



VILLAGE OF WILLIAMS BAY

250 Williams Street | PO Box 580 | Williams Bay | WI | 53191 | williamsbay.org Phone:
262-245-2700 | Fax: 262-245-2705

NOTICE

COMMITTEE MEETINGS

WEDNESDAY, MARCH 10, 2021 AT 6:30 PM

VIA ZOOM MEETING

WATCH FROM A COMPUTER BY GOING TO: <https://zoom.us/j/97480277884>

LISTEN-IN BY PHONE: 888-475-4499 | MEETING ID: 974 8027 7884#

AGENDA

The following agenda items may be considered for Discussion, Consideration, or Action

I. Protective Services Committee – Vlach, McMannamy, D'Alessandro

- a. Call to Order
- b. Roll Call
- c. Protective Services Committee Meeting Minutes of February 10, 2021
- d. Protective Services Committee Meeting Minutes of February 22, 2021
- e. Renewal of the School Resource Officer agreement
- f. Monthly Police Report
- g. Police Chief's Report
- h. Adjourn

II. Finance & Personnel Committee – Parker, D'Alessandro, Wright

- a. Call to Order
- b. Roll Call
- c. Finance & Personnel Committee Meeting Minutes of February 10, 2021
- d. Recommendation from the Protective Services Committee to find a source of funding for the hiring of one additional full-time Police Officer
- e. Recommendation from the Protective Services Committee to find a source of funding of \$3,000.00 to purchase three new squad rifles
- f. Application of T-Mobile to upgrade certain equipment on the Olive Street water tower
- g. Austin Pier Service Contract
- h. Motion to convene in closed session pursuant to the exemption contained in section 19.85(1)(e) of the Wisconsin Statutes for the purpose of conducting other specified public business whenever competitive or bargaining reasons require a closed session.
 - 1. Contract for Building Inspection Services
- i. Motion to reconvene into open session
- j. Possible discussion of/action for those items discussed in closed session
- k. Adjourn

III. Streets & Highways Committee – McMannamy, Umans, Vlach

- a. Call to Order
- b. Roll Call
- c. Streets & Highways Committee Meeting Minutes of February 10, 2021
- d. Culvert Installation - 7 Cedar Point Drive
- e. Public Works Update
- f. Adjourn

IV. Parks & Lakefront Committee – D’Alessandro, McMannamy, Wright

- a. Call to Order
- b. Roll Call
- c. Parks & Lakefront Committee Meeting Minutes of February 10, 2021
- d. Parks & Lakefront Committee Meeting Minutes of February 15, 2021
- e. Edgewater Park use for Corn and Brat Fest
- f. Hiring Process and Setting Wages for the Lakefront Staff
- g. Inquiry from Terry Soltow regarding a permanent site for hovercraft rides in Williams Bay
- h. Dog Park Sponsorships
- i. Lakefront Boat Platforms
- j. Adjourn

V. Water & Sewer Committee – Umans, Parker, Vlach

- a. Call to Order
- b. Roll Call
- c. Water & Sewer Committee Meeting Minutes of February 10, 2021
- d. Water & Sewer Committee Meeting Minutes of February 17, 2021
- e. 2021 Water & Sewer Budget
- f. Next meeting date
- g. Adjourn

VI. Building, Zoning & Ordinance Committee – Wright, Umans, Parker

- a. Call to Order
- b. Roll Call
- c. Building, Zoning & Ordinance Committee Meeting Minutes of February 10, 2021
- d. Appointment of Village Officials
- e. Adjourn

Requests from persons with disabilities, who need assistance to participate in this meeting or hearing, should be made to the Village Clerk's office in advance so the appropriate accommodations can be made.

Posted: 03/09/2021 5:00 PM



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UNOFFICIAL MINUTES PROTECTIVE SERVICES COMMITTEE MONDAY, FEBRUARY 10, 2021 AT 6:30 PM VIA TELECONFERENCE

Call to Order

Meeting was called to order by Chairman Vlach at 8:30pm

Roll Call

Trustees Vlach, D'Alessandro and McMannamy

Also Present: President Duncan, Trustees Parker, Umans, Wright, Interim Administrator Bretl, Treasurer Peternell, Public Works Director Edwards, Police Chief Timm and Recreation Director Rowland.

