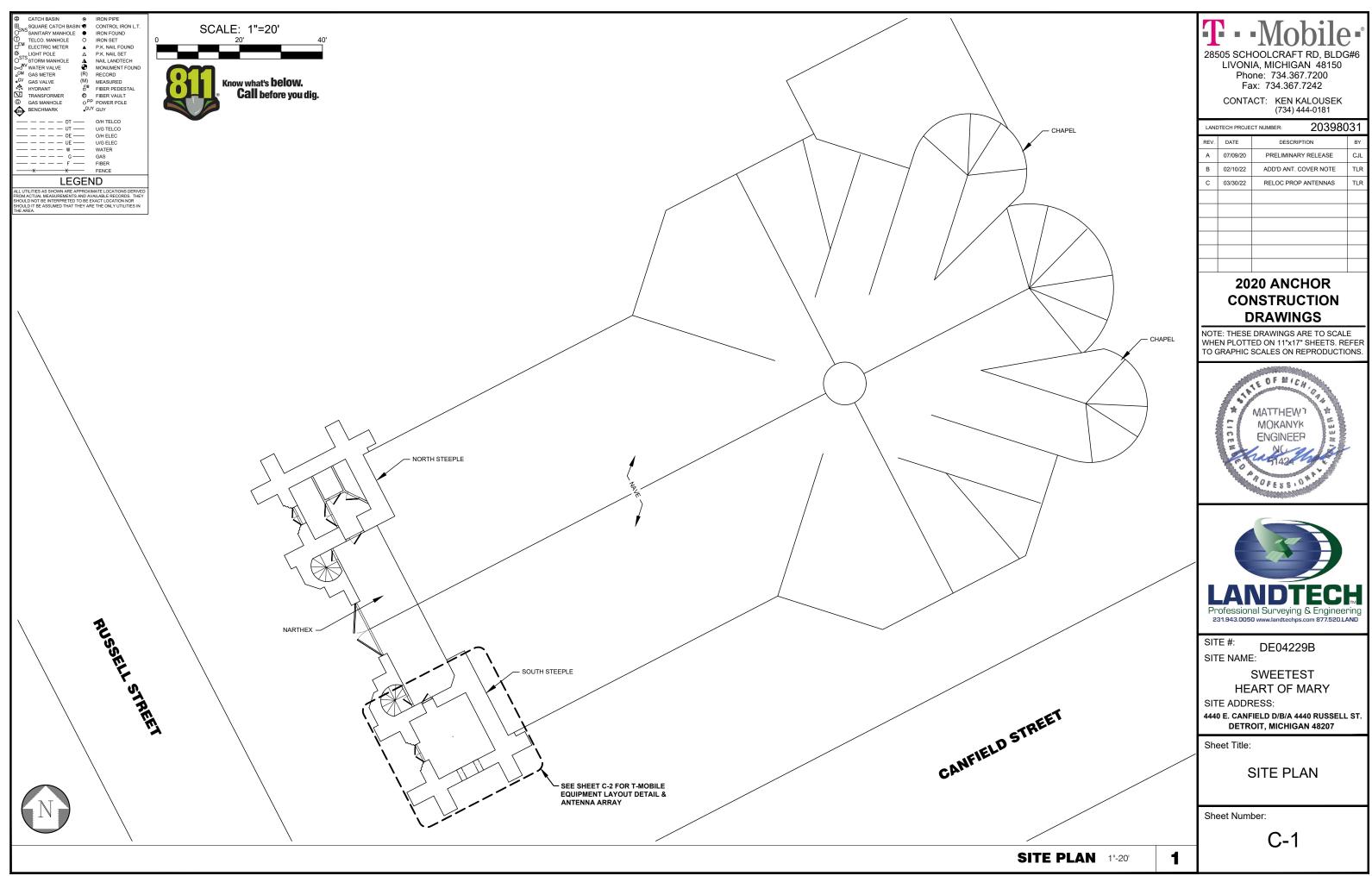
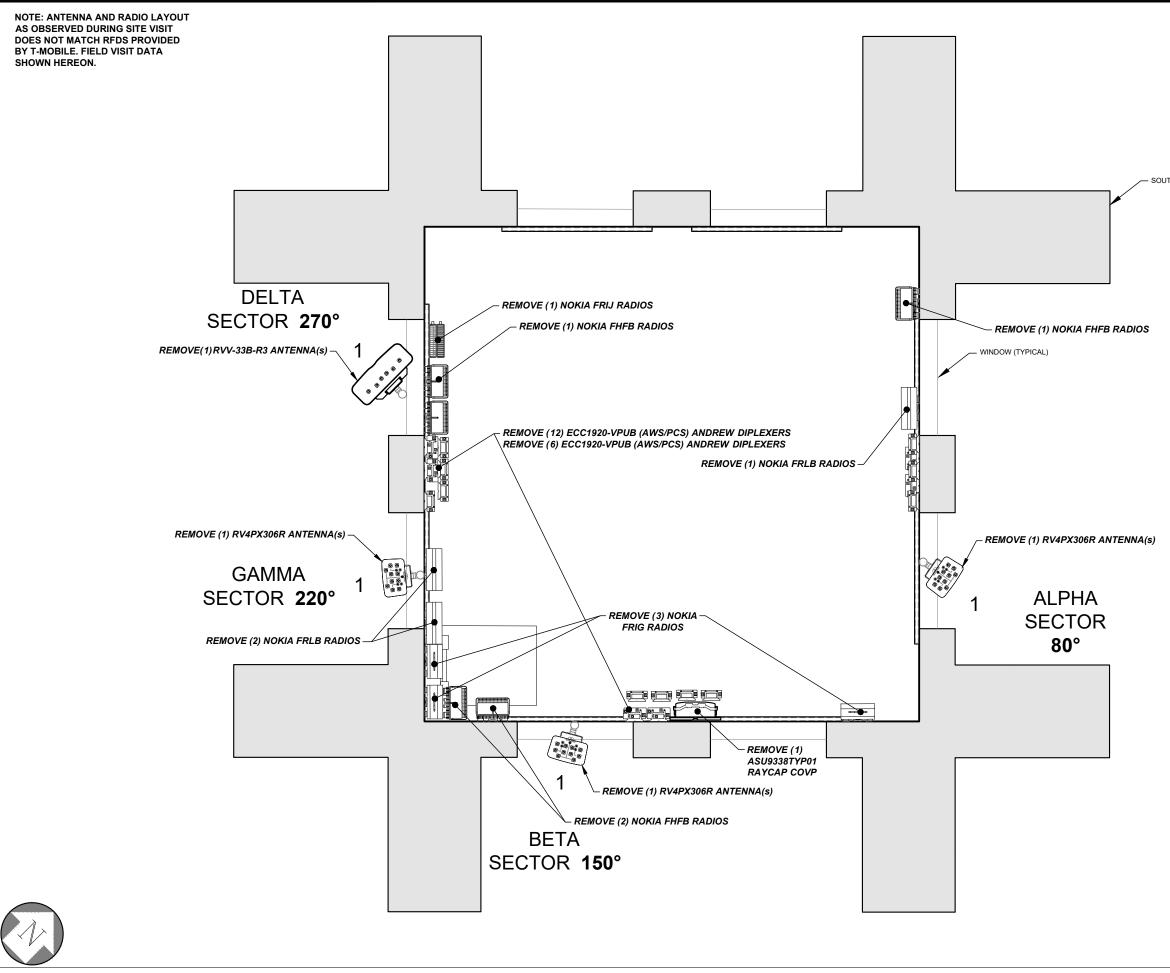


