SCOPE OF WORK:
- PROPOSED 50'x50' FENCED COMPOUND.
- PROPOSED 140' TALL MONOPOLE.

Exhibit LH-1 Permit Plans

TOWER EQUIPMENT TO INCLUDE:
- NEW ANTENNAS: 2 ANTENNAS PER SECTOR, 6 TOTAL.
- NEW ANTENNA MOUNTS: 1 MOUNT PER SECTOR, 3 TOTAL.
- NEW MMUs: 1 MMU PER SECTOR, 3 TOTAL.
- NEW RRHs, 2 RRHs PER SECTOR, 6 TOTAL.
- NEW 12-PORT OVP DISTRIBUTION BOX, 1 TOTAL.
- NEW (2) HYBRID TRUNKS.

GROUND EQUIPMENT TO INCLUDE:
- NEW 12'x20' EQUIPMENT SHELTER.
- NEW 30KW DIESEL GENERATOR.
- NEW CABLE BRIDGE.
- NEW ELECTRICAL AND TELEPHONE SERVICE.
- NEW 500 GALLON PROPANE TANK (IF REQUIRED).

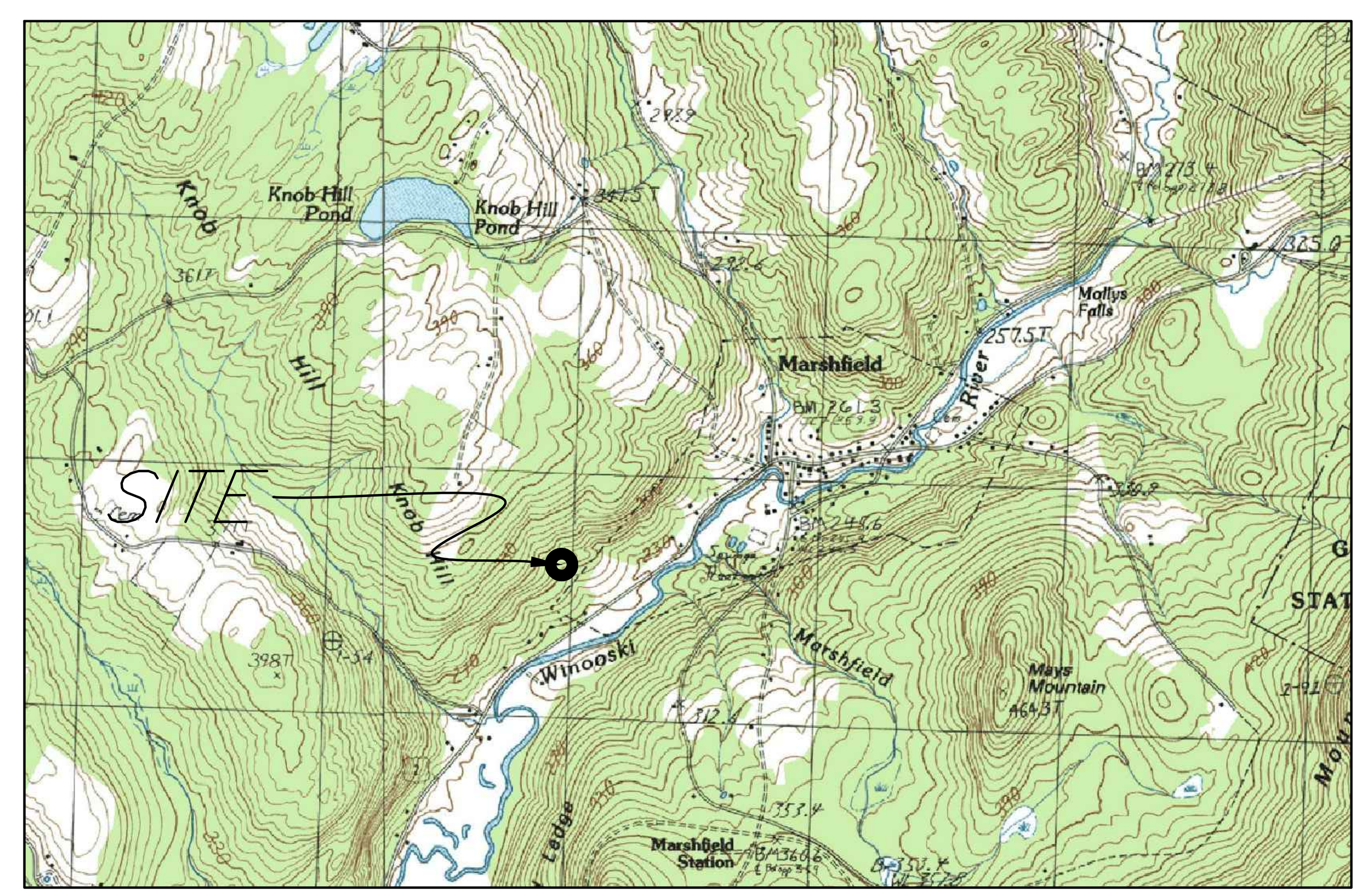
vb

verizonwireless

MARSHFIELD VT
2264 U.S. ROUTE 2
MARSHFIELD, VT 05658

SITE INFORMATION:

1. SITE ADDRESS:	2264 U.S. ROUTE 2 MARSHFIELD, VT 05658
2. LATITUDE: LONGITUDE:	44°-20'-51.01"± 72°-21'-55.74"±
3. GROUND ELEVATION:	919.0' A.M.S.L.
4. TAX MAP NUMBER:	RT131.
5. PARCEL AREA:	78.73 ACRES
6. PARCEL OWNER:	BRADLEY PILETTE AND LYNN SUE PILETTE 2264 U.S. ROUTE 2 MARSHFIELD, VT 05658
7. ZONING DISTRICT:	FORESTRY & CONSERVATION DISTRICT
8. STRUCTURE TYPE:	MONOPOLE
9. STRUCTURE HEIGHT:	140.0' A.G.L.



LOCATION MAP
NOT TO SCALE

DO NOT SCALE DRAWINGS
THESE DRAWINGS ARE FORMATTED TO BE FULL SIZE AT 22"X34". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE THE STATE OF VERMONT LOW RISK SITE HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

DRAWING INDEX:

SHELTER PLANS:

PROJECT TEAM:

1. LAND OWNER:	BRADLEY PILETTE AND LYNN SUE PILETTE 2264 U.S. ROUTE 2 MARSHFIELD, VT 05658
2. APPLICANT:	VERTICAL BRIDGE 750 PARK OF COMMERCE DRIVE, SUITE 200 BOCA RATON, FL 33487
3. CO-APPLICANT:	BELL ATLANTIC MOBILE SYSTEMS OF ALLENTOWN, INC. AND CELLCO PARTNERSHIP EACH D/B/A VERIZON WIRELESS C/O BRIAN SULLIVAN, ESQ,. MURPHY SULLIVAN KRONK P.O. BOX 4485, 275 COLLEGE STREET BURLINGTON, VT 05401-4485 (802) 861-7000
4. ENGINEERING FIRM:	DUBOIS & KING, INC. 6 GREEN TREE DRIVE SOUTH BURLINGTON, VT 05403 (802) 878-7661

CODE COMPLIANCE:
ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING CODES.

1. 2015 INTERNATIONAL BUILDING CODE
2. 2017 NATIONAL ELECTRICAL CODE
3. NFPA 1 FIRE CODE, 2015 EDITION
4. NFPA 101 LIFE SAFETY CODE, 2015 EDITION
5. AMERICAN CONCRETE INSTITUTE
6. AMERICAN INSTITUTE OF STEEL CONSTRUCTION
7. MANUAL OF STEEL CONSTRUCTION 13TH EDITION
8. ANSI/TIA-222-G
9. TIA 607
10. INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEER 81
11. IEEE C2 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION
12. TELECORDIA GR-1275
13. ANSI/T 311

APPROVAL BLOCK:

		APPROVED	APPROVED AS NOTED	DISAPPROVED/ REVISE
PROPERTY OWNER	DATE	☐	☐	☐
SITE ACQUISITION	DATE	☐	☐	☐
CONSTRUCTION MANAGER	DATE	☐	☐	☐
RF ENGINEER	DATE	☐	☐	☐

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BRANDON, VT
BEDFORD, NH
LACONIA, NH

PROFESSIONAL SEAL

STATE OF VERMONT
LOUIS J. HODGETTS
No. 53T99
Civil
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY	CK'D
3	05-07-2025	REVISED IMPACT AREA CALCULATIONS	LJH	
2	11-02-2023	REVISED LINE WORK TO BE OUTSIDE BUFFER	JWP	LJH
1	10-23-2023	ISSUED FOR BID	JWP	LJH

verizonwireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

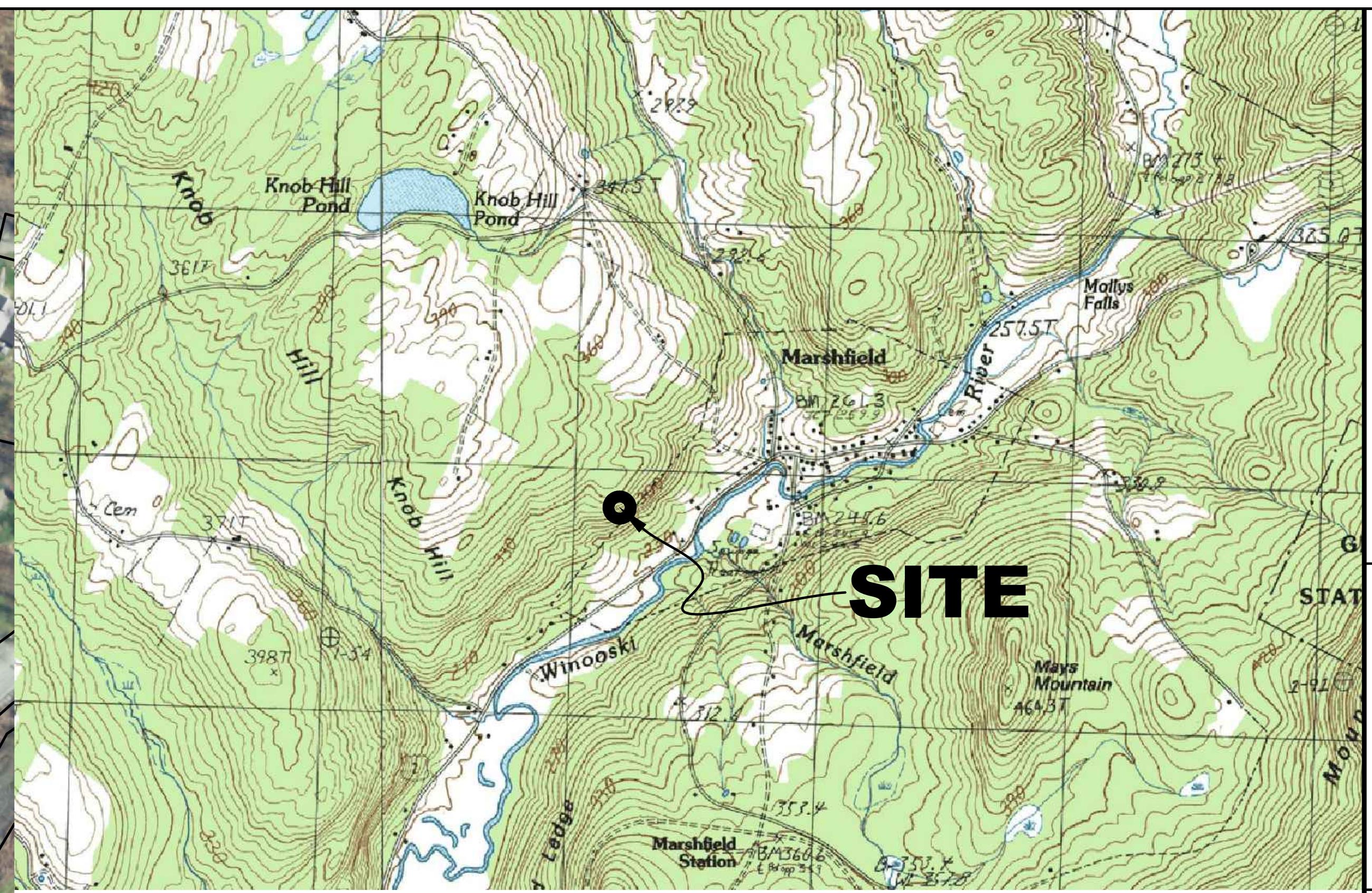
TITLE SHEET

CONSTRUCTION PLANS

DRAWN BY: JWP	DATE: OCT. 2023
CHECKED BY: LJH	D&K PROJECT #: 422065L1
PROJ. ENG.: LJH	D&K ARCHIVE #:

SHEET NUMBER

T-1



LOCATION MAP
NOT TO SCALE

GENERAL CONSTRUCTION NOTES:

1. THESE CONSTRUCTION NOTES RECOGNIZE THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, LATEST EDITION AS A SUPPLEMENTAL SOURCE FOR STANDARDS OR SPECIFICATIONS.
2. THE CONTRACTOR SHALL REVIEW ALL RELEVANT PERMITS ASSOCIATED WITH THIS PROJECT, AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ASSURE ALL RELEVANT REQUIREMENTS REGARDING CONSTRUCTION, TESTING, AND REPORTING ARE MET. UPON REQUEST THE ENGINEER WILL FURNISH ALL COPIES OF THE RELEVANT PERMITS TO THE CONTRACTOR. UNLESS OTHERWISE DETERMINED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND INCURRING THE COST OF ALL RELEVANT FEDERAL, STATE AND LOCAL BUILDING PERMITS PRIOR TO COMMENCEMENT OF CONSTRUCTION. REQUIRED INSPECTIONS AND FEES ASSOCIATED WITH THESE INSPECTIONS, IF APPLICABLE, SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY.
3. THE CONTRACTOR SHALL NOTIFY DIG SAFE @ 1-888-344-7233 AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO EXCAVATION.
4. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND VERIZON WIRELESS IN WRITING OF SITE CONDITIONS THAT VARY MATERIALLY FROM WHAT IS SHOWN ON THESE DRAWINGS. WRITTEN APPROVAL FROM THE ENGINEER IS REQUIRED TO DEVIATE FROM THESE DRAWINGS.
5. ALL MATERIAL TO BE USED FOR YARD CONSTRUCTION SHALL CONFORM TO THE SPECIFICATION CONTAINED HEREON OR APPROVED IN WRITING BY THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE THIS APPROVAL. A SAMPLE OF BASE MATERIAL IS REQUIRED TO BE TESTED FOR CONFORMANCE WITH THE STANDARDS OUTLINED ON THESE PLANS, BY AN APPROVED MATERIALS TESTING LABORATORY. TESTING OF ALL BASE MATERIALS SHALL BE AT THE CONTRACTOR'S EXPENSE.
6. THE CONTRACTOR SHALL RESTORE ALL PUBLIC OR PRIVATE PROPERTY DAMAGED AS A RESULT OF CONSTRUCTION TO A CONDITION EQUAL TO OR BETTER THAN BEFORE THE SITE WAS DISTURBED. THIS SHALL INCLUDE THE ACCESS ROAD TO THE SITE. ALL EXISTING SERVICES AND ACCESS TO THE EXISTING FACILITY LOCATED ON THE SITE MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
7. UTILITY CONNECTIONS AND TIE-INS SHALL BE COORDINATED WITH THE ENGINEER, THE BUILDING OWNER, AND THE UTILITY. THE CONTRACTOR SHALL MEET APPLICABLE UTILITY STANDARDS.
8. THE CONTRACTOR SHALL COOPERATE AND COORDINATE FULLY WITH ALL OTHER CONTRACTORS WORKING ON THIS SITE. THE CONTRACTOR SHALL ALSO COOPERATE WITH THE OWNER OF THE SITE PARCEL AND THE OWNER OF THE PROPERTY ON WHICH THE ACCESS ROAD IS LOCATED.
9. AS-BUILT DRAWINGS ARE REQUIRED AT THE COMPLETION OF THE PROJECT. THE CONTRACTOR SHALL NOTE ALL DEVIATIONS FROM THE DRAWINGS, AND LOCATE ALL SUBSURFACE CONSTRUCTION ON THE AS-BUILT DRAWINGS. APPROVAL AND ACCEPTANCE OF THESE DRAWINGS WILL BE REQUIRED PRIOR TO FINAL PAYMENT.
10. SURFACE DRAINAGE SHALL BE CONTROLLED DURING CONSTRUCTION TO PERMIT PROPER CONSTRUCTION. FINAL (FINISHED) GRADES SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE AWAY FROM PROPOSED AND EXISTING BUILDINGS, AND TOWER.
11. EXISTING MONUMENTATION SHALL NOT BE DISTURBED OR DESTROYED. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY MONUMENTATION DISTURBED DURING THE COURSE OF CONSTRUCTION. THE MONUMENTATION SHALL BE REPLACED UNDER THE SUPERVISION OF A VERMONT STATE LICENSED LAND SURVEYOR.

GRAPHIC SCALE
200 0 100 200 400 800
(IN FEET)
1 inch = 200 ft. AT 22X34
HALF SIZE AT 11X17

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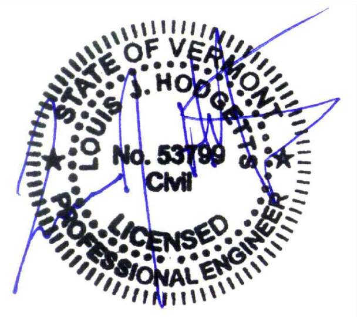
PROFESSIONAL SEAL



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verizonwireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

OVERALL SITE PLAN

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

C-1

PROJECT DESCRIPTION:

1. TYPE OF PROJECT: TELECOMMUNICATION FACILITY

2. DESCRIPTION OF MAJOR PROJECT COMPONENTS: A 50'x50' EQUIPMENT COMPOUND TO BE CONSTRUCTED ON A 78.73 ACRE PARCEL. THE PARCEL MAINTAINS AN EXISTING RESIDENCE. THE COMPOUND IS LOCATED OFF AN EXISTING WOODS ROAD BEHIND THE EXISTING RESIDENCE. THE COMPOUND IS LOCATED ON THE NORTHWEST SIDE OF THE EXISTING HIGH VOLTAGE POWER LINES. THE 12'x20' EQUIPMENT SHELTER TO BE CONSTRUCTED INSIDE THE COMPOUND. THE PROPOSED 140' TALL MONOPOLE TO BE CONSTRUCTED IN THE CENTER OF THE COMPOUND. NEW ANTENNAS AND EQUIPMENT ARE PROPOSED TO BE INSTALLED AT 137.0' A.G.L. UNDERGROUND UTILITIES TO BE ROUTED FROM THE EXISTING UTILITY POLE (BETWEEN U.S. ROUTE 2 AND THE EXISTING RESIDENCE) TO THE COMPOUND.

3. POSTED SPEED LIMIT: N/A

4. TOTAL ACREAGE OF TEMPORARY EARTH DISTURBANCE: 20,050 S.F. (0.46 ACRES)
   4.1. STORMWATER CONSTRUCTION GENERAL PERMIT REQUIRED: NO

5. TOTAL ACREAGE OF TREE CLEARING: 4,120 S.F. (0.09 ACRES)

6. TOTAL ACREAGE OF PERMANENT EARTH DISTURBANCE: 2500 S.F. (0.06 ACRES)

7. IMPERVIOUS AREA
   7.1. EXISTING = 20,899 S.F. (0.48 ACRES)
   7.2. PROPOSED = 2,500 S.F. (0.06 ACRES)
   7.3. TOTAL = 23,399 S.F. (0.53 ACRES)
   7.4. STORMWATER OPERATIONAL PERMIT REQUIRED: NO (5,000 S.F. EXEMPTION)

8. SEQUENCE OF MAJOR PROJECT COMPONENTS:
   8.1. DEMARCATE LIMITS OF CONSTRUCTION
   8.2. INSTALL EPSC MEASURES
   8.3. INSTALL ANTENNAS AND MISC. TOWER EQUIPMENT
   8.4. CONSTRUCT EQUIPMENT SHELTER
   8.5. INSTALL UNDERGROUND ELECTRIC/TELCO
   8.6. SITE STABILIZATION, SURFACE TREATMENT, RE-SEEDING

9. PROPOSED POLLUTION PREVENTION STRATEGIES: CONTRACTOR TO ENSURE THAT THE SITE REMAINS CLEAN AND ALL DEBRIS AND UNUSED MATERIALS ARE REMOVED AT THE END OF EACH DAY.

10. MAXIMUM CONCURRENT EARTH DISTURBANCE: THE PROJECT WILL BE LIMITED TO TWO ACRES OR LESS OF EARTH DISTURBANCE AT ANY ONE TIME.

11. USE OF VEGETATED BUFFERS: THE PROJECT WILL HAVE STORMWATER DISCHARGES FROM THE CONSTRUCTION SITE TO STREAM CROSSINGS ALONG THE ACCESS ROAD THAT DO NOT FIRST FILTER THROUGH A 50 FT. VEGETATED BUFFER. SILT FENCE WILL BE INSTALLED AT THESE LOCATIONS. THE ACCESS ROAD AND COMPOUND WILL BE GRADED TO PROVIDE A MODERATE CROSS-SLOPE TO DIRECT RUNOFF TO THE UNDISTURBED VEGETATED FOREST ADJACENT TO THE ROAD.

12. NAME OF RECEIVING WATERS: UNNAMED TRIBUTARY TO WINOOSKI RIVER

13. NUMBER OF EXISTING STREAM CROSSINGS: 0
   13.1. STREAM ALTERATION PERMIT: NO

14. WETLAND IMPACTS:
   14.1. AREA OF WETLANDS IMPACTED BY PROPOSED ACTIVITIES: 0 ACRES
   14.2. AREA OF WETLAND BUFFERS IMPACTED BY PROPOSED ACTIVITIES: 0.00 ACRES
   14.3. STATE WETLANDS PERMIT: NO
   14.4. ARMY CORPS OF ENGINEERS PERMIT: NO

15. RIVER AND STREAM IMPACTS: NONE
   15.1. LOCATED IN A FLOOD HAZARD AREA: NO
   15.2. LOCATED IN A RIVER CORRIDOR: NO
   15.3. LOCATED IN A RIPARIAN BUFFER: NO

16. RARE, THREATENED, OR ENDANGERED SPECIES IMPACTS: NO IDENTIFIED CONCERNS

17. SIGNIFICANT NATURAL COMMUNITY: NO IDENTIFIED CONCERNS

18. WATER SUPPLY SOURCE PROTECTION AREA IMPACTS: NO IDENTIFIED CONCERNS

19. NATURAL RESOURCES HABITAT IMPACTS:
   19.1. DEER WINTERING AREA: NO IDENTIFIED CONCERNS
   19.2. BEAR HABITAT AREA: NO IDENTIFIED CONCERNS
   19.3. SONG BIRD HABITAT: NO IDENTIFIED CONCERNS
   19.4. BAT HABITAT AREA: NO IDENTIFIED CONCERNS
   19.5. HABITAT BLOCK: FINAL 5, THREAT 5
   19.6. BIOFINDER: PRIORITY: INTERIOR FOREST BLOCKS, CONNECTIVITY BLOCKS.

20. LOCAL ZONING – TOWN OF MARSHFIELD
   20.1. ZONING DISTRICT: FORESTRY & CONSERVATION DISTRICT
   20.2. OVERLAY DISTRICT:

21. PROPERTY LINE INFORMATION PROVIDED BY THE TOWN OF MARSHFIELD TAX MAPS. DUBOIS & KING, INC. DID NOT PERFORM A BOUNDARY SURVEY.

22. TOPOGRAPHIC SURVEY PERFORMED BY DUBOIS & KING, INC. ON JANUARY 30, 2023

23. THE PROJECT WILL COMPLY WITH THE LOW RISK HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL BY THE VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION, 2020 EDITION.

24. ELEVATIONS FROM GPS OBSERVATION.

25. WETLAND AND NATURAL RESOURCES REVIEW CONDUCTED BY DUBOIS & KING, INC. ON AUGUST 19, 2022 AND OCTOBER 13, 2022.

EXISTING FEATURES LEGEND

- APPROXIMATE PROPERTY LINE
- OHE — OVERHEAD UTILITY LINE
- EXISTING TREE LINE
- DELINEATED STREAM
- RIPARIAN BUFFER
- WB — 50' WETLAND BUFFER
- DELINEATED WETLAND
- MINOR CONTOUR LINE
- MAJOR CONTOUR LINE
- UTILITY POLE
- BENCHMARK
- DECIDUOUS TREE
- EVERGREEN TREE

PROPOSED FEATURES LEGEND

- LIMITS OF DISTURBANCE
- LIMITS OF CONSTRUCTION
- SF — REINFORCED SILT FENCE
- PROPOSED TREE LINE
- UET — UNDERGROUND ELEC & TEL LINE
- CHAIN LINK FENCE
- PROPOSED UTILITY POLE
- PROPOSED WATER BAR
- TEMPORARY WATER BAR

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PROFESSIONAL SEAL

STATE OF VERMONT
LOUIS J. HODGETTS
No. 5310? Civil
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY	CK'D
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1	10-23-2023	ISSUED FOR BID	JWP	LJH

verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

GENERAL NOTES

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

C-2

I:\4\422065P VZW Marshfield\dwg\Construction Plans\C22065SP01.dwg 5/7/2025 2:07 PM

ABUTTER LIST:

A. PARCEL #: CF013.A
N/F DONNY & DIMPLES MUCHERINO
248 CREE FARM ROAD
MARSHFIELD, VT 05658

B. PARCEL #: RT135.
N/F JEFFREY & DONNA HISSON
P.O. BOX 46
MARSHFIELD, VT 05658

C. PARCEL #: RT133.
N/F MICHAEL & CHANDRA LAMERY
2076 U.S. ROUTE 2
MARSHFIELD, VT 05658

D. PARCEL #: RT133.
N/F MICHAEL & CHANDRA LAMERY
2076 U.S. ROUTE 2
MARSHFIELD, VT 05658

E. PARCEL #: LD012.
N/F TOWN OF MARSHFIELD
122 SCHOOL STREET, ROOM 1
MARSHFIELD, VT 05658

F. PARCEL #: FG001.
N/F VERMONT FISH & GAME DEPT.
103 SOUTH MAIN STREET
WATERBURY, VT 05676

G. PARCEL #: RT131.A
N/F NEWTON AFRICA & GAIL EVANS
256 PEACHAM ROAD
MARSHFIELD, VT 05658

H. PARCEL #: RT128.
N/F THOMAS JOHNSON
2 MEDFORD STREET
CHELSEA, MA 02150

I. PARCEL #: RT129.
N/F KEVIN ROGERS & LINDSAY ERICSON
2356 U.S. ROUTE 2
MARSHFIELD, VT 05658

J. PARCEL #: RT127.
N/F LAWRENCE & JOYCE WHEELER
2436 U.S. ROUTE 2
MARSHFIELD, VT 05658

K. PARCEL #: RT125.
N/F WESTON CATE, III
692 HOLT ROAD
PLAINFIELD, VT 05667

L. PARCEL #: RT123.
N/F JOSHUA KILBURN
2596 U.S. ROUTE 2
MARSHFIELD, VT 05658

M. PARCEL #: RT119.
N/F KENNETH DUXBURY
2750 U.S. ROUTE 2
MARSHFIELD, VT 05658

N. PARCEL #: RT115.A
N/F DENNIS & ELAINE CLISHAM
P.O. BOX 79
MARSHFIELD, VT 05658

O. PARCEL #: PR017.
N/F WILLIAM & ELIZABETH LARSEN
P.O. BOX 322
MARSHFIELD, VT 05658

P. PARCEL #: RT115.B
N/F MERVIN & CLARA WELLS
C/O ELIZABETH LARSEN
P.O. BOX 322
MARSHFIELD, VT 05658

Q. PARCEL #: JO007.
N/F JERI & SYLVIA HEALEY
631 JOHNSON ROAD
MARSHFIELD, VT 05658

GRAPHIC SCALE
200 0 100 200 400 800
(IN FEET)
1 inch = 200 ft. AT 22X34
HALF SIZE AT 11X17

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PROFESSIONAL SEAL

STATE OF VERMONT
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No. 53799
Civil
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verizon wireless

PROJECT ID: 20202051531
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LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
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SHEET TITLE

ABUTTER PLAN

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

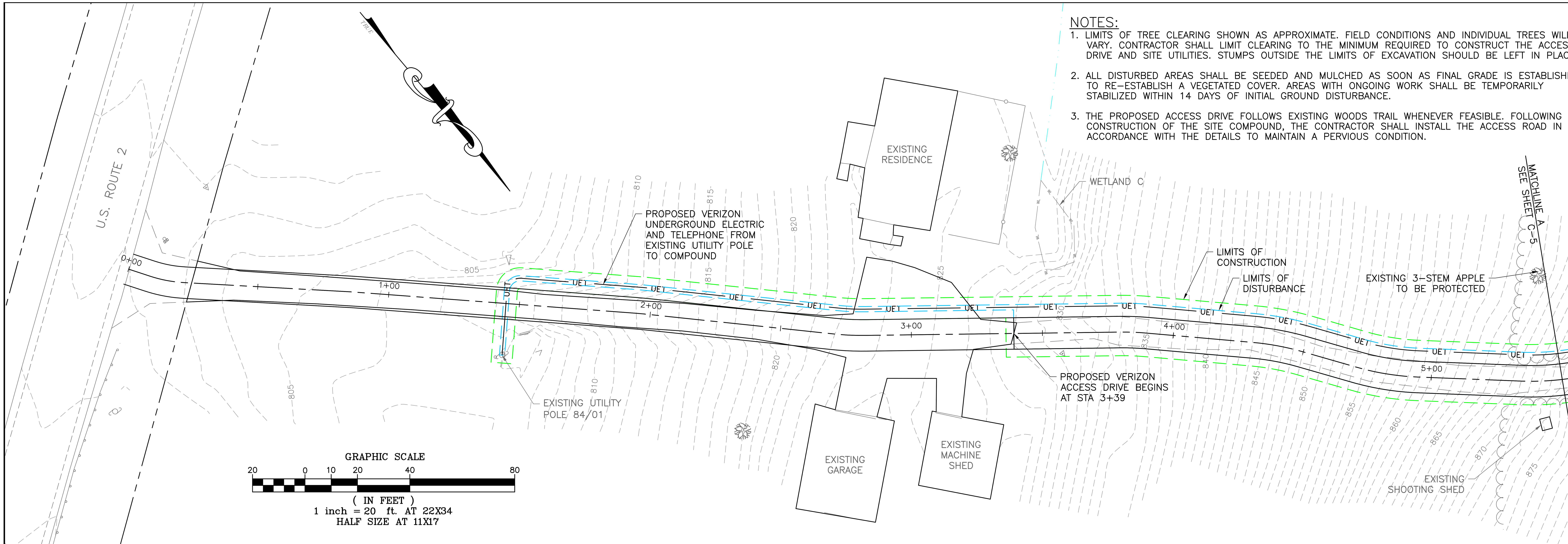
SHEET NUMBER

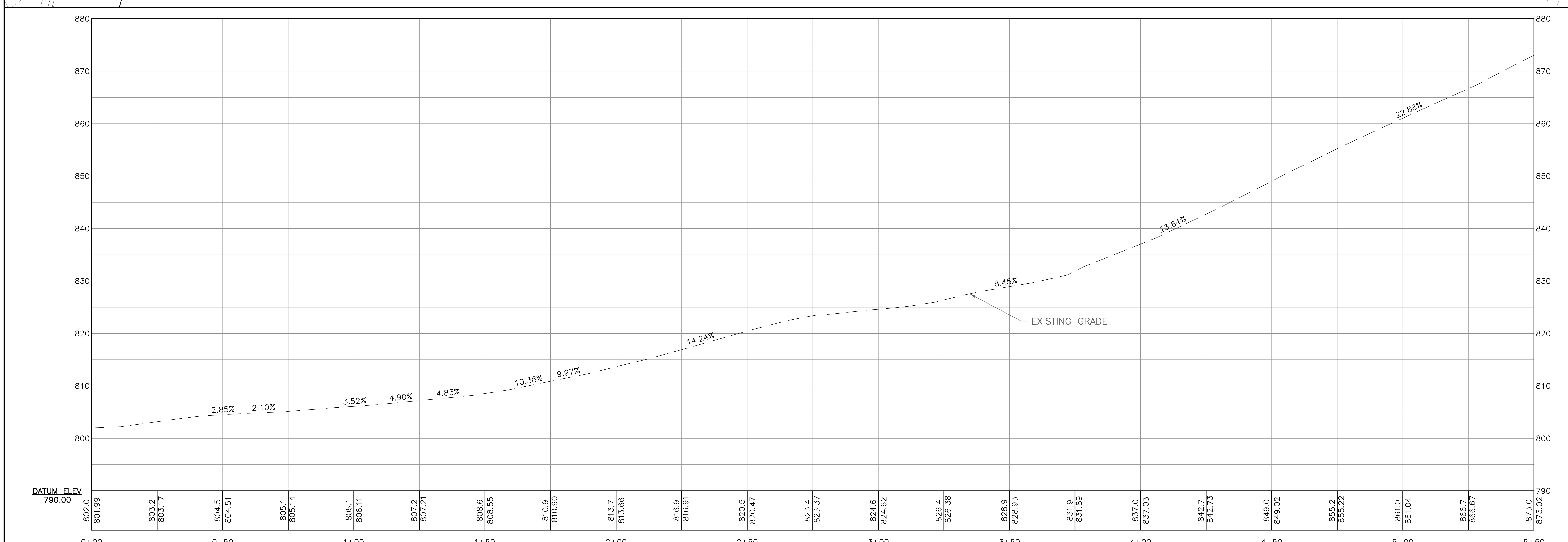
C-3

I:\4\422065P VZW Marshfield\dwg\Construction Plans\C22065SP01.dwg 5/7/2025 2:07 PM

NOTES:

1. LIMITS OF TREE CLEARING SHOWN AS APPROXIMATE. FIELD CONDITIONS AND INDIVIDUAL TREES WILL VARY. CONTRACTOR SHALL LIMIT CLEARING TO THE MINIMUM REQUIRED TO CONSTRUCT THE ACCESS DRIVE AND SITE UTILITIES. STUMPS OUTSIDE THE LIMITS OF EXCAVATION SHOULD BE LEFT IN PLACE.
2. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED AS SOON AS FINAL GRADE IS ESTABLISHED TO RE-ESTABLISH A VEGETATED COVER. AREAS WITH ONGOING WORK SHALL BE TEMPORARILY STABILIZED WITHIN 14 DAYS OF INITIAL GROUND DISTURBANCE.
3. THE PROPOSED ACCESS DRIVE FOLLOWS EXISTING WOODS TRAIL WHENEVER FEASIBLE. FOLLOWING CONSTRUCTION OF THE SITE COMPOUND, THE CONTRACTOR SHALL INSTALL THE ACCESS ROAD IN ACCORDANCE WITH THE DETAILS TO MAINTAIN A PERVIOUS CONDITION.





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PROFESSIONAL SEAL

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verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

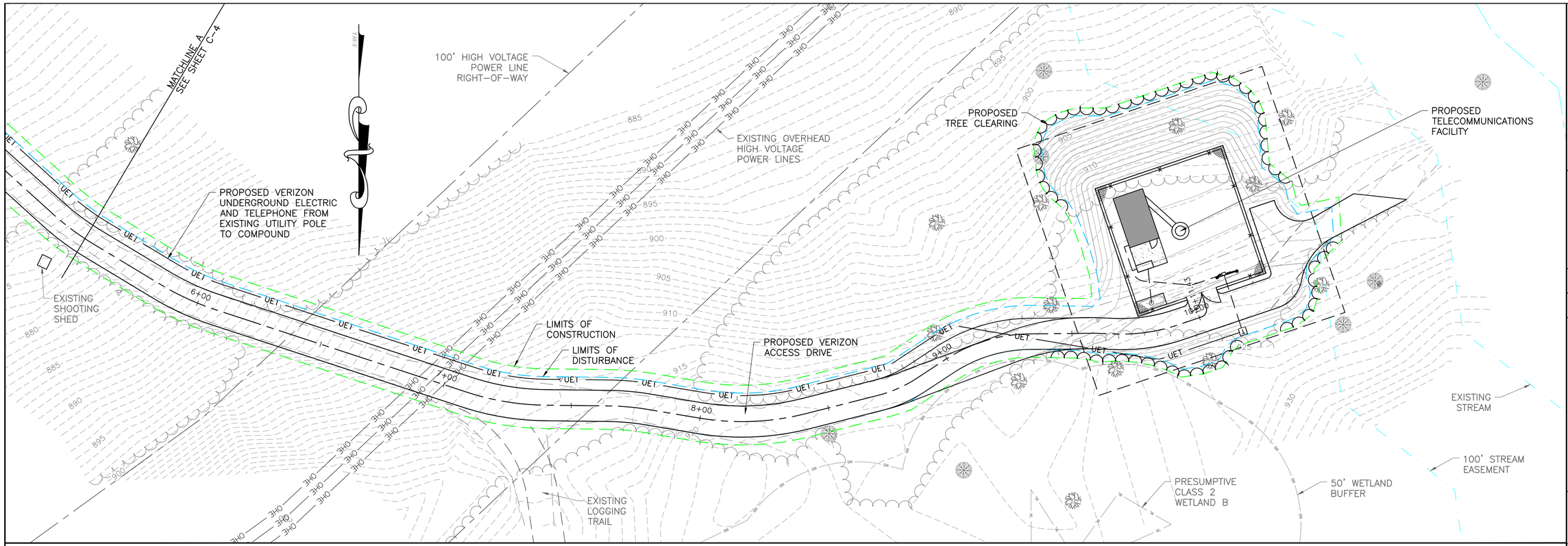
PLAN AND PROFILE

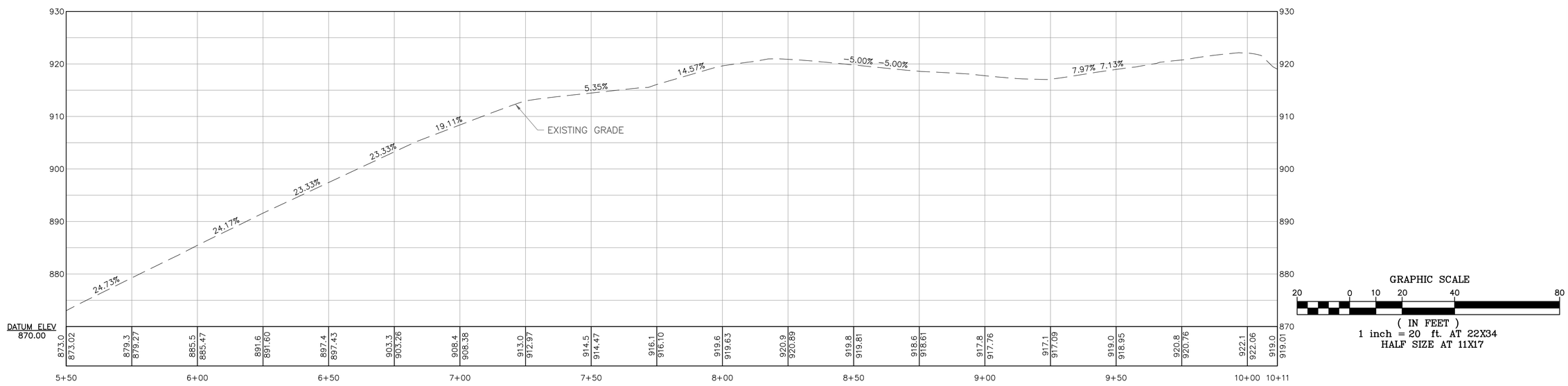
CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

C-4





GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft. AT 22X34
HALF SIZE AT 11X17

NOTES:

1. LIMITS OF TREE CLEARING SHOWN AS APPROXIMATE. FIELD CONDITIONS AND INDIVIDUAL TREES WILL VARY. CONTRACTOR SHALL LIMIT CLEARING TO THE MINIMUM REQUIRED TO CONSTRUCT THE ACCESS DRIVE AND SITE UTILITIES. STUMPS OUTSIDE THE LIMITS OF EXCAVATION SHOULD BE LEFT IN PLACE.
2. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED AS SOON AS FINAL GRADE IS ESTABLISHED TO RE-ESTABLISH A VEGETATED COVER. AREAS WITH ONGOING WORK SHALL BE TEMPORARILY STABILIZED WITHIN 14 DAYS OF INITIAL GROUND DISTURBANCE.
3. THE PROPOSED ACCESS DRIVE FOLLOWS EXISTING WOODS TRAIL WHENEVER FEASIBLE. FOLLOWING CONSTRUCTION OF THE SITE COMPOUND, THE CONTRACTOR SHALL INSTALL THE ACCESS ROAD IN ACCORDANCE WITH THE DETAILS TO MAINTAIN A PERVIOUS CONDITION.

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PROFESSIONAL SEAL

NO.	DATE	DESCRIPTION	BY	CK'D
3	05-07-2025	REVISED IMPACT AREA CALCULATIONS	LJH	LJH
2	11-02-2023	REVISED LINE WORK TO BE OUTSIDE BUFFER	JWP	LJH
1	10-23-2023	ISSUED FOR BID	JWP	LJH

verizonwireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

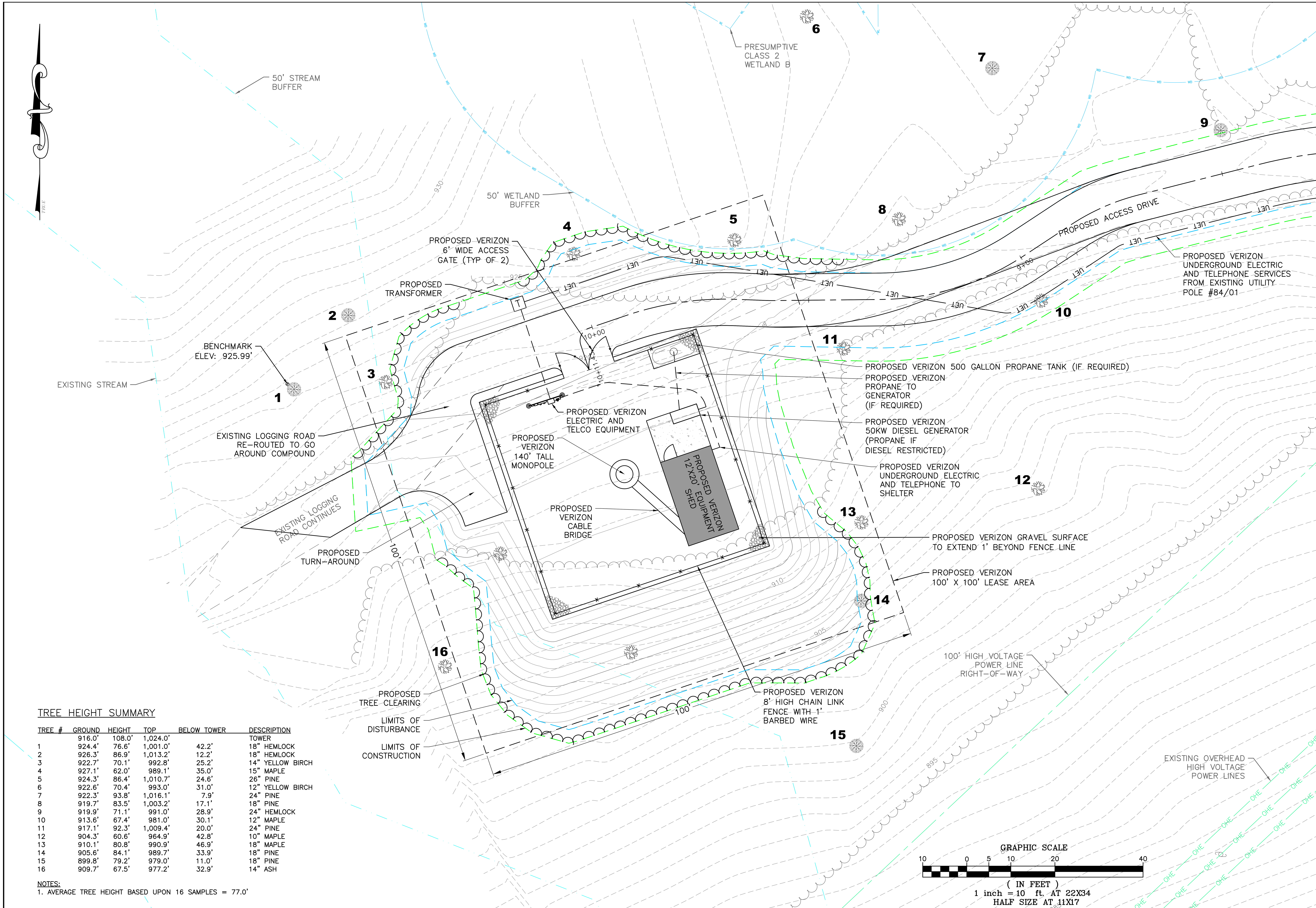
PLAN AND PROFILE

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

C-5



TREE HEIGHT SUMMARY

TREE #	GROUND	HEIGHT	TOP	BELOW TOWER	DESCRIPTION
	916.0'	108.0'	1,024.0'		TOWER
1	924.4'	76.6'	1,001.0'	42.2'	18" HEMLOCK
2	926.3'	86.9'	1,013.2'	12.2'	18" HEMLOCK
3	922.7'	70.1'	992.8'	25.2'	14" YELLOW BIRCH
4	927.1'	62.0'	989.1'	35.0'	15" MAPLE
5	924.3'	86.4'	1,010.7'	24.6'	26" PINE
6	922.6'	70.4'	993.0'	31.0'	12" YELLOW BIRCH
7	922.3'	93.8'	1,016.1'	7.9'	24" PINE
8	919.7'	83.5'	1,003.2'	17.1'	18" PINE
9	919.9'	71.1'	991.0'	28.9'	24" HEMLOCK
10	913.6'	67.4'	981.0'	30.1'	12" MAPLE
11	917.1'	92.3'	1,009.4'	20.0'	24" PINE
12	904.3'	60.6'	964.9'	42.8'	10" MAPLE
13	910.1'	80.8'	990.9'	46.9'	18" MAPLE
14	905.6'	84.1'	989.7'	33.9'	18" PINE
15	899.8'	79.2'	979.0'	11.0'	18" PINE
16	909.7'	67.5'	977.2'	32.9'	14" ASH

NOTES:
1. AVERAGE TREE HEIGHT BASED UPON 16 SAMPLES = 77.0'

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STATE OF VERMONT · LOUIS J. HODGETTS · No. 5379 · Civil · LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY	CK'D
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verizon wireless

PROJECT ID: 20202051531
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MARSHFIELD VT

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SHEET TITLE

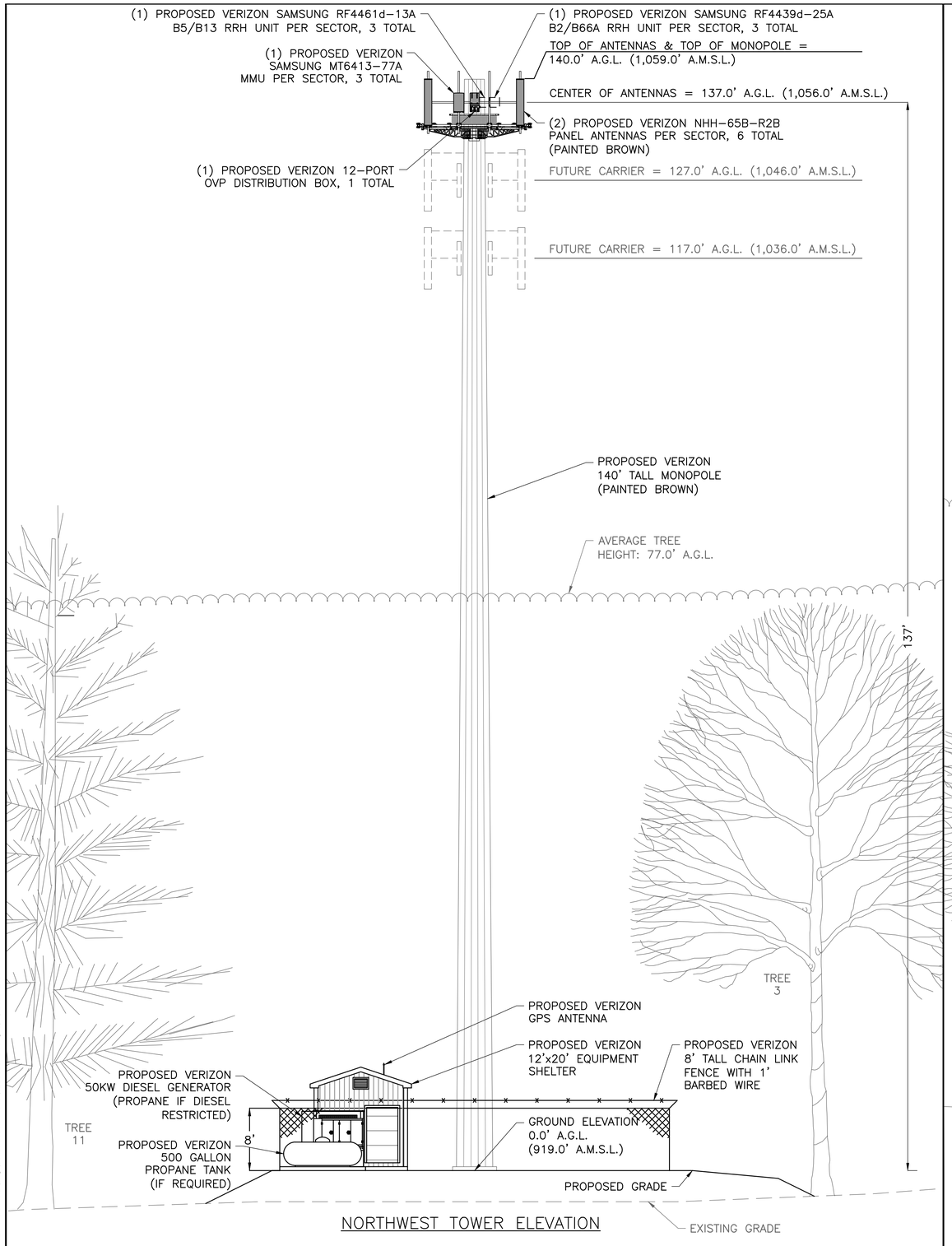
DETAIL SITE PLAN

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

C-6



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PROJECT ID: 20202051531
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SHEET TITLE

TOWER ELEVATIONS

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
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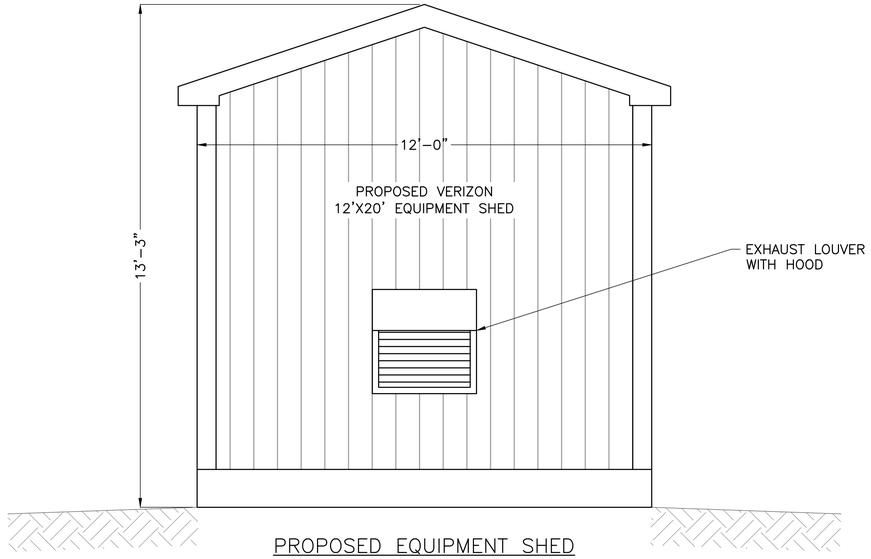
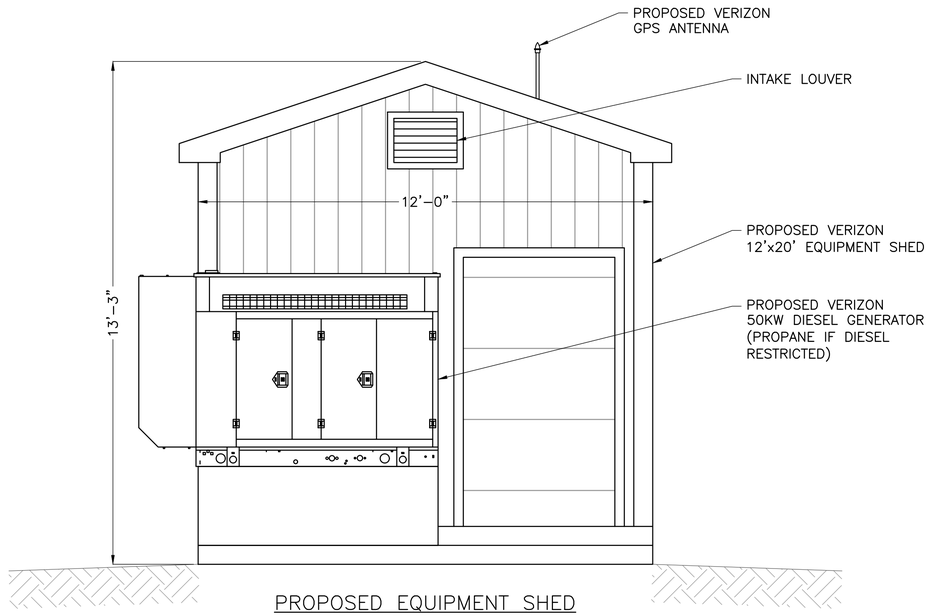
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

