Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

August 7, 2018

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: **Notice of Exempt Modification for Sprint DO Macro: 876387**
Sprint Site ID: CT33XC560
107 Buck Road, Hebron, CT 06248
Latitude: 41° 39' 16.02"/ Longitude: -72° 24' 39.11"

Dear Ms. Bachman:

Sprint currently maintains six (6) antennas at the 117-foot level of the existing 119.5-monopine tower located at 107 Buck Road, Hebron, CT. The tower is owned by Crown Castle. The property card states Global Signal Acq II (Crown Castle entity) listed owner data. Sprint now intends to replace six (6) antennas with six (6) new antennas. These antennas would be installed at the 117-foot level of the tower. Sprint also intends to install nine (9) RRH's and add four (4) Hybrid cables.

The facility was approved by a settlement agreement with the Town of Hebron on October 10, 2000, which a copy is included as well petition 99-11 for applicant Sprint PCS at the time of filing with the Town of Hebron.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to the Town Manager Mr. Andrew J. Tierney & Mr. Michael K. O'Leary, Town Planner. Again, Global Signal Acq II (Crown Castle entity) is listed on the property card.

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

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

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

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

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

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

For the foregoing reasons, Sprint respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mr. Andrew J. Tierney
Town of Hebron Manager
15 Gilead Street
Hebron, CT 06248
(860) 228-5971

Mr. Michael K. O'Leary
Town of Hebron Planner
15 Gilead Street
Hebron, CT 06248
(860) 228-5971, x137

SETTLEMENT AGREEMENT

This Agreement of Settlement (the "Agreement") is being entered into this 10th day of October, 2000, by and between Sprint Spectrum, L.P. ("Sprint PCS"); the Town of Hebron (the "Town") and the Town of Hebron Planning and Zoning Commission ("PZC") (the parties to this Agreement will be collectively referred to herein as the "Parties").

WHEREAS, Sprint PCS is a duly licensed telecommunications service provider providing telecommunications in the State of Connecticut; and

WHEREAS, in order to further enhance Sprint PCS's telecommunications system in Connecticut, Sprint PCS filed a special permit application with the PZC dated July 21, 1999, for approval of a 150 monopole telecommunications tower (the "Zoning Application") on property located on Buck Road in Hebron, CT (the "Property"); and

WHEREAS, the PZC acting upon the Zoning Application denied Sprint PCS's request for a 150 foot tower, but instead approved, with conditions, a 100 foot tower (the "Original Approval"); and

WHEREAS, Sprint PCS appealed the decision of the PZC in an action entitled *Sprint Spectrum, L.P. vs. Town of Hebron and Town of Hebron Planning and Zoning Commission Docket No. CV-00-0072426S* (the "Zoning Appeal"), which is currently pending in the Superior Court for the Judicial District of Tolland at Rockville; and

WHEREAS, the Parties to this Agreement desire to resolve their differences by settlement and agreement, without the necessity of further litigation and the expense and inconvenience attendant thereto.

NOW THEREFORE, in consideration of the mutual promises contained herein and other valuable consideration, the Parties, intending to be legally bound, hereto agree and stipulate as follows:

1. **Approval of 120 foot Tower.** As a condition of this Settlement, the PZC shall approve a 120 foot tower at the Property, at a location approximately 150 feet north of the original tower site on the Property in accordance with the plans attached hereto as and described in detail on Exhibit A (the "Plans"). Sprint PCS represents that the tower and site shown on Exhibit A will meet its expected and foreseeable needs for that general location. Except for the height and location of the tower, as modified by this Settlement Agreement, all other conditions of the Original Approval, specifically including the requirement for camouflaging, shall remain in effect.

2. **Camouflaging.** Sprint PCS agrees that the camouflaging of the tower shall be in accordance with the design and plans therefor attached hereto as Exhibit B.

3. **Co-location.** Sprint PCS agrees to accept co-location by Nextel and other telecommunications providers (if location sites on the Sprint PCS tower are available) on the tower to be constructed at a suitable height on terms customary in the industry. Sprint PCS will also co-locate facilities on a tower

to be constructed by SBA. Sprint PCS's co-location plans for its facilities on the SBA tower have already been approved by the PZC.

4. **Withdrawal of Zoning Appeal.** Upon the execution of this Agreement and approval by the PZC of the plans and designs shown on Exhibits A and B, as set forth in paragraphs 1 and 2 above, Sprint PCS and the PZC shall immediately jointly move in the Zoning Appeal pursuant to Conn.Gen.Stat. § 8-8(n) for court approval to withdraw said appeal and otherwise settle this dispute. Once court approval is obtained, Sprint PCS shall immediately file the withdrawal form in the Zoning Appeal. In the event the court refuses to approve the withdrawal of the Zoning Appeal, this entire Agreement shall become null and void and of no force and effect.

5. **Representations and Warranties.** Each of the Parties to this Agreement represents, warrants and agrees as follows:

(a) Each Party has received independent legal advice from it attorneys with respect to the advisability of making the settlement provided for herein and with respect to the advisability of executing this Agreement

(b) Each Party to this Agreement has made such investigation of the facts pertaining to this settlement and this Agreement and of all matters pertaining thereto as it deems necessary

(c) Each Party or responsible officer thereof has read this Agreement and understands the contents hereof. Each of the officers executing this Agreement on behalf of their respective corporation, municipality and municipal agency, as the case may be, is empowered to do so and thereby binds his respective entity.

(d) Each Party has not heretofore assigned, transferred, or granted, or purported to assign, transfer or grant, any f the claims, demands and cause or causes of action disposed of by this Agreement.

(e) The Parties shall execute all such further and additional documents as shall be reasonable, convenient, necessary or desirable to carry out the provisions of this Agreement.

(f) No Party relies upon any statement of any other Party in executing this Agreement, except as expressly stated in this Agreement.

(g) This Agreement is intended to be and is final and binding between the parties hereto, regardless of any claims or misrepresentations, concealment of fact, mistake of fact or law or any of any other circumstance whatsoever.

(h) This Agreement constitutes a full and final settlement of all disputes between the Parties and shall operate as a full and final release from and discharge of any claims, suits or causes of action which have been asserted or which could have been asserted, whether known or unknown, by either Party against any other Party.

6. **Miscellaneous**

(a) The rights and obligations of the Parties hereto shall be construed and enforced in accordance with, and governed by, the laws of the State of Connecticut.

(b) This Agreement is the entire agreement among the Parties with respect to the subject matter hereof and supersedes all prior and contemporaneous oral and written agreements and discussions. This Agreement may be amended only by an agreement in writing.

(c) This Agreement is binding upon and shall inure to the benefit of the Parties hereto, their respective agents, employees, representatives, officers, directors, divisions, subsidiaries, affiliates, assigns, heirs, attorneys, successors in interest and shareholders.

(d) Each Party has cooperated in the drafting and preparation of this Agreement. Hence., in any construction to be made of this Agreement, the same shall not be construed against any party.

(e) In the event of litigation relating to this Agreement, the prevailing Party shall be entitled to recover from the nonprevailing Party all of its reasonable expenses, including attorneys' fees and costs.

(f) This Agreement may be executed in counterparts, and when each party has signed and delivered at least one such counterpart, each counterpart shall be deemed an original, and, when taken together with other signed counterparts, shall constitute an Agreement, which shall be binding upon and effective as to all parties.

7. **Settllement.** This Agreement effects the settlement of claims which are denied and contested, and nothing contained herein shall be construed as an admission by any Party hereto of any liability of any kind to any other Party. Each of the Parties hereto denies any liability in connection with any claim and intends merely to avoid further litigation.

SPRINT SPECTRUM, L. P.

By _____

Name TOM KINCAID

Its SITE DEVELOPMENT MANAGER

TOWN OF HEBRON

By _____ 10/11/00
Robert E. Lee
Its Town Manager

TOWN OF HEBRON PLANNING AND ZONING COMMISSION

By _____ 10/10/00
David W. Schoolcraft
Its Chairman

TOWN OF HEBRON
15 Gilead Street, Hebron, CT 06248
TEL (860) 228-5971 FAX (860) 228-5980

Planning/Zoning Building Health Conservation

CERTIFIED MAIL

February 10, 2000

Spring PCS
9 Barnes Industrial Road
Wallingford, CT 06492

RE: Petition 99-11, Application by Sprint PCS for Telecommunications Facility on Buck Road, R-1 District

Dear Sprint PCS:

Please be advised that at the February 8, 2000 meeting of the Planning and Zoning Commission, the Commission took the following action on the above-referenced application:

Approved with the following conditions:

1. The overall height of the tower shall not exceed 100 (one hundred) feet.
2. The tower shall be modified to be of such design and treated with an architectural material so that it is camouflaged to resemble a woody tree with a single trunk and branches on its upper part, in a manner acceptable to the Commission, unless waived by the Commission
3. The tower shall be permitted to accommodate a single PCS provider, as shown on the plans, plus a GPS antenna. Any other antenna, including a potential co-locator shall require a Special Permit Application to the Commission.
4. The chain link fence surrounding the leased area shall be a green colored vinyl clad mesh material.
5. Evergreen plantings, a minimum of 6 (six) feet in height, shall be planted in double staggered rows along the south, east, and north sides of the fenced area, shown on a plan acceptable to the Commission.
6. This facility shall comply, at all times, with the standards promulgated by the FCC for non-ionizing electromagnetic emissions, as amended. After the facility is operational, the applicant shall submit, within 90 (ninety) days of beginning operations from this site, and annually thereafter, existing and maximum future projected measurements of non-ionizing electromagnetic emissions as well as the Federal standard established for such emissions.
7. Any change from the battery powered emergency generator system, as proposed, shall require application to, and approval from the Commission
8. The property owner and owner(s) of the facility shall execute a statement, to be recorded in the land records of the Town of Hebron, agreeing to the requirements of Subsection 8.23.10.
9. The plans shall incorporate the items contained in the report of the Town Engineer
10. As specified by the applicant, no lighting shall be mounted on the tower; and any lights within the leased area shall be shielded from glare off the property.
11. A Disposal Plan is needed as to how to dismantle the tower, either due to Section 8.23.10, or due to a decision to discontinue use of the tower by Sprint.

CERTIFIED MAIL

2-10-00
Sprint PCS
RE: Petition 99-11, Application by Sprint PCS for Telecommunications Facility (cont.)

Please have the plans revised to include the above conditions and forward one set of mylars and four blueline sets of plans for signature by the Commission. Also, a Special Permit Certification must be filed in the Town Clerk's Office before the approval is effective. We will prepare the Certificate for you. A filing fee will be needed before filing with the Town Clerk.

If you have any questions, please call me.

Very truly yours,

Michael K. O'Leary, Town Planner
for the Planning and Zoning Commission

MKO/l

cc: Petition File #99-11
Thomas J. Regan, Esq., Brown, Rudnick, Freed, & Gesmer, PC
Edward A. and Renee J. Ellis

TOWN OF HEBRON, CONNECTICUT
PLANNING AND ZONING COMMISSION

IN RE: 99-11

APPLICATION OF SPRINT PCS
FOR SPECIAL PERMIT TO CONSTRUCT
A TELECOMMUNICATIONS TOWER
ON A 131 ACRE PARCEL OF LAND ON
BUCK ROAD IN THE TOWN OF HEBRON,
CONNECTICUT.

FINDINGS OF FACT

At its regular meeting on February 8, 2000, pursuant to statutory notice, the Town of Hebron Planning and Zoning Commission considered the above-captioned application and acted upon same. At that time the Commission adopted the following findings in support of their action:

1. Sprint Spectrum, LP, d/b/a Sprint PCS (hereinafter "Sprint" or "Applicant"), is a telecommunications company created to provide wireless communication services known as Personal Communications Service ("PCS"). Sprint is duly authorized to construct, operate and manage a wireless personal communication system using the FCC radio license of its sister company, Wireless Co. Co. LP. Under that agreement, Sprint is authorized to make this application on behalf of Wireless Co. LP.

2. Sprint is, specifically, a provider of PCS service. PCS is digital a digital technology. Although similar to analog cellular service, digital service works on a higher frequency and at a lower power than analog service. While this gives PCS a higher quality, the geographic area covered by a digital facility is smaller than that covered by an analog facility. The result is that a digital network requires more antennae.

3. A PCS network is a grid made up of a continuous series of overlapping cells. A cell is the geographic area serviced by any single antenna facility. The size of any given cell is determined by topography and vegetation. PCS antennae must be located above the height of surrounding trees or structures to be effective. When a PCS user moves from one cell to another the call is automatically transferred to the next cell without interruption. In order for this to work there must be some overlap of cells.

4. Sprint is not provider of analog service. As such, if a Sprint user reaches gap in digital service, the call will not automatically switch to analog service. Once a gap is reached the Sprint user's PCS call will be dropped, regardless of the availability of analog coverage in the area.

5. Sprint maintains that it is charged with the responsibility of providing wireless telephone service throughout Connecticut including the area in and around the Town of Hebron. Sprint further maintains that it has a mandate to provide "seamless" service coverage throughout Connecticut.

6. The cell which Sprint seeks to cover comprises a significant portion of central/eastern Hebron, along with parts of the westerly portion of Marlborough. Within the cell is that portion of Rt. 66 running east from the Rt. 85 intersection, and that portion of Rt. 85 running north of the intersection with Rt. 66

7. Sprint maintains that there is a gap in PCS coverage along Routes 66 and 85, and in the immediate surrounding areas of Hebron

8. With its application Sprint provided a computer-generated map showing gaps in coverage within Hebron and the surrounding area and bearing the description "Holes visible on portions of Rt. 66 & 85." The representation was based on computer modeling and reflected what coverage would be based on surrounding sites, but without the planned Buck Road facility.

9. As to the coverage gaps within the Town of Hebron, the computer-generated map showed a gap in coverage along Rt. 66 from just west of the Marlborough town line to just east of the intersection with Jennifer Drive. The claimed gap extends south of Rt. 66 to the western half of Hope Valley Road, and north of the highway into Gilead. The map also showed gaps along Rt. 85, one near the intersection with Prentice Hill Road, and two others between Martin Road and the intersection with East Street.

10. Virtually the entire gap identified by Sprint falls within residential zoned districts. R-1 north of Rt. 66 and primarily R-2 south of Rt. 66.

11. Virtually all the coverage gaps identified by Sprint within the Town of Hebron encompass substantial portions of the Town's designated inland wetlands and watercourses

12. The Applicant has complied with basic site plan content requirements of Section 8.23.6 in that either with its application or in the course of the hearings it submitted the following documentation:

(1) A plan showing where/how proposed antenna would be affixed to the tower.
(2) Details of proposed antenna including size and color.
(3) Elevations and details of proposed shielding.
(4) Elevations of proposed equipment boxes/buildings and details of landscaping/lighting.
(5) Description of tower co-location capacity, number and type of antennas, positions for co-locators and collapsing design.
(6) Statement that performance standards in Regulation 5.6.3 shall be complied with and site will not interfere with public safety communications.
(7) An analysis of fall zone prepared by licensed engineer
(8) Proof of FFC license.
(9) Maps depicting (a) planned town coverage; (b) future planned sites/towers in Hebron; (c) service area of proposed site; (d) search radius of proposed site (e) all existing, approved and planned towers and structures over 40' in planned area.
(10) Simulation of site to ascertain visual impacts.
(11) Certified letters to similar providers seeking co-location opportunities.

13. The Buck Road site selected by Sprint is situated on the westerly one-third of the gap identified by Sprint in its application.

14. The neighborhood consists of predominantly open and forested, presently vacant, residentially zoned land, with residential development currently averaging two acres or more per household. The area is situated in an R-1 zone. The topography consists of rolling hills ranging from 350 feet to 685 feet above mean sea level. There are 28 property owners located within 200 feet of the Ellis property on which the proposed tower would be built. The areas residences are single-family homes.

15. The Ellis property on which the proposed tower would be located is a 131-acre parcel consisting of mostly wooded land, with some open space dedicated to farming/pasturing.

16. Within the property, the site selected for the tower would be 683 feet from Buck Road. The proposed location would put the tower roughly 450 feet from the three-lot Buck Road Subdivision and roughly 750 feet from the only existing residence pictured on Applicant's plans.

17. The facility proposed by Sprint for the Ellis property would consist of an access drive off of Buck Road, a 100-foot square equipment compound, and a 150-foot-tall "monopole" tower with antennae mounted upon it.

18. The monopole would be constructed of galvanized steel. It would have an antenna platform located at the top. The platform would consist of three sectors forming a horizontally situated triangle. On each of the three sectors there would be mounted up to three panel antennae, for a total of up to nine antennae per platform. Each individual antenna would be five feet high, six inches wide, and two inches thick. The antenna panels would be off-white in color. With additional, potential co-locators, successive arrays of antennae/platform would be added at 10-foot increments along the pole.

19. Section 8.23.7 of Hebron's zoning regulations dictates minimum lot area and setback requirements for proposed telecommunications facilities. These are intended to achieve a minimum level of desired safety in the event of a structural failure and to achieve a sense of land use compatibility between diverse uses. Specifically, the regulations provide that a tower shall be located on a lot of two acres or more. The proposed facility on Buck Road complies with this requirement.

20. Section 8.23.7 of the regulations also dictates that all towers shall be setback from property lines the greater of 100 feet or the distance equal to one and one-half (1 1/2) times the tower height. This requirement includes all equipment/buildings related to the tower. Based on our review of the site plans we conclude that the proposed tower complies with the requirements of Section 8.23.7.3.