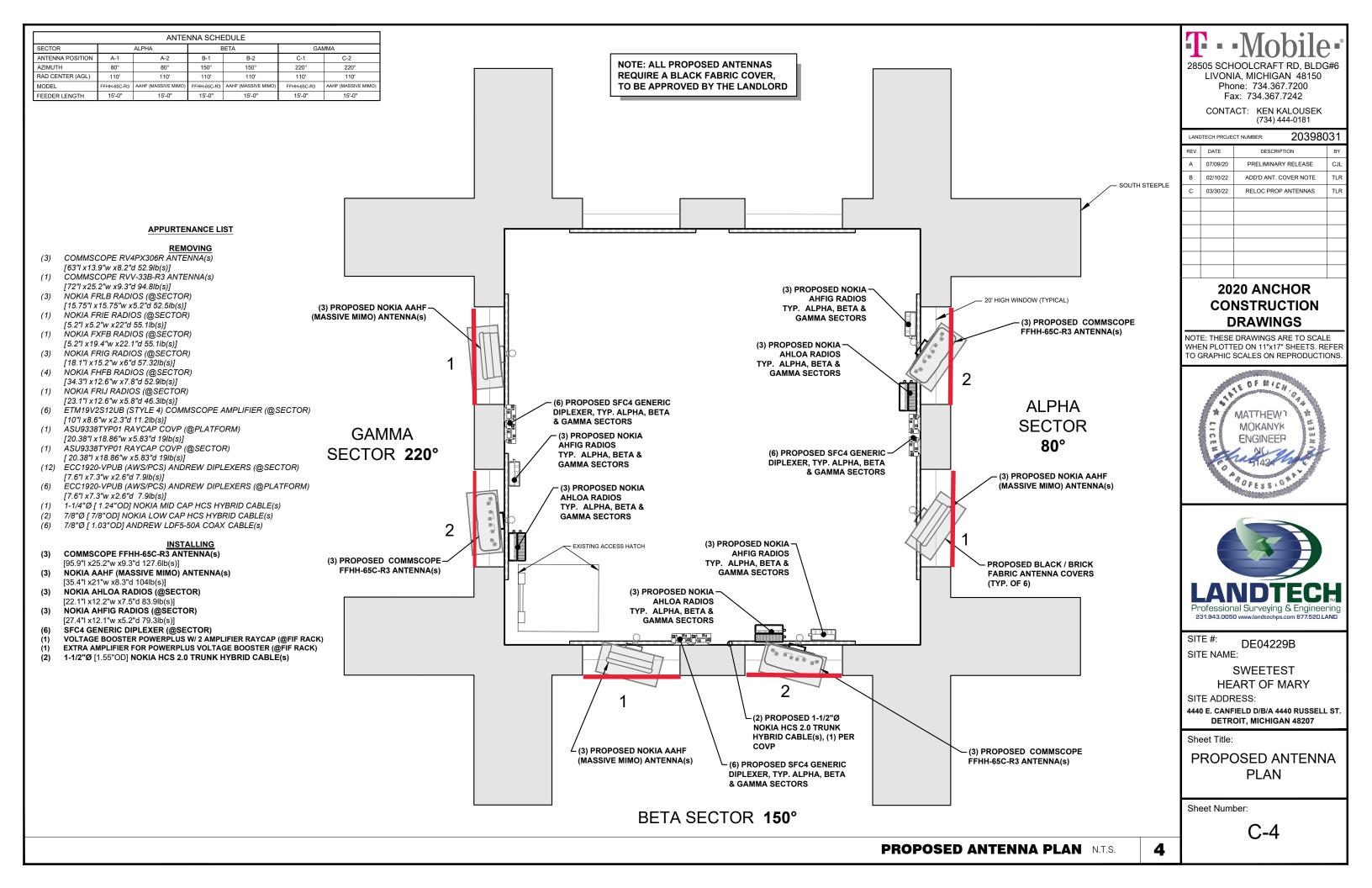
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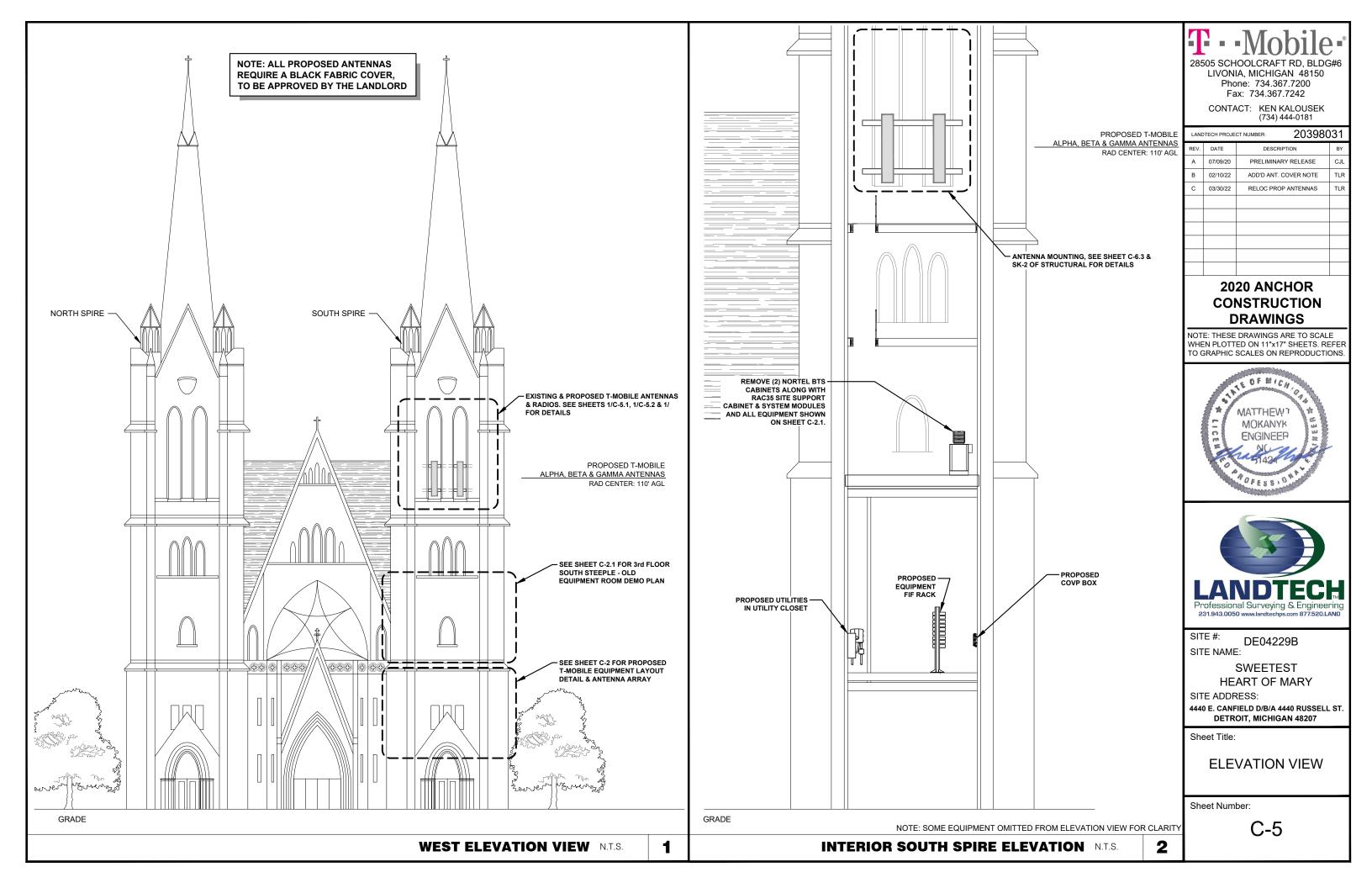


