

Northeast Site Solutions Victoria Masse 420 Main St Unit 1 Box 2 Sturbridge, MA 01566 victoria@northeastsitesolutions.com

July 14, 2023

Members of the Siting Council Connecticut Siting Council Ten Franklin Square New Britain, CT 06051

RE: Notice of Exempt Modification 539 Plains Road, Haddam, CT 06438 Latitude: 41.443056 Longitude: -72.506222 T-Mobile Site#: CT11235A_NHP

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 186-foot level of the existing 180-foot tower. The property is owned by 539 Plains Road LLC and the Tower is owned by Crown Castle. T-Mobile now intends to add a 48Kw generator to a new 10'x6' concrete pad within an existing fenced compound.

Planned Modifications: Ground work only-Install New: (1) GENERAC RD 48KW AC DIESEL GENERATOR – 233-gallon double walled self-contained tank with fuel sensor. Requires two (2) 12-minute run cycles bi-weekly. (1) 10'x6' concrete pad This facility was approved by the Connecticut Siting Council Docket No. 58, dated July 11, 1986. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-SOj-73, a copy of this letter is being sent to Robert McGarry, First Selectman, and Bill Warner, Town Planner, as well as the tower and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Victoria Masse

Victoria Masse Mobile: 860-306-2326 Fax: 413-521-0558 Office: 420 Main Street, Unit 2, Sturbridge MA 01566 Email: victoria@northeastsitesolutions.com

420 Main Street, Unit 1 Box 2, Sturbridge, MA 01566

Attachments cc: Robert McGarry, First Selectman Town of Haddam 30 Field Park Drive Haddam, CT 06438

Bill Warner, Town Planner Town of Haddam 30 Field Park Drive Haddam, CT 06438

539 Plains Rd LLC c/o Crown Atlantic Co – property owner PMB353 4017 Washington Road McMurray, PA 15317

Crown Castle - tower owner

Exhibit A



STATE OF CONNECTICUT *CONNECTICUT SITING COUNCIL* Ten Franklin Square, New Britain, CT 06051 Phone: (860) 827-2935 Fax: (860) 827-2950 E-Mail: <u>siting.council@ct.gov</u> Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

March 20, 2023

Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103 kbaldwin@rc.com

RE: **SUBPETITION NO. 1133-CROWN-20230127** - Crown Castle eligible facility request for modifications to an existing telecommunications facility located at 539 Plains Road, Haddam, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby approves your Eligible Facilities Request (EFR) to extend and install antennas and associated equipment at the above-referenced facility pursuant to the Federal Communications Commission Wireless Infrastructure Report and Order, with the following conditions:

- 1. Approval of any changes be delegated to Council staff;
- 2. Prior to installation of the tower extension, the proposed structure modifications referenced as Project No. 100140.020.01 and dated July 18, 2022 shall be installed in accordance with the Structural Analysis prepared by B+T Engineering, Inc., dated December 8, 2022 and stamped and signed by Chad Tuttle;
- 3. Within 45 days following completion of equipment installation, T-Mobile shall provide documentation certified by a Professional Engineer that its installation complied with the recommendations of the Structural Analysis;
- 4. In no event shall the tower exceed a total height of 193 feet including antennas in accordance with Condition No. 4 of the Council's Decision and Order in Docket No. 58;
- 5. Construction activities shall take place during daylight working hours in accordance with Condition No. 14 of the Council's Decision and Order in Docket No. 58;
- 6. RF access restriction and caution signage shall be installed at the site in compliance with FCC guidance;
- 7. Written notification to the Council at least two weeks prior to the commencement of site construction activities;
- 8. Deployment of any 5G services must comply with FCC and FAA guidance relative to air navigation, as applicable;
- 9. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- 10. Any nonfunctioning antenna and associated antenna mounting equipment, or other equipment at this facility owned and operated by T-Mobile shall be removed within 60 days of the date the antenna or equipment ceased to function;
- 11. The validity of this action shall expire one year from the date of this letter; and
- 12. Crown Castle may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the EFR dated January 26, 2023. Any changes to the eligible facility request require advance notification and approval.

Thank you for your attention and cooperation.

Sincerely,

Muliiphal

Melanie Bachman Executive Director

MAB/IN/laf

c: The Honorable Robert McGarry, First Selectman, Town of Haddam (selectasst@haddam.org)

DOCKET NO. 58

AN APPLICATION OF HARTFORD CELLULAR COPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN HARTFORD, TOLLAND AND MIDDLESEX COUNTLES. CONNECTICUT SITING

COUNCIL

July 11, 1986.

DECISION AND ORDER

Pursuant to the foregoing opinion, the Connecticut Siting Council (Council) hereby directs that a Certificate of Environmental Compatibility and Public Need as provided by Section 16-50k of the General Statutes of Connecticut (CGS) be issued to the Hartford Cellular Company for the construction, maintenance, and operation of cellular mobile phone telecommunication towers and associated equipment in the towns of Glastonbury, Haddam, Hartford, Portland, Rocky Hill, Somers, Vernon, Windsor, and Willington subject to the conditions below.

1) The proposed Bloomfield and Middlefield sites are rejected without prejudice.

2) The antennas on the Glastonbury tower shall be mounted no higher than the 180' level of this existing tower.

3) The Portland and Rocky Hill towers shall be monopoles.

4) The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed total heights, including antennas, of

a) 193' at the Haddam site;

b) 173' at the Portland site;

c) 153' at the Rocky Hill site;

d) 173' at the Somers site;

e) 173' at the Vernon site;

f) 153' at the Willington site;

q) 173' at the Windsor site.

5) The Hartford site receive antennas shall be mounted below the top of the high point of the building to preclude visibility.

6) Any future actions requiring the removal of the existing Glastonbury tower to be shared by the certificate holder shall also apply to the equipment mounted on that tower by the certificate holder, regardless of that equipment's status under Chapter 277a of the CGS.

7) The certificate holder shall submit a development and management (D&M) plan for the Haddam, Portland, Rocky Hill, Somers, Vernon and Windsor sites pursuant to Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies (RSA), except that irrelevant items in Section 16-50j-76 need only be identified as such. In addition to the requirements of Section 16-50j-76, the D&M plan shall provide plans for evergreen screening around the fenced perimeter at the Haddam, Somers, Vernon, and Windsor sites. The D&M plan shall include a proposal for painting the approved monopole structures to blend with the sky. The D&M plan must be approved prior to facility construction. Any changes to specifications in the D&M plan must be approved by the Council prior to facility operation.

8) All certified facilities shall be constructed, operated, and maintained as specified in the Council's record and in the

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site plan required by order number 7.

9) The certificate holder shall comply with any future radiofrequency (RF) standards promulgated by state or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facilities granted in this decison shall continue to be in compliance with such standards.

10) The certificate holder shall permit public or private entities to share space on the towers approved herein, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. In addition to complying with Section 16-50j-73 of the RSA, the certificate holder shall notify the Council of the addition of any equipment to any approved tower.

11) A fence not lower than 8' shall surround each tower and associated equipment.

12) Unless necessary to comply with order 13, no lights shall be installed on any of these towers.

13) The facilities' construction and any future tower sharing shall be in accordance with all applicable federal, state, and municipal laws and regulations. Shared uses by entities not subject to jurisdiction pursuant to Section 16-50k of the CGS shall be subject to all applicable federal, state, and municipal laws and regulations.

14) Construction activities shall take place during daylight working hours.

-3-

15) This decision and order shall be void and the towers and associate equipment shall be dismantled and removed, or reapplication for any new use shall be made to the Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction.

16) This decision and order shall be void if all construction authorized herein is not completed within three years of the issuance of this decision, or within three years of the completion of any appeal if appeal of this decision is taken, unless otherwise approved by the Council.

Pursuant to CGS Section 16-50p, we hereby direct that a copy of the decision and order shall be served on each person listed below. A notice of the issuance shall be published in the Hartford Courant, Middletown Press, Manchester Journal Inquirer, and the Willimantic Chronicle.

The parties to the proceeding are:

Metro Mobile 5 Eversley Avenue Norwalk, Connecticut 06855 ATTN: Armand Mascioli General Manager

(its attorneys)

(applicant)

Howard L. Slater, Esq. Scott A. Gursky, Esq. Byrne, Slater, Sandler, Shulman & Rouse, P.C. 111 Pearl Street Hartford, Connecticut 06103

Richard Rubin, Esq. Fleischman and Walsh, P.C. 1725 N Street, N.W. Washington, D. C. 20036 Mr. William Wamester 1225 Randolph Road Middletown, Connecticut 06457

The Southern New England Telephone Company 227 Church Street New Haven, Connecticut 06506 ATIN: Peter J. Tyrrell, Esq.

Mr. James W. Tilney

represented by: Patricia A. Ayars Samuel Baily, Jr. Robinson & Cole One Commercial Plaza Hartford, CT. 06103-3597

Mr. Samuel DuBosar, Chairman Bessie Bennett, Esq. Town Plan & Zoning Commission P.O. Box 337 Bloomfield, Connecticut 06002

Town of Somers

represented by:

Mr. Robert F. Peters Town Counsel Tatoian, Devline, Peters & Davis 11 South Road P.O. Box 415 Somers, CT. 06071

Town of Haddam represented by:

Lucy R. Petrella Chairperson Town Office Building Route 9A P.O. Box 87 Haddam, CT. 06438

Midstate Regional Planning Agency

represented by:

Thomas M.Gilligan Regional Planner P.O. Box 139 Middletown, CT. 06457 Dr. Donald P. IaSalle Director Talcott Mountain Science Center Montevideo Road Avon, Connecticut 06001

(service waived)

Barnard Tilson Secretary Avon Planning and Zoning 60 West Main Street Avon, Connecticut 06001

Alden Giddings 33 Privelege Road Bloomfield, Connecticut 06002

Town of Bloomfield

represented by:

Joseph M.Suggs, Jr. Deputy Mayor Town Hall 880 Bloomfield Avenue P.O. Box 337 Bloomfield, CT. 06002 (service waived)

Town of Middlefield

represented by:

David Silverstone, Esq. Silverstone & Koontz 37 Lewis Street Hartford, CT. 06103

with a copy to:

Geoffrey Colegrove Midstate Regional Planning Agency 100 DeKoven Drive Middletown, CT. 06457

represented by:

Joseph A. Paradis Chairman Town Hall 600 Main Street P.O. Box 803 Somers, CT. 06071

Zoning Commission Town of Somers Barbara Sirwilo, Secretary (service waived) Planning & Zoning Commission Town of Rocky Hill 600 Old Main Street P.O. Box 657 Rocky Hill, Connecticut 06067

H. Robert Goodrich (service waived) Goodrich Lane Portland, Connecticut 06480

The Honorable Richard P. Antonetti State Representative (service waived) 5 Sachem Circle Meriden, Connecticut 06450

John Hevrin R.D. #1 - Plains Road Haddam, Connecticut 06438

Norman and Darlene Manning

(represented by)

Elizabeth Allen, Esq. P.O. Box 467 Higganum, CT. 06441 (service waived) The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut, this 11th day of July, 1986.

Council Members

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<u>Vote Cast</u>

)	Absent
Gloria Dibble Pond Chairperson	
Patricia Shea) Commissioner John Downey Designee: Patricia Shea	Yes
Commissioner Stanley Pac Designee: Christopher Cooper	Yes
When L. Clark.)	Yes
Jatme, G. Lebatan) Mortimer A. Gelston	Yes
James G. Horsfall	Yes
Pamela B. Katz // /////////////////////////////////	Absent
William H. Smith	Yes
Colin C. Tait	Yes

STATE OF CONNECTICUT) New Britain, July 11, 1986 ss. ; COUNTY OF HARTFORD

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

Christopher S. Wood, Executive Director Connecticut Siting Council

Petition No. 434 Docket 58 (Alternately, EM-CROWN-061-990927) Crown Atlantic Company LLC Staff Report October 21, 1999

On October 8, 1999, Connecticut Siting Council (Council) Chairman Mortimer A. Gelston and Council staff Steve Levine conducted a field review of Crown Atlantic Company's (Crown) Turkey Hill communications tower in Haddam. Crown proposes to modify the tower to permit use by Omnipoint Communications, Inc. (Omnipoint), and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the modification. Crown submits that the proposed modification will not have a substantial adverse environmental effect, but instead will reduce the unnecessary proliferation of telecommunications towers by utilizing an existing structure, and qualifies for an order of tower sharing pursuant to C.G.S. § 16-50aa.

The Turkey Hill tower is a 180-foot-tall lattice tower. In 1986, the Council approved a maximum height of 193 feet, *including antennas, in Docket 58.* According to a verbal communication from Crown's attorney in this matter, 13-foot antennas were originally mounted on this tower to a height of 193 feet, but were removed in the early 1990's. The tower presently supports antennas owned by Bell Atlantic Mobile, Springwich Cellular, and Sprint. The Council recently approved additional shared use of the tower by Nextel Communications. An engineering study submitted by Crown indicates the tower is capable of supporting all of these antennas and the proposed Omnipoint antennas as well.

Omnipoint would install three panel-type antennas in an accelerator unit mounted on a mast extending above the 180-foot top of the existing tower. The Omnipoint antennas would extend to a height of 189 feet above grade, four feet under the maximum height approved by the Council in 1986. Omnipoint's antennas would be held in place by a 4-inch diameter, 3-foot-long extension pipe mounted to the top of the tower. The antennas themselves are 19 inches in diameter and rise an additional six feet above the pipe to a total height of 189 feet. Omnipoint also plans to install a 5 x 7-foot equipment cabinet within existing fencing at the base of the tower.

The proposed antennas and associated equipment will not increase the noise levels at the existing site, under normal operating conditions, by six decibels or more. The worst case power density for the telecommunications operations at the site has been calculated to be 13.3% of the applicable standard for uncontrolled environments, including a contribution of 0.5% by Omnipoint. Crown asserts that the proposed installation will not cause a substantial adverse environmental effect, and for this reason would not require a Certificate.

Crown has given separate prior notice of this work as an exempt modification under R.C.S.A. § 16-50j-72(b)(2). See EM-CROWN-061-990927. This item was tabled at the October 8, 1999 Council meeting due to concerns that the pipe might be considered part of the tower, thereby increasing tower height and disqualifying this installation as an exempt modification. Crown would withdraw the Petition from further consideration if the Council chooses to acknowledge the addition of Omnipoint's antennas on the Turkey Hill tower as an exempt modification.

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Exhibit B

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2020.



Information on the Property Records for the Municipality of Haddam was last updated on 7/11/2023.