21. In addition, the Town's regulations require compliance with a number of general requirements contained within Section 8.23.8. With regard to those requirements we find the following:

(1) The tower is not within 500' of any facilities identified in Section 8.

(2) The proposed tower is not closer than three (3) times the tower height to any residence
(3) The proposed tower, although over 75 feet, is not within 1000' of historic district.
(4) The Applicant has produced evidence that the tower as planned would not require lighting in order to comply with FCC regulations.
(5) The tower as planned would be galvanized and would weather to neutral gray.
(6) The proposed tower is not located in town open space.
(7) The proposed tower will be a monopole and will be designed to collapse upon itself.
(8) Although the Applicant did not present any specific plan for camouflage of the proposed tower it did indicate a willingness to provide such camouflage if requested by the Commission.
(9) The proposed tower at 150 feet will accommodate two additional users.
(10) The site will be served by driveway and will have sufficient parking.
(11) Not applicable.
(12-13) The proposed facility will not include a dish antenna.
(14) The site as designed will not interfere with public safety communications.
(15) The site is not in Flood Hazard Plan.
(16) Applicant has produced evidence that the design of the facility is such that it will comply with FCC standards for non-ionizing electromagnetic emissions
(17) As designed all utilities leading to the tower will be underground. The compound will be surrounded by a 6-foot-high fence with locked gate and will be landscaped.
(18) As proposed the facility will not include a generator and that no fuel will be stored.
(19) Applicant has stated that Sprint personnel will visit the site at least monthly for maintenance and Sprint will be responsible for upkeep of the site.

22. The Commission is satisfied that there are no existing or approved towers, structures or buildings which would provide potential co-location opportunities.

23. Applicant has produced evidence to support the fact that once in operation the proposed tower facility would meet the following standards:

a) The use will be carried on in such a manner and with such precautions against fire and explosion hazards as to produce no serious exposure hazard to adjacent property, and the storage of all flammable or explosive materials shall be in a manner approved by the Fire Marshall of the town of Hebron.

b) The use will emit no offensive odors perceptible from any property line of the lot on which the operation is located, and shall emit no obnoxious, toxic or corrosive fumes or gases.

c) The use will not exhaust, or waste into the air, dust created by any industrial operation in excess of one cubic centimeter of settled matter per cubic meter of air, or produce heat or glare perceptible from any property line of the lot on which the operation is located for a period exceeding three continuous minutes.

d) Industrial and exterior lighting will not produce glare on public highways or neighboring property, or conflict with any traffic signals.

e) Smoke or other air contaminant will not be discharged into the atmosphere from any single source of emission for a period or periods aggregating more than three minutes in any one hour, which is as dark or darker in shade than as designated on No. 2 on the Ringelman Chart, as published by the United States Bureau of Mines, or which his of such opacity as to obscure an observers' view to a degree equal to or greater than does smoke designated as No. 2 on the Ringleman Chart.

f) The use will be operated in conformance with the following performance standards governing noise, and no sound pressure level shall exceed the decibel levels in the designated octave bands shown in Section 5.6.3 of the Hebron Zoning Regulations, with sound measurements being made in accordance with that section.

24. The site chosen for the proposed tower is in a residential zone, specifically, an R-1 district. Given that the proposed tower is over 75 feet tall the proposed site for this telecommunications facility is clearly the least favored location as defined by the town's zoning regulations.

25. However, the gap in coverage that Sprint seeks to fill falls entirely within residential districts of this town.

26. Based on the evidence presented and our own review of the topography and vegetation in the area, we are satisfied that in order to provide any reasonable degree of coverage along the Rt. 66 corridor the Sprint must locate its antenna facility within a residential area.

27. In the abstract, the Ellis parcel on Buck Road, given its size, its present use, the fact that it is about ¾ wooded and is largely vacant, and given its proximity to Rt. 66 we find that the 131-acre parcel in question is a reasonable location for a telecommunications facility, given the restrictions place upon us by the Federal Telecommunications Act of 1996.

28. The average tree height in the area of the proposed site is approximately 75 feet.

29. As for the specific location of the proposed tower and compound within the 131-acre parcel, the neighbors have expressed great concern about the location of the tower in such proximity to their residences.

30. The proposed site is on a large parcel of land (131 acres) that could contain the site further from established residences. The proposed tower is approximately 750' to the closest residence. The Commission asked the applicant if the tower could be moved into the open field (and perhaps camouflaged) further from the established residences. The applicant responded that the tower could be moved slightly in one direction of the other but essentially had to stay very close to the proposed site or coverage would be lost on Rt. 66.

31. Evidence as to the applicant's statement that moving the site into the open field would not work was not provided by the applicant. A 100' propagation map was asked of the applicant for the site in the open field. The applicant responded with the need to fill the cell with a 150' tower and further studies are not necessary.

32. Indeed, the chosen site is much closer to both the public road and to the neighbors than would be necessary simply based on the size of the parcel. In assessing the appropriateness of this specific location there are several factors to consider under our Regulations.

33. We find that given the setbacks and distances from surrounding residences, even at 150-feet the proposed tower, as located, would not pose a risk to the health and safety of the local residents in the event of a structural failure. Moreover, given that the Applicant will not be storing hazardous materials at the site, we find that the equipment in the compound would not present a hazard to neighbors.

34. While the Commission recognizes and understands the concerns of the neighbors about the possible effects of radio frequency radiation, this Commission cannot consider such concerns so long as the facility, as planned, is in compliance with FCC guidelines. We find that the applicant has submitted sufficient documentation to satisfy us that the proposed facility will be well within FCC guidelines.

35. During the public hearing the applicant submitted data from other towns to support their contention that there would be no negative impact on the value of surrounding property in this case. Members of the public opposed to the tower also submitted material suggesting that towers do tend to decrease property values. No evidence was submitted by anyone, however, regarding the value of the properties surrounding this particular site and no direct opinion evidence was submitted as to any potential impact of a tower at this site on neighboring property values.

36. While there are questions about the methodology of the studies provided by the applicant, and questions about the applicability of those studies to this neighborhood in Hebron, the commission concludes for the purpose of this application that there is no credible evidence that the placement of a PROPERLY CAMOUFLAGED telecommunications tower at this site on Buck road would seriously harm the surrounding property values.

37. The commission finds that the proposed tower facility would have an impact on the "appearance and beauty" of the community.

38. However, any tower significantly higher than the tree height would be visible from the surrounding neighborhood.

39. In order to achieve coverage on Rt. 66 it will be necessary to place a tower in such a position that it will rise above the tree height.

40. Based on the evidence presented in the hearings we find that, assuming proper camouflage of a nature acceptable to the Commission, the location of a telecommunications tower of some height at the proposed location would be appropriate, in light of the restrictions place upon us by Federal Telecommunications Act.

41. Hebron's zoning regulations provide "The maximum height of a tower proposed under this regulation shall be 150 feet including the antenna and all other appurtenances and shall not exceed the minimum height necessary to carry out the function of the facility

42. Sprint's radio frequency engineer, Alessandro Ponce, stated that Sprint's main concern was covering Rt. 66 and Rt. 85. He said that most of the cellular traffic comes from people driving on the roads and that Route 66 and Route 85 provide a lot of traffic. In short, Sprints main objective in placing a tower at the Buck Road site is to "cover the main thoroughfares through Town."

43. Sprint does not believe that the cell will be filled at a lower height than 150 feet. To illustrate this point, Mr. Ponce presented at the October 12, 1999 hearing a propagation study showing what the coverage would be if the Buck Road tower were limited to 120-feet. This study was prepared by Sprint not in response to any request by the Commission but because it was aware of subsequent changes in the town's zoning regulations capping tower height at 120 feet. Those revisions in the regulations, however, are inapplicable to this application.

44. At the October 12, 1999 hearing a Commission member specifically questioned whether the amount of coverage shown at 150 feet and the amount shown at 120-feet was significantly different, questioning the value of the higher tower. Sprint's response to this was that it had only generated the 120-foot study because "we know the Town's preference for a tower at that height." The Applicant's spokesman went on to say:

> "... to be honest with you, it probably hurts more than helps showing you that because when you look at a blob of green and a blob of blue, I agree with you. It doesn't look significantly different, but I guess from our perspective, the important point for you to hear is that the tower at 120 feet, in our opinion, doesn't fulfill the coverage need."

45. At the November 9, 1999 hearing Sprint provided each Commission member a packet of propagation studies for the Buck Road site, each reflecting the coverage achieved by a different height tower. The packet was supposed to have included a map again showing the limitations of a 120-foot tower at the proposed site, but for some reason this 120-foot propagation study was not included in the packet of propagation studies provided to the individual commissioners at that hearing. A copy was provided to the Commission staff and the Commission members had an opportunity to review this in detail at a subsequent meeting.

46. The 120-foot study submitted on November 9, 1999 had been prepared on November 4, 1999. This study actually showed worse coverage than had been reflected by the 120-foot study presented at the first hearing, i.e. the one conducted sua sponte by Sprint on October 12, 1999. Specifically, the November 4, 1999 study demonstrated a larger gap in coverage along Rt. 66 west of the Marlborough town line, and it also showed a *new* gap on Rt. 66 in the area of Stone House Lane.

47. On careful comparison of the two studies it is clear that the location of the hypothetical 120-foot tower on the second study was at a different longitude and latitude that had been reflected on the first study.

48. With its application Sprint submitted a propagation study map dated July 19, 1999 purporting to show the coverage that would be achieved by the proposed 150 foot tower (560-02) that map being further identified as "Holes covered on portions of Rt. 66 & 85."

49. That July 19, 1999 propagation study showed that a 150-foot tower would achieve a substantial increase in coverage in the sparsely populated areas north and south of Rt. 66. It also showed that such a tower would eliminate the significant gap along Rt. 66 between the Marlborough town line and Jennifer Drive. However, the study showed that the proposed tower would not close the gap on Rt. 66 west of the town center. Further, the study also showed that the gaps on Rt. 85, while modestly reduced by the 150-foot Buck Road tower, would not be eliminated.

50. Even Sprint's own expert admitted that the 150-foot tower as proposed would still leave gaps along Route 66. Any gap, no matter how small, will cause the traveling caller to drop his call.

51. At the time of the October 12, 1999 hearing a Commission member raised questions about the fact that the 150 foot tower would not be able to achieve the seamless coverage that Sprint was putting forth as justification for the tower. At that time the available propagation study for 150 feet was the one prepared on July 19, 1999 and included in the application materials.

52. The propagation study prepared on November 4, 1999, and entered into the record at the December 7, 1999 hearing, showed greater coverage with a 150-foot tower than had been reflected in the July 1999 study submitted with the application. Specifically, the November version eliminated the gap on Rt. 66 west of the town line completely, eliminated the northernmost gap on Rt. 85 (near Prentice Road), and eliminated a small gap on Rt. 85 near Hills Farm.

53. To help evaluate the technical data the Commission retained the services of a consultant. CompComm, a telecommunications-engineering firm from New Jersey. John W. Sieber, PE, an engineer with CompComm, reviewed the materials provided by the applicant prior to the first pubic hearing. Among other things, CompComm's initial evaluation highlighted the need to request propagation studies from Sprint showing potential coverage at heights less than 150 feet, including 125 feet, 100 feet and 80 feet.

54. After reviewing the additional submissions of Sprint, Mr. Sieber opined that when existing coverage is factored in the proposed 150-tower "covers very little new area" than would be covered by a 120-foot tower. CompComm found no significant difference in coverage within Hebron with a 120-foot tower than with a 150-foot tower.

55. Based on our own review of the propagation studies, the Commission is convinced that a tower of 150 feet at the proposed site would provide no greater coverage on Rt. 66 than would a tower of 120 feet at that same location. The only effect that the placement of a 120-foot tower at the site rather than a 150-foot tower would have on Rt. 85 would be to slightly increase the size of one of the gaps that would exist even with the 150-foot tower.

56. The applicant stated that three candidate sites were evaluated for this tower application. The applicant stated that the other sites were north and south of the selected site on Buck Road. Applicant stated that it chose the Ellis site because it was a large parcel. Applicant did not provide propagation maps for the two sites not selected.

57. On their own initiative, the applicant did not provide the Commission with any alternatives to the proposed site at Buck Road. Only one propagation map with a lower height on the proposed site was provided.

58. From the very first hearing the commission made it clear that it wanted to explore the possibility of obtaining coverage in town through the use of smaller, more numerous towers. On several occasions, including the October 12, 1999 and November 9, 1999 hearings, the Commission asked that Applicant provide propagation maps for two specifically-named alternative sites (Lions' Park and Main Street Firehouse), as well as other potential sites which in combination might provide similar coverage with multiple, shorter towers.

59. Throughout the course of the hearings sprint demonstrated an unwillingness to consider alternative sites involving varying heights of towers at two or more locations on the same map.

60. The applicant ultimately provided the commission with a few maps, namely existing coverage with other proposed towers; coverage from the proposed site with 150', 120' and 100' towers; coverage from the Main St. Firehouse (150') and Lions' Park (150'). When the Commission finally received maps of combined multiple sites, the applicant used only the two alternative sites specifically referenced by the Commission (Lions Park and fire station) and simply used 80' at all three sites.

61. The Commission did not receive propagation maps as requested for multiple sites with varying combinations of heights to determine if alternatives were feasible, nor were any other alternative combination of sites provided by the applicant . In other words, propagation maps requested to determine the applicant's compliance with Section 8.23.8.20 of the regulations were not provided.

62. In response to a request for alternative site propagation studies made at the November 9, 1999, sprint stated that "at some point when you start requiring us to put multiple towers on a site, it becomes economically prohibitive for us to fill the cell." No cost data was ever submitted as evidence to back up this claim of "economic prohibitiveness".

63. When pressed on the issue of the economic factors Sprint responded, "I think at this point, our position is we're prepared to put one tower in this cell."

64. Sprint's representative also stated: "{W}e have submitted to you what we feel we're capable of putting in this area to fill this cell. If the Commission feels that we've not proven the necessity of the tower, then they have the ability to deny the application and we have the ability to pursue whatever remedies are available to us."

65. Accurate propagation maps are critical to determine compliance with the regulations.

66. The map of coverage dated November 4, 1999 produced by applicant to show the extent of coverage from the proposed site with only a 100-foot tower, actually shows results that are virtually identical as those produced by applicant on the same date but designed to reflect coverage from the site with a 120-foot tower. Comparing the 100-foot study and the 120-foot study, it is clear that coverage in the vicinity of Rt. 66 and Rt. 85 is virtually unchanged and coverage in the outlying areas is also quite similar.

67. On 11/9/99 the applicant's representative stated that a 150-foot tower would provide 27.2 sq. mi. of coverage, a 120-foot tower would provide only 9 sq. mi. coverage, and a 100-foot tower would provide a meager 3.5 sq. miles of coverage. Based on our review of the propagation studies we find that this assertion is simply not credible.

68. CompComm analyzed a number of alternative antenna arrangements. CompComm identified two locations, which in combination would allow Sprint to provide the requisite coverage on both Rt.66 and Rt. 85 with lower towers than that proposed for the Buck Road site.

69. CompComm, in its report dated 12/3/99, stated that coverage similar to what Sprint seeks at 150 feet can likely be achieved with multiple lower towers and the studies provided by Sprint do not demonstrate the necessity of a 150' tower. The report states, *"The propagation studies submitted by Sprint do not demonstrate the need for the taller structure."*

70. The CompComm report went on to also make note of the questionable assertion about the amount of decreased coverage that would result for a shorter tower. Specifically, CompComm stated, *"These studies show a major decrease in coverage area when the antenna height is decreased by only 30 feet - from 150' to 120', which is still well above the tree line and most of the surrounding terrain. This difference should not cause a coverage difference this extreme."*

71. The CompComm report went on to state, *"The studies show that coverage on Route 66 and Route 85 in Hebron are similar with the proposed antenna at 150 feet and 120 feet.... When the antenna is lowered to 100 feet, the signal along Route 66 is similar and the signal along Route 85 decreases further. From the simulations, CompComm recommends a maximum height of 120 feet at this location to reduce visual impact."*

72. CompComm undertook an independent analysis of alternative sites in town. Based on their review, CompComm stated, *"Our conclusion is that coverage of the areas of concern could likely be achieved through a combination of smaller towers on certain alternative sites." "The best single site alternative is Site V on the map." (a site southeast of the proposed site, south of Route 66 and west of Route 85). Another approach would be to allow two sites to provide the same coverage. The best combination of sites in this case is Site III and Site VII. These would provide the required coverage to both Route 66 and Route 85 with lower towers than the single site solution demonstrated in the application."*

73. Putting aside momentarily the question of coverage on Rt. 66 and Rt. 85, most of the additional coverage gained by building a 150-foot tower over a 120-foot tower would be in largely uninhabited, sparsely populated and heavily wooded portions of town, most of which fall within wetlands.

74. Sprint conducted a Visual Resource Evaluation study within a two-mile radius of the site. The evaluation was conducted three separate times, September 24, October 2, and October 30, 1999. Between the first and last study deciduous trees had lost some but not all foliage cover. Because not all foliage had dropped by October 30, 1999 visual impact may be greater than estimated, or in places not anticipated, since Sprint could not predictively "remove" leaves in its predictive model."

75. Likewise, Visual Resource Evaluation may be slightly skewed since conflicting testimony was given as to the intensity of the wind. The wind may have lowered the balloon so it did not fly at 150 feet. Therefore, visual simulations may be lower than actual 150 feet.