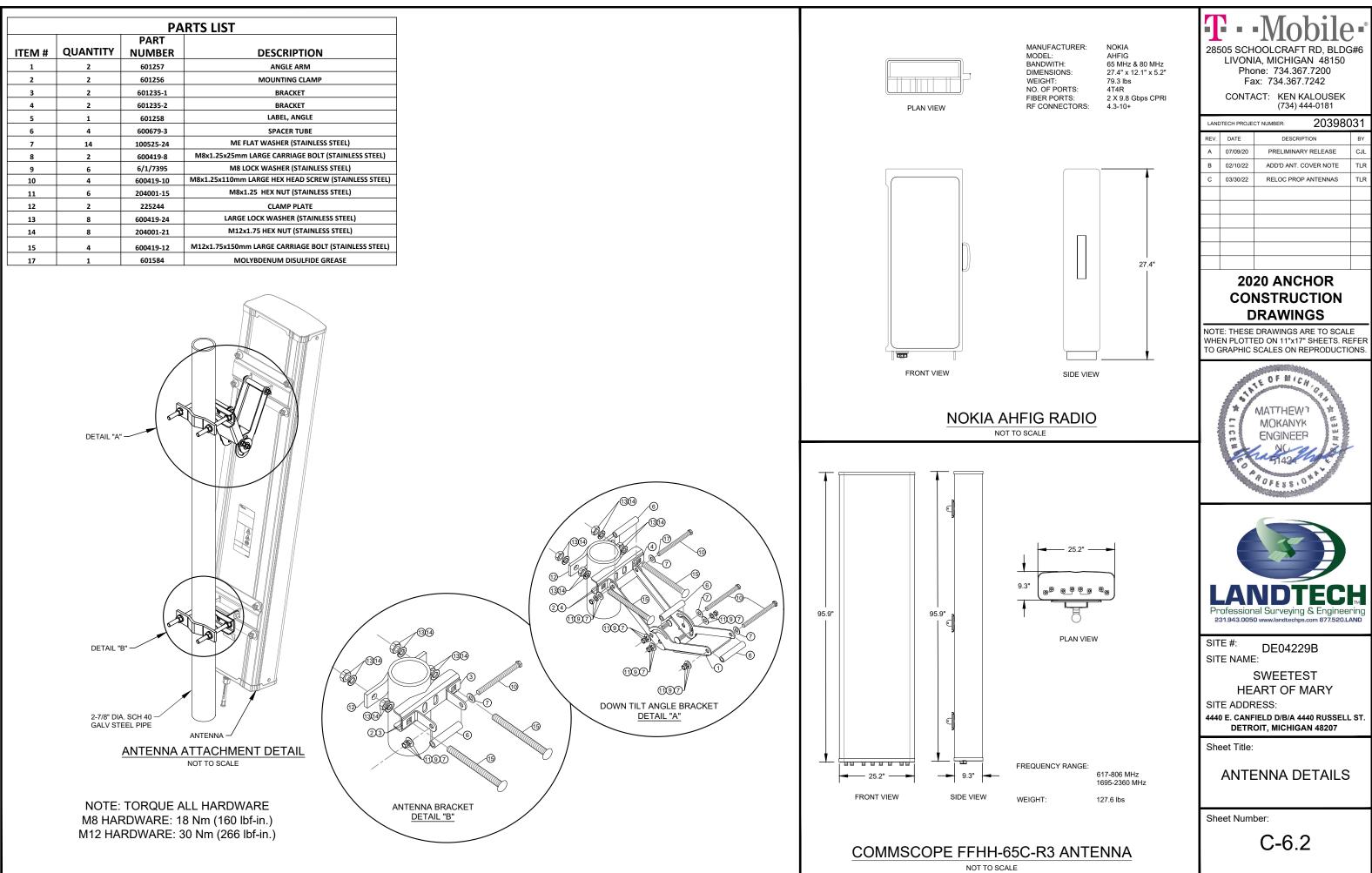


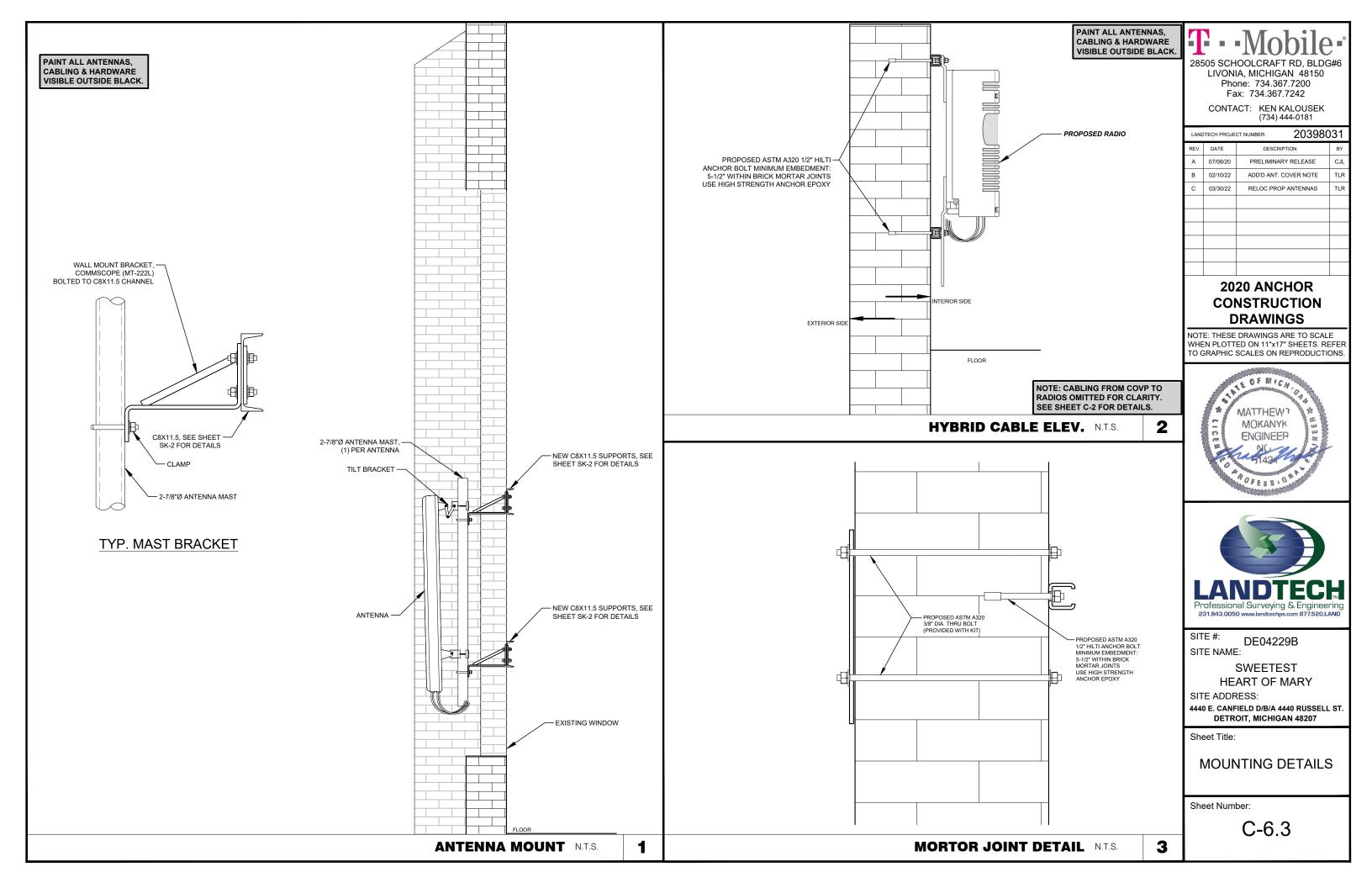
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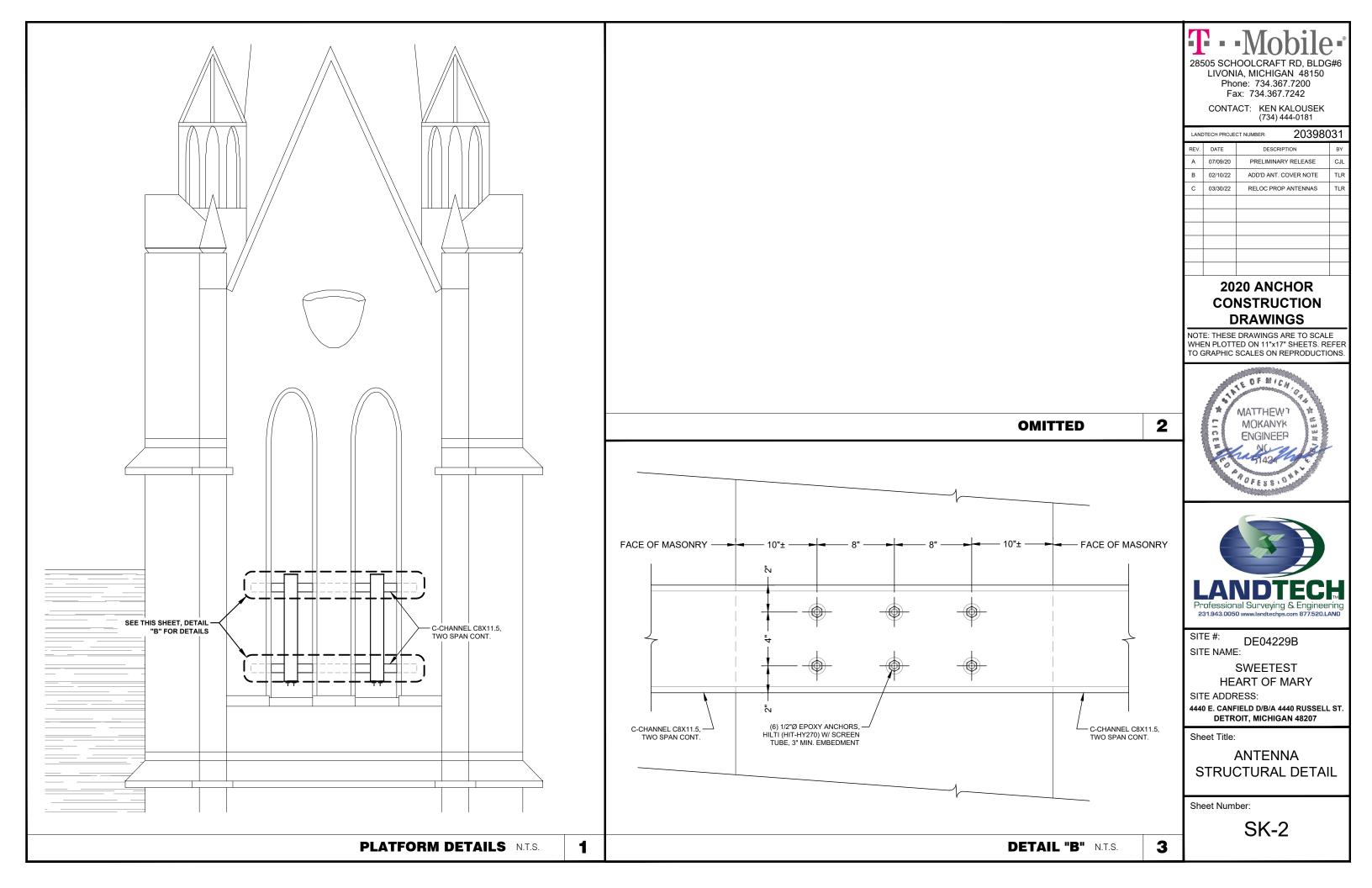
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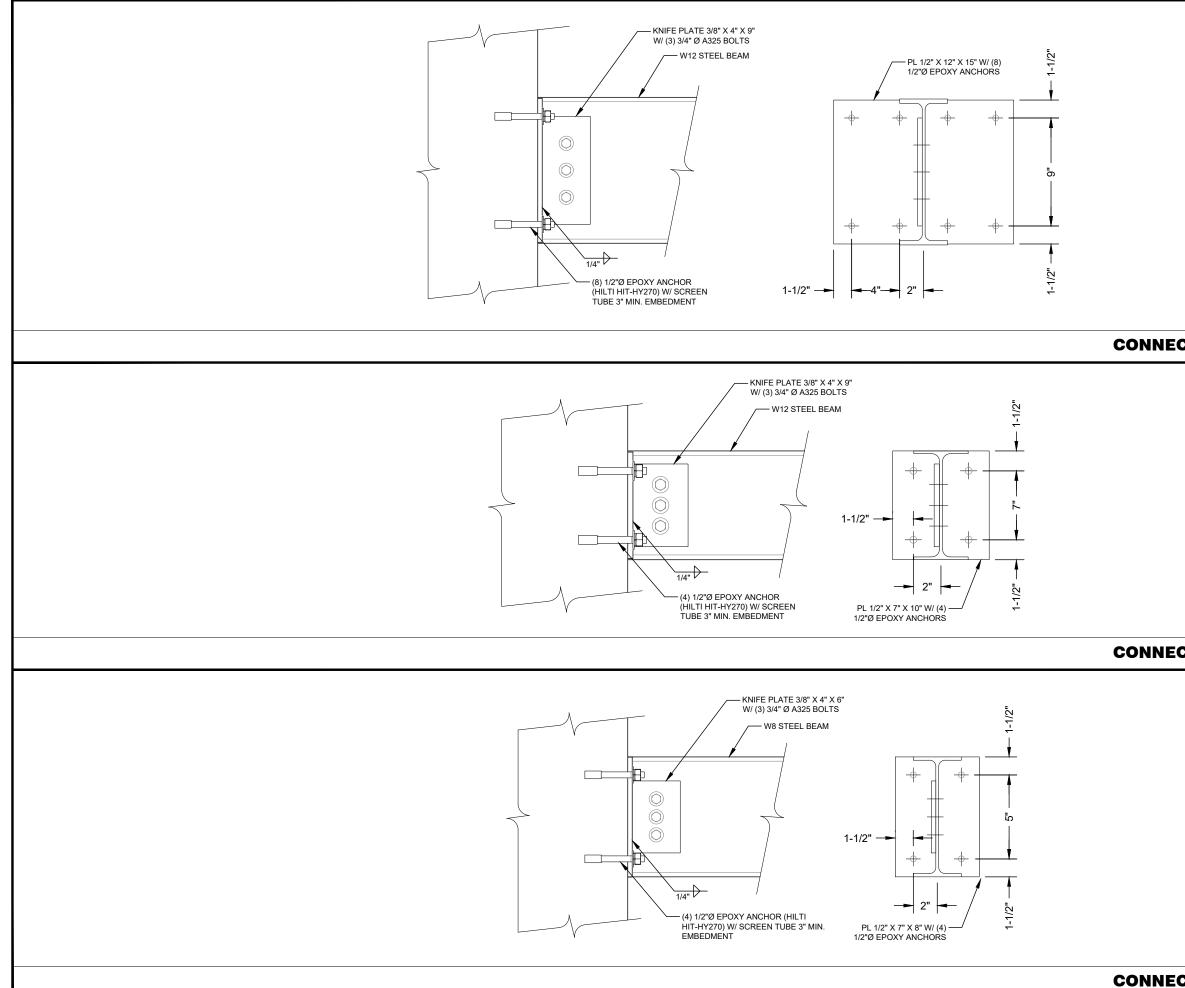