Parcel Information

Location:	PLAINS RD	Property Use:	Vacant Land	Primary Use:	Cell Tower
Unique ID:	PT496410	Map Block Lot:	63 022 2 C	Acres:	0.2500
490 Acres:	0.00	Zone:	R-2A	Volume / Page:	0347/0725
Developers Map / Lot:		Census:	5901		

Value Information

	Appraised Value	Assessed Value
Land	415,000	290,500
Buildings	0	0
Detached Outbuildings	18,650	13,060
Total	433,650	303,560

Owner's Information

Owner's Data

539 PLAINS RD LLC C/O CROWN ATLANTIC CO PMB353 4017 WASHINGTON RD MCMURRAY, PA 15317

Detached Outbuildings

Туре:	Year Built:	Length:	Width:	Area:
4 Ft Chain Fence	1997			1,200
Building Utility	2004			315
Building Utility	2004			96
Building Utility	2004			312

Owner History - Sales

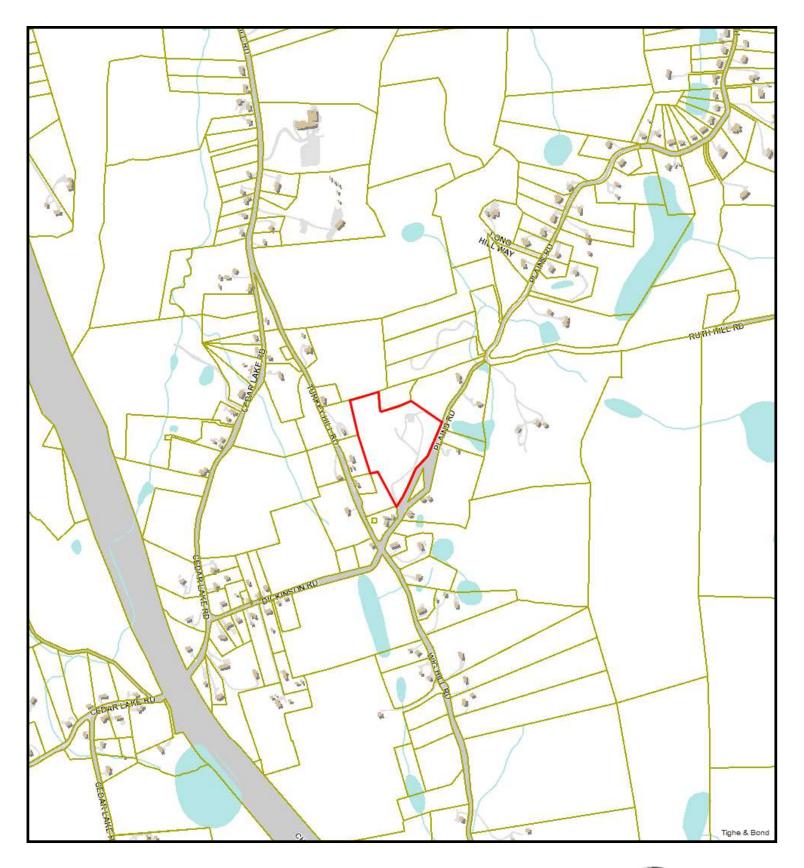
Owner Name	Volume	Page	Sale Date	Deed Type	Sale Price
539 PLAINS RD LLC	0347	0725	10/25/2011	Quit Claim	\$325,000
MICHAEL JACQUELINE A	0330	0411	06/26/2009		\$0
PIONEER ENTERPRISES LLC	0308	0256	12/21/2006		\$0
MICHAEL JACQUELINE	0284	0001	10/26/2004		\$0
MICHAEL JACK & JACQUELINE	0090	0198	12/02/1958		\$0

Building Permits

Permit	Permit	Date	Reason
Number	Type	Opened	
11458	Addition	01/29/2013	3 NW ANTENNAS+6 RRUS TO EXSTNG TOWER/1 CABINET TO EXST SHELTER

Permit Number	Permit Type	Date Opened	Reason
11422	Addition	12/13/2012	2NEW CABINETS/1 H-FRAME GROUND MOUNT RRH TO EXSTNG PAD/REMV OLD CAB
9691	Unknown	10/01/2008	ADD ELECTRIC TO CELL SITE

Information Published With Permission From The Assessor



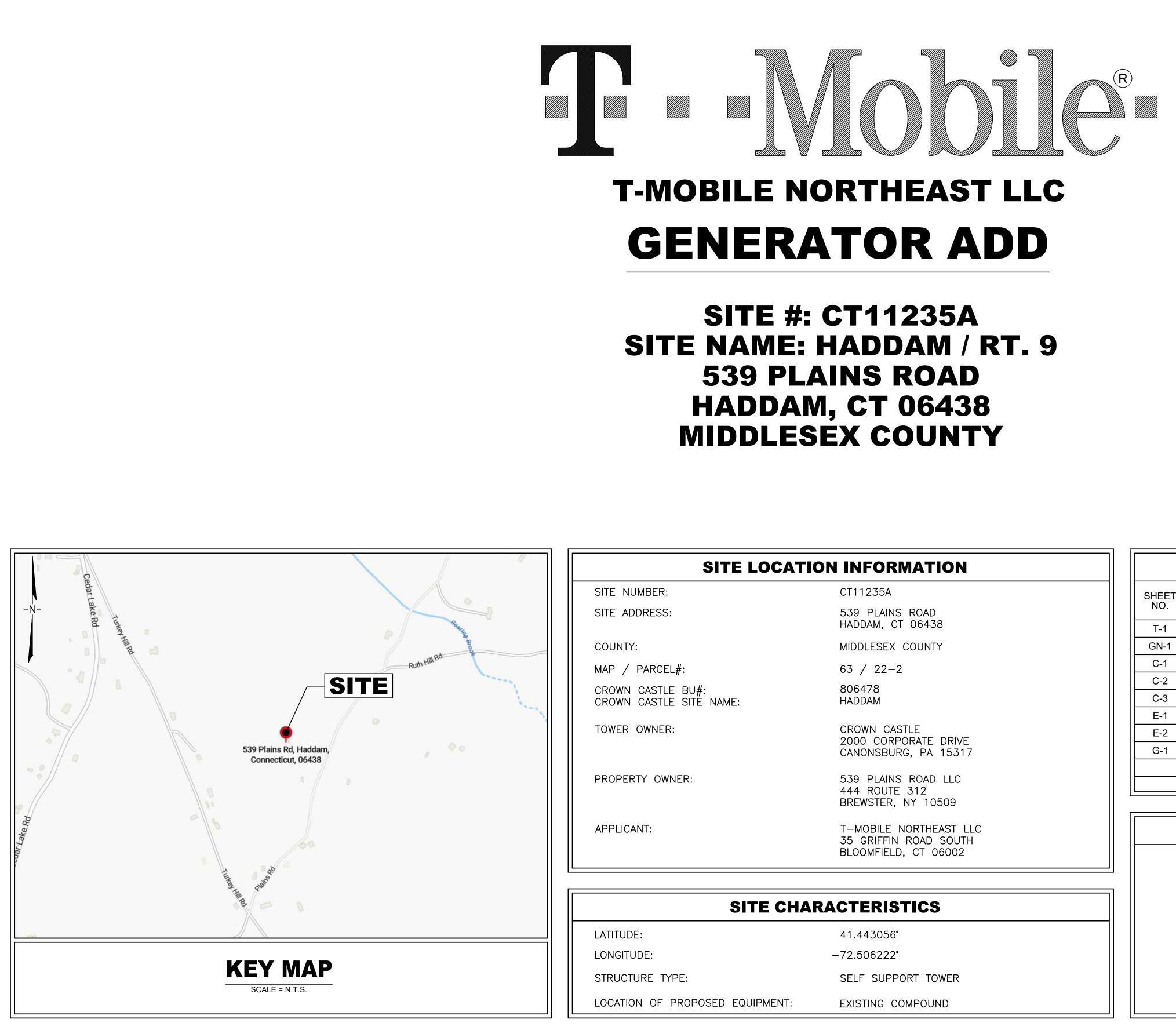
7/11/2023 3:56:15 PM

Scale: 1"=1000' Scale is approximate



The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

Exhibit C



SITE LOC	ATION INFORMATION			
NUMBER:	CT11235A		HEET NO.	
ADDRESS:	539 PLAINS ROAD HADDAM, CT 06438		νΟ. T-1	TITLE SHEET
ITY:	MIDDLESEX COUNTY		6N-1	GENERAL NOTES
/ PARCEL#:	63 / 22-2	C	C-1	COMPOUND PLAN
	·		C-2	EQUIPMENT PLANS AND D
VN CASTLE BU#: VN CASTLE SITE NAME:	806478 HADDAM		C-3	EQUIPMENT DETAILS
		E	E-1	ONE-LINE DIAGRAM
R OWNER:	CROWN CASTLE	E	E-2	ELECTRICAL NOTES
	2000 CORPORATE DRIVE CANONSBURG, PA 15317	G	G-1	GROUNDING PLAN & NOTE
PERTY OWNER:	539 PLAINS ROAD LLC 444 ROUTE 312 BREWSTER, NY 10509			
ICANT:	T-MOBILE NORTHEAST LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			UNDER
SITE C	HARACTERISTICS			
UDE:	41.443056°			
ITUDE:	-72,506222°			

CONSTRUCTION DRAWINGS

ALL SCALES RELATIVE TO 24"X36" PAGE SIZE

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	EN(97	EVATED GINEERING 6 TABOR ROAD, UNIT 6 PRRIS PLAINS, NJ 07950 862-242-8050
	including th for the sp which they use to any other par consent of unlawfully a a way oth user will ho	prepared by Elevated Engineering, his document, are to be used only ecific project and specific use for were intended. Any extension of other projects, by owner or by any ty, without the expressed written of Elevated Engineering, is done nd at the users own risk. If used in er than that specifically intended, Id Elevated Engineering, harmless om all claims and losses.
	SCI	HEDULE OF REVISIONS
7		
6 5		
5		
3	07/13/23	RE-ISSUED AS FINAL
2	06/16/23	ISSUED AS FINAL
1	06/12/23	
0 REV NO.	05/15/23 DATE	INITIAL SUBMISSION DESCRIPTION OF CHANGES
NU.		
DR	AWN BY:	CJT
СН	ECKED BY	
60		
	ALE: B NO: INFORMAT NO ACCOMF	NDB AS NOTED 23001-TRN 10N ON THIS SET OF DRAWINGS IS T FOR OFFICIAL USE UNLESS PANIED BY THE STAMPED SEAL & RE OF A PROFESSIONAL ENGINEER
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SHEET INDEX

SHEET DESCRIPTION

DETAILS

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RGROUND SERVICE ALERT

CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

1.	FOR THE PURPOSE OF THE CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:	9.	S C, D
	CONTRACTORS – TO BE DETERMINED SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION) OWNER – T–MOBILE		TF Tł
2.	PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.	10. 11.	C S
3.	ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE	10	S A
	ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.	12. 13.	
ŀ.	DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.	14.	. Al SI IN
5.	UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.	15.	А((F
6.	"KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE PROVIDED BY THE SUBCONTRACTOR.		36 T(US
7.	THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.	16.	. C(C(
8.	IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSED AND ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY CONTRACTOR.	17.	. SI C(Df Al C(

ELECTRICAL & GROUNDING NOTES

1.	THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE SPECIFIC (UL, LPI, OR NFPA) LIGHTNING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.	11 12
2.	ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO LIGHTNING PROTECTION AND AS POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.	13
3.	THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.	14 15
4.	METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO THE BTS EQUIPMENT.	16
5.	EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.	17
6.	EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.	18 19
7.	APPROVED ANTIOXIDANT COATING (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.	20
8.	ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.	21
9.	ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.	21
10.	MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.	22

UBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 ABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN RAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW RAYS AS NECESSARY . SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH HE CONTRACTOR.

HE SUBCONTRACTOR SHALL PROTECT THE EXISTING IMPROVEMENTS, PAVEMENTS, URBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT UBCONTRACTORS EXPENSE TO THE SATISFACTION OF OWNER.

UBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIAL UCH AS COAXIAL CABLE AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. NTENNAS REMOVED SHALL BE RETURNED TO THE OWNERS DESIGNATED LOCATION.

UBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

LL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN ONCRETE INSTITUTE (ACI) 301.

NY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

LL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN CCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 $F_y = 36$ ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 6 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. OUCH UP ALL SCRATCHED AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED ISING A COMPATIBLE ZINC RICH PAINT.

ONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL ONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."

UBCONTRACTORS SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO OMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE RAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF NY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH ONSTRUCTION.

METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

. ALL NEW STRUCTURE WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.

. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.

ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.

THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.

GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.

. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.

. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.

. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN OR THIN INSULATION.

0. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.

. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.

2. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.

- OF ANY DANGEROUS EXPOSURE LEVELS.
- 19. APPLICABLE BUILDING CODES:

SUBCONTRACTORS WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

 BUILDING CODE: 2022 CONNECTICUT STATE BUILDING CODE ELECTRICAL CODE: NFPA 70 NATIONAL ELECTRICAL CODE, 2020 EDITION • LIGHTNING CODE: NFPA 780-2014 LIGHTNING PROTECTION CODE

SUBCONTRACTORS WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

- STRUCTURAL CONCRETE
- AMERICAN INSTITUTE FOR STEEL CONSTRUCTION (AISC)
- MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION
- STANDARDS FOR STEEL
- DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS A CONFLICT BETWEEN A GENERAL REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN

- 23. GROUNDING SHALL COMPLY WITH NEW ART. 250.

- TO BE IN CONTACT WITH GALVANIZED STEEL.
- GROUND IN BTS UNIT)
- EGB PLACES NEAR THE ANTENNA LOCATION.
- 31. BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
- DOCUMENTATION.
- MASTER GROUND BAR.
- CONSTRUCTION.

	ABBREVIATIONS						
AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	R/		
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS				
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TC		
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TC		
EXISTING	EXISTING	N.T.S,	NOT TO SCALE	TBRR	TC		
EG	EQUIPMENT GROUND	REF	REFERENCE		AN		
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED	TYP	TY		

18. THE EXISTING CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT

• AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENT FOR

• TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL

24. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.

25. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON DRAWING.

26. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE

27. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.

28. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL): NON-SURGING OBJECTS (EGB

29. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.

30. BOND ANTENNA MOUNTING BRACKETS. COAXIAL CABLE GROUND KITS AND ALNA TO

32. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT

33. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO

34. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO

RADIO FREQUENCY TO BE DETERMINED

TO BE REMOVED TO BE REMOVED AND REPLACED PICAL

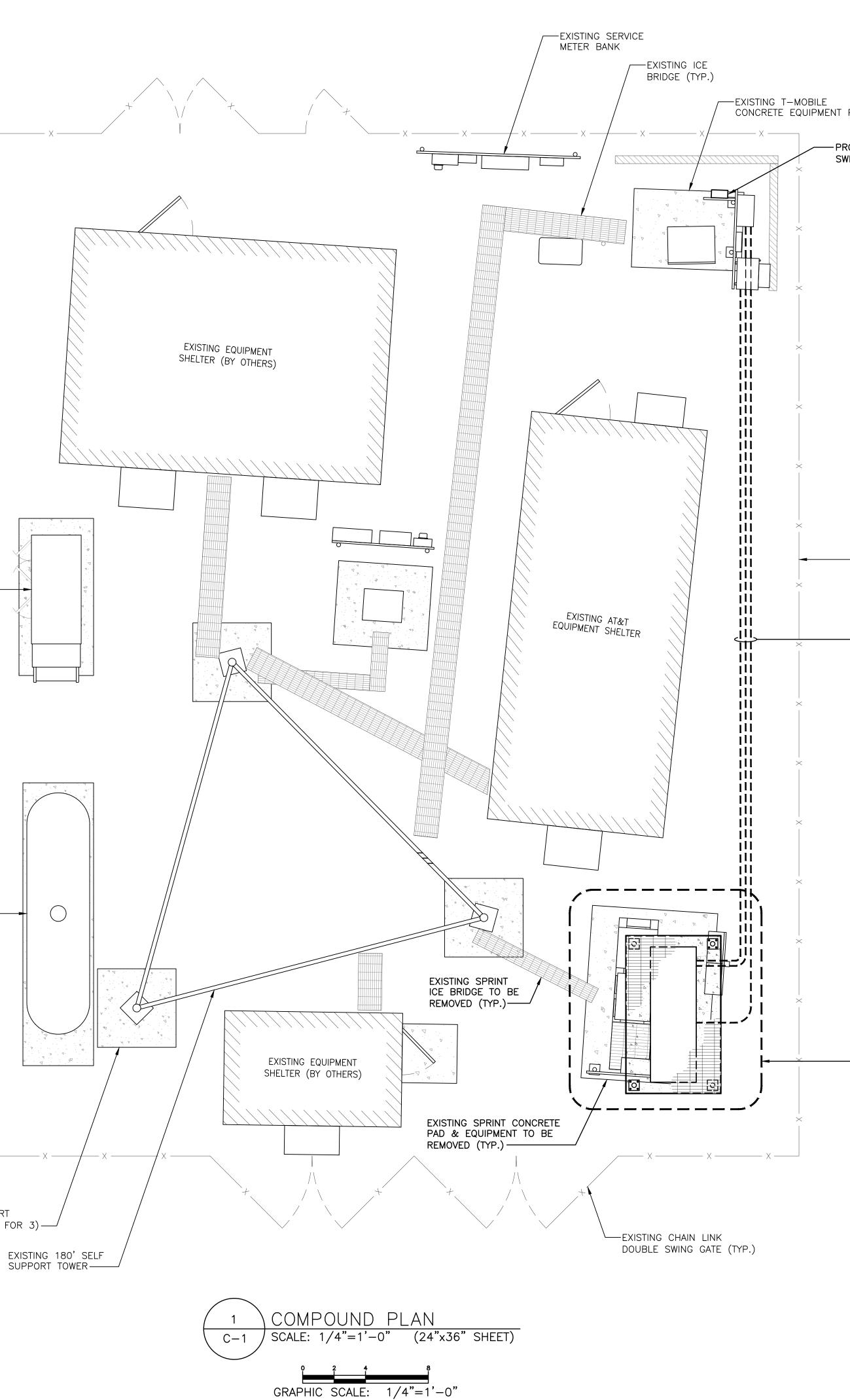
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	including th for the sp which they use to any other par consent o unlawfully a a way oth user will ho	prepared by Elevated Engineering, his document, are to be used only ecific project and specific use for were intended. Any extension of other projects, by owner or by any ty, without the expressed written of Elevated Engineering, is done nd at the users own risk. If used in er than that specifically intended, ld Elevated Engineering, harmless om all claims and losses.			
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	INFORMATION ON THIS SET OF DRAWINGS IS NOT FOR OFFICIAL USE UNLESS ACCOMPANIED BY THE STAMPED SEAL & SIGNATURE OF A PROFESSIONAL ENGINEER				
NICHOLAS D. BARILE PROFESSIONAL ENGINEER, CT LIC. No. 28643					
SITE ID: CT11235A HADDAM / RT 9 539 PLAINS ROAD HADDAM, CT 06438 MIDDLESEX COUNTY					
GENERAL NOTES					
с Г	RAWING	SHEET:			
	GN-1				

EXISTING SELF SUPPORT TOWER FOOTING (TYP. FOR 3)