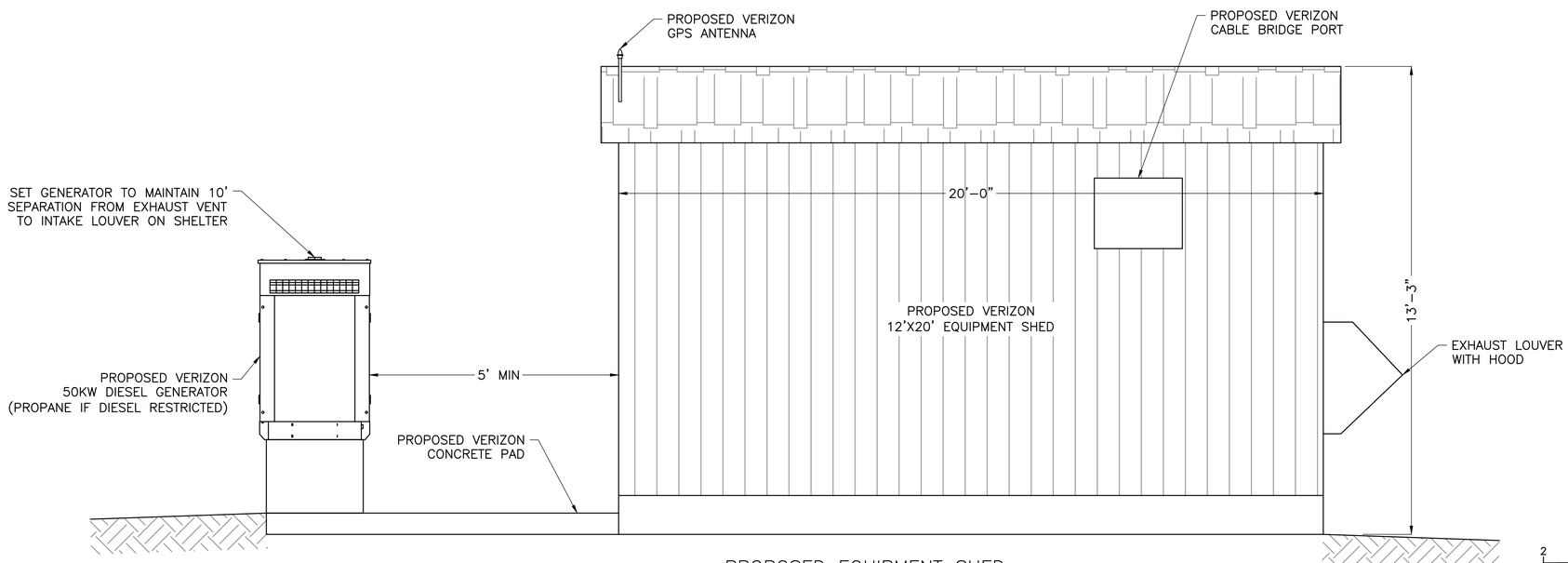
C-7



PROPOSED EQUIPMENT SHED
SOUTHEAST ELEVATION
SCALE: 1" = 2'



PROPOSED EQUIPMENT SHED
NORTHWEST ELEVATION
SCALE: 1" = 2'



PROPOSED EQUIPMENT SHED
SOUTHWEST ELEVATION
SCALE: 1" = 2'

GRAPHIC SCALE
2 0 1 2 4 8
(IN FEET)
1 inch = 2 ft. AT 22X34
HALF SIZE AT 11X17

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EQUIPMENT SHELTER

CONSTRUCTION PLANS

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PROJ. ENG.	D&K ARCHIVE #
LJH	

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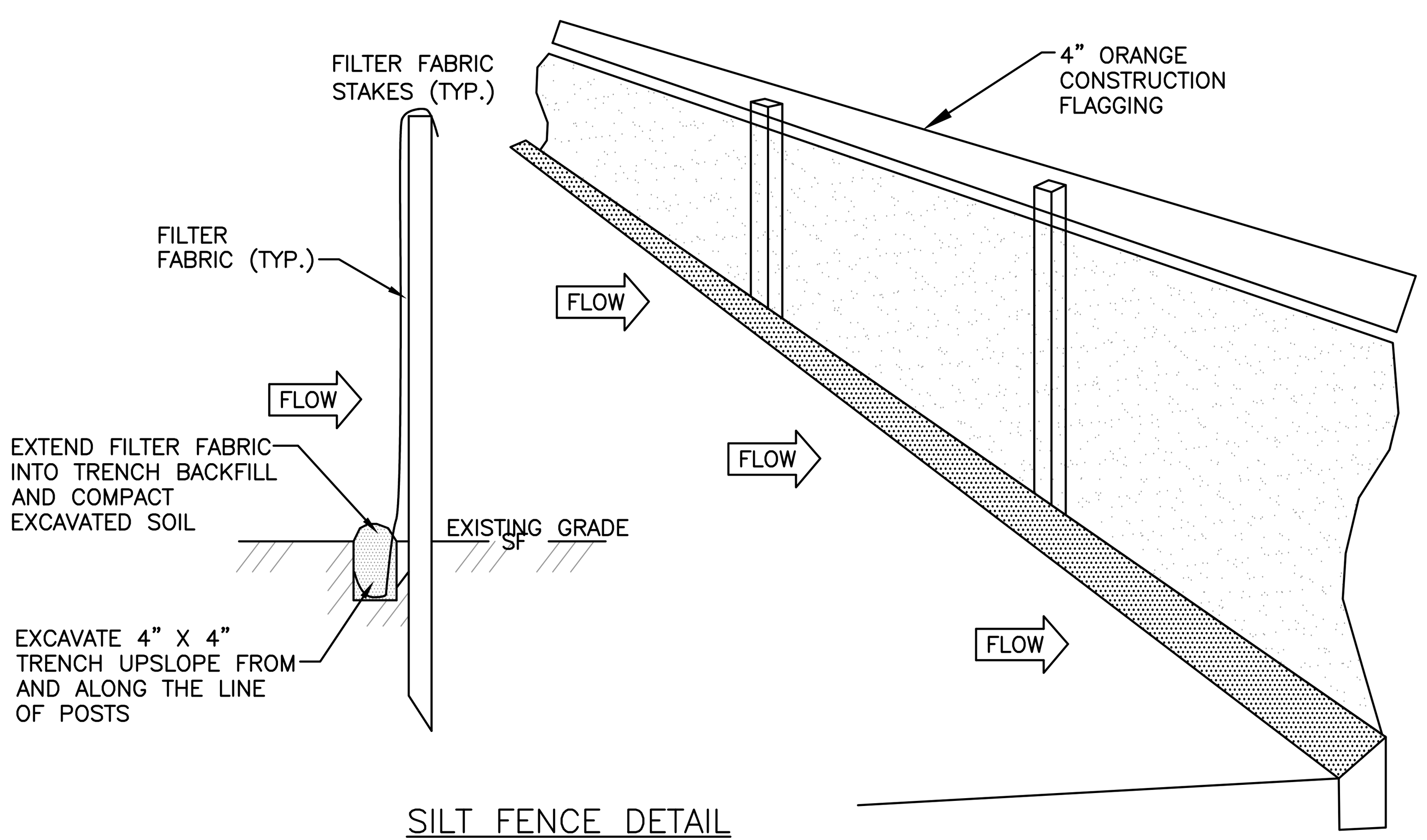
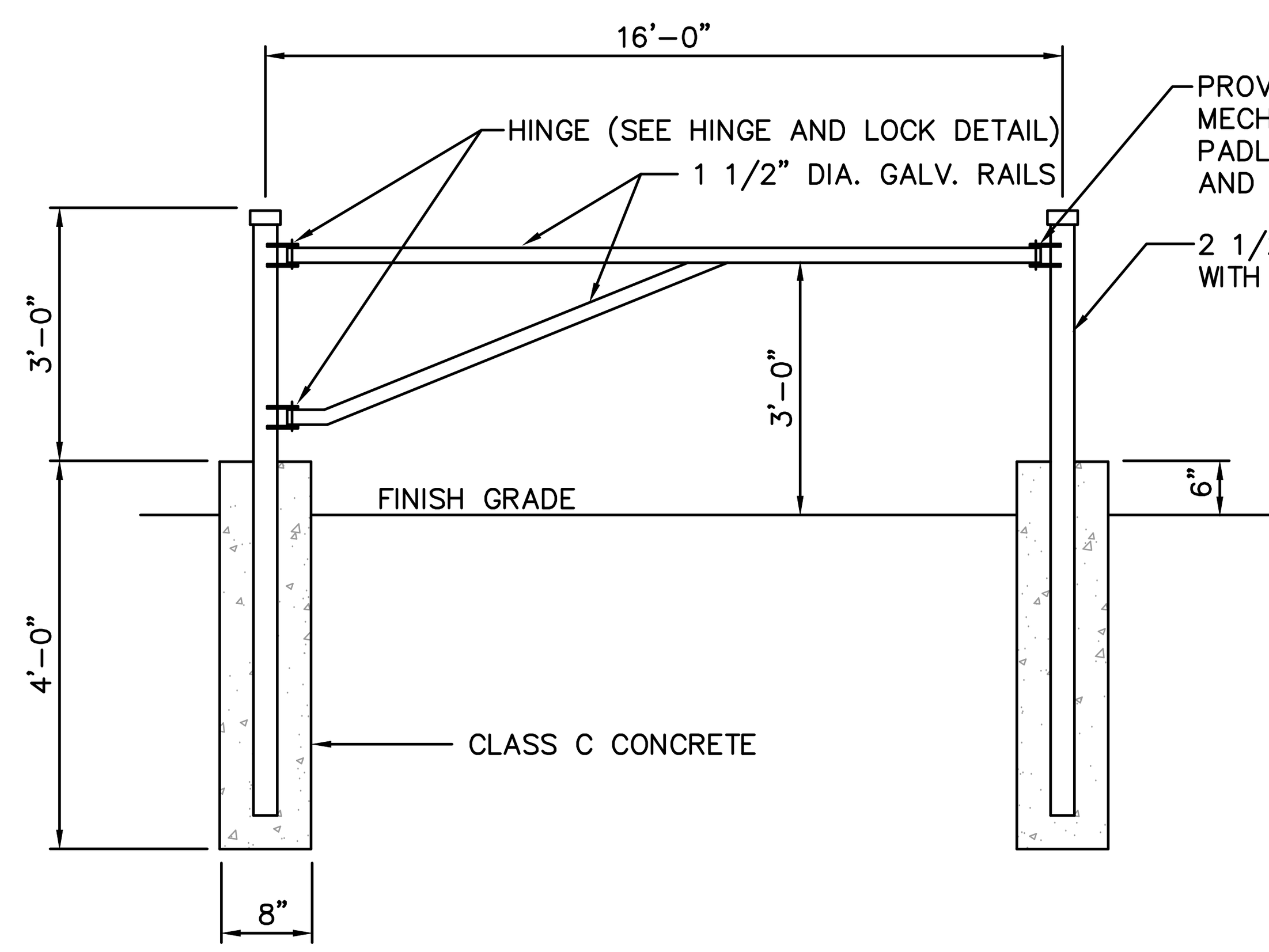
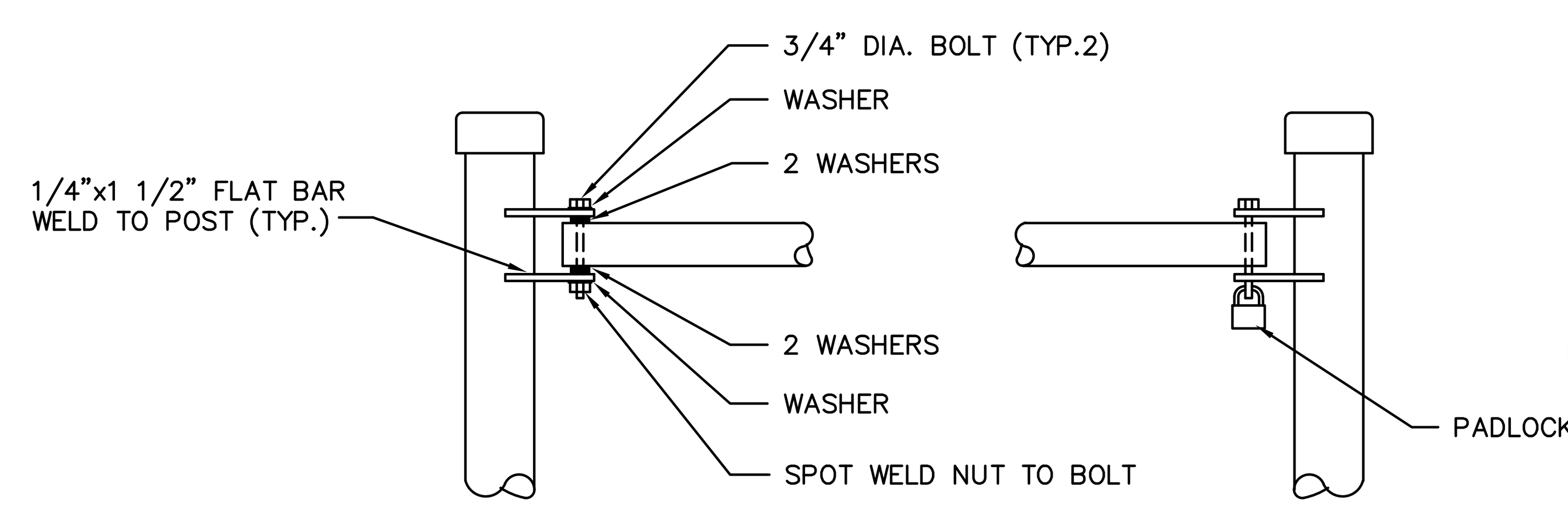


SILT FENCE DETAIL
NOT TO SCALE

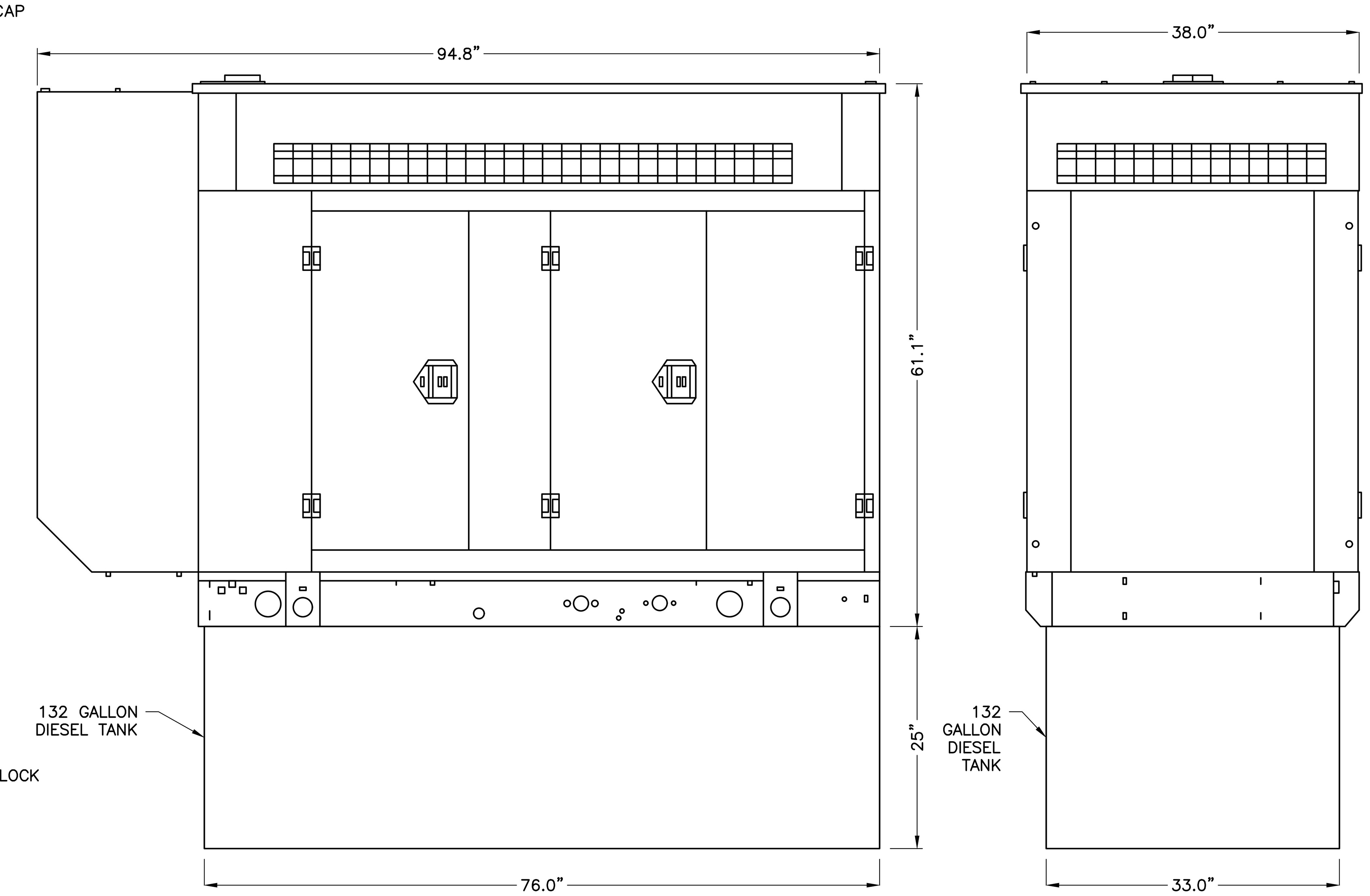
NOTES:
1. SEED AND MULCH ALL EXPOSED SOILS AS SOON AS FEASIBLE.
2. CONTRACTOR TO FOLLOW STATE OF VERMONT LOW RISK HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL.



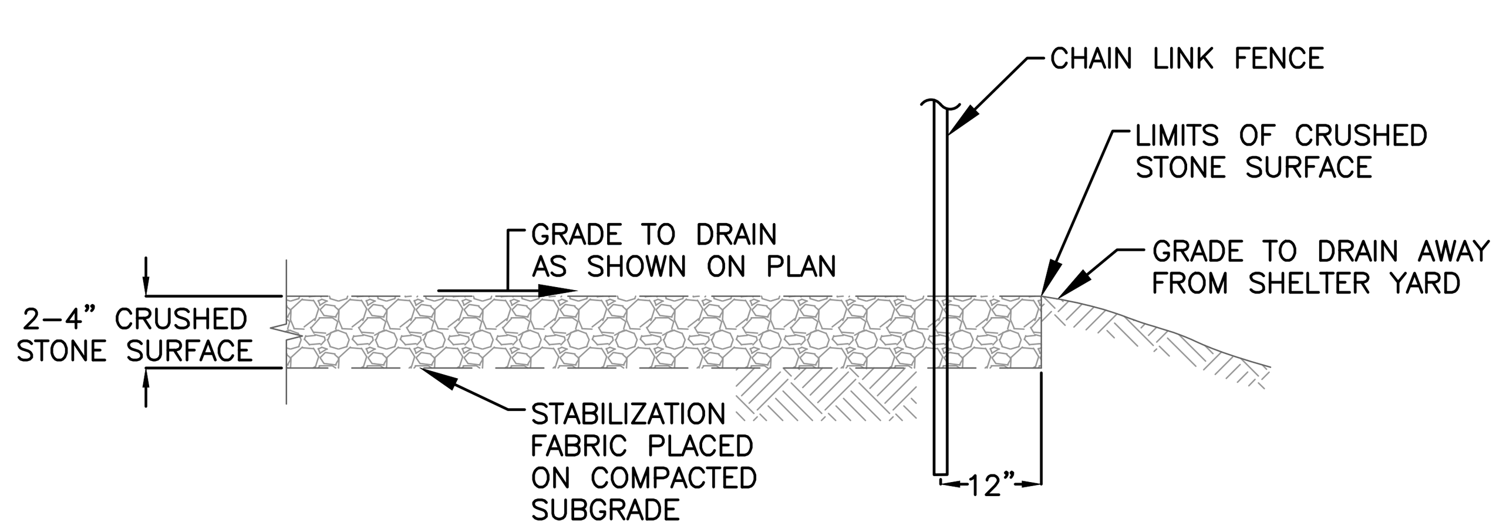
ACCESS ROAD GATE DETAIL
NOT TO SCALE



GATE HINGE AND LOCK DETAIL
NOT TO SCALE

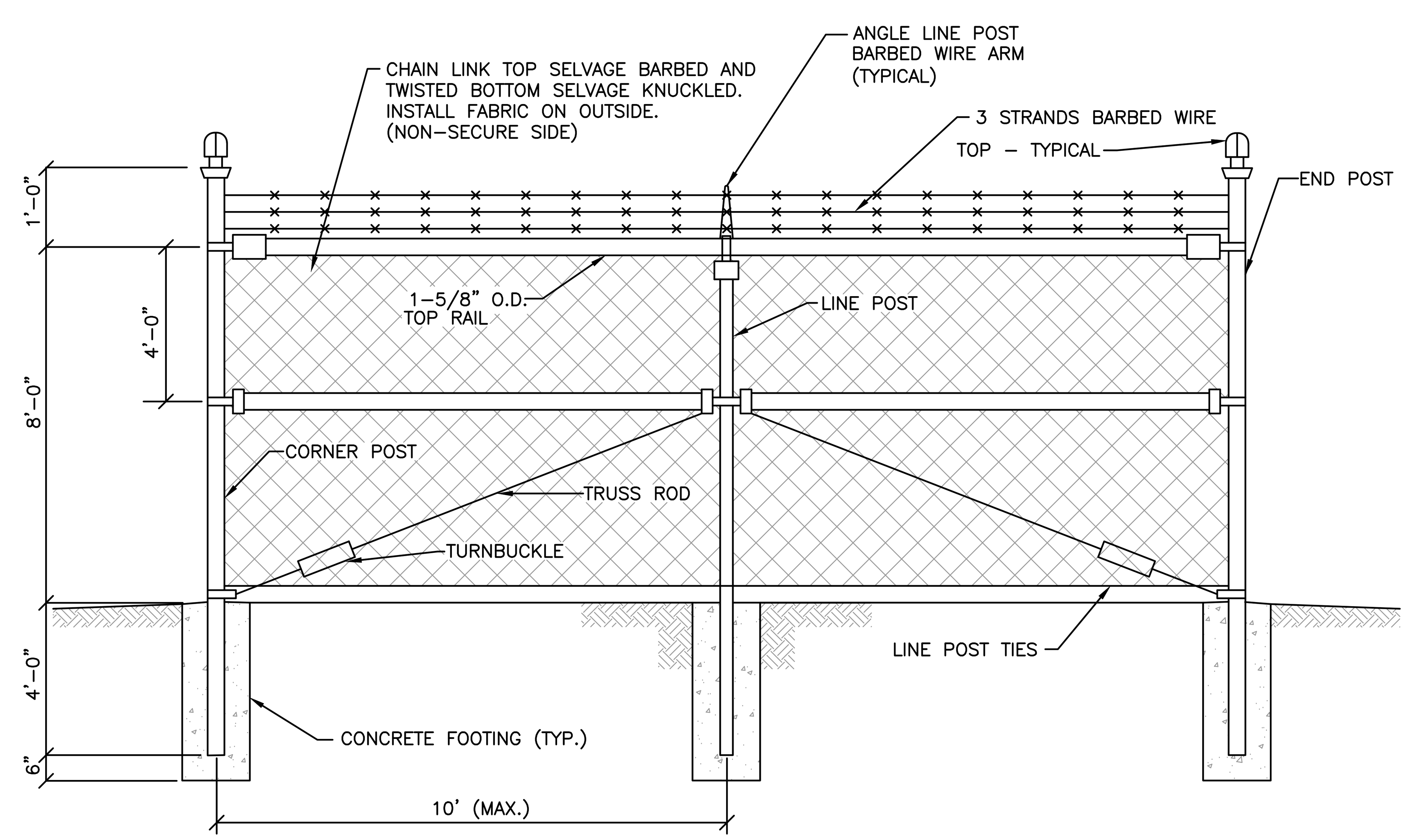


GENERAC 50KW DIESEL GENERATOR DETAIL
NOT TO SCALE

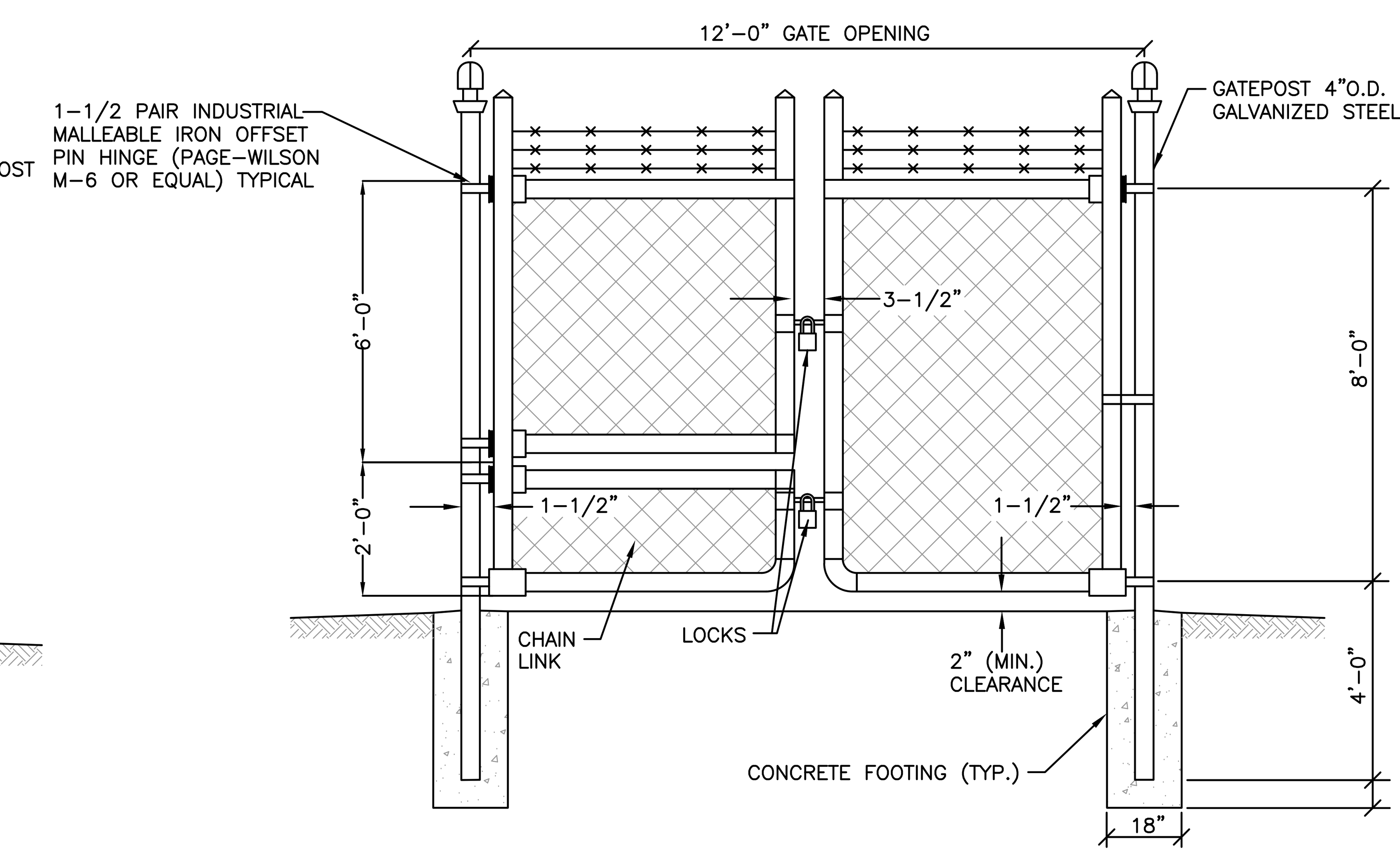


SECTION THROUGH SHELTER YARD
NOT TO SCALE

NOTE:
REMOVE TOPSOIL FOR THE PLACEMENT OF YARD STONE AND STOCKPILE ON SITE. BLEND TOPSOIL INTO NEW GRADE IMMEDIATELY SURROUNDING THE FENCED-IN AREA, AND INSURE THAT IT REMAINS WITHIN THE TOP LAYER OF SOIL STRATA.



PROPOSED CHAIN LINK FENCE DETAIL
NOT TO SCALE



PROPOSED DOUBLE SWING GATE DETAIL
NOT TO SCALE

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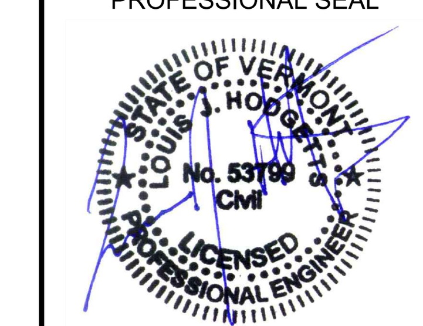

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verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

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SHEET TITLE

CIVIL DETAILS

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
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LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

C-9

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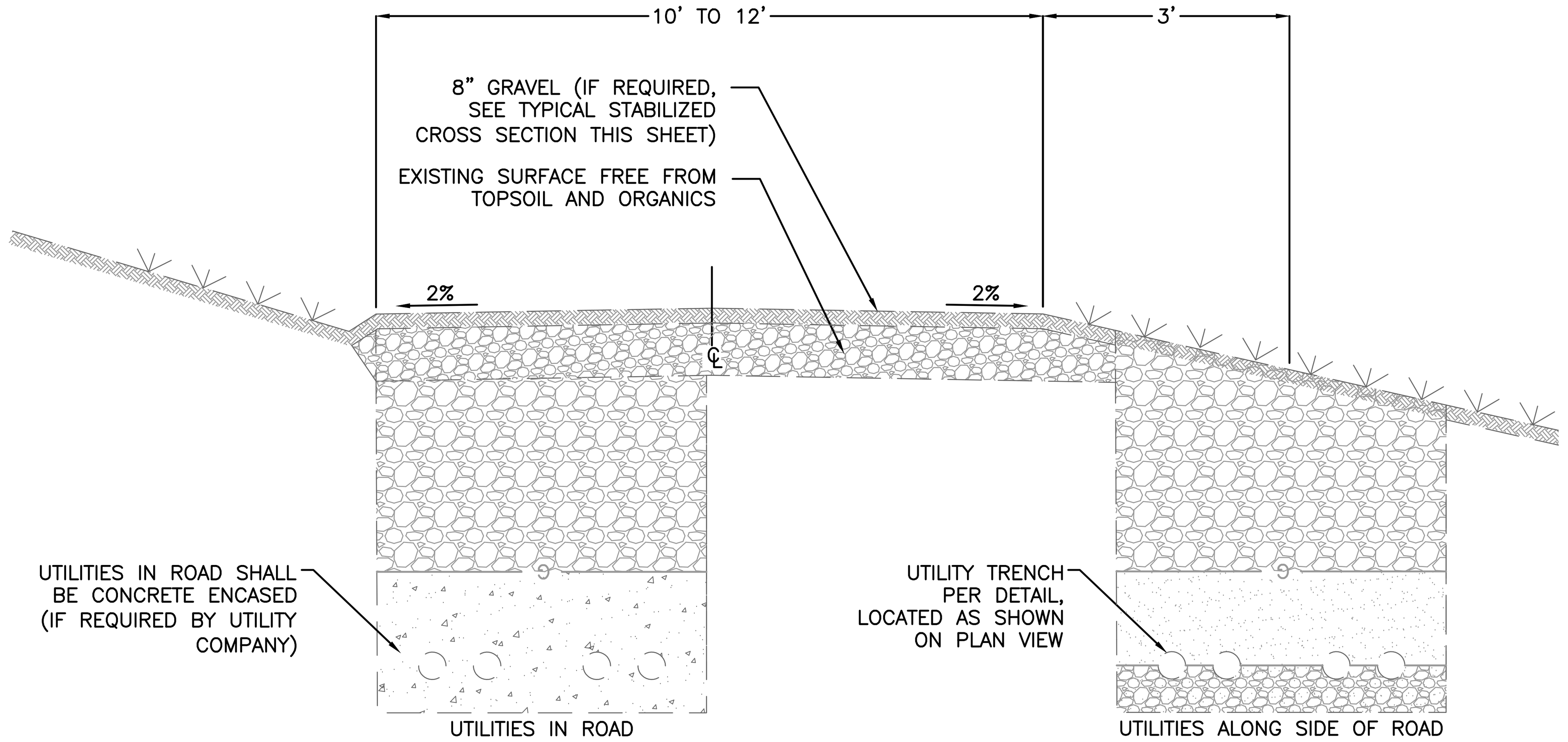
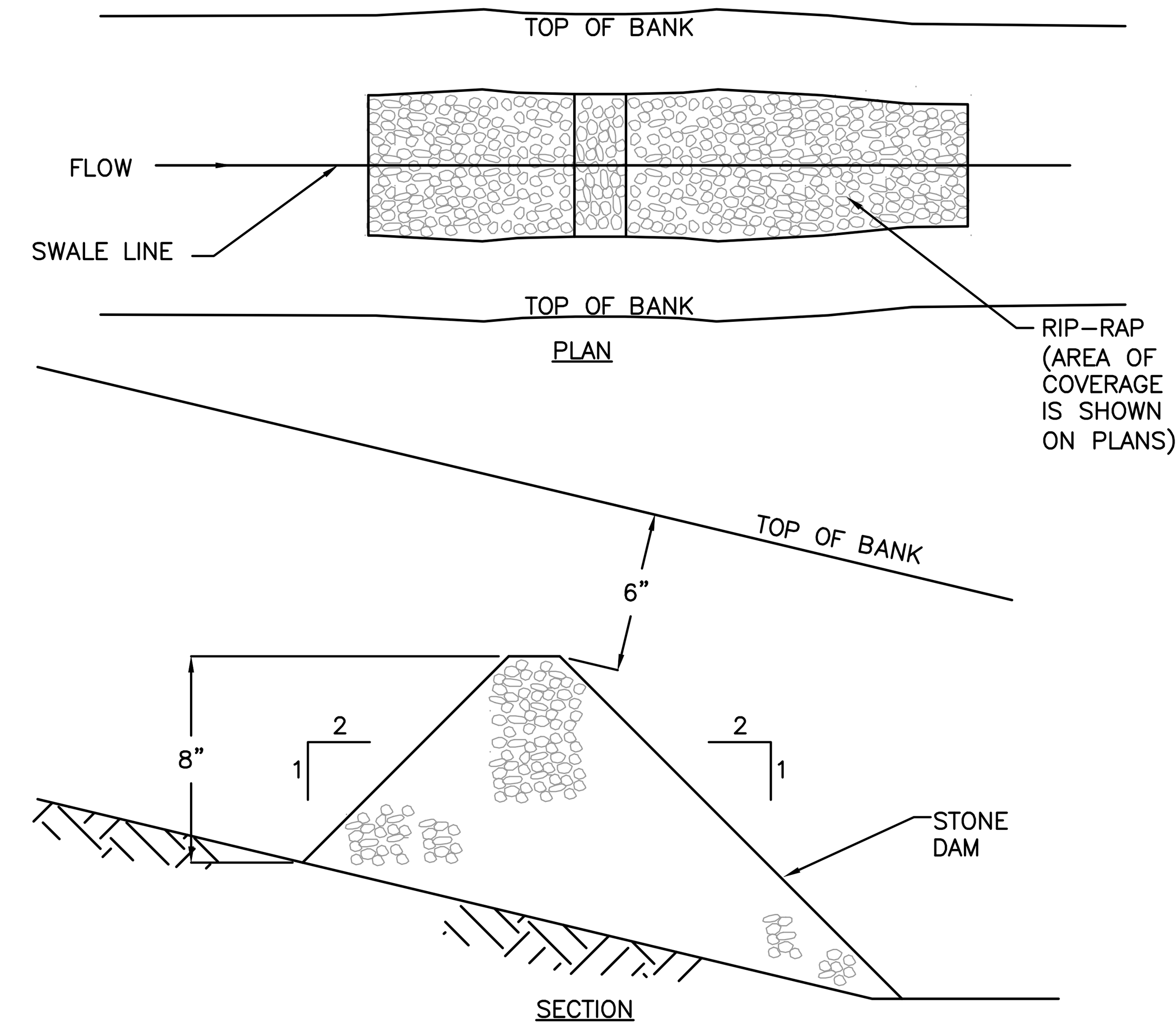


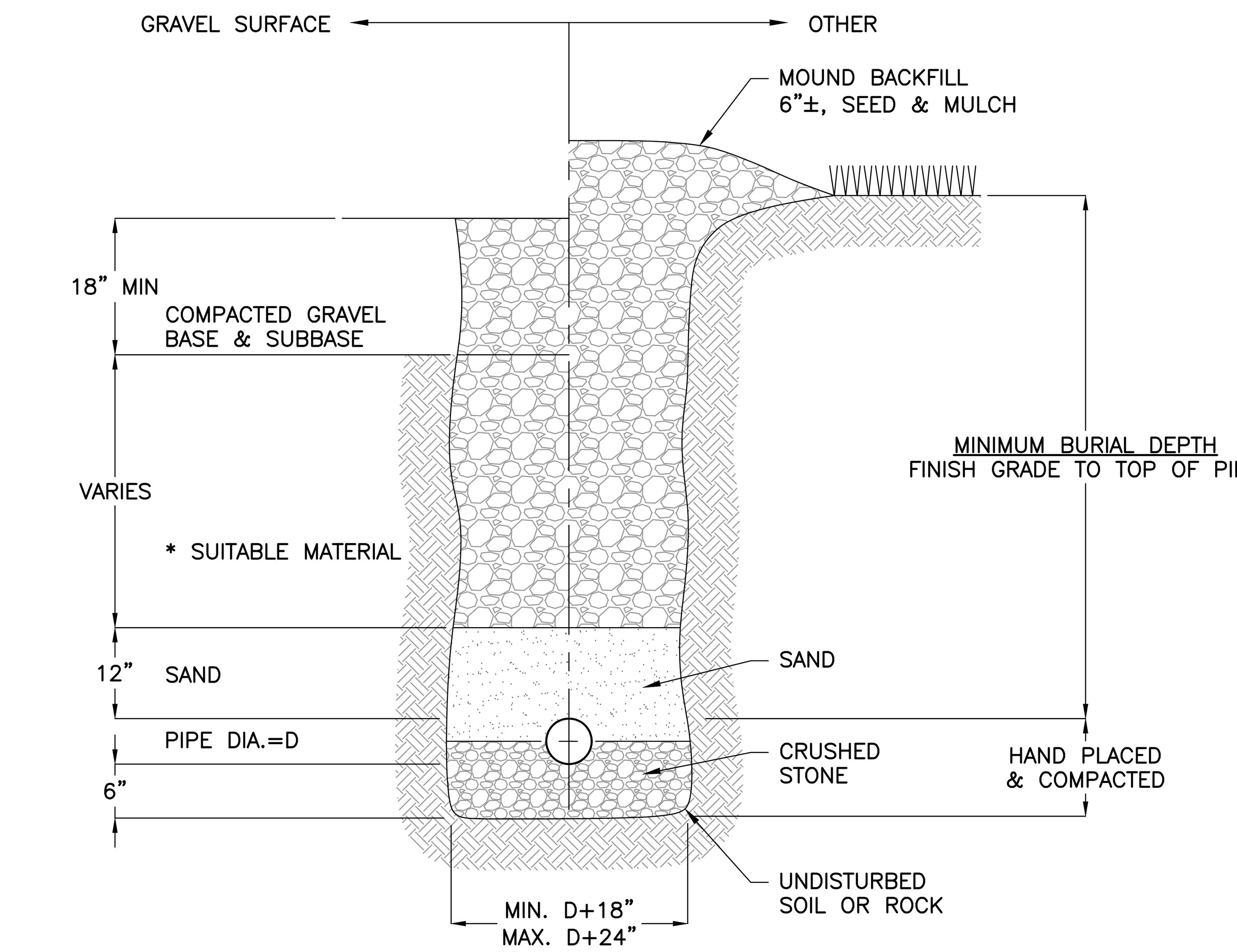
TYPICAL CROSS SECTION
NOT TO SCALE

NOTES:
1. ACCESS TO FOLLOW EXISTING PATHS WHENEVER FEASIBLE.
2. TREE CLEARING SHALL BE LIMITED TO THE MINIMUM REQUIRED TO PERMIT CONSTRUCTION VEHICLE ACCESS.
3. CONSTRUCTION STANDARDS SHALL MEET OR EXCEED THOSE OUTLINED IN "THE ACCEPTABLE MANAGEMENT PRACTICES FOR MAINTAINING WATER QUALITY ON LOGGING JOBS IN VERMONT" HANDBOOK.
4. UTILITY TRENCH LOCATION SHOWN AS TYPICAL.
5. SEED AND MULCH ALL EXPOSED SOILS AS SOON AS FEASIBLE.
6. SEED AND MULCH ALL NEW ACCESS TRAILS FOLLOWING CONSTRUCTION.
7. CONTRACTOR TO FOLLOW STATE OF VERMONT LOW RISK HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL. SEE EPSC LOW RISK HANDBOOK SHEETS INCLUDED IN THIS DRAWING SET.



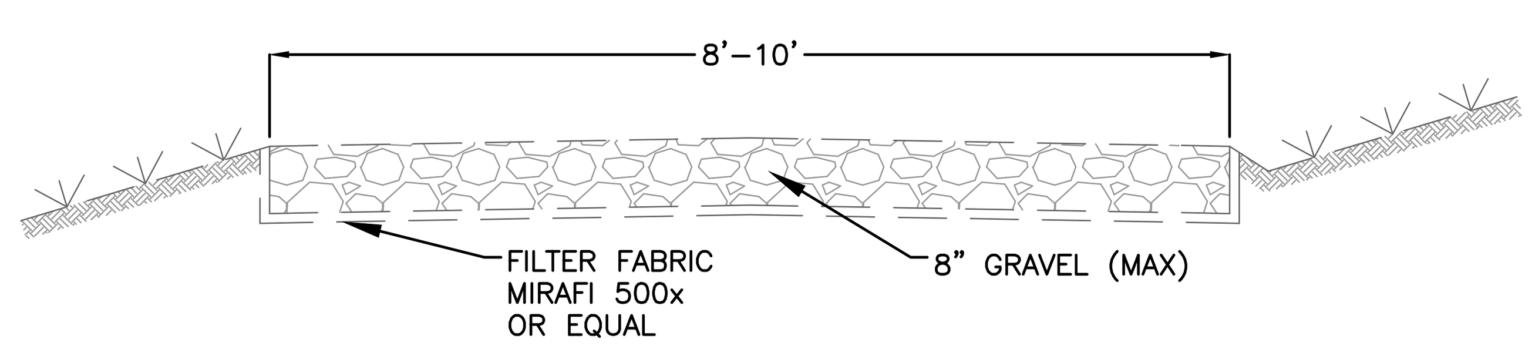
EROSION CONTROL MEASURE TYPE 10 (CHECKDAM) (IF REQUIRED)
NOT TO SCALE

NOTES:
1. ALL EMBANKMENTS AND DISTURBED AREAS SHALL BE VEGETATED AND MULCHED IN ACCORDANCE WITH EROSION CONTROL MEASURE NO. 3.
2. CHECK DAM TO BE CONSTRUCTED OF STONE. MINIMUM HEIGHT IS 8", BUT NO HIGHER THAN 6" BELOW THE TOP OF THE BANK.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN A MANNER APPROVED BY THE ENGINEER, WHEN ½ OF THE CONTAINMENT VOLUME HAS BEEN LOST.
4. CHECK DAM SHALL REMAIN UNTIL DIRECTED BY THE ENGINEER, AT WHICH TIME THE STRUCTURE SHALL BE REMOVED AND THE MATERIALS DISPOSED OF IN A MANNER APPROVED BY THE ENGINEER.



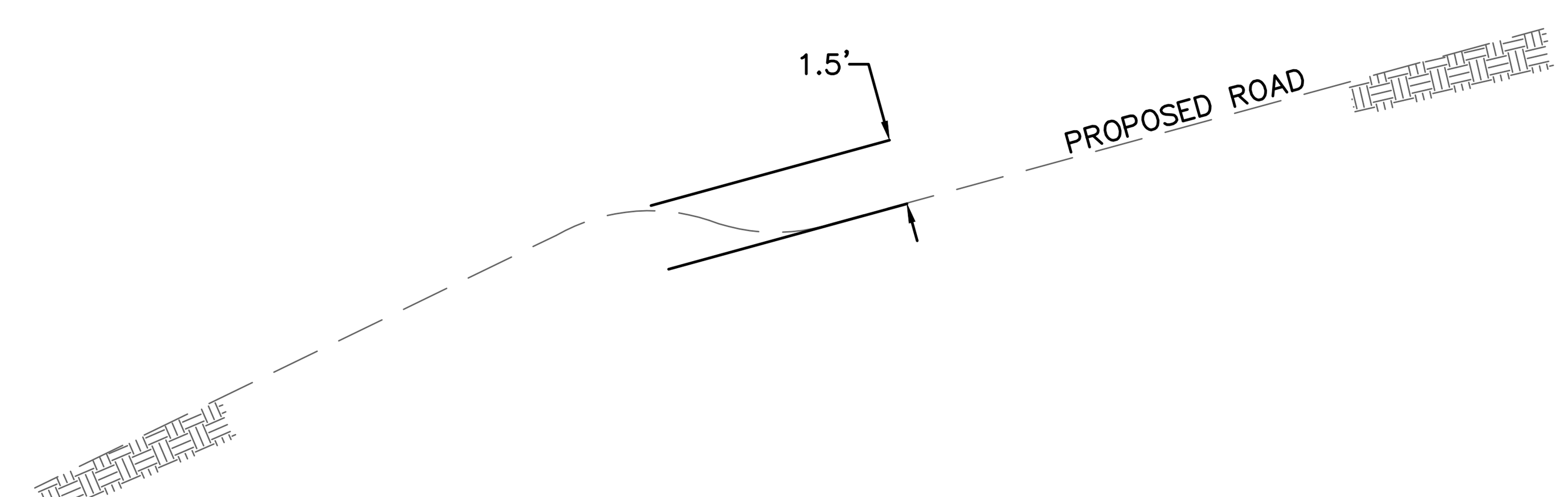
NOTES:
1. WHERE BACKFILL IS DESIGNATED "COMPACTED", THIS MEANS 90% TO 95% STANDARD PROCTOR, AASHTO T-99. ALL FILL PLACED BELOW PIPES MUST MEET THIS REQUIREMENT.
2. SUITABLE MATERIAL SHALL CONTAIN NO STONES GREATER THAN 4" IN DIAMETER, NO FROZEN LUMPS, AND ONLY MINOR AMOUNTS OF CLAY OR ORGANIC MATERIAL. ALL MATERIAL TO BE PLACED IN MAXIMUM OF 12" LIFTS AND COMPACTED BEFORE PLACING NEXT LIFT.
3. SEE ELECTRICAL PLANS FOR QUANTITY OF CONDUITS.

TYPICAL TRENCH DETAIL
NOT TO SCALE

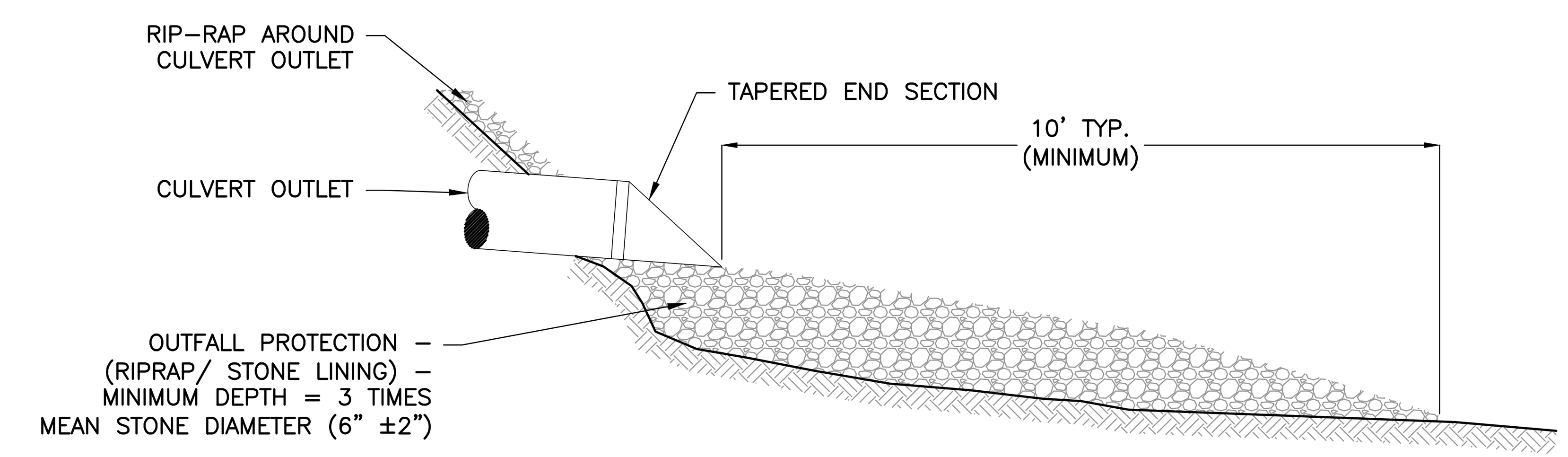


TYPICAL STABILIZED CROSS SECTION FOR EXISTING TRAILS
NOT TO SCALE

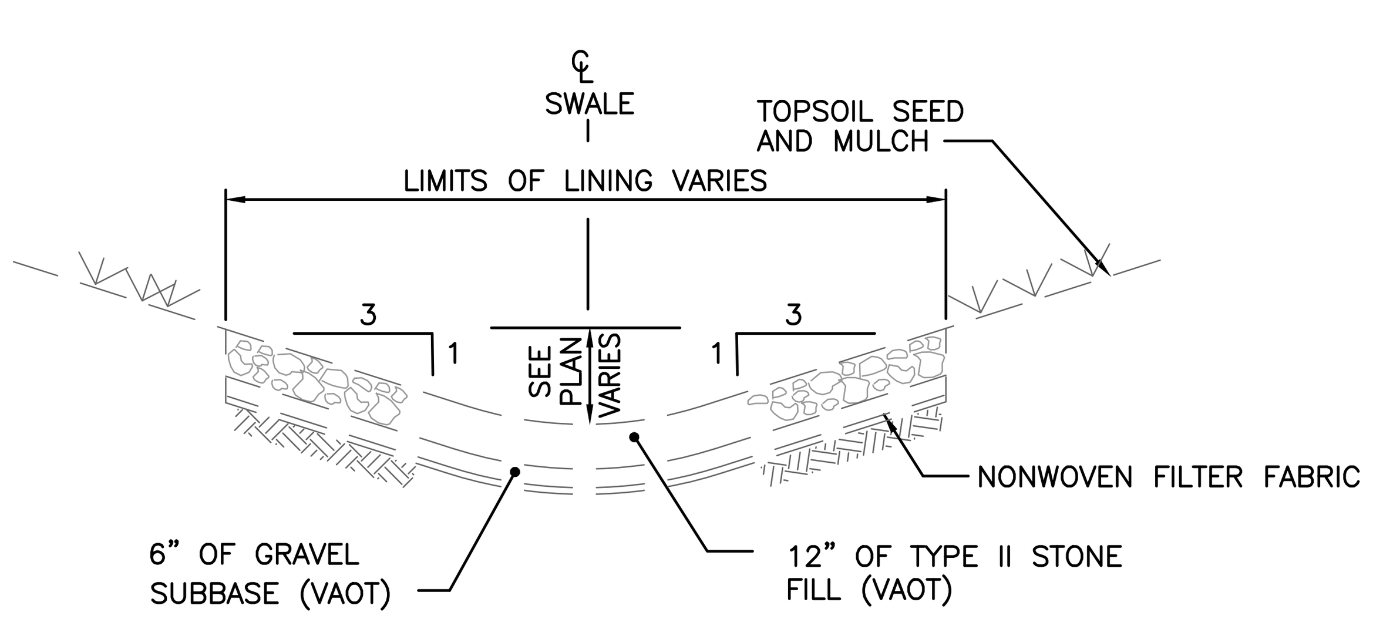
NOTES:
1. AREAS OF WEAK SOILS SHALL BE IMPROVED TO REDUCE EROSION AND TO PROVIDE STABLE WORKING AREAS.
2. EXCAVATE SURFACE MATERIAL.
3. INSTALL FILTER FABRIC (MIRAFI 500x OR EQUAL) PER MANUFACTURER'S INSTRUCTIONS.
4. BACKFILL WITH A MINIMUM 8" CRUSHED GRAVEL.
5. SEED AND MULCH ALL EXPOSED SOILS AS SOON AS FEASIBLE.
6. CONTRACTOR TO FOLLOW STATE OF VERMONT LOW RISK HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL, SEE SHEETS 13 AND 14.