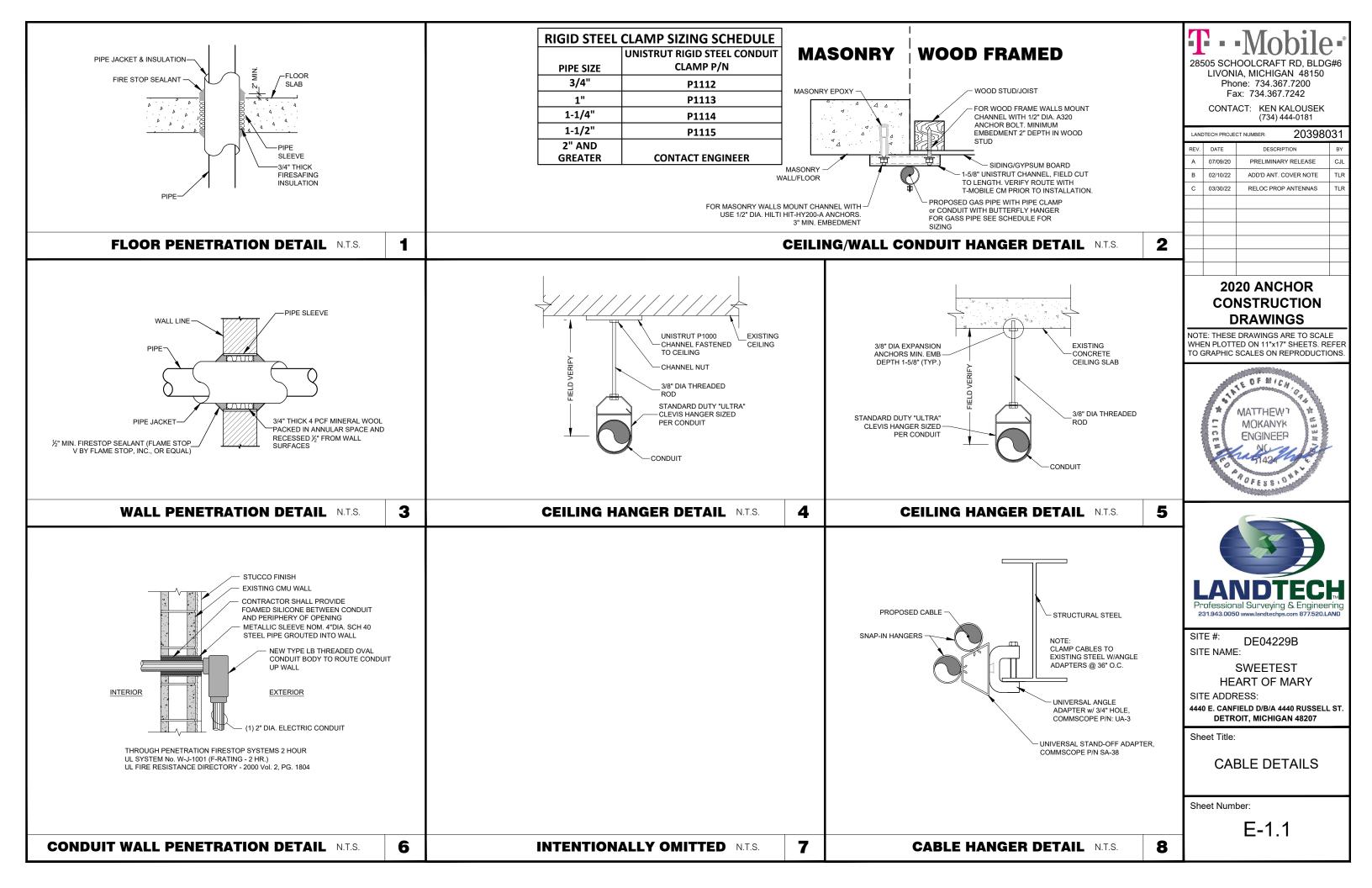








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DIVISION 1 - GENERAL REQUIREMENTS

PART 1 - GENERAL

11 Intent

A. These specifications and construction drawings accompanying them describe the work to be done and the materials to be furnished for the construction of this project.
B. The drawings and specifications are intended to be fully explanatory and supplementary.

However, should anything be shown, indicated or specified on one and not the other, it shall be done the same as if shown, indicated or specified in both.
 C. The intention of the documents is to include all labor and materials reasonably necessary for the

proper execution and completion of the work as stipulated in the contract.
 D. The purpose of the specifications is to interpret the intent of the drawings and to designate the

method of the procedure, type and quality of material required to complete the work. memory or the procedure, type and quality or material required to complete the work. E. Minor deviations from the design layout are anticipated and shall be considered as part of the work. No changes that alter the character of the work will be made or permitted by the Owner without issuing a change order.