76. Based on the evidence presented at the hearings, and the statements and testimony of the applicant's representatives, along with a detailed review of the propagation studies and the supporting opinions of the expert retained by the Commission, we find:

a. That the proposed facility is not within a historic district and the provisions of Section 8.23.9.1 are inapplicable.

b. That, while the site chosen by the Applicant is not a inappropriate site for some type of telecommunications tower facility, the Applicant has failed to show that it has made diligent efforts to minimize the proximity of the facility to, and its visibility from, residential properties.

c. That the proposed location is not a preference 1 through 2 location, but that the applicant has adequately described the efforts and measure taken to pursue those preferences and why a higher preference location was not technologically, legally or economically feasible.

d. That the applicant has failed to demonstrate to the Commission's satisfaction, the necessity of the height of the proposed telecommunications tower.

e. That the proposed tower of 150 feet exceeds the minimum height necessary to carry out the function of the facility.

f. That the function of the facility, and the coverage goals stated by the applicant, could be carried out and satisfied at the proposed location with a 100 foot tower, and that 100 feet is the minimum antenna height needed to carry out the function of the facility.

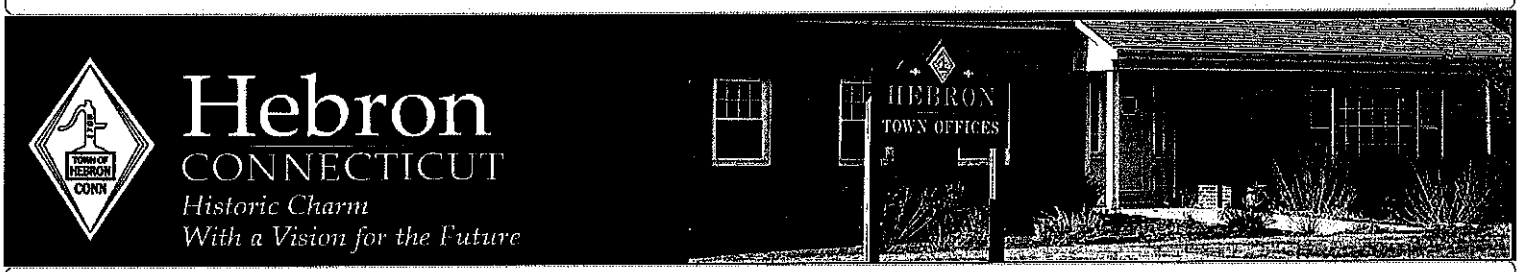
g. That the nature of the area and neighborhood is such that any tower at the proposed site, if higher than the tree canopy, could be camouflaged and that camouflage is reasonable and necessary to protect the well being and property values of the neighborhood.

h. That the applicant has failed to provide an abandonment plan.

2/3/00

David W. Schoolcraft
Chairman, Hebron Planning and
Zoning Commission

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2016.



Information on the Property Records for the Municipality of Hebron was last updated on 8/6/2018.

Parcel Information

Location:	107 BUCK RD	Property Use:	Vacant Land	Primary Use:	Commercial Vacant Land
Unique ID:	4018	Map Block Lot:	42-3X.A	Acres:	1.04
490 Acres:	0.00	Zone:	R-1	Volume / Page:	0435/0526
Developers Map / Lot:		Census:	5261		

Value Information

	Appraised Value	Assessed Value
Land	165,000	115,500
Buildings	0	0
Detached Outbuildings	0	0
Total	165,000	115,500

Owner's Information

Owner's Data
ELLIS EDWARD A & RENEE (CT33XC560) C/O GLOBAL SIGNAL ACQ II PMB 331 4017 WASHINGTON RD MCMURRAY PA 15317

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Cell Tower	2000	0.00	0.00	1

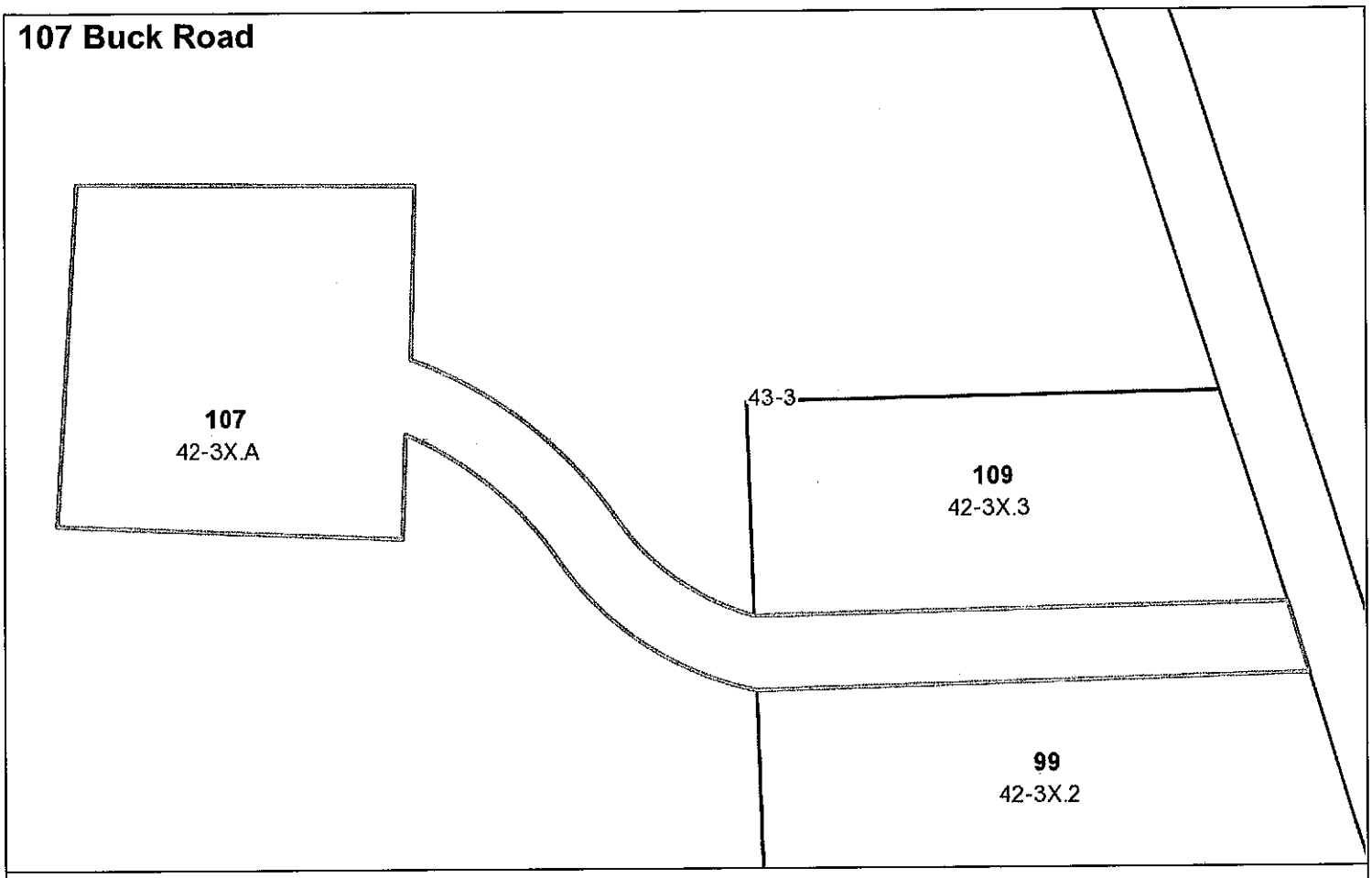
Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
ELLIS EDWARD A & RENEE	0435	0526	04/29/2008		No	$0
ELLIS EDWARD A&RENEE(CT33XC560	0134	0493	09/29/1988		No	$0

Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
14-188B	Other	01/27/2014		Closed	
2012-21150	Mechanical	01/16/2013		Closed	
2011-20817	Mechanical	12/13/2011		Closed	CHANGE 12 ANTENNAS
11528B	Outbuilding/Yard Item	06/28/2004		Closed	
11780	Mechanical	08/07/2002		Closed	

107 Buck Road



Town of Hebron, Connecticut

Selected Parcel: 107 BUCK RD ID: 42-3X.A

Printed 8/7/2018 from http://www.mainstreetmaps.com/ct/hebron/public.asp

20 m
100 ft

N

MainStreetGIS
MainStreetGIS, LLC
www.mainstreetgis.com

SPECIAL CONSTRUCTION NOTE:
SPRINT WORK IS CONTINGENT ON THE FOLLOWING:
* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS.
* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT.
* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.

Sprint

PROJECT: DO MACRO UPGRADE (800 3G/4G & 2.5)

SITE NAME: SOUTH HEBRON/ NED ELLIS PROP.

SITE CASCADE: CT33XC560

MARKET: NE

SITE ADDRESS: 107 BUCK RD.
HEBRON, CT 06248

SITE TYPE: MONOPINE

811 Know what's below. Call before you dig. www.call811.com

NOTE:

OWNER AND TENANT MAY, FROM TIME TO TIME AT TENANT'S OPTION, REPLACE THIS EXHIBIT WITH AN EXHIBIT SETTING FORTH THE LEGAL DESCRIPTION OF THE SITE, OR WITH ENGINEERED OR AS-BUILT DRAWING DEPICTING THE SITE OR ILLUSTRATING STRUCTURAL MODIFICATIONS OR CONSTRUCTION PLANS OF THE SITE. ANY VISUAL OR TEXTUAL REPRESENTATION OF THE EQUIPMENT LOCATED WITHIN THE SITE CONTAINED IN THESE OTHER DOCUMENTS IS ILLUSTRATIVE ONLY, AND DOES NOT LIMIT THE RIGHTS OF SPRINT AS PROVIDED FOR IN THE AGREEMENT. THE LOCATIONS OF ANY ACCESS AND UTILITY EASEMENTS ARE ILLUSTRATIVE ONLY. ACTUAL LOCATIONS MAY BE DETERMINED BY TENANT AND/OR THE SERVICING UTILITY COMPANY IN COMPLIANCE WITH LOCAL LAWS AND REGULATIONS.

STRUCTURAL NOTE:

PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION DATED MAY 25, 2018 AND MOUNT STRUCTURAL ANALYSIS BY HUDSON DESIGN GROUP DATED MAY 04, 2018 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

CROWN CASTLE SITE #: 876387
CROWN CASTLE SITE NAME: SOUTH HEBRON/ NED ELLIS PROP.

VICINITY MAP
N.T.S.

APPROVALS

PROJECT MANAGER	DATE
CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING / SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE

PROJECT INFORMATION

SITE INFORMATION:

SPRINT EQUIPMENT MODIFICATIONS REQUIRED TO SUPPORT MODERNIZATION OF AN EXISTING WIRELESS COMMUNICATIONS FACILITY AND UTILIZATION OF FCC BROADBAND SPECTRUM LICENSE FOR DO_MACRO UPGRADE, INCLUDING INSTALLATION OF:
GROUND-LEVEL RAN EQUIPMENT, CONSISTING OF:
* NO CHANGES
TOWER EQUIPMENT, INCLUDING INSTALLATION OF:
* (6) PANEL ANTENNAS TO REPLACE (6) EXISTING ANTENNAS
* (9) REMOTE RADIO HEADS (RRH), (3) RELOCATED TO TOWER TOP FROM GROUND LEVEL
* (4) HYBRID CABLES

LATITUDE:	N 41° 39' 16.02"
LONGITUDE:	W 72° 24' 39.11"
GROUND ELEVATION	560'± AMSL (PER GOOGLE EARTH)
STRUCTURE HEIGHT	119'-6"± AGL (TYPE: MONOPINE)
ZONING JURISDICTION	HEBRON

APPLICANT:

SPRINT
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

PROPERTY OWNER:

UNKNOWN

TOWER OWNER:

CROWN CASTLE
12 GILL STREET
SUITE 5800
WOBURN, MA 01801

SPRINT CONSTRUCTION MANAGER:

MIKE DURKIN
PHONE: 401-363-9923
michael.durkin@sprint.com

CROWN CASTLE PROJECT MANAGER:

WILL STONE
PHONE: 518-373-3543
william.stone@crowncastle.com

SPRINT MARKET MANAGER:

RONALD HIBBARD
PHONE: 774-269-8812
ronald.hibbard@sprint.com

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
SP-1	OUTLINE SPECIFICATIONS	1
SP-2	OUTLINE SPECIFICATIONS	1
SP-3	OUTLINE SPECIFICATIONS	1
A-1	COMPOUND PLAN & EQUIPMENT PLAN	1
A-2	ANTENNA PLANS & ELEVATION	1
A-3	EQUIPMENT DETAILS	1
A-4	MOUNTING DETAILS	1
RF-1	RF DATA SHEET	1
RF-2	WIRING DIAGRAMS	1
G-1	ONE LINE DIAGRAM, GROUNDING DETAILS & NOTES	1

SPECIAL ZONING NOTE

BASED ON INFORMATION PROVIDED BY SPRINT REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, ADMINISTRATIVE REVIEW).

GENERAL NOTES

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
- ADA COMPLIANCE NOT REQUIRED.
- POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
- NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.

2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.

3. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

4. NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
BUILDING CODE: INTERNATIONAL BUILDING CODE 2012 WITH 2016 CT STATE BUILDING CODE AMENDMENTS
ELECTRICAL CODE: NFPA 70 2014 - NATIONAL ELECTRIC CODE
STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (866) 357-7641

CROWN CASTLE
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

HUDSON Design Group LLC
45 RESEARCH DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28556
LICENSED PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/06/18	CONSTRUCTION REVISED	GA
0	01/23/18	ISSUED FOR CONSTRUCTION	AM

SITE NUMBER:
CT33XC560
SITE NAME:
SOUTH HEBRON/ NED ELLIS PROP.
CROWN BU NUMBER:
876387
SITE ADDRESS:
107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
TITLE SHEET
(DO MINO REDESIGN)

SHEET NUMBER
T-1

THESE OUTLINE SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT CONSTRUCTION STANDARDS FOR WIRELESS SITES, CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 PRECEDENCE: SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
1. GR–78–CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
2. GR–1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY –GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
3. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
4. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
5. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
6. AMERICAN CONCRETE INSTITUTE (ACI)
7. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
8. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
9. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
10. PORTLAND CEMENT ASSOCIATION (PCA)
11. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
12. BRICK INDUSTRY ASSOCIATION (BIA)
13. AMERICAN WELDING SOCIETY (AWS)
14. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
15. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
16. DOOR AND HARDWARE INSTITUTE (DHI)
17. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
18. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

1.5 DEFINITIONS:

A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B. COMPANY: SPRINT CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.
G. CONSTRUCTION MANAGER – ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT...

1.6 SITE FAMILIARITY: CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

1.7 POINT OF CONTACT: COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

1.8 ON–SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.9 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS–BUILT" DRAWINGS.
B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.
C. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

1.10 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.11 UTILITIES SERVICES: WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

1.12 PERMITS / FEES: WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

1.14 METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION: CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.

A. TOP HAT
B. HOW TO INSTALL A NEW CABINET
C. BASS BAND UNIT IN EXISTING UNIT
D. INSTALLATION OF BATTERIES
E. INSTALLATION OF HYBRID CABLE
F. INSTALLATION OF RRH'S
G. CABLING
H. SPRINT TS–0200 (CURRENT VERSION) – ANTENNA LINE ACCEPTANCE STANDARDS
I. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012–001, REV 1.
J. COMMISSIONING MOPS
K. SPRINT CELL SITE ENGINEERING NOTICE – EN–2013–002
L. SPRINT ENGINEERING LETTER – EL–0504
M. SPRINT ENGINEERING LETTER – EL–0568
N. SPRINT TECHNICAL SPECIFICATION – TS–0193

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

A. CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

3.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

3.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH ON THE CONSTRUCTION DRAWINGS AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD–PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

3.4 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

3.5 EXISTING CONDITIONS: NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

A. COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY–FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF–LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.

B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

SECTION 01 300 – CELL SITE CONSTRUCTION

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 NOTICE TO PROCEED:

A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF THE WORK ORDER.

B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. THE ACTIVITIES DESCRIBED ARE NOT EXHAUSTIVE, AND CONTRACTOR SHALL TAKE ANY AND ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.

B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
2. PREPARE GROUND SITES: PROVIDE DE–GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND TELCO BACKHAUL.
4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
5. INSTALL ABOVE GROUND GROUNDING SYSTEMS.
6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
7. INSTALL "H–FRAMES", CABINETS AND SHELTERS AS INDICATED.
8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
18. PERFORM, DOCUMENT, AND CLOSE OUT ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
19. PERFORM ANTENNAL AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND–OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

A. CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREINAFTER

B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
2. PROJECT PROGRESS REPORTS.
3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
5. LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
6. POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
7. TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
8. PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
9. TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS)
13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS.

CONTINUE SHEET SP–2

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

CROWN CASTLE
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

HDG
HUDSON
Design Group LLC
45 BRENTWOOD DRIVE
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TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED
PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS NOT VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/09/18	CONSTRUCTION REVISED	DA
0	01/23/18	ISSUED FOR CONSTRUCTION	AN

SITE NUMBER:
CT33XC560
SITE NAME:
SOUTH HEBRON/ NED ELLIS PROP.
CROWN BU NUMBER:
876387
SITE ADDRESS:
107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
OUTLINE SPECIFICATIONS
(DO MIMO REDESIGN)

SHEET NUMBER
SP-1

CONTINUED FROM SP-1:

SECTION 01 400 – SUBMITTALS, TESTS, AND INSPECTIONS

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 SUBMITTALS:

A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.
1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
3. SPECIAL FINISHES FOR INTERIOR SPACES, IF ANY.
4. ALL EQUIPMENT AND MATERIALS SO IDENTIFIED ON THE CONSTRUCTION DRAWINGS.
5. CHEMICAL GROUNDING DESIGN.