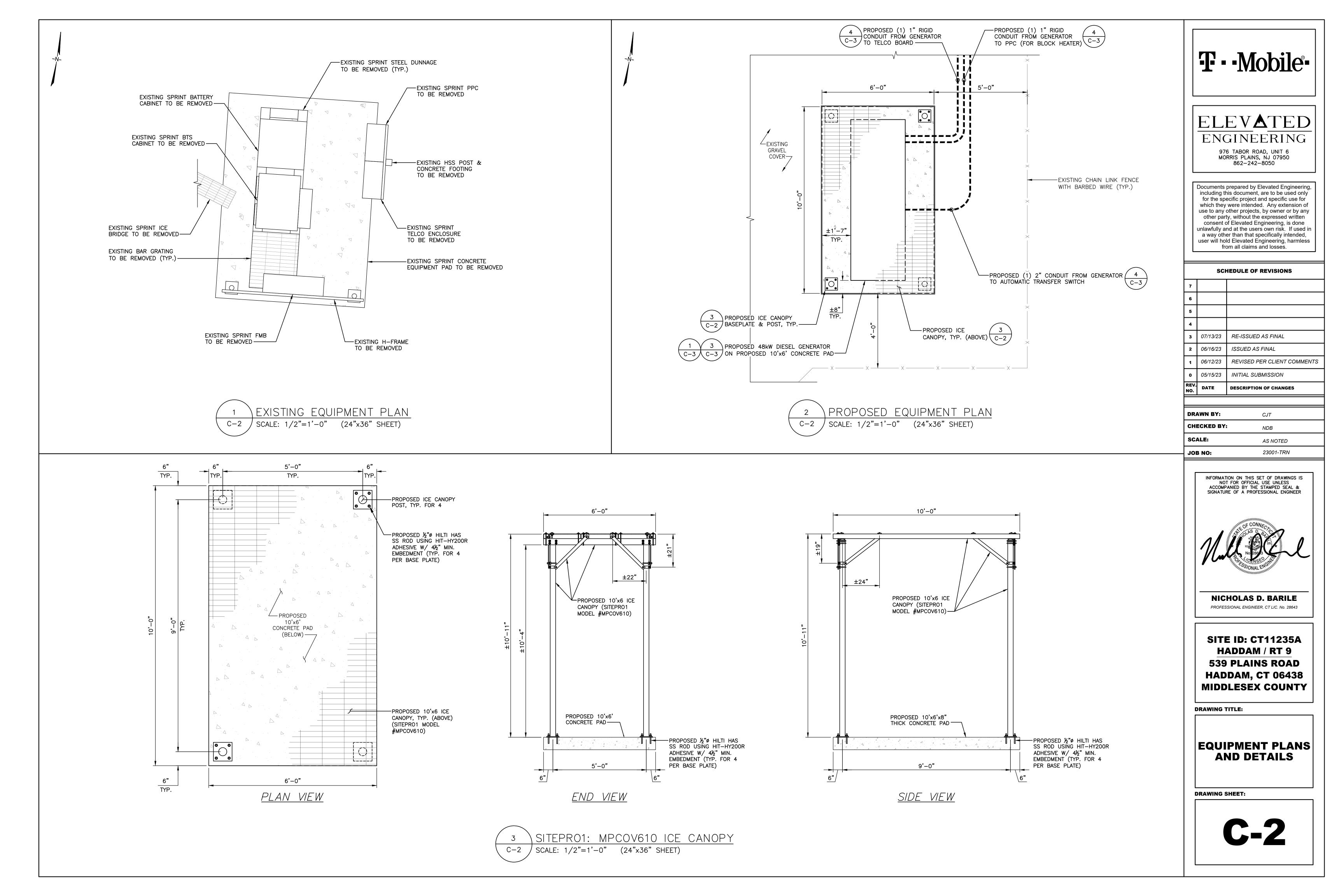
EXISTING PROPANE TANK ON CONCRETE PAD (BY OTHERS)—

EXISTING GENERATOR ON CONCRETE PAD (BY OTHERS)——

— X —



PAD		Ŧ·	-Mobile [®] -
DPOSED 240VAC, 200A, 2–P AUTOMATIC TRANSFER $\begin{pmatrix} 2 \\ C-3 \end{pmatrix}$ TCH (NEMA 3R) MOUNTED ON EXISTING UNISTRUT $\begin{pmatrix} 2 \\ C-3 \end{pmatrix}$		ENC 977 MO	EVATED GINEERING 6 TABOR ROAD, UNIT 6 RRIS PLAINS, NJ 07950 862-242-8050
		including th for the spe which they use to any other part consent of unlawfully at a way othe user will hol	prepared by Elevated Engineering, his document, are to be used only ecific project and specific use for were intended. Any extension of other projects, by owner or by any ty, without the expressed written of Elevated Engineering, is done nd at the users own risk. If used in er than that specifically intended, Id Elevated Engineering, harmless om all claims and losses.
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WITH BARBED WIRE (TYP.)	1	06/12/23	REVISED PER CLIENT COMMENTS
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(3) PROPOSED T-MOBILE UNDERGROUND CONDUIT FROM	NO.	DATE	DESCRIPTION OF CHANGES
ĠÉNERATOR TO EQUIPMENT AREA:	DR	AWN BY:	CJT
 (1) 1"Ø RIGID CONDUIT FROM GENERATOR TO PPC (1) 1"Ø RIGID CONDUIT FROM GENERATOR TO TELCO CUBE 	СН	ECKED BY:	NDB
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EXISTING & PROPOSED (1) EQUIPMENT PLANS		ACCOMP SIGNATUR SIGNATUR NIC PROFES SITI HAD 539 HAD MIDD ORAWING 1	OMPOUND PLAN

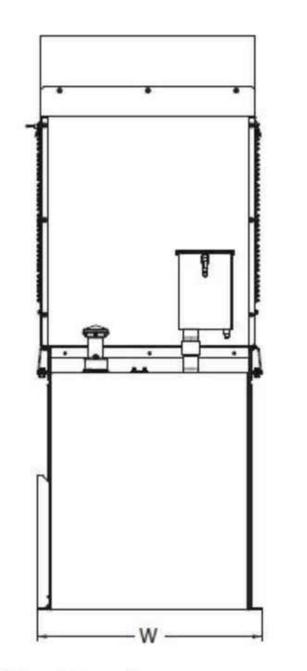


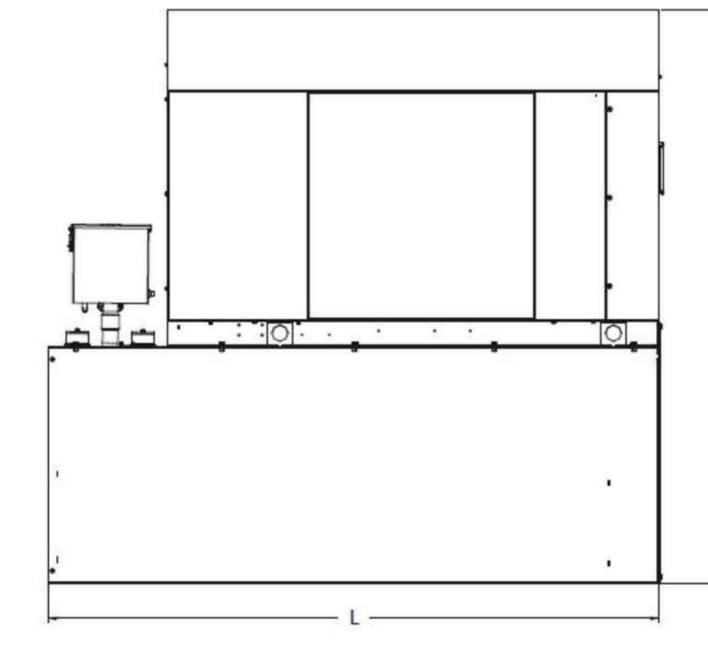


EPA Certified Stationary Emergency



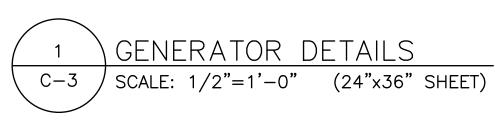
Model Number 48kW: G0071940

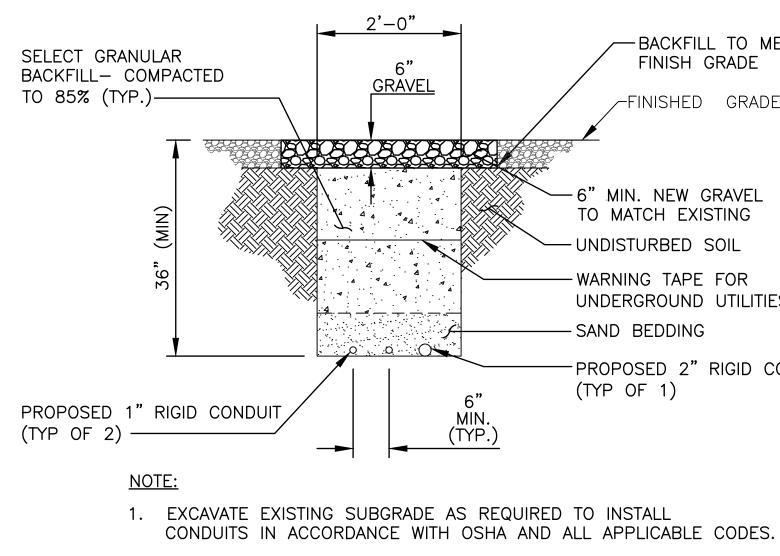




Weights and Dimensions

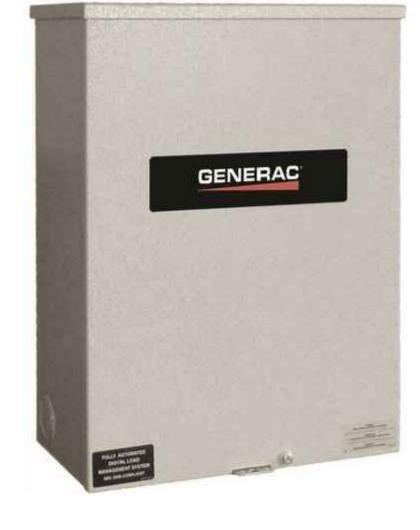
Unit Weight - Ibs	Unit Weight with Skid - Ibs	Dimensions (L x W x H) - in
2,915	2,954	103.4 (2,625) x 35.0 (888) x 90.0 (2,286)

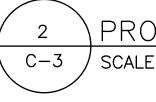




4

Fuel Tank Gross Total Capacity	240
Fuel Tank Gross Usable Capacity	229
Fuel Tank Net Usable Capacity (Run Hours Based on Net Usable Capacity	/) 206
Run Hours 100% Load	52
Run Hours 75% Load	67
Run Hours 50% Load	96
Sound Emission Data Rated Load Sound Output at 23ft - dB(A)	a 65
* All measurements are approximate and for estimation	purposes on

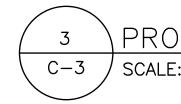




-BACKFILL TO MEET EXISTING FINISH GRADE FINISHED GRADE

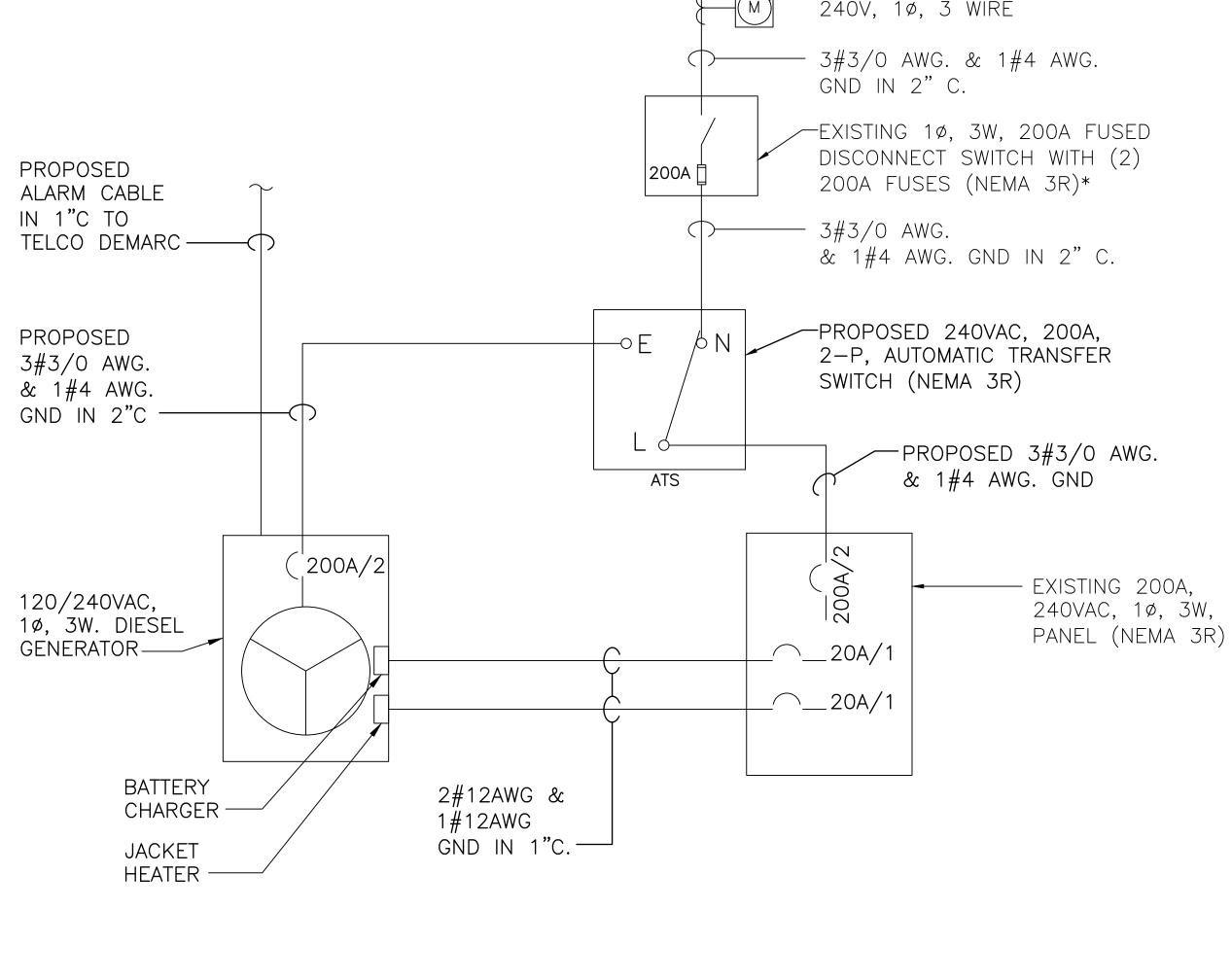
-6" MIN. NEW GRAVEL UNDERGROUND UTILITIES (TYP.) -PROPOSED 2" RIGID CONDUIT

PROPOSED #4 @ 12" E.W. (TYP.) — (MIN.)· · · · · -EXISTING COMPACTED SUBGRADE (TYP.)



PROPOSED TRENCH DETAIL C-3 / SCALE: 1/2"=1'-0" (24"x36" SHEET)

		RXSC200A43 ANSFER SWITCH		EL ENC 97 MC Documents including t for the sp which they use to any other par consent unlawfully a a way oth user will ho	• OROBICS • OROBICS
-	PHASE VOLTAGE	1-PHASE 120/240		SC	HEDULE OF REVISIONS
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Į	DIMENSIONS	17.3"(L) x 12.5"(W)	5		
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. 1/2 -1 0				AWN BY:	CJT
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4000 I SLAB	SED 8' THK. PSI CONCRETE 4" (MIN.) 2" (MIN.) 2" (N A A A A A A A CLEAN STONE	MIN.) EXISTING GRAVEL COVER (TYP.) PROPOSED 1" CHAMFER PROPOSED GRAVEL COVER TO MATCH EXISTING (TYP.)		NIC PROFES SIT HAD MIDD	QUIPMENT
POSED	<u>CONCRETE PAD</u>)" (24"x36" SHEET)			DRAWING	DETAILS SHEET: C-3



ONE-LINE DIAGRAM E-1 / SCALE: N.T.S.

ELECTRICAL POWE			
SYMBOL	DESCRIPTION		
	ELECTRICAL PANELBOARD/E		
G	GENERATOR		
ç	CIRCUIT BREAKER		
Ð	GROUNDING ELECTRODE		

	ABBREVIATIONS
A	AMPERE
AC	ALTERNATING CURRENT
AFCI	ARC FLASH CIRCUIT INTERRUPTER
AWG	AMERICAN WIRE GAUGE
C	CONDUIT, CORRIDOR
СТ	CURRENT TRANSFORMER
EX	EXISTING
GND	GROUND
GFI	GROUND FAULT INTERRUPTER
KW	KILOWATT
MSB	MAIN SWITCHBOARD
N.T.S.	
OCPD	OVERCURRENT PROTECTIVE DEVICE
P	POLE(S)
PH, φ	PHASE
PNL SE	PANEL SERVICE ENTRANCE
SL SW	SWITCH
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLT
W	WATT, WIRE
WP	WATERPROOF
G	GENERATOR
м	METER
СВ	CIRCUIT BREAKER

NOTES:

1. CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

ALL NEW WIRING SHALL BE COPPER. ALL CONDUCTORS LARGER THAN #10 AWG SHALL BE THWN-2, THW-2, RHW-2, OR XHHW-2 WIRE UNLESS NOTED OTHERWISE.