1.2 Conflicts

A. The Contractor shall be responsible for verification of all measurements at the site before ordering any materials or doing any work. No extra charge or compensation shall be allowed due to difference between actual dimensions and dimensions indicated on the construction drawings. Any such discrepancy in dimension which may be found shall be submitted to the Owner for consideration before the Contractor proceeds with the work in the affected areas.

B. The Bidder, if awarded the contract, will not be allowed any extra compensation by reason of any matter or thing concerning the work which the Bidder might have fully discovered prior to the bidding.

C. No plea of ignorance of conditions that exist, or of difficulties or conditions that may be encountered or of any other related matter concerning the work to be performed in the execution of the work will be accepted as an excuse for any failure or omission on the part of the Contractor to fulfill every detail of all the requirements.

13 Contracts and Warranties

A. Each Contractor is responsible for obtaining the building permit at the local jurisdiction as the Contractor of record, and provide local jurisdiction with all proof required to operate as a Contractor in that jurisdiction. The Contractor shall be reimbursed only the amount of any fee paid as follows:

Plan review fee

Building permit fee. Connections and inspections fee.

4. Development fee

B. Contractor is responsible for application and payment of Contractor licenses and bonds.

1.4 Storage

All materials must be stored in a level and dry fashion in a manner that does not necessarily obstruct the flow of other work. Any storage method must meet all recommendations of the associate manufacturer

1.5 Clean Up

The Contractor shall at all times keep the site free from accumulation of waste, material or rubbish at the work site and, at completion of the work, shall remove all rubbish from and about the building area, including all tools, equipment, and surplus materials and shall leave the work area clean and ready for use.

1.6 Change Order Procedure

Change order may be initiated by the Owner and/or the Contractor involved. The Contractor, upon verbal request from the Owner shall prepare a written proposal describing the change in work or materials and any changes in the contract amount and present to the Owner for approval. Submit requests or substitutions in the form and in accordance with procedures required for change order proposals. Any changes in scope of work or materials which are performed by the Contractor without a written change order as described and approved by the Owner shall place full responsibility of these actions on the Contractor.

17 Related Documents And Coordination

General Carpentry, electrical, and antenna drawings are interrelated. In performance of the work, the Contractor must refer to all drawings. All coordination to be the responsibility of the Contractor.

1.8 Products And Substitutions

A. Submit 3 copies of each request for substitution. In each request identify the product or fabrication or installation method to be replaced by the substitution. Include related specification section and drawing numbers and complete documentation showing compliance with the requirements

B. Submit all necessary product data and cut sheets which properly indicate and describe the items. products, and materials being installed. The Contractor shall, if deemed necessary by the Owner, submit actual samples to the Owner for approval in lieu of cut sheets.

Quality Assurance 19

All work shall be in accordance with applicable local, state and federal regulations. These shall include but not be limited to the latest version of the following:

ANSI/EIA - 222 - E

International Building Code

- National Electrical Code (NEC) with local Amendments UnderWriter Laboratories Approved Electrical Products American Institute of Steel Construction Specifications (AISC)
- Life Safety Code NFPA 101 oth Minimum design criteria for steel antenna towers and supporting structures will be TIA / EIA 222 F 2.

1.10 Administration

A. Prior to the commencement of any work, the Contractor will assign a Project Manager who will act as a single point of Contact for all personnel involved in this project. This Project Manager will develop a master schedule for the project which will be submitted to the Owner prior to the commencement of any work.

B. Submit a bar chart type progress not more than 3 days after the date established for commencement of the work on the schedule. Indicate a time bar for each major category or unit of work to be performed at site, property sequenced and coordinated with other elements of work. Show completion of the work sufficiently in advance of the date established for substantial completion of the work

C. Prior to commencing construction, the Owner will schedule an "on-site" meeting with all major parties. This would include (though not limited to) the Owner, local telephone company, Tower Erection foreman (if subcontracted).

D. Contractor shall be equipped with some means of constant communications, such as a mobile phone or a pager. This equipment will NOT be supplied or paid for by the Owner nor will cellular service be arranged.

E. During construction, Contractor must ensure that employees and Subcontractors wear OSHA Level D personal protective equipment at all times. The Contractor must comply with all applicable OSHA requirements

D. Contractor shall be equipped with some means of constant communications, such as a mobile phone or a pager. This equipment will NOT be supplied or paid for by the Owner nor will cellular ervice be arranged

E. During construction, Contractor must ensure that employees and Subcontractors wear OSHA Level D personal protective equipment at all times. The Contractor must comply with all applicable OSHA requirements

F. Contractor shall provide DAILY updates on site progress, either verbal or written

G. A complete inventory of construction materials and equipment is required prior to start of construction

1 1 1 Insurance And Bonds

A. Contractor shall at his own expense carry and maintain for the duration of the project all insurance as required and shall not commence with his work until he has presented a certificate of insurance stating all coverage to the Contractor who shall, in turn, forward a copy of all certificates to the Owner. **DIVISION 2 - SITE WORK**

PART 1 - GENERAL

11 Work Included

Refer to the survey and architectural site plan for work included

Related Work 1.2

- A. Installation of antenna system B. Erection of fence C. Access road
- D. Parking area

13 Descriptions

Access road, turnaround areas, and sites are constructed to provide a well drained, easily maintained, even surface for material and equipment deliveries and maintenance personnel access

References 14

ASTM - American Society of Testing Materials, latest edition

15 Quality Assurances

A. Contractor shall apply soil sterilizer in accordance with manufacturer's recommendations, as B. Vegetation and landscaping, if required within the contract, shall be placed and maintained as nded by nursery industry standards.

1.6 Sequencing

A. Contractor shall confirm survey stakes and set elevation stakes prior to any construction B. The complete road and site area shall be cleared of heavy growth of grass, trees, shrub and topsoil prior to foundation construction or placement of backfill or subbase material.

- Construct temporary construction zone along access drive. The site area shall be brought to subbase course elevation and the access road to base course
- levation prior to forming foundations.
- E. Contractor shall apply soil herbicide prior to placing base materials. F. If required, grade, seed, fertilize and mulch disturbed area immediately after bringing the site and access road to base course elevation. Water to ensure growth.
- Remove gravel from temporary construction zone After applications of final surfaces, soil herbicide shall be applied to the stone surfaces.
- 1.7

Submittals

A. Prior to Construction
If landscaping is applicable to the contract, submit two copies of the landscaping plan under Submit for approval 1/2 cubic feet of the proposed surface course material.

- Following Construction
- Manufacturer's description of product and warranty statement on soil herbicide treatment Manufacturer's description of product on grass seed and fertilizer, if needed.
- Landscaping warranty statement, if required.

1.8 Warranty

A. In addition to the warranty on all construction covered in the contract documents, the Contractor shall repair all damage of surrounding property caused by construction. B. Soil herbicide application will guarantee vegetation free road and site area for one year from the

date of final inspection Disturbed areas shall reflect growth of new grass cover prior to final inspection. Landscaping, if included within the scope of the contract, shall be guaranteed for one year from

date of final inspection

PART 2 - PRODUCTS

- 2.1 Material
- Subbase: Granular material
- Aggregate Base Course: For bases to be surfaced with concrete or bituminous mixtures, use Aggregate 22A unless
- For bases to be surfaced with aggregate, use Aggregate 6A or 3-4" crushed concrete (no rerod).
- C. Aggregate Surface Course: Usa Aggregate 21AA when the Aggregate surface course is to be constructed without a bituminous surface.

2.2 Equipment

- A. Compaction shall be accomplished by mechanical means. 1. Larger areas shall be compacted by sheeps foot, vibratory or rubber tired rollers weighing at least
- 2. Smaller areas shall be compacted by power-driver, hand held tampers.
- PART 3 EXECUTION
- 3.1 Preparation
- A. Clear trees, brush and debris from site area and access road right of way (if required)
- B. Prior to other excavation and construction efforts clear site of organic material to a minimum of six inches below original ground level

C. Unless otherwise instructed by the Owner, remove trees, brush, and debris from the property to an authorized landfil

D. Prior to placement of fill or base materials, proof roll the soil.

E. Where unstable soil conditions are encountered, cover cleared areas with stabilizer mat prior to accement of fill or base material

32 Installation

I. Subbase

J. Aggregate Base Course:

slopes greater than 2:1

swales, not otherwise riprapped

the ditch for six feet above the culvert entrance.

DIVISION 3 - CONCRETE

Inspections

Summary

A. The work includes all cast-in-place concrete.

ACI 318. Building Code Requirements for Reinforced Concrete ACI 301. Specifications for Structural Concrete for Buildings.