WATERBAR DETAIL (IF REQUIRED)
NOT TO SCALE

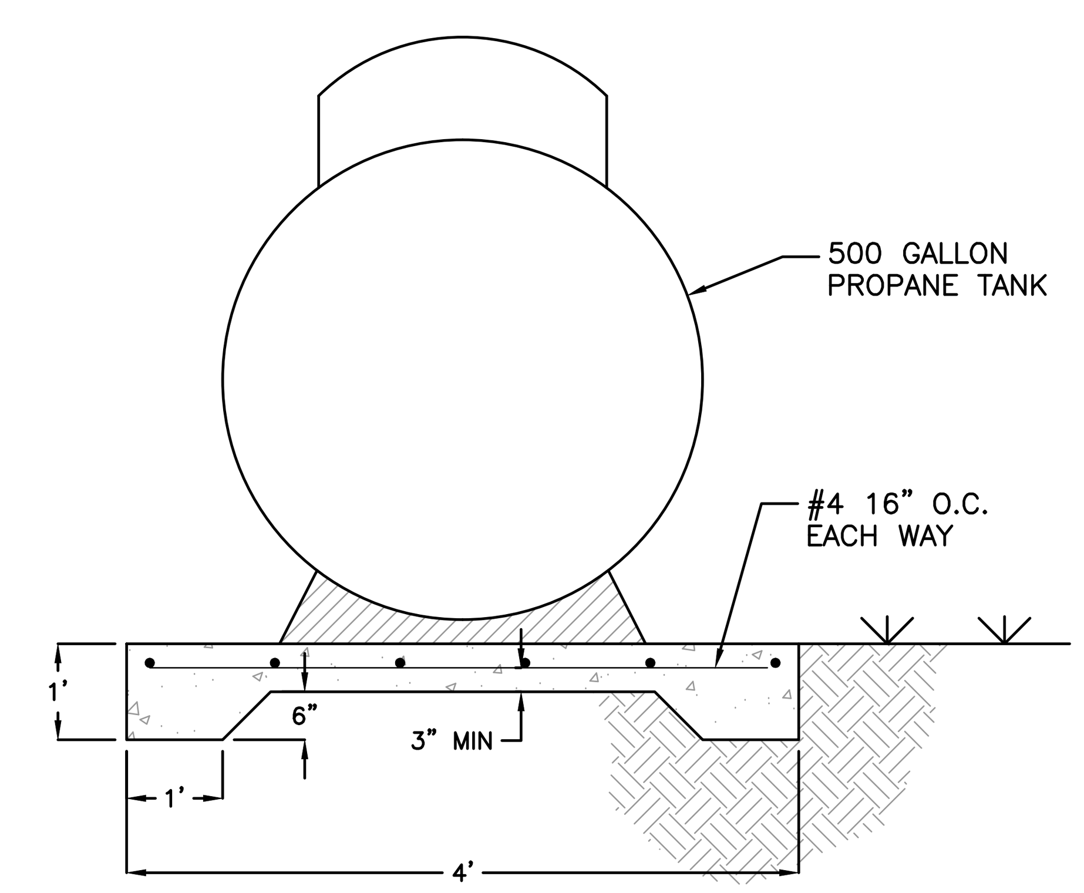


CULVERT OUTLET DETAIL (IF REQUIRED)
NOT TO SCALE

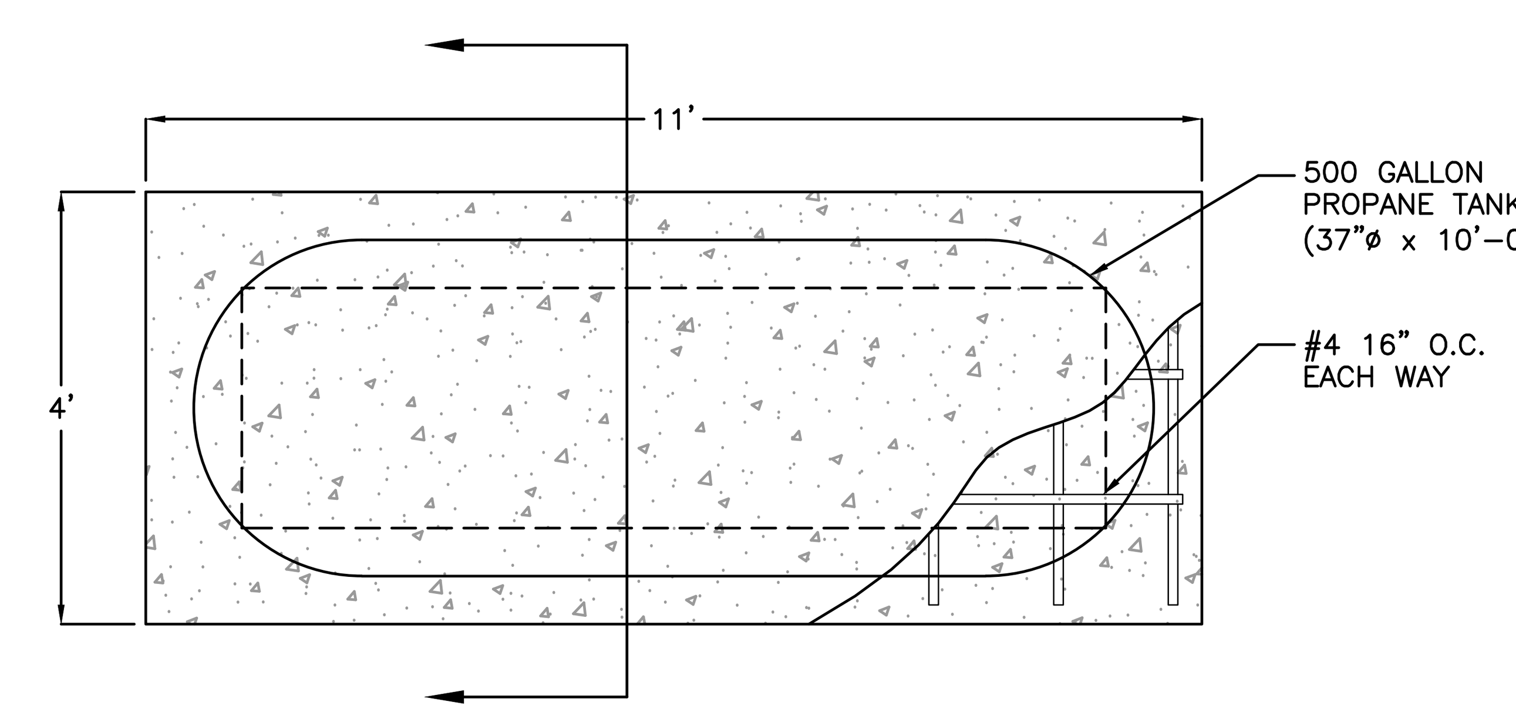


NOTE: ALL SWALES GREATER THAN 5% SHALL BE STONE LINED

TYPICAL STONE LINED SWALE (IF REQUIRED)
NOT TO SCALE



ABOVE GROUND PROPANE TANK (IF REQUIRED)
NOT TO SCALE



PROPANE TANK CONCRETE PAD DETAIL (IF REQUIRED)
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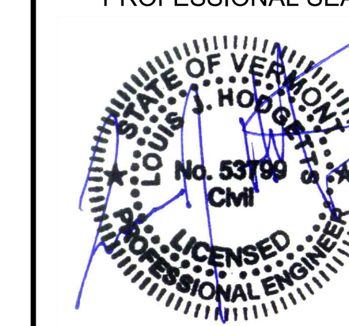

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verizon wireless

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MARSHFIELD VT

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SHEET TITLE

CIVIL DETAILS

CONSTRUCTION PLANS

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CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
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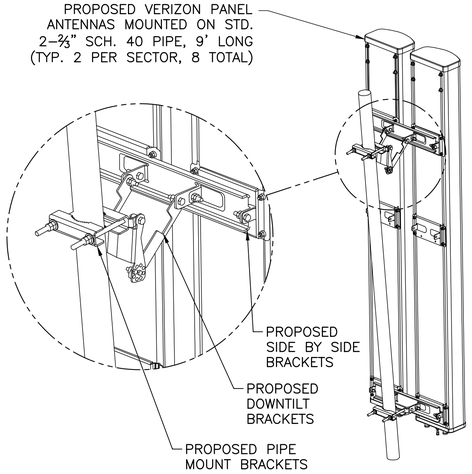
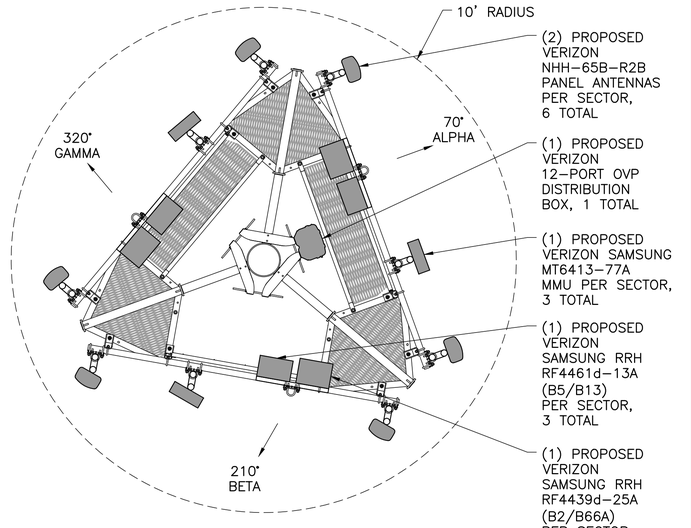


ANTENNA MOUNT DETAIL
NOT TO SCALE

12 PORT OVP DISTRIBUTION BOX DETAIL
NOT TO SCALE

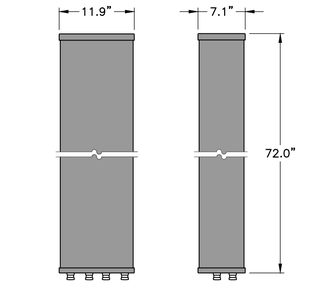


PROPOSED ANTENNA PLAN VIEW

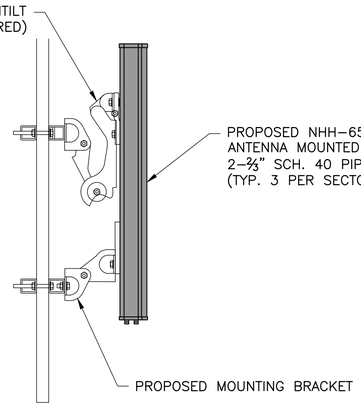
GRAPHIC SCALE

3 0 1.5 3 6 12

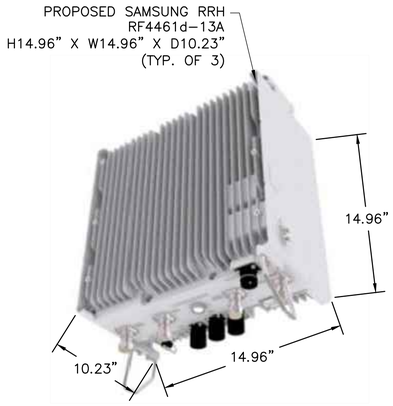
(IN FEET)
1 inch = 3 ft. AT 24X36
HALF SIZE AT 11X17



PANEL ANTENNA DETAILS
NOT TO SCALE



PROPOSED ANTENNA DETAILS
NOT TO SCALE



SAMSUNG RRH B5/B13
RF4461d–13A 700/850 DETAIL
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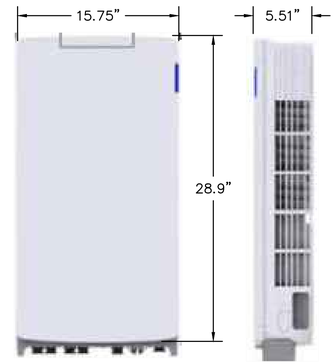
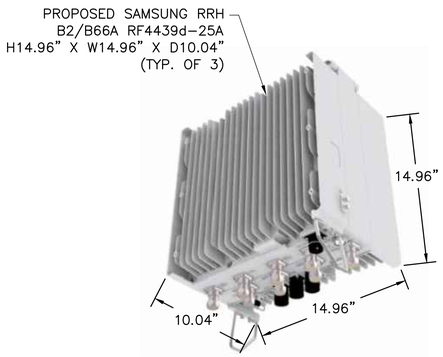


SAMSUNG MT6413–77A
PANEL ANTENNA DETAIL
NOT TO SCALE



SAMSUNG RRH B2/B66A
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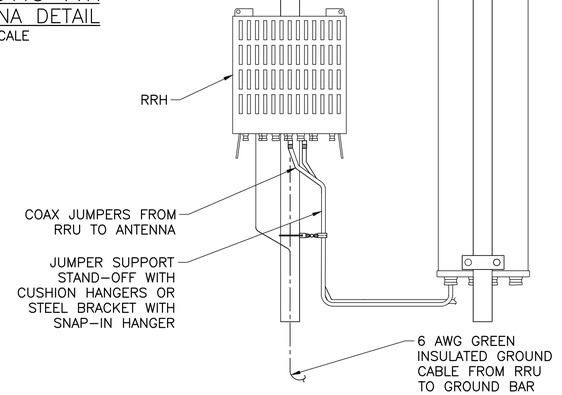
NOT TO SCALE



RRH DETAIL
NOT TO SCALE

ANTENNA & EQUIPMENT SUMMARY

DESCRIPTION	HEIGHT (in)	WIDTH (in)	SURFACE AREA (sq. ft.)	WEIGHT OF UNIT (lbs)	NUMBER OF UNITS	TOTAL SURFACE AREA (sq. ft.)	EXPOSED SURFACE AREA (sq. ft.)	TOTAL WEIGHT (lbs)
ANTENNA: NHH–65B–R2B	72.00	11.90	5.95	56.93	6	35.70	35.70	341.58
MMU: SAMSUNG MT6413–77A	28.90	15.75	3.16	66.82	3	9.48	9.48	200.46
RRH: SAMSUNG RF4461d–13A B5/B13 700/850	14.96	14.96	1.55	79.10	3	4.65	0.00	237.30
RRH: SAMSUNG RF4439d–25A B2/B66A PCS/AWS	14.96	14.96	1.55	97.80	3	4.65	0.00	293.40
12–PORT OVP	29.50	16.50	3.38	32.00	1	3.38	0.00	32.00
SITE PRO1 F3P–12W (WALKWAY)	N/A	N/A	N/A		1	N/A	N/A	
SITE PRO1 F3P–HRK12 (RAIL KIT)	N/A	N/A	N/A		1	N/A	N/A	
ANTENNA MOUNTING PIPE	N/A	N/A	N/A		12	N/A	N/A	
(2) 6x12 HYBRID CABLES					TOTAL =		45.18	1104.74

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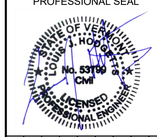

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verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

ANTENNA DETAILS

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

C-11

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Low Risk Site Handbook
for
Erosion Prevention and Sediment Control

VERMONT
ENVIRONMENTAL CONSERVATION
February 2020

Low Risk Site Handbook for Erosion Prevention and Sediment Control

A construction stormwater discharge permit must be obtained for construction activity that results in total land disturbance of equal to or greater than 1 acre, including construction activities where disturbance is less than 1 acre, but is part of a larger common plan of development, if the larger development will ultimately result in the disturbance of 1 or more acres.

Vermont Construction General Permit (CGP) 3-9020 guides an applicant in assessing the potential risk to water quality from the proposed construction activity and categorizes the project activity as Low Risk, Moderate Risk, or that which requires an Individual Permit.

The practices in this handbook serve as the required Erosion Prevention and Sediment Control Plan for construction activity that is determined to be "Low Risk" under CGP 3-9020.

Table of Contents

Section 1
Introduction

What is erosion prevention and sediment control?

Stormwater runoff carrying sediment into streams, lakes, and wetlands is a large contributor to surface water quality problems in Vermont. Sediment discharges from unmanaged construction sites can adversely impact aquatic habitat, and may have lasting impacts on fish and other aquatic organisms.

On most construction sites, the existing vegetation that holds the soil in place and protects it from the erosive forces of rain and runoff is removed, leaving large areas of soil exposed. During rainfall or snowmelt, the exposed soil may be easily eroded and transported to nearby streams, lakes, or wetlands*.

To prevent this from happening, a small number of practices to prevent erosion and contain soil on the construction site must be used. The most effective approach to prevent a sediment discharge is temporary and final stabilization of exposed soils. Controls for sediment laden runoff are necessary at times, but should not be used as the primary means of prevention.

*Projects involving work within a jurisdictional (perennial) waterway for stream alteration, please contact your regional River Management Engineer for technical and permitting assistance.

*Projects involving work within or adjacent to jurisdictional lakes or buffers, please contact your regional Lakes and Ponds permitting staff for technical and permitting assistance.

*Projects involving work within jurisdictional wetlands or buffers, please contact your regional Wetland Ecologist for technical and permitting assistance.

Section 2
The Requirements

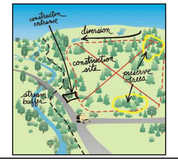
1. Demarcate Limits of Disturbance

Purpose:

Delineating the site will help to: limit the area of disturbance to only what is necessary for construction, prevent unauthorized disturbance, preserve existing vegetation, and limit erosion potential on the site.

Requirement:

You must physically mark the limits of construction activity using one of the methods described below.



How to comply:

Before initiating any earth disturbing activities, install a perimeter fence, orange barrier tape, or flagging on stakes or trees to physically demarcate the approved limits of earth disturbance.

Properly placed barrier tape marks the boundaries and limits of construction on this site.

2. Pollution Prevention

Purpose:

Many construction sites require storage of chemicals and materials that have detrimental effects if released into our waterways. A storage plan for these potential pollution sources as well as a spill prevention and clean up plan are required to mitigate these risks.

Requirement:

Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained in accordance with the following requirements.

How to comply:

1. Minimize the exposure of the following to precipitation and to stormwater:
   - building materials,
   - building products,
   - construction wastes,
   - trash,
   - landscape materials,
   - fertilizers,
   - pesticides,
   - herbicides,
   - detergents,
   - sanitary waste, and
   - other materials present on the site.
2. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

3. Limit Concurrent Earth Disturbance

Purpose:

Limit the amount of soil exposed at one time to reduce the potential erosion on the construction site.

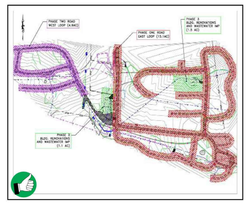
Requirement:

The maximum area of concurrent earth disturbance is specified on the site's written authorization to discharge. Earth disturbance at any one time cannot exceed the maximum concurrent disturbance identified in the authorization. Areas that are at final stabilization or that have been temporarily stabilized in accordance with Section 4 of this handbook, are not counted toward the maximum concurrent disturbance area.

How to comply:

Plan ahead and phase the construction activities to ensure that no more than the permitted maximum concurrent acreage is disturbed and unstabilized at one time.

Be sure to properly stabilize exposed soil using one of the methods introduced in Section 4 of this handbook before beginning work in a new section of the site.



4. Site Stabilization

Purpose:

Seeding and mulching, applying erosion control matting, and hydroseeding are all methods to temporarily stabilize exposed soil and prevent soil erosion prior to vegetative growth. Mulches and matting protect the soil surface while grass is establishing. Areas of earth disturbance may also be stabilized with stone, such as rip-rap or gravel, or other impervious surfaces such as pavement and concrete.

Requirements for Temporary Stabilization:

All areas of earth disturbance must have temporary or final stabilization within 14 days of initial disturbance, as stated in the project authorization. After this time, disturbed areas must be temporarily stabilized or permanently stabilized in advance of any runoff producing event. A runoff producing event is an event that produces runoff from the construction site.

The following exception applies:

- Temporary stabilization is not required if the work is occurring in a self-contained excavation (i.e. no outlet) with a depth of 2 feet or greater (e.g. house foundation excavation, utility trenches), provided any dewatering, if necessary, is conducted in accordance with Part 13.

How to comply:

As required by the authorization, temporary stabilization for areas of earth disturbance shall be completed utilizing one or more of the methods below:

Hay or Straw Mulch

Mulching Rates

April 16 - Oct. 14 – Hay or Straw*: 1 inch deep (1-2 bales/1000 s.f.)

Oct. 15 - April 15 – Hay or Straw*: 2 inch deep (2-4 bales/1000 s.f.)

*seed may also be incorporated

Excellent application of hay mulch. Good mulch cover and perimeter control around soil stockpile.

Wood Chip Mulch or Stump Grindings

Cover entire area with 2-7 inches or more of wood chip mulch or stump grindings.

Good application of wood chip mulch and stump grindings.

Hydroseed

As per manufacturer's instructions.

- Must include mulch component
- Not acceptable stabilization for winter construction period

Excellent application of hydroseed with a mulch component. Entire soil surface has been covered and is temporarily stabilized.

Poor hydroseed application. Not applied at the appropriate rate, soil not prepared, and very little mulch component in mix.

Requirements for Dust Control:

Construction roads, access points, and other disturbed areas subject to surface dust movement and dust blowing during dry periods where off-site damage may occur if dust is not controlled shall be sprayed with water to prevent dust mobilization. **Chemical applications, including the use of chloride, shall not be applied without written approval from the VT DEC.**

Requirements for Final Stabilization:

All areas of disturbance must have permanent stabilization within 48 hours of reaching final grade.

- Bring the site or sections of the site to final grade as soon as possible after construction is completed. This will reduce the need for additional sediment and erosion control measures and will reduce the total disturbed area.
- Prepare bare soil for seeding by grading the top 4 to 6 inches of soil and removing any large rocks or debris, and apply seed per suppliers specifications.

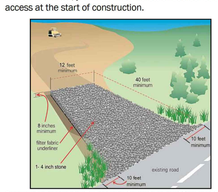
5. Stabilized Construction Access

Purpose:

A stabilized construction access helps remove mud and sediment from vehicles and equipment to prevent tracking onto streets.

Requirements:

If there will be any vehicle or equipment traffic off of the construction site, you must install a stabilized construction access at the start of construction.



Construction access detail. Access pad must keep mud from tracking onto both paved and gravel roads.

How to install:

Rock Size: Use a mix of 1 to 4 inch stone
Depth: 8 inches minimum
Width: 12 feet minimum, flared at road for vehicle turning
Length: 40 feet minimum (or length of driveway for residential projects, if shorter)
Geotextile: Place filter cloth under entire stone bed

Maintenance:

Redress with clean stone or scarify to open voids as required to keep sediment from tracking onto the street.

Good stabilized construction access. Adequate width to accommodate construction traffic and prevent mud tracking offsite. Ensure that the pad is 8 inches deep and 40 feet long.

Poor construction access. Rock pad is poorly constructed; rock is too small. Filter fabric is required under the 1 - 4 inch rock. Mud should not be tracked onto street.

- Where sediment has been tracked-out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day.
- Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal.
- You are prohibited from hosing or sweeping tracked-out sediment into any stormwater conveyance, storm drain inlet, or water of the state.

6. Divert Upland Runoff

Purpose:

Diversion berms intercept stormwater runoff contributing from above the construction site and direct it around the disturbed area. This prevents offsite runoff from entering the construction site, thus reducing the potential for erosion and reducing the drainage area contributing to the site.

Requirements:

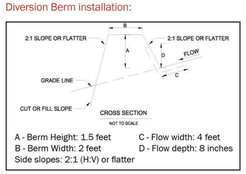
If stormwater runoff contributes to the construction site from upslope areas and the site meets the following two conditions, you are required to first install a diversion berm and stabilized swale before disturbing any additional soil.

1. One or more acres of soil will be disturbed at any one time.
2. Average slope of the disturbed area is 20% or steeper.*

* See page 63 for slope calculations.

Berms and ditches divert upslope contributing runoff around construction sites and reduce erosion and sedimentation problems. Stabilize berms and ditches after construction.

Diversion Berm installation:



A - Berm Height: 1.5 feet
B - Berm Width: 2 feet
C - Flow width: 4 feet
D - Flow depth: 8 inches
Side slopes: 2:1 (H:V) or flatter

1. Construct berm to the minimum specification above.
2. Compact the berm with a shovel or earth-moving equipment.
3. Seed and mulch berm or cover with erosion control matting immediately after installation.
4. Stabilize the flow channel with seed and mulch or erosion control matting. Line the channel with 4 inch stone if the channel slope is greater than 20%.
5. Ensure the berm drains to an outlet stabilized with riprap. Ensure that there is no erosion at the outlet.

6. The diversion berm shall remain in place until the disturbed areas are completely stabilized.

Good construction, seeding, and stabilization of diversion berm. Note that diversion ditch is lined with grass on flatter part of slope, and with rock on steeper part.

7. Install Perimeter Controls

Purpose:

Silt Fence and Erosion Control Berms intercept runoff and allow suspended sediment to settle or filter out. Filter Socks and Straw Wattles also filter construction runoff and are acceptable for use in specific situations.

Silt Fence, Erosion Control Berms, Filter Socks and Straw Wattles are all acceptable perimeter controls based on site specific conditions. Permittee(s) must ensure the right practice is selected for erosion prevention and sediment control.

Requirements:

Perimeter controls must be installed:

- On the downhill side of the construction activities
- Between any ditch, swale, storm drain, or surface water and the disturbed soil
- Perimeter controls not labeled as biodegradable shall be removed once the drainage area has reached final stabilization

** Hay bales must not be used exclusively as sediment barriers due to their tendency to degrade and fall apart and may only be used in support of other required practices.*

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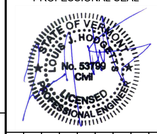

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verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

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MARSHFIELD, VT
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SHEET TITLE

EPSC
LOW RISK
HANDBOOK

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

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How to Comply:

Select and install a perimeter control from the following options: Silt Fence, Erosion Control Berms, Filter Socks, or Straw Wattles.

Where to place:

- Place perimeter controls on the downhill side of disturbed soil. If space is available, place perimeter control 10 ft from the bottom of the slope, otherwise place along the contour at the bottom of the slope.
- Ensure the perimeter control catches all runoff from distrubed soil.
- Maximum drainage area is ¼ acre for 100 feet of silt fence and erosion control berm.
- Install perimeter controls across the slope (not up and down slope)
- Install multiple rows of perimeter control on long slopes to intercept flow.
- Do not install perimeter controls across ditches, channels, or streams.
- Maximum slope length (in feet) above a filter sock or straw wattle:

Slope (%)	Sock Diameter (in)			
	12"	18"	24"	32"
<5	225	250	275	325
5-10	125	150	200	275
10-20	65	70	130	150
20-25	50	55	100	120
25-33	40	45	60	75
>33	25	30	35	50

Slope	Straw Wattle (12")
<6:1	50
6:1-4:1	25
4:1-2:1	20
2:1-1:1	10
>1:1	5

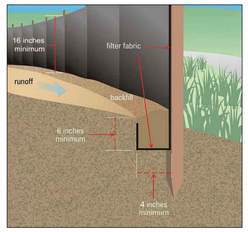
Perimeter Control Construction Specifications

Silt Fence

A temporary barrier of geotextile fabric installed on the contours across a project site to intercept sediment laden runoff from small drainage areas of disturbed soil.

Silt Fence Installation:

- Dig a trench 6 inches deep across the slope
- Unroll silt fence along the trench
- Ensure stakes are on the downhill side of the fence
- Join fencing by rolling the end stakes together
- Drive stakes in against downhill side of trench
- Drive stakes until 16 inches of fabric is in trench
- Push fabric into trench; spread along bottom
- Fill trench with soil and pack down
- Gravel can be used to create ground contact with filter fabric when bedrock, ledge, or nearby tree roots do not allow for trenching. (A secondary perimeter control can be effective in these locations as well.)



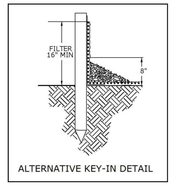
Silt Fence Maintenance:

- Remove accumulated sediment before it is halfway up the fence.
- Ensure that silt fence is trenched in ground and there are no gaps.
- Replace any silt fence that is torn, ripped, or otherwise damaged that is no longer effective.

Good use of J-hook in silt fence to trap sediment in water running along the fence. Sediment must be removed before it reaches halfway to top of fence.

Poor installation of silt fencing. Silt fence must be trenched in along bottom. Hay bales are not approved as sediment barriers.

Excellent installation of reinforced silt fence and j-hooks in front of a stone-lined drainage channel.



Erosion Control Berms

Erosion control berms are comprised of a dense mixture of intertwining wood fragments and grit that form a stable, long lasting mulch. Common sources include stump grindings, and aged wood waste.

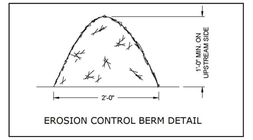
Erosion Control Berm Installation:

- Stump grindings from land clearing are an excellent source of material for erosion control berms, and may be readily produced when the area to be developed is forested.
- Erosion control berms are effective on frozen ground, rock outcrops, and forested areas with heavy root cover. It may be necessary to pack down or remove vegetation to prevent the creation of voids or bridges which will allow berm washout and pass sediment laden water offsite.
- The erosion control berm should be a minimum of 1 foot tall and 2 feet wide. On longer or steeper slopes a larger berm may be necessary.

Erosion Control Berm Maintenance:

- Erosion control berms must be redressed and reshaped as necessary to ensure that sediment doesn't accumulate more than halfway up the berm face.

The erosion control berm above is allowing for both ponding and filtering of stormwater.



Filter Socks

A manufactured tube made of either a synthetic material or an organic fiber which is filled with erosion control mix or other finely shredded organic material such as coconut fiber. They are an excellent practice for slowing runoff on long open slopes and for use around stockpiles.

Filter Sock Installation:

- Filter socks are best used for small areas of disturbance, at the base of stockpiles, across slope contours and across paved areas.
- Full contact with the ground is critical for filter socks to be effective and to prevent bypass. A trench 2"-3" deep shall be dug along the path of the filter sock, with the exception of installations across paved areas.
- Most applications will require staking at 10 ft intervals, which should help both keep the filter sock in place and push it downward for maximum contact with the ground.

Filter Sock Maintenance:

- Accumulated sediment should be removed and placed in an upland location when material reaches half of the filter sock height.
- Filter socks can be reshaped if they become flattened or caked in sediment.

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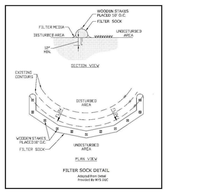


Good use of filter socks along a slope to slow runoff velocity.

Straw Wattles

Straw wattles are similar to filter socks, but with less density due to straw filling material. These can be used in successive rows to slow sheet flow and collect sediment on long slopes or around the base of soil stock piles, but are not appropriate for application on impervious surfaces such as asphalt, concrete, or ledge.

Straw Wattle Installation:

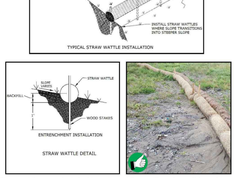
Straw Wattles are best used for small areas of disturbance, at the base of stockpiles,and across slope contours.

- Full contact with the ground is critical for straw wattles to be effective and to prevent short circuiting. A trench 2"-3" deep shall be dug along the path of the wattle.
- Straw wattles shall be secured with 18-24" stakes every 3-4' and with a stake at each end. Stakes shall be driven through the middle of the wattle and perpendicular to slope, leaving at least 2-3" of stake extending above wattle. In limited cases, wattles may be secured without stakes by use of sandbags if staking is not feasible.
- Adjacent wattles shall tightly abut or overlap.

Straw Wattle Maintenance:

- Accumulated sediment should be removed and placed in an upland location.

- Straw wattles can be reshaped if they become flattened or caked in sediment.



Straw wattle properly staked in and providing settling of runoff from this shallow slope. Note a clean wattle was placed in front of an older less effective wattle.

8. Storm Inlet Protection

Purpose:

Existing or new storm inlets on construction sites constitute a site perimeter and must be protected from sediment laden runoff. The practices below allow stormwater to settle and filter through the practice and not bypass the inlet entirely.

Requirements:

Stormwater inlets shall be 4 inches above grade or an acceptable inlet control/protection should be installed.

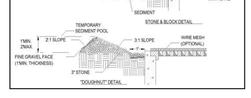
Inlet Protection Installation:

Proprietary Inlet Protection:

Shall provide for storage and removal of sediment and be sized appropriately for the drainage area, while allowing stormwater to filter through. These may be used if installed and maintained in accordance with the manufacturer's specifications.

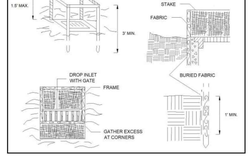
Stone and Block Inlet Protection:

Concrete blocks placed around an inlet with a circle of filtering stone sloped against the blocks.



Filter Fabric and Stone Inlet Protection:

Vertical filter fabric installed around drop inlet with stone around fabric for stormwater filtering and creating ground contact with filter fabric. Alternatively, fabric may be buried below ground.



Use of stone inlet protection with the incorporation of a straw wattle in place of cinder blocks for the stone and block specification.

9. Water Bars

Purpose:

Some sites may benefit from the use of water bars on the construction site. When installed these may capture and redirect runoff to a stable low gradient location. Water bars limit the erosive velocity of water by diverting surface runoff at pre-designed intervals.

Requirements:

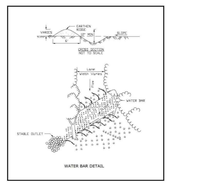
These can be constructed per the following detail, with side slopes no steeper than 4:1 where vehicles cross with a minimum design height of 12 inches, measured from channel bottom to ridge top.

Water Bar installation:

Water bars should have stable outlets, either natural or constructed. The spacing should follow Table 1.

Table 1. Water Bar Spacing

Slope (%)	Distance between structures (ft)
< 5	125
5 - 10	100
10 - 20	75
20 - 35	50
> 35	25



Good installation of a water bar along an access road.

10. Slow Down Channelized Runoff

Purpose:

Stone check dams reduce erosion in drainage channels by slowing down the stormwater flow.

Requirements:

If there is a concentrated flow (e.g. in a ditch or channel) of stormwater on your site, then you are required to install stone check dams. Hay bales and silt fence must not be used as check dams.

Check Dam installation:

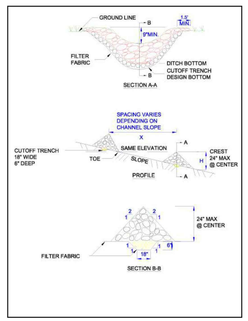
- **Height:** No greater than 2 feet. Center of dam should be 9 inches lower than the side elevation
- **Side slopes:** 2:1 or flatter (see p.63 for slope calculation)
- **Stone size:** Use a mixture of 2 to 9 inch stone; the larger stone should act as armoring, while the smaller stone helps to filter the channelized runoff. The small stone should be placed primarily in the interior of the check dam and the large stone should be placed in an armoring layer on the outside.
- **Width:** Dams should span the width of the channel and extend up the sides of the banks

- **Spacing:** Space the dams so that the bottom (toe) of the upstream dam is at the elevation of the top (crest) of the downstream dam. This spacing is equal to the height of the check dam divided by the channel slope.

Spacing (in feet) = Height of check dam (in feet) / Slope in channel (ft/ft)

Check Dam Maintenance:

- Correct all observed damage immediately after every runoff event.
- Remove all sediment accumulated behind the check dams and dispose of in an upland location.
- If significant erosion is observed between check dams, the channel shall be stone lined.



Good installation of rock check dams. The check dams should extend up the sides of the banks. Middle section should be lower than the sides. Clean out sediment as it accumulates.

Hay bales must not be used as check dams due to their high failure rates.

Rock Outlet Protection:

- Waterways or outlets with concentrated stormwater runoff shall be stabilized with riprap, proprietary stabilization product or permanent material. This additional stabilization is applicable in areas where the channel slope and velocity or soil type require additional stabilization.
- All outlets from concentrated stormwater flows will require a stabilized bed.
- Stone shall be sized so it is not mobilized during high flows.

The images on page 44 show the before and after of an eroding channel from a culvert outlet, stabilized with stone, to a small pool for energy dissipation at the bottom of the slope.

Before installing rock outlet protection

After installing rock outlet protection

11. Slope Stabilization

Purpose:

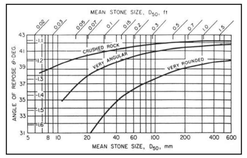
Surface covering designed to protect and stabilize an area prone to erosion where seeding and mulching may be inadequate, generally slopes 3:1 or greater. The erosion potential may be due solely to slope angle; however, a more gradual slope and poor soil structure can also require additional stabilization.

Requirements for Temporary Stabilization:

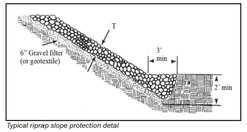
Use of one of the listed slope protection practices below on slopes 3:1 and greater or as needed on flatter slopes based on soil type.

Riprap: A layer of stone designed to protect and stabilize areas subject to erosion.

Stone rip-rap installed on an unstable slope with a stormwater outlet pipe along the slope.



Angle of repose of riprap stones (FHWA)



Typical riprap slope protection detal

Rolled Erosion Control Product:

A preformed protective blanket of straw or other plant residue, formed into a mat, with a supporting mesh framework on one or both sides. This mesh cannot be made of a material with welded joints.

Install blankets and mats vertically on long slopes. Unroll from top of hill and staple as you unroll it. Do not stretch blankets.

Erosion Control Matting:

Install per manufacturer's instructions.

Excellent stabilization of large slopes to limit the area of disturbance. Make sure to install erosion control matting within 48 hours of grading to ensure good contact between soil and mat.

IMPORTANT NOTE:

Rolled Erosion Control Product (RECP) materials have the potential to ensnare animals such as snakes and birds, which can lead to injury or fatality. This has been observed to be most problematic in products with a plastic mesh, whether biodegradable or not.

Accordingly, only woven and interlinked products are approved for use in RECP applications.

(See Tables 4.3 and 4.4 of the Vermont Standards & Specifications for Erosion Prevention and Sediment Control)

12. Winter Construction Requirements October 15 - April 15

Purpose:

'Winter construction' as discussed here, describes the period from October 15 through April 15, when erosion prevention and sediment control is significantly more difficult. There are specific requirements for sites that conduct earth disturbance during the defined Winter Construction Period and for sites where disturbed areas have not reached final stabilization by October 15.

Rains in late fall, thaws throughout the winter, and spring melt and rains can produce significant flows over frozen and saturated ground, greatly increasing the potential for erosion. A construction site can be managed to anticipate these conditions to prevent erosion and thus minimize the risk to water quality during this time period.

Requirements for Winter Shutdown:

For projects or areas of a site that will have completed earth disturbance activities prior to the winter construction period (October 15 through April 15), the following requirements must be adhered to:

1. For areas to be stabilized for the winter through the establishment of vegetation, seeding and mulching shall be completed no later than September 15 to ensure adequate growth and cover before the start of the winter period.

Stabilization and seeding of slopes before winter will reduce or eliminate erosion in the spring.

2. If seeding is not completed by September 15, additional non-vegetative protection must be used to stabilize the site for the winter period. Areas of disturbance not seeded and mulched by September 15 are required to temporarily stabilize by one of the following methods:
   - Implement Rolled Erosion Control Products (i.e. matting) over the areas of earth disturbance.
   - Apply a 2" mulch layer to areas of earth disturbance, equivalent to double the standard rate. Mulch should be tracked in open areas vulnerable to wind.
   - Seeding with winter rye is recommended to allow for early germination during wet spring conditions.

Requirements for Winter Construction

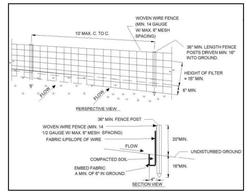
If construction activities involving earth disturbance continue into the winter construction period, the following requirements apply:

1. Enlarged access points, stabilized to provide for snow stockpiling.
2. Snow shall be managed with adequate storage and control of meltwater, requiring cleared snow to be stored down slope of all areas of disturbance and out of stormwater treatment structures.

3. For areas of disturbance within 100 ft of a waterbody, the following must be installed across the slope, down gradient of the earth disturbance:
   - a combination of one practice from group A placed in front of a practice from group B, or
   - two group B practices, or
   - a single row of Reinforced Silt Fence

Group A	Group B
Filter Socks	Silt Fence
Straw Wattles	Erosion Control Berms

Use of a combination of silt fence and filter sock in place of reinforced silt fence for winter construction perimeter control requirements in proximity to a water resource area.



4. Drainage structures must be kept open and free of snow and ice dams.
5. Silt fence and other practices requiring earth disturbance must be installed ahead of frozen ground.
6. Mulch used for temporary stabilization must be applied at a minimum of 2 inches with an 80-90% cover.

7. To ensure cover of disturbed soil in advance of a precipitation or melt event, areas of disturbed soil must be stabilized prior to any runoff producing event.
   - Stabilization is not required if the work is occuring in a self-contained excavation (i.e. no outlet) with a depth of 2 feet or greater (e.g. house foundation excavation, utility trenches), provided any dewatering, if necessary, is conducted in accordance with Part 13.
8. Prior to stabilization, snow or ice must be removed to the extent practicable.
9. Use stone to stabilize areas such as the perimeter of buildings under construction or where construction vehicle traffic is anticipated. Stone paths should be sufficient width to accommodate vehicle or equipment traffic.

13. Dewatering Activities

Purpose:

To minimize and prevent discharges of sediment as a result of dewatering activities.

Requirements:

Stormwater and groundwater from dewatering activities shall be uncontaminated and shall be filtered or passed through a sediment trapping device, or both, and routed in a manner that does not result in visually turbid discharges to waters. Pump intake for dewatering must be at or near the surface of the ponding area to prevent disturbance of the settled material. Visually turbid water must not be pumped directly to storm drains or other conveyance that leads to waters without implementing one or more of the practices described below.

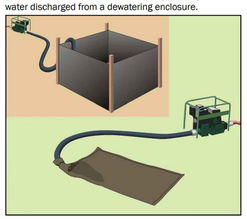
How to comply:

Implement one or more of the following practices when dewatering:

- Implement sock filters or sediment filter bags on dewatering pump discharge hoses or pipes.
- Route dewatering pump into silt fence enclosures or into staked hay bale enclosures lined with fabric.

- Route dewatering pump to vegetated area at least 50 feet from surface waters and at a slope no greater than 5%.

Remove accumulated sediment after the water has dispersed or infiltrated and stabilize the area with seed and mulch as necessary. A sufficient area of vegetation greatly improves the efficacy of filtering/settling of turbid water discharged from a dewatering enclosure.



Water is pumped from the construction site into a silt fence enclosure on a vegetated area or into a sock filter away from waterways.

14. Concrete Washout

Purpose:

Concrete wash water often contains a slurry of heavy metals, can be caustic, and has a high pH. As a result, concrete washwater is not a permitted discharge.

Requirements:

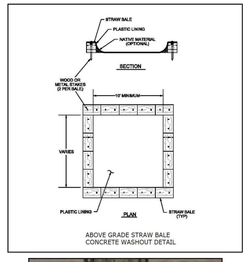
Concrete washwater and excess washout concrete should go in a lined washout. This washout should be accessible to the cement truck and at least 50 feet away from stormwater inlets and surface water.

Concrete Washout Installation:

If cement washout is going to occur on site, a lined concrete washout as shown below shall be used onsite. Care should be given to assure that the washout does not overtop during a storm event. Proprietary lined and contained concrete washout basins may also be utilized in accordance with manufacturer's specifications.

Concrete Washout Maintenance:

Concrete washout shall be pumped to a concrete truck as necessary, for disposal or reuse at a batch plant. Washout may also be allowed to evaporate/harden for disposal in accordance with all applicable local, state, and federal regulations.



ABOVE GRADE STRAW BALE CONCRETE WASHOUT DETAIL

15. Permanent Controls

Permanent stormwater treatment practices are constructed to maintain water quality, preserve existing water table elevations, prevent downstream flooding, and are often required for a project under a Vermont operational stormwater discharge permit applicable to the construction or redevelopment of impervious surfaces.*

Permanent Stormwater Treatment Practices (STPs) include infiltration and filtering practices as well as detention ponds and treatment wetlands. **It is critical that infiltration practices do not receive runoff until the site area has reached final stabilization.**

The outlet of permanent controls that are used as temporary storage and sediment basins during construction constitutes a potential discharge point and therefore must be managed to minimize and prevent sediment laden stormwater discharges. These practices will often need to be reshaped to meet the operational design criteria for volumes, grades and geometry once final grading and stabilization has occurred.

*An impervious surface is a manmade surface, including, but not limited to, paved and unpaved roads, parking areas, roofs, driveways, and walkways, from which precipitation runs off rather than infiltrates.

Infiltrating stormwater practices such as this bioretention system should be kept offline until the drainage area has been fully stabilized.

Install all permanent stormwater treatment practices before constructing any impervious surfaces on site. This stormwater wetland treats stormwater runoff from the adjacent parking lot.

16. Inspection, Maintenance, and Discharge Reporting

Site inspections are required to ensure that all erosion prevention and sediment control practices are sufficient and functioning properly. Regular inspections and maintenance of practices will help to reduce costly repairs and minimize the risk to water quality from construction stormwater discharges.

Requirements:

Inspect the site at least once every 7 days and after every rainfall or snowmelt that results in stormwater runoff. Perform maintenance to ensure that practices are functioning according to the specifications outlined in this handbook.

In the event of a visibly turbid discharge from the construction site, you must take immediate action to inspect and maintain existing erosion prevention and sediment control practices. Additional erosion prevention and sediment control measures must be installed as necessary, including temporary stabilization, to minimize and prevent the discharge of sediment laden stormwater runoff.

If after maintaining and supplementing BMPs, a discharge of visibly discolored stormwater from the construction site to surface waters continues, the permittee is required to notify DEC within 24 hours.

While documentation of a routine inspection is not required, example inspection forms and forms for required discharge reporting are available at the Stormwater Program website. Permittees shall review Construction General Permit 3-9020 for all discharge reporting requirements.

- A copy of the Low Risk Site Handbook shall be kept on-site.
- Daily inspections are required from October 15 through April 15.

Section 3
Additional Resources

How to calculate slope:

Approximate Slope Conversions			
Steepness	**Percent**	**Slope ratio (ft/ft)**	**Degrees**
Very steep	100%	1:1	45°
Moderate	50%	2:1	27°
	33%	3:1	18°
	25%	4:1	14°
Slight	10%	10:1	6°
	5%	20:1	3°

How to estimate disturbance area:

1 acre = 43,560 square feet = 4,840 square yards

Area in acres (width in feet x length in feet)							
(w) x (l)	100	150	200	300	400	500
100	0.2	0.3	0.5	0.7	0.9	1.1
150	0.3	0.5	0.7	1.0	1.4	1.7
200	0.5	0.7	0.9	1.4	1.8	2.3
300	0.7	1.0	1.4	2.1	2.8	3.4
400	0.9	1.4	1.8	2.8	3.7	4.6
500	1.1	1.7	2.3	3.4	4.6	5.7

Acknowledgements

Some design details and standards were adopted from those provided by: Vermont Electric Power Company (VELCO), TRC Solutions, Connecticut Department of Transportation (CTDOT) and the New York Department of Environmental Conservation (NYDEC).

Vermont Department of Environmental Conservation
Watershed Management Division
1 National Life Drive
Montpelier, VT 05620-3522

dec.vermont.gov/watershed/stormwater

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PROFESSIONAL SEAL

NO.	DATE	DESCRIPTION	BY	CK'D
3	05-07-2025	REVISED IMPACT AREA CALCULATIONS	LJH	LJH
2	11-02-2023	REVISED LINE WORK TO BE OUTSIDE BUFFER	JWP	LJH
1	10-23-2023	ISSUED FOR BID	JWP	LJH

verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

EPSC
LOW RISK
HANDBOOK

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

C-14

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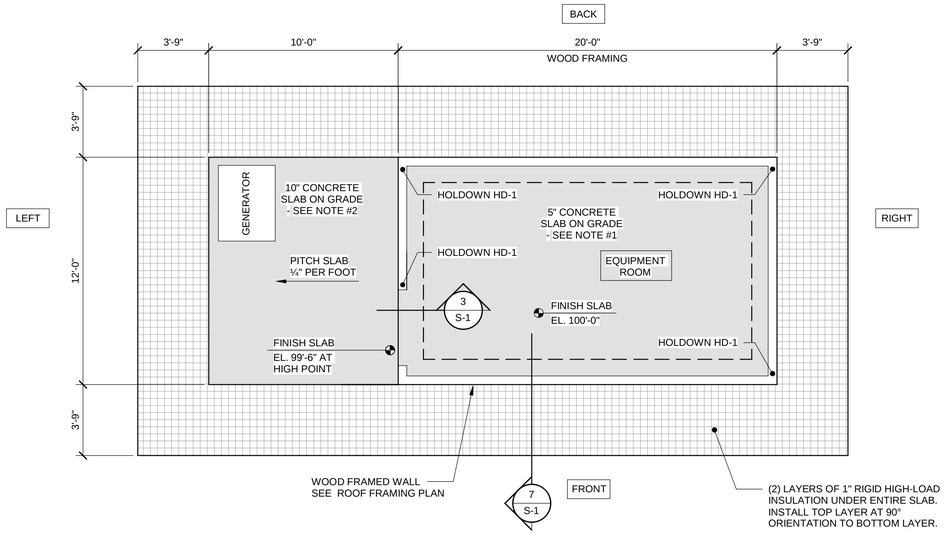
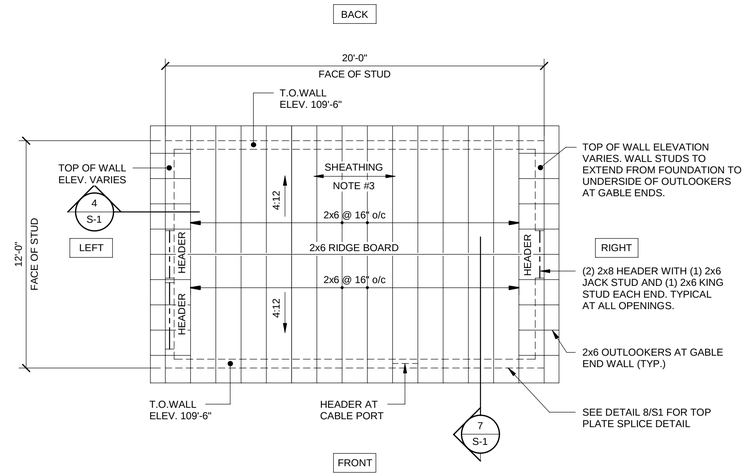


1 S-1 EQUIPMENT BUILDING FOUNDATION/FLOOR PLAN

1/4" = 1'-0"

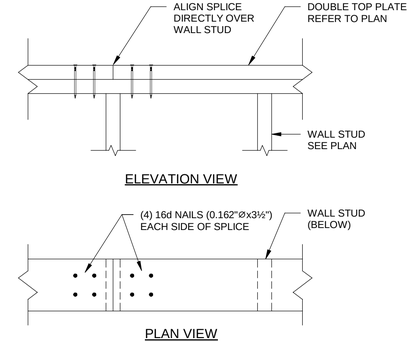
1. 5" SLAB ON GRADE. REINFORCE WITH #4 @ 16" ON CENTER, EACH WAY, PLACED 1¼" CLEAR FROM TOP.
2. 10" SLAB ON GRADE. REINFORCE WITH #4 AT 12" ON CENTER, EACH WAY, TOP AND BOTTOM. PLACE TOP BARS 1½" CLEAR FROM TOP OF SLAB, AND BOTTOM BARS 3" CLEAR FROM BOTTOM OF SLAB.
3. REFER TO MECH. DWGS. FOR LOUVER SIZES AND LOCATIONS.
4. SEE GENERAL NOTES FOR INTERIOR AND EXTERIOR CONCRETE SLAB FINISHES.
5. PROVIDE A ¾" CHAMFER AT EXPOSED EDGES OF 10" EXTERIOR SLAB.