C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

1.4 TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. COAX SWEEPS AND FIBER TESTS PER SPRINT TS-0200 (CURRENT VERSION) ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING;
1. AZIMUTH, DOWNTILT, AGL – UPLOAD REPORT FROM ANTENNA ALIGNMENT TOOL TO SITERRA TASK 485. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
2. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
3. ALL AVAILABLE JURISDICTIONAL INFORMATION
4. PDF SCAN OF REDLINES PRODUCED IN FIELD
5. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS 'CLOUDS' IDENTIFIED AS THE 'AS-BUILT' CONDITION.
6. LIEN WAIVERS
7. FINAL PAYMENT APPLICATION
8. REQUIRED FINAL CONSTRUCTION PHOTOS
9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

1.6 INTEGRATION: PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY: WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
1. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
2. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.

3.2 REQUIRED TESTS:

A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
3. FIELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND ANCHOR LOCATIONS
5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.
6. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
7. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
8. GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS
9. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

3.3 REQUIRED INSPECTIONS:

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE- AND POST-CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. ANTENNA AZIMUTH , DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS – ANTENNALIGN ALIGNMENT TOOL (AAT)
7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.
8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.
9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.
10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
11. ALL AVAILABLE JURISDICTIONAL INFORMATION
12. PDF SCAN OF REDLINES PRODUCED IN FIELD

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

F. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.

3.4 DELIVERABLES: TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.

A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.
1. CONCRETE MIX AND CYLINDER BREAK REPORTS.
2. STRUCTURAL BACKFILL COMPACTION REPORTS.
3. SITE RESISTANCE TO EARTH TEST.
4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.
6. COAX CABLE SWEEP TESTS PER COMPANY'S 'ANTENNA LINE ACCEPTANCE STANDARDS'.

B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING;
1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.
2. CONDUITS, CONDUCTORS AND GROUNDING; PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;
3. CONCRETE FORMS AND REINFORCING; CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS – PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.
4. TOWER, ANTENNAS AND MAINLINE; INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING – TOP AND BOTTOM; PHOTOS OF COAX GROUNDING—TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
5. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
6. SITE LAYOUT – PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
7. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.
8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.
9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 500 – PROJECT REPORTING

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.

B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 PROJECT CONFERENCE CALLS:

A. SPRINT MAY HOLD WEEKLY PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

3.3 PROJECT TRACKING IN SMS:

A. CONTRACTOR SHALL PROVIDE SCHEDULE UPDATES AND PROJECTIONS IN THE SMS SYSTEM ON A WEEKLY BASIS.

3.4 ADDITIONAL REPORTING:

A. ADDITIONAL OR ALTERNATE REPORTING REQUIREMENTS MAY BE ADDED TO THE REPORT AS DETERMINED TO BE REASONABLY NECESSARY BY COMPANY.

3.5 PROJECT PHOTOGRAPHS:

A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE;
1. SHELTER AND TOWER OVERVIEW.
2. TOWER FOUNDATION(S) – FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).
3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).
4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).
5. PHOTOS OF TOWER SECTION STACKING.
6. CONCRETE TESTING / SAMPLES.
7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.
8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.
9. SHELTER FOUNDATION---FORMS AND STEEL BEFORE POURING.
10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.
11. COAX CABLE ENTRY INTO SHELTER.
12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.
14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.
15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.
16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.
17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.
18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.
19. ELECTRICAL TRENCH(S) WITH FOIL--BACKED TAPE BEFORE FURTHER BACKFILL.
20. SEND TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.
21. TELCO TRENCH WITH FOIL--BACKED TAPE BEFORE FURTHER BACKFILL.
22. SHELTER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
24. FENCE GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
25. ALL BTS GROUND CONNECTIONS.
26. ALL GROUND TEST WELLS.
27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.
28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.
29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.
30. GPS ANTENNAS.
31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.
32. DOGHOUSE/CABLE EXIT FROM ROOF.
33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.
34. MASTER BUS BAR.
35. TELCO BOARD AND NIU.
36. ELECTRICAL DISTRIBUTION WALL.
37. CABLE ENTRY WITH SURGE SUPPRESSION.
38. ENTRANCE TO EQUIPMENT ROOM.
39. COAX WEATHERPROOFING—TOP AND BOTTOM OF TOWER.
40. COAX GROUNDING –TOP AND BOTTOM OF TOWER.
41. ANTENNA AND MAST GROUNDING.
42. LANDSCAPING – WHERE APPLICABLE.

3.6 FINAL PROJECT ACCEPTANCE: COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

SECTION 07 500 – ROOF CUTTING, PATCHING AND REPAIR

SUMMARY:
THIS SECTION SPECIFIES CUTTING AND PATCHING EXISTING ROOFING SYSTEMS WHERE CONDUIT OR CABLES EXIT THE BUILDING ONTO THE ROOF OR BUILDING-MOUNTED ANTENNAS, AND AS REQUIRED FOR WATERTIGHT PERFORMANCE. ROOFTOP ENTRY OPENINGS IN MEMBRANE ROOFTOPS SHALL BE CONSTRUCTED TO COMPLY WITH LANDLORD, ANY EXISTING WARRANTY, AND LOCAL JURISDICTIONAL STANDARDS.

1.4 SUBMITTALS:

A. PRE-CONSTRUCTION ROOF PHOTOS: COMPLETE A ROOF INSPECTION PRIOR TO THE INSTALLATION OF SPRINT EQUIPMENT ON ANY ROOFTOP BUILD. AT A MINIMUM INSPECT AND PHOTOGRAPH (MINIMUM 3 EA.) ALL AREAS IMPACTED BY THE ADDITION OF THE SPRINT EQUIPMENT.

B. PROVIDE SIMILAR PHOTOGRAPHS SHOWING ROOF CONDITIONS AFTER CONSTRUCTION (MINIMUM 3 EA.)

C. ROOF INSPECTION PHOTOGRAPHS SHOULD BE UPLOADED WITH CLOSEOUT PHOTOGRAPHS.

SECTION 09 900 – PAINTING

QUALITY ASSURANCE:

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS.

CONTINUE SHEET SP-3

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 25557
LICENSED
PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREON

CHECKED BY:	BB
APPROVED BY:	DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/06/16	CONSTRUCTION REVISED	GA
0	01/22/16	ISSUED FOR CONSTRUCTION	AH

SITE NUMBER:
CT33XC560
SITE NAME:
SOUTH HEBRON/ NED ELLIS PROP.
CROWN BU NUMBER:
876387
SITE ADDRESS:
107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
OUTLINE SPECIFICATIONS
(DO MIMO REDESIGN)

SHEET NUMBER
SP-2

CONTINUED FROM SP-2:

MATERIALS:

A. MANUFACTURERS: BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED EQUAL. PROVIDE PREMIUM GRADE, PROFESSIONAL-QUALITY PRODUCTS FOR COATING SYSTEMS.

PAINT SCHEDULE:

A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS. PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTIONS WHENEVER POSSIBLE.

B. ROOF TOP CONSTRUCTION: TOUCH UP - PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION:

1. INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK MEANS ACCEPTANCE OF SUBSTRATE.
2. COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK. COORDINATE WITH WORK OF OTHER SECTIONS.
3. MATCH APPROVED MOCK-UPS FOR COLOR, TEXTURE, AND PATTERN. RE-COAT OR REMOVE AND REPLACE WORK WHICH DOES NOT MATCH OR SHOWS LOSS OF ADHESION.
4. CLEAN UP, TOUCH UP AND PROTECT WORK.

TOUCHUP PAINTING:

1. GALVANIZING DAMAGE AND ALL BOLTS AND NUTS SHALL BE TOUCHED UP AFTER TOWER ERECTION WITH "GALVANOX," "DRY GALV," OR "ZINC-IT."
2. FIELD TOUCHUP PAINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. ALL METAL COMPONENTS SHALL BE HANDLED WITH CARE TO PREVENT DAMAGE TO THE COMPONENTS, THEIR PRESERVATIVE TREATMENT, OR THEIR PROTECTIVE COATINGS.

SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO HEADS AND CABLE INSTALLATION

SUMMARY:
THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRH'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRH'S:
THE NUMBER AND TYPE OF ANTENNAS AND RRH'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:
HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:
FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRH'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRH'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE. DO NOT USE SUPERFLEX OUTDOORS. JUMPERS SHALL BE FACTORY FABRICATED IN APPROPRIATE LENGTHS WITH A MAXIMUM OF 4 FEET EXCESS PER JUMPER AND HAVE CONNECTORS AT EACH END, MANUFACTURED BY SUPPLIER. IF JUMPERS ARE FIELD FABRICATED, FOLLOW MANUFACTURER'S REQUIREMENTS FOR INSTALLATION OF CONNECTORS

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:
INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:
THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLES INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
   a. FIBER: SUPPORT FIBER BUNDLES USING ¾" VELCRO STRAPS OF THE REQUIRED LENGTH @ 18" OC. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
   b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
   a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE. NOTIFY THE CONSTRUCTION MANAGER.
   b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
   c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURES RECOMMENDED MAXIMUM BEND RADIUS.
5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 4.
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SUM LOCK CLOSURE 716. SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

A. LABEL CIRCUIT BREAKERS ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1.

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE TRANSCIEVER STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
1. ALLIED TUBE AND CONDUIT
2. B-LINE SYSTEM
3. UNISTRUT DIVERSIFIED PRODUCTS
4. THOMAS & BETTS

B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR ENCASED RUNS IN CONCRETE. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION, SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT
1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL.
2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKETED COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS AS INDICATED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

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STATE OF CONNECTICUT
DEREK J. CREASER
10,259
LICENSED
PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER SIGNING OR RECORDING STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREON

CHECKED BY: BB

APPROVED BY: DJC

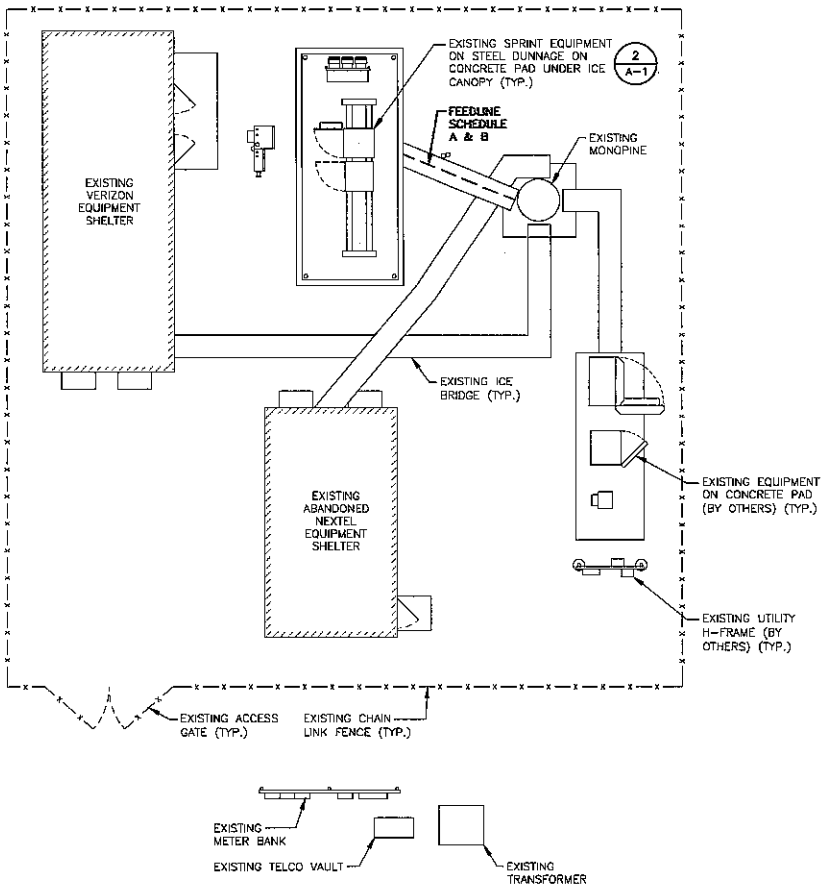
SUBMITTALS

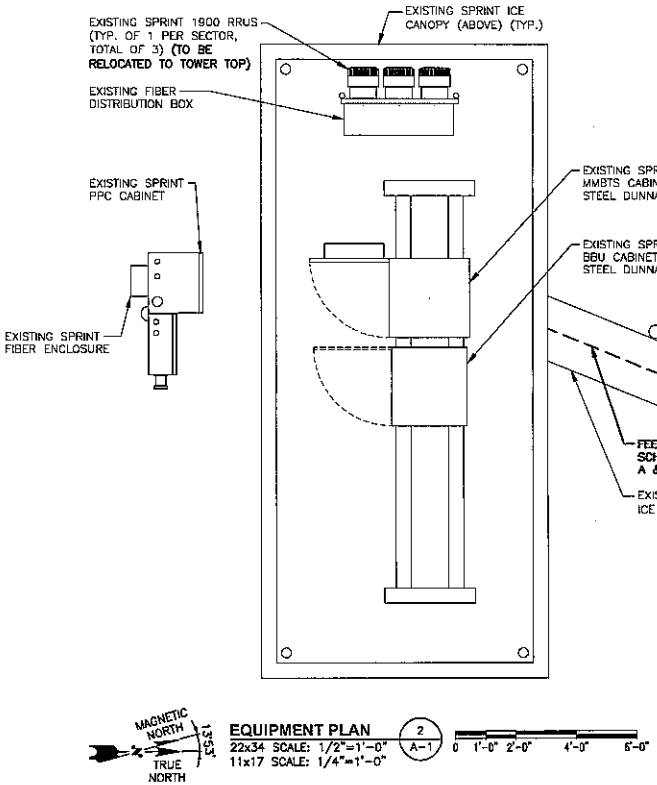
REV.	DATE	DESCRIPTION	BY
1	07/06/18	CONSTRUCTION REVISED	CA
0	01/23/18	ISSUED FOR CONSTRUCTION	AN

SITE NUMBER:
CT33XC560
SITE NAME:
SOUTH HEBRON/ NED ELLIS PROP.
CROWN BU NUMBER:
876387
SITE ADDRESS:
107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
OUTLINE SPECIFICATIONS
(DO MIMO REDESIGN)

SHEET NUMBER
SP-3





NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

STRUCTURAL NOTE:

PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION DATED MAY 25, 2018 AND MOUNT STRUCTURAL ANALYSIS BY HUDSON DESIGN GROUP DATED MAY 04, 2018 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

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Design Group LLC
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N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28351
LICENSED
PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREON

CHECKED BY:	BB
APPROVED BY:	DJC

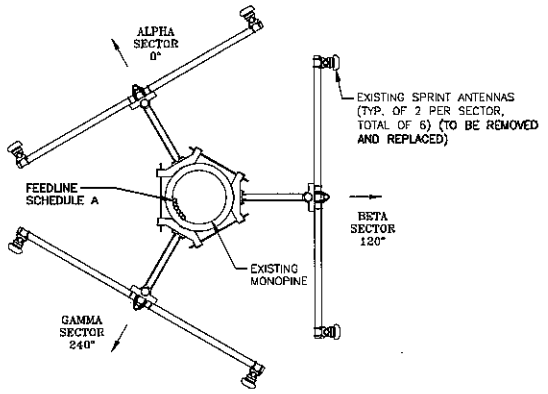
SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/06/18	CONSTRUCTION REVISED	GA
0	01/23/18	ISSUED FOR CONSTRUCTION	AH

SITE NUMBER:
CT33XC560
SITE NAME:
SOUTH HEBRON/ NED ELLIS PROP.
CROWN BU NUMBER:
876387
SITE ADDRESS:
107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
COMPOUND PLAN & EQUIPMENT PLAN
(DO MIMO REDESIGN)

SHEET NUMBER
A-1

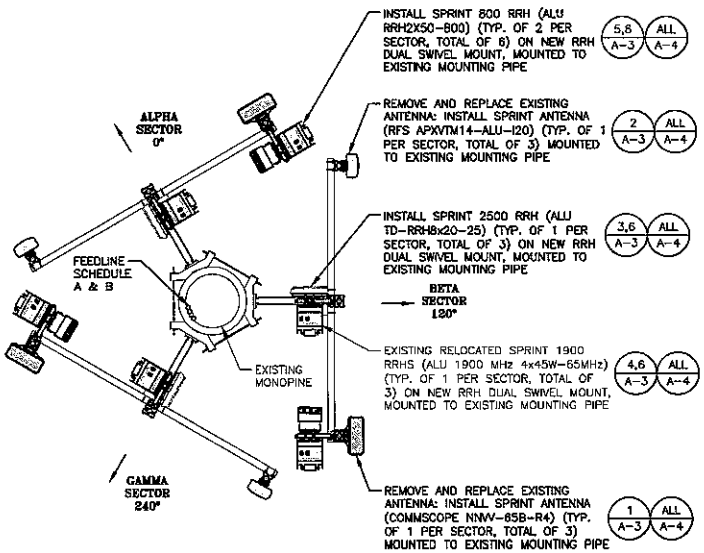


MAGNETIC NORTH 13.5°± TRUE NORTH

EXISTING ANTENNA PLAN (1 / A-2)

22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

0 1'-4" 2'-8" 5'-4" 8'-0"



MAGNETIC NORTH 13.5°± TRUE NORTH

PROPOSED ANTENNA PLAN (2 / A-2)

22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

0 1'-4" 2'-8" 5'-4" 8'-0"

SPECIAL CONSTRUCTION WORK NOTE (PAINT-TO-MATCH REQUIRED):
PAINT-TO-MATCH BROWN ALL PROPOSED AND EXPOSED EQUIPMENT INCLUDING EXISTING UN-PAINTED LEGACY EQUIPMENT CONSISTING OF ANTENNA RADOMES, ANTENNA MOUNTING PIPES, AND ASSOCIATED MOUNTING HARDWARE. ANTENNA RADOME PAINT SHALL CONTAIN <5% METALLIC PIGMENTS/EMULSIONS AND EQUIVALENT TO SHERMAN-WILLIAMS COROTHANE II (AND/OR OTHERWISE APPROVED BY ANTENNA MANUFACTURER/RF ENGINEER).