FINAL ELECTRICAL SERVICE LAYOUT SUBJECT TO UTILITY COORDINATION

-EXISTING 200A METER SOCKET, 240V, 1ø, 3 WIRE

DISCONNECT SWITCH WITH (2)

/ENCLOSURE

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	SITE ID: CT11235A HADDAM / RT 9 539 PLAINS ROAD HADDAM, CT 06438 MIDDLESEX COUNTY DRAWING TITLE:				
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1. GENERAL REQUIREMENTS:

- 1.1 THE WORK TO BE DONE UNDER THIS PROJECT INCLUDES PROVIDING ALL EQUIPMENT, MATERIALS, LABOR AND SERVICES, AND PERFORMING ALL OPERATIONS FOR COMPLETE AND OPERATING SYSTEMS. ANY WORK NOT SPECIFICALLY COVERED BUT NECESSARY TO COMPLETE THIS INSTALLATION. SHALL BE PROVIDED. ALL EQUIPMENT AND WIRING TO BE NEW AND PROVIDED UNDER THIS CONTRACT UNLESS OTHERWISE NOTED.
- 1.2 ENTIRE INSTALLATION, INCLUDING MATERIALS, EQUIPMENT AND WORKMANSHIP, SHALL CONFORM TO THE 2014 EDITION OF THE NATIONAL ELECTRIC CODE (NEC) AS WELL AS ALL APPLICABLE LAWS AND REGULATIONS AND REGULATORY BODIES HAVING JURISDICTION OVER THIS WORK:
- 1.3 THE TERM "FURNISH" SHALL MEAN TO OBTAIN AND SUPPLY TO THE JOB SITE. THE TERM "INSTALL" SHALL MEAN TO FIX IN POSITION AND CONNECT FOR USE. THE TERM "PROVIDE" SHALL MEAN TO FURNISH AND INSTALL. THE TERM "CONTRACTOR" SHALL MEAN ELECTRICAL CONTRACTOR.
- 1.4 ONLY WRITTEN CHANGES AND/OR MODIFICATIONS APPROVED BY THE ENGINEER, CONSULTING ENGINEER OR OWNER'S REPRESENTATIVE WILL BE RECOGNIZED.
- 1.5 THE ELECTRICAL CONTRACTOR SHALL SUBMIT, FOR THE ENGINEER'S APPROVAL, DETAILED SHOP DRAWINGS OF ALL EQUIPMENT SPECIFIED.
- 1.6 CONTRACTOR SHALL COORDINATE WITH SPECIFICATIONS PROVIDED BY OTHER TRADES.
- 1.7 PROVIDE OPERATING AND MAINTENANCE MANUALS, PER SPECIFICATIONS, AND GIVE INSTRUCTIONS TO USER FOR ALL EQUIPMENT AND SYSTEMS PROVIDED UNDER THIS CONTRACT AFTER ALL ARE CLEANED AND OPERATING.
- 1.8 KEEP PREMISES FREE FROM RUBBISH. REMOVE ALL ELECTRICAL RUBBISH FROM SITE.
- 1.9 ALL WORK SHALL BE INSTALLED CONCEALED UNLESS OTHERWISE NOTED.
- 1.10 THE WORK SHALL INCLUDE ALL PANELS, DEVICES, FEEDERS AND BRANCH CIRCUIT WIRING AS REQUIRED FOR THE DISTRIBUTION SYSTEM INDICATED AND CALLED FOR ON THE DRAWINGS. REQUIRED BY SPECIFICATIONS AND AS NECESSARY FOR COMPLETE FUNCTIONAL SYSTEMS PRESENTED AND INTENDED.
- 1.11 THE CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR, TOOLS, EQUIPMENT, CONSUMABLES AND SERVICES REQUIRED FOR OBTAINING, DELIVERY, INSTALLATION, CONNECTION, DISCONNECTION, REMOVAL, RELOCATION, REPAIR, REPLACEMENT, TESTING AND COMMISSIONING OF ALL EQUIPMENT AND DEVICES INCLUDED IN OR NECESSARY FOR THE WORK, AS APPLICABLE. THIS INCLUDES SCAFFOLDING, LADDERS, RIGGING, HOISTING, ETC.
- 1.12 ELECTRICAL WORK SHALL INCLUDE ALL REQUIRED CUTTING, PATCHING AND THE FULL RESTORATION OF WALL AND FLOOR STRUCTURE AND SURFACES. ALL EQUIPMENT, WALLS, FLOORS, ETC., DISTURBED OR DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER, AT THE CONTRACTORS EXPENSE.
- 1.13 BEFORE SUBMITTING HIS BID, THE CONTRACTOR SHALL FULLY ACQUAINT HIMSELF/HERSELF WITH THE JOB CONDITIONS AND DIFFICULTIES THAT WILL PERTAIN TO THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED, WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
- 1.14 THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING UTILITIES.
- 1.15 UPON COMPLETION OF THE ELECTRICAL WORK, THE CONTRACTOR SHALL TEST THE COMPLETE ELECTRICAL SYSTEM FOR SHORTS, GROUNDS, AND PROPER OPERATION, IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE.
- 1.16 UPON COMPLETION OF WORK, THE CONTRACTOR SHALL CLEAN AND ADJUST ALL EQUIPMENT AND LIGHTING AND TEST SYSTEMS TO THE SATISFACTION OF OWNER AND ENGINEER. RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL
- 1.17 THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS OF FINISHED CONSTRUCTION PRIOR TO FABRICATION AND INSTALLATION OF FIXTURES AND EQUIPMENT
- 1.18 EXACT ROUTING OF CONDUITS AND "MC" CABLES SHALL BE DETERMINED IN THE FIELD.
- 1.19 IF THE OWNER AND/OR HIS REPRESENTATIVE CONSIDERS ANY WORK TO BE INFERIOR, THE RESPECTIVE CONTRACTOR SHALL REPLACE SAME WITH CONTRACT STANDARD WORK WITHOUT ADDITIONAL CHARGE. ALL WORK SHALL BE DONE IN A NEAT, WORKMANLIKE MANNER, LEFT CLEAN AND FREE FROM DEFECTS, AND COMPLETELY OPERABLE.
- 1.20 THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AS SHOWN ON THE DRAWINGS AND/OR AS SPECIFIED. ALL MATERIALS SHALL BE NEW, AND BEAR THE UL LABEL. ALL WORK SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER.
- 1.21 DRAWINGS ARE TO BE CONSIDERED DIAGRAMMATIC. AND SHALL BE FOLLOWED AS CLOSELY AS CONDITIONS ALLOW TO COMPLETE THE INTENT OF THE CONTRACT. THE DRAWINGS AND SPECIFICATIONS COMPLIMENT ONE ANOTHER, AND WHAT IS SHOWN ON THE DRAWINGS AND NOT MENTIONED IN THE SPECIFICATIONS, AND VICE VERSA, IS TO BE INCLUDED IN THE SCOPE OF WORK.
- 1.22 ALL EQUIPMENT CONNECTIONS SHALL BE INSTALLED PER APPLICABLE SEISMIC REQUIREMENTS.
- 1.23 ENGINEER WILL MAKE A FINAL INSPECTION WITH THE OWNER AND CONTRACTOR AND WILL NOTIFY THE CONTRACTOR IN WRITING OF ALL PARTICULARS IN WHICH THIS INSPECTION REVEALS THAT THE WORK IS INCOMPLETE OR DEFECTIVE. THE CONTRACTOR SHALL IMMEDIATELY TAKE SUCH MEASURES AS ARE NECESSARY TO COMPLETE SUCH WORK OR REMEDY SUCH DEFICIENCIES.
- 1.24 THE CONTRACTOR SHALL PERFORM ALL EXCAVATION. TRENCHING AND BACKFILL REQUIRED FOR ELECTRICAL WORK. BACKFILL SHALL BE SUITABLE MATERIAL PROPERLY COMPACTED TO 95% DENSITY IN EACH LAYER OF SIX (6) INCH DEPTH. CONDUIT SHALL BE MINIMUM 36" BELOW FINISHED GRADE.

2. PROJECT COORDINATION:

- 2.1 THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS AT THE SITE AND NOTIFY THE OWNER OF ANY DISCREPANCIES, PRIOR TO COMMENCING WITH THE WORK.
- 2.2 THE CONTRACTOR SHALL REVIEW AND COORDINATE WITH THE DOCUMENTS OF ALL TRADES. 2.3 THE CONTRACTOR SHALL FURNISH A SCHEDULE INDICATING HIS PORTION OF TIME, WITHIN THE OVERALL SCHEDULE, REQUIRED TO COMPLETE THE WORK, IN CONJUNCTION WITH ALL TRADES. ALL WORK THAT MAY AFFECT OPERATION OF BUILDING SYSTEMS SHALL BE COORDINATED WITH
- THE OWNER'S REPRESENTATIVE.
- 2.4 REFER TO THE CONSTRUCTION DRAWINGS AND APPROPRIATE VENDORS APPROVED DIMENSIONED LAYOUT DRAWINGS FOR THE LOCATIONS OF ALL ELECTRICAL DEVICES AND EQUIPMENT. A. EXTERIOR, BUILDING MOUNTED LUMINARIES SWITCHES
- 2.5 REFER TO THE PLUMBING DRAWINGS FOR THE LOCATIONS OF THE FOLLOWING: A. GENERATOR
- 2.6 SHUT DOWN OF POWER SHALL BE COORDINATED WITH THE OWNER, ARCHITECT AND PROJECT MANAGER AT LEAST 14 WORKING DAYS PRIOR TO SHUT DOWN. SHUT DOWNS LONGER THAN 2 DAYS SHALL BE COORDINATED WITH THE ABOVE PERSONNEL AT LEAST ONE MONTH IN ADVANCE. TEMPORARY POWER FOR CONSTRUCTION SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR FOR SHUT DOWNS OVER 2 DAYS.
- 2.7 ALL CONDUITS AND DEVICE BOXES SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR, INCLUDING ALL TECHNOLOGY CONDUITS AND BOXES.
- 2.8 EXACT LOCATIONS OF OUTLETS AND EQUIPMENT SHALL BE COORDINATED WITH ARCHITECTURAL AND MILLWORK PLANS. ALL OUTLET AND EQUIPMENT LAYOUTS SHALL BE VERIFIED AND COORDINATED WITH WORK OF OTHER TRADES.
- 2.9 PROVIDE TEMPORARY LIGHTING AND POWER IN ACCORDANCE WITH ARTICLE 305 OF THE NEC. TEMPORARY LIGHTING FIXTURES IN UNFINISHED AREAS SHALL REMAIN CONNECTED UNTIL REMOVAL IS REQUESTED BY THE CONTRACTOR.
- 2.10 COLORS AND FINISHES OF ALL LIGHTING FIXTURES SHALL BE AS DETERMINED BY THE PROPERTY OWNER WHO SHALL SELECT SAME FROM THOSE AVAILABLE AS STANDARD OF THE EQUIPMENT SPECIFIED. PROVIDE CUSTOM ENGRAVING FOR ALL DIMMER SWITCHES.
- 2.11 THE CONTRACTOR SHALL CONTACT THE BUILDING MANAGER TO OBTAIN A COPY OF THE GENERAL REQUIREMENTS AND/OR CONDITIONS TO BE USED FOR THIS PROJECT.
- 2.12 INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. TEMPORARY SHUT DOWNS OF ANY SYSTEM SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER AND ARCHITECT.
- 2.13 CONTRACTOR SHALL VERIFY ALL EQUIPMENT POWER REQUIREMENTS AND REQUIRED OUTLET TYPES WITH EQUIPMENT MANUFACTURER AND OWNER PRIOR TO POWER DISTRIBUTION AND RECEPTACLE INSTALLATION.
- 3. PROTECTION OF WORK:
- 3.1 EFFECTIVELY PROTECT ALL MATERIALS AND EQUIPMENT FROM ENVIRONMENTAL AND PHYSICAL DAMAGE UNTIL FINAL ACCEPTANCE. CLOSE AND PROTECT ALL OPENINGS DURING CONSTRUCTION. PROVIDE NEW MATERIALS AND EQUIPMENT TO REPLACE ITEMS DAMAGED.
- 4. WARRANTIES AND BONDS:
- MINIMUM OF ONE YEAR AFTER FINAL ACCEPTANCE BY OWNER.
- OF COMPLIANCE.

5. PERMITS:

- 5.1 CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND INSPECTION FEES FOR ELECTRICAL WORK.
- 6. RACEWAYS:
- 6.1 ALL CONDUIT SHALL BE MINIMUM SIZE OF 3/4" FOR POWER CIRCUITS AND CONTROL CIRCUITS EXCEPT WHERE FLEXIBLE CONDUIT IS CALLED FOR ON PROJECT DOCUMENTS. ALL EXTERIOF EXPOSED CONDUIT SHALL BE GRC (GALVANIZED RIGID METAL CONDUIT). ALL UNDERGROUND, IN SLAB OR UNDER SLAB SHALL BE RNC (RIGID NONMETALLIC CONDUIT). CHANGE TO RIGID METALLIC CONDUIT OR INTERMEDIATE METALLIC CONDUIT BEFORE EXITING OUT OF CONCRETE OR PENETRATING A WALL, FLOOR OR ROOF. EMT IS ALLOWED IN INTERIOR DRY LOCATIONS WHERE NOT SUBJECT TO DAMAGE.
- 6.2 ALL FLEXIBLE CONDUIT IN WET OR DRY AREAS SHALL BE LIQUID TIGHT CONDUIT. NONMETALLIC FLEXIBLE CONDUIT IS SPECIFICALLY PROHIBITED.
- 6.3 CONDUIT SHALL BE RUN AT RIGHT ANGLES AND PARALLEL TO BUILDING LINES. SHALL BE NEATLY RACKED AND SECURELY FASTENED. JUNCTION BOXES SHALL BE PROVIDED WHERE REQUIRED TO FACILITATE INSTALLATION OF WIRES.
- 6.4 ALL CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN AN APPROVED MANNER.
- 6.5 ALL EMPTY RACEWAYS SHALL BE FURNISHED WITH A 200 LB. TEST NYLON DRAG LINE.
- 6.6 ARRANGEMENT OF CONDUIT AND EQUIPMENT SHALL BE AS INDICATED, UNLESS MODIFICATION IS REQUIRED TO AVOID INTERFERENCES.
- 6.7 ALL RACEWAY AND WIRING SHALL BE CONCEALED IN FINISHED AREAS. RACEWAY IN MECHANICAL ROOMS, BASEMENTS AND CRAWL SPACES MAY BE SURFACE MOUNTED.
- 6.8 FOR CONDUITS CROSSING EXPANSION JOINTS, PROVIDE EXPANSION FITTINGS FOR SIZE 1-1/4",

SIZES 1" AND SMALLER.

- 6.9 THE CONTRACTOR SHALL SEAL ALL PENETRATIONS THROUGH FIRE RATED WALLS AND FLOORS WITH APPROVED FIRE RATED SEALANT. ALL PENETRATIONS THROUGH ALL WALLS AND FLOORS SHALL BE SEALED. FOR ALL SLAB PENETRATIONS THE METHOD, DEPTHS AND LOCATIONS SHALL BE PRE-APPROVED BY THE BUILDING ENGINEER PRIOR TO THE START OF WORK.
- 6.10 THE CONTRACTOR SHALL INSTALL DETECTABLE UNDERGROUND TAPES FOR THE PROTECTION, LOCATION AND IDENTIFICATION OF UNDERGROUND CONDUIT INSTALLATION.
- 6.11 EXACT ROUTING OF CONDUITS AND CABLES SHALL BE DETERMINED IN FIELD.
- 6.12 ALL PENETRATIONS THROUGH FLOORS SHALL BE FIRE STOPPED AND SEALED WITH APPROVED SFALANT.
- 6.13 ELECTRICAL RACEWAY CONNECTIONS TO VIBRATING EQUIPMENT AND MACHINERY SUCH AS MOTORS, TRANSFORMERS, ETC., SHALL BE MADE WITH FLEXIBLE LIQUID TIGHT METALLIC CONDUIT.
- 6.14 SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS IN HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK. MACHINE SCREWS IN METAL, BEAM CLAMPS IN FRAMEWORK AND WOOD SCREWS IN WOOD. NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO BUILDING LINES.
- 6.15 DO NOT RUN RACEWAYS CLOSER THAN 6 INCHES WHEN PARALLEL TO HOT WATER OR STEAM PIPES. WHEN CROSSING WATER OR STEAM PIPES CROSS A MINIMUM OF 3 INCHES ABOVE. IF CROSSING BELOW IS UNAVOIDABLE, PROVIDE DRIP SHIELDS EXTENDING 6 INCHES BEYOND THE WATER OR STEAMPIPE. BOXES INSTALLED IN PROXIMITY TO WATER OR STEAM PIPE SHALL BE RATED NEMA 4X.