2 S-1 EQUIPMENT BUILDING ROOF FRAMING PLAN

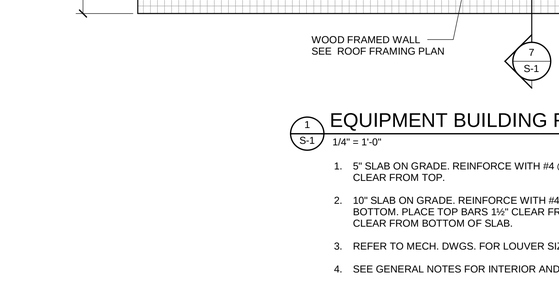
1/4" = 1'-0"

1. ALL EXTERIOR WOOD WALLS TO BE TYPE-A SHEARWALLS WITH 2x6 STUDS SPACED AT 16" ON CENTER. REFER TO SHEAR WALL SCHEDULE FOR FURTHER INFORMATION.
2. REFER TO HOLDOWN SCHEDULE FOR HOLDOWN INFORMATION AND TO FOUNDATION PLAN FOR HOLDOWN LOCATIONS AT RIGHT AND LEFT WALLS.
3. ROOF SHEATHING SHALL BE 5/8" APA RATED SHEATHING, FASTENED TO FRAMING WITH 8d COMMON WIRE NAILS (0.131"Øx2½") SPACED AT 6" ON CENTER AT PLYWOOD EDGES AND 12" ON CENTER AT INTERMEDIATE SUPPORTS.



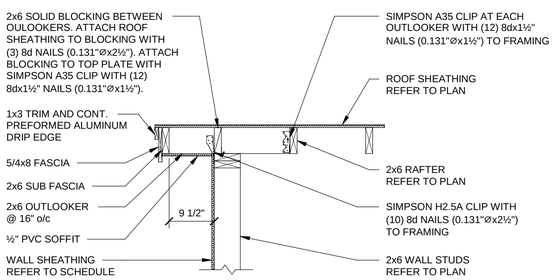
8 S-1 TOP PLATE SPLICE

1 1/2" = 1'-0"



3 S-1 EQUIPMENT BLDG. GENERATOR PAD DETAIL

3/4" = 1'-0"



4 S-1 GABLE END ROOF DETAIL

3/4" = 1'-0"

SHEAR WALL PANEL SCHEDULE

MARK	SHEATHING	NAILING			TIE-DOWN [2]	SILL ANCHORS
		SIZE [1]	EDGE	INTERMEDIATE		
TYPE-A	½" APA RATED, EXT. FACE	8d	6" o/c	12" o/c	(2) 2x6 SPF	½"ø BOLTS @ 32" o/c

NOTES:
1. FASTENERS: 8d COMMON (0.131"øx2½").
2. FASTEN EDGE CHORD MEMBERS TOGETHER WITH (8) 10d NAILS (0.148"x3"), DISTRIBUTED ALONG MEMBER HEIGHT.
3. INSTALL SOLID BLOCKING AT ALL UNSUPPORTED PLYWOOD PANEL EDGES.

5 S-1 SCHEDULE

1" = 1'-0"

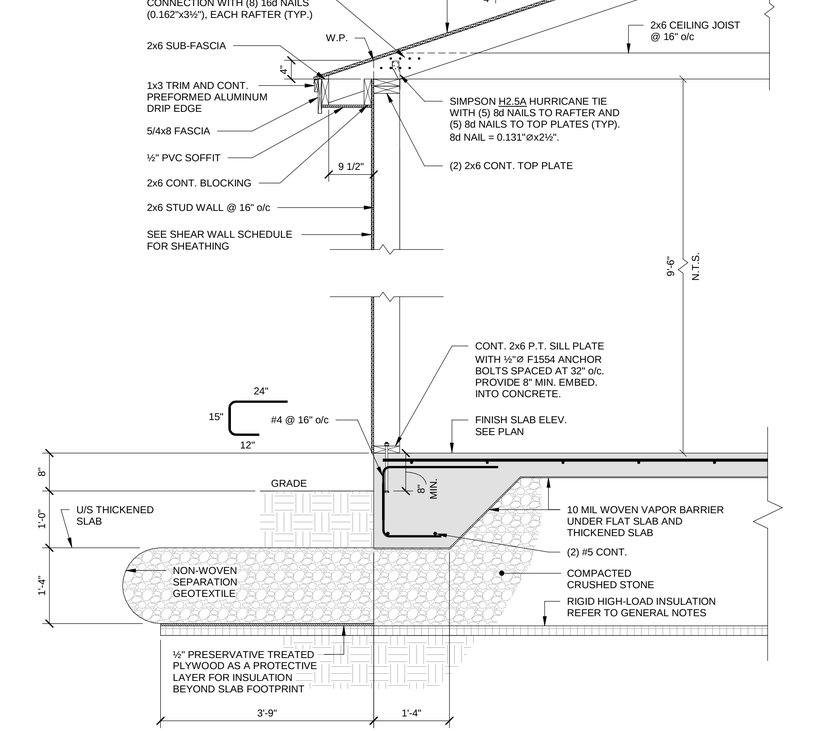
HOLDOWN / TENSION-TIE SCHEDULE

MARK	HOLDOWN	ANCHOR ROD	FASTENERS TO TIE-DOWN [4]	EMBEDMENT DEPTH [3] FOR CAST-IN-PLACE	EMBEDMENT DEPTH [5] FOR POST-INSTALLED
HD-1	HDU2-SDS2.5	5/8"ø	(6) SDS25212	8"	8"

NOTES:
1. REFER TO PLAN FOR HOLDOWN LOCATIONS.
2. HOLDOWN HARDWARE AND SDS SCREWS AS MANUFACTURED BY SIMPSON STRONG-TIE.
3. REFER TO DETAIL 5/S-2 FOR ANCHOR ROD ATTACHMENT. INSTALL NUT AT EMBEDDED END OF ANCHOR ROD FOR CAST-IN-PLACE OPTION. EMBEDMENT DEPTH LISTED IS TO TOP OF NUT.
4. SDS25212 = SIMPSON ¼"Ø x 2½" SDS SCREW.
5. POST-INSTALLED ANCHORS TO BE INSTALLED USING HILTI HIT-HY 200 EPOXY ADHESIVE. 5/8"Ø HILTI HAS-E THREADED ROD; MAINTAIN 2¾" MIN. EDGE DISTANCE TO EDGE OF CONCRETE.

6 S-1 SCHEDULE

1" = 1'-0"



7 S-1 EQUIPMENT BUILDING SECTION

3/4" = 1'-0"

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No. 8096
Structural II
LICENSED PROFESSIONAL ENGINEER
TIMOTHY W. DUAL

NO.	DATE	DESCRIPTION	BY	CK'D

verizonwireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD, VT

2264 U.S. ROUTE 2
MARSHFIELD, VT 05658

SHEET TITLE

EQUIPMENT BUILDING PLANS AND SECTIONS

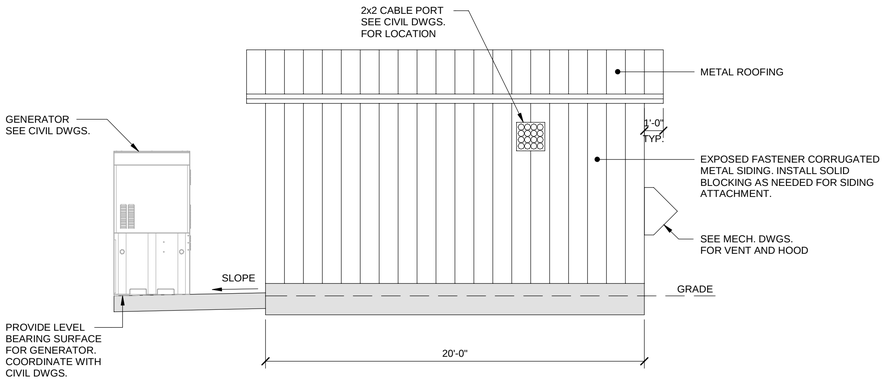
CONSTRUCTION PLANS

DRAWN BY	DATE
SAM	OCT. 2023
CHECKED BY	D&K PROJECT #
TWD	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

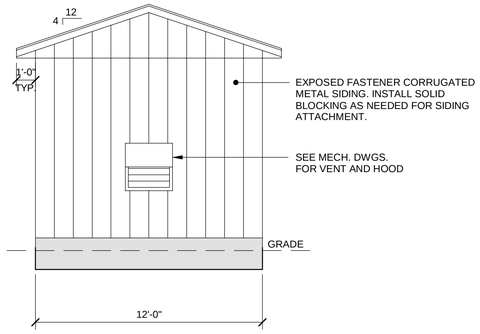
S-1

SHEET 1 OF 2



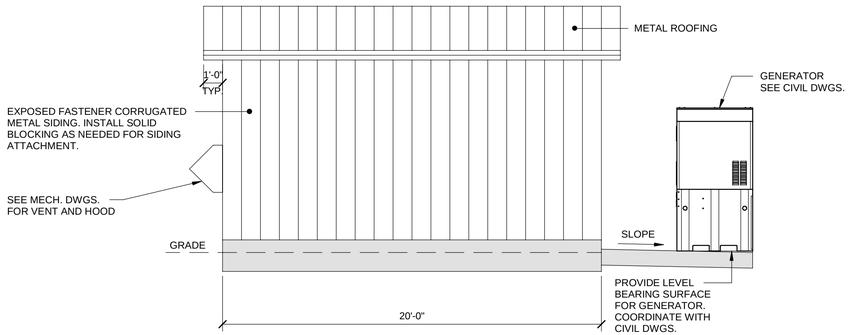
1 S-2 FRONT ELEVATION

1/4" = 1'-0"



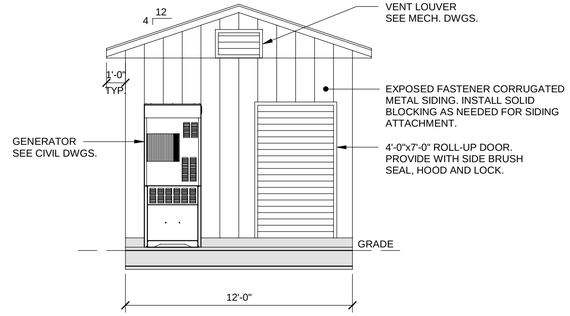
3 S-2 RIGHT ELEVATION

1/4" = 1'-0"



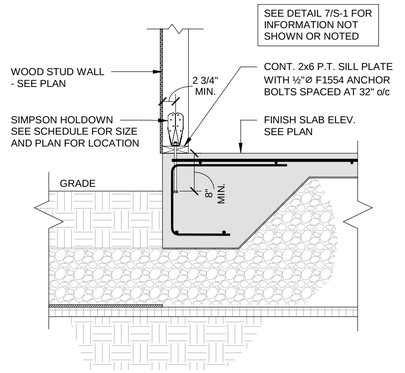
2 S-2 BACK ELEVATION

1/4" = 1'-0"



4 S-2 LEFT ELEVATION

1/4" = 1'-0"



5 S-2 TYPICAL HOLDOWN

3/4" = 1'-0"

GENERAL

1. USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH THE SPECIFICATIONS AND MECHANICAL, ELECTRICAL AND CIVIL DRAWINGS.
2. PERFORM ALL WORK IN ACCORDANCE WITH APPLICABLE CODES.
3. DO NOT SCALE DIMENSIONS FROM DRAWINGS.
4. DETAILS SHOWN ARE TYPICAL, UNLESS NOTED OTHERWISE.
5. VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS, AND REPORT DISCREPANCIES TO ENGINEER BEFORE PROCEEDING WITH THE WORK.

EARTHWORK

1. COMPACTED CRUSHED STONE MATERIAL: WASHED, NARROWLY GRADED MIXTURE OF CRUSHED STONE OR GRAVEL, ASTM D448 COARSE AGGREGATE GRADING SIZE 57 WITH 100% PASSING A 1½" SIEVE AND 0%-5% PASSING A NO. 8 SIEVE.
2. FOOTINGS/SLABS: PLACE FOOTING/SLABS ON COMPACTED CRUSHED STONE FILL. ASSUMED BEARING CAPACITY FOR FOUNDATION DESIGN IS 2000 POUNDS PER SQUARE FOOT.
3. SEPARATION GEOTEXTILE: NON-WOVEN GEOTEXTILE FABRIC, MANUFACTURED FOR SEPARATION APPLICATIONS, COMPLYING WITH VTRANS SPECIFICATION ITEM 649.31 GEOTEXTILE UNDER STONE FILL.

CONCRETE

1. ALL CONCRETE SHALL CONFORM TO REQUIREMENTS AND RECOMMENDATIONS OF ACI 318 "BUILDING CODE REQUIREMENTS OF REINFORCED CONCRETE" AND TO ACI FIELD REFERENCE MANUAL SP-15.
2. CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS", EXCEPT AS MODIFIED OR SUPPLEMENTED BELOW.
3. CONCRETE COMPRESSIVE DESIGN STRENGTH AND MIX PROPORTIONS SHALL BE AS OUTLINED BELOW. MIX PROPORTIONS AND DESIGNS SHALL BE SUBMITTED FOR APPROVAL. LIMIT MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE BY WEIGHT OF CEMENT FOR CAST-IN-PLACE CONCRETE TO 0.15 FOR ALL CONCRETE.

   INTERIOR SLABS ON GRADE:
   CONCRETE CLASS: F2, S0, W1, C1
   COMPRESSIVE STRENGTH = 4,500 PSI
   MAX. W/CM RATIO = 0.45
   AIR CONTENT = ≤ 3%

   EXTERIOR SLABS ON GRADE:
   CONCRETE CLASS: F3, S0, W1, C2
   COMPRESSIVE STRENGTH = 5,000 PSI
   MAX. W/CM RATIO = 0.40
   AIR CONTENT = 6% +/- 1.5%
4. ALL CONCRETE SHALL BE READY-MIX CONCRETE CONFORMING TO ASTM C94, EXCEPT THAT ADDITION OF WATER WILL NOT BE PERMITTED.
5. CONCRETE SLABS SHALL BE WET CURED. USE OF MEMBRANE-FORMING CURING COMPOUND IS PROHIBITED.
6. INTERIOR SLABS SHALL RECEIVE A FLOAT FINISH. EXTERIOR SLABS SHALL RECEIVE A BROOM FINISH.
7. INTERIOR SLABS SHALL RECEIVE A PENETRATING FLOOR SEALER. APPLY ASHFORD FORMULA OR APPROVED EQUAL TO EXPOSED CONCRETE SURFACES IN STRICT COMPLIANCE WITH MANUFACTURER'S RECOMMENDATIONS.
8. REINFORCING STEEL: ASTM A615 GRADE 60.
9. FOUNDATION INSULATION: ASTM C578 TYPE VI RIGID INSULATION INSTALLED IN (2) LAYERS OF 1" THICKNESS, WITH TOP LAYER PLACED 90° TO BOTTOM LAYER.

WOOD FRAMING

1. ALL WOOD CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION" BY THE NATIONAL FOREST PRODUCTS ASSOCIATION AND TO LOCAL BUILDING CODES.
2. ALL WOOD MEMBERS SHALL BE SPRUCE-PINE-FIR, NO. 2 GRADE OR BETTER.
3. ALL PRESSURE TREATED WOOD MEMBERS SHALL BE SOUTHERN PINE NO. 2 GRADE OR BETTER. ALL METAL CONNECTORS, ANCHORS AND FASTENERS USED FOR PRESERVATIVE TREATED WOOD SHALL BE STAINLESS STEEL OR HOT-DIPPED GALVANIZED AS RECOMMENDED BY THE CONNECTOR, ANCHOR OR FASTENER MANUFACTURER.
4. ALL WOOD HEADERS AT BEARING WALLS SHALL BE A MINIMUM OF (2) 2x8's, UNLESS NOTED OTHERWISE. WOOD MEMBERS USED FOR HEADERS, OR BUILT-UP BEAMS SHALL NOT HAVE CHECKS OR SPLITS LONGER THAN THE WIDE FACE WIDTH.
5. EXTERIOR WALL SHEATHING SHALL BE 1/2" ADVANTECH ZIP SYSTEM.

BUILDING MATERIALS

1. FINISHES:
   A. ROOFING: MINIMUM 24 GAGE CORRUGATED METAL OVER GRACE ICE & WATER SHIELD WITH EXPOSED FASTENERS.
   B. WALLS: MINIMUM 24 GAGE CORRUGATED METAL WITH EXPOSED FASTENERS. SEE DETAILS.
   C. CEILING: NONE.
   D. FLOOR: CONCRETE SLAB. SEE CONCRETE NOTE #6 ABOVE.
   E. ALL EXPOSED FASTENERS SHALL BE MANUFACTURED FOR CONTINUOUS EXPOSURE AND HAVE AN INTEGRAL RUBBER GASKET DESIGNED TO SEAL THE FASTENER PENETRATION THROUGH THE CORRUGATED METAL.
2. INSULATION:
   A. BELOW FLOOR SLAB AND OUTSIDE BUILDING PERIMETER: REFER TO CONCRETE NOTES ABOVE.
   B. ROOF: NONE.
   C. WALLS: NONE.
3. LOUVERS: REFER TO MECHANICAL DRAWINGS.

DESIGN CRITERIA

1. CODES: IBC 2015 AND ASCE 7-10, AS AMENDED BY THE 2015 VERMONT FIRE AND BUILDING SAFETY CODE.
2. BUILDING/STRUCTURE RISK CATEGORY: III.
3. ROOF LOADS:
   RAFTER DEAD: 8 PSF
   CEILING DEAD: 8 PSF
   ROOF LIVE: 20 PSF
4. SNOW LOADS:
   GROUND SNOW: Pg = 50 PSF
   EXPOSURE FACTOR: Ce = 1.2
   THERMAL FACTOR: Ct = 1.2
   IMPORTANCE FACTOR: Is = 1.10
   FLAT ROOF SNOW LOAD: Pf = 56 PSF
   SLOPED ROOF SNOW LOAD: Ps = 56 PLUS DRIFT AS REQUIRED
5. FLOOR LIVE LOADS: 100 PSF
6. WIND LOADS:
   WIND SPEED: V = 120 MPH
   NOMINAL WIND SPEED: V_{ASD} = 93 MPH
   EXPOSURE: C
   INTERNAL PRESSURE COEFFICIENT: GCpi = +/- 0.18
   COMPONENTS AND CLADDING: ASCE 7-10
7. SEISMIC LOADS:
   IMPORTANCE FACTOR: Ie = 1.25
   MAPPED SPECTRAL RESPONSE COEFFICIENTS: S_S = 0.254, S_1 = 0.090
   SITE CLASS: D (ASSUMED PER IBC 1618.3.2)
   SPECTRAL RESPONSE COEFFICIENTS: S_{DS} = 0.271, S_{D1} = 0.144
   SEISMIC DESIGN CATEGORY: C
   SEISMIC FORCE RESISTING SYSTEM: BEARING WALL SYSTEM WITH LIGHT-FRAMED WOOD WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE WITH R = 6.5.
   SEISMIC BASE SHEAR: V = 0.052W
   ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE

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PROFESSIONAL SEAL

STATE OF VERMONT · TIMOTHY W. DULL · No. 8096 · Structural II · LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY	CK'D

verizonwireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD, VT

2264 U.S. ROUTE 2
MARSHFIELD, VT 05658

SHEET TITLE

EQUIPMENT BUILDING ELEVATIONS AND NOTES

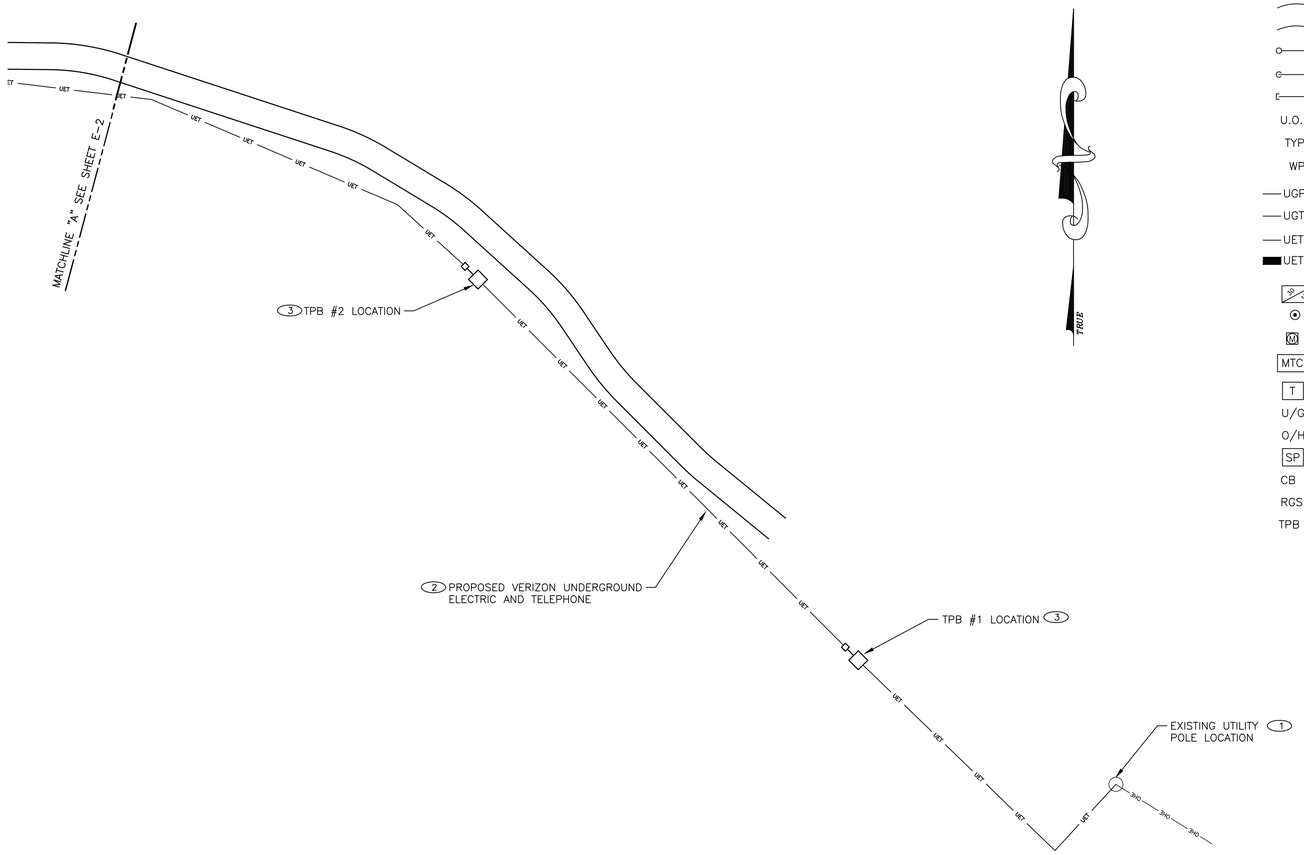
CONSTRUCTION PLANS

DRAWN BY	DATE
SAM	OCT. 2023
CHECKED BY	D&K PROJECT #
TWD	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

S-2

SHEET 2 OF 2



POWER LEGEND

	BRANCH CIRCUIT OR FEEDER.
	HOMERUN TO PANELBOARD AND BREAKER INDICATED
	CONDUIT RISER.
	CONDUIT DROP.
	CONDUIT WITH BUSHINGS.
U.O.N.	UNLESS OTHERWISE NOTED.
TYP.	TYPICAL.
WP	WEATHER PROOF
UGP	NEW UNDERGROUND POWER CONDUIT
UGT	NEW UNDERGROUND TELEPHONE CONDUIT
UET	NEW UNDERGROUND POWER & TELEPHONE CONDUIT
UET	NEW UNDERGROUND POWER & TELEPHONE CONDUIT CONCRETE ENCASED
	DISCONNECT SWITCH. FRAME/FUSE SIZE AS INDICATED
	GROUND ROD
M	METER
MTC	PAD MOUNTED UTILITY TERMINATING CABINET
T	PAD MOUNTED UTILITY TRANSFORMER
U/G	UNDERGROUND
O/H	OVERHEAD
SP	SECONDARY PEDESTAL
CB	CIRCUIT BREAKER
RGS	RIGID GALVANIZED STEEL CONDUIT
TPB	TELEPHONE PULL BOX

GENERAL NOTES

1. NEW ELECTRICAL SERVICE BY GREEN MOUNTAIN POWER. COORDINATE REQUIREMENTS AND FEES WITH UTILITY AND OWNER. UTILITY CONTACT: NIKKI HOWE, TEL. 802-464-1651.
2. TELEPHONE SERVICE TO BE DETERMINED.
3. CONTRACT DRAWINGS ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE AND ARRANGEMENT OF WORK. CONSULT GENERAL CONSTRUCTION DRAWINGS FOR FAMILIARITY WITH CONDITIONS AFFECTING WORK. VERIFY ALL SPACES IN WHICH WORK WILL BE PERFORMED BY ON SITE MEASUREMENTS. DO NOT SCALE DRAWINGS.
4. WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH NEC, UNDERWRITERS LABORATORIES, IBC, STATE AND OTHER AUTHORITIES, PUBLIC AND PRIVATE, HAVING JURISDICTION. REPORT ALL DISCREPANCIES WITH SUCH REGULATIONS TO THE ENGINEER AND DO NOT PROCEED WITH ANY WORK UNTIL WRITTEN AUTHORIZATION IS RECEIVED FROM THE ENGINEER.
5. COORDINATE WORK WITH ALL TRADES TO AVOID INTERFERENCE. NO CHANGE IN CONTRACT PRICE WILL BE ALLOWED BECAUSE OF ANY WORK MADE NECESSARY BY FAILURE TO DO THE REQUIRED COORDINATION.
6. ELECTRICAL DEVICES AND FIXTURES ARE SHOWN DIAGRAMMATIC ONLY. CONFIRM ACTUAL LOCATIONS WITH FINAL CEILING, CABINET, AND OTHER ARCHITECTURAL DETAILS BEFORE BEGINNING INSTALLATION.
7. EQUIPMENT CONNECTIONS INCLUDE WIRING TO CONTROLS, DISCONNECTS, ETC..
8. GROUND ALL SYSTEMS AND EQUIPMENT AS PER NEC.
9. PROVIDE JUNCTION BOXES AS REQUIRED AND SIZED PER NEC.
10. CONTACT ALL UTILITIES BEFORE BEGINNING CONSTRUCTION.
11. MTC LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS TO BE DETERMINED BY THE UTILITY CO. COORDINATE LOCATION WITH UTILITY COMPANY.

KEYED NOTES

1. PROVIDE (2) 3" PVC TELEPHONE CONDUIT WITH 300# PULLCORDS, AND (2) 3" PVC PRIMARY POWER CONDUIT WITH 500# PULLCORD AS PER UTILITY SPECIFICATIONS, FOR TELEPHONE AND ELECTRIC SERVICE. FINAL CONNECTIONS BY UTILITIES, COORDINATE WITH BOTH ELECTRIC AND TELEPHONE UTILITIES.
2. PROVIDE (2) 3" SCH 40 PVC CONDUITS WITH 300# PULLCORD AND (1) 3" PVC PRIMARY POWER CONDUIT WITH 500# PULLCORD U/G, AS PER TRENCH SECTION "A-A" (THIS SHEET) FROM POLE TO THE SITE VIA MTC'S AND TELEPHONE PULL BOXES. PROVIDE CONCRETE ENCASEMENT AS INDICATED ON PLAN.
3. PREP AREA AND INSTALL TELEPHONE PULL BOX AS PER DETAIL 5/E-6. COORDINATE ALL WORK WITH BOTH UTILITIES. COORDINATE ACCESS OPENING WITH UTILITY AND MAINTAIN 10' CLEARANCE FROM OBSTRUCTIONS.
4. PROVIDE HANDHOLE IN CONDUIT RUN AS TO NOT EXCEED 360° OF CONDUIT BENDS TO COMPLY WITH NEC. REFER TO TYPICAL SECTION @ HANDHOLE ON DRAWING E-3 FOR MORE DETAIL.

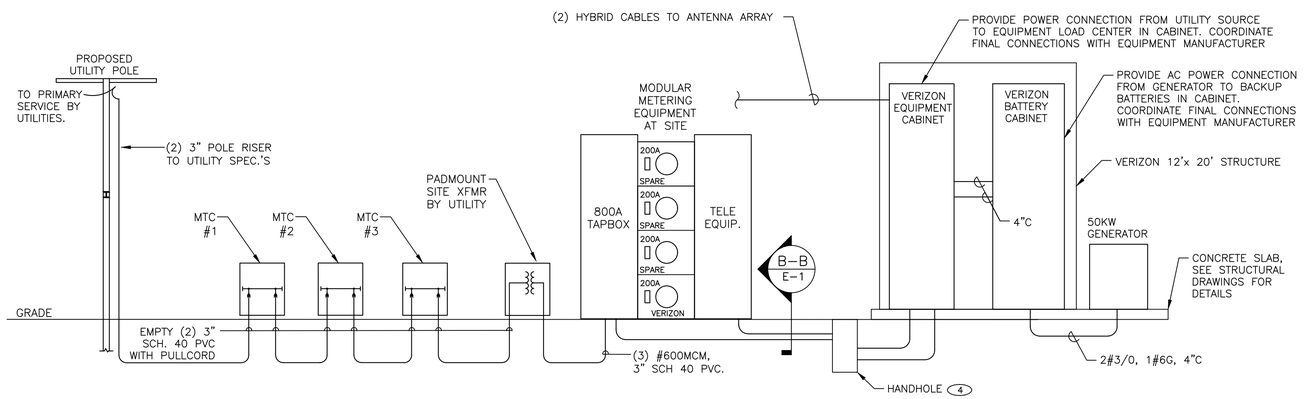
1 E-1 ELECTRICAL LINE EXTENSION PLAN 1

SCALE: 1" = 50'-0"

GRAPHIC SCALE

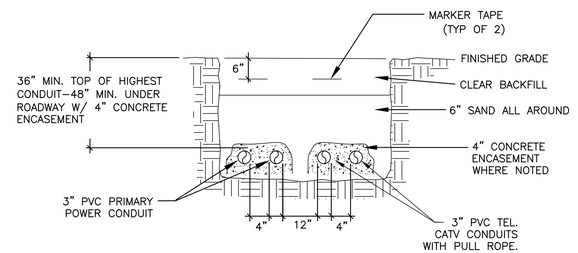
50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft. AT 24X36
HALF SIZE AT 11X17



2 E-1 ONE-LINE DIAGRAM

NOT TO SCALE



TRENCH SECTION 'A-A'

NOT TO SCALE

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PROFESSIONAL SEAL

STATE OF VERMONT · WILLIAM H. HOWE · No. 4750 · ELECTRICAL · LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY	CK'D
1	10-23-2023	ISSUED FOR BID	JWP	LJH

verizonwireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

LINE EXTENSION PLAN #1

CONSTRUCTION PLANS

DRAWN BY	DATE
EJD	OCT. 2023
CHECKED BY	D&K PROJECT #
WHH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

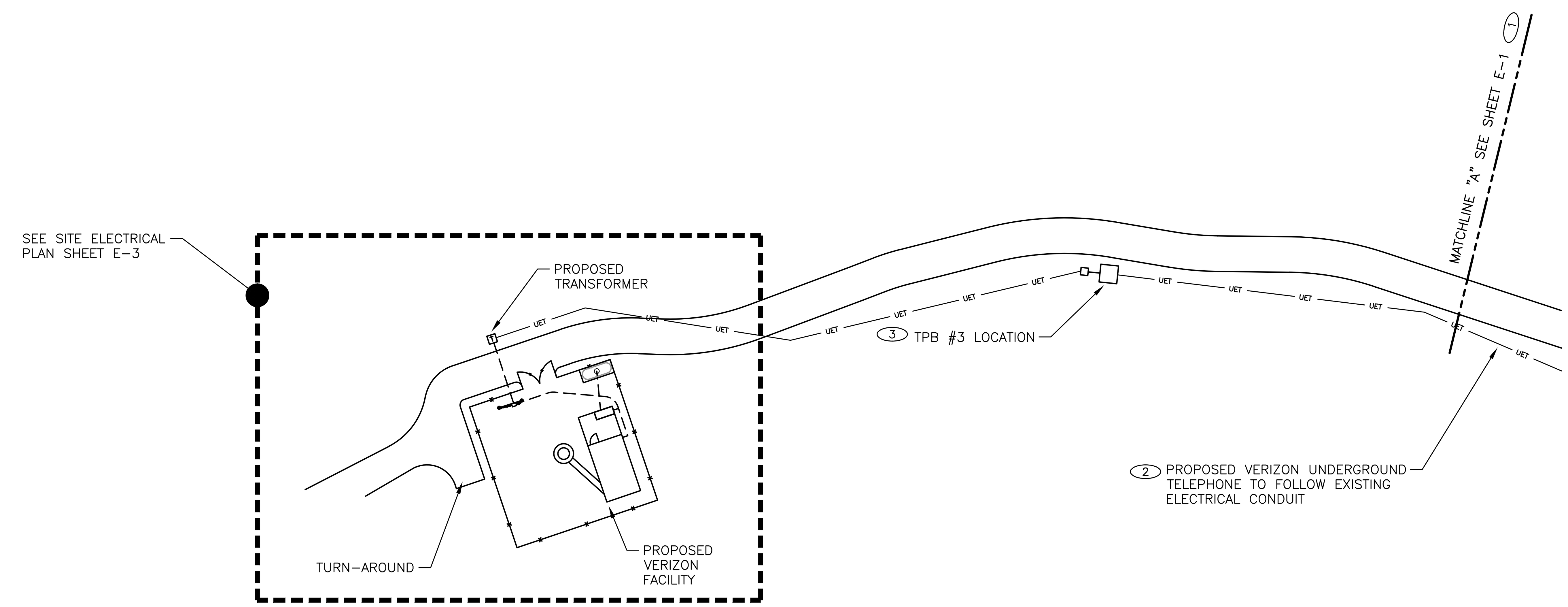
SHEET NUMBER

E-1

I:\4\422065P VZW Marshfield\dwg\Construction Plans\E22065-E1.dwg 10/23/2023 9:22 AM

KEYED NOTES

1. PROVIDE (2) 3" PVC TELEPHONE CONDUIT RISERS WITH 300# PULLCORDS AS PER UTILITY SPECIFICATIONS, FOR TELEPHONE SERVICE. FINAL CONNECTIONS BY UTILITIES, COORDINATE WITH TELEPHONE UTILITIES.
2. PROVIDE (2) 3" SCH 40 PVC CONDUITS WITH 300# PULLCORD AS PER TRENCH SECTION "A–A" (THIS SHEET) FROM POLE TO THE SITE VIA TELEPHONE PULL BOXES. PROVIDE CONCRETE ENCASEMENT AS INDICATED ON PLAN.
3. PREP AREA AND INSTALL TELEPHONE PULL BOX AS PER DETAIL 5/E–6. COORDINATE ALL WORK WITH BOTH UTILITIES. COORDINATE ACCESS OPENING WITH UTILITY AND MAINTAIN 10' CLEARANCE FROM OBSTRUCTIONS.



ELECTRICAL LINE EXTENSION PLAN 4

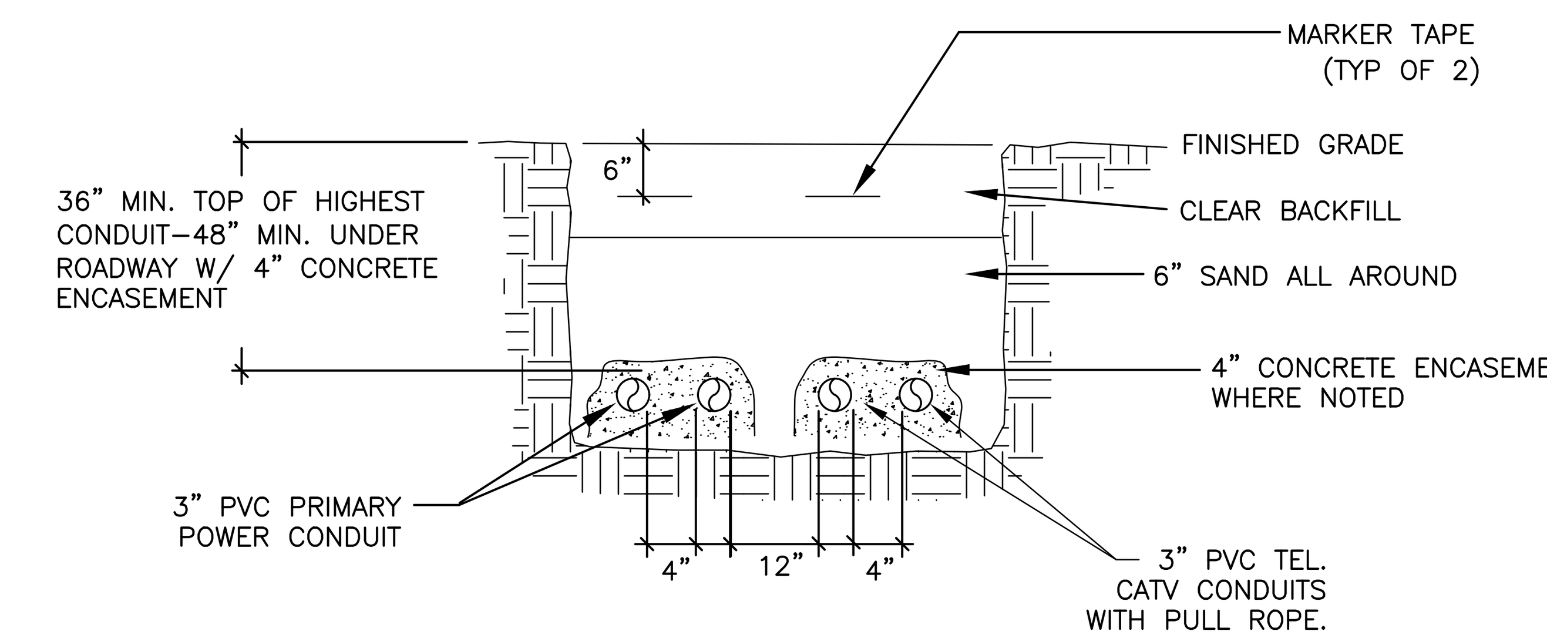
1 / E–2

SCALE: 1" = 50'–0"

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft. AT 24X36
HALF SIZE AT 11X17



TRENCH SECTION 'A–A'

NOT TO SCALE

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PROFESSIONAL SEAL

STATE OF VERMONT · No. 7790 · ELECTRICAL · LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY	CK'D
1	10–23–2023	ISSUED FOR BID	JWP	LJH

verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

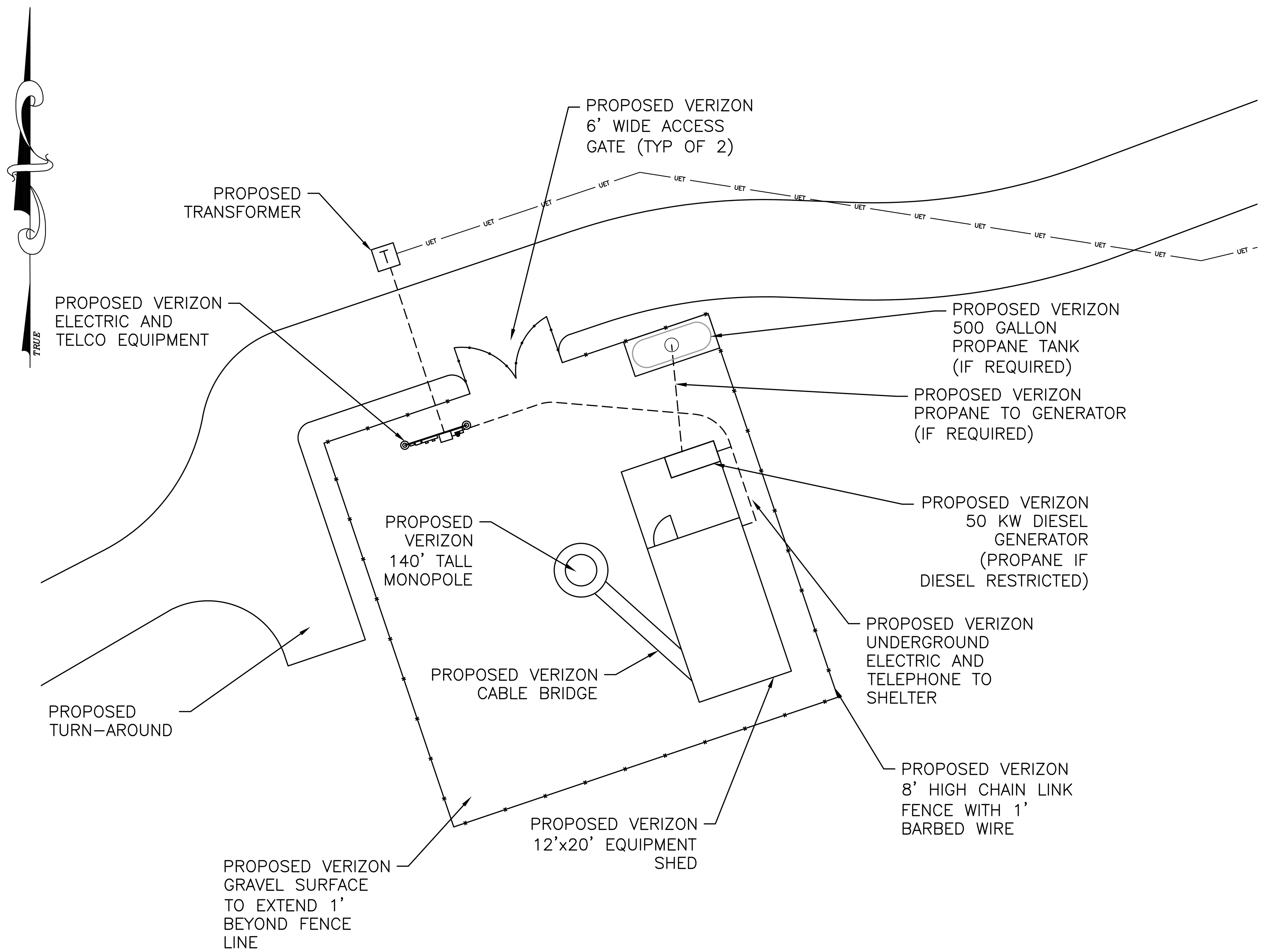
LINE EXTENSION PLAN #2

CONSTRUCTION PLANS

DRAWN BY	DATE
EJD	OCT. 2023
CHECKED BY	D&K PROJECT #
WHH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

E-2



1 / E-2 SITE ELECTRICAL PLAN

SCALE: 1" = 40'-0"

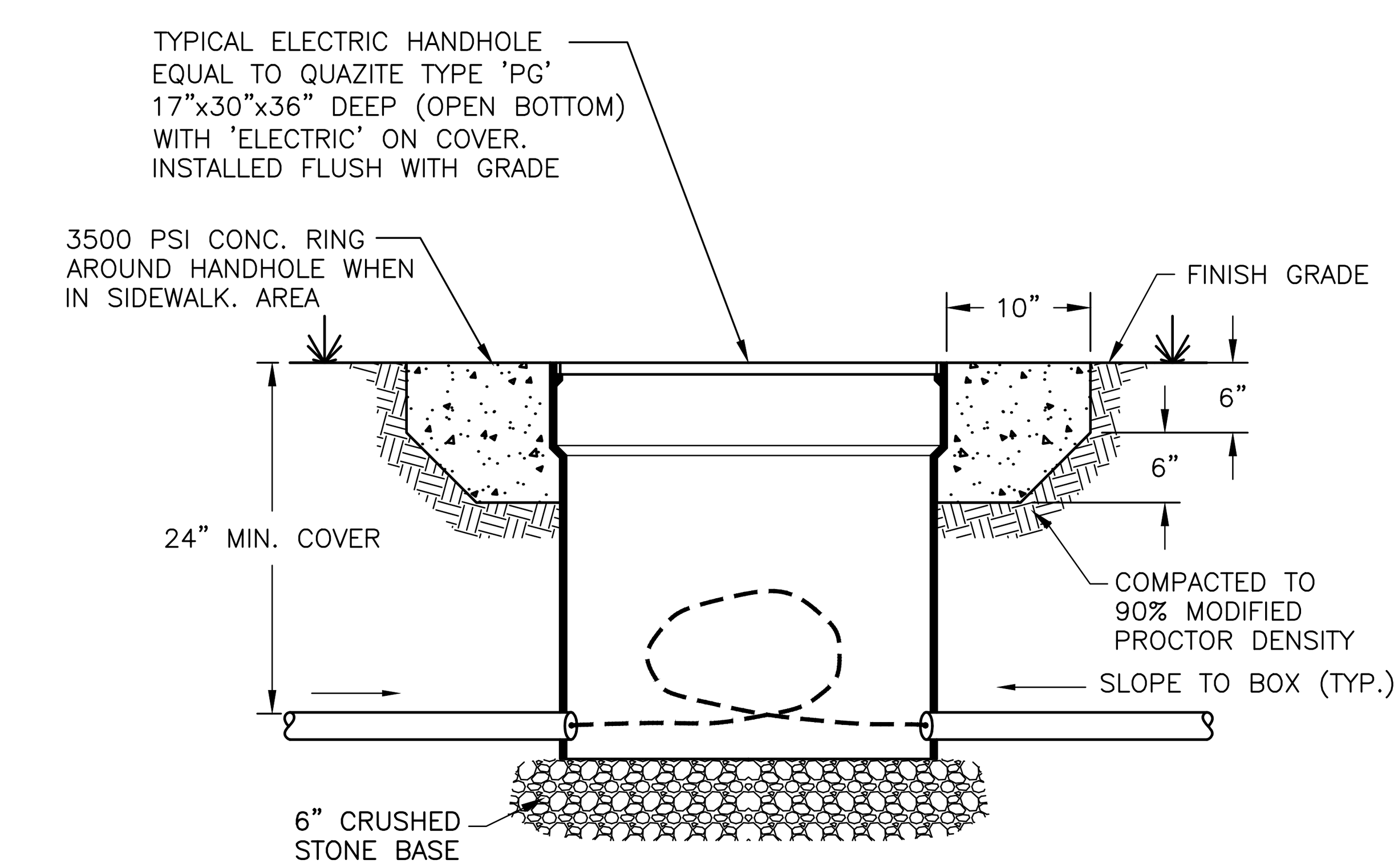
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft. AT 24X36
HALF SIZE AT 11X17

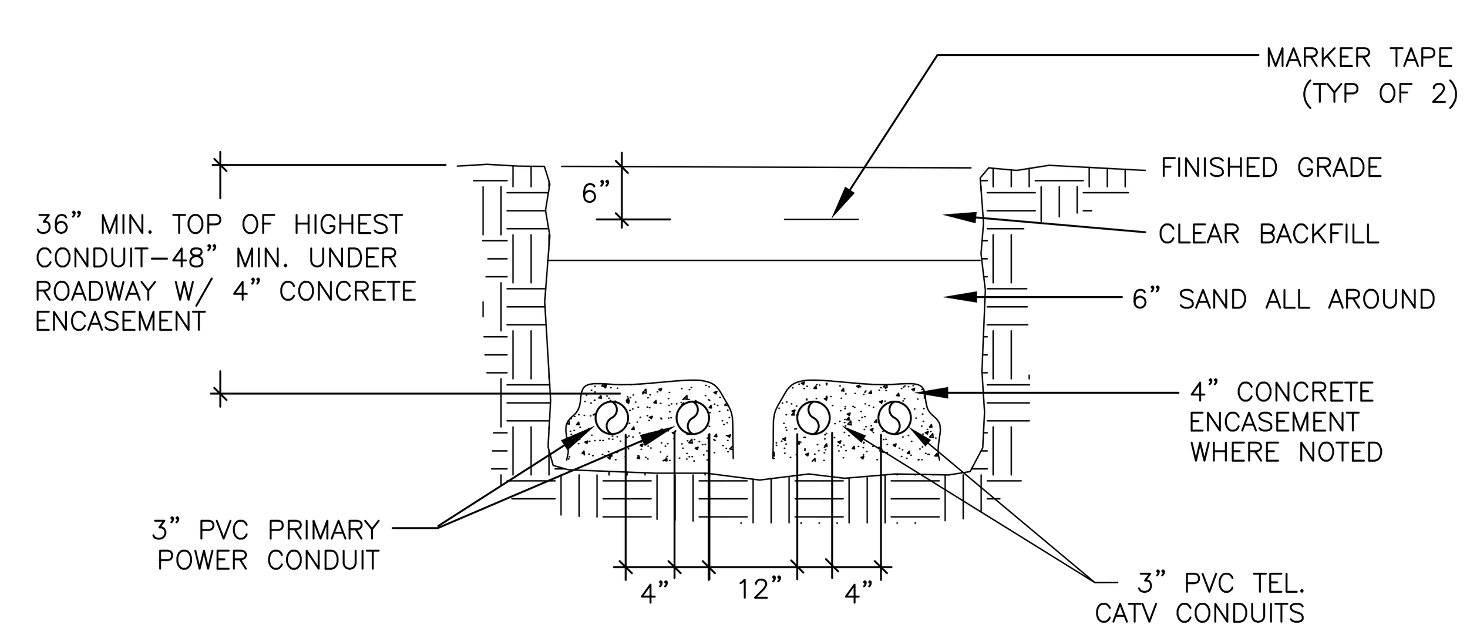
KEYED NOTES

1. PROVIDE (2) 3" SCH 40 PVC CONDUITS WITH 300# PULLCORD AND (2) 3" PVC PRIMARY POWER CONDUIT WITH 500# PULLCORD U/G, AS PER TRENCH SECTION "A-A" FROM THE MTC #2 BOX LOCATION (SEE SHT E-2) TO THE SITE TRANSFORMER AND CSC BOX PAD LOCATIONS. PROVIDE CONCRETE ENCASEMENT UNDER DRIVE TURNAROUND. EXTEND CONCRETE 5' BEYOND DRIVE LIMITS.
2. PROVIDE (2) 3" SCH 40 PVC CONDUIT WITH 500# PULLCORD U/G AS PER TRENCH SECTION "B-B" TO SITE TRANSFORMER LOCATION. PROVIDE CONCRETE ENCASEMENT AS INDICATED, 5' BEYOND DRIVE LIMITS.
3. PROVIDE (2) 3" SCH 40 PVC CONDUIT U/G AS PER TRENCH SECTION "B-B" TO SITE BACKBOARD AND TELEPHONE LOCATION. PROVIDE CONCRETE ENCASEMENT AS INDICATED, 5' BEYOND DRIVE LIMITS.
4. PREP AREA AND PROVIDE GROUNDING PER UTILITY SPECIFICATIONS FOR NEW TRANSFORMER (BY UTILITY). STUB PRIMARY POWER CONDUIT UP PER UTILITY SPECIFICATIONS. ALL FINAL CONNECTIONS AT TRANSFORMER BY UTILITY. COORDINATE WITH SAME. SEE DETAIL 1/E-6.
5. PROVIDE (1) TELEPHONE TERMINATION CABINET AT SITE BACKBOARD. PROVIDE (1) 30A NON FUSED NEMA 3R DISCONNECT AT BOX PAD FOR EQUIPMENT DISCONNECT. COORDINATE ALL WORK WITH TELEPHONE UTILITY.
6. PROVIDE SITE BACKBOARD AS PER DETAIL 2/E-4.
7. PROVIDE (1) 3" SCH 40 PVC CONDUIT, WITH (3) #600MCM, U/G AS PER TRENCH SECTION "B-B", FROM TRANSFORMER TO MODULAR METER 800A TAPBOX.
8. PROVIDE (4) SCH 40 PVC CONDUITS FROM VERIZON SHELTER, (1) 2" WITH (3) #3/0, (1) #4G, TO VERIZON METER, (1) 1" WITH (3) #10'S FROM NEW 1 POLE 30A CB IN VERIZON PANEL TO SITE BACKBOARD, (1) 4" WITH 300# PULLCORD TO SITE BACKBOARD, AND (1) 3" WITH 300# PULLCORD TO CSC CABINET. U/G AS PER TRENCH SECTION "C-C".
9. PROVIDE HANDHOLE IN CONDUIT RUN AS TO NOT EXCEED 360° OF CONDUIT BENDS TO COMPLY WITH NEC. REFER TO TYPICAL SECTION @ HANDHOLE ON TIHS DRAWING FOR MORE DETAIL.