STRUCTURAL NOTE:

DESIGN LIMITATIONS AND ASSUMPTIONS:
1. EQUIPMENT AND LOCATIONS SHOULD NOT DEVIATE FROM THE CONSTRUCTION DRAWINGS WITHOUT WRITTEN APPROVAL OF THE ENGINEER.
2. HDG IS NOT RESPONSIBLE FOR ANY MODIFICATIONS COMPLETED PRIOR TO AND HEREAFTER WHICH HDG WAS NOT INVOLVED.
3. ALL STRUCTURAL MEMBERS AND THEIR CONNECTIONS ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES. CONTRACTOR IS TO PERFORM A PRE-INSPECTION TO CONFIRM.
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5. ALL COMPONENTS SUPPORTING THE SPRINT EQUIPMENT ARE ASSUMED TO BE DESIGNED TO ALL APPLICABLE CODES AND DESIGNED FOR IDENTICAL TO OR GREATER THAN THE CURRENT LOADS.

STRUCTURAL NOTE:

PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION DATED MAY 25, 2018 AND MOUNT STRUCTURAL ANALYSIS BY HUDSON DESIGN GROUP DATED MAY 04, 2018 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

FEEDLINES

FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION	LENGTH
A	EXISTING TO BE REMOVED: (6) 1-5/8" COAX	ROUTED WITHIN MONOPINE	ALPHA: 170'± BETA: 170'± GAMMA: 170'±
B	PROPOSED (4) 1-1/4" HYBRID TRUNKS		

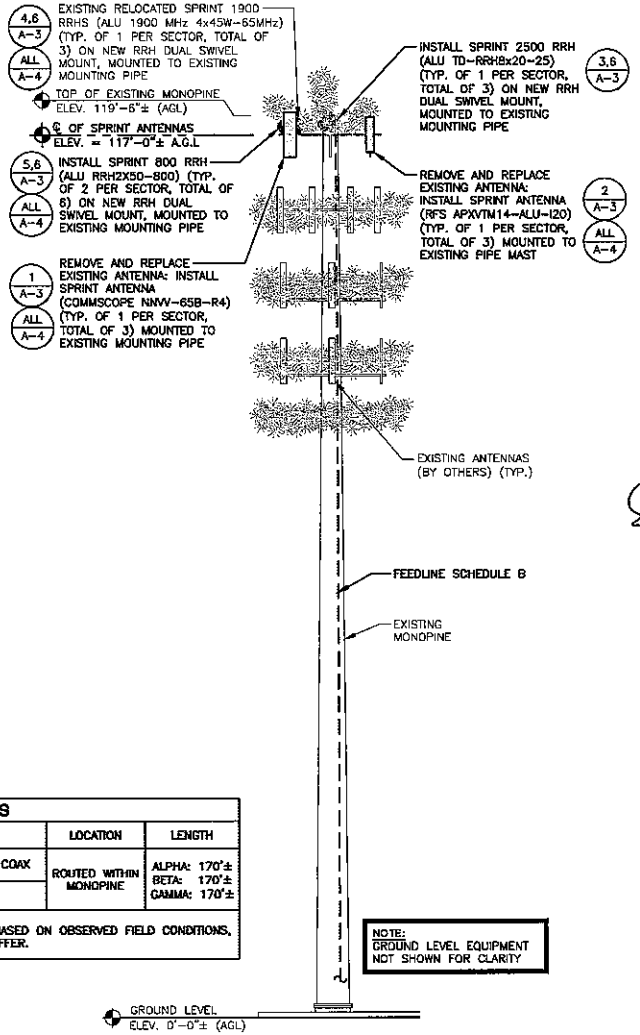
NOTE:
EXISTING SPRINT EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS, RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.

SCOPE NOTE:

PROPOSED DESIGN IS BASED OFF OF CROWN APPLICATION REV 0 DATED 05/08/18

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



NOTE:
GROUND LEVEL EQUIPMENT NOT SHOWN FOR CLARITY

ELEVATION (3 / A-2)

22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

0 4'-0" 8'-0" 16'-0" 24'-0"

Sprint
1 INTERNATIONAL BLVD. SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

CROWN CASTLE
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR SITE WORKS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREON

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

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0	01/23/18	ISSUED FOR CONSTRUCTION	AM

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CT33XC560
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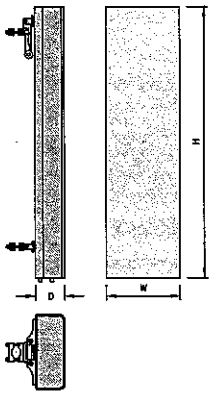
SOUTH HEBRON/ NED ELLIS PROP.
CROWN BU NUMBER:
876387
SITE ADDRESS:
107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
ANTENNA PLANS & ELEVATION
(DO MIMO REDESIGN)

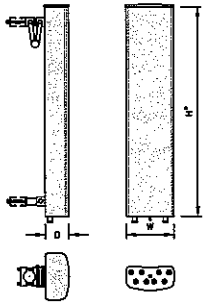
SHEET NUMBER
A-2

800/1900 MHZ ANTENNA DIMENSIONS	
MODEL #	NNVV-65B-R4
MANUF.	COMMSCOPE
HEIGHT	72.0"
WIDTH	19.5"
DEPTH	7.8"
WEIGHT	77.4 LBS



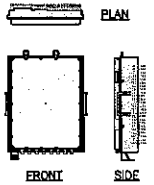
800/1900 MHZ ANTENNA DETAIL (1 / A-3)
SCALE: N.T.S

2.5MHZ ANTENNA DIMENSIONS	
MODEL #	APXVTM14-ALU-I20
MANUF.	RFS
HEIGHT	56.3"
WIDTH	12.6"
DEPTH	6.3"
WEIGHT	56.2 LBS



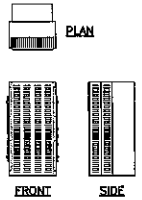
2.5MHz ANTENNA DETAIL (2 / A-3)
SCALE: N.T.S

2.5MHZ RRH DIMENSIONS	
MODEL #	TD-RRHBX20-25
MANUF.	ALCATEL-LUCENT
LENGTH	26.1"
WIDTH	18.6"
DEPTH	8.7"
WEIGHT	70 LBS



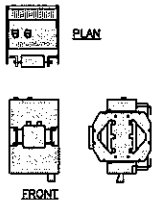
2.5MHz RRH DETAIL (3 / A-3)
SCALE: N.T.S

1900MHZ RRH DIMENSIONS	
MODEL #	1900MHZ 4X45W-65MHZ
MANUF.	ALCATEL-LUCENT
LENGTH	25"
WIDTH	11.1"
DEPTH	11.4"
WEIGHT	60 LBS

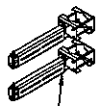


1900 MHZ RRH DETAIL (4 / A-3)
SCALE: N.T.S

800MHZ RRH DIMENSIONS	
MODEL #	RRH-2X50-800
MANUF.	ALCATEL-LUCENT
LENGTH	19.7"
WIDTH	13"
DEPTH	10.8"
WEIGHT	53 LBS



800 MHZ RRH DETAIL (5 / A-3)
SCALE: N.T.S



FURNISH AND INSTALL RRU DUAL SWIVEL MOUNT (SITEPRO1 PART# RRUDSM) (TYP. OF 2 KIT PER SECTOR, TOTAL OF 6 KITS)

RRU DUAL SWIVEL MOUNT DETAIL (6 / A-3)
SCALE: N.T.S

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (000) 357-7641

CROWN CASTLE
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

HDG
HUDSON
Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 29554
LICENSED
PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OR RECORDS STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/06/16	CONSTRUCTION REVISED	EA
0	01/21/16	ISSUED FOR CONSTRUCTION	AH

SITE NUMBER:
CT33XC560
SITE NAME:
SOUTH HEBRON/ NED ELLIS PROP.
CROWN BU NUMBER:
876387
SITE ADDRESS:
107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
EQUIPMENT DETAILS
(DO MIMO REDESIGN)

SHEET NUMBER
A-3

STRUCTURAL NOTE:

DESIGN LIMITATIONS AND ASSUMPTIONS:
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5. ALL COMPONENTS SUPPORTING THE SPRINT EQUIPMENT ARE ASSUMED TO BE DESIGNED TO ALL APPLICABLE CODES AND DESIGNED FOR IDENTICAL TO OR GREATER THAN THE CURRENT LOADS.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

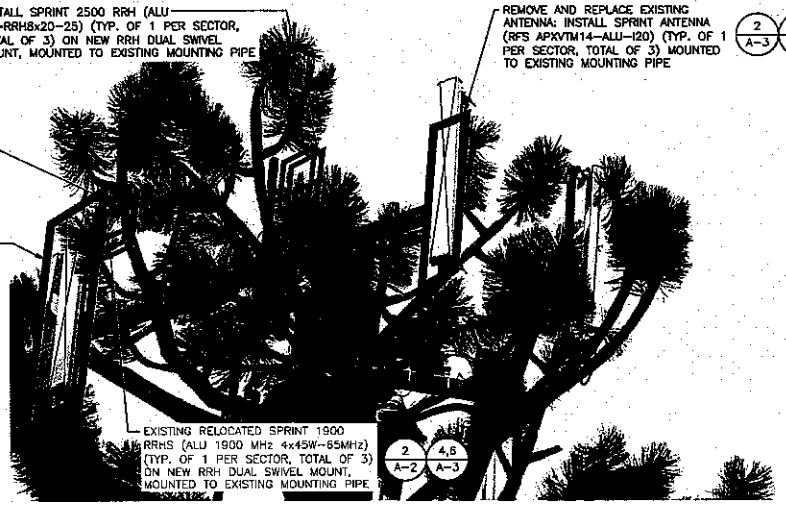
STRUCTURAL NOTE:

PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION DATED MAY 25, 2018 AND MOUNT STRUCTURAL ANALYSIS BY HUDSON DESIGN GROUP DATED MAY 04, 2018 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

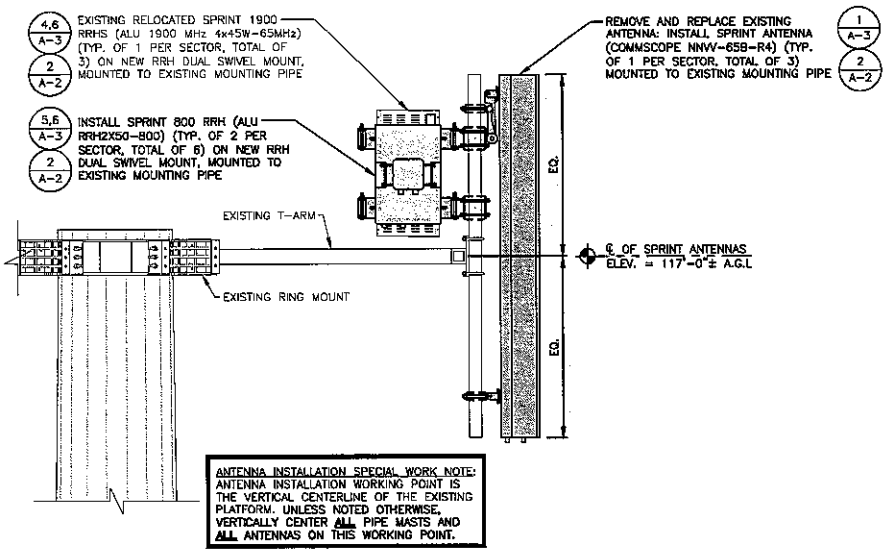
SCOPE NOTE:

PROPOSED DESIGN IS BASED OFF OF CROWN APPLICATION REV 0 DATED 05/08/18

SPECIAL CONSTRUCTION WORK NOTE (PAINT-TO-MATCH REQUIRED):
PAINT-TO-MATCH BROWN ALL PROPOSED AND EXPOSED EQUIPMENT INCLUDING EXISTING UN-PAINTED LEGACY EQUIPMENT CONSISTING OF ANTENNA RADOMES, ANTENNA MOUNTING PIPES, AND ASSOCIATED MOUNTING HARDWARE. ANTENNA RADOME PAINT SHALL CONTAIN <5% METALLIC PIGMENTS/EMULSIONS AND EQUIVALENT TO SHERMAN-WILLIAMS COROTHANE II (AND/OR OTHERWISE APPROVED BY ANTENNA MANUFACTURER/RF ENGINEER).



ANTENNA & RRH MOUNT PHOTO DETAIL (2 / A-4)
SCALE: N.T.S



ANTENNA INSTALLATION SPECIAL WORK NOTE:
ANTENNA INSTALLATION WORKING POINT IS THE VERTICAL CENTERLINE OF THE EXISTING PLATFORM. UNLESS NOTED OTHERWISE, VERTICALLY CENTER **ALL** PIPE MASTS AND **ALL** ANTENNAS ON THIS WORKING POINT.

PROPOSED ANTENNA & RRH MOUNTING ELEVATION (1 / A-4)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

MAJOR RF EQUIPMENT LIST
(GC SHALL FURNISH AND INSTALL ALL OTHER MATERIALS AND EQUIPMENT NOT SUPPLIED BY SPRINT)

DESCRIPTION	QUANTITY	MAKE/MODEL/MATERIAL	PROVIDED BY
MMBTS RAN UPGRADE (VARIOUS)			
PPC DIN-RAIL CIRCUIT BREAKER			
800/1900 ANTENNA 2.5 ANTENNA	3 3	COMMSCOPE NNVV-65B-R4 RFS APXVTM14-ALU-I20	SPRINT
RRU/GPS	6 3 3	ALCATEL-LUCENT 800MHz RRH2x50-800 ALCATEL-LUCENT TD-RRH8x20-25 ALCATEL-LUCENT PCS 1900MHZ 4X45W-65MHZ	SPRINT
DIPLEXER			
HYBRID TRUNK	1 3	HB114-13U3M12-XXXF HB114-1-08U4-M5J	SPRINT
AC-POWER TRUNK			
DC-POWER TRUNK			
F/ENET TRUNK			
AC-POWER JB			
F/ENET JB			

SPRINT-PROVIDED EQUIPMENT SCHEDULE (3 / A-4)
SCALE: N.T.S

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

CROWN CASTLE
CROWN CASTLE
12 CAL STREET, SUITE 5000
WOBURN, MA 01801

HDG
HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
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STATE OF CONNECTICUT
DEREK J. CREASER
No. 27552
LICENSED PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE ISSUED FOR SITE MODIFYING ATTACHMENTS PER RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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SOUTH HEBRON/ NED ELLIS PROP.
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107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
MOUNTING DETAILS
(DD MIMO REDESIGN)

SHEET NUMBER
A-4

Date: **May 25, 2018**

GPD Engineering and Architecture
Professional Corporation

520 South Main Street Suite 2531
Akron, Ohio 44311
(216) 927-8663

Marianne Dunst
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate** **Carrier Site Number:**	 CT33XC560
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Order Number:**	876387 SOUTH HEBRON / NED ELLIS PROP. 501750 1575862 438442 Rev. 0
Engineering Firm Designation:	**GPD Project Number:**	2018777.876387.04
Site Data:	**107 Buck Rd., Hebron, Tolland County, CT 06248** **Latitude *41° 39' 16.02"*, Longitude *-72° 24' 39.11"*** **119.5 Foot – Modified EEI Monopine Tower**	

Dear Marianne Dunst,

We are pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1192007, in accordance with order 438442, revision 0.

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

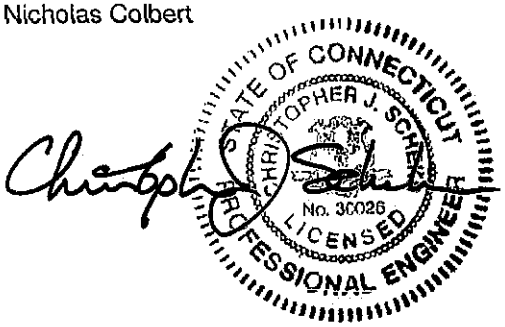
LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with a Risk Category II were used in this analysis.

We appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Nicholas Colbert

Respectfully submitted by:



Christopher J. Scheks, P.E.
Connecticut #: 0030026

5/25/2018

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 119.5 ft monopine tower designed by Engineered Endeavors, Inc. in October of 2000. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

The existing monopine has 18 sides and is evenly tapered from 51" (flat-flat) at the base to 19" (flat-flat) at the top. It has three major sections connected by two slip joints. The structure is painted and is disguised to look like a pine tree.