Meeting Minutes

McMannamy/D'Alessandro motion to approve meeting minutes of January 13, 2021. Unanimously carried.

Monthly Police Report

Chief Timm presented the monthly report and answered any questions.

Police Chief's Report

Chief Timm discussed recent trainings attended by several officers. The Chief and Lieutenant Kostock recently attended a Leadership Conference; Lieutenant Kostock and Officer Borgen attended a Defense Tactics training. Other topics: Officer Hammett will be returning from military leave sometime in early June and Officer Borgen will be the Student Resource Officer (SRO) for the next school year.

Adjourn

D'Alessandro/Vlach motion to adjourn at 8:38pm. Unanimously carried.

/s/ Lori Peternell, Village Treasurer



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UNOFFICIAL MINUTES PROTECTIVE SERVICES COMMITTEE MONDAY, FEBRUARY 22, 2021 AT 4:30 PM VIA TELECONFERENCE

Call to Order

Meeting was called to order by Chairman Vlach at 4:31pm.

Roll Call

Present: Trustees Vlach, D'Alessandro and McMannamy.

Also Present: President Duncan, Interim Administrator Bretl, Clerk Pankau, Police Chief Timm, Police Lieutenant Kostock, Fire Chief Smith, Assistant Fire Chief Nicholson, Jess Haak; Lions Club Corn & Brat Fest Chairman and Richard Tuma; Bay Public Safety Concepts and Solutions, LLC.

Street Closure for Lion's Corn and Brat Fest

Jess Haak (Corn & Brat Fest Chairman) stated that the Lions Club would like to have the Corn and Brat Fest this year but would like to know their options on how to run it safely due to the pandemic. Haak suggested closing Geneva Street to allow room for more tents and distancing of crowds. Fire Chief Smith stated that the Fire Department will accommodate the closing of Geneva Street, but would need to staff a crew on the other side of town which would mean they would not have enough people to volunteer at the Corn and Brat Fest which they have done in the past. Police Chief Timm stated that the Police Department has all officers on duty during the Corn and Brat Fest anyways and would be fine with either plan. Trustee Vlach stated that if the tents are spread out and there isn't a fence surrounding the area, it would be harder to control the alcohol staying inside the fest. President Duncan stated that it seems the complications of closing the street outweigh the benefits. Trish Gages (Vernon Street) commented that the number of people in this area has quadrupled and she wants people to anticipate a much larger event this year.

After much discussion between all of the parties, the Committee concluded that they are going to hold this agenda item for additional input from the event organizers after the speak with the Police Department.

Results of police staffing study conducted by Richard Tuma

Richard Tuma, owner of Bay Public Safety Concepts and Solutions, LLC, presented the staffing study he conducted on the Williams Bay Police Department which concluded that the Village has the justification to consider hiring one more full-time police officer instead of filling hours and trying to cover so many hours with overtime and part time officers.

McMannamy/D'Alessandro motion to recommend the hiring of one additional full-time officer and forward the recommendation to the Finance and Personnel committee to identify a source of funding. Unanimously carried.

Replacement of Police AR-15 rifles

Chief Timm explained that the current AR-15 rifles being five years old and how the trade in value has doubled since last year. He stated that the new rifles are much smaller and compact for the officers to be able to maneuver around a building better. The cost would be roughly \$3,000.00 for three new rifles which is about half the cost of what it would cost without the trade-in value currently. Chief Timm stated that Mustang Suits are in the current year's budget but could be held off and that money could be reallocated to the purchase of the rifles.

D'Alessandro/Vlach motion to approve the purchase of the rifles and forward it to the Finance and Personnel Committee to identify a source of funding.

D'Alessandro is favorable to reallocating the money from the suits but would like to see if the Finance and Personnel Committee could find other funding first.