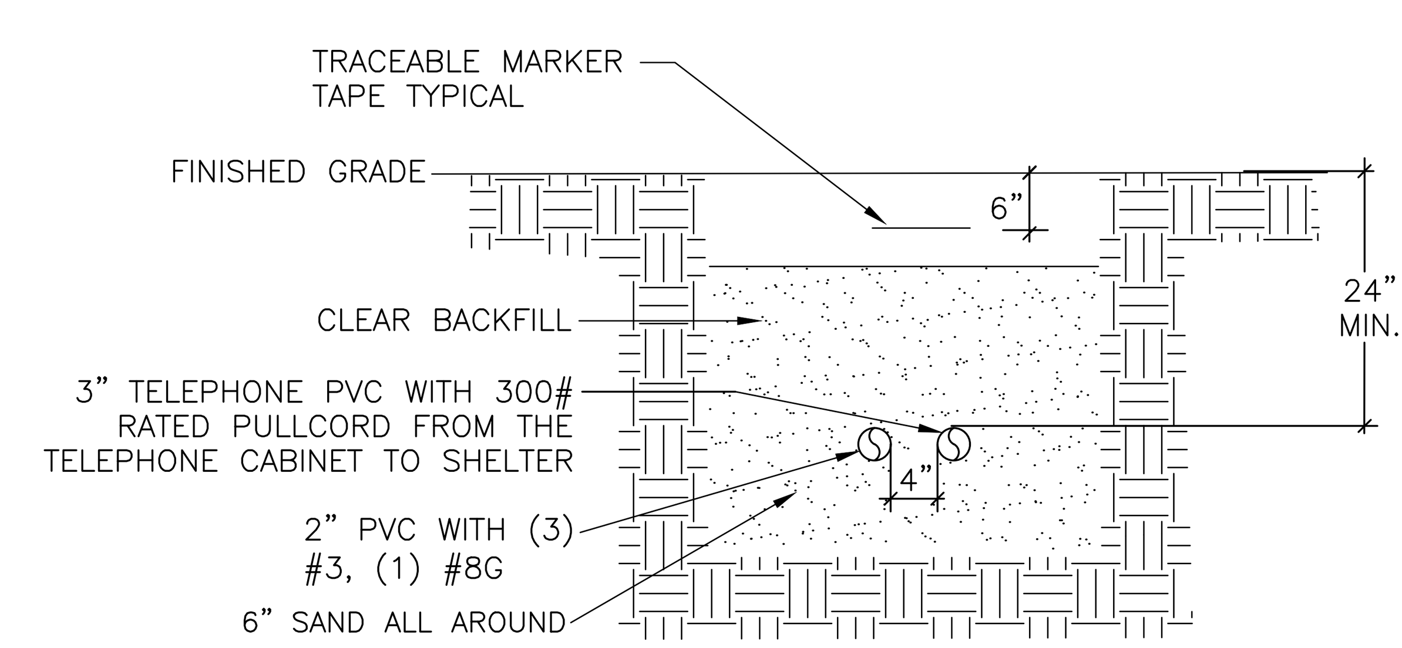
TYPICAL SECTION @ HANDHOLE

NOT TO SCALE



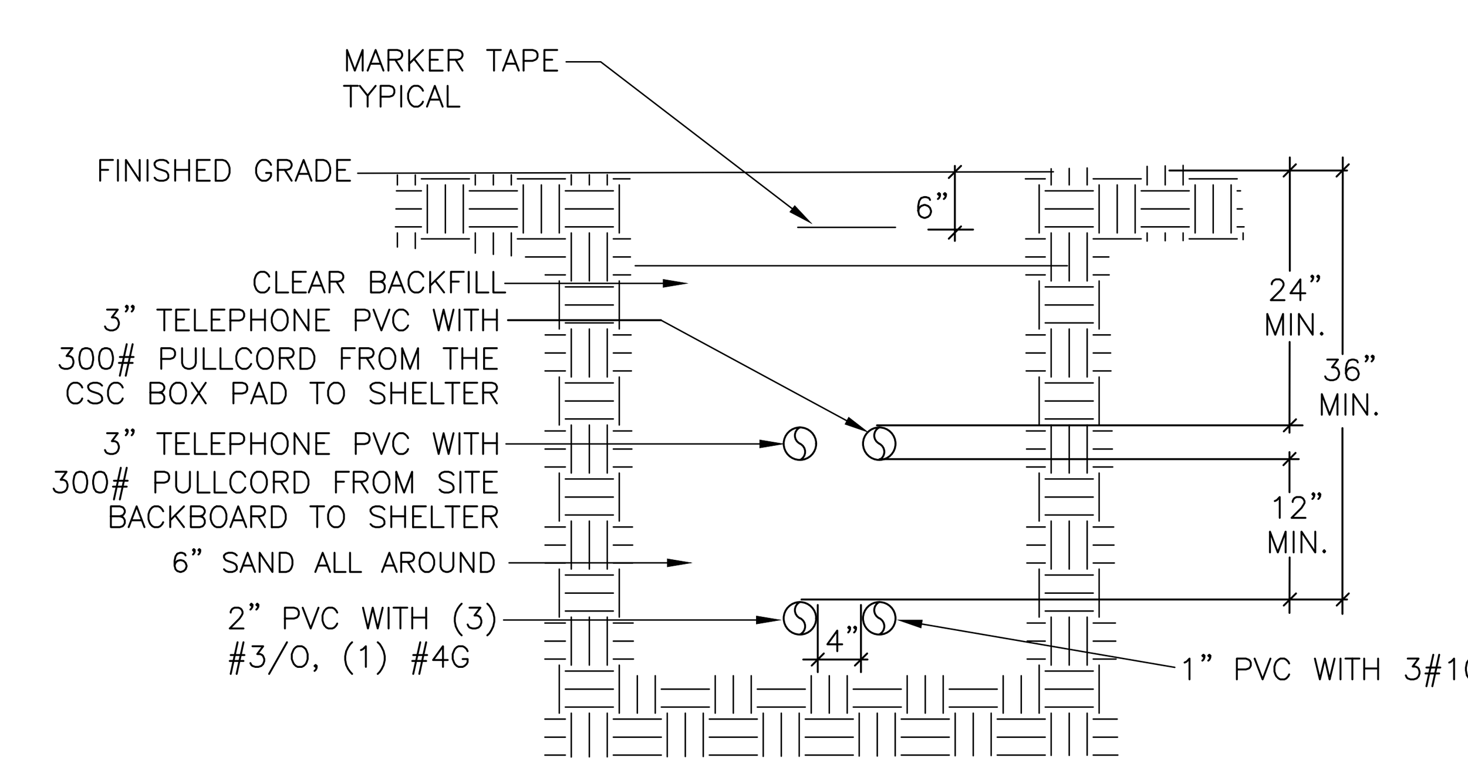
TRENCH SECTION 'A-A'

NOT TO SCALE



TRENCH SECTION "B-B"

NOT TO SCALE



TRENCH SECTION "C-C"

NOT TO SCALE

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LACONIA, NH

PROFESSIONAL SEAL

STATE OF VERMONT · No. 7790 · ELECTRICAL · LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY	CK'D
1	10-23-2023	ISSUED FOR BID	JWP	LJH

verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

SITE ELECTRICAL PLAN

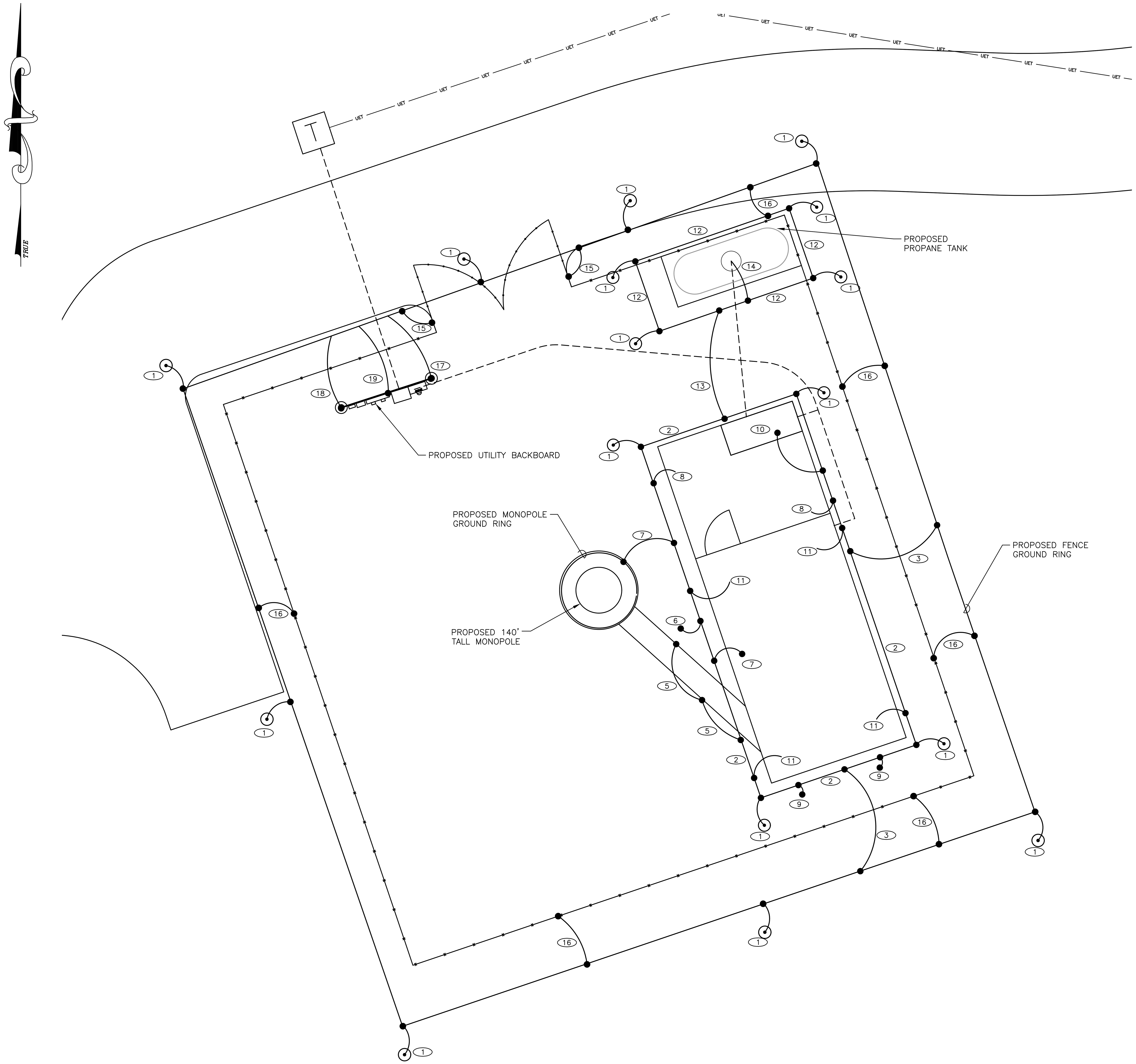
CONSTRUCTION PLANS

DRAWN BY	DATE
EJD	OCT. 2023
CHECKED BY	D&K PROJECT #
WHH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

E-3

I:\4\422065P VZW Marshfield\dwg\Construction Plans\E22065-E1.dwg 10/23/2023 9:22 AM



SITE GROUNDING PLAN (1 / E-2)
SCALE: 1" = 5'-0"

GRAPHIC SCALE
5 0 2.5 5 10 20
(IN FEET)
1 inch = 5 ft. AT 24X36
HALF SIZE AT 11X17

GENERAL GROUNDING NOTES

A. OBJECTIVE IS TO PROVIDE A CELLULAR GROUNDING SYSTEM WITH GROUND RESISTANCE OF LESS THAN 5 OHMS BETWEEN ANY POINT ON THE GROUNDING SYSTEM AND REFERENCE GROUND. MODIFY THE GROUNDING SCHEME WITH THE CELL PROVIDER'S ENGINEER'S APPROVAL TO ACHIEVE DESIRED AC RESISTANCE TO GROUND. CHEMICAL ADDITIVES SHALL NOT BE USED TO ENHANCE MINIMUM RESISTANCE ON THE CELLULAR GROUNDING SYSTEM UNLESS APPROVED BY THE CELL PROVIDER'S ENGINEER. OBTAIN TESTING PROCEDURE FROM THE CELL PROVIDER'S ENGINEER. TEST GROUND GRID IN AN APPROVED METHOD AFTER INSTALLATION TO CONFIRM SPECIFIED RESISTANCE LEVELS HAVE BEEN MET.

B. MINIMUM BENDING RADIUS FOR BURIED GROUND RING SHALL BE 2'-0" NOMINAL AND 12" MINIMUM. ANTENNA GROUNDING CONDUCTOR SHALL BE AS STRAIGHT AS POSSIBLE WITH A MINIMUM BENDING RADIUS OF 6".

C. GROUND CONNECTIONS MADE BELOW GRADE SHALL BE HEAVY DUTY EXOTHERMIC WELD. PROVIDE CADWELD CONNECTIONS, STYLE AND TYPE REQUIRED.
- CABLE TO CABLE (TYPE 'TA')
- CABLE TO ROD (TYPE 'GI' OR 'NC')
- CABLE TO SURFACE (TYPE 'LA')
- CABLE TO FENCE (TYPE 'VS')

D. GROUND CONNECTION TO THE HALO CORNER DROP SHALL BE BY A COMPRESSION LUG CONNECTOR – 15 TON COMPRESSION, 2 HOLE LONG BARREL, ELECTRO-TINNED PLATED HIGH CONDUCTIVITY COPPER, 600V RATED. USE 1/4" DIAMETER BOLT 3/4" SPACING LUGS. CONNECTOR SHALL BE BURNDY "HYLUG SERIES" OR EQUIVALENT.

E. CORROSION PROTECTION SHALL BE PROVIDED FOR ALL CONNECTIONS ABOVE AND BELOW GRADE. USE ZRC COLD GALVANIZED COMPOUND MFGD BY ZRC CHEMICAL PRODUCTS, QUINCY, MASS.

F. SURFACES INTENDED TO BE CONNECTED WITH MECHANICAL CONNECTIONS SHALL BE BARE METAL. PRIME AND PAINT OVER BONDED AREA TO PREVENT CORROSION.

G. WHEN CONNECTING ALUMINUM COMPONENTS TO THE GROUNDING SYSTEM, USE UL APPROVED BI-METALLIC CONNECTIONS BETWEEN COPPER CONDUCTORS AND ALUMINUM SURFACES.

H. GROUNDING CONNECTIONS MADE TO BAR PLATE SHALL BE MADE WITH DOUBLE HOLE HYDRAULICALLY INDENTED LUGS.

GROUNDING KEYED NOTES

1. 3/4" x 8'-0" COPPER CLAD STEEL ROD (TYP. OF 14), TOP OF ROD AT 30" BELOW FINISHED GRADE WITH #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE FROM GROUND ROD TO GROUND RING. IF LEDGE IS ENCOUNTERED THE CONTRACTOR IS TO PRE-DRILL A 1-1/2" DIAMETER HOLE FOR THE FULL LENGTH.
2. #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE FOR SHELTER GROUND RING.
3. #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE FROM THE SHELTER GROUND RING TO THE EXISTING FENCE GROUND RING.
4. #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE FROM THE SHELTER GROUND RING TO THE EXISTING MONOPOLE GROUND RING.
5. #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE FROM THE SHELTER GROUND RING TO THE ICE BRIDGE SUPPORT COLUMNS. SEE DETAIL 2/E-2.
6. #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE FROM THE SHELTER GROUND RING TO THE GPS ANTENNA. SEE GROUNDING DETAIL 1/E-2.
7. #2 AWG SOLID COPPER CONDUCTORS, BURIED 30" BELOW FINISHED GRADE FROM THE BUILDING GROUND RING TO THE CABLE ENTRY GROUND BAR.
8. #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE, FROM THE SHELTER GROUND RING TO CONCRETE REBAR.
9. #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE, FROM THE SHELTER GROUND RING TO MECHANICAL EQUIPMENT.
10. #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE FROM THE SHELTER GROUND RING TO THE VERIZON GENERATOR.
11. #2 AWG ANNEALED SOLID TINNED BARE COPPER FROM THE BUILDING GROUND RING TO THE HALO CORNER DROP, COILED OUTSIDE THE ENCLOSURE, VIA 1" PVC SLEEVE IN THE ENCLOSURE WALL.
12. #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE FOR PROPANE GROUND RING.
13. #2 AWG SOLID COPPER CONDUCTORS, BURIED 30" BELOW FINISHED GRADE FROM THE BUILDING GROUND RING TO THE PROPANE GROUND RING.
14. #2 AWG SOLID COPPER CONDUCTORS, BURIED 30" BELOW FINISHED GRADE FROM THE PROPANE GROUND RING TO CONCRETE REBAR.
15. CHAIN LINK FENCE GATE SWING GROUND. USE #2 COPPER TIN SOLID GROUND STRAP. FASTEN TO THE GATE STRUCTURE WITH HEAVY GROUND STRAPS.
16. THE NEW CHAIN LINK FENCE IS TO BE CONNECTED TO THE FENCE GROUND RING WITH A #2 AWG ANNEALED SOLID TINNED BARE COPPER CONDUCTOR, BURIED 30" BELOW FINISHED GRADE.
17. CONNECT THE MODULAR METERING MOUNTING POST TO THE FENCE GROUND RING WITH #2 AWG ANNEALED SOLID TINNED BARE COPPER CONDUCTOR, BURIED 30" BELOW FINISHED GRADE.
18. CONNECT THE MODULAR METERING GROUND TERMINATION TO THE FENCE GROUND RING WITH #2 AWG ANNEALED SOLID TINNED BARE COPPER CONDUCTOR, BURIED 30" BELOW FINISHED GRADE.
19. #2 AWG ANNEALED SOLID TINNED BARE COPPER, BURIED 30" BELOW FINISHED GRADE, FROM FENCE GROUND RING TO PLANT TERMINAL BOX ON BOARD.

NOTE:
EXTENT OF GROUNDING TO BE INSTALLED BY VZW TO BE DETERMINED BY THE VZW CONSTRUCTION MANAGER. PLANS ILLUSTRATE TYPICAL GROUNDING REQUIRED.

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PROFESSIONAL SEAL

NO.	DATE	DESCRIPTION	BY	CK'D
1	10-23-2023	ISSUED FOR BID	JWP	LJH

verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

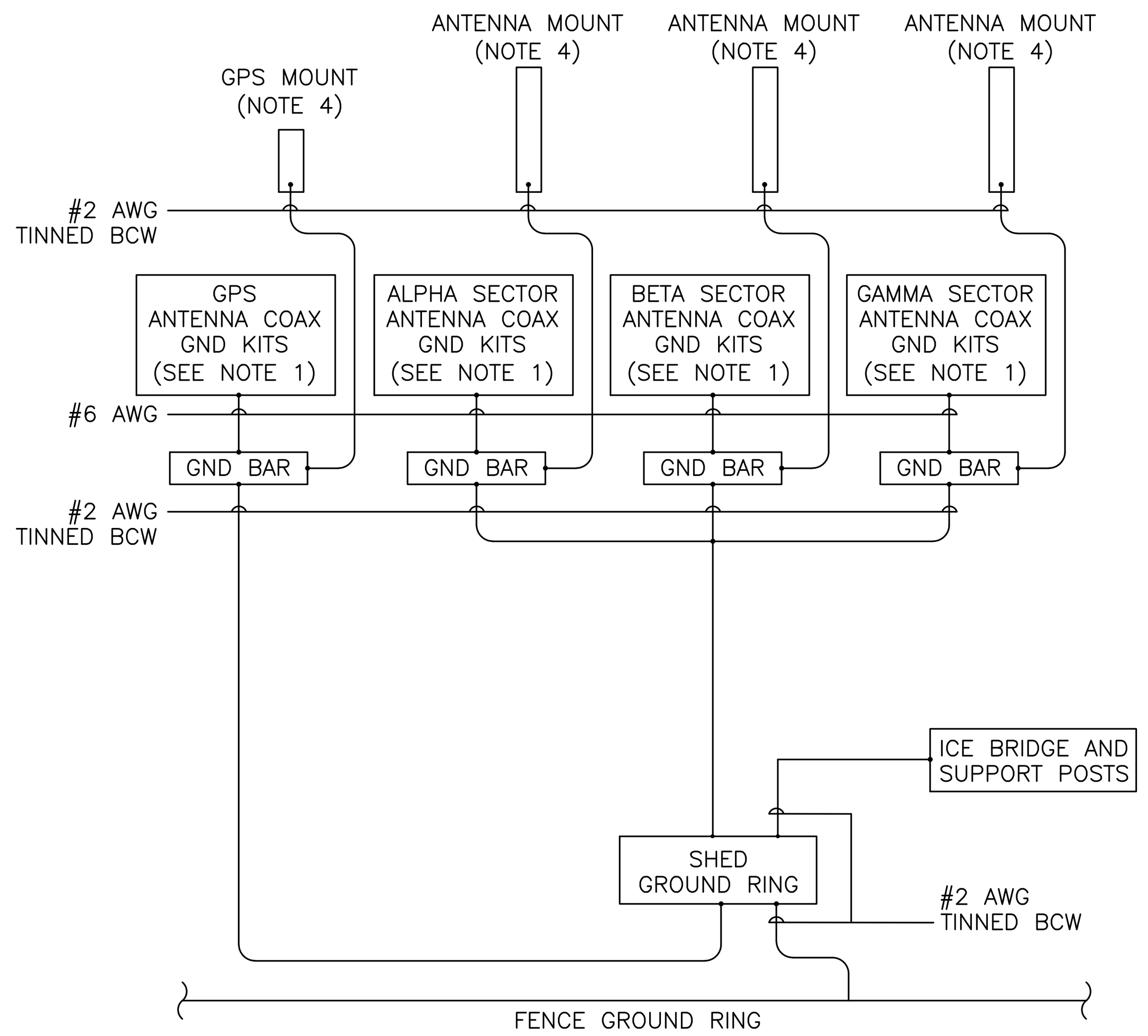
SITE GROUNDING PLAN

CONSTRUCTION PLANS

DRAWN BY	DATE
EJD	OCT. 2023
CHECKED BY	D&K PROJECT #
WHH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

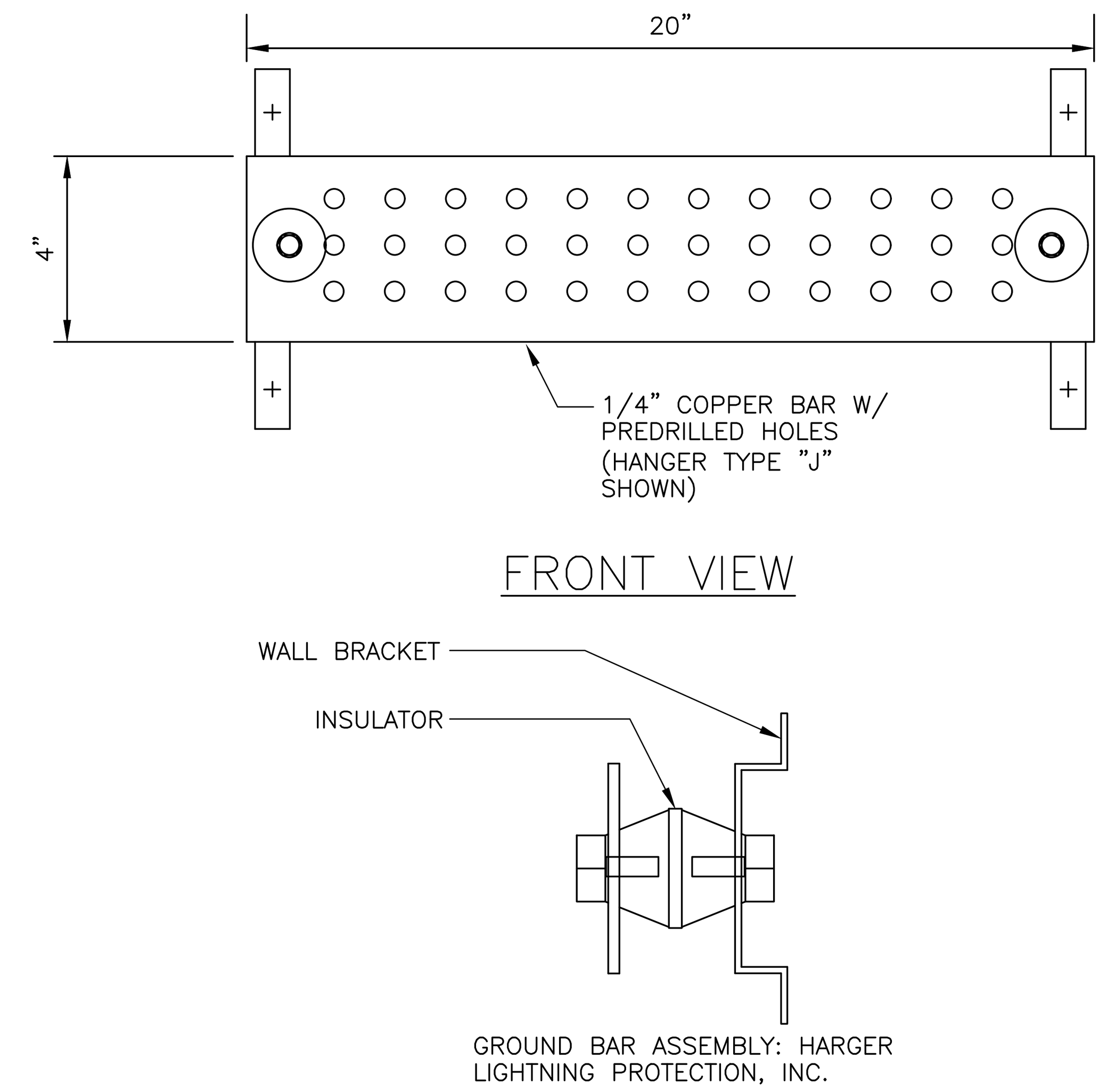
E-4



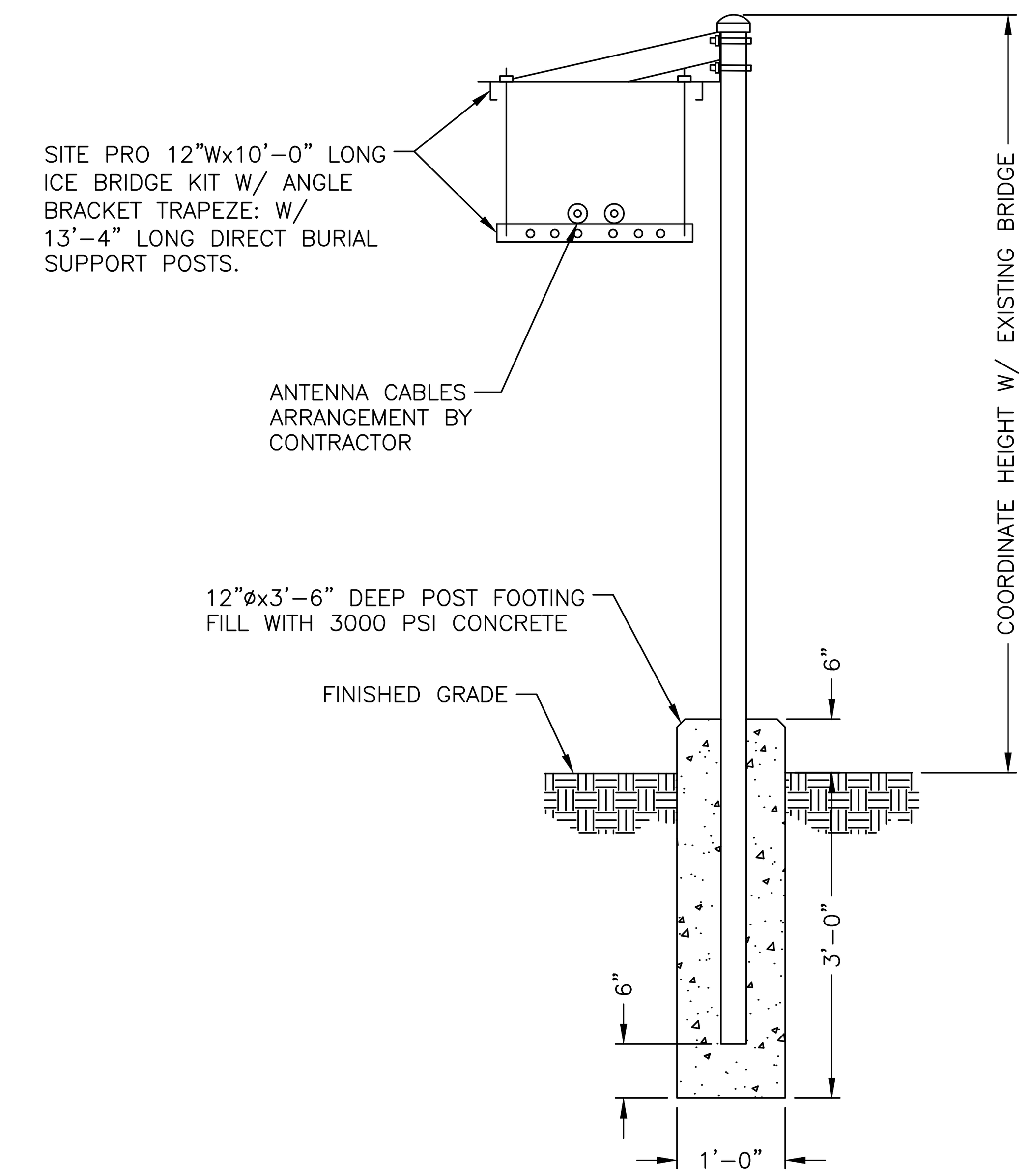
NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO GROUND BAR (GND BAR).
2. HALO GROUND DESIGNED AND INSTALLED BY SHELTER MANUFACTURER.
3. ALL CELL EQUIPMENT (BTS. BATTERY FRAME, POWER CABINETS, MISC. EQUIPMENT FRAMES, ETC.) SHALL BE GROUNDED IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
4. GROUND ANTENNA SUPPORT PIPES (TYP. 4 PER SECTOR) WITH #2 AWG TINNED BCW DEDICATED LEAD BACK TO GROUND BAR.

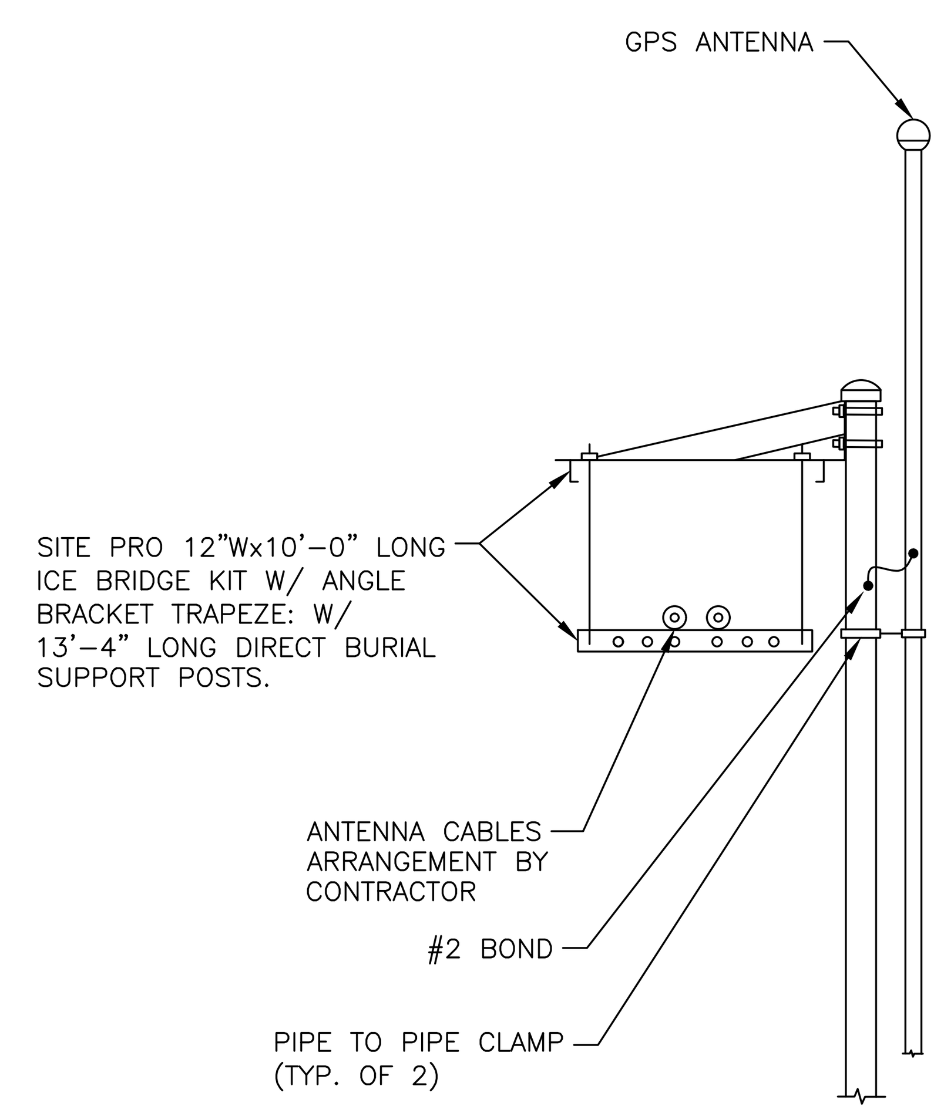
1 / E-5 GROUNDING DIAGRAM
NOT TO SCALE



2 / E-5 GROUND BAR PLATE DETAIL
NOT TO SCALE



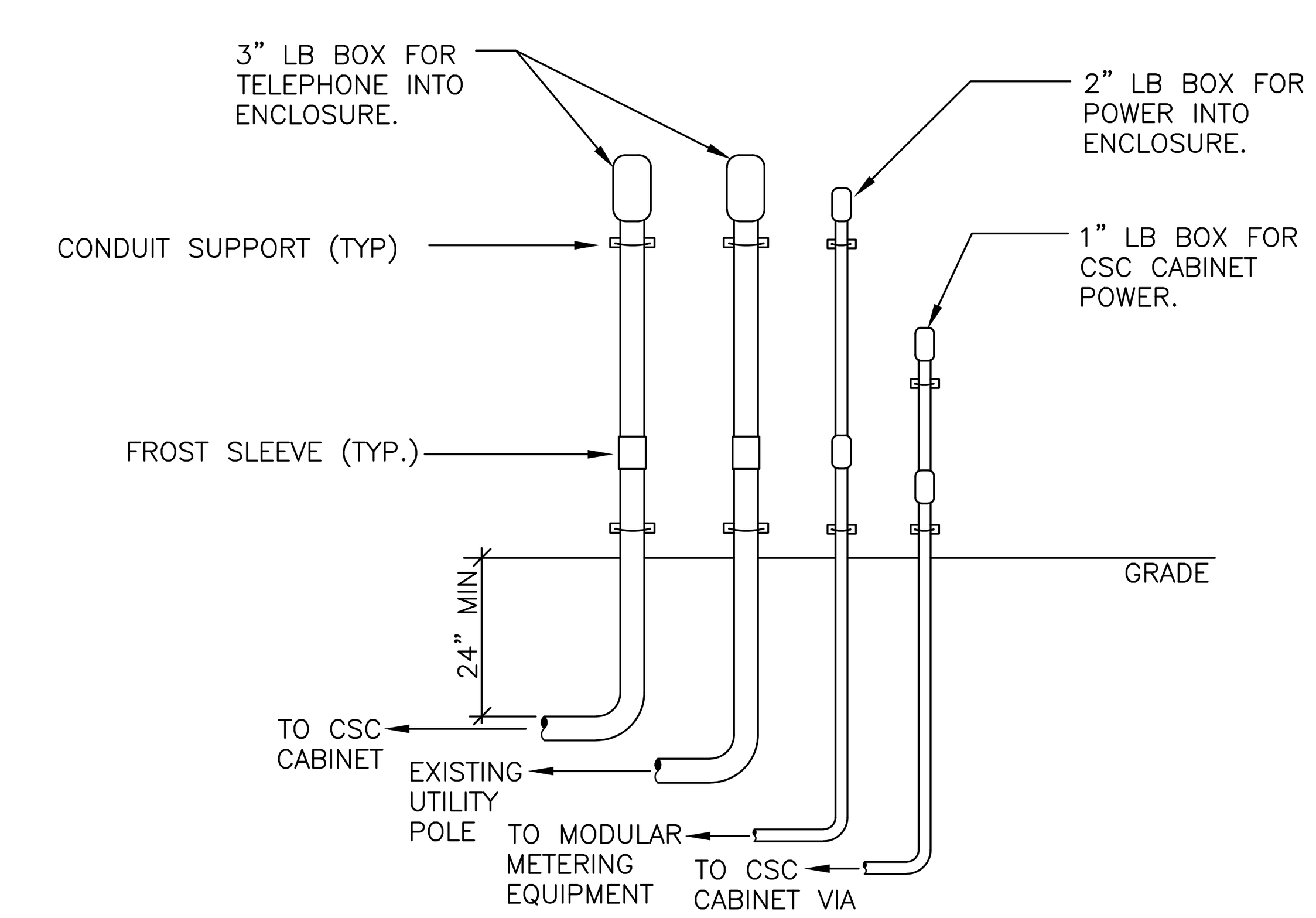
3 / E-5 ICE BRIDGE DETAIL
NOT TO SCALE



NOTES:

1. THE ELEVATION AND LOCATIONS OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 2-1/2" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE OUT TO THE REQUIRED LENGTH (MINIMUM 24") USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE SUT PPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.
3. ATTACH TO ICE BRIDGE POST NEAREST ANTENNA CABLE PORT ON SHELTER.
4. PRIOR TO INSTALLATION CONTRACTOR SHALL TEST GPS LOCATION WITH HAND HELD AND MOVE GPS ANTENNA TO OTHER ICE BRIDGE POSTS AS REQUIRED TO ACHIEVE ADEQUATE SIGNAL. FAILURE TO ACHIEVE ADEQUATE SIGNAL WITH A HAND HELD GPS SHALL BE REPORTED TO CONSTRUCTION MANAGER AND ENGINEER TO DETERMINE ALTERNATE INSTALLATION LOCATION FOR GPS ANTENNA.

4 / E-5 GPS GROUNDING/MOUNTING BRACKET DETAIL
NOT TO SCALE



5 / E-5 BLDG SERVICE ENTRANCE DETAIL
NOT TO SCALE

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PROFESSIONAL SEAL

NO.	DATE	DESCRIPTION	BY	CK'D
1	10-23-2023	ISSUED FOR BID	JWP	LJH

verizonwireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

GROUNDING DETAILS

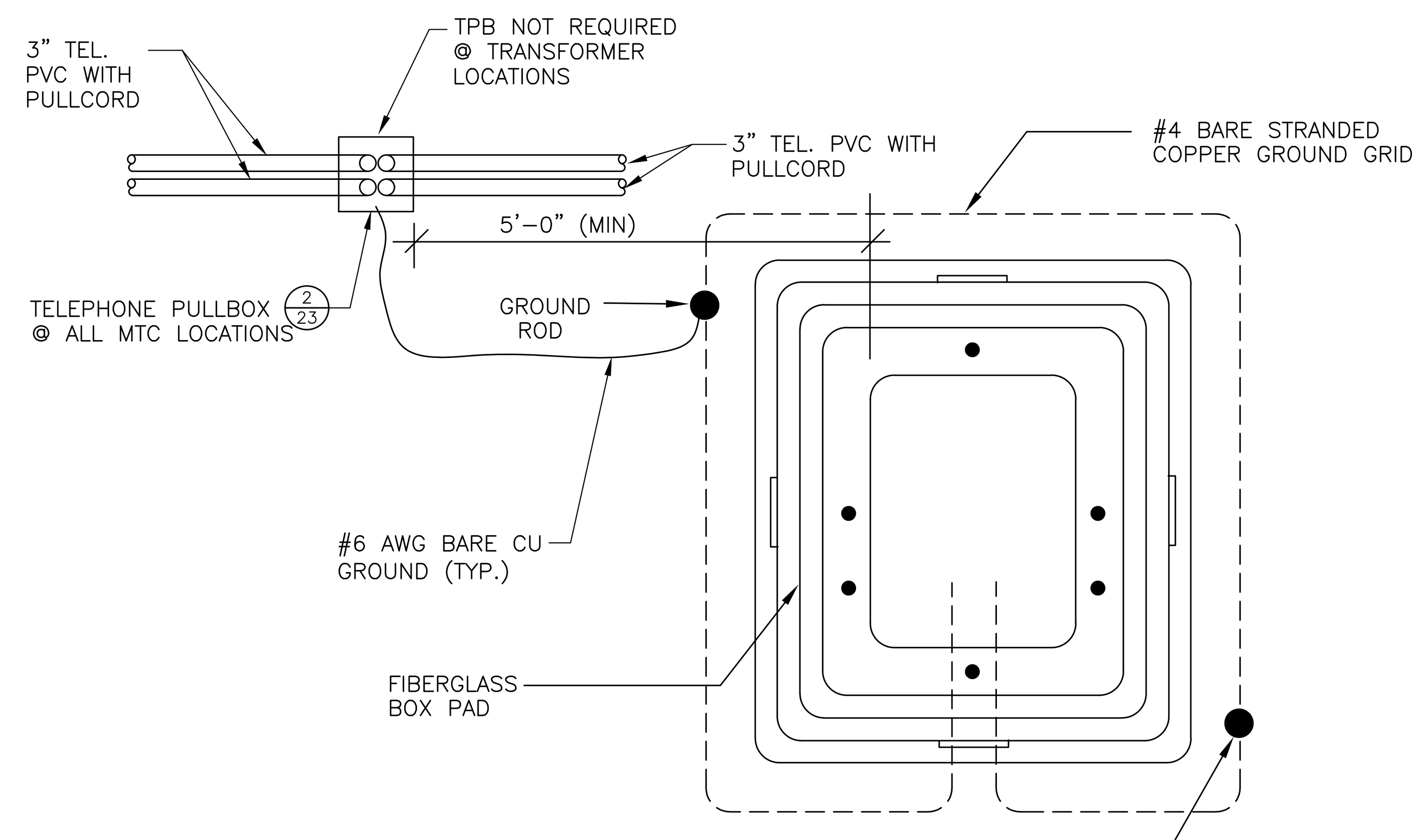
CONSTRUCTION PLANS

DRAWN BY	DATE
EJD	OCT. 2023
CHECKED BY	D&K PROJECT #
WHH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

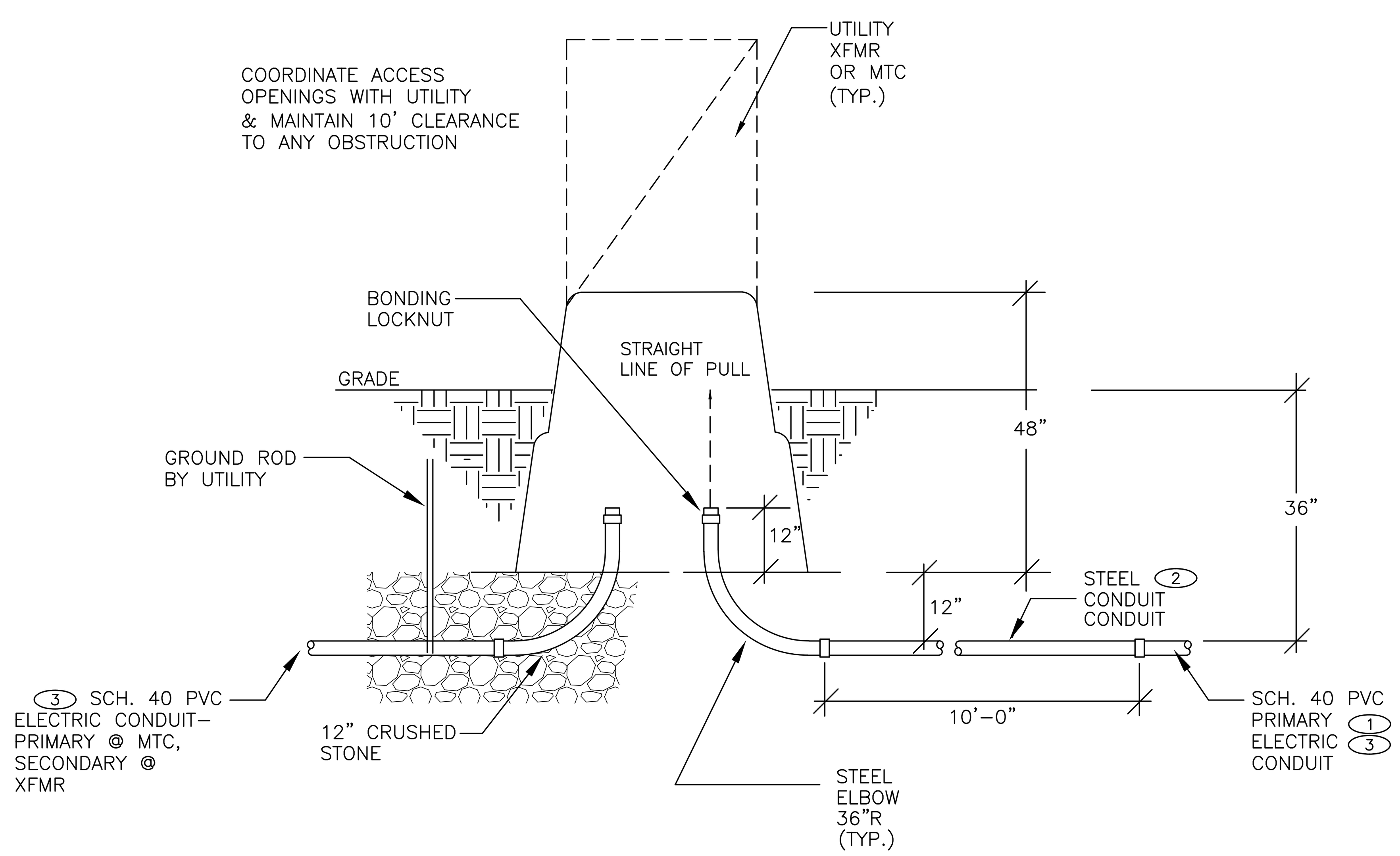
SHEET NUMBER

E-5

I:\4\422065P VZW Marshfield\dwg\Construction Plans\E22065-E1.dwg 10/23/2023 9:22 AM



PLAN VIEW



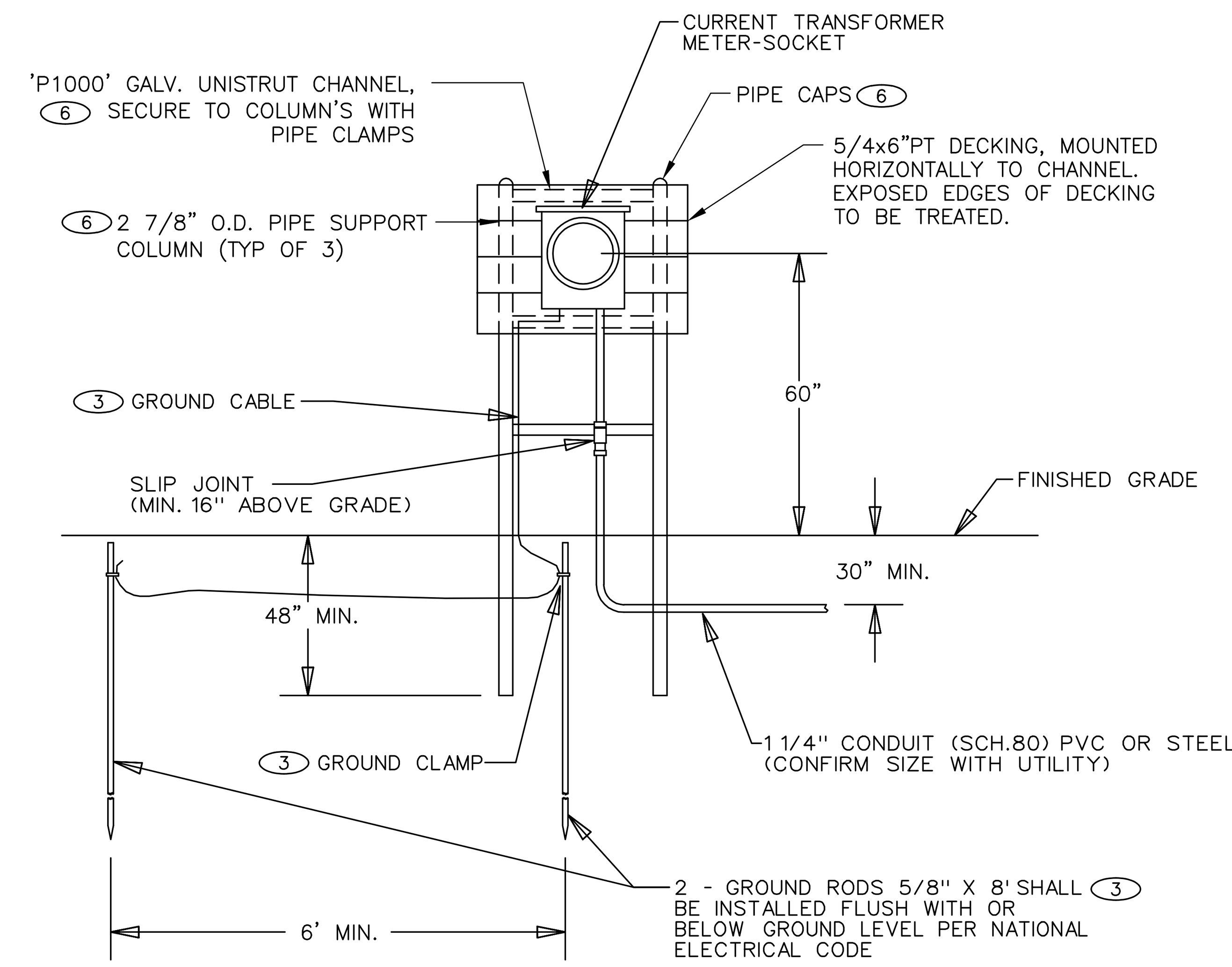
ELEVATION

DETAIL NOTES:

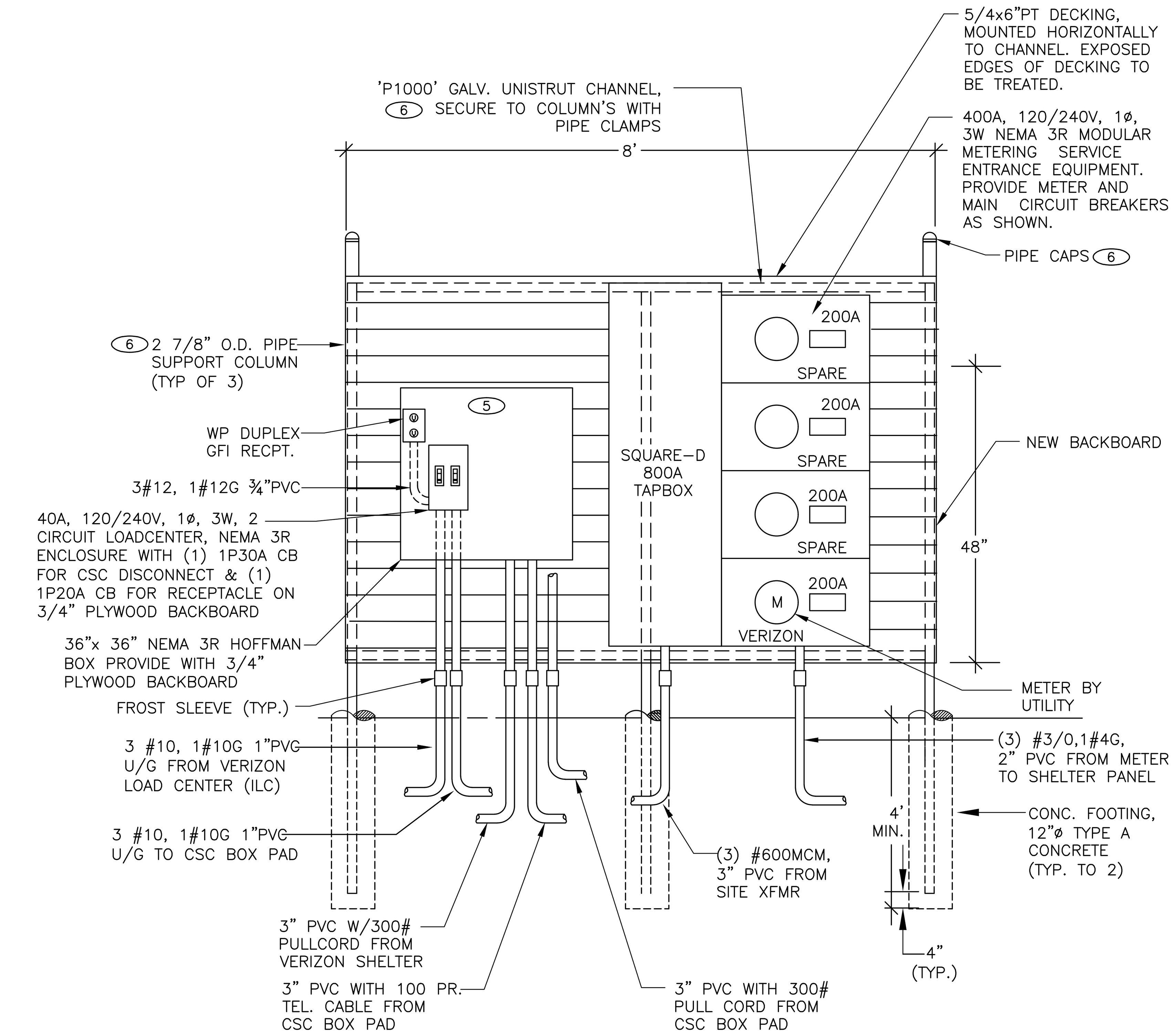
1. PROVIDE DRAINAGE HOLES IN FIRST LENGTH OF UPHILL PVC PER UTILITY SPECS.
2. BOND STEEL CONDUIT PER NEC.
3. FINAL CONNECTIONS AT TRANSFORMER AND MTC BY UTILITY.