Modifications in the form of base plate stiffeners designed by GPD (Job #: 2008282.56, dated 12/02/08) have been considered in the analysis.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with a Risk Category II were used in this analysis.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
117.0	117.0	3	Commscope	NNVV-65B-R4	4	1-1/4	1
		3	RFS/Celwave	APXVTM14-ALU-I20			
		3	Alcatel Lucent	PCS 1900MHZ 4X45W-65MHZ			
		3	Alcatel Lucent	TD-RRH8X20-25			
		6	Alcatel Lucent	RRH2X50-800			

Notes:
1) See Appendix B for the proposed coax layout.

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
117.0	117.0	3		10' T-Arm			1
		6	Decibel	DB980H90E-M	6	1-5/8	2
107.0	107.0	1		T-Arm Mount [TA 602-3]	12	7/8	3
		12	Decibel	DB844H90			
97.0	97.0	1		T-Arm Mount [TA 602-3]	12	1-5/8	1
		3	Antel	BXA-70063-6CF-2			
		6	Antel	LPA-80080-4CF-EDIN-0			
		6	RFS/Celwave	FD9R6004/2C-3L			
		3	Swedcom	SPXW 8515 T4			
88.0	90.0	3	Ericsson	TME-RRUS-11			1
		1	Raycap	DC6-48-60-18-8F			
	88.0	1		Side Arm Mount [SO 102-3]			
87.0	89.0	6	Powerwave Technologies	7770.00	12 2 1	7/8 7/16 3/8	1
		6	Powerwave Technologies	LGP21401			
		6	Powerwave Technologies	LGP21901			
	88.0	3	KMW Communications	AM-X-CD-16-65-00T-RET			
	87.0	1		T-Arm Mount [TA 602-3]			

Notes:
1) Existing Equipment.
2) Equipment to be removed.
3) Abandoned Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
117.5	117.5	12	Dapa	48000		
114	114	1		Pine Limbs		
107.5	107.5	12	Dapa	48000		
104	104	1		Pine Limbs		
97.5	97.5	12	Dapa	48000		
94	94	1		Pine Limbs		
84	84	1		Pine Limbs		
77	77	1		Pine Limbs		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	Goodkind & O'Dea, Inc. , dated 8/1/2000	2157932	CCISITES
Post Modification Inspection	GPD Job #: 2009177.09, dated 5/12/09	2431180	CCISITES
Foundation Drawings	EEI Job #: 8058, dated 10/18/00	1630217	CCISITES
Tower Drawings	EEI Job #: 8058, dated 10/18/00	1613574	CCISITES
Tower Modifications	GPD Job #: 2008282.56, dated 12/02/08	2374441	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	119.5 - 69.67	Pole	TP33.02x19x0.3125	1	-17.90	2311.28	70.6	Pass
L2	69.67 - 42.25	Pole	TP39.99x31.0839x0.375	2	-24.82	3355.39	83.9	Pass
L3	42.25 - 0	Pole	TP51x37.7131x0.4375	3	-40.92	5013.55	84.7	Pass
						Summary	ELC:	Load Case 5
						Pole (L3)	84.7	Pass
						Rating =	84.7	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	87.3	Pass
1	Base Plate	0	85.8	Pass
1	Base Foundation Structure	0	99.3	Pass
1	Base Foundation Soil Interaction	0	70.0	Pass

Structure Rating (max from all components) =	99.3%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower has sufficient capacity to carry the proposed load configuration. Modifications will not be required to bring the tower into compliance with the TIA-222-G standard for the proposed load configuration.

5) DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

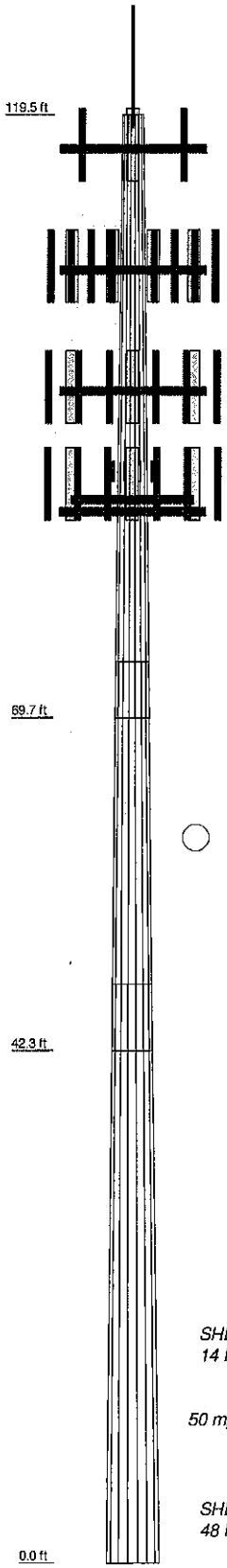
Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3
Length (ft)	49.83	32.08	47.75
Number of Sides	18	18	18
Thickness (in)	0.3125	0.3750	0.4375
Socket Length (ft)	4.66	5.50	
Top Dia (in)	19.0300	31.0839	37.7131
Bot Dia (in)	33.0200	39.9900	51.0000
Grade		A572-65	
Weight (K)	4.3	4.6	9.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 3/4" x 7'	123.5	T-Arm Mount [TA 602-3]	97
NNVV-65B-R4 w/ Mount Pipe	117	(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	97
NNVV-65B-R4 w/ Mount Pipe	117	(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	97
NNVV-65B-R4 w/ Mount Pipe	117	EEI Branches (Large)	94
APXVTM14-ALU-I20 w/ Mount Pipe	117	DC6-48-60-18-8F Surge Suppression Unit	88
APXVTM14-ALU-I20 w/ Mount Pipe	117	Pipe Mount 6'x2.375"	88
APXVTM14-ALU-I20 w/ Mount Pipe	117	Pipe Mount 6'x2.375"	88
PCS 1900MHZ 4X45W-65MHZ	117	Pipe Mount 6'x2.375"	88
PCS 1900MHZ 4X45W-65MHZ	117	Side Arm Mount [SO 102-3]	88
PCS 1900MHZ 4X45W-65MHZ	117	TME-RRUS-11	88
TD-RRH8X20-25	117	TME-RRUS-11	88
TD-RRH8X20-25	117	TME-RRUS-11	88
TD-RRH8X20-25	117	AM-X-CD-16-65-00T-RET w/ Mount Pipe	87
(2) RRH2X50-800	117	AM-X-CD-16-65-00T-RET w/ Mount Pipe	87
(2) RRH2X50-800	117	AM-X-CD-16-65-00T-RET w/ Mount Pipe	87
(2) RRH2X50-800	117	(2) LGP21401	87
(3) 10' T-Arms	117	(2) LGP21401	87
EEI Branches (Large)	114	(2) LGP21401	87
(4) DB844H90 w/ Mount Pipe	107	(2) LGP21901	87
(4) DB844H90 w/ Mount Pipe	107	(2) LGP21901	87
(4) DB844H90 w/ Mount Pipe	107	(2) LGP21901	87
T-Arm Mount [TA 602-3]	107	T-Arm Mount [TA 602-3]	87
EEI Branches (Large)	104	(2) 7770.00 w/ Mount Pipe	87
(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	97	(2) 7770.00 w/ Mount Pipe	87
BXA-70063-6CF-2 w/ Mount Pipe	97	(2) 7770.00 w/ Mount Pipe	87
BXA-70063-6CF-2 w/ Mount Pipe	97	EEI Branches (Large)	84
BXA-70063-6CF-2 w/ Mount Pipe	97	EEI Branches (Small)	77
SPXW 8515 T4 w/ Mount Pipe	97		
SPXW 8515 T4 w/ Mount Pipe	97		
SPXW 8515 T4 w/ Mount Pipe	97		
(2) FD9R6004/2C-3L	97		
(2) FD9R6004/2C-3L	97		
(2) FD9R6004/2C-3L	97		

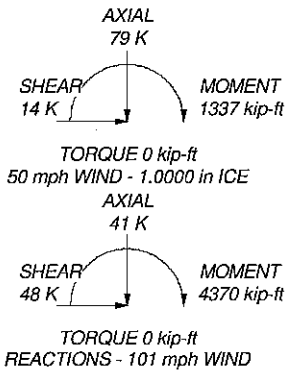
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 84.7%

ALL REACTIONS ARE FACTORED



GPD
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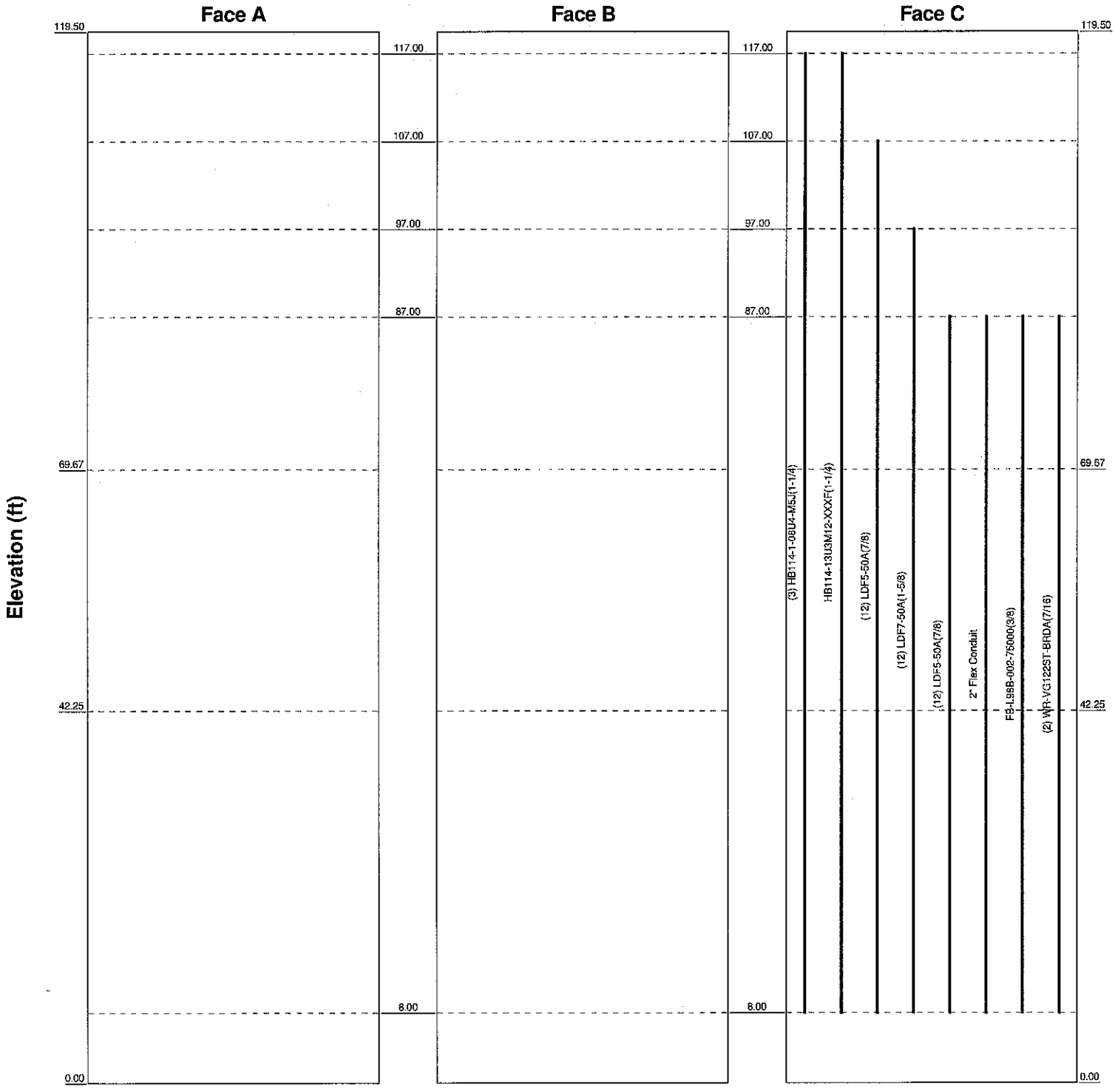
Phone: (330)572-2100
FAX: (330)572-2101

Job: SOUTH HEBRON / NED ELLIS PROP. / BU#: 876387			
Project: 2018777.876387.04			
Client: Crown Castle USA, Inc.	Drawn by: Nicholas Colbert	App'd:	
Code: TIA-222-G	Date: 05/25/18	Scale: NTS	
Path: T:\Crown\876387\04\tnx\876387.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 119'6"

Round Flat App In Face App Out Face Truss Leg



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Client: Crown Castle USA, Inc.	Drawn by: Nicholas Colbert	App'd:	
Code: TIA-222-G	Date: 05/25/18	Scale: NTS	
Path: T:\Crown\876387\04\mx\876387.eri		Dwg No. E-7	

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Tolland County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 101 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	119.50-69.67	49.83	4.66	18	19.0000	33.0200	0.3125	1.2500	A572-65 (65 ksi)
L2	69.67-42.25	32.08	5.50	18	31.0839	39.9900	0.3750	1.5000	A572-65 (65 ksi)
L3	42.25-0.00	47.75		18	37.7131	51.0000	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	19.2931	18.5357	817.8017	6.6341	9.6520	84.7287	1636.6795	9.2696	2.7940	8.941
	33.5294	32.4418	4384.6653	11.6112	16.7742	261.3940	8775.1000	16.2240	5.2615	16.837
L2	32.8771	36.5512	4354.7927	10.9017	15.7906	275.7837	8715.3156	18.2791	4.8108	12.829
	40.6069	47.1518	9348.7731	14.0633	20.3149	460.1925	18709.8476	23.5804	6.3782	17.009
L3	39.8489	51.7618	9086.4782	13.2328	19.1582	474.2856	18184.9126	25.8858	5.8675	13.411
	51.7868	70.2124	22678.1721	17.9497	25.9080	875.3347	45386.1847	35.1128	8.2060	18.757