PART 1 - GENERAL

1.3 References

1.4 Submittals

1. Cement.

Aggregates.
 Admixtures.

4. Reinforcement

2.1 Materials

C. Certifications for the following:

PART 2 - PRODUCTS

3. Fine aggregate: ASTM C33. 4. Mixing water: Clean, fresh, and potable.

loss on ignition limited to 4 percent (4%).

and configuration of reinforcement bars

C. Curing Compound, if needed: ASTM C309

11

12

to be seeded to even the surface and loosen the soil.

A. The site and turnaround area shall be at the subbase course elevation prior to forming foundations. Grade or fill the site and access road as required such that there is an even distribution of spoils resulting from foundation excavations. The resulting grade shall correspond with said subbase course; elevations shall be calculated from finished grades or slopes indicated.

B. Excess spoils, if any, shall be cleared from iob site and not spread beyond the limits of Owner/leased property unless authorized by project manager.

C. The access road shall be brought to base course elevation prior to foundation construction to permit use. Compaction shall be performed during construction of the site.

D. Avoid creating depressions where water may pond

Thickness: Conform to design cross section.

K. Aggregate Surface Course:
 1. Thickness: Compacted in place in two (2) equal courses.

P. Riprap shall be applied to the side of ditches or drainage swales

Q. Riprap entire ditch for six feet in all directions at culvert openings

evenly and compact to not less than ninety-five percent (95%) maximum density

Thickness: Compacted in place in two (2) equal courses

E. The Contract shall be assumed to include grading, banking, ditching and unless otherwise indicated, covering with two inches of surface course all roads or routes utilized for access to the Owner site, commencing at the point of intersection with the nearest public thoroughfare.

F. When improving an existing access road, the existing road shall be graded to remove any organic matter and smooth the surface before placing fill or stone.

G. Fill material or stone shall be placed in six-inch maximum lifts and compacted as described in Section 2.10 prior to placement of next lift.

H. The finish grade, including top surface course, shall extend a minimum of three feet beyond the

Construction method: Place in layers not exceeding 15 inches loose measure. Spread

O. Riprap shall be applied to the side slopes of all fenced site areas, parking areas and to all other

R. Seed, fertilizer and straw cover shall be applied to all other disturbed areas and ditches, drainage,

T. If any ditch lies with slopes greater than ten percent, mound diversionary headwalls in the ditch at the culvert entrances 45 degrees off the ditch line. Riprap the upstream side of the headwall as well as

U. Seed and fertilizer shall be applied to surface conditions that will encourage rooting. Rake areas

Contractor is responsible for the growth of seeded and landscaped areas by watering up to the

point of release from the Contract. Continue to rework bare areas until complete coverage is obtained.

A. LOCAL BUILDING INSPECTION SHALL RECEIVE ADEQUATE NOTIFICATION IN ADVANCE OF CONCRETE POURS.

ASTM - American Society Testing Materials, latest edition. ACI - American Concrete Institute, latest

A. Proposed mix design prepared by an approved independent testing firm for each class of

B. Shop drawings showing fabrication dimensions and locations for placing the reinforcing steel and

concrete. Select proportions according to ACI 301-05. Section 3.8. Method 1 or Method 2.

accessories. Details of reinforcement and accessories shall be in accordance with ACI 315

A. Concrete:
 1. Cement: ASTM C150 or ASTM C595 (maximum fly ash content shall be 20% by weight). All

Admixtures: Air-entraining: ASTM C260. Water-reducing, retarding, and accelerating: ASTM C494.

Calcium chloride will not be permitted as an admixture. Pozzolanic admixtures: ASTM C618. Type F

B. Reinforcement: Refer to tower foundation design or tower manufacturer for type for material type

cement used in exposed concrete shall be of the same brand from the same mil 2. Course aggregates: ASTM C33.

S. Under no circumstances will ditches, swales or culverts be placed such that they direct water

towards, or permit standing water immediately adjacent to the site. If Owner designs or eleva conflict with this guidance the Owner should be advised immediately.

V. Saw seed in two directions in twice the quantity recommended by the seed producer

2.15 Field Quality Control

Aggregates

instructions

32

cylinders taken.

2.2 Proportioning Concrete

A. Proportions and Materials: Permissible Cement Types: I, IP, I-A, IP-A

PART 3 - EXECUTION

3.3 Field Quality Control

3.1 Performance

A. Compaction shall be at least 95% of maximum density and within 2% of optimum moisture content in accordance with ASTM D-1557. Areas of settlement shall be excavated and refilled at Contractor's expense.

All trees placed in conjunction with a landscape contract will be wrapped, tied with hose protected wire and secured to 2- inch x 2-inch x 4-inch wooden stakes extending two feet into the ground on four sides of the tree.

C. All exposed areas shall be protected against washouts and soil erosion. Straw bales will be placed at the inlet approach to all new or existing culverts. Where the site or road areas have been elevated immediately adjacent to a rail line, erosion control, fabric will be staked full ength in the swale between the site and the rail bed to prevent contamination of the ra

D. Field inspection and testing is to be performed by a firm appointed and paid for by the Owner. When additional testing of materials or concrete is necessary because of their failure by test or inspection to meet specification requirements, the cost of the additional testing shall be paid for by the Contractor. Additional testing for early form removal shall also be paid for by

E. Acceptance Testing: If initial testing indicates failed or non-conformance to specification, perform additional test. If further testing verifies non-conformance, additional testing shall be paid by CONTRACTOR. Replace non-conforming material at no additional cost to OWNER.

A. Sampling and Analysis: Michigan Testing Methods, Series 100.
 B. Exception: Provide certification of approved stockpiled material

Minimum Cement Content: 5.5 sacks/cu.yd. for 3500 psi, 6.0 sacks/cu.yd. for 4000 psi. Maximum Water-Cement Ratio: 5.0 gal./sack

Entrained Air Content: five percent (5%) to eight percent (8%). Maximum Slump:3%-inch for floors and slabs on grade, 4 inches otherwise (individual batches may be \pm % inch as long as the average of all batches is at or below maximum). Minimum Compressive Strength, fc' (28 day) 4000 psi floors and slabs on grade, all other 3500 psi.

B. Admixtures: Approval of ENGINEER required. Use in accordance with the manufacturer'

C. If the CONTRACTOR intends to place concrete by pumping, the mix design shall be prepared in accordance with these specifications and the recommendations of ACI 304

2.3 Fabricating Reinforcement

Fabricate in accordance with approved shop drawings and ACI 315.

Reinforcing splices: Class B unless otherwise shown

In accordance with the requirements of ACI 301, Chapters 4 through 13, 17 and 18

Concrete Work For Drilled Piers

All concrete piers shall be drilled and poured on the same day to prevent any migration of water into the hole and to prevent debris from collecting in the hole.

A. Provide access to all portions of the work and any necessary assistance in obtaining and handling samples at the project or other material sources. Three concrete test cylinders will be taken for every 50 cubic yards, or fraction thereof, for each class of concrete place in any one day. One additional cylinder will be taken during cold weather concreting and be cured on the project site under the same conditions as the concrete it represents. One slump test will be taken for each set of

> NOTE: THESE NOTES ARE OF A GENERAL NATURE AND ARE NOT SITE-SPECIFIC. SOME NOTES MAY NOT APPLY TO THIS SITE. CROSS-REFERENCE NOTES WITH OTHER SHEETS AND T-MOBILE SCOPE OF WORK TO VERIFY WORK TO BE COMPLETED.

T··Mobile[•] 28505 SCHOOL CRAFT RD BLDG# LIVONIA, MICHIGAN 48150 Phone: 734.367.7200 Fax: 734.367.7242

CONTACT: KEN KALOUSEK (734) 444-0181

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REV.	DATE	DESCRIPTION	BY
Α	07/09/20	PRELIMINARY RELEASE	CJL
в	02/10/22	ADD'D ANT. COVER NOTE	TLR
С	03/30/22	RELOC PROP ANTENNAS	TLR

2020 ANCHOR CONSTRUCTION DRAWINGS

NOTE: THESE DRAWINGS ARE TO SCALE WHEN PLOTTED ON 11"x17" SHEETS. REFE TO GRAPHIC SCALES ON REPRODUCTIONS





SITE #: DE04229B SITE NAME:

> SWEETEST HEART OF MARY

SITE ADDRESS 4440 E. CANFIELD D/B/A 4440 RUSSELL ST.

DETROIT, MICHIGAN 48207

Sheet Title:

GENERAL NOTES

Sheet Number

N-1

Division 15 - MECHANICAL PART 1 - GENERAL

1. Included - Work of this section generally includes provisions of labor, materials, equipment. accessories, necessary for installation of mechanical systems shown on the contract drawings and specified in the General Notes. Intent of construction documents is to provide the Owner with a omplete and operating facility, and any minor items omitted but obviously necessary to accomplish ntent shall be provided whether or not shown or specified

2. Related - The General Requirements division of the General Notes is hereby made a part of the work of this specification. The requirements of this specification apply to the work of all sections of division 15.