D'Alessandro/Vlach motion to amend the original motion to approve the trade-in of the current rifles and purchase of the new ones and forward it to the Finance and Personnel Committee to find a source of funding and if the Finance and Personnel Committee will not approve the new funding then the Protective Services Committee votes to approve the trade-in and purchase using funds originally designated for the Mustang Suits.

McMannamy stated that she supports the Police Department but does not believe she understands the situation fully to be able to vote aye.

Aye: Vlach and D'Alessandro. Nay: McMannamy. Motion carries.

Adjourn

D'Alessandro/McMannamy motion to adjourn at 5:50pm. Unanimously carried.

/s/ Jackie Pankau, Village Clerk

These are not official minutes until approved by the Water and Sewer Committee

MEMORANDUM OF UNDERSTANDING
for the
SCHOOL RESOURCE OFFICER (SRO)
Between
VILLAGE OF WILLIAMS BAY, WILLIAMS BAY POLICE DEPARTMENT,
and
WILLIAMS BAY SCHOOL DISTRICT

This Memorandum of Understanding, herein referred to as "Agreement," is by and between the Village of Williams Bay, herein referred to as "Village," the Williams Bay School District, herein referred to as "School District," and the Williams Bay Police Department, herein referred to as "Police Department."

This Agreement clarifies the roles of the School Resource Officer, herein referred to as "SRO," and the School District's District Administrator and Principals, herein referred to as "School District Administration," and the scope of authority and the responsibilities of the School District, the Police Department, and the Village in this collaboration.

1. **PURPOSE**

The purpose of the Agreement is to foster a community partnership between the Police Department and the School District to benefit the overall development of the school community. The major purpose of the SRO is to (1) help maintain a safe environment in our schools and (2) to increase the mutual respect between students and law enforcement.

2. **INITIAL TERM**

The initial term of this Agreement shall commence on February 25, 2019 and terminate on June 30, 2020, except as provided by Section 3 below.

3. **RENEWAL AND TERMINATION**

This Agreement shall be automatically renewed for additional school-year (July 1 through June 30) terms, unless any party provides written notice not to renew this Agreement to the other parties on or before May 1, 2020 for the initial term or on or before May 1 of any additional term.

4. **GOALS AND DUTIES OF THE SRO**

- a. The School District Administration and the SRO will work together to design and maintain a physically safe environment for School District staff, students, community members, and visitors. The SRO will assist the School District Administration in developing appropriate school safety plans.
- b. The SRO will present educational programs to School District students in grades 4K-12 on, among other topics, drug awareness, bullying, legal issues, the law enforcement profession, and internet safety.
- c. The SRO can act as an advisor for School District students who have questions or concerns about the law during the school day and how it affects them.

- d. The SRO may assist School District teachers, administrators, and other personnel in understanding the law, referral procedures, and other pertinent information.
- e. The SRO can assist the School District Administration in referring students to other social agencies such as social services, local hospitals, etc.
- f. The SRO is to work collaboratively with school officials on problems such as truancy, student parking, and discipline situations which may lead to violations of the law.
- g. The School District Administration and the SRO will collaborate on student problems which may result in a violation of the law.
- h. The SRO is to deal with issues considered to be violations of federal, state and local laws, recognizing the difference between student discipline matters and matters of safety and security warranting formal law enforcement intervention. In general, absent a real and immediate threat to a student, a teacher, or public safety, incidents involving public order offenses by students (including, but not limited to, disturbance/disruption of schools or public assembly; loitering; profanity; and fighting that does not involve physical injury or weapon) do not warrant formal law enforcement intervention, but rather shall be considered student discipline matters and referred to the School District Administration for a response. The SRO shall only be involved in student discipline matters at the direction of the School District Administration. Criminal activity that comes to the attention of the School District Administration, other than incidents involving public order offenses by students that do not create a real and immediate threat to a student, a teacher, or public safety (including, but not limited to, disturbance/disruption of schools or public assembly; loitering; profanity; and fighting that does not involve physical injury or weapon) shall be reported to the SRO or the Police Department.
- i. The SRO can be invited to staff meetings and/or other meetings upon the request of the School District Administration.
- j. The SRO shall make every effort to conduct their non-school business with students at times other than class time.
- k. The SRO will dress in his/her official police uniform.