1/E-6 ELECTRIC UTILITY TRANSFORMER & MTC INSTALLATION DETAIL

NOT TO SCALE



PRIMARY UTILITY BACKBOARD



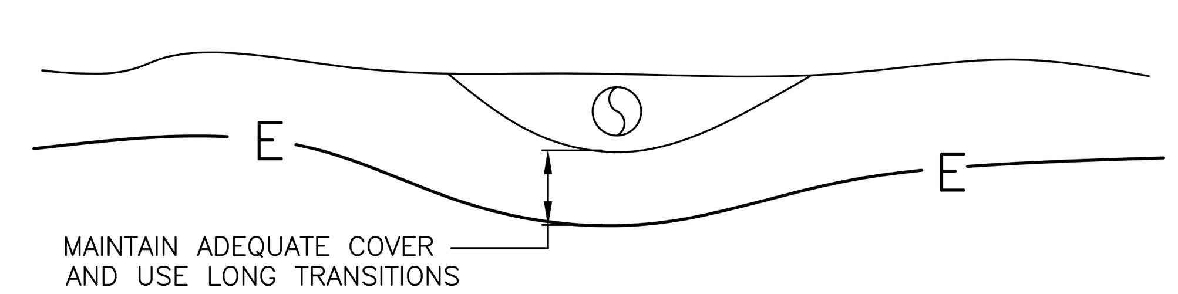
BACKBOARD AT SITE

DETAIL NOTES:

1. FURNISH & INSTALL ALL ITEMS UNLESS OTHERWISE NOTED.
2. GROUND METER STACK AS PER UTILITY SPECS AND NEC.
3. UTILIZE APPROVED GROUNDING METHOD.
4. PROVIDE CAPS FOR ALL CONDUITS WITHOUT WIRING.
5. OUTSIDE PLANT TERMINAL CABINET, EMERSON CAT. NO. BUPB100FS. PUNCH DOWN ALL PAIRS HERE AND IN VERIZON SHELTER AS DIRECTED IN FIELD.
6. ALL UNISTRUT AND RELATED SUPPORTING STRUCTURES SHALL BE HD GALVANIZED.

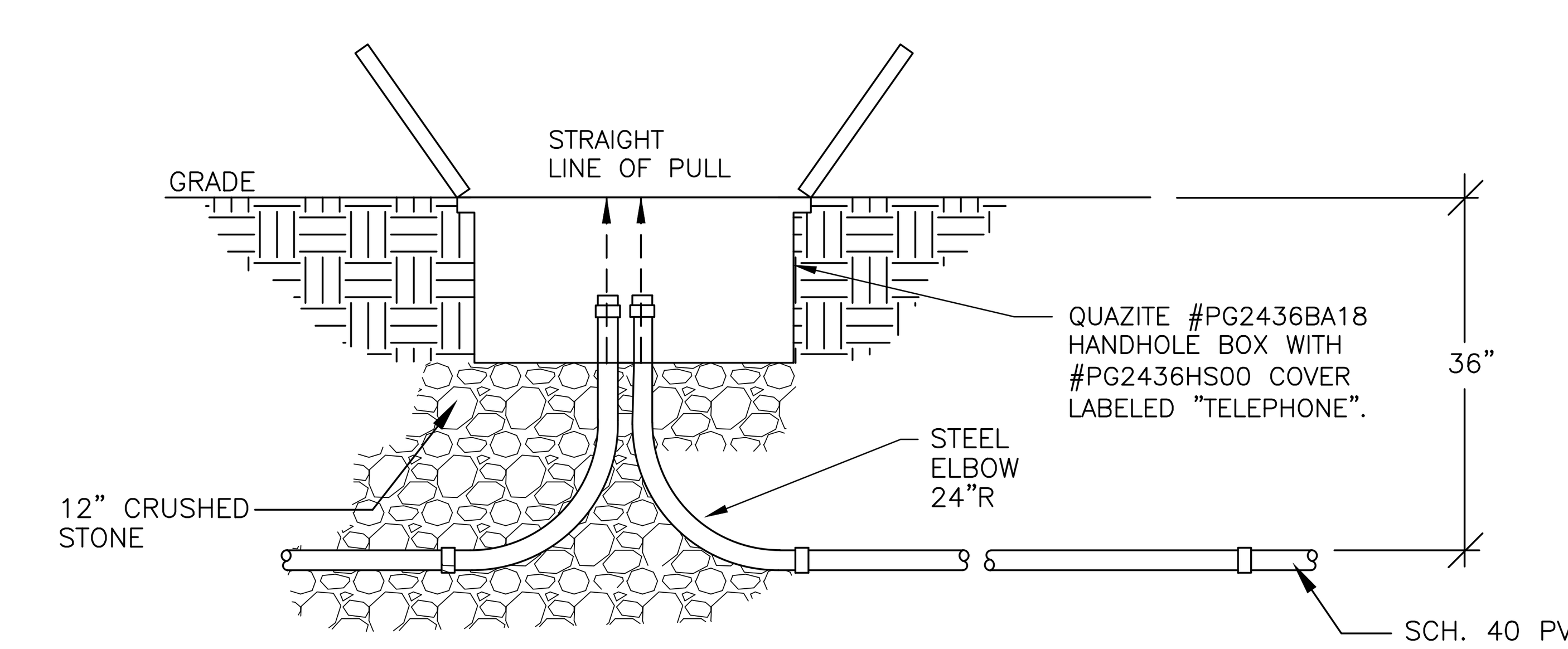
2/E-6 BACKBOARD DETAILS

NOT TO SCALE



3/E-6 CROSS SECTION @ CULVERTS/SWALES & POND DISCHARGE

NOT TO SCALE



4/E-6 TELEPHONE PULL/SPLICE BOX DETAIL

NOT TO SCALE

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PROFESSIONAL SEAL

NO.	DATE	DESCRIPTION	BY	CK'D
1	10-23-2023	ISSUED FOR BID	JWP	LJH

verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT 05658

SHEET TITLE

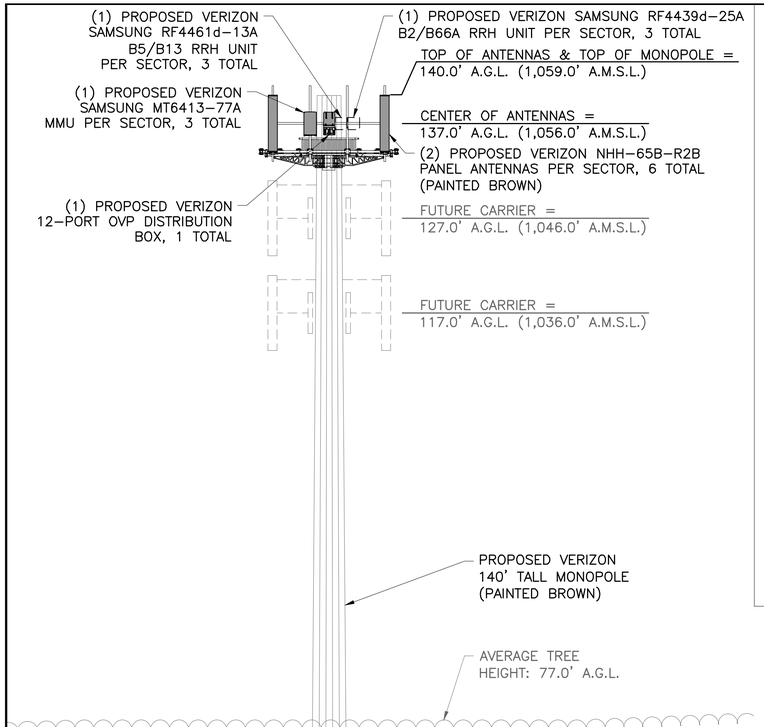
GROUNDING DETAILS

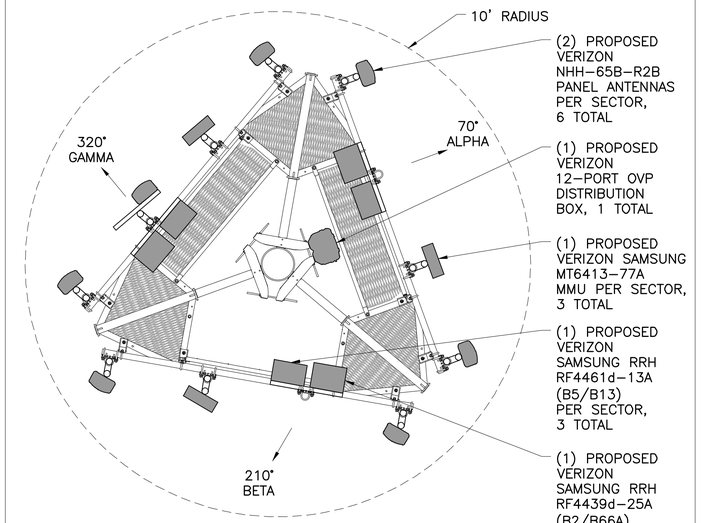
CONSTRUCTION PLANS

DRAWN BY	DATE
EJD	OCT. 2023
CHECKED BY	D&K PROJECT #
WHH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

E-6





PROPOSED ANTENNA PLAN VIEW

SCALE: 1" = 3'

GRAPHIC SCALE

3 0 1.5 3 6 12

(IN FEET)
1 inch = 3 ft. AT 22X34
HALF SIZE AT 11X17

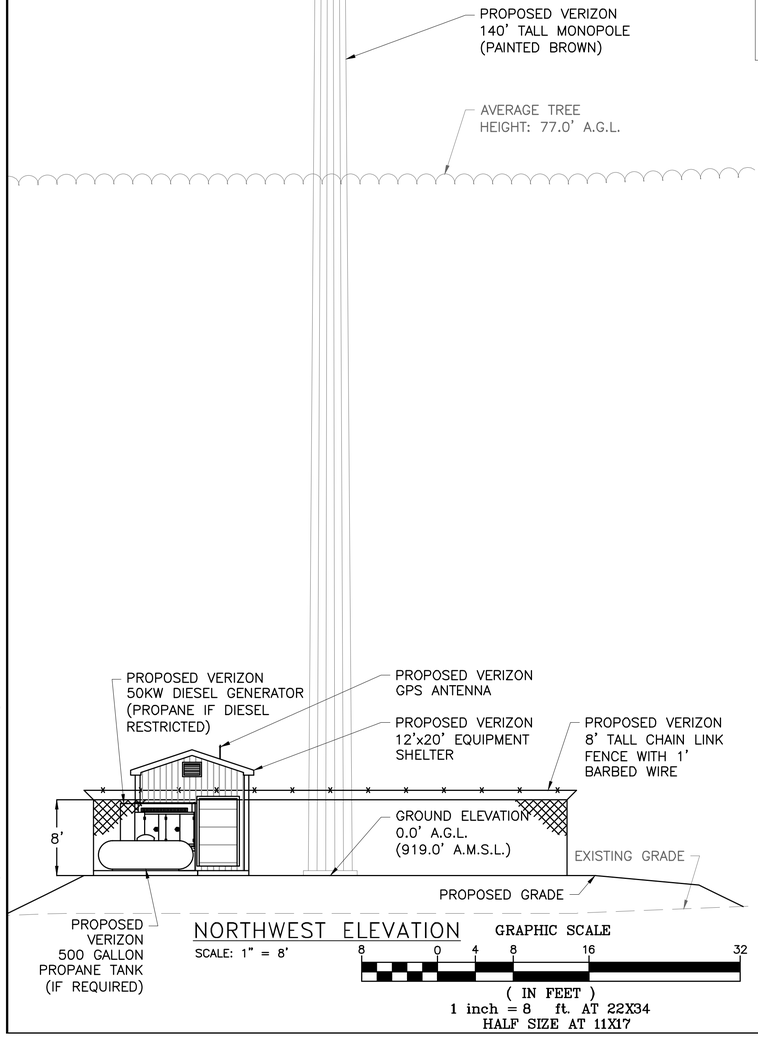
GENERAL NOTES:

1. CONTRACTOR SHALL REFER TO THE LATEST VERIZON WIRELESS RF DATA SHEET WHICH MAY INCLUDE ANTENNA SECTOR AZIMUTHS/ANTENNA CHANGES, ETC. THAT ARE REQUIRED AS PART OF THE PROJECT.
2. CONTRACTORS SHALL SECURE ALL CONTROL CABLES IN ACCORDANCE WITH INDUSTRY STANDARDS AND MANUFACTURERS INSTRUCTIONS. EXTERIOR CONTROL CABLES MAY BE TAPED OR TIE–WRAPPED TO EXISTING COAXIAL CABLES EVERY 4 FT. MAX. FOR HORIZONTAL RUNS. CONTRACTOR MAY USE HOISTING GRIPS AT TOP OF VERTICAL CABLE RUNS IN CERTAIN APPLICATIONS.
3. CONTRACTOR SHALL VERIFY ALL CABLE LENGTHS PRIOR TO CONSTRUCTION.
4. CABLE LENGTH BASED ON RRUs LOCATION ON BACKSIDE OF ANTENNA MASTS.

BILL OF MATERIALS

SITE NAME: WATERBURY 2 VT

ITEM	DESCRIPTION	QTY	LENGTH	MODEL NUMBER	COMMENTS	SUPPLIED BY
1	PORT TERMINAL CAP	0	–	–	–	CONTRACTOR
2	1/2" FOAM COAX JUMPER	36	2m–6.56ft	–	–	VERIZON WIRELESS
3	POWER CABLE	9	70ft	–	–	VERIZON WIRELESS
4	FIBER CABLE	9	70ft	–	–	VERIZON WIRELESS
5	UPPER OVP	1	–	–	12–PORT	VERIZON WIRELESS
6	6x12 HYBRID CABLE	2	100ft	–	–	VERIZON WIRELESS
7	GROUNDING KIT	6	–	–	3 PER CABLE	CONTRACTOR
8	RRH	3	–	SAMSUNG RF4461d–13A B5/B13 RRH	700/850	VERIZON WIRELESS
9	RRH	3	–	SAMSUNG RF4439d–25A B2/B66A RRH	PCS/AWS	VERIZON WIRELESS
10	ANTENNA	6	–	NHH–65B–R2B	700/850/PCS/AWS	VERIZON WIRELESS
11	MMU	3	–	SAMSUNG MT6413–77A	5G	VERIZON WIRELESS
12	EQUIPMENT RACK	1	–	–	2 OVP/BBU EQUIPMENT RACK	VERIZON WIRELESS
13	EQUIPMENT RACK	1	–	–	BATTERY CABINET	VERIZON WIRELESS
14	700/850 CDU30	1	–	–	–	VERIZON WIRELESS
15	PCS/AWS CDU30	1	–	–	–	VERIZON WIRELESS
16	GPS CABLE	1	25ft	–	–	VERIZON WIRELESS
17	GPS ANTENNA	1	–	–	–	VERIZON WIRELESS



NORTHWEST ELEVATION

SCALE: 1" = 8'

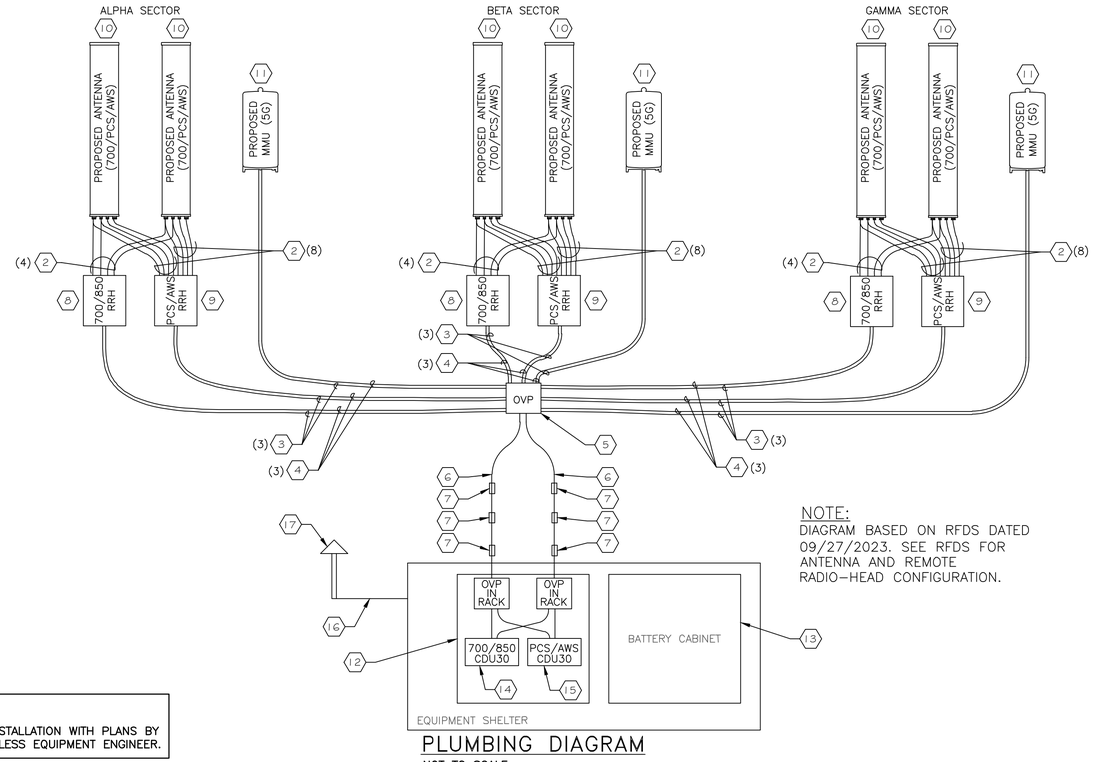
GRAPHIC SCALE

8 0 4 8 16 32

(IN FEET)
1 inch = 8 ft. AT 22X34
HALF SIZE AT 11X17

NOTES:

1. COORDINATE INTERIOR EQUIPMENT INSTALLATION WITH PLANS BY VERIZON WIRELESS & VERIZON WIRELESS EQUIPMENT ENGINEER.



NOTE:
DIAGRAM BASED ON RFDS DATED 09/27/2023. SEE RFDS FOR ANTENNA AND REMOTE RADIO–HEAD CONFIGURATION.

PLUMBING DIAGRAM

NOT TO SCALE

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PROFESSIONAL SEAL

NO.	DATE	DESCRIPTION	BY	CK'D
2	11–02–2023	REVISED LINE WORK TO BE OUTSIDE BUFFER	JWP	LJH
1	10–23–2023	ISSUED FOR BID	JWP	LJH

verizonwireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

MARSHFIELD VT

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

ANTENNA EQUIPMENT DETAILS & SCHEMATICS

CONSTRUCTION PLANS

DRAWN BY	DATE
JWP	OCT. 2023
CHECKED BY	D&K PROJECT #
LJH	422065L1
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

E-7

ELECTRICAL SPECIFICATIONS

PART 1 GENERAL

1.01 WORK INCLUDED

A. COMPLYING WITH THE APPLICABLE PROVISIONS OF THE GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, SPECIAL STATE CONDITIONS AND OTHER PROVISIONS OF THE CONTRACT DOCUMENTS THAT APPLY TO THE WORK INCLUDED IN DIVISION 26. THE GENERAL PROVISIONS OF THE CONTRACT, INCLUDING THE GENERAL, SUPPLEMENTARY, AND SPECIAL CONDITIONS AND THE GENERAL REQUIREMENTS APPLY TO THE WORK SPECIFIED IN ALL SECTIONS OF THIS DIVISION.

B. THE WORK REQUIRED OF THIS DIVISION SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, TRANSPORTATION AND ALL NECESSARY AND RELATED ITEMS REQUIRED TO PROVIDE COMPLETE AND SATISFACTORY OPERATING ELECTRICAL SYSTEMS FOR THE PROJECT. INSTALL NEW ELECTRICAL SYSTEMS INCLUDING BUT NOT LIMITED TO: SELECTIVE DEMOLITION, POWER DISTRIBUTION, ELECTRICAL DEVICES AND RECEPTACLES, LIGHTING, EMERGENCY LIGHTING, EXIT SIGNS, PANELBOARD, FIRE ALARM MODIFICATIONS, BRANCH CIRCUIT WIRING, CAT 6E CABLES, SWITCHING, GROUNDING, AND POWER SYSTEMS FOR THE SYSTEM UPGRADES AND ADDITIONS/MODIFICATIONS.

C. THE WORK IN GENERAL INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING:

1. WIRE AND CABLE.
2. WIRING DEVICES, RACEWAYS, BOXES AND FITTINGS.
3. BRANCH CIRCUITS TO ALL ELECTRICAL EQUIPMENT.
4. PANELBOARD AND CIRCUIT BREAKERS.
5. DISCONNECT SWITCHES AND FUSES.
6. LIGHTING SYSTEM, FIXTURES AND ACCESSORIES.
7. FINAL CONNECTIONS TO ALL EQUIPMENT FURNISHED BY THIS DIVISION AND BY OTHER DIVISIONS.
8. GROUNDING AND BONDING
9. RECEIVING, HANDLING AND STORAGE OF ALL EQUIPMENT REQUIRED OF THIS DIVISION
10. MOUNTING OF EQUIPMENT FURNISHED BY OTHER TRADES, IF SO DESIGNATED
11. THE FINAL TESTING AND ADJUSTMENT OF ALL ELECTRICAL SYSTEMS AND EQUIPMENT TO DEMONSTRATE PROPER FUNCTION, CONTROL AND INTERLOCK.
12. ALL MINOR AND RELATED ITEMS AND ACCESSORIES TO MAKE EACH SYSTEM COMPLETE IN ALL RESPECTS.

D. DRAWINGS: CONTRACT DRAWINGS FOR ELECTRICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT. ELECTRICAL TRADE SHALL FOLLOW THESE DRAWINGS IN LAYING OUT THEIR WORK, CONSULT GENERAL CONSTRUCTION DRAWINGS TO FAMILIARIZE THEMSELVES WITH CONDITIONS AFFECTING THEIR WORK, AND SHALL VERIFY SPACES IN WHICH THEIR WORK WILL BE INSTALLED BY MEASUREMENTS ON THE JOB. DO NOT SCALE DRAWINGS.

E. COORDINATE ALL WORK ACTIVITIES WITH THE OWNER.

F. CONTRACTOR SHALL COORDINATE WITH OWNER WHEN ANY SHUTDOWNS OR POWER OUTAGES ARE REQUIRED. FAILURE TO DO SO, AND ANY SUBSEQUENT EXPENSES DUE TO FAILURE, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

G. CONTRACTOR SHALL COORDINATE WITH UTILITIES, AND THE OWNER OR ANY OTHER CUSTOMERS AFFECTED BY WORK. FAILURE TO DO SO, AND ANY SUBSEQUENT EXPENSES DUE TO FAILURE, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

H. COORDINATION WITH LOCAL FIRE DEPARTMENT PRIOR TO INSTALLATION OF ANY FIRE ALARM DEVICES.

I. THROUGHOUT CONSTRUCTION CONTRACTOR SHALL PROVIDE UPGRADED SCHEDULES TO ACCURATELY REFLECT TIME FRAME OF WORK.

J. COMPLYING WITH REQUIREMENTS OF ALL CODES AND REGULATORY AGENCIES.

K. ARRANGING FOR AND PAYING ALL FEES FOR PERMITS AND OBSERVATIONS.

L. INSTALLING EQUIPMENT FURNISHED BY OTHERS:

1. INSTALLING AND CONNECTING ELECTRICALLY OPERATED EQUIPMENT, CABINETS, STARTERS, CONTROLS AND RELATED ITEMS FURNISHED UNDER OTHER DIVISIONS.
2. INSTALLING CONDUIT AND WIRING AS REQUIRED FOR SUCH EQUIPMENT.

M. INSTALLING AND CONNECTING ELECTRICALLY OPERATED EQUIPMENT, CABINETS, STARTERS, CONTROLS AND RELATED ITEMS FURNISHED UNDER OTHER DIVISIONS OR FURNISHED UNDER THIS DIVISION. INSTALLING CONDUIT AND WIRING AS REQUIRED FOR SUCH EQUIPMENT. COMPLYING WITH THE APPLICABLE PROVISIONS OF THE GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, SPECIAL STATE CONDITIONS AND OTHER PROVISIONS OF THE CONTRACT DOCUMENTS THAT APPLY TO THE WORK INCLUDED IN DIVISION 26.

1.02 COORDINATION WITH UTILITY COMPANY

A. THE PUBLIC SERVICE COMPANY IS: GREEN MOUNTAIN POWER (GMP)

B. UTILITY BACK CHARGES WILL BE PAID BY OWNER.

C. WORK UNDER THIS SECTION SHALL BE CLOSELY COORDINATED WITH RELATED WORK OF THE LOCAL UTILITY COMPANY AND SHALL BE IN ACCORDANCE WITH REQUIREMENTS SET FORTH HEREBY.

D. SUBMIT DRAWINGS AND SPECIFICATIONS INDICATING WORK TO BE ACCOMPLISHED AND OBTAIN APPROVAL FROM THE LOCAL UTILITY COMPANY.

1.03 NOT INCLUDED

A. DIGGING, BACKFILLING, BLASTING, PUMPING, SHORING, CONCRETE AND WORK FURNISHED BY OTHER TRADES.

B. WORK SPECIFICALLY INDICATED TO BE DONE BY OWNER OR OTHERS.

1.04 REFERENCE STANDARDS

A. ELECTRICAL WORK SHALL CONFORM TO ALL REQUIREMENTS OF:

1. NATIONAL ELECTRIC CODE NEC
2. STATE BUILDING CODES.
3. LOCAL ORDINANCES AND REGULATIONS.
4. NFPA FIRE CODES, CURRENT EDITION.
5. UNDERWRITERS' LABORATORIES STANDARDS.
6. LOCAL UTILITY COMPANY REQUIREMENTS.

B. IT SHALL BE UNDERSTOOD THAT ALL CODES AND STANDARDS MENTIONED SHALL BE THOSE IN FORCE AT THE TIME THE CONTRACT IS SIGNED. IF ANY CODE IS CHANGED DURING THE CONSTRUCTION PERIOD, THESE SPECIFICATIONS MAY BE CHANGED BY MUTUAL AGREEMENT BETWEEN THE ENGINEER AND CONTRACTOR.

1.05 QUALITY ASSURANCE

A. CODES AND STANDARDS

1. COMPLY WITH NATIONAL ELECTRICAL CODE REQUIREMENTS FOR ELECTRICAL MATERIALS AND INSTALLATIONS.
2. KEEP COPY OF NATIONAL ELECTRICAL CODE IN FIELD OFFICE FOR DURATION OF PROJECT.
3. IN EACH CASE, CODES ARE MINIMUM REQUIREMENTS.

B. THE CONTRACTOR SHALL SUBMIT PROOF THAT THE ITEMS WHICH HE PROPOSES TO FURNISH UNDER THIS SPECIFICATION CONFORM TO THE STANDARDS OF UNDERWRITERS LABORATORIES, INC. (UL), FACTORY MUTUAL ENGINEERING CORP. (FM) OR WARNOCK HERSEY INC. (WH). THE LABELS OF THESE THREE ORGANIZATIONS SHALL BE ACCEPTED AS CONFORMING TO THIS REQUIREMENT. IN LIEU OF THE LABEL, THE CONTRACTOR MAY SUBMIT A WRITTEN CERTIFICATION FROM ANY NATIONALLY RECOGNIZED TESTING AGENCY, ADEQUATELY EQUIPPED AND COMPETENT TO PERFORM SUCH SERVICES, THAT THE ITEM HAS BEEN TESTED AND CONFORMS TO THE STANDARDS INCLUDING METHODS OF TEST, OR THE TESTING ORGANIZATION(S).

C. QUALIFICATIONS OF INSTALLERS:

1. FOR THE ACTUAL FABRICATION, INSTALLATION AND TESTING OF THE WORK OF THIS SECTION USE ONLY THOROUGHLY TRAINED AND EXPERIENCED PERSONNEL WHO ARE COMPLETELY FAMILIAR WITH THE REQUIREMENTS FOR THIS WORK AND WITH THE INSTALLATION RECOMMENDATIONS OF THE MANUFACTURERS OF THE SPECIFIED ITEMS. CONTRACTOR SHALL BE ONE THAT IS REGULARLY ENGAGED IN THIS TYPE OF WORK.
2. IN THE ACCEPTANCE OR REJECTION OF THE INSTALLED ELECTRICAL SYSTEM, NO ALLOWANCE WILL BE MADE FOR LACK OF SKILL ON THE PART OF INSTALLERS.
3. THE CONTRACTOR SHALL NOT BE RELIEVED FROM COMPLYING WITH ANY OF THE REQUIREMENTS OF THE SPECIFICATIONS OR DRAWINGS WHICH MAY BE IN EXCESS OF AND NOT CONTRARY TO THE REQUIREMENTS OF THE ABOVE MENTIONED RULES.

D. OBSERVATION CERTIFICATES:

1. DELIVER TO THE ENGINEER TWO (2) COPIES OF THE ELECTRICAL OBSERVER'S CERTIFICATE OF APPROVAL SHOWING ACCEPTABILITY OF WORK DONE UNDER THIS CONTRACT.
2. DELIVER TO THE ENGINEER TWO (2) COPIES OF ANY OTHER CERTIFICATES OF APPROVAL.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. PROTECTION: USE ALL MEANS NECESSARY TO PROTECT ELECTRICAL SYSTEM MATERIALS BEFORE, DURING AND AFTER INSTALLATION AND TO PROTECT THE INSTALLED WORK AND MATERIALS OF ALL OTHER TRADES.

B. REPLACEMENTS: IN THE EVENT OF DAMAGE, IMMEDIATELY MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY TO THE ACCEPTANCE OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE OWNER. IF ANY APPARATUS HAS BEEN SUBJECT TO POSSIBLE INJURY BY WATER, IT SHALL BE THOROUGHLY DRIED OUT AND PUT THROUGH SUCH SPECIAL TESTS AS DIRECTED BY THE ENGINEER AT THE COST AND EXPENSE OF THE CONTRACTOR, OR SHALL BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.

C. PROTECT THE WORK OF OTHER TRADES. RESTORE ANY DAMAGE CAUSED TO OTHER TRADES TO THE CONDITION EXISTING PRIOR TO DAMAGE AT NO ADDITIONAL COST TO THE OWNER.

D. INVESTIGATE EACH SPACE IN THE BUILDING THROUGH WHICH EQUIPMENT MUST PASS TO REACH ITS FINAL LOCATION. IF NECESSARY, THE MANUFACTURER SHALL BE REQUIRED TO SHIP HIS MATERIAL IN SECTIONS SIZED TO PERMIT PASSING THROUGH SUCH RESTRICTED AREAS IN THE BUILDING.

1.07 PROJECT CONDITIONS

A. PROJECT DESCRIPTION:

1. THE PROJECT IS TO PROVIDE ALL ELECTRICAL EQUIPMENT NECESSARY TO PROVIDE A COMPLETE AND WORKING SYSTEM. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, APPLIANCES AND TOOLS AND PERFORM ALL WORK NECESSARY FOR THE COMPLETE EXECUTION OF THE ELECTRICAL WORK AS SHOWN ON THE DRAWINGS, REQUIRED BY THE SPECIFICATIONS AND WORK NOT SPECIFICALLY SHOWN OR SPECIFIED, YET REQUIRED TO INSURE PROPER AND COMPLETE OPERATION OF ALL SYSTEMS AND TO SATISFY THE DESIGN INTENT INHERENT IN THE WORK AND TO COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS.
2. ALL MATERIAL REMOVED INCLUDING CONDUIT, WIRE AND RELATED ELECTRICAL EQUIPMENT IS TO BE DISPOSED OF BY THE CONTRACTOR IN A LEGAL MANNER THAT COMPLIES WITH ALL RULES AND REGULATIONS APPLICABLE IN THE STATE OF VERMONT.

B. EXISTING CONDITIONS:

1. PRIOR TO ALL WORK OF THIS SECTION, CAREFULLY OBSERVE THE INSTALLED WORK OF ALL OTHER TRADES AND VERIFY THAT ALL SUCH WORK IS COMPLETE TO THE POINT WHERE THIS INSTALLATION MAY PROPERLY COMMENCE.
2. VERIFY THAT THE ELECTRICAL INSTALLATION MAY BE MADE IN COMPLETE ACCORDANCE WITH ALL PERTINENT CODES AND REGULATIONS AND THE DESIGN. IN THE EVENT OF DISCREPANCY, IMMEDIATELY NOTIFY THE ENGINEER. DO NOT PROCEED WITH INSTALLATION IN AREAS OF DISCREPANCY UNTIL ALL SUCH DISCREPANCIES HAVE BEEN FULLY RESOLVED.
3. VERIFY SIZES AND RATINGS OF MOTORS AND OTHER ELECTRICALLY OPERATED DEVICES SUPPLIED BY OTHERS.

C. COORDINATION:

1. COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE SCHEDULES FOR WORK OF OTHER TRADES TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.
2. ANY CHANGES SHALL BE DONE AT THE CONTRACTOR'S EXPENSE.
3. WHERE ELECTRICAL ITEMS ARE SHOWN IN CONFLICT WITH LOCATIONS OF STRUCTURAL MEMBERS AND MECHANICAL OR OTHER EQUIPMENT, FURNISH AND INSTALL ALL REQUIRED SUPPORTS AND WIRING TO CLEAR THE ENCROACHMENT.
4. ANY WORK INSTALLED CONTRARY TO OR WITHOUT ACCEPTANCE BY THE ENGINEER SHALL BE SUBJECT TO CHANGE AS DIRECTED BY THE ENGINEER, AND NO EXTRA COMPENSATION WILL BE ALLOWED THE CONTRACTOR FOR MAKING THESE CHANGES.

D. ACCURACY OF DATA:

1. THE DRAWINGS ARE DIAGRAMMATIC AND FUNCTIONAL ONLY, AND ARE NOT INTENDED TO SHOW EXACT CIRCUIT LAYOUTS, NUMBER OF FITTINGS, OR OTHER INSTALLATION DETAILS.
2. LOCATIONS ARE APPROXIMATE ONLY AND FIELD MEASUREMENTS GOVERN. WHERE CONFLICTS OR INTERFERENCES OCCUR, CONSULT WITH ENGINEER BEFORE INSTALLATION.

PART 2 PRODUCTS

2.01 MATERIALS

A. MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS' LABORATORIES, OR OTHER OSHA ACCEPTED TESTING LABORATORY, UNLESS IT CAN BE DEMONSTRATED THAT NO UL STANDARDS EXIST FOR A SPECIFIC ITEM OR CLASS OF EQUIPMENT. ELECTRICAL EQUIPMENT SHALL BE HEAVY DUTY INDUSTRIAL GRADE OR FEDERAL SPECIFICATION GRADE OR BETTER. RESIDENTIAL OR COMMERCIAL GRADE PRODUCTS WILL NOT BE ACCEPTED. ALL OTHER MATERIALS, NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND OPERABLE ELECTRICAL INSTALLATION, SHALL BE NEW, FIRST QUALITY OF THEIR RESPECTIVE KINDS, SPECIFICATION GRADE OR BETTER, AND AS SELECTED BY THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE ENGINEER. ROUGH IN AND MAKE FINAL CONNECTIONS OF ELECTRICAL TO ALL EQUIPMENT FURNISHED UNDER OTHER SECTIONS. CONNECTIONS SHALL INCLUDE NECESSARY DISCONNECT SWITCHES, ETC. CONTRACTOR SHALL OBTAIN ACCEPTED ROUGH IN DRAWINGS FOR EQUIPMENT BEFORE STARTING WORK. ROUGH IN WORK DONE WITHOUT ACCEPTED DRAWINGS SHALL BE RELOCATED AT CONTRACTOR'S EXPENSE

B. ALL CONTROL PANELS, WHETHER FABRICATED BY CONTRACTOR OR FURNISHED AS PART OF A MANUFACTURED EQUIPMENT ASSEMBLY, SHALL BE CONSTRUCTED TO STANDARDS OF AND CONTAIN ONLY PRODUCTS AND COMPONENTS THAT HAVE BEEN TESTED AND LABELED BY UL, ETL, FM, OR OTHER OSHA ACCEPTED INDEPENDENT TESTING LABORATORY. ALL CONTROL PANELS SHALL BE UL LISTED AS A COMPLETE ASSEMBLY OR BE A UL FIELD EVALUATED PRODUCT. THE CONTRACTOR SHALL BEAR ALL COSTS RELATED TO THE UL FIELD EVALUATION, PANEL MODIFICATIONS AND FOLLOW-UP EVALUATIONS. CONTROL PANELS FAILING TO MEET UL LISTING STANDARDS SHALL BE REMOVED AND REPLACED BY LISTED PANELS AT NO COST TO THE OWNER.

C. ALL OTHER MATERIALS, NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND OPERABLE ELECTRICAL INSTALLATION, SHALL BE NEW, FIRST QUALITY OF THEIR RESPECTIVE KINDS, AND AS SELECTED BY THE CONTRACTOR SUBJECT TO THE ACCEPTANCE BY THE ENGINEER. THE ENGINEER RESERVES THE RIGHT TO REJECT ANY SUBMITTAL WHICH CONTAINS EQUIPMENT FROM VARIOUS MANUFACTURERS IF SUITABLE MATERIALS CAN BE SECURED FROM FEWER MANUFACTURERS AND TO REQUIRE THAT SOURCE OF MATERIALS BE UNIFIED TO THE MAXIMUM EXTENT POSSIBLE.

D. LOCATE ALL EQUIPMENT WHICH MUST BE SERVICED, OPERATED, OR MAINTAINED IN FULL ACCESSIBLE POSITIONS. EQUIPMENT SHALL INCLUDE BUT NOT BE LIMITED TO MOTORS, CONTROLLERS, SWITCHGEAR AND PANELS.

2.02 INTERCHANGEABILITY

A. IN ALL DESIGN AND PURCHASING, INTERCHANGEABILITY OF ITEMS OF EQUIPMENT, SUBASSEMBLIES, PARTS, AND OTHER ITEMS IS ESSENTIAL. FOR EASE OF MAINTENANCE AND PARTS REPLACEMENT, ALL SIMILAR ITEMS SHALL BE OF THE SAME MANUFACTURER, TYPE, MODEL AND DIMENSIONS.

B. THE ENGINEER RESERVES THE RIGHT TO REJECT ANY SUBMITTAL WHICH CONTAINS EQUIPMENT FROM VARIOUS MANUFACTURERS IF SUITABLE MATERIALS CAN BE SECURED FROM FEWER MANUFACTURERS AND TO REQUIRE THAT SOURCE OF MATERIALS BE UNIFIED TO THE MAXIMUM EXTENT POSSIBLE.

2.03 ACCESSIBILITY

A. VERIFY THE SUFFICIENCY AND THE SIZE OF SPACES FOR THE PROPER INSTALLATION OF THE WORK. COORDINATE AND COOPERATE WITH ALL OTHER TRADES WHOSE WORK IS WITHIN THE SAME SPACE. COORDINATE CLEARANCE REQUIREMENTS AMONG VARIOUS PIECES OF EQUIPMENT THAT WILL BE INSTALLED IN CLOSE PROXIMITY WITH ONE ANOTHER TO ELIMINATE EQUIPMENT CONFLICTS AND INTERFERENCE.

B. LOCATE ALL EQUIPMENT WHICH MUST BE SERVICED, OPERATED, OR MAINTAINED IN FULL ACCESSIBLE POSITIONS. EQUIPMENT SHALL INCLUDE BUT NOT BE LIMITED TO MOTORS, CONTROLLERS, SWITCHGEAR AND PANELS. COORDINATE AND COOPERATE WITH ALL OTHER TRADES WHOSE WORK IS WITHIN THE SAME SPACE N.E.C. CODE CLEARANCES SHALL BE MAINTAINED AT ALL TIMES AND SHALL BE CONSIDERED THE MINIMUM CLEARANCES ALLOWED.

2.04 CONNECTIONS TO EQUIPMENT AND FIXTURES

A. ROUGH-IN AND MAKE FINAL CONNECTIONS OF ELECTRICAL TO ALL EQUIPMENT FURNISHED UNDER OTHER SECTIONS. CONNECTIONS SHALL INCLUDE NECESSARY DISCONNECT SWITCHES, ETC. CONTRACTOR SHALL OBTAIN ACCEPTED ROUGH-IN DRAWINGS FOR EQUIPMENT BEFORE STARTING WORK. ROUGH-IN WORK DONE WITHOUT ACCEPTED DRAWINGS SHALL BE RELOCATED AT CONTRACTOR'S EXPENSE.

2.05 PAINTING AND CLEANING

A. PAINTING SHALL BE UNDER THE SECTION 09900 EXCEPT AS STATED BELOW.

B. METAL SURFACES (CONDUIT HANGERS, SUPPORTS, ETC.) EXPOSED TO OUTDOORS SHALL BE GIVEN TWO (2) COATS OF RUST INHIBITING PAINT BY THE INSTALLING CONTRACTOR PER MANUFACTURER'S INSTRUCTIONS.

C. CONDUIT, STEEL, BOLTS, ETC. INSTALLED IN EARTH OR BELOW VAPOR BARRIER SHALL BE GIVEN TWO (2) COATS OF ZINC RICH COMPOUND. MATERIAL EMBEDDED IN CONCRETE NEED NOT BE PAINTED. CONDUIT PROTRUDING THROUGH CONCRETE FLOORS SHALL BE PLASTIC AT THE POINT OF BREACH.

2.06 ELECTRICAL EQUIPMENT MANUFACTURERS

A. ACCEPTABLE MANUFACTURERS:

1. EATON CORPORATION; CUTLER-HAMMER PRODUCTS.
2. GENERAL ELECTRIC CO.; ELECTRICAL DISTRIBUTION & CONTROL DIVISION.
3. SIEMENS ENERGY & AUTOMATION, INC.
4. SQUARE D/GROUP SCHNEIDER.

B. SUBSTITUTIONS: ITEMS OF SAME FUNCTION AND PERFORMANCE ARE ACCEPTABLE IN CONFORMANCE WITH THE GENERAL REQUIREMENTS. MANUFACTURER'S CATALOG NUMBERS ARE USED TO DEFINE QUALITY AND PERFORMANCE AND ARE NOT INTENDED TO PROHIBIT USE OF COMPARABLE PRODUCTS BY OTHER MANUFACTURERS.

2.07 BUILDING WIRING AND IT CABLING

A. BRANCH CIRCUIT WIRING IN CONDUIT SHALL BE TYPE THHN-THWN, 600V COPPER, UL LISTED. MINIMUM SIZE: #12 AWG WITH GROUND. WIRING LARGER THAN #8 SHALL BE STRANDED. ALL WIRING SHALL BE IN CONDUIT (EMT) OR TYPE MC AS ACCEPTED BY THE ENGINEER.

B. CONDUIT SHALL BE EMT. MOTOR CONNECTIONS SHALL BE MADE WITH FLEXIBLE CONDUIT AND MATCHING CONNECTORS.

C. CONDUIT UNDERGROUND SHALL BE SCHEDULE 40 PVC, ¾" MINIMUM.

D. SPLICES FOR #10 AWG AND SMALLER WIRE SHALL BE WIRE NUT TYPE AND SOLDERLESS LUGS FOR # 8 AWG AND LARGER.

E. COLOR-CODING FOR PHASE AND VOLTAGE LEVEL IDENTIFICATION, 600 V AND LESS: USE THE COLORS LISTED BELOW FOR UNGROUNDED SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS.

1. COLOR SHALL BE FACTORY APPLIED.
2. COLORS FOR 208Y/120-V AND 240/120 CIRCUITS:
   a. PHASE A: BLACK.
   b. PHASE B: RED.
   c. PHASE C: BLUE.
   d. NEUTRAL: WHITE
   e. SWITCH LEG - OTHER THAN PHASE WIRE COLOR
   f. GROUND - GREEN, IF INSULATED
3. COLORS FOR 48V CIRCUITS:
   a. CONDUCTOR 1: ONE/BLACK.
   b. CONDUCTOR 1: TWO/RED.
   c. CONDUCTOR 1: THREE/BLUE.
   d. CONDUCTOR 1: FOUR/ORANGE.
   e. GROUND - GREEN, IF INSULATED

G. PULL AND JUNCTION AND BOXES:

1. PULLBOXES AND JUNCTION BOXES: METAL OR NONMETALLIC TYPE CONSTRUCTION, CONFORMING TO NATIONAL ELECTRICAL CODE, WITH SCREW-ON OR HINGED COVER, SIZE AND LOCATE BOXES AS REQUIRED.
2. ENCLOSURE TYPES SHALL BE USED AS FOLLOWS:
   a. NEMA 1 - INTERIOR LOCATIONS, DRY.
   b. NEMA 12 - INTERIOR LOCATIONS SUBJECT TO OIL SEEPAGE OR DUST, MAY SUBSTITUTED FOR NEMA 1.
   c. NEMA 3R - EXTERIOR WET LOCATIONS ON OUTDOOR STRUCTURES WHERE MOISTURE IS PRESENT, ENCLOSURES ARE TO BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED ALUMINUM.

2.08 DISCONNECT SWITCHES

A. PROVIDE HEAVY-DUTY TYPE, FUSED OR UNFUSED AS REQUIRED. FUSES SHALL BE TYPE TIME DELAY RK-1 OR EQUIVALENT, UNLESS OTHERWISE NOTED. PROVIDE FOR ALL HVAC EQUIPMENT WHERE NOT FURNISHED WITH EQUIPMENT OR BY DIVISION 23, FULLY COORDINATE BETWEEN TRADES.

2.09 FUSIBLE AND NONFUSIBLE SWITCHES

A. FUSIBLE SWITCH, 600 A AND SMALLER: NEMA KS 1, TYPE HD, WITH CLIPS OR BOLT PADS TO ACCOMMODATE SPECIFIED FUSES, LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION.

B. NONFUSIBLE SWITCH, 600 A AND SMALLER: NEMA KS 1, TYPE HD, LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION.

C. ACCESSORIES:

1. EQUIPMENT GROUND KIT: INTERNALLY MOUNTED AND LABELED FOR COPPER AND ALUMINUM GROUND CONDUCTORS.
2. NEUTRAL KIT: INTERNALLY MOUNTED; INSULATED, CAPABLE OF BEING GROUNDED, AND BONDED; AND LABELED FOR COPPER AND ALUMINUM NEUTRAL CONDUCTORS.
3. AUXILIARY CONTACT KIT: AUXILIARY SET OF CONTACTS ARRANGED TO OPEN BEFORE SWITCH BLADES OPEN.

2.10 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES

A. MOLDED-CASE CIRCUIT BREAKER: NEMA AB 1, WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS.

1. THERMAL-MAGNETIC CIRCUIT BREAKERS: INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250 A AND LARGER.
2. ADJUSTABLE INSTANTANEOUS-TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT-MOUNTED, FIELD-ADJUSTABLE TRIP SETTING.
3. CURRENT-LIMITING CIRCUIT BREAKERS: FRAME SIZES 400 A AND SMALLER AND LET-THROUGH RATINGS LESS THAN NEMA FU 1, RK-5.
4. GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH 5-MA TRIP SENSITIVITY.

B. MOLDED-CASE CIRCUIT-BREAKER FEATURES AND ACCESSORIES:

1. STANDARD FRAME SIZES, TRIP RATINGS, AND NUMBER OF POLES.
2. LUGS: MECHANICAL STYLE WITH COMPRESSION LUG KITS SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIAL.
3. APPLICATION LISTING: TYPE SWD FOR SWITCHING FLUORESCENT LIGHTING LOADS; TYPE HACR FOR HEATING, AIR-CONDITIONING, AND REFRIGERATING EQUIPMENT.

2.11 ENCLOSURES

A. NEMA AB 1 AND NEMA KS 1 TO MEET ENVIRONMENTAL CONDITIONS OF INSTALLED LOCATION.

1. OUTDOOR LOCATIONS: NEMA 250, TYPE 3R.
2. CHEMICAL: NEMA 250, TYPE 4X, STAINLESS STEEL OR NON-METALLIC, COMPATIBLE WITH CHEMICAL
3. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4.

2.12 GROUNDING

A. WORK INCLUDED:

1. FURNISHING POWER SYSTEM GROUNDING.
2. INSTALLATION.
3. PROVIDE AND INSTALL EACH ELECTRICAL GROUNDING SYSTEM WITH ASSEMBLY OF MATERIALS REQUIRED FOR COMPLETE INSTALLATION INCLUDING WIRES/CABLES, CONNECTORS, LUGS, CLAMPS, GROUND RODS, BONDING JUMPERS AND ACCESSORIES.
4. PROVIDE AND INSTALL ELECTRICAL CONNECTORS, LUGS, CLAMPS, BONDING JUMPERS AND ACCESSORIES AS RECOMMENDED BY THE RESPECTIVE MANUFACTURER FOR THE PARTICULAR APPLICATION, UNLESS OTHER INDICATED.

B. GROUNDING AND BONDING EXECUTION:

1. INSTALL BONDING JUMPER FOR FLEXIBLE METAL CONDUIT UNLESS FITTINGS ARE ACCEPTED FOR GROUNDING OR OTHERWISE COMPLY WITH N.E.C.
   a. SIZE JUMPER TO MATCH OVER-CURRENT DEVICE.
   b. GREEN INSULATION.
   c. CONNECT TO GROUNDING BUSHING AT EACH END.
2. ENSURE THAT ENTIRE ELECTRICAL SYSTEM IS ELECTRICALLY CONTINUOUS AND PERMANENTLY AND EFFECTIVELY GROUNDED, INCLUDING ALL ELECTRICAL EQUIPMENT AND MOTORS.