A. Work performed by others includes installation of electrical equipment, except as noted otherwise n drawings or in spec

B. Electrical division 16

3. Ordinances and Codes

A. All work shall be executed and inspected in accordance with all underwriter's, public utilities, local and state codes and regulations applicable to the trade affected. Recommendations of AFA. NFPA. OSHA and ASHRAE and applicable state energy code compliance shall be rigidly followed. B. Should any change in the plans and specifications be required to comply with these regulations, the contractor shall notify the Owner before submitting his bid. After entering into contract with the Owner the contractor will be held accountable to complete all work necessary to meet these requirements a his own expense.

. Where the work required by the drawings and specifications is above the standard required, it shall

4 Permits - The contractor shall arrange and pay for all permits in connection with the work bereinafter specified and at completion of the work furnish the Owner with the final certificate of inspectior

5. Drawings - The drawings indicate the general arrangement of the proposed work. Details of d departures due to actual field conditions or other causes shall be provided for. No extras will be paid for correcting faulty, poorly arranged, or poorly coordinated work

6. Site Examination - The contractor shall visit the premises so as to ascertain the existing conditions before submitting his bid. No extras will be allowed for his lack of knowledge of these conditions.

7. Complete Installation - The contractor shall furnish and install all incidental parts, valves, fittings, pumps, control valves and control wiring required for the proper function of all component parts. The complete installation shall function smoothly and noiselessly to the full extent of the plans and specifications. The contractor shall complete his installation as rapidly as general construction permits. All filters, strainers, and safety devices shall be properly installed before starting equipment. The Owner shall be left with a new set of filters at final acceptance.

8. Coordination - Before any equipment is purchased or fabricated and before running and/or abircating any lines of piping or ductwork, the mechanical contractor and his subcontractors shall assure themselves that they can be run as contemplated. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings and accessories that may be required. The mechanical contractor and his subcontractors shall carefully investigate all other mechanical, and electrical and structural drawings and finish conditions affecting all of their work accordingly, furnishing such fittings, valves, duct transitions, offsets and accessories as may be required to meet such conditions, at no

9. Temporary Heat - Arrangements for usage of system for temporary heat shall be coordinated with peneral contractor. System shall not be used for temporary heat unless all temporary filters are installed. Temporary filters and operation of units shall be provided by the general contractor.

10. Submittals - Within 5 days after proposal acceptance the contractor shall submit to the Owner for approval two (2) copies of shop drawings on each item of equipment whether as specified or substituted. Shop drawings shall give overall dimensions, weights, metal gauges, materials, certified capacities, brake HP, motor HP, tube diameters friction drop and nameplate data. The contractor shall be responsible for checking shop drawings before submitting for approval. The Owner's check shall be general and does not relieve the contractor of final responsibility for a complete job to the intent of olans and specifications. All control diagrams and equipment should be assembled in one submittal.

11. Substitution of Equipment

A. Bids shall be based on providing all equipment mentioned by brand name in plans and specifications. No substitutions shall be considered before bidding.

B. The contractor shall attach a list of proposed substitutions, giving the amount to be added or deducted to contract price for each tem. Complete engineering data shall be submitted on each request for substitution item. Substitute items shall be equal or better than items mentioned in regard to all accessories, capacities, durability and appearance. Contractor shall pay all costs incurred to or building alteration shall be included in said costs.

C. All standard accessories as well as specified extras shall be provided with equipment

12. Guarantee - All material and workmanship installed and/or furnished under this section of work shall be guaranteed against defects for a period of one year from date of acceptance by Owner. Any ects or faulty workmanship shall be the contractor's responsibility and shall be corrected entirely at his expense

PART 2 - PRODUCTS

1. Approved manufacturers - approval by name listed in this specification does not imply that the manufacturer standard product meets the intent of the drawings and specification. It is the contractors responsibility to provide all necessary alterations, materials, labor, etc., as approved by the Owner to meet the full intent of the drawings and specifications. This is to include, but not necessarily be limited to electrical, structural, mechanical, and architectural alterations and revisions necessary to provide a complete and operating facility at no additional costs to the Owner

2. Materials - Materials throughout shall be new and of the best grades specified. They shall be standard catalog items and manufactured by nationally known manufacturers of the items specified. Contractor shall receive and be responsible for all Owner furnished equipment and provide rough-in and final connections for all mechanical equipment furnished under this contract or by others. The contractors shall provide a suitable shed for the storage of all materials during progress of the job

3. Solder - All solder used on sweat fittings shall be 95-5 hard solder unless brazing or silver solder is specified. All buried copper piping shall be silver sold

4. Floor, Ceiling Plates, Flanges - Provide tight fitting floor and ceiling plates on pipes passing through walls, ceilings, floors, nickel or chrome plate in finished areas. Provide wall and ceiling flanges fo ducts in finished areas.

5. Pipe Hangers, Supports - Provide hangers, supports, braces by Grinnell, Fee and Mason, Grabler, Elcen, Unistrut, Basin Engineers, Inc. to prevent undue strain, stresses, noise, vibration.

PART 3 - EXECUTION

1. Workmanship

A. Work throughout shall be performed by men skilled in the installation of the various trades of the ork herein speci B. All piping and ductwork shall be run concealed in finished areas except where noted otherwise or

Curbs, Bases, Supports - Major curbs, openings, and equipment supports will be provided under the

general section of this contract only where shown on engineering or structural plans. All other supports, anchors, and bases shall be provided by mechanical contractor for all mechanical equipment. Equipment shall be supported per manufacturer's written recommendations for noise-free installation. 3. Removal of Existing Work - All existing mechanical equipment, piping, etc., removed by the contractor shall be the property of the building. Such items will be disposed of at the building owner's

Removal of Rubbish - On completion of his work, the contractor shall remove all of his tools

 A removal of reason - or map can be and such as work, the contractor of more than to be a set of second seco operating and maintenance instructions covering all mechanical equipment with moving or moveable

parts including general operating or heating, plumbing and cooling systems and shall give the Owner four (4) copies of these instructions. Manufacturer's printed operations and maintenance instructions shall also be provided for each piece of equipment. A. Name, address, and telephone number of party to be contacted for 24 hour service for each item of

B. Starting, stopping, lubrication, and adjustment shall be clearly indicated for each piece of

C. Prepare 8-1/2"x11" blueprints with binding edge of appropriate scale to indicate all equipment, espective switches, and valve locations. Bind in instruction book

DIVISION 5 - FENCE

PART 1 - GENERAL

- Work Included 3.1
- A. Refer to the site plans for size and location of fence and gates to be installed.

32 Related Work

Coordinate fence grounding with Electrical Contractor. Refer to Fence Detail Plan - concrete for specification of concrete and grout.

C. Refer to Fence Detail Plan for applicable locations of access road gate

Description 3.3

A. A security fence is provided in order to inhibit unauthorized access to the site area

34 Quality Assurance

Refer to Fence Detail Plan

Sequencing 3.5

A. If the site area has been brought up to surface course elevation prior to fence construction, fence post excavation spoils must be controlled to preclude contamination of surface course.

Submittals 3.6

A. Manufacturer's descriptive literature.B. Certificate of compliance that specifications have been met.

37 Fence Material

Refer to Fence Detail Plan.

DIVISION 7 - ANTENNA SYSTEM

PART 1 - GENERAL

1.1 Work Included

- A. Erect furnished tower as indicated in the drawings.
- Install antennas as indicated on drawings and Owner specifications. Install antenna platform as indicated on drawings.
- Install furnished galvanized steel waveguide ladder. Install waveguide bridge as indicated on drawings.

- Install coax cable, connectors, jumpers, grounding kits as indicated in drawings
- Sweep test result

1.2 Requirements of Regulatory Agencies

A. Furnish U.L. listed equipment were such label is available, install in conformance with U.L. standards where applicable

B. Install antenna, antenna cables, grounding system in accordance with drawings and specification in effect at project location and recommendations of state and local building codes, special codes having jurisdiction over specific portions of work. This includes, but is not limited to, the following:

1. EIA - Electrical Industries Association RE - 222, structural standards for steel, antenna towers and

antenna supporting structures.
 FAA - Federal Aviation Administration advisory circular AC 70/7460-IH, obstruction marking and

lighting. 3. FCC - Federal Communications Commission rules and regulations form 715 "obstruction marking and lighting specifications for antenna structures", and form 715A, "high intensity obstruction lighting specification for antenna structures".
 DISC - American Institute of Steel Construction specifications for structural joints using ASST. A325

or A490 holts

NECK - National Electrical Code - on tower lighting kits.