5. PERSONNEL

- a. The Police Department's Chief of Police shall assign the SRO from one of the members of the Police Department. When an SRO is initially assigned to the School District, the Police Department's Chief of Police and the School District's District Administrator shall jointly agree on that SRO's assignment to the School District. The School District's District Administrator or designee shall meet with the Police Department's Chief of Police or his/her designee to resolve any disputes related to the selection of the SRO. In the event of an impasse regarding the selection of the SRO, the Police Department's Chief of Police shall have the final say as to the selection of the SRO, subject to the rights of the School District provided by this Agreement.

- b. The SRO shall receive the appropriate training and keep and maintain knowledge consistent with the SRO's duties. The costs for this training shall be paid in accordance with Section 12.C below.
- c. The School District shall have the right to request that the Police Department remove an SRO from assignment within the School District, temporarily or permanently. The Police Department shall accommodate any such request and assign a new SRO to the School District as soon as reasonably practical.

6. WORK DAYS

The SRO shall be available for duty under the program for each student day in the school year calendar. The SRO will also be available to the School District on staff inservice days upon request of the School District Administration.

7. WORK SCHEDULES

The SRO shall establish a weekly work schedule in conjunction with the School District Administration. The basic hours of the SRO shall be from 7:00 a.m. until 4:00 p.m. during regularly scheduled student days. Except in the event of an emergency or other unforeseen circumstance, deviation from such schedule by the SRO will require written or verbal approval of the School District Administration, in addition to the verbal approval of the SRO's Police Department supervisor.

8. ABSENCES

The SRO shall notify both the School District's District Administrator and the SRO's Police Department supervisor of each day he/she is not available for duty due to illness or otherwise. When the SRO is not available for duty due to illness or otherwise, the Police Department shall provide another officer to serve as a substitute SRO in the District.

9. OFFICER EVALUATION

The School District's District Administrator shall promptly report to the Police Department's Chief of Police or his/her designee any infractions or deficiencies in the assigned SRO's performance. At the end of the school year, the School District's District Administrator shall provide the SRO with a written performance evaluation. A copy of that evaluation shall be provided to the Police Department's Chief of Police or his/her designee. As the SRO's employer, ultimate responsibility for the supervision and evaluation of the SRO shall remain with the Village and the Police Department.

10. CO-CURRICULAR ACTIVITIES

As part of his/her responsibilities, the SRO shall attend and assist at certain select co-curricular activities of the School District as determined by the School District Administration. If such attendance and assistance results in the SRO being eligible for overtime pay, such pay will be paid 100% by the School District. However, the School District Administration can, after consultation with the Chief of Police or his/her designee, adjust the SRO's schedule for a given workweek so that the SRO is not eligible for overtime pay.

11. SCHOOL DISTRICT ADMINISTRATIVE HEARINGS

The SRO may attend suspension, expulsion, discipline, termination, grievance, or other School District administrative hearings upon request of the School District Administration. The SRO shall be prepared to provide testimony on any actions that were taken by the SRO and any personally observed conduct witnessed by the officer. The SRO shall make available any physical evidence. Unless otherwise arranged, it will be the responsibility of the SRO to transport and safeguard any physical evidence that is needed at the administrative hearing. If such attendance and assistance results in the SRO being eligible for overtime pay, such pay will be paid 100% by the School District. However, the School District Administration can, after consultation with the Chief of Police or his/her designee, adjust the SRO's schedule for a given workweek so that the SRO is not eligible for overtime pay.