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 119.50-69.67				1	1	1			
L2 69.67-42.25				1	1	1			
L3 42.25-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
HB114-1-08U4-M5J(1-1/4)	C	No	Inside Pole	117.00 - 8.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
HB114-13U3M12-XXXF(1-1/4)	C	No	Inside Pole	117.00 - 8.00	1	No Ice	0.00	0.99
						1/2" Ice	0.00	0.99
						1" Ice	0.00	0.99
LDF5-50A(7/8)	C	No	Inside Pole	107.00 - 8.00	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
LDF7-50A(1-5/8)	C	No	Inside Pole	97.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
87								
LDF5-50A(7/8)	C	No	Inside Pole	87.00 - 8.00	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
2" Flex Conduit	C	No	Inside Pole	87.00 - 8.00	1	No Ice	0.00	0.32
						1/2" Ice	0.00	0.32
						1" Ice	0.00	0.32
FB-L98B-002-75000(3/8)	C	No	Inside Pole	87.00 - 8.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG122ST-BRDA(7/16)	C	No	Inside Pole	87.00 - 8.00	2	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lighting Rod 3/4" x 7'	C	None		0.0000	123.50	No Ice	0.53	0.53	0.03
						1/2" Ice	1.24	1.24	0.04
						1" Ice	1.97	1.97	0.05
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	7.17 8.13 8.97	0.10 0.19 0.28
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	7.17 8.13 8.97	0.10 0.19 0.28
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	7.17 8.13 8.97	0.10 0.19 0.28
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.23 2.43 2.64	0.06 0.08 0.11
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.23 2.43 2.64	0.06 0.08 0.11
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.23 2.43 2.64	0.06 0.08 0.11
TD-RRH8X20-25	A	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
TD-RRH8X20-25	B	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
TD-RRH8X20-25	C	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
(2) RRH2X50-800	A	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
(2) RRH2X50-800	B	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
(2) RRH2X50-800	C	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
(3) 10' T-Arms	A	None		0.0000	117.00	No Ice 1/2" Ice 1" Ice	18.17 24.42 30.67	18.17 24.42 30.67	0.73 0.93 1.13
T-Arm Mount [TA 602-3]	A	None		0.0000	107.00	No Ice 1/2" Ice 1" Ice	11.59 15.44 19.29	11.59 15.44 19.29	0.77 0.99 1.21
(4) DB844H90 w/ Mount	A	From Leg	4.00	0.0000	107.00	No Ice	3.30	4.80	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe			0.00			1/2" Ice	3.67	5.42	0.07
			0.00			1" Ice	4.03	6.04	0.11
(4) DB844H90 w/ Mount Pipe	B	From Leg	4.00	0.0000	107.00	No Ice	3.30	4.80	0.03
			0.00			1/2" Ice	3.67	5.42	0.07
			0.00			1" Ice	4.03	6.04	0.11
(4) DB844H90 w/ Mount Pipe	C	From Leg	4.00	0.0000	107.00	No Ice	3.30	4.80	0.03
			0.00			1/2" Ice	3.67	5.42	0.07
			0.00			1" Ice	4.03	6.04	0.11
(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	A	From Leg	4.00	0.0000	97.00	No Ice	2.86	6.57	0.03
			0.00			1/2" Ice	3.22	7.19	0.08
			0.00			1" Ice	3.59	7.84	0.13
(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	B	From Leg	4.00	0.0000	97.00	No Ice	2.86	6.57	0.03
			0.00			1/2" Ice	3.22	7.19	0.08
			0.00			1" Ice	3.59	7.84	0.13
(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	C	From Leg	4.00	0.0000	97.00	No Ice	2.86	6.57	0.03
			0.00			1/2" Ice	3.22	7.19	0.08
			0.00			1" Ice	3.59	7.84	0.13
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	97.00	No Ice	7.81	5.80	0.04
			0.00			1/2" Ice	8.36	6.95	0.10
			0.00			1" Ice	8.87	7.82	0.17
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	97.00	No Ice	7.81	5.80	0.04
			0.00			1/2" Ice	8.36	6.95	0.10
			0.00			1" Ice	8.87	7.82	0.17
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	97.00	No Ice	7.81	5.80	0.04
			0.00			1/2" Ice	8.36	6.95	0.10
			0.00			1" Ice	8.87	7.82	0.17
SPXW 8515 T4 w/ Mount Pipe	A	From Leg	4.00	0.0000	97.00	No Ice	3.69	4.15	0.17
			0.00			1/2" Ice	4.16	4.95	0.21
			0.00			1" Ice	4.59	5.61	0.26
SPXW 8515 T4 w/ Mount Pipe	B	From Leg	4.00	0.0000	97.00	No Ice	3.69	4.15	0.17
			0.00			1/2" Ice	4.16	4.95	0.21
			0.00			1" Ice	4.59	5.61	0.26
SPXW 8515 T4 w/ Mount Pipe	C	From Leg	4.00	0.0000	97.00	No Ice	3.69	4.15	0.17
			0.00			1/2" Ice	4.16	4.95	0.21
			0.00			1" Ice	4.59	5.61	0.26
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.0000	97.00	No Ice	0.31	0.08	0.00
			0.00			1/2" Ice	0.39	0.12	0.01
			0.00			1" Ice	0.47	0.17	0.01
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	97.00	No Ice	0.31	0.08	0.00
			0.00			1/2" Ice	0.39	0.12	0.01
			0.00			1" Ice	0.47	0.17	0.01
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	97.00	No Ice	0.31	0.08	0.00
			0.00			1/2" Ice	0.39	0.12	0.01
			0.00			1" Ice	0.47	0.17	0.01
T-Arm Mount [TA 602-3]	A	None		0.0000	97.00	No Ice	11.59	11.59	0.77
						1/2" Ice	15.44	15.44	0.99
						1" Ice	19.29	19.29	1.21
TME-RRUS-11	A	From Leg	1.00	0.0000	88.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			2.00			1" Ice	3.21	1.49	0.09
TME-RRUS-11	B	From Leg	1.00	0.0000	88.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			2.00			1" Ice	3.21	1.49	0.09
TME-RRUS-11	C	From Leg	1.00	0.0000	88.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			2.00			1" Ice	3.21	1.49	0.09
DC6-48-60-18-8F Surge	A	From Leg	1.00	0.0000	88.00	No Ice	0.92	0.92	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert (ft, ft, ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (K)
Suppression Unit			0.00			1/2" Ice	1.46	1.46	0.04
			2.00			1" Ice	1.64	1.64	0.06
Pipe Mount 6'x2.375"	A	From Leg	1.00	0.0000	88.00	No Ice	1.43	1.43	0.03
			0.00			1/2" Ice	1.92	1.92	0.04
			2.00			1" Ice	2.29	2.29	0.05
Pipe Mount 6'x2.375"	A	From Leg	1.00	0.0000	88.00	No Ice	1.43	1.43	0.03
			0.00			1/2" Ice	1.92	1.92	0.04
			2.00			1" Ice	2.29	2.29	0.05
Pipe Mount 6'x2.375"	A	From Leg	1.00	0.0000	88.00	No Ice	1.43	1.43	0.03
			0.00			1/2" Ice	1.92	1.92	0.04
			2.00			1" Ice	2.29	2.29	0.05
Side Arm Mount [SO 102-3]	C	None		0.0000	88.00	No Ice	3.00	3.00	0.08
						1/2" Ice	3.48	3.48	0.11
						1" Ice	3.96	3.96	0.14
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	87.00	No Ice	5.84	4.35	0.06
			0.00			1/2" Ice	6.32	5.20	0.11
			2.00			1" Ice	6.77	5.92	0.16
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	87.00	No Ice	5.84	4.35	0.06
			0.00			1/2" Ice	6.32	5.20	0.11
			2.00			1" Ice	6.77	5.92	0.16
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	87.00	No Ice	5.84	4.35	0.06
			0.00			1/2" Ice	6.32	5.20	0.11
			2.00			1" Ice	6.77	5.92	0.16
AM-X-CD-16-65-00T-RET	A	From Leg	4.00	0.0000	87.00	No Ice	8.26	6.30	0.07
w/ Mount Pipe			0.00			1/2" Ice	8.82	7.48	0.14
			1.00			1" Ice	9.35	8.37	0.21
AM-X-CD-16-65-00T-RET	B	From Leg	4.00	0.0000	87.00	No Ice	8.26	6.30	0.07
w/ Mount Pipe			0.00			1/2" Ice	8.82	7.48	0.14
			1.00			1" Ice	9.35	8.37	0.21
AM-X-CD-16-65-00T-RET	C	From Leg	4.00	0.0000	87.00	No Ice	8.26	6.30	0.07
w/ Mount Pipe			0.00			1/2" Ice	8.82	7.48	0.14
			1.00			1" Ice	9.35	8.37	0.21
(2) LGP21401	A	From Leg	4.00	0.0000	87.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			2.00			1" Ice	1.38	0.54	0.03
(2) LGP21401	B	From Leg	4.00	0.0000	87.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			2.00			1" Ice	1.38	0.54	0.03
(2) LGP21401	C	From Leg	4.00	0.0000	87.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			2.00			1" Ice	1.38	0.54	0.03
(2) LGP21901	A	From Leg	4.00	0.0000	87.00	No Ice	0.23	0.16	0.01
			0.00			1/2" Ice	0.29	0.21	0.01
			2.00			1" Ice	0.36	0.28	0.01
(2) LGP21901	B	From Leg	4.00	0.0000	87.00	No Ice	0.23	0.16	0.01
			0.00			1/2" Ice	0.29	0.21	0.01
			2.00			1" Ice	0.36	0.28	0.01
(2) LGP21901	C	From Leg	4.00	0.0000	87.00	No Ice	0.23	0.16	0.01
			0.00			1/2" Ice	0.29	0.21	0.01
			2.00			1" Ice	0.36	0.28	0.01
T-Arm Mount [TA 602-3]	A	None		0.0000	87.00	No Ice	11.59	11.59	0.77
						1/2" Ice	15.44	15.44	0.99
						1" Ice	19.29	19.29	1.21
EEI Branches (Large)	C	None		0.0000	114.00	No Ice	90.00	90.00	1.50
						1/2" Ice	120.00	120.00	1.90
						1" Ice	144.00	144.00	2.47
EEI Branches (Large)	C	None		0.0000	104.00	No Ice	90.00	90.00	1.50

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	120.00	120.00	1.90
						1" Ice	144.00	144.00	2.47
EEI Branches (Large)	C	None		0.0000	94.00	No Ice	90.00	90.00	1.50
						1/2" Ice	120.00	120.00	1.90
						1" Ice	144.00	144.00	2.47
EEI Branches (Large)	C	None		0.0000	84.00	No Ice	90.00	90.00	1.50
						1/2" Ice	120.00	120.00	1.90
						1" Ice	144.00	144.00	2.47
EEI Branches (Small)	C	None		0.0000	77.00	No Ice	45.00	45.00	0.75
						1/2" Ice	60.00	60.00	0.85
						1" Ice	72.00	72.00	0.95

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119.5 - 69.67	17.637	39	1.2441	0.0004
L2	74.33 - 42.25	6.903	39	0.9012	0.0002
L3	47.75 - 0	2.786	39	0.5477	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.50	Lighting Rod 3/4" x 7'	39	17.637	1.2441	0.0004	38300
117.00	NNVV-65B-R4 w/ Mount Pipe	39	16.990	1.2300	0.0004	38300
114.00	EEI Branches (Large)	39	16.215	1.2130	0.0004	34819
107.00	T-Arm Mount [TA 602-3]	39	14.421	1.1719	0.0004	15320
104.00	EEI Branches (Large)	39	13.662	1.1533	0.0004	12355
97.00	(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	39	11.930	1.1065	0.0003	8511
94.00	EEI Branches (Large)	39	11.207	1.0846	0.0003	7509
88.00	TME-RRUS-11	39	9.807	1.0367	0.0003	6078
87.00	(2) 7770.00 w/ Mount Pipe	39	9.580	1.0282	0.0003	5891
84.00	EEI Branches (Large)	39	8.912	1.0012	0.0003	5393
77.00	EEI Branches (Small)	39	7.434	0.9310	0.0003	4511

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119.5 - 69.67	89.557	2	6.3244	0.0020
L2	74.33 - 42.25	35.080	2	4.5817	0.0012
L3	47.75 - 0	14.164	2	2.7847	0.0005

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.50	Lighting Rod 3/4" x 7'	2	89.557	6.3244	0.0020	7699
117.00	NNVV-65B-R4 w/ Mount Pipe	2	86.273	6.2529	0.0020	7699
114.00	EEI Branches (Large)	2	82.339	6.1664	0.0019	6999
107.00	T-Arm Mount [TA 602-3]	2	73.236	5.9575	0.0018	3078
104.00	EEI Branches (Large)	2	69.388	5.8630	0.0018	2481
97.00	(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	2	60.595	5.6254	0.0017	1707
94.00	EEI Branches (Large)	2	56.928	5.5142	0.0016	1506
88.00	TME-RRUS-11	2	49.821	5.2708	0.0015	1217
87.00	(2) 7770.00 w/ Mount Pipe	2	48.669	5.2271	0.0015	1180
84.00	EEI Branches (Large)	2	45.278	5.0904	0.0014	1079
77.00	EEI Branches (Small)	2	37.774	4.7334	0.0013	901

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	119.5 - 69.67 (1)	TP33.02x19x0.3125	49.83	0.00	0.0	31.1413	-17.90	2311.28	0.008
L2	69.67 - 42.25 (2)	TP39.99x31.0839x0.375	32.08	0.00	0.0	45.3343	-24.82	3355.39	0.007
L3	42.25 - 0 (3)	TP51x37.7131x0.4375	47.75	0.00	0.0	70.2123	-40.92	5013.55	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	119.5 - 69.67 (1)	TP33.02x19x0.3125	1037.53	1489.10	0.697	0.00	1489.10	0.000
L2	69.67 - 42.25 (2)	TP39.99x31.0839x0.375	2178.43	2622.82	0.831	0.00	2622.82	0.000
L3	42.25 - 0 (3)	TP51x37.7131x0.4375	4369.63	5208.65	0.839	0.00	5208.65	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	119.5 - 69.67 (1)	TP33.02x19x0.3125	41.80	1155.64	0.036	0.00	2981.84	0.000
L2	69.67 - 42.25 (2)	TP39.99x31.0839x0.375	44.01	1677.70	0.026	0.00	5252.07	0.000
L3	42.25 - 0 (3)	TP51x37.7131x0.4375	47.55	2506.78	0.019	0.00	10430.00	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	119.5 - 69.67 (1)	0.008	0.697	0.000	0.036	0.000	0.706	1.000	4.8.2
L2	69.67 - 42.25 (2)	0.007	0.831	0.000	0.026	0.000	0.839	1.000	4.8.2
L3	42.25 - 0 (3)	0.008	0.839	0.000	0.019	0.000	0.847	1.000	4.8.2

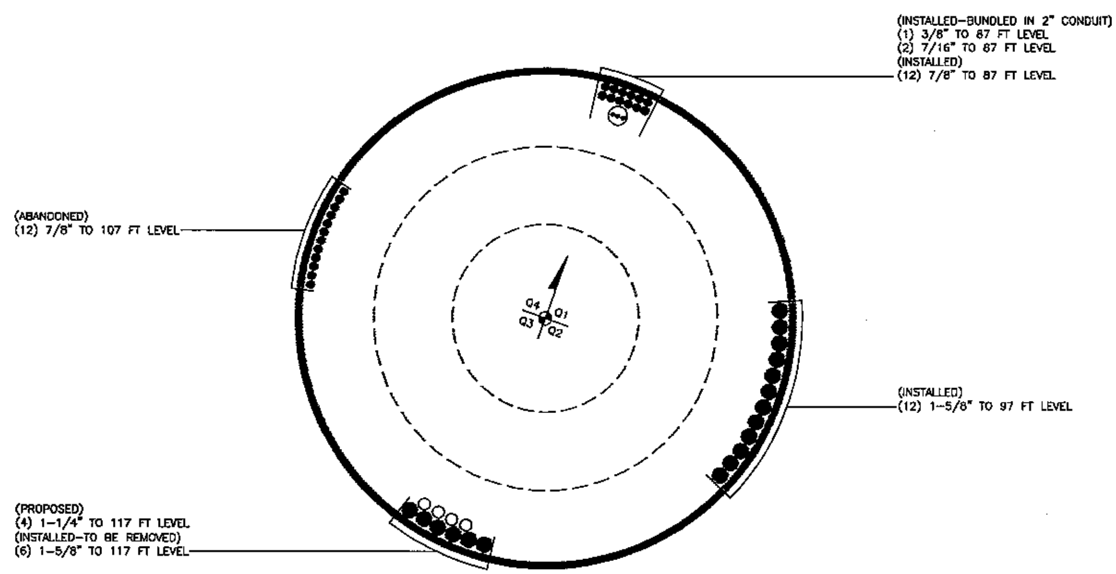
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	119.5 - 69.67	Pole	TP33.02x19x0.3125	1	-17.90	2311.28	70.6	Pass
L2	69.67 - 42.25	Pole	TP39.99x31.0839x0.375	2	-24.82	3355.39	83.9	Pass
L3	42.25 - 0	Pole	TP51x37.7131x0.4375	3	-40.92	5013.55	84.7	Pass

Summary		
	ELC:	Load Case 5
Pole (L3)	84.7	Pass
Rating =	84.7	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876387 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

1	03/12/07	NEW BUILD PER WORK ORDER # 175190	KEY
2	06/11/08	APPLICATION ADDED PER WORK ORDER # 236343	AMM
3	03/05/10	AS-BUILT INFORMATION ADDED PER WORK ORDER # 323287	PLW
4	14/08/12	APPLICATION ADDED PER WORK ORDER # 519491	TE
5	07/08/13	AS-BUILT INFORMATION ADDED PER WORK ORDER # 636273	SF
6	07/11/14	UPDATED PER WORK ORDER # 963180	ADJ
7	2/7/2015	UPDATED PER WORK ORDER 1063869	ADE
8	29/11/17	UPDATED PER WORK ORDER 1496351	CJR
9	10/05/18	UPDATED PER WORK ORDER 1575793	SLS

DRAWN BY: KEYSTONE/TF
CHECKED BY: JM
DRAWING DATE: 3/12/07

SITE NUMBER:
SITE NAME:

SITE NAME

SOUTH HEBRON / NED ELLIS PROP.

BUSINESS UNIT NUMBER

875387

SITE ADDRESS

107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING | SCALE: 1" = 1'-0" | 1

PLOT DATE: 8/13/2015 FILE NAME: 876387_BASELEVEL.DWG
Xref R:\TEMPLATES\TYPICAL BLOCKS FOR TEMPLATES\TITLE BLOCK STD-WEB 8.1.dwg

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data	
BU#:	*876387*
Site Name:	*SOUTH HEBRON / NED E.*
App #:	*438442 Rev. 0*
Pole Manufacturer:	*Other*

Reactions		
Mu:	4369.6	ft-kips
Axial, Pu:	41	kips
Shear, Vu:	47.5	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria:	AISC LRFD	<-Only Applcable to Unstiffened Cases

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	60	in

Plate Data		
Diam:	66	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	10.12	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Both	
Groove Depth:	0.5625	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	7	in
Height:	21	in
Thick:	1.25	in
Notch:	1	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	51	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ή):	227.0 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	87.3% **Pass**	

Base Plate Results

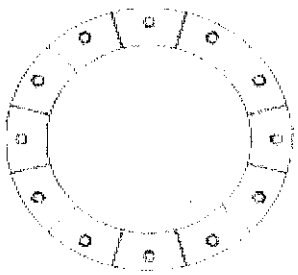
	Flexural Check		Stiffened
Base Plate Stress:	#NAME?	ksi	AISC LRFD
Allowable Plate Stress:	54.0	ksi	φ*Fy
Base Plate Stress Ratio:	#NAME?	######	Y.L. Length: N/A, Roark

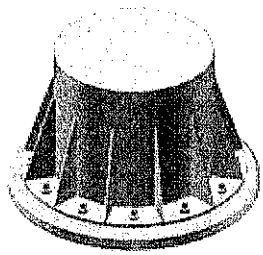
Stiffener Results

Horizontal Weld :	85.8% **Pass**
Vertical Weld:	63.9% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	12.9% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	51.1% **Pass**
Plate Comp. (AISC Bracket):	50.3% **Pass**

Pole Results

Pole Punching Shear Check:	13.8% **Pass**





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Pier and Pad Foundation

BU # :	876387
Site Name:	SOUTH HEBRON
App. Number:	438442 Rev. 0

TIA-222 Revision:	G
Tower Type:	Monopole

Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	41	kips
Base Shear, Vu_comp:	47.5	kips
Moment, M_u:	4369.6	ft-kips
Tower Height, **H**:	119.5	ft
BP Dist. Above Fdn, bp_{dist}:	2.75	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	6.5	ft
Ext. Above Grade, **E**:	0.50	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	38	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	4	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	5.0	ft
Pad Width, **W**:	28.0	ft
Pad Thickness, **T**:	3.0	ft
Pad Rebar Size, **Sp**:	8	
Pad Rebar Quantity, **mp**:	56	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	4000	psi
Dry Concrete Density, δc:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	100	pcf
Ultimate Gross Bearing, Qult:	24.000	ksf
Cohesion, **Cu**:		ksf
Friction Angle, φ:		degrees
SPT Blow Count, N_{blows}:	49	
Base Friction, μ:	0.3	
Neglected Depth, **N**:	3.00	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, **gw**:	8	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	128.41	47.50	**37.0%**	**Pass**
Bearing Pressure (ksf)	18.00	3.38	**18.8%**	**Pass**
*Overturning (kip*ft)*	6634.55	4641.74	**70.0%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	4520.83	4488.35	**99.3%**	**Pass**
Pier Compression (kip)	26891.28	60.01	**0.2%**	**Pass**
*Pad Flexure (kip*ft)*	6039.74	2110.48	**34.9%**	**Pass**
Pad Shear - 1-way (kips)	1004.09	276.86	**27.6%**	**Pass**
Pad Shear - 2-way (ksi)	0.19	0.05	**23.8%**	**Pass**

Soil Rating:	**70.0%**
Structural Rating:	**99.3%**

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL
TO NON-IONIZING EMISSIONS

SPRINT Existing Facility

Site ID: CT33XC560

South Hebron/ Ned Ellis Prop.
107 Buck Road
Hebron, CT 06248

August 1, 2018

EBI Project Number: 6218005230

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**14.96 %**

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

August 1, 2018

SPRINT
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Emissions Analysis for Site: **CT33XC560 – South Hebron/ Ned Ellis Prop.**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **107 Buck Road, Hebron, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

General population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **107 Buck Road, Hebron, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **Commscope NNVV-65B-R4 and the RFS APXVTM14-ALU-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed panel antennas are **117 feet** above ground level (AGL) for **Sector A, 117 feet** above ground level (AGL) for **Sector B** and **117 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general population threshold limits.