- 4.1 ALL MATERIALS, EQUIPMENT AND WORKMANSHIP SHALL BE GUARANTEED IN WRITING FOR A
- 4.2 OBTAIN AND DELIVER TO THE OWNER'S REPRESENTATIVE ALL GUARANTEES AND CERTIFICATES

AND LARGER. PROVIDE SECTIONS OF FLEXIBLE CONDUIT WITH GROUNDING JUMPERS FOR

- 7. BOXES:
- 7.1 INTERIOR OUTLET BOXES SHALL BE METALLIC, EXCEPT AS NOTED. FAN MOUNTING BOXES SHALL BE RATED FOR THE APPLICATION AND FOR THE WEIGHT OF THE FAN. EXTERIOR OUTLET BOXES SHALL BE CAST ALUMINUM AND SHALL BE MADE WEATHERTIGHT.
- 7.2 INTERIOR JUNCTION BOXES SHALL BE SHEET STEEL. EXTERIOR JUNCTION BOXES SHALL BE NONMETALLIC, WITH SCREW COVERS. BOXES SHALL BE SUPPORTED INDEPENDENTLY OF CONDUITS.
- 7.3 MOUNTING HEIGHTS OF EQUIPMENT AND DEVICES SHALL BE AS FOLLOWS: RECEPTACLES (WALL MOUNTED) - 18" A.F.F.
 - RECEPTACLES (COUNTER HEIGHT) 9" ABOVE COUNTER
 - RECEPTACLES (EXTERIOR) 24" ABOVE FINISHED GRADE COMMUNICATION OUTLETS - SAME AS RECEPTACLES
 - LIGHTING SWITCHES AND CONTROLS 44" A.F.F.
 - F. PANELBOARDS AND CABINETS 78" TO TOP OF ENCLOSURE
- 7.4 WHERE MULTIPLE SWITCHES AND RECEPTACLES ARE INDICATED AT THE SAME LOCATION, THEY SHALL BE MOUNTED BEHIND A COMMON FACEPLATE. TECHNOLOGY OUTLETS SHALL BE SEPARATED FROM AND BE PROVIDED WITH SEPARATE FACEPLATES FROM THE ASSOCIATED POWER RECEPTACLES.
- 7.5 RECEPTACLES SHALL BE ACCESSIBLE EXCEPT A DEDICATED RECEPTACLE MAY BE OBSTRUCTED BY THE REMOVABLE EQUIPMENT IT SERVES.
- 7.6 OUTLET BOXES IN EXISTING CONCRETE FLOORS WITH ACCESS FROM BELOW SHALL BE FIRE RATED, POKE-THROUGH TYPE FOR POWER AND LOW TENSION SERVICE. SERVICE FITTING HEADS SHALL BE ANODIZED ALUMINUM AND SHALL CONTAIN DEVICES AS SHOWN ON THE DRAWINGS. BOXES SHALL BE AS MANUFACTURED BY STEEL CITY OR HUBBELL.
- 7.7 SET BOXES SQUARE AND TRUE WITH BUILDING FINISH. INSTALL RECEPTACLE AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. SECURE TO BUILDING STRUCTURE IN ACCORDANCE WITH NEC REQUIREMENTS.
- 7.8 FURNISH OUTLET BOXES WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WHERE NO FIXTURE OR DEVICE IS INSTALLED, PROVIDE OUTLET BOX WITH BLANK COVER. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 INCH HORIZONTAL SEPARATION.
- <u>8. WIRING</u>:
- 8.1 ALL WIRE SHALL BE COPPER WITH TYPE THNN/THWN 600 VOLT INSULATION, MINIMUM #12 AWG FOR POWER AND LIGHTING CIRCUITS AND #16 AWG FOR CONTROL CIRCUITS.
- 8.2 UNDER NO CIRCUMSTANCES SHALL FEEDERS BE SPLICED.
- 8.3 ALL COMPUTER CIRCUITS SHALL HAVE SEPARATE NEUTRAL CONDUCTORS. ALL OTHER CIRCUITS MAY SHARE GROUND AND NEUTRAL CONDUCTORS.
- 8.4 WHERE EQUIPMENT, LIGHTING FIXTURES AND WIRING DEVICES ARE SHOWN WITH CIRCUIT NUMBERS ONLY, THE MINIMUM BRANCH CIRCUITING REQUIREMENTS SHALL BE AS FOLLOWS: A. LIGHTING FIXTURES - (2)#12 & #12 GND.
 - B. RECEPTACLES (2)#12 & #12 GND.
 - BRANCH CIRCUIT BREAKERS (120 VOLT) 1P, 20A HOMERUNS TO PANEL BOARDS SHALL CONTAIN NO MORE THAN THREE CIRCUITS. WHERE LIGHTING SWITCH INDICATIONS ARE NOT SHOWN
 - SWITCHES SHALL BE CONNECTED TO CONTROL ALL SWITCHED FIXTURES WITHIN THE CORRESPONDING SPACE.
- 8.5 CONTRACTOR SHALL INCREASE SIZE OF CIRCUIT WIRING/CONDUCTORS TO COMPENSATE FOR VOLTAGE DROP.
- 8.6 WIRE SIZES SHALL BE INCREASED TO COMPENSATE FOR VOLTAGE DROP AS FOLLOWS: A. 120V AND 208V CIRCUITS LONGER THAN 80' SHALL UTILIZE MIN. #10 AWG.
 - B. 208V CIRCUITS LONGER THAN 150' SHALL UTILIZE MIN. #10 AWG.
- 9. GROUNDING:
- 9.1 PROVIDE A COMPLETE EQUIPMENT GROUND SYSTEM FOR THE ELECTRICAL SYSTEM AS REQUIRED BY ARTICLE 250, OF THE NEC, AND AS SPECIFIED HEREIN.
- 9.2 ALL BRANCH CIRCUITS FOR POWER WIRING SHALL CONTAIN A COPPER GROUND WIRE. NO FLEXIBLE METAL CONDUIT OF ANY KIND OR LENGTH SHALL BE USED AS THE EQUIPMENT GROUNDING CONDUCTOR.
- 10. DEVICES:
- 10.1 THE CONTRACTOR SHALL VERIFY COLOR, LOCATION AND MOUNTING HEIGHT OF ALL DEVICES WITH ARCHITECT PRIOR TO INSTALLATION.
- 10.2 RECEPTACLES SHALL BE DUPLEX TYPE, 20 AMP, 125 VOLT RATING, WITH SIDE AND BACK WIRING. HUBBELL 5362 OR APPROVED EQUAL.
- 10.3 GROUND FAULT INTERRUPTERS SHALL BE SPECIFICATION GRADE. HUBBELL GF5362 OR APPROVED EQUAL.
- 10.4 SWITCHES SHALL BE SPECIFICATION GRADE, 20 AMP AT 120/277 VOLTS, QUIET, AC, SINGLE OR DOUBLE POLE, THREE OR FOUR WAY AS REQUIRED, ROCKER STYLE WITH BACK AND SIDE
- 10.5 ALL RECEPTACLES MARKED WP SHALL BE GROUND FAULT PROTECTED AND WEATHER TIGHT WHILE IN USE.
- 10.6 THE COLOR OF FACEPLATES SHALL MATCH COLOR OF DEVICE WHICH IT COVERS. ALL PLATES SHALL BE METALLIC.

- <u>11. PANELBOARDS</u>:
- TRANSPARENT COVER.
- PROJECT.

- <u>12. LIGHTING:</u>
- 13. IDENTIFICATION:
- UNDER THIS CONTRACT.
- 14. RECORD DRAWINGS:
- STOPPING.

11.1 PANELBOARDS: SWITCHING UNITS SHALL BE 120/240V, 1-PHASE, 3-WIRE, 200A, 45KAIC CIRCUIT BREAKER TYPE UNLESS OTHERWISE NOTED ON PANEL SCHEDULES. BUS BARS SHALL BE HARD DRAWN COPPER, MINIMUM 98% CONDUCTIVITY, AND SILVER OR TIN-PLATED JOINTS. CABINETS SHALL BE GALVANIZED SHEET STEEL BACK BOX, WITH DOOR AND TRIM AND LAPPED AND WELDED CORNERS. HARDWARE SHALL BE CHROME-PLATED WITH FLUSH LOCK/LATCH HANDLE ASSEMBLY (UP TO 48 IN. HIGH DOORS) OR VAULT HANDLE, LOCK AND 3-POINT CATCH (LARGER THAN 48 IN. HIGH DOORS). HINGES SHALL BE SEMI-CONCEALED, 5-KNUCKLE STEEL WITH NONFERROUS PINS, 180-DEG OPENING, LOCATED A MAXIMUM 26 IN. ON CENTERS. PROVIDE DOOR-IN-DOOR CONSTRUCTION. MINIMUM GUTTER SPACES FOR LIGHTING PANELS SHALL BE 5- BOTTOM. DIRECTORY HOLDER SHALL BE METAL FRAME WITH CLEAR PLASTIC,

11.2 PROVIDE A NEW TYPE WRITTEN CIRCUIT DIRECTORY FOR EACH PANEL AFFECTED BY THIS

11.3 WHEREVER POSSIBLE, PANELBOARDS SHALL BE RECESSED IN WALL. SURFACE MOUNTED PANELBOARDS SHALL BE MOUNTED ON A PLYWOOD BACKBOARD. PLYWOOD SHALL BE MOUNTED ON TOP OF GYMPSUM BOARD. PLYWOOD SHALL BE PAINTED ON ALL SIDES AND EDGES. COORDINATE WITH OWNER FOR COLOR.

11.4 PROVIDE LIGHTNING SURGE PROTECTION FOR MAIN SWITCHBOARD OR MAIN SERVICE PANEL BOARD. PROVIDE GROUNDING OF SURGE DEVICE PER THE NEC.

11.5 CIRCUIT NUMBERS SHOWN SHALL BE GENERALLY FOLLOWED. HOWEVER, CONTRACTOR IS RESPONSIBLE FOR BALANCING LOADS ON ALL PHASES AND MAY ALTER ASSIGNMENT OF CIRCUITS FOR BALANCING PHASES.

11.6 CIRCUIT SCHEDULES ARE INTENDED TO REPRESENT THE GENERAL WIRING NEEDS OF THE EQUIPMENT SERVICED FROM THE PANEL. THE EXACT CIRCUIT ARRANGEMENT WILL BE DETERMINED BY PANEL SHOP DRAWING AND ARRANGEMENT WILL BE DETERMINED BY PANEL SHOP DRAWING AND PANELS ACTUALLY FURNISHED.

12.4 PROVIDE LIGHTING FIXTURES AS SHOWN ON THE CONSTRUCTION DRAWINGS, COMPLETE WITH ALL STEMS, RODS, SUPPORTS, PLASTER FRAMES, ETC., NECESSARY FOR AN INSTALLATION IN OR ON THE MATERIAL FINISHES PROVIDED. PROVIDE ALL LAMPS FOR LIGHTING FIXTURES. FIXTURES SHALL HAVE ENERGY SAVING LAMPS, AND WHERE APPLICABLE, ENERGY SAVING BALLASTS WITH HIGH POWER FACTOR.

12.5 SEE DRAWINGS AND SPECIFICATIONS FOR FIXTURE REQUIREMENTS.

13.1 PROVIDE BLACK PHENOLIC IDENTIFICATION PLATES, WITH WHITE LETTERS ON ALL ELECTRICAL EQUIPMENT FURNISHED IN THIS CONTRACT. ATTACH WITH SUITABLE ADHESIVE.

13.2 INSTALL NAMEPLATES ON ALL MAJOR EQUIPMENT, INCLUDE STARTERS, TRANSFORMERS, PANELBOARDS, DISCONNECT SWITCHES AND OTHER ELECTRICAL BOXES AND CABINETS INSTALLED

13.3 APPLY CABLE/CONDUCTOR IDENTIFICATION MARKERS ON EACH CABLE AND CONDUCTOR IN EACH BOX, ENCLOSURE OR CABINET.

14.1 THE CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS. THE APPROVAL OF SHOP DRAWINGS SHALL ONLY BE CONSTRUED TO APPLY TO THE GENERAL LAYOUT AND CONFORMANCE TO THE DESIGN CONCEPT OF THE PROJECT AND FOR THE COMPLIANCE WITH THE GENERAL REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL RETAIN THE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

14.2 PROVIDE SHOP DRAWINGS FOR THE LIGHTING FIXTURES, PANEL BOARDS, CIRCUIT BREAKERS, WIRING DEVICES, FIRE ALARM DEVICES AND SEALS FOR FIRE AND WATER

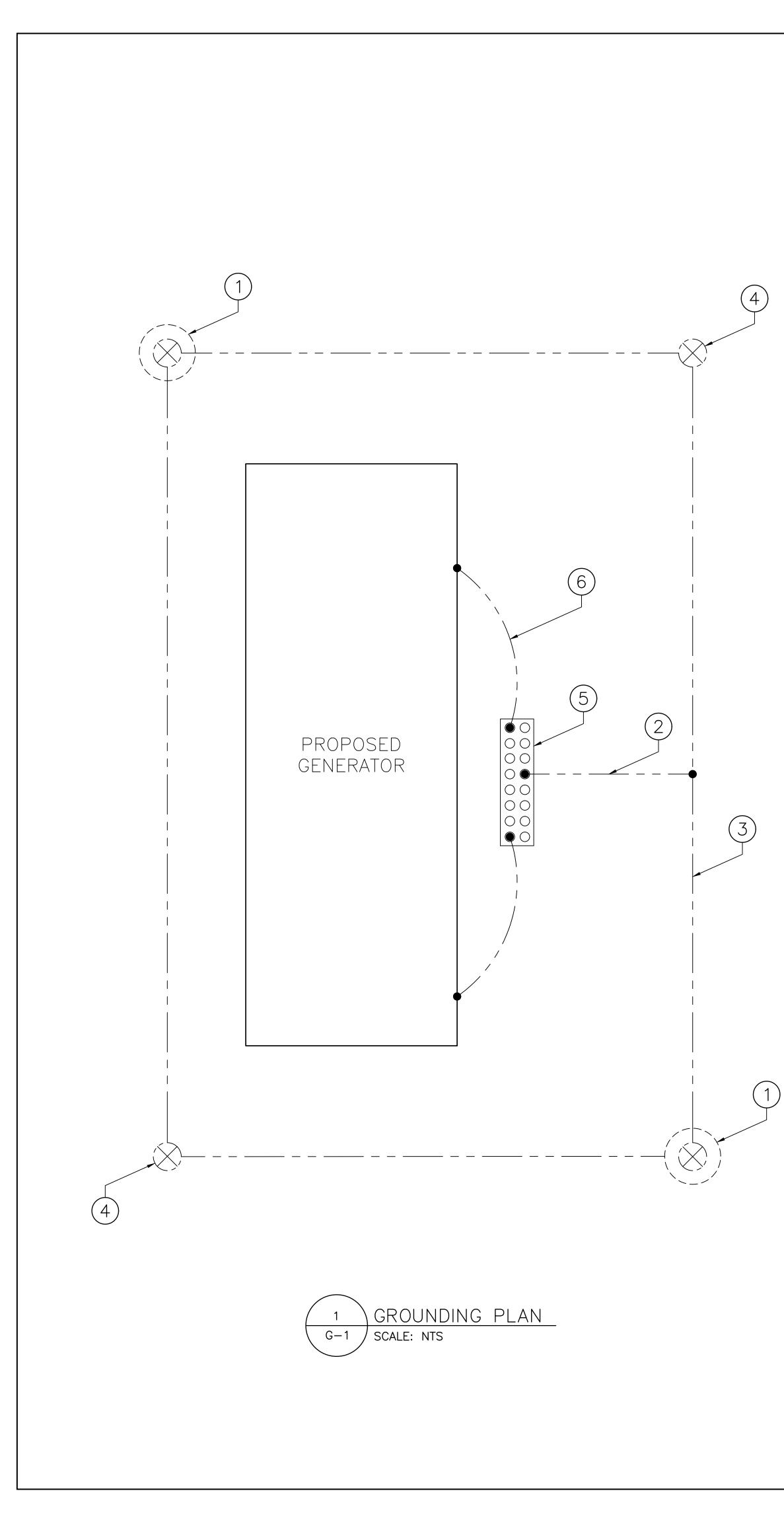
14.3 DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A RECORD SET OF INSTALLATION PRINTS. HE SHALL NEATLY AND CLEARLY RECORD ON THESE PRINTS ALL DEVIATIONS FROM THE CONTRACT DRAWINGS IN SIZES, LOCATIONS AND DETAILS.

14.4 UPON PROJECT COMPLETION, THE CONTRACTOR SHALL COMPLETE THE MARK UP OF ALL PROJECT DRAWINGS TO RECORD INSTALLED CONDITIONS.