12. COST SHARING AND EMPLOYMENT OF THE SRO

- a. The Village and the School District shall share in the actual wages and fringe benefits costs of the Village employing the SRO. The School District will cover 75% and the Village will cover 25% of these costs, subject to Sections 10 and 11 above.
- b. The Village shall bill the School District for the School District's share of costs as follows:
 - i. On June 15 of each term of this Agreement, the Village will bill the School District for 100% of the School District's share of costs incurred under this Agreement from January 1 through the last day of student attendance for the school year.
 - ii. On January 15 of each term of this Agreement, the Village will bill the School District for 100% of the School District's share of costs incurred under this Agreement from the first day of student attendance for the school year through December 31.
- c. The Village will pay for all professional development trainings sufficient for the SRO to keep and maintain knowledge consistent with the SRO's duties, such as knowledge and training on working with students with disabilities and on laws governing student restraint and seclusion. All Village-requested training will be approved by the Police Chief or his/her designee prior to the SRO registering for the training. The School District will pay for all professional development trainings that are specifically requested by the School District Administration. The Police Chief or his/her designee and a member of the School District Administration will work together to mutually agree on any adjustments to scheduling and staffing when an SRO's District-requested training will cause the SRO to be absent from the District during the regular school day.
- d. The SRO will not be considered an employee of the School District nor shall the School District be considered a co-employer or joint employer of the SRO.

13. INTERAGENCY AGREEMENT/EXCHANGE OF INFORMATION

The Village and the School District enter into this Agreement in order to protect the confidentiality of pupil records as required by law, while providing for the lawful disclosure of pupil records and information with the Police Department to the extent permitted by law, to serve the interests of pupils and all other concerned parties.

The exchange of information is for the purpose of investigating and in some cases prosecuting acts including but not limited to truancy, theft, harassment, assault, drug or alcohol possession, use and/or distribution, or other acts in violation of local ordinances or state statutes, and assisting the School District with administrative hearings.

It is understood and agreed that this Agreement is an Interagency Agreement that authorizes the Police Department to routinely disclose information to the School District as permitted by Wis. Stat. § 938.396(1).

For purposes of SRO access to education and pupil records, the School District designates the SRO as a school official with a legitimate educational interest in accessing education records under the Federal Educational Rights and Privacy Act ("FERPA") 20 U.S.C. § 1232g, and in accessing pupil records under Wis. Stat. § 118.125(2)(d). The School District may provide the SRO with access to education and pupil records information maintained by the School District only as needed by the SRO to perform his/her duties as SRO. Such information may include student behavior intervention plans and student safety plans. The SRO may also be granted access to education and pupil records information in the event of an emergency situation threatening the health or safety of a student or other individual. The SRO may only re-disclose education or pupil records information consistent with FERPA and Wisconsin pupil records law.

Records created and maintained by the SRO for the purpose of ensuring the safety and security of persons or property in the School District, or for the enforcement of local, state, or federal laws or ordinances shall not be considered education or pupil records—even when such records may serve the dual purpose of enforcing school rules—and are not subject to the same prohibitions of access or disclosure by the SRO.

14. RELEASE OF POLICE INFORMATION

Consistent with the basic tenets of the relationship between the SRO and the School District described in this Agreement, open communication is essential for effectiveness. The SRO shall exchange information with the School District Administration regarding students' involvement in criminal activity in and around the school. This shall be limited to that which directly relates to and contributes to the safety of the school environment. The SRO shall not make any official documents, police reports, or records available to the School District, except as provided under Wis. Stat. 938.396(1).

15. INVESTIGATIONS

Formal investigations by the SROs will be conducted in accordance with applicable legal requirements. SRO investigations will also be conducted in accordance with School District board policies applicable to SRO investigations provided such policies are mutually agreeable to all parties.

16. LAW ENFORCEMENT INTERVIEWS

The SRO must coordinate with the School District Administration or the School District Administration's designee prior to the SRO conducting an interview with students or employees on School District property or at a School District function. The SRO shall demonstrate the necessity of conducting a law enforcement interview on School District property or at a School District function. The goal of this coordination is to minimize the disruption of School District operations without unreasonably hindering the SRO's ability to investigate when such investigation is necessary.

The SRO must abide by all applicable legal requirements concerning any such interview should such an interview be necessary. SRO interviews will also be conducted in accordance with School District board policies applicable to SRO interviews provided such policies are mutually agreeable to all parties.

