OF MASONRY
EQUIP	EQUIPMENT	TYP	TYPICAL
EW	EACH WAY		
EXIST	EXISTING		
EXT	EXTERIOR		
		UBC	UNIFORM BUILDING CODE
		UNO	UNLESS NOTED OTHERWISE
		VERT	VERTICAL
		VIF	VERIFY IN FIELD
		VT	VINYL TILE
		W	WEST
		W/	WITH
		WIN	WINDOW
		W/O	WITHOUT
		WP	WATERPROOF
		4 & C P @ #	ANGLE AND CENTER LINE PROPERTY LINE AT NUMBER
HARD'WD	HARDWOOD		
HORIZ	HORIZONTAL		
HR	HOOR		
HT	HEIGHT		
HVAC	HEATING, VENTING & AIR CONDITIONING		
ID	INSIDE DIA.		
IN	INCH		
INFO	INFORMATION		
INSUL	INSULATION		
INT	INTERIOR		
LB(S)	POUND(S)		
MAX	MAXIMUM		
MECH	MECHANICAL		
MET,MTL	METAL		
MFR	MANUFACTURER		
MGR	MANAGER		
MIN	MINIMUM		
MISC	MISCELLANEOUS		

1.21. GENERAL NOTES AND LEGEND

SCALE: AS NOTED

DRAWN BY: GJB

CHECKED BY: GJB

DATE: 03/04/21

FILE: 20-216-006

5112 WMU BTR2

PARKVIEW AVENUE

KALAMAZOO, MI 49009

Drawing / Rev.

GN-2/0

0

05/25/21

FOR ZONING

GJB

A

03/31/21

FOR APPROVAL

GJB

Rev.

Date:

Description:

Mgr:

To: Oshtemo Township Planning Commission

In the initial conversations with KCCDA, coverage requirements for the county were provided. Taking into account the existing ASR (antenna structure registration) sites, it was determined that four additional new ("Green") sites were needed by doing a coverage analysis (maps) of the county. These four "Green" sites are required in the Northwest, Northeast, Central and Western parts of the county. KCCDA provided candidate locations for these four sites based on availability and accessibility of existing land parcels that could be acquired and provided the best additional use of those locations, one of those sites being an existing water tower, and another used as a sub-station and battery farm. Based on these locations, Motorola ran coverage maps to determine their viability. The result was that these four sites, along with three existing sites, would provide an optimum seven-site simulcast cell, with a proposed coverage design of 95% Portable-In-Street coverage, and in turn meeting the design request for the Public Safety radio system.

Derek Sonksen
Project Manager



m: +1.616.498.9020

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1. In addition to why the tower is proposed where it is, the proposed fence has been designed to match the existing fence on the WMU property where the battery farm is located
2. As this tower does not meet setbacks KCCDA will request a variance to allow this tower to be built at the proposed location

Inspection of Tower

The Michigan's Public Safety Communications System (MPSCS) will maintain the proposed tower. An inquiry was made of them on how frequently the towers will be inspected. Their response is as follows:

The tower is inspected every quarter from the ground looking up. As far as climbing the tower for an inspection it depends. We climb to inspect anytime a new antenna is added to the tower. If there is a bad antenna that needs to be replaced, we will inspect the tower at the same time. If we see something from the ground inspection that needs to be looked at, we will inspect by climbing the tower. In a perfect world the tower would be climbed once a year for an inspection, but I would say if no maintenance is required, we will climb the tower about every 2 to 3 years for an inspection

Some years we could climb the tower 6 times or more in a year and other years never climb it once

As for fire ladder trucks up to the tower to aid in rescue. Everyone at MPSCS is trained in tower rescue and we make sure contractors that work for us are also trained in tower rescue. If they are unable to reach the top of the tower from outside the fence compound making the driveway big enough for a ladder truck is a waste of money for the county to put into this site. The best way to perform a tower rescue is to do it by the use of rope.

Any more questions let me know.

Rodney Anway

Site Maintenance Southern Supervisor

State of Michigan-DTMB-Center for Shared Solutions

Michigan's Public Safety Communications System

Michigan State Police Headquarters, 2nd floor Wing A

7150 Harris Dr., Dimondale, MI 48821

Mobile: 517-242-0575

anwayr@michigan.gov

DTMB
HELP. CONNECT. SOLVE.





Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2021-AGL-5413-OE

Issued Date: 03/31/2021

Pyramid Network Services, LLC c/o Everett Ozba
Kalamazoo County
6615 Towpath Road
East Syracuse, NY 13057

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Antenna Tower WMU
Location:	Kalamazoo, MI
Latitude:	42-15-37.80N NAD 83
Longitude:	85-38-56.70W
Heights:	942 feet site elevation (SE) 194 feet above ground level (AGL) 1136 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 10/01/2022 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (404) 305-6337, or nick.goodly@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-AGL-5413-OE.

Signature Control No: 472670317-476177934

(DNE)

Nick Goodly
Technician

Attachment(s)
Case Description
Frequency Data
Map(s)

cc: FCC

Case Description for ASN 2021-AGL-5413-OE

Proposed new self supporting tower with max. overall height of 194'AGL

Frequency Data for ASN 2021-AGL-5413-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
6	7	GHz	55	dBW
6	7	GHz	42	dBW
10	11.7	GHz	55	dBW
10	11.7	GHz	42	dBW
17.7	19.7	GHz	55	dBW
17.7	19.7	GHz	42	dBW
21.2	23.6	GHz	55	dBW
21.2	23.6	GHz	42	dBW
614	698	MHz	1000	W
614	698	MHz	2000	W
698	806	MHz	1000	W
806	901	MHz	500	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
929	932	MHz	3500	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1670	1675	MHz	500	W
1710	1755	MHz	500	W
1850	1910	MHz	1640	W
1850	1990	MHz	1640	W
1930	1990	MHz	1640	W
1990	2025	MHz	500	W
2110	2200	MHz	500	W
2305	2360	MHz	2000	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W
2496	2690	MHz	500	W





AERONAUTICS COMMISSION

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STATE OF MICHIGAN

Gretchen Whitmer, Governor

Michigan Department of Transportation

2700 Port Lansing Rd Lansing, MI 48906
Phone: 517-335-9949 Fax: 517-886-0366

April 13, 2021

Pyramid
Kalamazoo County
6615 Towpath Road
East Syracuse, NY 13057

Re: The Michigan Department of Transportation review of the following proposal:

The Michigan Department of Transportation has conducted a review of the following proposal:

FAA Airspace Case #:	2021-AGL-5413-OE
Description:	Antenna Tower
Height Above Ground:	194
Overall Height:	1136
Geographic Coordinates:	42d15m37.8sN / 85d38m56.7sW

Michigan's Tall Structure Act (Act 259, P.S. 1959, as amended by Act 28 P.A. 2016), places authority for review of construction proposals which may affect Michigan airspace with the Michigan Aeronautics Commission (MAC). The Michigan Aeronautics Commission has delegated its authority for airspace reviews and approvals to the Michigan Department of Transportation's Office of Aeronautics.

After review of the study listed above, it has been determined that No Permit is required for the referenced application. However, this notice concerns the effect on air navigation specific to the Michigan Tall Structure Act and does not relieve the proponent of any compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If any changes are made to either the location or overall height, the application must be re-submitted or re-evaluation.

I can be contacted at 517-335-9282 or via email at MDOT_Tall_Structures@michigan.gov if you have any questions or comments.

Sincerely,

Kelly Badra

Kelly Badra
Michigan Department of Transportation