14.5 REPRODUCIBLE "RECORD" DRAWINGS PREPARED IN CAD (AUTOCAD 2002) FORMAT SHALL BE PROVIDED TO T-MOBILE INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. A FULL SIZE PRINT OUT OF THE "RECORD" DRAWING FILE SHALL BE PROVIDED TO T-MOBILE AFTER COMPLETION OF THE INSTALLATION.

14.6 UPON COMPLETION AND ACCEPTANCE OF WORK, THE CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO T-MOBILE THE PROPER OPERATIONS AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.

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	SITE ID: CT11235A HADDAM / RT 9 539 PLAINS ROAD HADDAM, CT 06438 MIDDLESEX COUNTY DRAWING TITLE:					
	ELECTRICAL NOTES					
	DRAWING SHEET:					



GROUNDING NOTES:

- (1) GROUND ROD INSPECTION WELL (TYP. 2)
- 2 #2 AWG. SOLID TINNED CU. TO BOND MAIN GROUND BAR TO GROUND RING (TYP. 2)
- (3) #2 AWG. SOLID TINNED CU. 30" BELOW GRADE (GROUND RING)
- (4) 5/8 % x 10' CU. CLAD GROUND ROD (TYP. 6)
- (5) MAIN GROUND BAR INSTALLED ON EQUIPMENT FRAME
- (6) #2 AWG. STRANDED INSULATED CU. TO BOND GENERATOR TO MAIN GROUND BAR (TYP.)
- (7) #2 AWG. SOLID TINNED CU. TO BOND EQUIPMENT STEEL

GROUNDING NOTES:

- CADWELD WITH GALVANIZING PAINT.
- COATING.

- TO CARRIER'S CONSTRUCTION MANAGER.
- EXTERIOR GROUND BARS TINNED COPPER.
- KOPR-SHIELD OR EQUAL.
- RESISTANCE TEST" FORM.
- WITH SILICONE MATERIAL.
- ANTI-OXIDIZATION PAINT.

1. THE EQUIPMENT BONDING JUMPER SHALL BE PERMITTED TO BE INSTALLED INSIDE OR OUTSIDE OF A RACEWAY OR ENCLOSURE. WHERE INSTALLED ON OUTSIDE, THE LENGTH OF THE EQUIPMENT BONDING JUMPER SHALL NOT EXCEED 6 FEET AND SHALL BE ROUTED WITH THE RACEWAY OR ENCLOSURE. REFER TO NEC 2008 – 250.102 (E)

2. ALL GROUNDING DEVICES SHALL BE U.L. APPROVED OR LISTED FOR THEIR INTENDED USE.

3. ALL WIRES SHALL BE AWG THHN/THWN COPPER UNLESS NOTED OTHERWISE.

4. GROUNDING CONNECTIONS TO GROUND RODS, GROUND RING WIRE, TOWER BASE AND FENCE POSTS SHALL BE EXOTHERMIC ("CADWELDS") UNLESS NOTED OTHERWISE. CLEAN SURFACES TO SHINY METAL. WHERE GROUND WIRES ARE CADWELDED TO GALVANIZED SURFACES, SPRAY

5. GROUNDING CONNECTIONS TO GROUND BARS ARE TO BE TWO-HOLE BRASS MECHANICAL CONNECTORS WITH STAINLESS STEEL HARDWARE (INCLUDING SCREW SET.) CLEAN GROUND BAR TO SHINY METAL. AFTER MECHANICAL CONNECTION, TREAT WITH PROTECTIVE ANTIOXIDANT

6. GROUND COAXIAL CABLE SHIELDS AT BOTH ENDS WITH MANUFACTURER'S GROUNDING KITS. 7. ROUTE GROUNDING CONDUCTORS THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 12' RADIUS.

8. INSTALL #2 AWG GREEN-INSULATED STRANDED WIRE FOR ABOVE GRADE GROUNDING AND #2 BARE TINNED COPPER WIRE FOR BELOW GRADE GROUNDING UNLESS OTHERWISE NOTED.

9. GROUNDING CONNECTIONS SHALL BE EXOTHERMIC TYPE ("CADWELDS") TO ANTENNA MOUNTS AND GROUND RING. REMAINING GROUNDING CONNECTIONS SHALL BE COMPRESSION FITTINGS. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO-HOLE LUGS.

10. EXOTHERMIC WELDS SHALL BE MADE IN ACCORDANCE WITH ERICO PRODUCTS BULLETIN A-AT. 11. CONSTRUCTION OF GROUND RING AND CONNECTIONS TO EXISTING GROUND RING SYSTEM SHALL BE DOCUMENTED WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PROVIDE PHOTOS

12. ALL GROUND LEADS EXCEPT THOSE TO THE EQUIPMENT ARE TO BE #2/0 TINNED. ALL

13. PRIOR TO INSTALLING LUGS ON GROUND WIRES, APPLY THOMAS & BETTS KOPR-SHIELD (TM OF JET LUBE INC.). PRIOR TO BOLTING GROUND WIRE LUGS TO GROUND BARS, APPLY

14. ENGAGE AN INDEPENDENT ELECTRICAL TESTING FIRM TO TEST AND VERIFY THAT IMPEDANCE DOES NOT EXCEED FIVE OHMS TO GROUND BY MEANS OF "FALL OF POTENTIAL TEST". TEST SHALL BE WITNESSED BY CARRIER REPRESENTATIVE, AND RECORDED ON CARRIER'S "GROUND

15. WHERE BARE COPPER GROUND WIRES ARE ROUTED FROM ANY CONNECTION ABOVE GRADE TO GROUND RING, INSTALL WIRE IN 3/4" PVC SLEEVE, FROM 1' BELOW GRADE AND SEAL TOP

16. PREPARE ALL BONDING SURFACES FOR GROUNDING CONNECTIONS BY REMOVING ALL PAINT AND CORROSION DOWN TO SHINY METAL. FOLLOWING CONNECTION, APPLY APPROPRIATE

17. ANY SITE WHERE THE EQUIPMENT (BTS, CABLE BRIDGE, PPC, GENERATOR, ETC.) IS LOCATED WITHIN 6 FEET OF METAL FENCING, THE BGR SHALL BE BONDED TO THE NEAREST FENCE POST USING (2) RUNS OF #2 BARE TINNED COPPER WIRE.

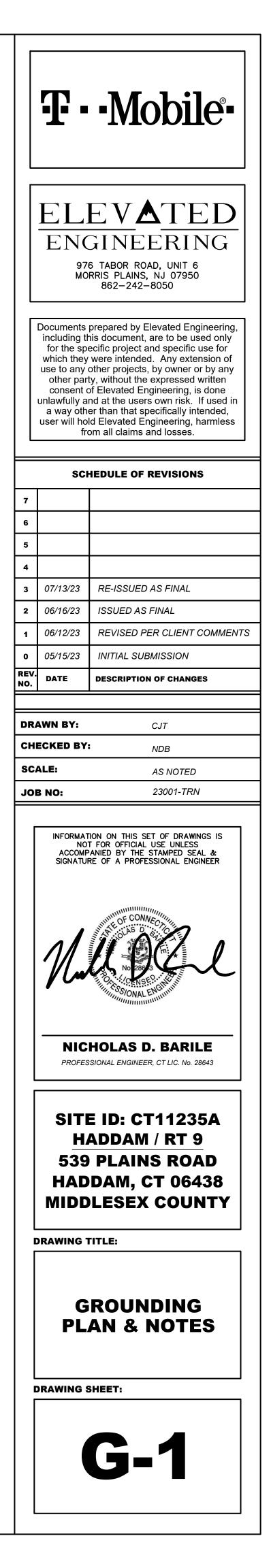


Exhibit D

RD048 | 3.4L | 48 kW

INDUSTRIAL DIESEL GENERATOR SET

EPA Certified Stationary Emergency

Standby Power Rating 48 kW, 60 kVA, 60 Hz



Image used for illustration purposes only

Codes and Standards

ANSI

Not all codes and standards apply to all configurations. Contact factory for details.



Powering Ahead

For over 50 years, Generac has led the industry with innovative design and superior manufacturing.

Generac ensures superior quality by designing and manufacturing most of its generator components, including alternators, enclosures and base tanks, control systems and communications software.

Generac's gensets utilize a wide variety of options, configurations and arrangements, allowing us to meet the standby power needs of practically every application.

Generac searched globally to ensure the most reliable engines power our generators. We choose only engines that have already been proven in heavy-duty industrial application under adverse conditions.

Generac is committed to ensuring our customers' service support continues after their generator purchase.



RD048 | 3.4L | 48 kW

INDUSTRIAL DIESEL GENERATOR SET

EPA Certified Stationary Emergency

Standard Features

ENGINE SYSTEM

- Cold Weather Kit
- Oil Drain Extension
- Fan Guard
- Stainless Steel Flexible Exhaust Connection
- Factory Filled Oil & Coolant

Fuel System

• Primary Fuel Filter

Cooling System

- Closed Coolant Recovery System
- Factory-Installed Radiator
- 50/50 Ethylene Glycol Antifreeze
- Radiator Drain Extension
- Can Operate at up to 122°F (50°C) Ambient Temperature

Electrical System

- Battery Charging Alternator
- Battery Cables
- Battery Tray
- Rubber-Booted Engine Electrical Connections
- Solenoid Activated Starter Motor
- Smart Battery Charger

ALTERNATOR SYSTEM

- Class H Insulation Material
- 2/3 Pitch
- Skewed Stator
- Sealed Bearings
- Low Temperature Rise (<120°C)
- Low THD (<5%)

GENERATOR SET

- Sound Attenuated Aluminum Enclosure
- Internal Genset Vibration Isolation
- Separation of Circuits High/Low Voltage
- Wrapped Exhaust Piping
- Standard Factory Testing
- 5 Year Limited Warranty
- Ready to Accept Full Load in <10 Seconds
- E-Stop

TANKS

- 48 Hour Run Time Tank
- UL 142 Listed Tank

CONTROL SYSTEM



Evolution [™] Controller

- Two-Line Plain Text LCD Display
- Programmable Start Delay Between 10-30 seconds
- 10 second Engine Start Sequence
- 5 second Engine Warm Up
- 1 minute Engine Cool-Down
- Starter Lock-Out
- Smart Battery Charger
- Automatic Voltage Regulation with Over and Under Protection
- Automatic Low Oil Pressure Shutdown
- Overspeed Shutdown
- High Temperature Shutdown

- Overcrank Protection
- Safety Fused
- Failure to Transfer Protection
- Low Battery Protection
- 50 Even Run Log
- Future Set Capable Exerciser
- Incorrect Wiring Protection
- Internal Fault Protection
- Common External Fault Capability
- Governor Failure Protection

Optional Shipped Loose and Field Install Kits

GENERATOR SET

- Paint Kit
- Scheduled Maintance Kit

CONTROL SYSTEM

○ Mobile Link [™] and Adapter Kit

TANKS

- Spill Box
- $\odot~$ 90% Fuel Alarm
- Tank Risers
- Spill Box Drainback Kit
- $\,\circ\,$ Vent Extension Support Kit
- 5 Day Run Time Tank
- Overfill Prevention Valve
- Fuel Fill Drop TubeLockable Fuel Cap



GENERAC

INDUSTRIAL POWER

APPLICATION AND ENGINEERING DATA

ENGINE SPECIFICATIONS

General

Make	Generac
Cylinder #	4
Туре	In-Line
Displacement - in ³ (L)	3.4 (207.48)
Bore - in (mm)	3.86 (98)
Stroke - in (mm)	4.45 (113)
Compression Ratio	18.5:1
Intake Air Method	Turbocharged/Aftercooled
Cylinder Head	Cast Iron OHV
Piston Type	Aluminum

Engine Governing

Governor Frequency Regulation (Steady State)

Electronic te) ±0.25%

Lubrication System

Oil Pump Type	Gear
Oil Filter Type	Full Flow Spin-On Canister
Crankcase Capacity with Filters- qt (L)	7.4 (7.0)

Cooling System

Cooling System Type	Closed Recovery
Fan Type	Pusher
Fan Speed- rpm	2,029
Fan Diameter - in (mm)	22 (559)

Fuel System

Fuel Type	Ultra Low Sulfur Diesel Fuel
Fuel Specification	ASTM
Fuel Pump Type	Mechanical Engine Driven Gear
Injector Type	Mechanical
Fuel Supply Lin (mm/in)	7.94/0.31 (ID)
Fuel Return Line (mm/in)	7.94/0.31 (ID)
Fuel Filtering (microns)	25

Engine Electrical System

System Voltage	12 VDC
Battery Charger Alternator	Standard
Battery Size	Group 27F
Battery Voltage	12 VDC
Ground Polarity	Negative

ALTERNATOR SPECIFICATIONS

Standard Model	Generac	Standard Excitation	Direct
Poles	4	Bearings	Single Sealed
Field Type	Rotating	Coupling	Flexible Disc
Insulation Class - Rotor	Н	Prototype Short Circuit Test	Yes
Insulation Class - Stator	Н	Voltage Regulator Type	Full Digital
Total Harmonic Distortion	<5%	Number of Sensed Phases	2
Telephone Interference Factor (TIF)	<50	Regulation Accuracy (Steady State)	±1.0%

EPA Certified Stationary Emergency

OPERATING DATA

POWER RATINGS

Single-Phase 120/480 VAC @0.1pf

48 kW

Standby Amps: 200

MOTOR STARTING CAPABILITIES (sKVA)

sKVA vs. Voltage Dip at 30%

120/240 V, Single-Phase at 0.4pf 189

FUEL CONSUMPTION RATES*

Percent Load	Diesel gal/hr (L/hr)	
25%	1.35 (5.11)	
50%	2.15 (8.14)	
75%	3.06 (11.58)	
100%	3.98 (15.07)	
75%	3.06 (11.58)	

* Fuel supply installation must accommodate fuel consumption rates at 100% load.

COOLING

Air Flow (Radiator and Alternator)ft³/min (m³/min)2824 (80)Coolant System Capacitygal (L)2.8 (10.6)Heat Rejection to CoolantBTU/hr (MJ/hr)135,900 (143.4)Temperature Deration3% for every 5°C above 25°C or 1.7% for every 5°F overAltitude Deration1% for every 100 m above 915 or 3% for every 1000 ft over 30Maximum Radiator Backpressurein H20 (kPa)0.50 (0.12)			Standby
Heat Rejection to CoolantBTU/hr (MJ/hr)135,900 (143.4)Temperature Deration3% for every 5°C above 25°C or 1.7% for every 5°F overAltitude Deration1% for every 100 m above 915 or 3% for every 1000 ft over 30	Air Flow (Radiator and Alternator)	ft ³ /min (m ³ /min)	2824 (80)
Temperature Deration3% for every 5°C above 25°C or 1.7% for every 5°F overAltitude Deration1% for every 100 m above 915 or 3% for every 1000 ft over 30	Coolant System Capacity	gal (L)	2.8 (10.6)
Altitude Deration1% for every 100 m above 915 or 3% for every 1000 ft over 30	Heat Rejection to Coolant	BTU/hr (MJ/hr)	135,900 (143.4)
	Temperature Deration	3% for every 5°C above 25°C or ²	1.7% for every 5°F over 77°F
Maximum Radiator Backpressure in H ₂ O (kPa) 0.50 (0.12)	Altitude Deration	1% for every 100 m above 915 or 3% fo	or every 1000 ft over 3000 ft
	Maximum Radiator Backpressure	in H ₂ O (kPa)	0.50 (0.12)

COMBUSTION AIR REQUIREMENTS

Horsepower at rated kW

Flow	at	Rated	Power	ft ³ /min	(m ³ /min)	

Standby 190 (5.38)

Exhaust Temp (Rated Output - Post Silencer)

ENGINE			EXHAUST	
		Standby		
Rated Engine Speed	rpm	1,800	Exhaust Flow (Rated Output)	ft ³ /min (m ³ /min)
Horsenower at rated kW	HP	85	Exhaust Temp (Rated Output - Post Silencer)	°F (°C)

Deration - Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions.

Please consult a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528 and DIN6271 standards. Standby - See Bulletin 0187500SSB

85

Standby 448 (12.7)

°F (°C)

1120 (604.4)

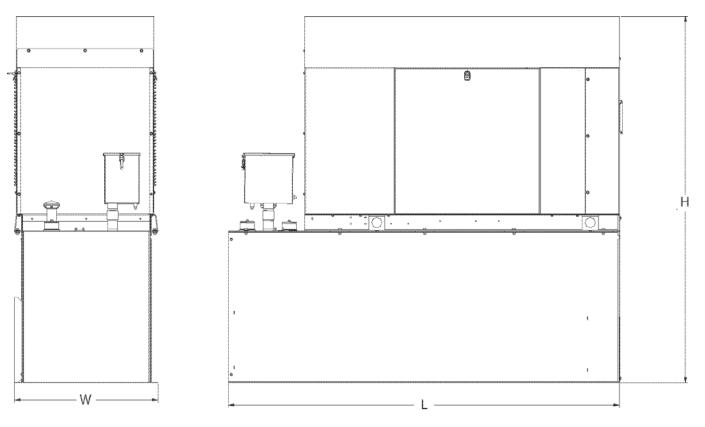


RD048 | 3.4L | 48 kW

INDUSTRIAL DIESEL GENERATOR SET

EPA Certified Stationary Emergency

DIMENSIONS AND WEIGHTS*



ENCLOUSED UNIT with 48hour Tank

L x W x H in (mm)	95.4 (2,422) x 35.0 (880) x 89.3 (2,269)
Sound output in dB(A) at 23ft with generator operating at normal Load	65

* All measurements are approximate and for estimation purposes only.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

5 of 5

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings.