17. SEARCHES

The SRO shall abide by all applicable legal requirements concerning searches should it become necessary to conduct searches of students or employees on property or at any School District function. The SRO may conduct searches in conjunction with the School District Administration in order to maintain a safe and proper educational environment, as permitted by law.

18. ARRESTS AND DETAINMENTS

The SRO must have agreement with the School District Administration or the School District Administration's designee prior to a student or employee being taken into custody, except where a student or employee poses a real and immediate threat to themselves, another student, an employee, or public safety, or pursuant to a warrant.

Where a student or employee poses a real and immediate threat to themselves, another student, an employee, or public safety, or pursuant to a warrant, the student or employee may be taken into custody without first reaching agreement with the School District Administration or the School District Administration's designee. However, in this situation, the SRO shall notify the School District Administration or the School District Administration's designee as soon as possible after the student or employee has been taken into custody.

Any arrest effected on school property shall be done within the confines of the law.

19. INDEMNIFICATION AND HOLD HARMLESS

The Village and the Police Department agree to defend, indemnify, and hold harmless the School District, its school board, officers, administration, employees, agents, and volunteers, individually and collectively, from and against all costs, losses, claims, demands, actions, suits, attorney fees, costs, and judgments arising from personal injuries, property damage, or otherwise, that may arise from or alleged to be caused by the Village or the Police Department's negligence as a result of the services, equipment, property owned, leased, or rented, or other activities as shown in this Agreement. The Village and Police Department agree to provide a certificate of insurance for liability coverages satisfactory to the School District and name the School District as an additional insured on the Village and Police Department's certificate of insurance.

The School District agrees to defend, indemnify, and hold harmless the Village and the Police Department, its officers, employees, agents, and volunteers, individually and collectively, from and against all costs, losses, claims, demands, actions, suits, attorney fees, costs, and judgments arising from personal injuries, property damage, or otherwise, that may arise from or alleged to be caused by the School District's negligence as a result of the School District's use or occupancy of the School District's facilities, equipment, property owned, leased, or rented, or other activities as shown in this Agreement. The School District further agrees to provide a certificate of insurance for liability coverages satisfactory to the Village and the Police Department and name the Village and Police Department as an additional insured on the School District's certificate of insurance.

20. INSURANCE

The Village and Police Department acknowledge their obligation to obtain and maintain throughout the term of this Agreement appropriate insurance coverage for the benefit of the Village and the Police Department, as well as the employees of the Village and the Police Department. The Village and the Police Department waive any rights to recovery from the School District for any injuries the employees of the Village or the Police Department may sustain or cause while performing services under this Agreement that are a result of the negligence of the Village, the Police Department, or the employees of the Village or the Police Department.

21. NON-WAIVER

Nothing herein is intended or shall be construed as a waiver of defenses or immunities (including the limitations of Wis. Stat. § 893.80) available under the law which the Village, the Police Department, or the School District are entitled to raise, nor shall purchase of insurance by the Village, Police Department, or the School District constitute a waiver of any such defenses and immunities.

22. AMENDMENTS

The Agreement may be amended only upon the mutual written agreement executed by all parties.

IN WITNESS WHEREOF, the Village of Williams Bay, the Williams Bay Police Department, and the Williams Bay School District have caused this Agreement to be executed by their duly authorized representatives as of the day and year below.

FOR THE VILLAGE OF WILLIAMS BAY

Walter B. Duncanson
Village President

03/21/2019
Date

FOR THE WILLIAMS BAY POLICE DEPARTMENT

Chris F. Secrest
Chief of Police

3-21-19
Date

FOR THE WILLIAMS BAY SCHOOL DISTRICT

D. Wayne R. Cash
District Administrator

Paul Lathin
School Board President

2/11/19
Date

2/11/19
Date

Squad Car	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
291(unmarked)	441	924	25		2547	776	1	3	232	925	638	73	6585
292	5	756	2154	1586	1851	1588	1768	1687	1564	1478	1339	1475	17251
293	680	769	1672	1789	1328	2280	1508	2180	2096	1879	3634	2761	22576
294	3612	2075	675	763	1273	924	781	2362	1615	1501	1189	1583	18353
Total	4738	4524	4526	4138	6999	5568	4058	6232	5507	5783	6800	5892	64765

	mileage end												
291	123372	124296	124321		126868	127644	127665	127668	127900	128825	129463	129536	
292	47418	48174	50328	51914	53765	55353	57121	58808	60372	61850	63189	64664	
293	87931	88700	90372	92161	93489	95769	97277	99457	101553	103432	107066	109827	
294	15027	17102	17777	18540	19813	20737	21518	23880	25495	26996	28185	29768	