EBI Consulting

environmental | engineering | due diligence

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	**117 feet**	Height (AGL):	**117 feet**	Height (AGL):	**117 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	7,378.61	ERP (W):	7,378.61	ERP (W):	7,378.61
Antenna A1 MPE%	**2.65 %**	Antenna B1 MPE%	**2.65 %**	Antenna C1 MPE%	**2.65 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**117 feet**	Height (AGL):	**117 feet**	Height (AGL):	**117 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**1.82 %**	Antenna B2 MPE%	**1.82 %**	Antenna C2 MPE%	**1.82 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**4.47 %**
Verizon Wireless	4.10 %
AT&T	4.90 %
Nextel	1.49 %
Site Total MPE %:	**14.96 %**

SPRINT Sector A Total:	4.47 %
SPRINT Sector B Total:	4.47 %
SPRINT Sector C Total:	4.47 %
Site Total:	14.96 %

SPRINT Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	376.73	117	1.10	850 MHz	567	0.18%
Sprint 850 MHz LTE	2	941.82	117	5.50	850 MHz	567	0.97%
Sprint 1900 MHz (PCS) CDMA	5	511.82	117	7.47	1900 MHz (PCS)	1000	0.75%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	117	7.47	1900 MHz (PCS)	1000	0.75%
Sprint 2500 MHz (BRS) LTE	8	778.09	117	18.16	2500 MHz (BRS)	1000	1.82%
						Total:	**4.47%**

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	4.47 %
Sector B:	4.47 %
Sector C:	4.47 %
SPRINT Maximum MPE % (per sector):	4.47 %
Site Total:	14.96 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **14.96 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

After printing this label:
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Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Wednesday, August 8, 2018 10:14 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 772916109734 Delivered

Your package has been delivered

Tracking # 772916109734

Ship date:
Tue, 8/7/2018

Jeff Barbadora
Crown Castle
WOBURN, MA 01801
US

Delivered

Delivery date:
Wed, 8/8/2018 10:08 am

Mr. Michael O'Leary-Town Planner
Town of Hebron
15 Gilead Street
HEBRON, CT 06248
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	772916109734
Status:	Delivered: 08/08/2018 10:08 AM Signed for By: A.WOLF
Reference:	1766.6680
Signed for by:	A.WOLF
Delivery location:	HEBRON, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	8/8/2018 by 12:00 pm

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 9:13 AM CDT on 08/08/2018.

All weights are estimated.

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Barbadora, Jeff

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Sent: Wednesday, August 8, 2018 10:14 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 772916091349 Delivered

Your package has been delivered

Tracking # 772916091349

Ship date:
Tue, 8/7/2018

Jeff Barbadora
Crown Castle
WOBURN, MA 01801
US

Delivered

Delivery date:
Wed, 8/8/2018 10:08 am

Mr. Andrew Tierney-Town Manager
Town of Hebron
15 Gilead Street
HEBRON, CT 06248
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	772916091349
Status:	Delivered: 08/08/2018 10:08 AM Signed for By: A.WOLF
Reference:	1766.6680
Signed for by:	A.WOLF
Delivery location:	HEBRON, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	8/8/2018 by 12:00 pm

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 9:13 AM CDT on 08/08/2018.

All weights are estimated.

NOTE:

RFDS HAS NOT BEEN PROVIDED BY CROWN CASTLE, REFER TO CROWN APP REV #0 DATED 05/08/18

NOTE:

SPRINT CM SHALL CONFIRM HYBRID CABLE LENGTH, COAX JUMPER LENGTH AND AISG CABLE LENGTH BEFORE PREPARING BOM. A&E RECOMMENDED HYBRID CABLE LENGTH BASED ON NV 2.5 EQUIPMENT AUDIT PLUS 20 FEET FOR (2) 10-FOOT COILS AT EACH END OF THE FIBER TRUNK.

NOTE:

GENERAL CONTRACTOR/TOWER CREW SHALL VERIFY THAT THE LATEST RF DATA SHEET IS USED FOR EQUIPMENT INSTALLATION.

SPECIAL WORK NOTE:

JUMPERS (COAX/AISG) FROM THE 2.5 RRH TO THE 2.5 ANTENNA CANNOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY.

RF DATA SHEET (1 / RF-1)
SCALE: N.T.S

Sprint
A INTERNATIONAL BLVD. SUITE 600
MAHWAH, NJ 07495
TEL: (800) 357-7641

CROWN CASTLE
CROWN CASTLE
12 GILL STREET, SUITE 6000
WOBURN, MA 01801

HDG
HUDSON
Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5536

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28538
LICENSED
PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OR RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREON

CHECKED BY:	BB
APPROVED BY:	DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/06/18	CONSTRUCTION REVISED	CA
0	01/23/18	ISSUED FOR CONSTRUCTION	AH

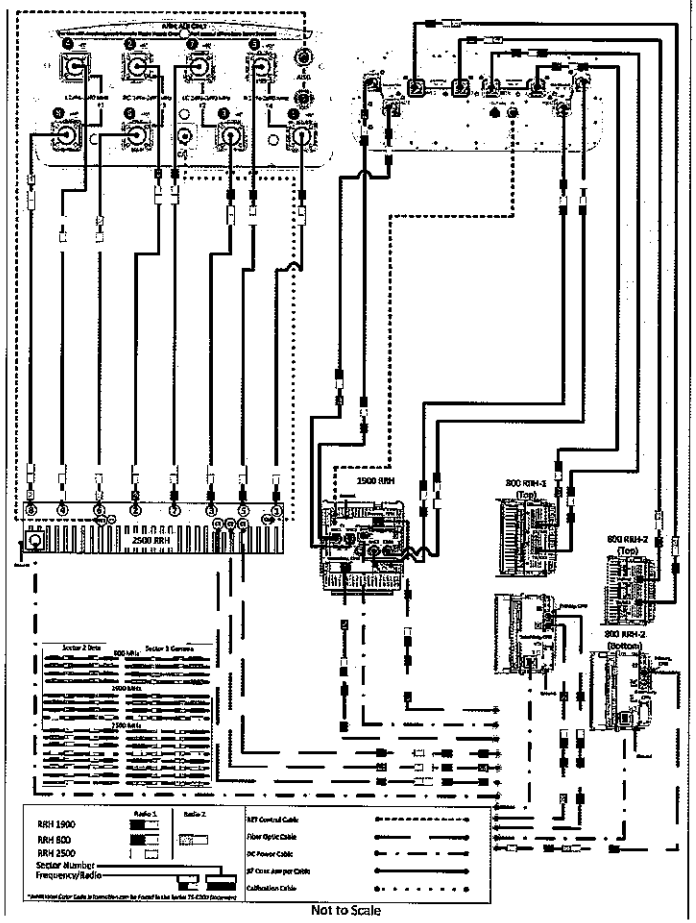
SITE NUMBER:
CT33XC560
SITE NAME:
SOUTH HEBRON/ NED ELLIS PROP.
CROWN BU NUMBER:
876387
SITE ADDRESS:
107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
RF DATA SHEET
(60 MIMO REDESIGN)

SHEET NUMBER
RF-1

Prepared By	Revision Date	Revision Number	
Mark Elliott	March 13, 2018	R1	Sprint
Approved By	Approval Date		
RAN Hardware & Antenna Teams	Final-Macro Generated		

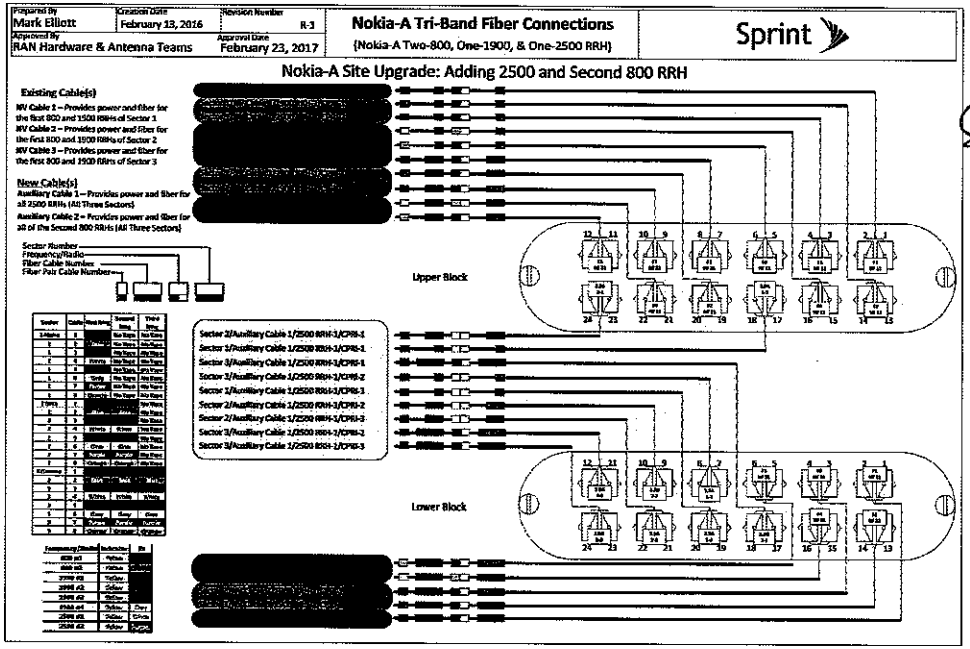
ALU 211 APXVTM14-ALU-I20 & NNVV-65B-R4 wo Filters



PLUMBING DIAGRAM 1 RF-2
SCALE: N.T.S

Prepared By	Creation Date	Revision Number	
Mark Elliott	February 13, 2016	R-3	Nokia-A Tri-Band Fiber Connections
Approved By	Approval Date		(Nokia-A Two-800, One-1900, & One-2500 RRH)
RAN Hardware & Antenna Teams	February 23, 2017		Sprint

Nokia-A Site Upgrade: Adding 2500 and Second 800 RRH



CPRI BLOCK DIAGRAM 2 RF-2
SCALE: N.T.S

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

CROWN CASTLE
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

HUDSON Design Group LLC
45 BEECHWOOD DRIVE TEL: (978) 557-5553
N. ANDOVER, MA 01845 FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
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LICENSED PROFESSIONAL ENGINEER
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0	01/23/18	ISSUED FOR CONSTRUCTION	AH

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CT33XC560
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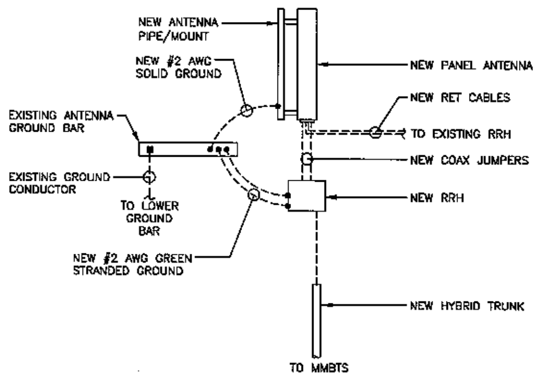
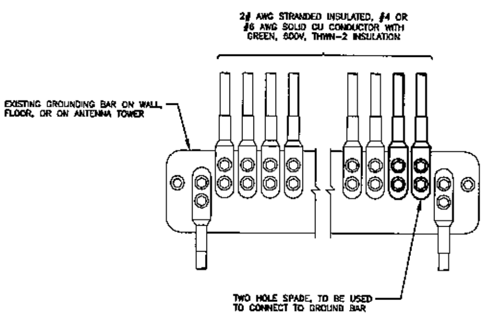
876387
SITE ADDRESS:
107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
WIRING DIAGRAM
(DO MIMO REDESIGN)

SHEET NUMBER
RF-2

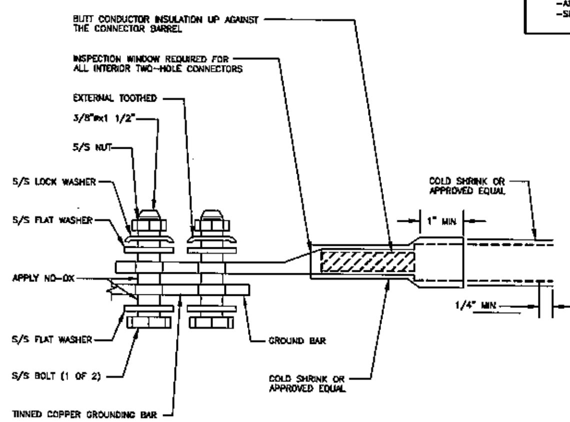


EQUIPMENT GROUNDING SCHEMATIC (1 / G-1)
SCALE: N.T.S



NOTES
1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR (2 / G-1)
SCALE: N.T.S



TWO HOLE LUG (3 / G-1)
SCALE: N.T.S

PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250-GROUNDING AND BONDING.
2. GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT SSEO DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES" AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING".
3. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
4. GROUND CONNECTIONS: CLEAN SURFACES THOROUGHLY BEFORE APPLYING GROUND LUGS OR CLAMPS. IF SURFACE IS COATED, REMOVE THE COATING, APPLY A NON-CORROSIVE APPROVED COMPOUND TO CLEAN SURFACE AND INSTALL LUGS OR CLAMPS. WHERE GALVANIZING IS REMOVED FROM METAL, IT SHALL BE PAINTED OR TOUCHED UP WITH "GALVANOX" OR EQUAL.
5. ALL GROUNDING WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
6. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
7. ALL GROUND WIRES SHALL BE #2 SOLID TINNED BCW UNLESS NOTED OTHERWISE.
8. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
9. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
10. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 SOLID TINNED BCW EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.
11. GROUND HYBRIFLEX SHIELD AT TOP, BOTTOM AND AT TRANSITION TO HYBRIFLEX JUMPER CABLES AT EQUIPMENT CABINET ENTRANCE USING MANUFACTURER'S GUIDELINES. WHEN HYBRIFLEX CABLE EXCEEDS 200', GROUND AT INTERVALS NOT EXCEEDING 100'.
12. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
13. EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL OTHERWISE. THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE-2 HOLES, LONG BARREL LUGS OR DOUBLE CRIMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH AN ANTI-OXIDANT (THOMAS BETTS KOPR-SHILD) BEFORE MAKING THE CRIMP CONNECTIONS THE CONTRACTOR SHALL FOLLOW MANUFACTURER'S RECOMMENDED TORQUES ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS.
14. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING. CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF-TAPPING SCREWS.
15. THE MASTER GROUND BAR (MGB) SHALL BE MADE OF BARE 1/4"x2" COPPER (FOR OUTDOOR APPLICATIONS IT SHALL BE TINNED COPPER) AND LARGE ENOUGH TO ACCOMMODATE THE REQUIRED NUMBER OF GROUND CONNECTIONS. THE HARDWARE SECURING THE MGB SHALL ELECTRICAL INSULATE THE MGB FROM ANY STRUCTURE TO WHICH IT IS FASTENED.
16. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
17. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH SPRINT CONSTRUCTION MANAGER.
18. FOR NEW OR REPAIRED GROUNDING EQUIPMENT. REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):
-ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED: 08-24-12 (OR CURRENT VERSION)
-SPRINT ENGINEERING LETTER EL-0504 DATED: 04-20-12 (OR CURRENT VERSION)

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

CROWN CASTLE
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

HDG
HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY:	BB
APPROVED BY:	DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	07/09/18	CONSTRUCTION REVISED	GA
0	01/23/18	ISSUED FOR CONSTRUCTION	AM

SITE NUMBER:
CT33XC560
SITE NAME:
SOUTH HEBRON/ NED ELLIS PROP.
CROWN BU NUMBER:
876387
SITE ADDRESS:
107 BUCK RD.
HEBRON, CT 06248
TOLLAND COUNTY

SHEET TITLE
ONE LINE DIAGRAM, GROUNDING DETAILS & NOTES
(DO MIMO REDESIGN)

SHEET NUMBER
G-1