 UL - Underwriter's Laboratories approved.
 In all cases part 77 or the FAA rules and parts 17 and 22 of the FCC rules are applicable and in the nt of conflict, supersede any other star ns. 1990 Life Safety code NAPA - 101

DIVISION 16 - GENERAL ELECTRIC PART 1 - GENERAL ELECTRICAL PROVISION

Submittal of bid indicates Contractor is cognizant of all job site conditions and work to be performed under this contract.

Contractor shall perform all verification, observations, tests, and examination work prior to the ordering of the electrical equipment and the actual construction. Contractor shall issue a written notice

- of all findings to the architect listing all malfunctions, faulty equipment and discrepancies.
- Heights shall be verified with Owner prior to installa These plans are diagrammatic only.
- Electrical Service 120/240 V.A.C. single phase 3-wire 100 AMP service.

 Contractor shall provide all labor, materials, insurance, equipment, installation, construction tools, transportation, etc. for a complete and properly operative system energized throughout and as indicated on drawings, as specified herein and/or as otherwise required

Contractor shall carry out all work in accordance with all governing state, county, and local codes and O.S.H.A.

Contractor shall secure all necessary building permits and pay all required fees 9. Complete job shall be guaranteed by the Contractor for a period of nor (1) year after the date of job acceptance by Owner. Any work, material, or equipment found to be faulty during that period shall be corrected at once, upon written notification, at the expense of the Contractor. Provide project manager with one set of complete electrical "as installed" drawings at th completion of the job, showing actual dimensions, routings and circuits.

 The entire electrical installation shall be grounded as required by all applicable codes.
 Upon completion of work, conduct continuity, short circuit and fall potential ground tests for approval. Submit test reports to project manager. Clean premises or all debris resulting from work and leave work in a complete and undamaged condition

PART 2 - PRODUCTS

A. All materials and equipment shall be new and in perfect condition when installed and shall be of the best grade and of the same manufacturer throughout for each class or group of equipment. Material shall be listed "J" where subject to such approval. Materials shall meet with approval of the division of industrial safety and all governing bodies having jurisdiction. Materials shall be manufactured in accordance with applicable standards established by ANSI, NEMA and NBFU.

All conduit only (C.O.) shall have a pull wire or rope. All conductors shall be copper.

D. All circuit breakers, fuses and electrical equipment shall have an interrupting short circuit to which they may be subjected, and a minimum of 10,000 A.I.C.
 E. Wire and cable conductors shall be copper 12 AWG Minimum unless specifically noted otherwise

on drawings.

- Grounding conductors shall be solid tinned copper and annealed +2
- G. Meter socket amperes, voltage, number of phases shall be as noted on the drawings, manufactured by Square D Company or approved equal. All material shall be U.L. listed.

No Restrictions

PART 3 - UNDERGROUND ELECTRICAL SERVICE

A. Coordinate the electrical service with the utility company.
 B. Contractor to coordinate with utility company connection of temporary and permanent power to the site. The temporary power and all hookup costs to be paid by contractor.

All external grounding connections shall be made by the "cadweld" process. Connections shall

include all cable to cable splices, Tees, Xs, etc. All cable to ground rods, ground rod splices and lightning protection system as indicated. All materials used (molds, welding, metal, tools, etc.) shall

be by "cadweld" and installed per manufacturer's recommendation and procedures, 2. All interior

grounding and bonding conductors shall be connected by two holes crimp type (compression) connections (except for the ACEG and ground rod) mechanical connections, fitting or connections that

All ground rods shall be 5/8" diameter x 10'-0" long "Copperweld" or approved equal of the number

and at locations indicated. Ground rods shall be driven full length vertical in undisturbed earth. All

The ground ring encircling the building shall be minimum size of no. 2 awg bare copper

2. All external ground rings shall be joined together and all connections shall be "cadweld". NO

conductor in direct contact with the earth at a depth of not less than 42 inches (min) conductor bends

E. Fence/Gate All sections of fence and gate shall be grounded as indicated on drawings. Ground

each gate post and corner post. All other connections for the ground grid system shall be made by the "cadweld" process, and installed per manufacturer's recommendations and procedures.

F. Ground test pit A ground test pit shall consist of 6" diameter SCH 40 PVC with 6" cleanout plug & eleanout adapter fitting. Plug threads shall be coated with anti-seize lubricant prior to installation. 6 PVC will be 18" long, buried 12" underground with 6" above finished grade. Top of Ground rod

All ground bars shall be 1/4" thick bare copper plate and of size indicated on drawings

elded to ground ring will be 12" from top of cleanout adapter

C. The service shall be installed in accordance with all applicable codes and standards to be otable to the governing authorities exercising legal jurisdiction over electrical installa

PART 4 - GROUNDING CONNECTIONS

All underground conduit shall be PVC schedule 40 (unless noted otherwise) at a minimum depth of

24" below grade J. Cables

. All ground cable shall be standard TND solid bare copper plate and of size indicated on drawings When the direction of the conductor must change it shall be done gradually. The curvature of the

turn shall be done in accordance with the following table:

Grounding Conductor Size Min Bending Radius to Inside Edge

No. 6 awg. to no. 4 awg

No. 2/0 awg. to 750 mcrn

Bus Bar

External Connections:

Ground Rods

C Ground Bars

D Ground Ring

depend solely on solder shall not be used.

ground rods to be 10' apart unless otherwise

shall have a minimum radius of 8 inches

LUGS OR CLAMPS WILL BE ACCEPTED.

o. 6 awg to no. 1/0 awg

PART 5 - ASTM Fall Potential Tests

not overlan

Equipment Building and Tower

Ground Resistance Test Report

within one week of work of completion

A. Ground tests shall be performed as indicated on drawings. A biddle ground ohm meter or the method of using two auxiliary ground rods (as described in I.E.E.E. standard no. 81-1983, part 1) may be used. The I.E.E.E. method requires the use of an a.c. test current. The auxiliary test rods must be sufficiently far away from the rod under test so that the regions in which their resistance is localized do

Contractor to conduct ground resistance test in the format as follows:

- 1. Equipment Building A. First test shall be with four ground rods installed, one at each corner of the building but not connected to the main grounding bus. Furnish wire to connect (temporary clamp) all four ground rods together to make a system test after each rod is individually tested. If any individual rod tests 25 OHMS or more, the electrical contractor and owner's representative should be notified so that the rod can be driven deeper until all four rods have a resistance of 10 OHMS or less on a dry day. B. Second test - shall be with the ground rods nave a restance of with or nave of rest of a dr day.
 B. Second test - shall be with the ground rods connected with dry soil and when no standing water has been present for the past ten days. The maximum allowable reading is 5 OHMS to ground. If the resistance of the entire system exceeds 5 OHMS, the electrical contractor and owner's representative
- should be notified so that either additional and/or deeper rods can be installed. A. First test - shall be with nine (9) ground rods installed (min.) equally spaced around the tower foundation, but not connected to the equipment building external ground ring. Furnish wire to connect (temporary clamp) all three ground rods together to make a system test after each rod is OHMS or
- more, the electrical engineer and the owner's representative should be notified so that the rod can be driven deeper until all three rods have a resistance of 10 OHMS or less on a dry day. B. Second test - shall be with the grounds connected, with dry soil and when no standing water has
- be operated by the maximum allocation because the maximum allocation of both and in the maximum allocation of the past the days, the maximum allocation of the set of the entire system exceeds 5 OHMS the electrical contractor and owner's represental should be notified so that either additional and/or deeper rods can be installed.
- A. After the equipment building and tower ground resistance test is completed, electrical contractor shall tie equipment building external ground ring together. After first and second test, all connections shall be "cadweld". No lugs or clamps will be accepted. B. After all the external ground rings are tied together but before the equipment building is tied down, a megger check of the ground system should be done. The maximum allowable reading is 5 OHMS to
- Upon completion of the testing for each site, Contractor shall submit a test report showing resistance in OHMS with auxiliary potential electrodes at 5-foot and 10-foot intervals until the average resistance
- starts increasing; 10-15 photos must be taken to proof entire external ground ring system before backfill or project manager must be notified no less than 48 hours in advance of backfill. Testing shall be pleted by general contractor and two (2) sets of test documents are to be bound and submitted

NOTE: THESE NOTES ARE OF A GENERAL NATURE AND ARE NOT SITE-SPECIFIC. SOME NOTES MAY NOT APPLY TO THIS SITE. CROSS-REFERENCE NOTES WITH OTHER SHEETS AND T-MOBILE SCOPE OF WORK TO VERIFY WORK TO BE COMPLETED.

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	28505 SCHOOLCRAFT RD, BLDG#6 LIVONIA, MICHIGAN 48150 Phone: 734.367.7200 Fax: 734.367.7242									
	CONTACT: KEN KALOUSEK (734) 444-0181									
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SITE ADDRESS:

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GENERAL NOTES

Sheet Number:

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