Series



Diesel Generator Set

INCLUDES:

- Two Line LCD Multilingual Digital Evolution™ Controller (English/Spanish/French/ Portuguese) with external viewing window for easy indication of generator status and breaker position.
- Isochronous Electronic Governor
- Sound Attenuated Aluminum Enclosure
- Smart Battery Charger
- UV/Ozone Resistant Hoses
- ±1% Voltage Regulation
- Integrated Base Tank Provides Up to 40 Hours of Run Time
- 5 Year Limited Warranty*
- UL 2200 / UL142 / ULC S601 Listed
- Meets code requirements for External Vent and Fill

Standby Power Rating

Model RD015 - 15 kW 60 Hz Model RD020 - 20 kW 60 Hz Model RD030 - 30 kW 60 Hz Model RD048 - 48 kW 60 Hz (single phase only) Model RD050 - 50 kW 60 Hz (three phase only)



Meets EPA Emission Regulations CA/MA Emissions Compliant

* 5 year warranty applicable to U.S. and Territories/Canada. International warranty is 3 year limited.

FEATURES

INNOVATIVE DESIGN & PROTOTYPE TESTING are key components of GENERAC'S success in "IMPROVING POWER BY DESIGN." But it doesn't stop there. Total commitment to component testing, reliability testing, environmental testing, destruction and life testing, plus testing to applicable CSA, NEMA, EGSA, and other standards, allows you to choose GENERAC POWER SYSTEMS with the confidence that these systems will provide superior performance.

O TEST CRITERIA:

 $\sqrt{}$ PROTOTYPE TESTED $\sqrt{}$ SYSTEM TORSIONAL TESTED

 \checkmark NEMA MG1-22 EVALUATION \checkmark Motor starting ability

- SOLID-STATE, FREQUENCY COMPENSATED VOLTAGE REGULATION. This state-of-the-art power maximizing regulation system is standard on all Generac models. It provides optimized FAST RESPONSE to changing load conditions and MAXIMUM MOTOR STARTING CAPABILITY by electronically torque-matching the surge loads to the engine. Digital voltage regulation at $\pm 1\%$.
- SINGLE SOURCE SERVICE RESPONSE from Generac's extensive dealer network provides parts and service know-how for the entire unit, from the engine to the smallest electronic component.
- GENERAC TRANSFER SWITCHES. Long life and reliability are synonymous with GENERAC POWER SYSTEMS. One reason for this confidence is that the GENERAC product line includes its own transfer systems and controls for total system compatibility.





application & engineering data

15 • 20 • 30 • 48 • 50 kW

GENERATOR SPECIFICATIONS

Туре	Synchronous
Rotor Insulation Class	H (15 & 20 kW) or F (30, 48 & 50 kW)
Stator Insulation Class	Н
Telephone Interference Factor (TIF)	<50
Alternator Output Leads 1-Phase	3 wire
Alternator Output Leads 3-Phase	6 wire
Bearings	Single Sealed Cartridge
Coupling	Direct, Flexible Disc
Excitation System	Direct

VOLTAGE REGULATION

Туре	Electronic
Sensing	Single Phase
Regulation	± 1%
Features	Adjustable Voltage & Gain

GOVERNOR SPECIFICATIONS

Туре	Electronic Isochronous
Steady State Regulation	± 0.25%

ELECTRICAL SYSTEM

Battery Charge Alternator	50 Amp (15 & 20 kW) or 70 Amp (30, 48 & 50 kW)
Smart Battery Charger	2 Amp
Recommended Battery (battery not included)	Group 27F, 700 CCA
System Voltage	12 Volts

GENERATOR FEATURES

Revolving field heavy duty generator Directly connected to the engine Operating temperature rise 120°C above a 40°C ambient Class H insulation is NEMA rated Class F insulation is NEMA rated All models fully prototype tested

ENCLOSURE FEATURES

Aluminum weather protective enclosure	Ensures protection against mother nature. Electrostatically applied textured epoxy paint for added durability.
Enclosed critical grade muffler	Quiet, critical grade muffler is mounted inside the unit to prevent injuries and maximize sound dampening.
Small, compact, attractive	Makes for an easy, eye appealing installation.
SAE	Sound attenuated enclosure ensures quiet operation.

(All ratings in accordance with BS5514, ISO3046, ISO8528, SAE J1349 and DIN6271)

2 of 12

GENERAC^{*}

15 • 20 • 30 • 48 • 50 kW

ENGINE SPECIFICATIONS: 15 & 20 kW

Make	Generac
Model	In-line
Cylinders	4
Displacement (Liters)	2.28
Bore (in./mm)	3.46/88
Stroke (in./mm)	3.70/94
Compression Ratio	21.3:1
Intake Air System	Naturally Aspirated
Cylinder Head Type	Cast Iron OHV
Piston Type	Aluminum
EPA Emissions Compliance	Emergency Stationary

ENGINE SPECIFICATIONS: 30 kW

Make	Generac
Model	In-line
Cylinders	4
Displacement (Liters)	2.4
Bore (in/mm)	3.54/90
Stroke (in/mm)	3.70/94
Compression Ratio	21.3:1
Intake Air System	Turbocharged
Cylinder Head Type	Cast Iron OHV
Piston Type	Aluminum
EPA Emissions Compliance	Emergency Stationary

ENGINE SPECIFICATIONS: 48/50 kW

Make	Generac
Model	In-Line
Cylinders	4
Displacement (Liters)	3.4
Bore in/mm	3.86/98
Stroke in/mm	4.45/113
Compression Ratio	18.5:1
Intake Air System	Turbocharged/Aftercooled
Cylinder Head Type	Cast Iron OHV
Piston Type	Aluminum
EPA Emissions Compliance	Emergency Stationary

application & engineering data

ENGINE LUBRICATION SYSTEM

Oil Pump Type	Gear
Oil Filter Type	Full flow spin-on canister
	6.87/6.5 - 15 & 20 kW
Crankcase Capacity (quarts/liters)	6.8/6.4 - 30 kW
	7.4/7 - 48 & 50 kW

ENGINE COOLING SYSTEM

Туре	Pressurized radiator - 15 & 20 kW Closed recovery - 30, 48 & 50 kW
Water Pump	Pre-lubed, self-seating
Fan Speed (rpm)	1800 - 15 & 20 kW 2061 - 30 kW 2029 - 48 & 50 kW
Fan Diameter (in/mm)	18.11/460 (15 & 20 kW) 22/559 (30, 48 & 50 kW)
Fan Mode	Pusher

FUEL SYSTEM

Fuel Type	Ultra Low Sulfur Diesel Fuel
Fuel Pump Type	Mechanical Engine Driven Gear
Injector Type	Mechanical
Fuel Supply Line (mm/in)	7.94/0.31 (ID)
Fuel Return Line (mm/in)	7.94/0.31(ID)
Fuel Specification	ASTM
Fuel Filtering (microns)	5 - 15, 20 & 30 kW 10 - 48 & 50 kW

TANK SPECIFICATIONS

Total Size (gallons/liters)	34/128.7 - 15 & 20 kW 62/234.7 - 30, 48 & 50 kW
Usable Size (gallons/liters)	32/121.1 - 15 & 20 kW 57/215.8 - 30, 48 & 50 kW
Run Time @ 1/2 Load (hrs)	41 - 15 kW 31 - 20 kW 38 - 30 kW 25 - 48 & 50 kW
Listings	UL142 ULC-S601

WEIGHTS AND DIMENSIONS

	15 kW	20 kW	30 kW	48 kW	50 kW
Weight (Ib/kg)	1380/626		1927/874	2197	7/997
Dimensions (LxWxH) (in/cm)	81 x 31 x 50/205 x 78 x 128		S S)5 x 35 x 57/242 x 89 x 145)

4 of 12

15 • 20 • 30 • 48 • 50 kW

GENERAC operating data

GENERATOR OUTPUT VOLTAGE/kW - 60 Hz

		kW (Standby)	Amp (Standby)	CB Size
	120/240 V, 1Ø, 1.0 pf	15	62	70
RD015	120/208 V, 3Ø, 0.8 pf	15	52	60
	120/240 V, 3Ø, 0.8 pf	15	45	50
	120/240 V, 1Ø, 1.0 pf	20	83	100
RD020	120/208 V, 3Ø, 0.8 pf	20	69	80
	120/240 V, 3Ø, 0.8 pf	20	60	70
	120/240 V, 1Ø, 1.0 pf	30	125	150
RD030	120/208 V, 3Ø, 0.8 pf	30	104	125
10000	120/240 V, 3Ø, 0.8 pf	30	90	100
	277/480 V, 3Ø, 0.8 pf	30	45	50
	120/240 V, 1Ø, 1.0 pf	48	200	200
RD048/	120/208 V, 3Ø, 0.8 pf	50	173	200
RD050	120/240 V, 3Ø, 0.8 pf	50	150	175
	277/480 V, 3Ø, 0.8 pf	50	75	90

SURGE CAPACITY IN AMPS

ENGINE FUEL CONSUMPTION

		Voltage Dip $@ < .4$ pf		
		15%	30%	
	120/240 V, 1Ø	53	129	
RD015	120/208 V, 3Ø	37	90	
_	120/240 V, 3Ø	32	78	
	120/240 V, 1Ø	87	211	
RD020	120/208 V, 3Ø	59	143	
	120/240 V, 3Ø	51	124	
	120/240 V, 1Ø	66	168	
RD030	120/208 V, 3Ø	59	144	
NU030	120/240 V, 3Ø	51	125	
	277/480 V, 3Ø	26	64	
	120/240 V, 1Ø	69	189	
RD048/	120/208 V, 3Ø	90	218	
RD050	120/240 V, 3Ø	78	189	
	277/480 V, 3Ø	36	87	

11.11

		gal/hr	L/hr
RD015	25% of rated load	0.51	1.93
	50% of rated load	0.79	2.99
	75% of rated load	1.14	4.31
	100% of rated load	1.48	5.58
	25% of rated load	0.67	2.6
RD020	50% of rated load	1.05	3.97
NDUZU	75% of rated load	1.52	5.32
	100% of rated load	1.98	7.48
RD030	25% of rated load	0.92	3.5
	50% of rated load	1.45	5.5
	75% of rated load	1.96	7.4
	100% of rated load	2.74	10.4
RD048/ RD050	25% of rated load	1.35	5.11
	50% of rated load	2.15	8.14
	75% of rated load	3.06	11.58
	100% of rated load	3.98	15.07

STANDBY RATING: Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-3046-1. Design and specifications are subject to change without notice.

GENERAC

15 • 20 • 30 • 48 • 50 kW

operating data

ENGINE COOLING

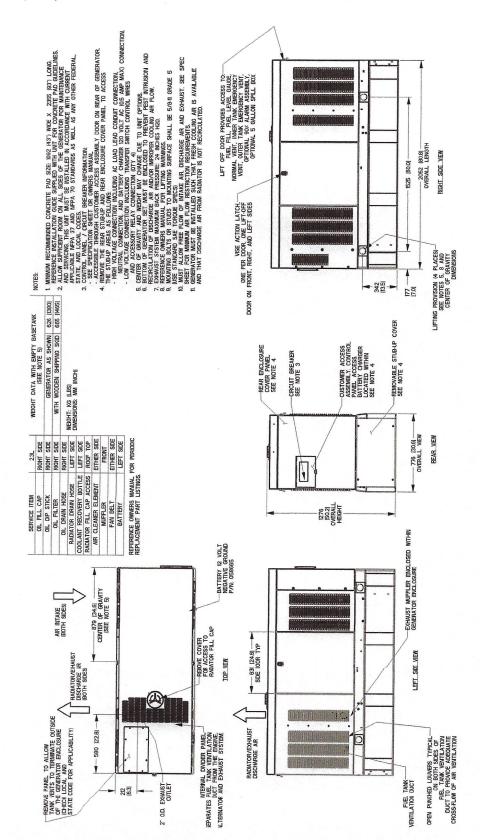
	15 kW	20 kW	30 kW	48/50 kW	
Air flow (inlet air including alternator and combustion air in cfm/cmm)	2824/80	2824/80	3038/86	2824/80	
System coolant capacity (gal/liters)	2.8/10.6	2.8/10.6	2.8/10.6	2.8/10.6	
Heat rejection to coolant (BTU per hr/MJ per hr)	63,535/67	63,535/67	111,000/117.1	135,900/143.4	
Maximum operation air temperature on radiator (°C/°F)		50,	/122		
Maximum ambient temperature (°C/°F)	50/122				
COMBUSTION REQUIREMENTS					
Flow at rated power (cfm/cmm)	84.76/2.4	84.76/2.4	90/2.55	190/5.38	
OUND EMISSIONS					
Sound output in dB(A) at 23 ft (7 m) with generator in exercise mode*		6	65		
Sound output in dB(A) at 23 ft (7 m) with generator operating at normal load*			0		
*Sound levels are taken from the front of the generator. Sound levels taken from other sides of the ge			meters.		
Exhaust flow at rated output (cfm/cmm)	98.88/2.8	98.88/2.8	230/6.51	448/12.7	
Exhaust temperature at rated output (°C/°F)	604.4/1120	604.4/1120	454.4/850	604.4/1120	
NGINE PARAMETERS					
Rated Synchronous RPM	1800				
HP at rated kW	26.4	33.5	49	85	
OWER ADJUSTMENT FOR AMBIENT CONDITIONS emperature Deration	1% for ever	rv 100 m above 915	m or 3% for every 10	ry 5 °F above 77 ° 00 ft above 3000 ;	
emperature Deration	1% for ever	rv 100 m above 915	m or 3% for every 10	ry 5 °F above 77 °I 00 ft above 3000 t	
emperature Deration Ititude Deration (15, 30, 48 & 50 kW) Ititude Deration (20 kW) ONTROLLER FEATURES Line Plain Text Multilingual LCD Display ode Buttons: Auto Manual Off eady to Run/Maintenance Messages		ry 100 m above 915 ry 100 m above 305 Si tomatic Start on Utili ntrol, unit stays on. ops unit. Power is re	m or 3% for every 10 m or 3% for every 10 mple user interface for ty failure. Programma If utility fails, transfer moved. Control and	ry 5 °F above 77 ° 00 ft above 3000 t 00 ft above 1000 t or ease of operatio able 7 day exercise to load takes plac charger still operat 	
emperature Deration Ititude Deration (15, 30, 48 & 50 kW) Ititude Deration (20 kW) ONTROLLER FEATURES -Line Plain Text Multilingual LCD Display ode Buttons: Auto Manual		ry 100 m above 915 y 100 m above 305 Si tomatic Start on Utili ntrol, unit stays on. ops unit. Power is re	m or 3% for every 10 m or 3% for every 10 mple user interface fi ty failure. Programma If utility fails, transfer moved. Control and Standard (programm From 14	ry 5 °F above 77 °I 00 ft above 3000 f 00 ft above 1000 f or ease of operatio able 7 day exercise to load takes plac charger still operat 	
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15 & 20 kW

GENERAC

installation layout

Drawing #0K7025-C (1 of 2)



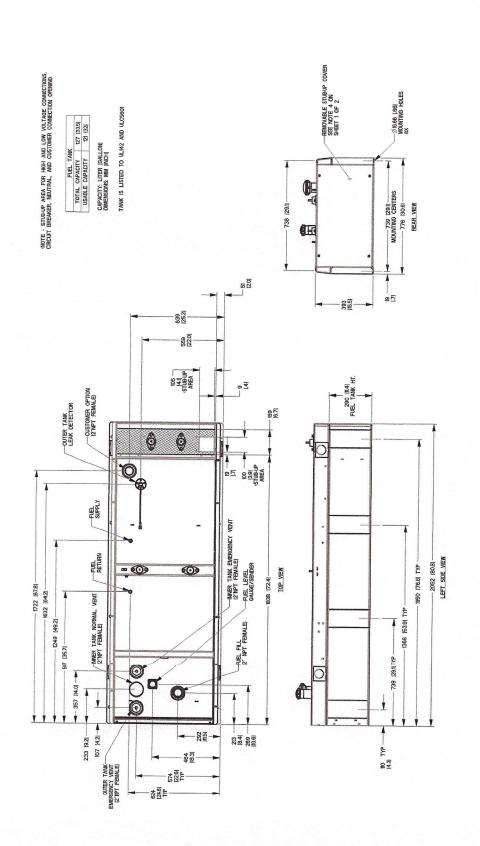
6 of 12

15 & 20 kW

GENERAC

installation layout

Drawing #0K7025-C (2 of 2)