2.13 SUPPORTING DEVICES AND LABELS

A. GALVANIZED CONDUIT CLAMPS. DO NOT USE PERFORATED PIPE STRAPS.

B. ANCHOR METHODS:

1. SOLID MASONRY: ACCEPTED STAINLESS STEEL EXPANSION ANCHORS OR PRESET INSERTS. RAWL OR DIAMOND MANUFACTURER OR EQUAL.
2. METAL SURFACES: GALVANIZED MACHINE SCREWS, BOLTS, OR WELDED STUDS.
3. CONCRETE SURFACES: SELF-DRILLING STAINLESS STEEL ANCHORS OR POWER-DRIVEN STUDS. STAR, DIAMOND OR RAWL MANUFACTURER OR EQUAL.
4. COMPLY WITH NFPA 70 AND 29 CFR 1910.145. SELF-ADHESIVE WARNING LABELS: FACTORY PRINTED, MULTICOLOR, PRESSURE-SENSITIVE ADHESIVE LABELS, CONFIGURED FOR DISPLAY ON FRONT COVER, DOOR, OR OTHER ACCESS TO EQUIPMENT, UNLESS OTHERWISE INDICATED.
5. EQUIPMENT IDENTIFICATION LABELS
   a. ADHESIVE FILM LABEL WITH CLEAR PROTECTIVE OVERLAY: MACHINE PRINTED, IN BLACK, BY THERMAL TRANSFER OR EQUIVALENT PROCESS. MINIMUM LETTER HEIGHT SHALL BE 3/8 INCH. OVERLAY SHALL PROVIDE A WEATHERPROOF AND ULTRAVIOLET-RESISTANT SEAL FOR LABEL.
   b. SELF-ADHESIVE, ENGRAVED, LAMINATED ACRYLIC OR MELAMINE LABEL: ADHESIVE BACKED, WITH WHITE LETTERS ON A DARK-GRAY BACKGROUND. MINIMUM LETTER HEIGHT SHALL BE 3/8 INCH.
6. AUXILIARY ELECTRICAL SYSTEMS INCLUDING EQUIPMENT, CONDUCTORS AND CABLE IDENTIFICATION: USE MARKER TAPE TO IDENTIFY FIELD-INSTALLED ALARM, CONTROL, SIGNAL, COMMUNICATIONS, VOICE, AND DATA WIRING CONNECTIONS.
   a. IDENTIFY CONDUCTORS, CABLES, AND TERMINALS IN ENCLOSURES AND AT JUNCTIONS, TERMINALS, AND CABLE PULL POINTS. IDENTIFY BY SYSTEM AND CIRCUIT DESIGNATION.
   b. USE SYSTEM OF DESIGNATIONS THAT IS UNIFORM AND CONSISTENT WITH SYSTEM USED BY MANUFACTURER FOR FACTORY-INSTALLED CONNECTIONS.
   c. WARNING LABELS FOR INDOOR CABINETS, BOXES, AND ENCLOSURES FOR POWER AND LIGHTING: COMPLY WITH 29 CFR 1910.145 AND APPLY SELF-ADHESIVE WARNING LABELS, BAKED-ENAMEL WARNING SIGNS, OR METAL-BACKED, BUTYRATE WARNING SIGNS. IDENTIFY SYSTEM VOLTAGE WITH BLACK LETTERS ON AN ORANGE BACKGROUND. APPLY TO EXTERIOR OF DOOR, COVER, OR OTHER ACCESS.
   d. EQUIPMENT WITH MULTIPLE POWER OR CONTROL SOURCES: APPLY TO DOOR OR COVER OF EQUIPMENT INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: EQUIPMENT REQUIRING WORKSPACE CLEARANCE ACCORDING TO NFPA 70: UNLESS OTHERWISE INDICATED, APPLY TO DOOR OR COVER OF EQUIPMENT BUT NOT ON FLUSH PANELBOARDS AND SIMILAR EQUIPMENT IN FINISHED SPACES.
7. EQUIPMENT IDENTIFICATION LABELS: ON EACH UNIT OF EQUIPMENT, INSTALL UNIQUE DESIGNATION LABEL THAT IS CONSISTENT WITH WIRING DIAGRAMS, SCHEDULES, AND OPERATION AND MAINTENANCE MANUAL. APPLY LABELS TO DISCONNECT SWITCHES AND PROTECTION EQUIPMENT, CENTRAL OR MASTER UNITS, CONTROL PANELS, CONTROL STATIONS, TERMINAL CABINETS, AND RACKS OF EACH SYSTEM.
8. SYSTEMS INCLUDE POWER, LIGHTING, CONTROL, COMMUNICATION, SIGNAL, MONITORING, AND ALARM SYSTEMS UNLESS EQUIPMENT IS PROVIDED WITH ITS OWN IDENTIFICATION. OUTDOOR EQUIPMENT: ENGRAVED, LAMINATED ACRYLIC OR MELAMINE LABEL, DRILLED FOR SCREW ATTACHMENT. THE FOLLOWING DEVICES SHALL BE LABELED: PANELBOARDS, ELECTRICAL CABINETS, ENCLOSURES, TRANSFORMERS, CONTROL CENTERS, DISCONNECT SWITCHES, CIRCUIT BREAKERS, POWER TRANSFER EQUIPMENT, AND CONTACTORS.

2.14 DEVICES AND OUTLET BOXES

A. OUTLET BOX CONSTRUCTION:

1. INTERIOR LOCATIONS: STEEL 4"SQUARE MINIMUM CONFORMING TO UL REQUIREMENTS.
2. EXTERIOR LOCATIONS: CAST METAL, DEEP TYPE.

B. SIZE BOXES PER NEC, MINIMUM 1-1/2 INCHES DEEP. USE GANG BOXES FOR MULTIPLE OUTLETS.

C. COVER PLATES:

1. PROVIDE OPENINGS AS REQUIRED.

D. DEVICES - NOTE: PROVIDE SPECIFICATION GRADE DEVICES 120V, 20A, UL LISTED. COLOR IVORY WITH MATCHING COVER PLATES.

1. RECEPTACLES, RECEPTACLES WITH INTEGRAL GFCI, AND ASSOCIATED DEVICE PLATES.
2. RECEPTACLES WITH INTEGRAL SURGE SUPPRESSION UNITS.
3. SNAP SWITCHES.
4. WALL-SWITCH OCCUPANCY SENSORS.
5. COMMUNICATIONS OUTLETS.
6. CEILING MOUNTED OCCUPANCY SENSORS.

E. SOURCE LIMITATIONS: OBTAIN EACH TYPE OF WIRING DEVICE AND ASSOCIATED WALL PLATE THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER. INSOFAR AS THEY ARE AVAILABLE, OBTAIN ALL WIRING DEVICES AND ASSOCIATED WALL PLATES FROM A SINGLE MANUFACTURER AND ONE SOURCE.

F. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NEC, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

G. MANUFACTURERS' NAMES: SHORTENED VERSIONS (SHOWN IN PARENTHESES):

1. COOPER WIRING DEVICES; A DIVISION OF COOPER INDUSTRIES, INC. (COOPER).
2. HUBBELL INCORPORATED; WIRING DEVICE-KELLEMS (HUBBELL).
3. LEVITON MFG. COMPANY INC. (LEVITON).
4. PASS & SEYMOUR/LEGRAND; WIRING DEVICES & ACCESSORIES (PASS & SEYMOUR).

H. CONVENIENCE RECEPTACLES, 125 V, 20 A: COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, AND UL 498.

1. COOPER; 5351 (SINGLE), 5352 (DUPLEX).
2. HUBBELL; HBL5351 (SINGLE), CR5352 (DUPLEX).
3. LEVITON; 5891 (SINGLE), 5352 (DUPLEX).
4. PASS & SEYMOUR; 5381 (SINGLE), 5352 (DUPLEX).

I. CORD AND PLUG DESCRIPTION: MATCH VOLTAGE AND CURRENT RATINGS AND NUMBER OF CONDUCTORS TO REQUIREMENTS OF EQUIPMENT BEING CONNECTED.

1. CORD: RUBBER-INSULATED, STRANDED-COPPER CONDUCTORS, WITH TYPE SOW-A JACKET; WITH GREEN-INSULATED GROUNDING CONDUCTOR AND EQUIPMENT-RATING AMPACITY PLUS A MINIMUM OF 30 PERCENT.
2. PLUG: NYLON BODY AND INTEGRAL CABLE-CLAMPING JAWS. MATCH CORD AND RECEPTACLE TYPE FOR CONNECTION.

K. SWITCHES, 120/277 V, 20 A:

3. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:
   a. COOPER; 2221 (SINGLE POLE), 2222 (TWO POLE), 2223 (THREE WAY), 2224 (FOUR WAY).
   b. HUBBELL; CS1221 (SINGLE POLE), CS1222 (TWO POLE), CS1223 (THREE WAY), CS1224 (FOUR WAY).
   c. LEVITON; 1221-2 (SINGLE POLE), 1222-2 (TWO POLE), 1223-2 (THREE WAY), 1224-2 (FOUR WAY).
   d. PASS & SEYMOUR; 20AC1 (SINGLE POLE), 20AC2 (TWO POLE), 20AC3 (THREE WAY), 20AC4 (FOUR WAY).

L. DEVICE WIRING

1. COMPLY WITH NECA 1, INCLUDING THE MOUNTING HEIGHTS LISTED IN THAT STANDARD, UNLESS OTHERWISE NOTED.
2. COORDINATION WITH OTHER TRADES: TAKE STEPS TO INSURE THAT DEVICES AND THEIR BOXES ARE PROTECTED. DO NOT PLACE WALL FINISH MATERIALS OVER DEVICE BOXES AND DO NOT CUT HOLES FOR BOXES WITH ROUTERS THAT ARE GUIDED BY RIDING AGAINST OUTSIDE OF THE BOXES.
3. KEEP OUTLET BOXES FREE OF PLASTER, DRYWALL JOINT COMPOUND, MORTAR, CEMENT, CONCRETE, DUST, PAINT, AND OTHER MATERIAL THAT MAY CONTAMINATE THE RACEWAY SYSTEM, CONDUCTORS, AND CABLES.
4. INSTALL DEVICE BOXES IN BRICK OR BLOCK WALLS SO THAT THE COVER PLATE DOES NOT CROSS A JOINT UNLESS THE JOINT IS TROWELED FLUSH WITH THE FACE OF THE WALL.
5. INSTALL WIRING DEVICES AFTER ALL WALL PREPARATION, INCLUDING PAINTING, IS COMPLETE.
6. CONDUCTORS AND DEVICE INSTALLATION:
   a. DO NOT STRIP INSULATION FROM CONDUCTORS UNTIL JUST BEFORE THEY ARE SPLICED OR TERMINATED ON DEVICES.
   b. STRIP INSULATION EVENLY AROUND THE CONDUCTOR USING TOOLS DESIGNED FOR THE PURPOSE. AVOID SCORING OR NICKING OF SOLID WIRE OR CUTTING STRANDS FROM STRANDED WIRE.
   c. THE LENGTH OF FREE CONDUCTORS AT OUTLETS FOR DEVICES SHALL MEET PROVISIONS OF NEC, ARTICLE 300, WITHOUT PIGTAILS.
7. REPLACE ALL DEVICES THAT HAVE BEEN IN TEMPORARY USE DURING CONSTRUCTION OR THAT SHOW SIGNS THAT THEY WERE INSTALLED BEFORE BUILDING FINISHING OPERATIONS WERE COMPLETE.
   a. KEEP EACH WIRING DEVICE IN ITS PACKAGE OR OTHERWISE PROTECTED UNTIL IT IS TIME TO CONNECT CONDUCTORS.
   b. DO NOT REMOVE SURFACE PROTECTION, SUCH AS PLASTIC FILM AND SMUDGE COVERS, UNTIL THE LAST POSSIBLE MOMENT.
   c. CONNECT DEVICES TO BRANCH CIRCUITS USING PIGTAILS THAT ARE NOT LESS THAN 6 INCHES (152 MM) IN LENGTH.
   d. WHEN THERE IS A CHOICE, USE SIDE WIRING WITH BINDING-HEAD SCREW TERMINALS. WRAP SOLID CONDUCTOR TIGHTLY CLOCKWISE, 2/3 TO 3/4 OF THE WAY AROUND TERMINAL SCREW.
   e. USE A TORQUE SCREWDRIVER WHEN A TORQUE IS RECOMMENDED OR REQUIRED BY THE MANUFACTURER.
   f. WHEN CONDUCTORS LARGER THAN NO. 12 AWG ARE INSTALLED ON 15- OR 20-A CIRCUITS, SPLICE NO. 12 AWG PIGTAILS FOR DEVICE CONNECTIONS.

PART 3 EXECUTION

3.01 INSTALLATION

A. INSTALL ALL EQUIPMENT AND FIXTURES IN COMPLETE ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ALL PERTINENT CODES AND REGULATIONS.

B. THOROUGHLY OBSERVE ALL ITEMS OF EQUIPMENT AND ANY ITEMS DENTED, SCRATCHED OR OTHERWISE DAMAGED IN ANY MANNER SHALL BE REPLACED OR REPAIRED AND PAINTED TO MATCH ORIGINAL FINISH.

1. ALL ITEMS SO REPAIRED AND REFINISHED SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR OBSERVATION AND APPROVAL.

C. UPON COMPLETION OF ALL INSTALLATION, LAMPING, AND TESTING, THOROUGHLY OBSERVE ALL EXPOSED PORTIONS OF THE ELECTRICAL INSTALLATION AND COMPLETELY REMOVE ALL EXPOSED LABELS, SOIL, MARKINGS AND FOREIGN MATERIAL.

3.02 CUTTING AND PATCHING

A. ALL CUTTING AND PATCHING SHALL BE AS DESCRIBED UNDER OTHER SECTIONS.

3.03 FLOOR AND WALL PENETRATIONS

A. PROVIDE, LOCATE AND SET ALL SLEEVES AND INSERTS AS REQUIRED FOR THIS WORK. PREPARE DIMENSIONED FLOOR AND WALL PENETRATION DRAWINGS, SHOWING THE SIZE AND LOCATION OF EACH PENETRATION ON EVERY FLOOR AND IN EVERY WALL WHICH IS TO ACCOMMODATE THIS WORK. THE PENETRATION DRAWINGS SHALL INCLUDE, BUT NOT BE LIMITED TO HANGERS, INSERTS, CONDUITS, RACEWAYS, AND CURBS.

1. DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT IN ADVANCE OF THE WORK TO BE DONE IN ORDER THAT ADJUSTMENTS MAY BE MADE TO THE REINFORCING STEEL, STRUCTURAL FRAMING AND OTHER RELATED WORK WITHOUT INTERRUPTION TO THE CONSTRUCTION SCHEDULE. ALL SLEEVES, COLLARS, HANGERS, INSERTS, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH THE PENETRATION DRAWINGS PRIOR TO CONSTRUCTING FLOORS AND WALLS. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DRILLING AND AS ACCEPTED BY THE ARCHITECT.

B. WHERE CONDUIT MOTION DUE TO EXPANSION AND CONTRACTION WILL OCCUR, MAKE SLEEVES OF SUFFICIENT DIAMETER TO PERMIT FREE MOVEMENT. CHECK FLOOR AND WALL CONSTRUCTION FINISH TO DETERMINE PROPER LENGTH OF SLEEVES FOR VARIOUS LOCATIONS, MAKE ACTUAL LENGTH TO SUIT THE FOLLOWING:

1. TERMINATE SLEEVES FLUSH WITH WALLS, PARTITIONS, AND CEILING.
2. IN AREAS WHERE CONDUIT IS CONCEALED, AS IN CHASES, TERMINATE SLEEVES FLUSH WITH FLOOR.
3. IN ALL AREAS WHERE CONDUIT IS EXPOSED, EXTEND SLEEVES 1/4" ABOVE FINISHED FLOOR, EXCEPT IN ROOMS HAVING FLOOR DRAINS, WHERE SLEEVES SHALL BE EXTENDED 3/4" ABOVE FLOOR.

C. SLEEVES SHALL BE CONSTRUCTED OF 22-GAUGE GALVANIZED SHEET STEEL WITH LOCK SEAM JOINTS FOR ALL SLEEVES SET IN CONCRETE FLOOR SLABS TERMINATING FLUSH WITH THE FLOOR. ALL OTHER SLEEVES SHALL BE CONSTRUCTED OF GALVANIZED STEEL PIPE.

D. FASTEN SLEEVES SECURELY IN FLOORS, WALLS, ETC. SO THAT THEY WILL NOT BECOME DISPLACED WHEN CONCRETE IS POURED OR WHEN OTHER CONSTRUCTION IS BUILT AROUND THEM. TAKE PRECAUTIONS TO PREVENT CONCRETE, PLASTER, OR OTHER MATERIALS BEING FORCED INTO THE SPACE BETWEEN PIPE AND SLEEVE DURING CONSTRUCTION.

E. WHERE CONDUITS PASS THROUGH FLOORS OR RATED WALLS, THE OPENINGS AROUND THE CONDUITS SHALL BE SEALED WITH 3M, HILTI OR ACCEPTED FIRE SEALING COMPOUND PROVIDED BY AN ACCEPTED MANUFACTURER. CONDUIT FLOOR PENETRATIONS WITHIN RATED CHASES SHALL BE SEALED WITH SMOKE BARRIER SEALANTS. THE 3M, HILTI OR ACCEPTED MANUFACTURER'S TYPE SEALANT USED SHALL BE ACCEPTED BY THE LOCAL AUTHORITIES HAVING JURISDICTION AND CARRY U.L. LISTING FOR RATING OF ASSEMBLY. ALL PRODUCTS SHALL BE LISTED FOR A TWO HOUR RATING UNLESS NOTED OTHERWISE.

F. ALL CONDUITS AND RELATED BRANCH CIRCUITS IN ANY EXTERIOR LOCATIONS IN THE FACILITY SHALL BE SEALED WATERTIGHT TO PREVENT WATER AND CONDENSATION FROM ENTERING THE BUILDING OR FIXTURES, BOXES, RECEPTACLES AND RELATED DEVICES.

3.04 ELECTRICAL CONNECTIONS TO EQUIPMENT AND SYSTEMS

A. EQUIPMENT WIRING SHALL BE AS FOLLOWS:

1. ALL WIRING SHALL BE PROVIDED UNDER DIVISION 26. ALL ASSOCIATED CONTROL WIRING FOR EQUIPMENT DESCRIBED UNDER DIVISION 23 AND OTHER CONTROL WIRING REQUIRED TO BE PROVIDED BY DIVISION 23.
2. ALL CONTROL ITEMS CONNECTED SHALL BE MARKED PLAINLY BY MACHINE-MADE NAMEPLATE ON THE EQUIPMENT THAT IS CONTROLLED, TO THE ACCEPTANCE OF THE OWNER.
3. THE HORSEPOWER RATING OF ALL STARTERS SHALL BE CHECKED AGAINST ACTUAL MOTOR TO BE CONTROLLED, BEFORE INSTALLATION, AND CORRECT SIZE OVERLOAD ELEMENTS SHALL BE PROVIDED IN ALL STARTERS BASED ON NAMEPLATE AND MANUFACTURER'S RECOMMENDATION.
4. GENERAL CLEARANCE REQUIREMENTS: PROVIDE CLEARANCE SPACES BETWEEN AND AROUND PROCESS, MECHANICAL AND ELECTRICAL EQUIPMENT FOR OPERATION, MAINTENANCE AND REPLACEMENT OF EQUIPMENT. MINIMUM CLEARANCES FOR EACH ITEM OR PIECE OF EQUIPMENT SHALL BE AS STATED IN THE MANUFACTURER'S PRINTED RECOMMENDATIONS OR AS SHOWN ON THE MANUFACTURER'S PRINTED DRAWINGS. COORDINATE CLEARANCE REQUIREMENTS AMONG VARIOUS PIECES OF EQUIPMENT THAT WILL BE INSTALLED IN CLOSE PROXIMITY WITH ONE ANOTHER TO ELIMINATE EQUIPMENT CONFLICTS AND INTERFERENCE. PREPARE AND SUBMIT SHOP DRAWINGS IF REQUESTED BY THE ARCHITECT SHOWING PROPOSED EQUIPMENT LAYOUTS AND CLEARANCES. N.E.C. CODE CLEARANCES SHALL BE MAINTAINED AT ALL TIMES AND SHALL BE CONSIDERED THE MINIMUM CLEARANCES ALLOWED.

3.06 DEBRIS

A. ALL DEBRIS SHALL BE REMOVED AS IT ACCUMULATES AND SHALL NOT BE STORED OR PERMITTED TO ACCUMULATE ON-SITE. REMOVE ALL DEBRIS AT THE END OF EACH WORKING DAY.

3.07 ENERGIZING ELECTRICAL SYSTEM

A. PRIOR TO ENERGIZING MAIN ELECTRICAL SYSTEM PERFORM THE FOLLOWING:

1. VERIFY SUPPLY AUTHORITY VOLTAGE AND PHASE ROTATION. ENSURE ALL INDEPENDENT TESTING AS SPECIFIED HAS BEEN COMPLETED AND DEFICIENCIES HAVE BEEN CORRECTED.
   a. MEGGER ALL FEEDERS AND RECORD RESULTS ON ACCEPTED TEST REPORT FORMS.
   b. TEST CONDUCTORS AT SWITCHBOARDS, DISTRIBUTION CENTRES AND PANELBOARDS FOR INSULATION RESISTANCE TO GROUND (MEGGER TEST).
   c. TEST SERVICE GROUNDING CONDUCTORS FOR GROUND RESISTANCE.
   d. TEST ALL WIRING DEVICES FOR CORRECT OPERATION AND CIRCUITRY.
   e. LOAD BALANCE TESTING PERFORM LOAD TESTS WITH AS MANY LOADS ON AS POSSIBLE.

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PROFESSIONAL SEAL

STATE OF VERMONT
WILBUR H. HORN[illegible] JR.
No. [illegible]790
ELECTRICAL
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY	CK'D
1	10-23-2023	ISSUED FOR BID	JWP	LJH

verizon wireless

PROJECT ID: 20202051531
PROJECT TYPE: BDGCD
LOCATION CODE: 470144

**MARSHFIELD
VT**

2264 U.S. ROUTE 2
MARSHFIELD, VT
05658

SHEET TITLE

ELECTRICAL
SPECIFICATIONS

CONSTRUCTION PLANS

DRAWN BY EJD	DATE OCT. 2023
CHECKED BY WHH	D&K PROJECT # 422065L1
PROJ. ENG. LJH	D&K ARCHIVE #

SHEET NUMBER

E-8

ELECTRICAL ABBREVIATIONS LIST:

(NOT ALL ABBREVIATIONS MAY BE USED)

A	AMPERE(S)
A.C.	ALTERNATING CURRENT
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AL	ALUMINUM
ALT	ALTERNATE
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BW	BUSWAY
C	CONDUIT (SEE RACEWAYS AND CONDUCTORS)
CB	CIRCUIT BREAKER
CC	CONTROL CABINET
CKT	CIRCUIT
CLG	CEILING
COND	CONDUCTOR
CONN	CONNECT
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
CU	COPPER
D.C.	DIRECT CURRENT
DM	DIMMER CONTROL
DISC	DISCONNECT
DN	DOWN
DP	DOUBLE POLE
DT	DOUBLE THROW
E.C.	ELECTRICAL CONTRACTOR
E.HTR	ELECTRIC HEATER
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EOL	END LINE RESISTOR
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
F	FUSE
F.P.C.	FIRE PROTECTION CONTRACTOR
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FDR	FEEDER
FL	FLOOR
FLUOR	FLUORESCENT
FS	FUSIBLE SWITCH
FVNR	FULL VOLTAGE NON-REVERSING
G.C.	GENERAL CONTRACTOR
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GRD	GROUND
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
HZ	FREQUENCY IN CYCLES PER SECOND
IC	INTERCOM
IMC	INTERMEDIATE METALLIC CONDUIT
ISO	ISOLATED NEUTRAL
JB	JUNCTION BOX
K	KEY OPERATED
KCMIL	THOUSAND CIRCULAR MIL(S)
kVA	KILOVOLT AMPERE(S)
KVAR	KILOVAR(S)
kW	KILOWATT(S)
LP	LIGHTING PANEL
LV	LOW VOLTAGE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MGST	MAGNETIC STARTER
MH	MANHOLE
MLO	MAIN LUGS ONLY
MTH	MOUNTING HEIGHT
MTR	MOTOR
MTS	MANUAL TRANSFER SWITCH
N.I.C.	NOT IN CONTRACT
NC	NORMALLY CLOSED
NF	NONFUSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	OVER COUNTER
OL	OVERLOAD ELEMENT
P	PILOT INDICATOR
PF	POWER FACTOR
PNL	PANEL
PP	POWER PANEL
PRI	PRIMARY
PS	PULL SWITCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
R	RELAY
RC	REMOTE CONTROL
RECP	RECEPTACLE
RGS	RIGID METAL CONDUIT
S.S.	SOLID STATE
SEC	SECONDARY
SMR	SURFACE METAL RACEWAY
SP	SINGLE POLE
SPK	SPEAKER
SST	SOLID STATE TRIP
ST	SINGLE THROW
SW	SWITCH
SWBD	SWITCHBOARD
TEL	TELEPHONE
TB	TERMINAL BOX
TEMP	TEMPORARY
TYP	TYPICAL
UC	UNDER CABINET
UG	UNDERGROUND
UH	UNIT HEATER
UNG	UNGROUNDED
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTED POWER SYSTEM
V	VOLT(S)
VA	VOLTAMP(S)
VAR	REACTIVE VOLT AMPERES
VP	VAPORPROOF
W	WATT(S)
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

MOUNTING ABBREVIATIONS LEGEND:

SUBSCRIPT AT OUTLET	DESCRIPTION
OC	OVER COUNTER OUTLET: INSTALL BOTTOM OF OUTLET BOX 1-1/2" ABOVE HIGHEST ELEMENT OF COUNTER (I.E., BACKSPLASH OR COUNTER TOP IF NO BACK SPLASH).
CR	CASEWORK RECESSED OUTLET: MOUNT BOX IN CASEWORK VERTICAL SURFACE.
EQ	EQUIPMENT OUTLET: FINAL TERMINATION METHOD AND EXACT LOCATION SHALL BE DETERMINED FROM EQUIPMENT MANUFACTURER'S APPROVED SHOP DRAWINGS.
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
MTH	MOUNTING HEIGHT

RACEWAYS AND CONDUCTORS LEGEND:

SYMBOL	DESCRIPTION
LV	LOW VOLTAGE WIRING
	CIRCUIT IN CONDUIT RUN IN-SLAB OR UNDERGROUND
	CIRCUIT IN CONDUIT CONCEALED IN WALLS OR ABOVE CEILING WHERE POSSIBLE.
CKT	HOMERUN TO PANELBOARD OR AS NOTED
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN

RECEPTACLE OUTLETS LEGEND:

SYMBOL	DESCRIPTION
	NUMBER BY THE SIDE OF SYMBOL DENOTES CIRCUIT NUMBER. DEVICE MOUNTING HEIGHTS ARE DENOTED BELOW UNLESS OTHERWISE NOTED ON PLANS. COORDINATE EXACT LOCATIONS AND ALL MOUNTING HEIGHTS W/ ARCHITECTURAL PLANS/SECTIONS.
	DUPLEX CONVENIENCE OUTLET. MOUNT AT +18" AFF.
	DOUBLE DUPLEX OUTLET (QUADPLEX RECEPTACLE). MOUNT AT +18" AFF.
	DOUBLE DUPLEX OUTLET (QUADPLEX). INSTALLED FLUSH WITH FLOOR.
	SINGLE DEDICATED OUTLET. MOUNT @ 18" AFF.
	SPECIAL OUTLET AS NOTED ON DRAWINGS. MOUNT AT +18" AFF. 'R' DENOTES RANGE. 'D' DENOTES DRYER.
24"	WIREMOLD 3000. DUPLEX RECEPTACLES SPACED 24" ON CENTER. WALL MOUNT AT 36" AFF.
GFCI, WP	DENOTES: GROUND FAULT CIRCUIT INTERRUPTER, WEATHERPROOF

SWITCH LEGEND:

SYMBOL	DESCRIPTION
	LOWER CASE LETTER (a, b, etc) BY THE SIDE OF SWITCH SYMBOL and LIGHTING FIXTURE SYMBOL DENOTES GROUPS OF FIXTURES ON A PARTICULAR SWITCH.
	DEVICE MOUNTING HEIGHTS ARE DENOTED BELOW UNLESS OTHERWISE NOTED ON PLANS. COORDINATE EXACT LOCATIONS AND ALL MOUNTING HEIGHTS WITH ARCHITECTURAL PLANS AND SECTIONS.
S	SINGLE POLE SWITCH. MOUNT AT 48" AFF.
S_2	TWO POLE SWITCH. MOUNT AT 48" AFF.
S	THREE-WAY SWITCH. MOUNT AT 48" AFF.
S_{HOA}	SINGLE POLE SWITCH FOR HAND-OFF-AUTO. MOUNT AT 48" AFF.
S_{OB}	OIL BURNER SWITCH. MOUNT AT 48" AFF.
S_{OR}	OVERRIDE SWITCH FOR AREA LIGHTING CONTROL PANEL. MOUNT AT 48" AFF.
S_P	SINGLE POLE SWITCH WITH PILOT LIGHT. MOUNT AT 48" AFF.
S^{WP}	SINGLE POLE SWITCH (WEATHERPROOF). MOUNT AT 48" AFF.
W	OCCUPANCY LIGHTING CONTROL SENSOR. CEILING MOUNT. "W" WALL MOUNTED
	OCCUPANCY LIGHTING CONTROL SENSOR. WALL MOUNT AT 48" AFF.
	DUAL LEVEL OCCUPANCY LIGHTING CONTROL SENSOR. WALL MOUNT AT 48" AFF.
LCR	LIGHTING CONTROL RELAY (PER MANUFACTURER'S INSTALLATION INSTRUCTIONS).

LIGHTING LEGEND:

CAPITAL LETTER ADJACENT TO LIGHTING FIXTURE INDICATES THE FIXTURE TYPE AS SPECIFIED IN THE 'LIGHTING FIXTURE SCHEDULE'. UNDERLINED NUMBER INDICATES CIRCUIT THAT THE FIXTURE IS ON. 'LOWER CASE' LETTER INDICATES THE CONTROL SWITCH. MOUNTING HEIGHTS ARE PER FIXTURE SCHEDULE. EXACT MOUNTING HEIGHTS SHALL BE COORDINATED WITH ARCHITECT.

CEILING MOUNTED FIXTURE	WALL MOUNTED FIXTURE	DESCRIPTION
WW, Q b	B, H	INCANDESCENT, HID OR SIMILAR LAMP FIXTURE
	W	SURFACE FLUORESCENT FIXTURE
T4, T4	W, W	SURFACE FLUORESCENT CONTINUOUS LINEAR
P4, P4		PENDANT CONTINUOUS LINEAR
S4	S4	SURFACE BARE LAMP FLUORESCENT STRIP
EX2, EX	EX2, EX	EXIT LIGHT. ARROWS DENOTE ROUTE OF EGRESS
	EB1, EB2	EMERGENCY BATTERY PACK ARROWS DENOTE AIMING DIRECTION ON LOCAL – NORMAL LTG CIRCUIT
B4, W	B, H	NIGHT-LIGHT' OPERATING 24/7 OR EMERGENCY FIXTURE

POWER APPURTANCES LEGEND:

SYMBOL	DESCRIPTION
SYMBOL	REFER TO PLANS FOR EXACT QUANTITIES AND LOCATIONS.
	FLUSH MOUNTED PANELBOARD AND CABINET. MOUNT AT 6'-6" MAX. AFF TO TOP.
	SURFACE MOUNTED PANELBOARD AND CABINET. MOUNT AT 6'-6" MAX. AFF TO TOP.
PB	ELECTRICAL PULL BOX, SIZED AS REQUIRED OR AS SHOWN ON DRAWINGS.
J	JUNCTION BOX (JB) (IN ACCESSIBLE LOCATION).
J	JUNCTION BOX (JB) (IN ACCESSIBLE LOCATION) W/ FLEXIBLE CONDUIT TO EQUIPMENT AS SHOWN. – JUNCTION BOX SUBSCRIPTS: 'C' CONTROL, 'D' DATA, 'DT' DATA/TELEPHONE, 'F' FIRE ALARM, 'P' POWER, 'T' TELEPHONE.
1	MOTOR. HORSEPOWER AS SHOWN ON DRAWINGS.
	DISCONNECT SWITCH. SIZE PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF (WP) WHEN LOCATED OUTSIDE.
	FUSED DISCONNECT SWITCH. SIZE AND FUSES PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF (WP) WHEN LOCATED OUTSIDE.
	DOUBLE DUPLEX (QUADPLEX RECEPTACLE). MOUNT AT +18" AFF.
	JUNCTION BOX (JB) (IN ACCESSIBLE LOCATION).
	SINGLE POLE MANUAL TIMER SWITCH. MOUNT AT 48" AFF.
	UTILITY METER. WALL MOUNT AT 5'-6" AFG TO CENTER OF METER MAX.

DATA, TELEPHONE, and CATV SYSTEMS LEGEND:

SYMBOL	DESCRIPTION
SYMBOL	COORDINATE EXACT LOCATIONS AND MTG HTS W/ ARCH PLANS AND SECTIONS.
P	TELEPHONE OUTLET MOUNTED @ 18" AFF OR AS NOTED. 'W' DENOTES WALL/'P' DENOTES PUBLIC.
	TELEPHONE OUTLET MOUNTED FLUSH WITH FLOOR.
	COMBINATION DATA/TELEPHONE OUTLET MOUNTED @ 18" AFF OR AS NOTED.
TMB	3/4" PLYWOOD TELEPHONE MOUNTING BOARD WITH #6 CU. GROUND AND DEDICATED DUPLEX CONVENIENCE OUTLET. FURNISH IN ACCORDANCE WITH TELEPHONE Co. REQUIREMENTS. SIZE AS NOTED.

GENERAL NOTES

1. THE SCOPE OF WORK IS TO PROVIDE ALL LABOR, MATERIALS, SERVICES, SUPPLIES, TOOLS, EQUIPMENT, TRANSPORTATION, AND FACILITIES NECESSARY TO FURNISH AND INSTALL COMPLETE ELECTRICAL WORK AS CALLED FOR ON THE DRAWINGS, SPECIFIED, OR AS MAY REASONABLY BE IMPLIED AS BEING INCIDENTAL TO THIS WORK.
2. SECURE AND PAY COSTS OF PERMITS, CERTIFICATES, LICENSES, INSPECTIONS, AND APPROVALS. ANY POWER OUTAGE SHALL BE SCHEDULED AND APPROVED BY THE OWNER.
3. DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF WORK. BASIC DESIGN CONCEPTS INDICATED ARE MINIMAL AND MUST BE EITHER FOLLOWED OR BETTERED. WORK IS NOT SHOWN IN DETAIL BUT IS INTENDED TO INCLUDE ITEMS NECESSARY FOR PROPER OPERATION AND COMPLETION. DO NOT SCALE DRAWINGS. VERIFY IN THE FIELD, ALL LOCATIONS, ELEVATIONS, AND DIMENSIONS.
4. EXECUTE ALL WORK IN A NEAT AND WORKMANLIKE MANNER IN CONFORMANCE WITH BEST MODERN TRADE PRACTICE, BY COMPETENT, EXPERIENCED MECHANICS, PRESENTING A NEAT APPEARANCE WHEN COMPLETED. REPLACE WORK NOT APPROVED BY OWNER WITHOUT ADDITIONAL CHARGE.
5. ALL MATERIALS AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, AND ALL CODES, REGULATIONS AND REQUIREMENTS OF ALL MUNICIPAL, STATE, FEDERAL AND OTHER PUBLIC OR PRIVATE AUTHORITIES WHICH HAVE JURISDICTION. IN EACH CASE, CODES ARE MINIMUM REQUIREMENTS.
6. CONTRACTOR TO LIMIT 20A, 120V BRANCH CIRCUITS TO A MAXIMUM 1920VA LOAD AND 15A, 120V BRANCH CIRCUIT TO A MAXIMUM 1440VA LOAD. VERIFY IN THE FIELD, ALL BRANCH CIRCUITS AFFECTED BY RENOVATION.
7. INSTALL A SEPARATE GREEN GROUND WIRE IN ALL POWER AND RECEPTACLE CIRCUITS.
8. WHERE ELECTRICAL EQUIPMENT IS BEING FED FROM AN EXISTING SOURCE, EXTEND TO NEAREST BRANCH CIRCUIT WITH ADEQUATE CAPACITY.
9. WHERE ELECTRICAL DEVICES AND FIXTURES ARE INDICATED THOSE LOCATIONS ARE APPROXIMATE AND NOT ALL ELECTRICAL DEVICES AND FIXTURES MAY BE INDICATED (FIELD VERIFY ALL ELECTRICAL ITEMS WHERE POSSIBLE).
10. EACH OUTLET OR JUNCTION IN ANY OF THE WIRING SYSTEMS SHALL BE MADE IN A METALLIC JUNCTION BOX. SUCH BOX SHALL BE SUITABLE FOR THE SIZE AND NUMBER OF CONDUCTORS AND DEVICES TO BE INSTALLED, AS WELL AS THE CONDITION ENCOUNTERED. ALL SPLICES SHALL BE MADE WITH MECHANICAL CONNECTORS.
11. DURING ROUGH IN AND FINISHED STAGES OF CONSTRUCTION, PROTECT AND KEEP CLEAN ALL ELECTRICAL EQUIPMENT, PANELS, FIXTURES AND DEVICES.
12. VERIFY OF THE FINAL LOCATIONS OF MECHANICAL, HVAC AND OWNER'S EQUIPMENT AND POWER CONNECTION DETAILS SO THAT THE ASSOCIATED ELECTRICAL WORK WILL BE PROPERLY COORDINATED AND INSTALLED.
13. THE FINISHED INSTALLATION SHALL BE COMPLETE IN EVERY RESPECT AND DETAIL, TESTED AND LEFT READY IN PERFECT OPERATING CONDITION FOR THE OWNER'S USE.
14. MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS' LABORATORIES AND SHALL BE INSTALLED IN ACCORDANCE WITH SUCH LISTINGS.
15. THE CONTRACTOR SHALL GUARANTEE THAT MATERIALS, EQUIPMENT AND WORKMANSHIP PROVIDED SHALL BE FREE FROM DEFECTS IN MATERIALS OR WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE OF THE WORK DONE UNDER THIS CONTRACT, AND SHALL REPLACE PARTS FOUND TO BE DEFECTIVE WITHIN THE PERIOD COVERED BY SUCH GUARANTEE, WITHOUT COST TO THE OWNER.
16. PROVIDE EACH ELECTRICAL FAN, PUMP OR HVAC UNIT WITH FUSED DISCONNECT, WEATHERPROOF (WP) NEMA 3R AND 12, FOR OUTDOOR, NEMA 1 FOR INDOOR. FUSE TO MATCH EQUIPMENT NAMEPLATE OF EQUIPMENT.
17. ALL MECHANICAL EQUIPMENT SHALL HAVE HACR RATED BREAKERS PER NEC REQUIREMENTS.
18. THE INTERIOR ELECTRICAL SYSTEM SHALL BE COMPLETELY AND EFFECTIVELY GROUNDED AS REQUIRED BY NEC. ALL METALLIC RACEWAYS SHALL BE ELECTRICALLY AND ELECTRICALLY SECURE AT ALL JOINTS AND AT ALL BOXES, CABINETS, FITTINGS, AND EQUIPMENT.
19. COMPLETE ALL PANEL BOARD CIRCUITS DIRECTORY CARDS TO REFLECT AS-BUILT CONDITIONS.ALL RACEWAYS SHALL BE PROVIDED WITH EQUIPMENT GROUND CONDUCTOR. EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL ELECTRICAL RACEWAYS OR HOSPITAL GRADE MC CABLE AND SHALL BE SPECIFIED IN ACCORDANCE WITH NEC 250 AND SHALL BE CONTINUOUS.
20. CLEARLY IDENTIFY ALL INCOMING CONDUCTORS BY CIRCUIT NUMBER DURING INSTALLATION IN THE DISTRIBUTION PANELS (E.G. CABLE MARKERS #1, #11 ETC).
21. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING, INSTALLATION TESTING, CALIBRATING, AND OTHERWISE MAKING OPERATIONAL ALL DEVICES AND EQUIPMENT SHOWN ON THESE DRAWINGS.
22. INSTALLATION SHALL BE MADE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
23. THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS TO OBTAIN A COMPLETE AND SATISFACTORY INSTALLATION. AN ATTEMPT HAS BEEN MADE TO SEPARATE AND DEFINE THE WORK. THESE DRAWINGS ARE DIAGRAMMATIC, BUT SHALL BE FOLLOWED AS CLOSELY AS ACTUAL CONSTRUCTION OF THE FACILITY AND THE WORK OF OTHER TRADES WILL PERMIT. THESE DRAWINGS UTILIZE SYMBOLS AND SCHEMATIC DIAGRAMS TO INDICATE VARIOUS ITEMS OF WORK. THEREFORE, NO INTERPRETATION WILL BE MADE FROM THE LIMITATION OF SYMBOLS AND DIAGRAMS THAT ANY ELEMENTS NECESSARY FOR THE COMPLETE INSTALLATION ARE EXCLUDED. THE ARCHITECT SHOULD BE NOTIFIED OF ANY DISCREPANCIES, OMISSIONS, CONFLICTS, OR INTERFERENCE WHICH MAY OCCUR BETWEEN VARIOUS DRAWINGS AND

ELECTRICAL DRAWING DIRECTORY

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PROFESSIONAL SEAL

STATE OF VERMONT, No. 7790, LICENSED PROFESSIONAL ENGINEER, ELECTRICAL

NO.	DATE	DESCRIPTION	BY	CK'D

verizon wireless

VERMONT 12' x 20' EQUIPMENT SHELTER

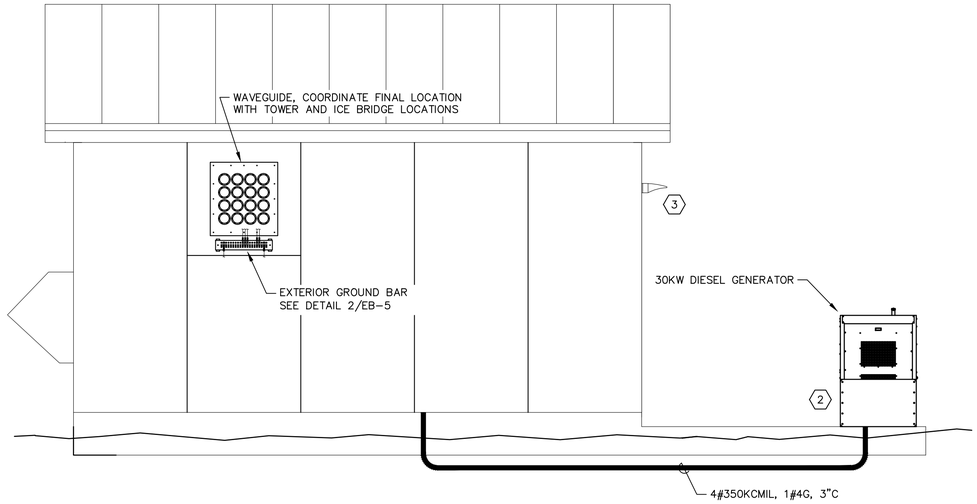
SHEET TITLE

ELECTRICAL ABBREVIATIONS, LEGEND, AND GENERAL NOTES

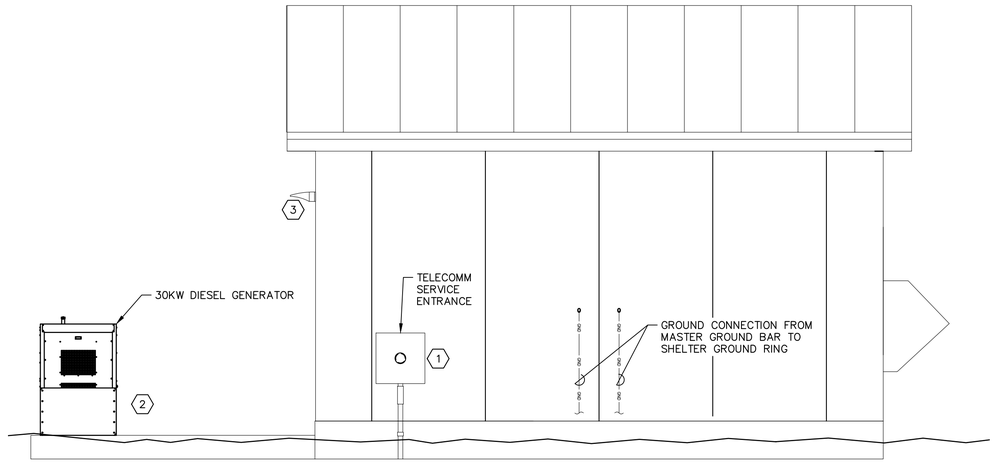
DRAWN BY: EJD	DATE: MARCH 2022
CHECKED BY: WHH	D&K PROJECT #
PROJ. ENG.: LJH	D&K ARCHIVE #

SHEET NUMBER

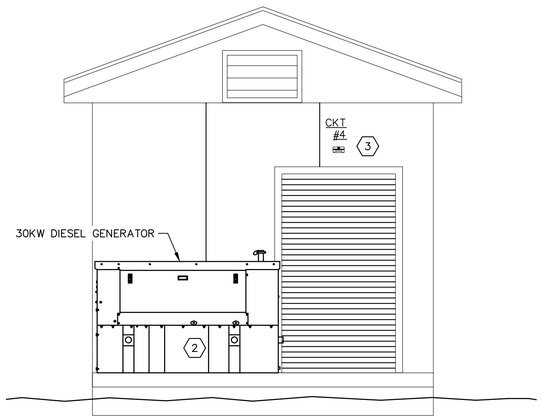
EB-1



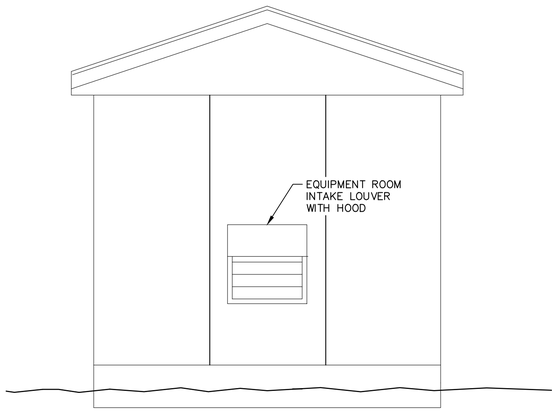
1 EB-2 EXTERIOR ELEVATION "A"
3/8" = 1'-0"



2 EB-2 EXTERIOR ELEVATION "C"
3/8" = 1'-0"



3 EB-2 EXTERIOR ELEVATION "B"
3/8" = 1'-0"



4 EB-2 EXTERIOR ELEVATION "D"
3/8" = 1'-0"

GENERAL NOTES:

1. COORDINATE BUILDING CONSTRUCTION WITH STRUCTURAL DRAWINGS.
2. COORDINATE FINAL MECHANICAL EQUIPMENT LOCATIONS WITH MECHANICAL DRAWINGS.
3. COORDINATE WITH ELECTRICAL SITE DRAWINGS FOR FINAL CONNECTIONS OF GROUNDING CABLES

KEY NOTES:

1. PROVIDE 2" SCH 40 PVC FROM UTILITY POLE TO TELECOM PULLBOX. PROVIDE 2" SCH 40 PVC THRU WALL INTO SHELTER.
2. PROVIDE CONNECTION OF CONDUIT AND WIRING FROM VERIZON BATTERY CABINET TO GENERATOR PER MANUFACTURER'S RECOMMENDATIONS.
3. PROVIDE RAB WPLED10 MOUNT 6" ABOVE DOOR

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PROFESSIONAL SEAL

NO.	DATE	DESCRIPTION	BY	CK'D

verizonwireless

VERMONT 12' x 20' EQUIPMENT SHELTER

SHEET TITLE

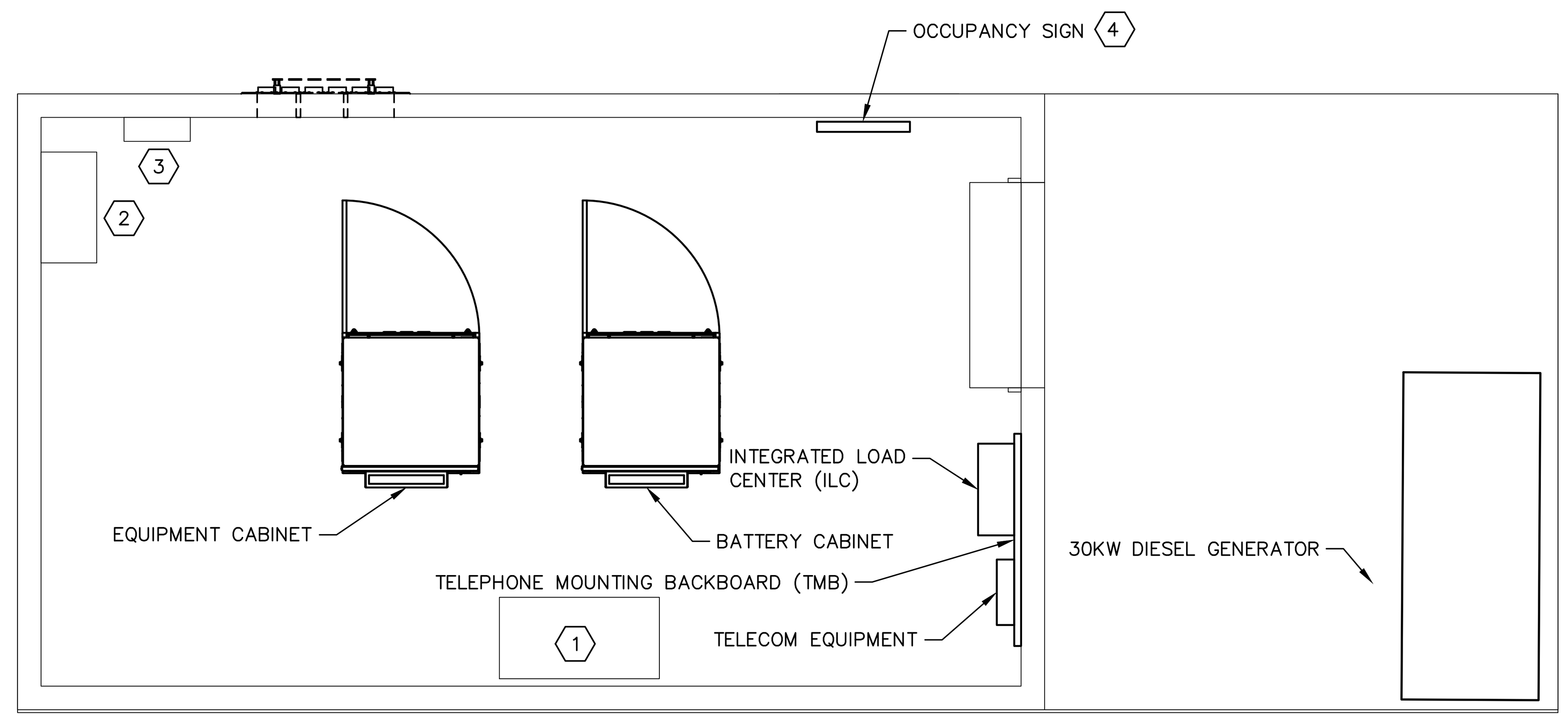
ELECTRICAL EXTERIOR ELEVATIONS

DRAWN BY	DATE
EJD	MARCH 2022
CHECKED BY	D&K PROJECT #
WHH	
PROJ. ENG.	D&K ARCHIVE #
LJH	

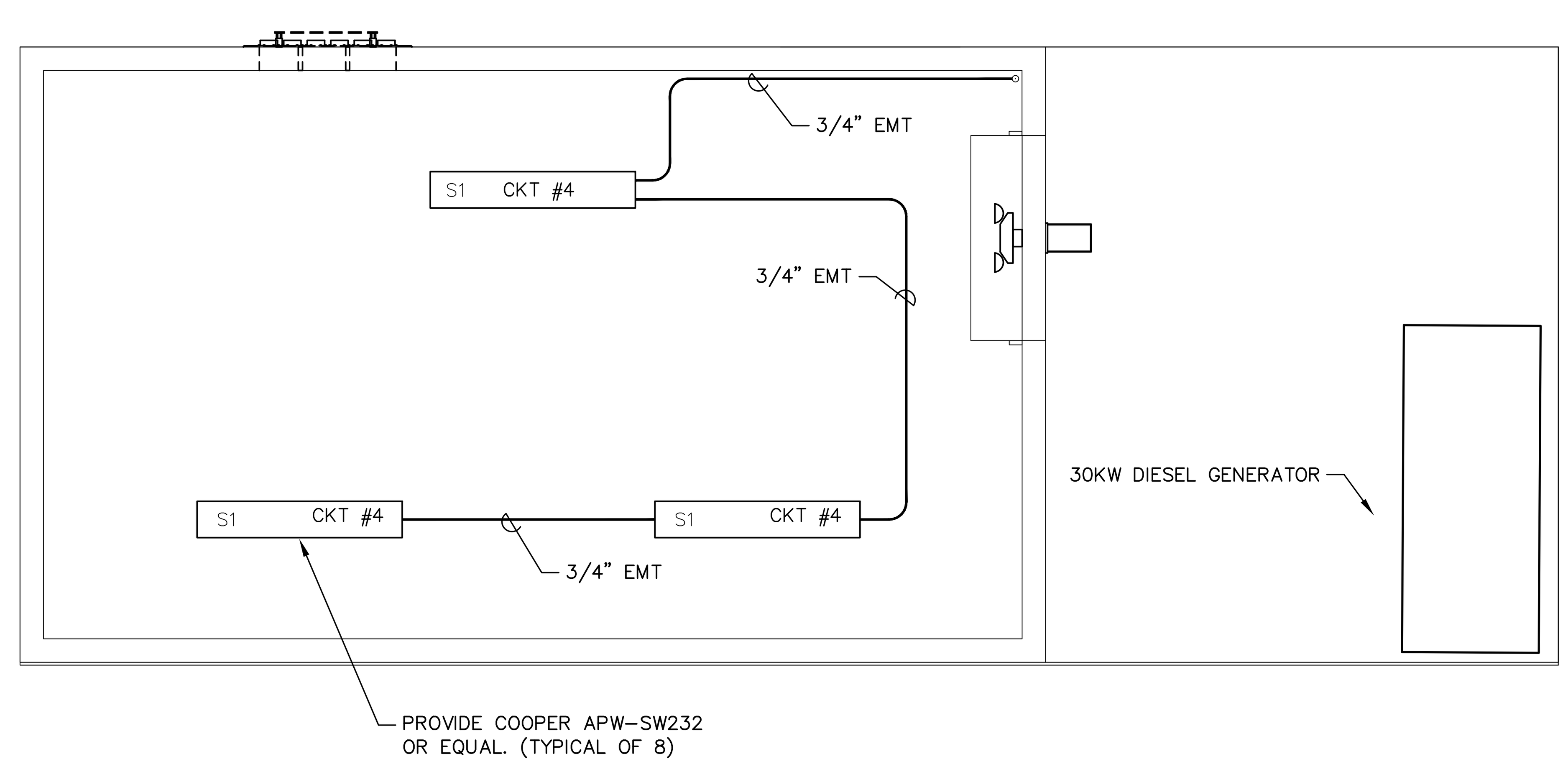
SHEET NUMBER

EB-2

G:\Electrical Standards, Guidelines, Product Info, & Vendors\VERIZON\Standards\Shelter Drawings (Dubois-King)\Modified Design_07.28.16\Typical 20' Building(Diesel).dwg 3/27/2022 12:21 PM



1 EQUIPMENT FLOOR PLAN
EB-3 3/8" = 1'-0"



2 REFLECTED CEILING PLAN – ELECTRICAL
EB-3 3/8" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR TO CONFIRM ALL EQUIPMENT LOCATIONS WITH OWNER.
2. COORDINATE BUILDING CONSTRUCTION WITH STRUCTURAL DRAWINGS.
3. COORDINATE FINAL MECHANICAL EQUIPMENT LOCATIONS WITH MECHANICAL DRAWINGS.
4. COORDINATE WITH ELECTRICAL SITE DRAWINGS FOR FINAL CONNECTIONS OF GROUNDING CABLES.
5. ALL INTERIOR GROUND CABLES TO BE #2 THHN STRANDED GREEN UNLESS OTHERWISE NOTED.
6. ALL CABLE TRAY TO BE 18" WIDE AND SUSPENDED FROM THE CEILING AS SHOWN WITH 17" HANGERS AND INSULATED CEILING BRACKETS. PROVIDE AUX CABLE BRACKETS AS SHOWN.
7. ALL GROUNDING CABLES TO BE SECURED USING WAX STRING, PLASTIC WIRE TIES NOT PERMITTED
8. ALL CABLES RUN IN EMT OR LIQUID TIGHT FLEXIBLE CONDUIT AND ATTACHED TO ROOF JOISTS.