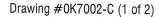


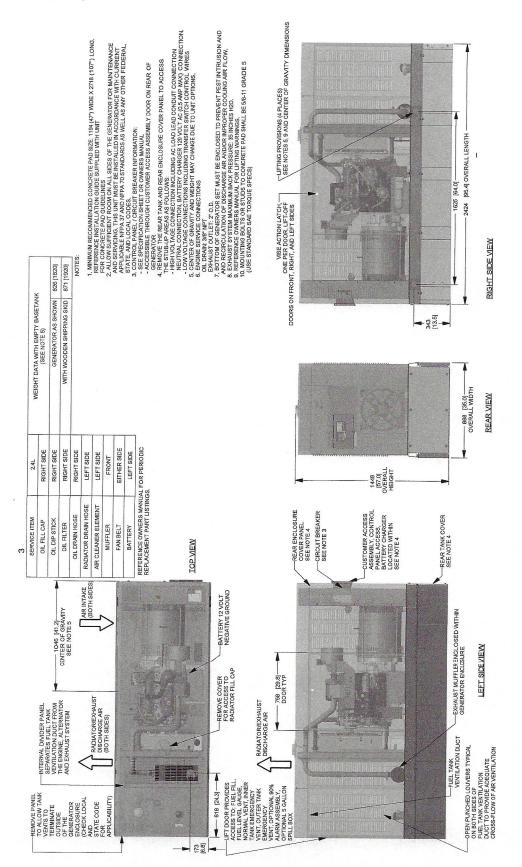
8 of 12

30 kW

GENERAC

installation layout



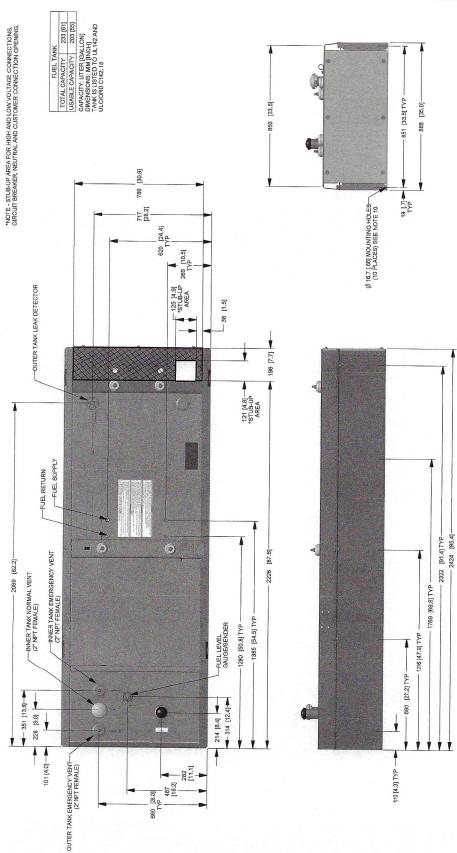




installation layout

Drawing #0K7002-B (2 of 2)

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30 kW

Protector[™] Series

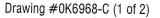
9 of 12

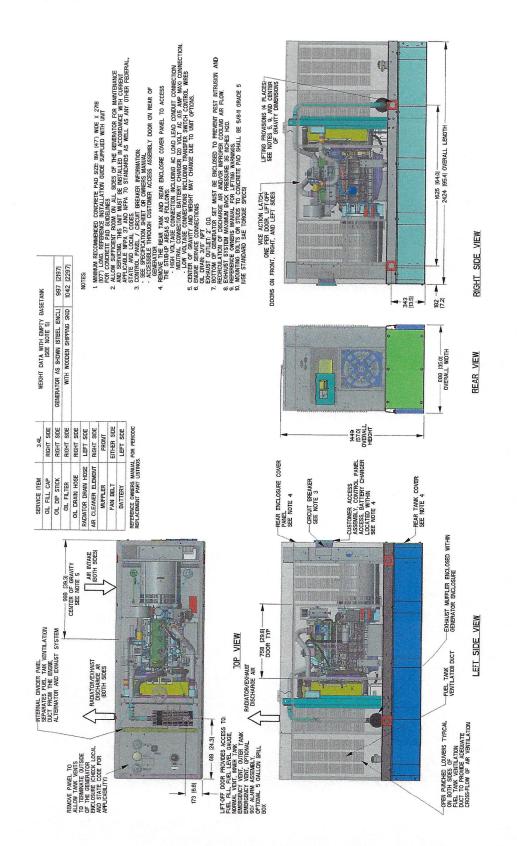
48 & 50 kW

GENERAC

installation layout

Protector TM Series

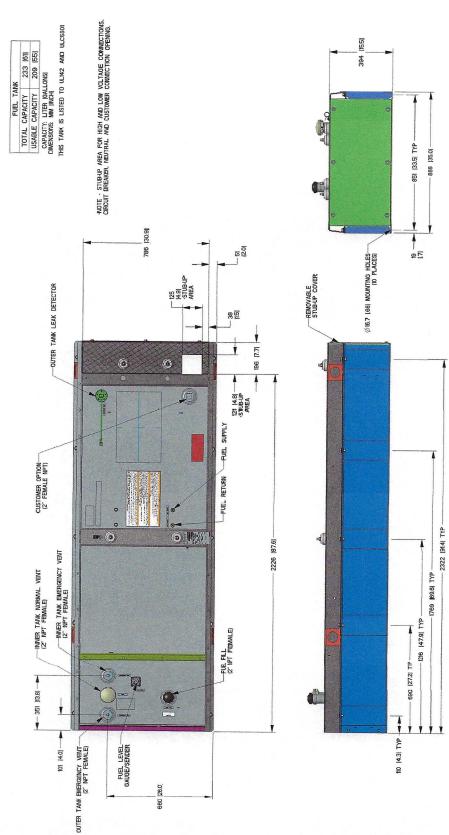




GENERAC

installation layout

Drawing #0K6968-A (2 of 2)



48 & 50 kW



15 • 20 • 30 • 48 • 50 kW

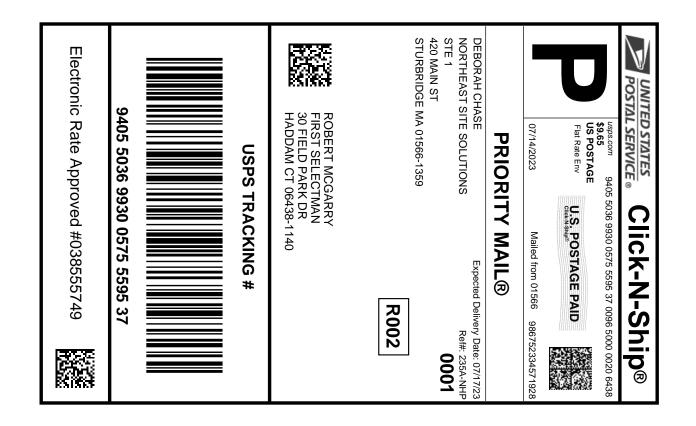
available accessories

Model #	Product	Description
G006463-4	Mobile Link™	Generac's Mobile Link allows you to check the status of your generator from anywhere that you have access to an Internet connection from a PC or with any smart device. You will even be notified when a change in the generator's status occurs via e-mail or text message. Note: Harness Adapter Kit required. Available in the U.S. only.
G006478-0	Harness Adapter Kit	The Harness Adapter Kit is required to make liquid-cooled units compatible with Mobile Link™.
G006502-0	Spill Box	The 5-gallon spill box screws into the existing fuel fill port of the base tank. It captures and contains fuel if over fueling or spilling occurs during the fill process.
G006504-0	90% Fuel Level Alarm	The 90% fuel level alarm alerts the fuel fill operator when the tank reaches a 90% fill level by sounding an audible alarm and triggering an LED warning light.
G006505-0 - 15 & 20 kW G006506-0 - 30, 48 & 50 kW	Tank Risers	Tank risers are required in some municipalities to help avoid potential base tank corrosion caused by mounting on rough surfaces.
G006507-0	Fuel Fill Drop Tube	A powder coat painted, steel fuel fill drop tube is required in some municipalities to prevent sparking due to static electricity buildup, which can be caused by the fuel dropping into the tank from the fill area. Using a drop tube also results in submerged filling, which increases the fuel delivery flow rate and reduces vapors, foam and potential tank evaporation.
G006513-0 - 15 & 20 kW G006517-0 - 30 kW G006516-0 - 48 & 50 kW	Stainless Steel Fuel Lines	Some municipalities require the use of stainless steel fuel lines instead of the standard hoses provided with the diesel generator products. These stainless steel lines are fire resistant for additional safety.
G006510-0	E-Stop	E-stop allows for immediate fuel shutoff and generator shutdown in the event of an emergency.
006511-0	Spill Box Drainback Kit	The spill box drainback kit allows fuel that was captured in the 5-gallon spill box to be drained directly back into the fuel tank to avoid vapors.
G006588-1	Vent Extension Support Kit	The vent extension support kit consists of two aluminum plates with the appropriate pipe cutouts to secure the vent extension pipes coming through the top of the generator enclosure. It helps to minimize stress on the NPT fittings integrated on the tank and also helps protect against pests.
G006512-0	Lockable Fuel Cap	The cast iron, lockable fuel cap provides the ability to lock the fuel system to prevent unwanted fuel tampering or fuel siphoning.
G006572-0 - 15 & 20 kW G006571-0 - 30 kW G006570-0 - 48 & 50 kW	Maintenance Kits	The Protector Maintenance Kits offer all the hardware necessary to perform complete maintenance on Generac Protector generators.
G006560-0 - 15 & 20 kW G006559-0 - 30 kW G006558-0 - 48 & 50 kW	Cold Weather Kits	Recommended for generators installed in regions where the temperature regularly falls below 32 °F (0 °C). The Cold Weather Kits consist of a block heater with all necessary mounting hardware and a battery warmer with a thermostat built into the battery wrap.
G005704-0	Paint Kit	If the generator enclosure is scratched or damaged, it is important to touch-up the paint to protect from future corrosion. The paint kit includes the necessary paint to properly maintain or touch-up a generator enclosure.
G006664-0	Local Wireless Remote	Completely wireless and battery powered, Generac's wireless remote monitor provides you with instant status information without ever leaving the house.
G006665-0	Wireless Remote Extension Harness	Recommended for use with the Wireless Remote on units up to 60 kW, required for use on units 70 kW or greater.
G006873-0	Smart Management Module (50 Amps)	Manage large loads by utilizing up to 8 individual Smart Management modules. These devices are installed directly in line with existing appliance wiring for easy installation.





Exhibit E

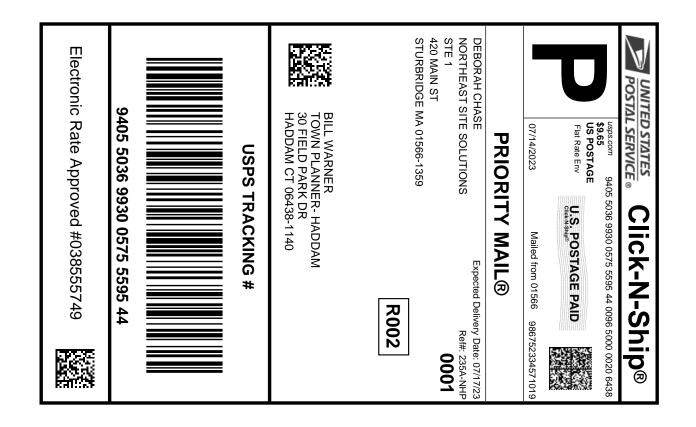


Instructions

- 1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
- 2. Place your label so it does not wrap around the edge of the package.
- 3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
- 4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
- 5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING #: 9405 5036 9930 0575 5595 37 Priority Mail® Postage: \$9.65 Trans. #: 591727210 Total. \$9.65 Print Date: 07/14/2023 07/14/2023 Ship Date: Expected 07/17/2023 Delivery Date: From: DEBORAH CHASE Ref#: 235A-NHP NORTHEAST SITE SOLUTIONS STE 1 420 MAIN ST STURBRIDGE MA 01566-1359 To: ROBERT MCGARRY FIRST SELECTMAN 30 FIELD PARK DR HADDAM CT 06438-1140 * Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

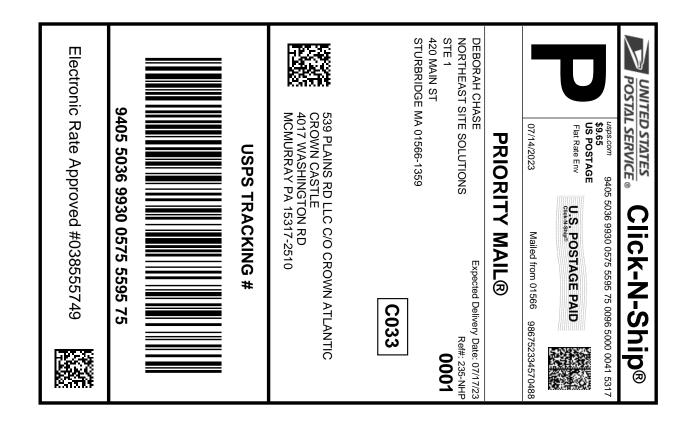


Instructions

- 1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
- 2. Place your label so it does not wrap around the edge of the package.
- 3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
- 4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
- 5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING #: 9405 5036 9930 0575 5595 44 Priority Mail® Postage: \$9.65 Trans. #: 591727210 Total. \$9.65 Print Date: 07/14/2023 07/14/2023 Ship Date: xpected 07/17/2023 Delivery Date: From: DEBORAH CHASE Ref#: 235A-NHP NORTHEAST SITE SOLUTIONS STE 1 420 MAIN ST STURBRIDGE MA 01566-1359 To: **BILL WARNER** TOWN PLANNER- HADDAM 30 FIELD PARK DR HADDAM CT 06438-1140 * Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

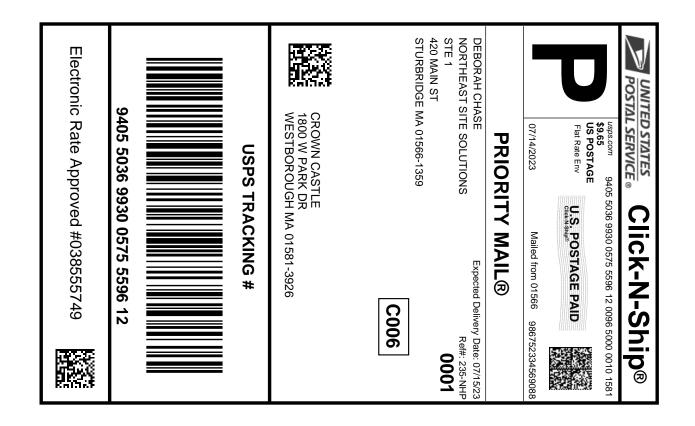


Instructions

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- 4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
- 5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING #: 9405 5036 9930 0575 5595 75 Priority Mail® Postage: \$9.65 Trans. #: 591727210 Total. \$9.65 Print Date: 07/14/2023 07/14/2023 Ship Date: xpected 07/17/2023 Delivery Date: From: DEBORAH CHASE Ref#: 235-NHP NORTHEAST SITE SOLUTIONS STE 1 420 MAIN ST STURBRIDGE MA 01566-1359 To: 539 PLAINS RD LLC C/O CROWN ATLANTIC **CROWN CASTLE** 4017 WASHINGTON RD MCMURRAY PA 15317-2510 * Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



Instructions

- 1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
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- 4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
- 5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record





POS.	IAL.	SER	VICE.
458 FISKDALE,	SKDALE MAIN MA 015: 275-87	8-9998	3
07/14/2023	1215-0	(/ /	01:38 PM
Product	Qty	Unit Price	Price
Prepaid Mail Haddam, CT 06438 Weight: 0 lb 10 Acceptance Date: Fri 07/14/20 Tracking #: 9405 5036 99	23	5595	\$0.00 37
Prepaid Mail Haddam, CT 06438 Weight: 0 lb 10 Acceptance Date: Fri 07/14/202 Tracking #: 9405 5036 992	23	i 5595	\$0.00
Prepaid Mail Canonsburg, PA 15 Weight: O lb 10 Acceptance Date: Fri 07/14/202 Tracking #:	.60 oz		\$0.00

9405 5036 9930 0575 5595 75

\$0.00

Prepaid Mail 1 Westborough, MA 01581 Weight: 0 lb 9.90 oz Acceptance Date: Fri 07/14/2023 Tracking #: 9405 5036 9930 0575 5596 12

Grand Total: \$0.00

Text your tracking number to 28777 (2USPS) to get the latest status. Standard Message and Data rates may apply. You may also visit www.usps.com USPS Tracking or call 1-800-222-1811.

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or call 1-800-410-7420.

UFN: 242703-0518 Receipt #: 840-50180227-1-4371032-1 Clerk: 1