KEY NOTES:

1. PROVIDE (1) 24" FOLDING TABLE AND (1) ROLLING OFFICE CHAIR FOR WORK SPACE.
2. PROVIDE (1) COMMERCIAL GRADE ROLLING UTILITY CART. HEAVY DUTY POLYMER WITH 3 SHELVES.
3. PROVIDE (1) 6' FIBERGLASS STEP LADDER WITH MINIMUM 350 LB. CAPACITY.
4. OCCUPANCY SIGN SHALL BE READILY VISIBLE, DURABLE SIGN IN LETTERS NOT LESS THAN 1" HIGH ON CONTRASTING BACKGROUND THAT READS: "THIS DOOR TO REMAIN OPEN WHEN THE SPACE IS OCCUPIED"

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PROFESSIONAL SEAL

NO.	DATE	DESCRIPTION	BY	CK'D

verizon wireless

VERMONT 12' x 20' EQUIPMENT SHELTER

SHEET TITLE

ELECTRICAL INTERIOR FLOOR PLAN AND CEILING PLANS

DRAWN BY EJD	DATE MARCH 2022
CHECKED BY WHH	D&K PROJECT #
PROJ. ENG. LJH	D&K ARCHIVE #

SHEET NUMBER

EB-3

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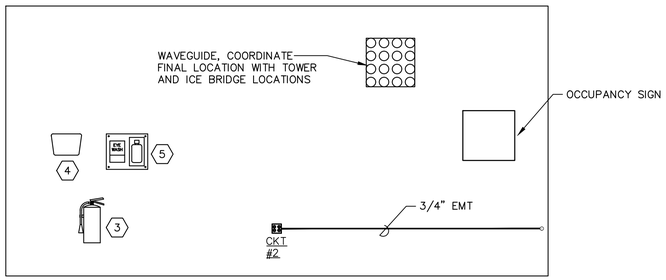
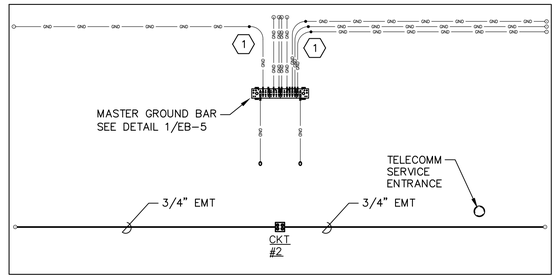
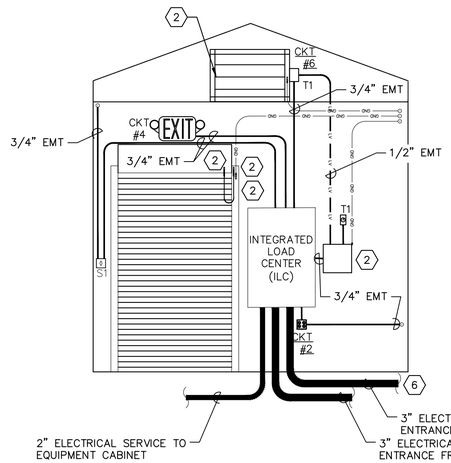
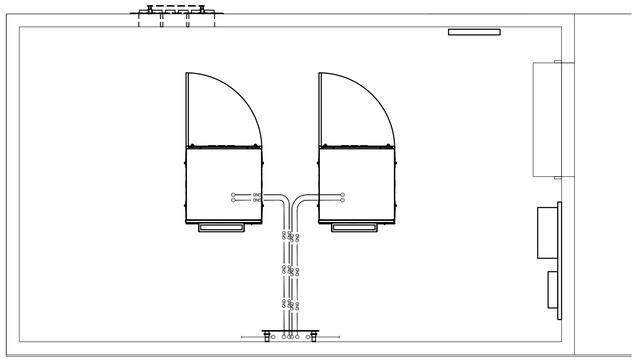




1 EB-4 INTERIOR ELEVATION "A"
3/8" = 1'-0"

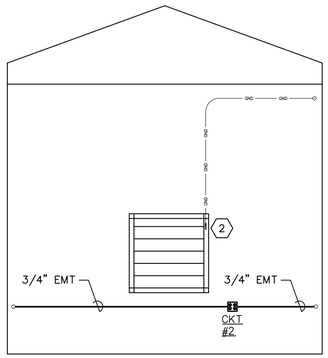


3 EB-4 INTERIOR ELEVATION "B"
3/8" = 1'-0"



4 EB-4 INTERIOR GROUNDING PLAN
3/8" = 1'-0"

2 EB-4 INTERIOR ELEVATION "C"
3/8" = 1'-0"



5 EB-4 INTERIOR ELEVATION "D"
3/8" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR TO CONFIRM ALL EQUIPMENT LOCATIONS WITH OWNER.
2. COORDINATE BUILDING CONSTRUCTION WITH STRUCTURAL DRAWINGS.
3. COORDINATE FINAL MECHANICAL EQUIPMENT LOCATIONS WITH MECHANICAL DRAWINGS.
4. COORDINATE WITH ELECTRICAL SITE DRAWINGS FOR FINAL CONNECTIONS OF GROUNDING CABLES.
5. ALL INTERIOR GROUND CABLES TO BE #2 THHN STRANDED GREEN UNLESS OTHERWISE NOTED.
6. ALL GROUNDING CABLES TO BE SECURED USING WAX STRING, PLASTIC WIRE TIES NOT PERMITTED
7. ALL CABLE TRAY TO BE 18" WIDE AND SUSPENDED FROM THE WALL AS SHOWN WITH INSULATED WALL BRACKETS.
8. DO NOT INSTALL RECEPTACLES ABOVE FIXED ELECTRIC BASEBOARD HEATERS PER NEC AND MANUFACTURER'S REQUIREMENTS.

KEY NOTES:

1. PROVIDE GROUNDING JUMPER CONNECTION PER NEC ARTICLE 250. PROVIDE BURNDY YGC, YGHC, OR EQUAL.
2. PROVIDE GROUNDING LUG CONNECTION PER NEC ARTICLE 250. PROVIDE BURNDY YGA, YGHA, OR EQUAL. PROVIDE WITH MIN. 1/4 x 20 SS CAP SCREWS, SS WASHER AND LOCK NUT.
3. PROVIDE (1) WALL MOUNTED BADGER 10# CO2 FIRE EXTINGUISHER. FINAL LOCATION DETERMINED IN FIELD.
4. PROVIDE (1) WALL MOUNTED PLASTIC FILE TRAY, LR-SMOKE. FINAL LOCATION DETERMINED IN FIELD.
5. PROVIDE (1) WALL MOUNTED EYE WASH STATION. SINGLE 32OZ. FINAL LOCATION DETERMINED IN FIELD.
6. PROVIDE CONNECTION OF CONDUIT AND WIRING TO GENERATOR PER MANUFACTURER'S RECOMMENDATIONS.

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PROFESSIONAL SEAL

NO.	DATE	DESCRIPTION	BY	CK'D

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VERMONT 12' x 20' EQUIPMENT SHELTER

SHEET TITLE

ELECTRICAL INTERIOR ELEVATIONS

DRAWN BY	DATE
EJD	MARCH 2022
CHECKED BY	D&K PROJECT #
WHH	
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

EB-4

PANEL No. ILC

BUS	225A
PANEL RATING	22 KAIC
SUPPLY VOLTAGE	120/208V, 3Ø
SERVICE	4W, 3ø, W GROUND BUS

LOCATION	EQUIPMENT ROOM
MOUNTING	SURFACE
DRAWING No.	

WIRING		DESCRIPTION	VA OR W			BREAKER		CKT.	BUS			CKT.	BREAKER		VA OR W			DESCRIPTION	WIRING	
WIRE	COND		ØA	ØB	ØC	POLE	A	NO	CONN			NO	POLE	A	ØA	ØB	ØC		COND	WIRE
\ /	\ /	\ /				\ /	\ /	1	●			2	1	20				RECEPTACLES	3/4"	2#12, 1#12G
4#2, 1#8G	2"	EQUIPMENT CABINET				3	100	3		●		4	1	20				LIGHTING	3/4"	2#12, 1#12G
/ \	/ \	/ \				/ \	/ \	5			●	6	1	20				EXHAUST FAN	3/4"	2#12, 1#12G
		SPARE				1	20	7	●			8	1	20				SPARE		
		SPARE				1	20	9		●		10	1	20				SPARE		
		SPARE				1	20	11			●	12	1	20				SPARE		
		BLANK						13	●			14						BLANK		
		BLANK						15		●		16						BLANK		
		BLANK						17			●	18						BLANK		
		TOTAL 1										TOTAL 2								
		TOTAL 2																		
		TOTAL 1 + 2																		

CONN. LOAD TOTAL

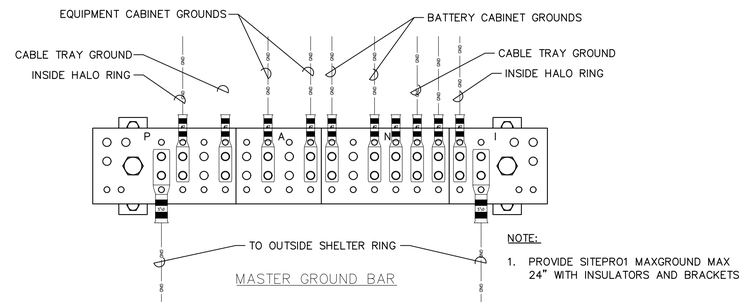
AMPERES

MAIN BREAKER	200A/3P
FEEDER ENTRANCE	BOTTOM
FEEDER SIZE	SEE ELECTRICAL ONE-LINE
SOURCE	SEE ELECTRICAL ONE-LINE
PANEL TYPE	INTERSECT AA300G & 3R ILC

MAIN LUGS

ENCLOSURE TYPE

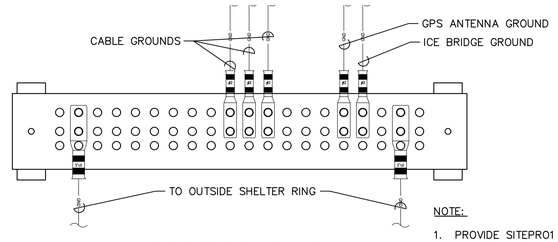
ACCESSORIES



NOTE:

1. PROVIDE SITEPRO1 MAXGROUND MAX 24" WITH INSULATORS AND BRACKETS

1 MASTER GROUND BAR DETAIL
EB-5 NO SCALE



NOTE:

1. PROVIDE SITEPRO1 MAXGROUND GALVANIZED MAX 24" WITH INSULATORS AND BRACKETS.

2 EXTERIOR GROUND BAR DETAIL
EB-5 NO SCALE

G:\Electrical Standards, Guidelines, Product Info, & Vendors\VERIZON\Standards\Shelter Drawings (Dubois-King)\Modified Design_07.28.16\Typical 20' Building(Diesel).dwg 3/27/2022 12:21 PM

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PROFESSIONAL SEAL

WILBUR H. HORTON JR. No. 7790 ELECTRICAL

NO.	DATE	DESCRIPTION	BY	CK'D

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VERMONT 12' x 20'
EQUIPMENT
SHELTER

SHEET TITLE

ELECTRICAL
DETAILS

DRAWN BY EJD	DATE MARCH 2022
CHECKED BY WHH	D&K PROJECT #
PROJ. ENG. LJH	D&K ARCHIVE #

SHEET NUMBER

EB-5

ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.01 WORK INCLUDED

A. COMPLYING WITH THE WORK AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.

B. COMPLYING WITH REQUIREMENTS OF CODES AND REGULATORY AGENCIES.

C. ARRANGING FOR AND PAYING ALL FEES FOR PERMITS AND INSPECTIONS.

1.02 REFERENCE STANDARDS

A. NATIONAL ELECTRICAL CODE (N.E.C.).

B. STATE BUILDING CODE (BOCA).

C. LOCAL ORDINANCES AND REGULATIONS.

D. NATIONAL FIRE CODES – NFPA.

E. THE STANDARD SPECIFICATIONS WHICH ARE REFERRED TO HEREIN SHALL BE THE LATEST REVISIONS OF SUCH SPECIFICATIONS.

F. IT SHALL BE UNDERSTOOD THAT ALL CODES AND STANDARDS MENTIONED SHALL BE THOSE IN FORCE AT THE TIME THE CONTRACT IS SIGNED. IF ANY CODE IS CHANGED DURING THE CONSTRUCTION PERIOD, THESE SPECIFICATIONS MAY BE CHANGED BY MUTUAL AGREEMENT BETWEEN THE OWNER AND CONTRACTOR.

1.03 QUALITY ASSURANCE

A. CODES AND STANDARDS

1. COMPLY WITH NATIONAL ELECTRICAL CODE REQUIREMENTS FOR ELECTRICAL MATERIALS AND INSTALLATIONS.

2. KEEP COPY OF NATIONAL ELECTRICAL CODE IN FIELD OFFICE FOR DURATION OF PROJECT.

3. IN EACH CASE, CODES ARE MINIMUM REQUIREMENTS.

B. SOURCE LIMITATIONS: TO THE FULLEST EXTENT POSSIBLE, PROVIDE PRODUCTS OF THE SAME KIND, FROM A SINGLE SOURCE.

C. COMPATIBILITY OF OPTIONS: WHEN THE CONTRACTOR IS GIVEN THE OPTION OF SELECTING BETWEEN TWO OR MORE PRODUCTS FOR USE ON THE PROJECT, THE PRODUCT SELECTED SHALL BE COMPATIBLE WITH PRODUCTS PREVIOUSLY SELECTED, EVEN IF PREVIOUSLY SELECTED PRODUCTS WERE ALSO OPTIONS.

D. THE CONTRACTOR SHALL SUBMIT PROOF THAT THE PROPOSED ITEMS TO BE FURNISHED UNDER THIS SPECIFICATION CONFORM TO THE STANDARDS OF UNDERWRITERS LABORATORIES, INC. (UL), FACTORY MUTUAL RESEARCH CORP. (FM), OR OTHER NATIONALLY RECOGNIZED TESTING LABS. THE LABELS OF THESE ORGANIZATIONS THREE SHALL BE ACCEPTED AS TO CONFORMING TO THIS REQUIREMENT. IN LIEU OF THE LABEL, THE CONTRACTOR MAY SUBMIT A WRITTEN CERTIFICATION FROM ANY NATIONALLY RECOGNIZED TESTING AGENCY, ADEQUATELY EQUIPPED AND COMPETENT TO PERFORM SUCH SERVICES, THAT THE ITEM HAS BEEN TESTED AND CONFORMS TO THE STANDARDS INCLUDING METHODS OF TEST, OF THE TESTING ORGANIZATION(S).

E. QUALIFICATIONS OF INSTALLERS:

1. FOR THE ACTUAL FABRICATION, INSTALLATION AND TESTING OF THE WORK OF THIS SECTION, USE ONLY THOROUGHLY TRAINED AND EXPERIENCED PERSONNEL WHO ARE COMPLETELY FAMILIAR WITH THE REQUIREMENTS FOR THIS WORK AND WITH THE INSTALLATION RECOMMENDATIONS OF THE MANUFACTURERS OF THE SPECIFIED ITEMS. CONTRACTOR SHALL BE ONE THAT IS REGULARLY ENGAGED IN THIS TYPE OF WORK. CONTRACTOR SHALL PROVIDE PROOF OF PREVIOUS PROJECTS OF THIS TYPE ALONG WITH BRIEF DESCRIPTIONS OF THE PROJECT, NAME OF CONTRACT AND APPROXIMATE AMOUNT OF PROJECT COST. SUBMIT LISTING OF THREE PROJECTS AS A MINIMUM (IF REQUESTED).

2. IN THE ACCEPTANCE OR REJECTION OF THE INSTALLED ELECTRICAL SYSTEM, NO ALLOWANCE WILL BE MADE FOR LACK OF SKILL ON THE PART OF INSTALLERS.

3. THE CONTRACTOR SHALL NOT BE RELIEVED FROM COMPLYING WITH ANY OF THE REQUIREMENTS OF THE SPECIFICATIONS OR DRAWINGS WHICH MAY BE IN EXCESS OF AND NOT CONTRARY TO THE REQUIREMENTS OF THE ABOVE MENTIONED RULES.

1.04 DEFINITIONS

A. DEFINITIONS USED IN THIS ARTICLE ARE NOT INTENDED TO CHANGE THE MEANING OF OTHER TERMS USED IN THE CONTRACT DOCUMENTS, SUCH AS "SPECIALTIES," "SYSTEMS," "STRUCTURES," "FINISHES," "ACCESSORIES," AND SIMILAR TERMS. SUCH TERMS ARE SELF-EXPLANATORY AND HAVE WELL RECOGNIZED MEANINGS IN THE CONSTRUCTION INDUSTRY.

1. "PRODUCTS" ARE ITEMS PURCHASED FOR INCORPORATION IN THE WORK, WHETHER PURCHASED FOR THE PROJECT OR TAKEN FROM PREVIOUSLY FURNISHED STOCK. THE TERM "PRODUCT" INCLUDES THE TERMS "MATERIAL," "EQUIPMENT," "SYSTEM," AND TERMS OF SIMILAR INTENT.

a. "NAMED PRODUCTS" ARE ITEMS IDENTIFIED BY MANUFACTURER'S PRODUCT NAME, INCLUDING MAKE OR MODEL DESIGNATION, INDICATED IN THE MANUFACTURER'S PUBLISHED PRODUCT LITERATURE, THAT IS CURRENT AS OF THE DATE OF THE CONTRACT DOCUMENTS.

2. "MATERIALS" ARE PRODUCTS THAT ARE SUBSTANTIALLY SHAPED, CUT, WORKED, MIXED, FINISHED, REFINED OR OTHERWISE FABRICATED, PROCESSED, OR INSTALLED TO FORM A PART OF THE WORK.

3. "EQUIPMENT" IS A PRODUCT WITH OPERATIONAL PARTS, WHETHER MOTORIZED OR MANUALLY OPERATED, THAT REQUIRES SERVICE CONNECTIONS SUCH AS WIRING OR PIPING.

1.05 SIZE OF EQUIPMENT

A. INVESTIGATE EACH SPACE IN THE BUILDING THROUGH WHICH EQUIPMENT MUST PASS TO REACH ITS FINAL LOCATION. IF NECESSARY, THE MANUFACTURER SHALL BE REQUIRED TO SHIP HIS MATERIAL IN SECTIONS SIZED TO PERMIT PASSING THROUGH SUCH RESTRICTED AREAS IN THE BUILDING.

1.06 FINAL SUBMITTALS

A. PROJECT RECORD DOCUMENTS:

1. DURING PROGRESS OF THE WORK, MAINTAIN AN ACCURATE RECORD OF THE INSTALLATION OF THE ELECTRICAL SYSTEM, LOCATING EACH CIRCUIT PRECISELY BY DIMENSIONS.

2. UPON COMPLETION OF THE ELECTRICAL INSTALLATION, TRANSFER ALL RECORD DATA TO PRINTS OF THE ORIGINAL DRAWINGS.

B. MANUAL: PRIOR TO COMPLETION OF THE ELECTRICAL INSTALLATION AND AS A CONDITION OF ITS ACCEPTANCE, DELIVER TO THE OWNER AND THE OWNER/ENGINEER FOUR (4) COPIES EACH OF A MANUAL CONTAINING ALL MANUFACTURER'S DETAILED INSTRUCTIONS FOR MAINTENANCE AND OPERATION OF ALL ELECTRICAL EQUIPMENT. THIS MANUAL WILL CONTAIN THE FOLLOWING INFORMATION:

1. IDENTIFICATION ON, OR READABLE THROUGH, THE FRONT COVER STATING THE GENERAL NATURE OF THE MANUAL.

2. NEATLY TYPEWRITTEN INDEX NEAR THE FRONT OF THE MANUAL, FURNISHING INFORMATION AS TO LOCATION IN THE MANUAL OF ALL EMERGENCY DATA REGARDING THE INSTALLATION.

3. COMPLETE INSTRUCTIONS REGARDING OPERATIONS AND MAINTENANCE OF ALL EQUIPMENT INVOLVED.

4. COMPLETE NOMENCLATURE OF ALL REPLACEABLE PARTS, THEIR PART NUMBERS, CURRENT COST, AND NAME AND ADDRESS OF NEAREST VENDOR OF PARTS.

5. COPY OF ALL GUARANTEES AND WARRANTIES ISSUED.

6. COPY OF THE APPROVED SHOP DRAWINGS WITH ALL DATA CONCERNING CHANGES MADE DURING CONSTRUCTION.

7. WHERE CONTENTS OF MANUALS INCLUDE MANUFACTURERS' CATALOG PAGES, CLEARLY INDICATE THE PRECISE ITEMS INCLUDED IN THIS INSTALLATION AND DELETE, OR OTHERWISE CLEARLY INDICATE, ALL MANUFACTURERS' DATA WITH WHICH THIS INSTALLATION IS NOT CONCERNED.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

A. PROTECTION: USE ALL MEANS NECESSARY TO PROTECT ELECTRICAL SYSTEM MATERIALS BEFORE, DURING AND AFTER INSTALLATION.

B. REPLACEMENTS: IN THE EVENT OF DAMAGE, IMMEDIATELY MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY TO THE ACCEPTANCE OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE OWNER. IF ANY APPARATUS HAS BEEN SUBJECT TO POSSIBLE INJURY BY WATER, IT SHALL BE THOROUGHLY DRIED OUT AND PUT THROUGH SUCH SPECIAL TESTS AS DIRECTED BY THE OWNER/ENGINEER AT THE COST AND EXPENSE OF THE CONTRACTOR, OR SHALL BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.

C. PROTECT THE WORK OF OTHER TRADES. RESTORE ANY DAMAGE CAUSED TO OTHER TRADES TO THE CONDITION EXISTING PRIOR TO DAMAGE AT NO ADDITIONAL COST TO THE OWNER.

1.08 PROJECT CONDITIONS

A. PROJECT DESCRIPTION:

1. THIS PROJECT IS TO PROVIDE AN ELECTRICAL SYSTEM TO INCLUDE: POWER PANELS, LIGHTING SYSTEMS, SWITCHES, RACEWAYS, DISCONNECT SWITCHES, AND BRANCH CIRCUIT WIRING AND TO PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, APPLIANCES AND TOOLS AND TO PERFORM ALL WORK NECESSARY FOR THE COMPLETE EXECUTION OF THE ELECTRICAL WORK AS SHOWN ON THE DRAWINGS, REQUIRED BY THE SPECIFICATIONS AND WORK NOT SPECIFICALLY SHOWN OR SPECIFIED, YET REQUIRED TO INSURE PROPER AND COMPLETE OPERATION OF ALL SYSTEMS AND TO SATISFY THE DESIGN INTENT INHERENT IN THE WORK AND TO COMPLY WITH ALL APPLICABLE CODES, REGULATIONS.

2. ALL MATERIAL REMOVED, INCLUDING CONDUIT, WIRE AND RELATED ELECTRICAL EQUIPMENT IS TO BE DISPOSED OF, UNLESS OTHERWISE NOTED, BY THE CONTRACTOR IN A LEGAL MANNER THAT COMPLIES WITH ALL RULES AND REGULATIONS OF THE STATE OF VERMONT.

A. EXISTING CONDITIONS:

1. PRIOR TO ALL WORK OF THIS SECTION, CAREFULLY INSPECT THE INSTALLED WORK OF ALL OTHER TRADES AND VERIFY THAT ALL SUCH WORK IS COMPLETE TO THE POINT WHERE THIS INSTALLATION MAY PROPERLY COMMENCE.

2. VERIFY THAT THE ELECTRICAL INSTALLATION MAY BE MADE IN COMPLETE ACCORDANCE WITH ALL PERTINENT CODES AND REGULATIONS AND THE DESIGN.

3. IN THE EVENT OF DISCREPANCY, IMMEDIATELY NOTIFY THE OWNER/ENGINEER.

4. DO NOT PROCEED WITH INSTALLATION IN AREAS OF DISCREPANCY UNTIL ALL SUCH DISCREPANCIES HAVE BEEN FULLY RESOLVED.

5. FOR DEMOLITION NOTES REFER TO DEMOLITION NOTES ON CONTRACT DOCUMENTS.

C. COORDINATION:

1. COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE SCHEDULES FOR WORK OF OTHER TRADES TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.

2. ANY CHANGES SHALL BE DONE AT THE CONTRACTOR'S EXPENSE.

3. WHERE ELECTRICAL ITEMS ARE SHOWN IN CONFLICT WITH LOCATIONS OF STRUCTURAL MEMBERS AND MECHANICAL OR OTHER EQUIPMENT, FURNISH AND INSTALL ALL REQUIRED SUPPORTS AND WIRING TO CLEAR THE ENCROACHMENT.

4. ANY WORK INSTALLED CONTRARY TO OR WITHOUT ACCEPTANCE BY THE OWNER/ENGINEER SHALL BE SUBJECT TO CHANGE AS DIRECTED BY THE OWNER/ENGINEER, AND NO EXTRA COMPENSATION WILL BE ALLOWED THE CONTRACTOR FOR MAKING THESE CHANGES.

5. PRIOR TO COMMENCEMENT OF WORK, SUBMIT TO OWNER FOR HIS REVIEW AND APPROVAL THE DURATION AND SCHEDULE OF ANY ANTICIPATED POWER OUTAGES.

D. ACCURACY OF DATA:

1. THE DRAWINGS ARE DIAGRAMMATIC AND FUNCTIONAL ONLY, AND ARE NOT INTENDED TO SHOW EXACT CIRCUIT LAYOUTS, NUMBER OF FITTINGS, OR OTHER INSTALLATION DETAILS. FURNISH ALL LABOR AND MATERIALS NECESSARY TO INSTALL AND PLACE IN SATISFACTORY OPERATION ALL ELECTRICAL SYSTEMS SHOWN. INSTALL ADDITIONAL CIRCUITS WHEREVER NEEDED TO CONFORM TO THE SPECIFIC REQUIREMENTS OF THE EQUIPMENT.

2. THE LOCATIONS OF EQUIPMENT, SWITCHES, OUTLETS, AND SIMILAR DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. FIELD MEASUREMENTS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS FROM DRAWINGS. EXACT LOCATIONS SHALL BE AS ACCEPTED BY THE OWNER'S FIELD REPRESENTATIVE DURING CONSTRUCTION. OBTAIN IN THE FIELD ALL INFORMATION RELEVANT TO THE PLACING OF ELECTRICAL WORK AND, IN CASE OF ANY INTERFERENCE WITH OTHER WORK, PROCEED AS DIRECTED BY THE OWNER'S FIELD REPRESENTATIVE AND FURNISH ALL LABOR AND MATERIALS NECESSARY TO COMPLETE THE WORK IN AN ACCEPTABLE MANNER.

3. VERIFY SIZES AND RATINGS OF MOTORS AND OTHER ELECTRICALLY OPERATED DEVICES SUPPLIED BY OTHERS.

4. CHECK WITH OWNER'S FIELD REPRESENTATIVE BEFORE INSTALLATION OF WORK FOR EQUIPMENT NOT SPECIFIED AS TO LOCATION OR FOR WORK THAT INTERFERES WITH OTHER TRADES.

PART 2 PRODUCTS

2.01 MATERIALS

A. ALL OTHER MATERIALS, NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND OPERABLE ELECTRICAL INSTALLATION, SHALL BE NEW, FIRST QUALITY OF THEIR RESPECTIVE KINDS, SPECIFICATION GRADE OR BETTER, AND AS SELECTED BY THE CONTRACTOR SUBJECT TO THE ACCEPTANCE BY THE OWNER/ARCHITECT.

2.02 INTERCHANGEABILITY

A. IN ALL DESIGN AND PURCHASING, INTERCHANGEABILITY OF ITEMS OF EQUIPMENT, SUBASSEMBLIES, PARTS, AND OTHER ITEMS IS ESSENTIAL. ALL SIMILAR ITEMS SHALL BE OF THE SAME MANUFACTURER, TYPE, MODEL AND DIMENSIONS.

B. FOR EASE OF MAINTENANCE AND PARTS REPLACEMENT, TO THE MAXIMUM EXTENT POSSIBLE, USE EQUIPMENT OF A SINGLE MANUFACTURER.

C. THE OWNER/ENGINEER RESERVES THE RIGHT TO REJECT ANY SUBMITTAL WHICH CONTAINS EQUIPMENT FROM VARIOUS MANUFACTURERS IF SUITABLE MATERIALS CAN BE SECURED FROM FEWER MANUFACTURERS AND TO REQUIRE THAT SOURCE OF MATERIALS BE UNIFIED TO THE MAXIMUM EXTENT POSSIBLE.

2.03 CONDUIT AND RACEWAYS

A. CONDUIT (AS INDICATED ON THE DRAWINGS):

1. ELECTRICAL METALLIC TUBING (EMT).

B. COUPLINGS

1. COMPRESSION FOR EMT.

C. FLEXIBLE CONDUIT

1. FLEXIBLE STEEL CONDUIT WITH LIQUID-TIGHT PVC JACKET AND LIQUIDTIGHT CONNECTORS.

2.04 WIRES AND CABLES

A. BUILDING WIRING

1. COPPER CONDUCTOR.

2. 600-VOLT INSULATION, TYPE THHN-THWN CONDUCTORS.

3. MINIMUM SIZE: #12 AWG. NUMBER OF CONDUCTORS AS INDICATED.

B. SPLICES

1. 10 AWG AND SMALLER: WIRE NUT TYPE.

2. 8 AWG AND LARGER: SOLDERLESS LUGS.

2.05 PULL AND JUNCTION BOXES

A. CONSTRUCTION: METAL WITH SCREW-ON OR HINGED COVER

1. NEMA 1: INTERIOR LOCATIONS, DRY.

2. NEMA 4: EXTERIOR AND INTERIOR LOCATIONS, WET.

3. WIREWAY AND AUXILIARY GUTTER AT GROUPED EQUIPMENT LOCATIONS.

4. LB FITTINGS MAY BE USED INSTEAD OF PULL BOXES.

2.06 DISCONNECT SWITCHES

A. HEAVY DUTY, 600 VOLT, AS INDICATED ON DRAWINGS.

2.07 PANELBOARDS

A. AS INDICATED ON DRAWINGS.

2.08 SUPPORTING DEVICES

A. METALLIC CONDUIT CLAMPS OF APPROVED DESIGN. DO NOT USE PERFORATED PIPE STRAPS OR METALLIC HANGERS OR ASSEMBLIES.

B. B. GALVANIZED CHANNEL E1.1/2"xE1.1/2" (UNISTRUT – GALVANIZED) OR APPROVED EQUAL.

C. ANCHOR METHODS:

1. WOOD SURFACES: WOOD SCREWS.

2. METAL SURFACES: MACHINE SCREWS, BOLTS, STEEL, (PLATED).

3. CONCRETE SURFACES: SELF-DRILLING ANCHORS OR POWER-DRIVEN STUDS.

PART 3 EXECUTION

3.01 INSTALLATION

A. INSTALL ALL EQUIPMENT IN COMPLETE ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ALL PERTINENT CODES AND REGULATIONS.

B. THOROUGHLY INSPECT ALL ITEMS OF EQUIPMENT AND ANY ITEMS DENTED, SCRATCHED OR OTHERWISE DAMAGED IN ANY MANNER SHALL BE REPLACED OR REPAIRED AND PAINTED TO MATCH ORIGINAL FINISH.

1. ALL ITEMS SO REPAIRED AND REFINISHED SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S FIELD REPRESENTATIVE FOR INSPECTION AND ACCEPTANCE.

C. UPON COMPLETION OF ALL INSTALLATION, LAMPING, AND TESTING, THOROUGHLY INSPECT ALL EXPOSED PORTIONS OF THE ELECTRICAL INSTALLATION AND COMPLETELY REMOVE ALL EXPOSED LABELS, SOIL, MARKINGS AND FOREIGN MATERIAL.

3.02 IDENTIFICATION

A. ADHESIVE LABELS SHALL BE ATTACHED TO PANELS EQUIPMENT AND CONTROLS TO DESIGNATE USE, RATING, VOLTAGE, PHASE AS APPROPRIATE FOR OWNER'S USE.

3.03 CONDUIT AND RACEWAYS

A. INSTALL AT LOCATIONS SHOWN ON DRAWINGS KEEPING RUNS PARALLEL OR PERPENDICULAR TO BUILDING LINES.

B. WHERE CONDUIT AND RACEWAYS ARE EXPOSED IN FINISHED AREAS, PAINT TO MATCH EXISTING FINISH.

3.04 WIRES AND CABLES

A. FOLLOW STANDARD COLOR CODING ON SYSTEMS WIRING.

B. INSTALL WIRE AND CABLES TO DEVICES INDICATED ON DRAWINGS.

1. LEAVE TAILS OF AMPLE LENGTH FOR SPLICING AND CONNECTION (NOT LESS THAN 8 INCHES).

2. SPLICE ONLY IN ACCESSIBLE JUNCTION AND OUTLET BOXES.

C. INSULATE ALL SPLICES WITH TWO HALF-LAPPED LAYERS OF VINYL ELECTRICAL TAPE OR USE UL LISTED INSULATING COVERS.

3.05 PULL AND JUNCTION BOXES

A. SECURELY FASTEN TO BUILDING STRUCTURE.

B. INSTALL COVER PLATES ON ALL BOXES.

3.06 PANELBOARDS

A. INSTALL NEW PANELBOARDS AS INDICATED ON THE DRAWINGS.

B. LABEL BREAKERS TO INDICATE BRANCH CIRCUIT LOADS AND COMPLETE DIRECTORIES.

3.07 SPECIFIC ELECTRICAL EQUIPMENT INCLUDING LIGHTING FIXTURES

A. INSTALL ALL ELECTRICAL EQUIPMENT REQUIRED BY THE CONTRACT AND AS SHOWN ON THE DRAWINGS AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

3.08 GROUNDING AND BONDING

A. INSTALL GROUNDING PER N.E.C. PROVIDE GROUND WIRE IN ALL FEEDERS AND BRANCH CIRCUITS SIZED PER N.E.C.

B. INSTALL BONDING JUMPER IF FLEXIBLE METAL CONDUIT AND FITTINGS ARE NOT APPROVED FOR GROUNDING.

3.09 TESTING

A. CONDUCT ALL TESTS REQUIRED TO SECURE APPROVAL OF THE INSTALLATION FROM ALL AGENCIES HAVING JURISDICTION.

B. DEMONSTRATE THAT ALL SYSTEMS ARE FREE FROM SHORT CIRCUITS, GROUNDS, MECHANICAL AND ELECTRICAL DEFECTS.

C. CONDUCT OPERATIONAL TESTS OF ALL SYSTEMS AS A CONDITION OF ACCEPTANCE.

D. SUBSEQUENT TO TESTS AND CORRECTION OF MALFUNCTIONS DETECTED, ENERGIZE CIRCUITRY AND DEMONSTRATE FUNCTIONING OF ELECTRICAL SYSTEMS IN ACCORDANCE WITH REQUIREMENTS.

E. DEMONSTRATE PROPER ROTATION OF ALL MOTORS.

1. CORRECT MOTOR ROTATION ONLY AT MOTORS.

3.10 CERTIFICATES

A. AS A REQUISITE FOR FINAL ACCEPTANCE, THE FOLLOWING ARE REQUIRED:

1. DELIVER TO THE OWNER TWO (2) COPIES OF THE ELECTRICAL INSPECTOR'S CERTIFICATE OF APPROVAL SHOWING ACCEPTABILITY OF WORK DONE UNDER THIS CONTRACT FOR PRESENTATION TO THE OWNER.

2. DELIVER TO THE OWNER TWO (2) COPIES OF ANY OTHER CERTIFICATES OF APPROVAL FOR PRESENTATION TO THE OWNER.

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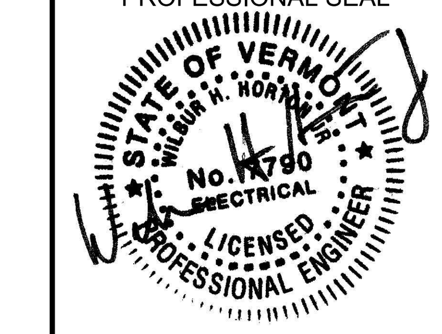


NO.	DATE	DESCRIPTION	BY	CK'D

verizon wireless

VERMONT 12' x 20' EQUIPMENT SHELTER

SHEET TITLE

ELECTRICAL SPECIFICATIONS

DRAWN BY EJD	DATE MARCH 2022
CHECKED BY WHH	D&K PROJECT #
PROJ. ENG. LJH	D&K ARCHIVE #

SHEET NUMBER

EB-6

G:\Electrical Standards, Guidelines, Product Info, & Vendors\VERIZON\Standards\Shelter Drawings (Dubois-King)\Modified Design_07.28.16\Typical 20' Building(Diesel).dwg 3/27/2022 12:21 PM

23 0500 BASIC MECHANICAL REQUIREMENTS

A. QUALITY OF WORK

1. CONTRACT DOCUMENTS ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY SCOPE & ARRANGEMENT OF WORK. CONSULT ELECTRICAL AND STRUCTURAL CONSTRUCTION DRAWINGS FOR FAMILIARITY WITH CONDITIONS AFFECTING WORK. VERIFY ALL SPACES IN WHICH WORK WILL BE PERFORMED BY ON-SITE MEASUREMENTS. DO NOT SCALE DRAWINGS.
2. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AS THERE MAY BE VARIOUS CONDITIONS AT THE SITE WHICH DO NOT SHOW ON THE ACCOMPANYING DRAWINGS, OR WHICH ARE AT VARIANCE WITH THE CONDITIONS INDICATED ON THE DRAWINGS. IT IS IMPORTANT THAT EACH BIDDER VISIT THE SITE TO BECOME ACQUAINTED WITH THE EXISTING CONDITIONS, AND TO TAKE THESE CONDITIONS INTO CONSIDERATION WHEN PREPARING THEIR PROPOSAL. EACH BIDDER SHALL OBTAIN ANY INFORMATION OR MAKE ANY MEASUREMENT DESIRED. LACK OF KNOWLEDGE RELATIVE TO THE EXISTING SITE CONDITIONS WILL NOT BE ALLOWED AS A BASIS FOR EXTRA COMPENSATION.
3. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
4. ALL WORKSMANSHIP, MATERIALS, AND EQUIPMENT SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY THE OWNER.

B. CODES/PERMITS

1. WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH NFPA, ASHRAE, UNDERWRITERS LABORATORIES AND ALL MUNICIPAL, STATE AND OTHER AUTHORITIES, PUBLIC AND PRIVATE, HAVING JURISDICTION. REPORT ALL DISCREPANCIES WITH SUCH REGULATIONS TO ENGINEER AND DO NOT PROCEED WITH ANY WORK UNTIL WRITTEN AUTHORIZATION IS RECEIVED FROM THE ENGINEER.
2. ALL NECESSARY FEES, PERMITS, AND APPROVALS AS REQUIRED BY THE WORK OF THESE DRAWINGS AND SPECIFICATIONS SHALL BE OBTAINED AND PAID FOR BY THIS CONTRACTOR.
3. NOTHING CONTAINED IN THE SPECIFICATIONS OR INDICATED ON THESE DRAWINGS SHALL BE CONSTRUED TO CONFLICT WITH APPLICABLE PORTIONS OF ANY LAWS, ORDINANCES, REGULATIONS, OR CODES.

C. COORDINATION OF WORK

1. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, AND ELECTRICAL WORK SHOWN ON OTHER CONTRACT DOCUMENTS.
2. CONCRETE HOUSEKEEPING PADS TO SUIT MECHANICAL EQUIPMENT SHALL BE SIZED AND LOCATED BY THE MECHANICAL CONTRACTOR. MINIMUM CONCRETE PAD THICKNESS SHALL BE 4 INCHES. PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 4 INCHES ON EACH SIDE. CONCRETE HOUSEKEEPING PADS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO COORDINATE SIZE AND LOCATION OF CONCRETE HOUSEKEEPING PADS WITH THE GENERAL CONTRACTOR.
3. WHEN MECHANICAL WORK (HVAC, PLUMBING, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
4. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS ARE APPROXIMATE AND NOT DEFINITELY FIXED BY DIMENSIONS. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE THE DRAWINGS.
5. COORDINATE LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS WITH ALL OTHER TRADES INVOLVED. ALL OPENINGS IN WALLS FOR PIPING, CONDUIT, DUCTWORK, ETC., SHALL BE FIRE STOPPED.

23 0553 MECHANICAL IDENTIFICATION

A. EQUIPMENT NAMEPLATES. IDENTIFY ALL SCHEDULED EQUIPMENT WITH PLASTIC NAMEPLATES. PLATES ARE LAMINATED THREE-LAYER PLASTIC WITH ENGRAVED LETTERS. LETTERING IS WHITE AND ¼ INCH HEIGHT. BACKGROUND COLOR IS BLACK.

23 3100 DUCTWORK

A. FABRICATE DUCTWORK FROM FIELD VERIFIED DIMENSIONS. FABRICATE DUCTWORK IN ACCORDANCE WITH SMACNA GUIDELINES (LASTEST EDITION). PRIOR TO FABRICATING DUCTWORK VERIFY CEILING CLEARANCES WITH STRUCTURE, PIPES, ETC. COORDINATE THE INSTALLATION OF DUCTWORK WITH SPRINKLER PIPING. INSTALL DUCTWORK PRIOR TO INSTALLING ANY PIPING AND ELECTRICAL WORK TO REDUCE CONFLICTS.

B. ALL DUCTWORK DIMENSIONS SHOWN ON PLANS ARE CLEAR INTERNAL SIZES.

C. ALL DUCTWORK SHALL BE DESIGNED AT A MINIMUM CLASS OF 2 INCH WATER GAGE, SEAL CLASS 'A'.

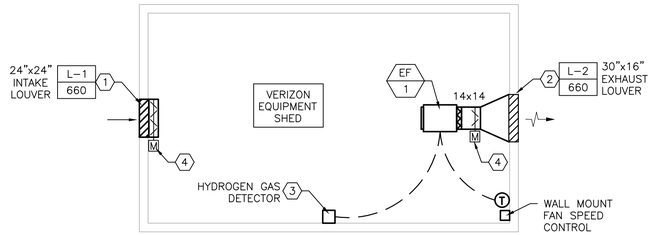
MECHANICAL LEGEND:

DUCTWORK

SYMBOL	DESCRIPTION
20x12	RECTANGULAR DUCT, FIRST NUMBER IS DIMENSION IN VIEW OF DRAWING
20ø	ROUND RIGID DUCT
	FLEXIBLE DUCT CONNECTOR
M	MOTOR OPERATED DAMPER
	DIRECTION OF SUPPLY AIR FLOW
	DIRECTION OF RETURN OR EXHAUST AIR FLOW

GENERAL SYMBOLS

SYMBOL	DESCRIPTION
T	WALL MOUNTED THERMOSTAT/CONTROLLER
AHU 1	MOTORIZED EQUIPMENT ABBREVIATION / MOTORIZED EQUIPMENT NUMBER
SD-1 100	AIR INLET/OUTLET DEVICE LABEL / DEVICE TAG NUMBER / CUBIC FEET PER MINUTE (CFM)
ø	PHASE OR ROUND DIAMETER
	HEAVY DASHED LINES DENOTE EQUIPMENT TO BE REMOVED
	LIGHT LINES DENOTE EXISTING EQUIPMENT TO REMAIN
1	REVISION CLOUD WITH REVISION NUMBER
	CONNECT NEW TO EXISTING AT THIS POINT
	REMOVE EXISTING UP TO THIS POINT
A	SECTION LETTER



1 MECHANICAL FLOOR PLAN
SCALE: 1/4" = 1'-0"

KEY NOTES:

1. BOTTOM OF INTAKE LOUVER IS 3' ABOVE FINISHED GRADE.
2. EXHAUST LOUVER, EXHAUST DUCT, AND EXHAUST FAN ARE CENTERED WITHIN THE ROOF FRAMING. VERIFY THE SUBMITTED ROOF FRAMING WILL ALLOW 30x16 LOUVER.
3. SEE ELECTRICAL DRAWINGS FOR HYDROGEN DETECTOR TO SENSE BATTERY LEAKAGE. DETECTOR, ALONG WITH REVERSE ACTING THERMOSTAT, SHALL ACTIVATE THE EXHAUST FAN.
4. GREENHECK VCD-23 LOW LEAKAGE CONTROL DAMPER WITH 120V MOTOR ACTUATOR. DAMPER IS NORMALLY CLOSED. ACTUATOR OPENS DAMPER WHEN EXHAUST FAN EF-1 IS ACTIVATED.

LOUVER SCHEDULE

SYMBOL L-# / CFM	MANUFACTURER AND MODEL	TYPE	LOUVER SIZE W x D (IN)	CFM	SPD ("WC)	MATERIAL/ FINISHING	FACE VELOCITY (FPM)	REQUIRED FREE AREA (SF)	REMARKS
L-1	RUSKIN ELF6375DX	EXTERIOR FIXED, DRAINABLE INTAKE LOUVER	24 x 24	660	0.015	6035T5 EXTRUDED ALUMINUM/ NOTE 1	349	1.89	6" DEEP FRAME, WITH BIRD SCREEN, 57% FREE AREA, NOTE 2
L-2	RUSKIN ELF6375DX	EXTERIOR FIXED, DRAINABLE EXHAUST LOUVER	30 x 16	660	0.029	6035T5 EXTRUDED ALUMINUM/ NOTE 1	480	1.37	6" DEEP FRAME, WITH BIRD SCREEN, 57% FREE AREA, NOTE 2

NOTES:
1. PROVIDE COLOR CHART TO OWNER FOR COLOR SELECTION.
2. BEGINNING OF WATER PENETRATION FOR THIS LOUVER STARTS AT 1023 FPM.

FAN SCHEDULE

SYMBOL EF #	MANUFACTURER AND MODEL	FAN TYPE	CFM	ESP ("WC)	POWER	STARTER	RPM	SONES	VOLTS/ø	DRIVE TYPE	REMARKS
EF-1	GREENHECK SQ-100-VG-1/4	IN-LINE	660	0.375	¼ HP	PROVIDE STARTER	1140	5.6	115/1	DIRECT	ALL NOTES

NOTES:
1. FAN HAS AN ELECTRONICALLY COMMUTATED MOTOR WITH SPEED CONTROL.
2. FAN IS ACTIVATED BY LINE VOLTAGE REVERSE ACTING THERMOSTAT (85 DEG F, ADJUSTABLE) AND BY HYDROGEN DETECTION SENSOR DESCRIBED ON ELECTRICAL DRAWINGS. PROVIDE WALL MOUNT SPEED CONTROL FOR BALANCING FLOW AND MOUNT ADJACENT TO THE THERMOSTAT. LABEL THERMOSTAT AND SPEED CONTROL WITH "EXHAUST FAN EF-1".
3. FAN INLET SHALL HAVE ½" MESH SCREEN.
4. LINE VOLTAGE MOTORIZED INTAKE AND EXHAUST ISOLATION DAMPERS (NORMALLY CLOSED) ARE INTERLOCKED TO EXHAUST EF-1 TO OPEN UPON FAN ACTIVATION.
5. SUSPEND FAN WITH SPRING VIBRATION ISOLATORS ON HANGERS.
6. FAN IS 21" LONG, 17" WIDE, AND 17' HIGH. VERIFY THAT FAN WILL FIT WITHIN SUBMITTED ROOF FRAMING. FAN WEIGHT IS 56 LB.

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BEDFORD, NH

PROFESSIONAL SEAL

STATE OF VERMONT — MICHAEL A. SPASYK — NO. 6821 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	BY	CK'D	DATE

verizonwireless

VERMONT 12x20 EQUIPMENT SHED

SHEET TITLE

MECHANICAL NOTES, FLOOR PLAN, AND SCHEDULES

DRAWN BY	DATE
GXS	NOV 2019
CHECKED BY	D&K PROJECT #
MAS	
PROJ. ENG.	D&K ARCHIVE #
LJH	

SHEET NUMBER

M1