Squad Car	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
291(unmarked)	68	321						596	20	1165	477	5	2652
292	1225	742	1124	1822	2171	1852	1618	2294	1774	1702	1033	1688	19045
293	2421	2036	2937	588	1736	2093	2125	1778	1329	1215	770	1495	20523
294	1196	1026	1137	1039	2798	2167	2371	1848	1655	2073	1388	2436	21134
Total	4910	4125	5198	3449	6705	6112	6114	6516	4778	6155	3668	5624	63354
	ENDING MILEAGE												
291	129604	129925	129925	129925	129925	129925	129925	130521	130541	131706	132183	132188	
292	65889	66631	67773	69595	71766	73618	75236	77530	79304	81006	82039	83727	
293	112248	114284	117221	588	2324	4417	6542	8320	9649	10864	11634	13129	
294	30964	31990	33127	34166	36964	39131	41502	43350	45005	47078	48466	50902	

Squad Car	Jan	Feb	Mar	Apr	May
291(unmarked)					
292	531	114			
293	1050	1227			
294	1228	1995			
Total	2809	3336	0	0	0

	ENDING MILEAGE				
291					
292	84258	84372			
293	14179	15406			
294	52130	54125			

Jun	Jul	Aug	Sept	Oct	Nov
0	0	0	0	0	0

Dec	Total
	0
	645
	2277
	3223
0	6145



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UNOFFICIAL MINUTES FINANCE AND PERSONNEL COMMITTEE MONDAY, FEBRAURY 10, 2021 AT 6:30 PM VIA TELECONFERENCE

Call to Order

Meeting was called to order by Chairman Parker at 7:35pm

Roll Call

Trustees Parker, D'Alessandro, and Wright.

Also Present: President Duncan, Trustees McMannamy and Umans, Interim Administrator Bretl, Treasurer Peternell, Public Works Director Edwards, Police Chief Timm and Recreation Director Rowland.

Meeting Minutes

D'Alessandro/Wright motion to approve meeting minutes of January 13, 2021. Unanimously carried.
Wright/D'Alessandro motion to approve meeting minutes of January 18, 2021. Unanimously carried.

Municipal Business Lease

Parker stated that the Temporary Use permit was approved by the Board in January with the condition that the municipal business lease be approved by the Finance Committee. The Committee reviewed the prior year's lease as reference. Wright/D'Alessandro motion to recommend Village Board approval of the Municipal Business lease with Dip In The Bay, LLC and John Dwyer. Unanimously carried.

Kayak and Paddleboard Rental Business Plan

Discussion was held regarding the business plan as presented. It was the consensus to track hours as part of the proforma analysis. D'Alessandro/Wright motion to recommend Village Board approval of the Kayak and Paddleboard Rental Business Plan. Unanimously carried.

Austin Pier Service Contract

Discussion was held regarding the 2-year contract proposal from Austin Pier Service. Parker inquired about previous discussions about bidding this in 2021. It was the consensus of the Committee to review what was discussed in 2020 prior to acting on proposal.

Request by T-Mobile to upgrade certain communications equipment on the Olive Street Water Tower

D'Alessandro/Wright motion to enter into closed session at 7:54pm pursuant to the exemption contained in section 19.85 (1)(e) of the Wisconsin Statutes for the purpose of considering other specified public business whenever bargaining or competitive reasons require a closed session.
Roll Call Vote: Parker-Aye, D'Alessandro-Aye, Wright-Aye. Unanimously carried.

D'Alessandro/Wright motion to reconvene into open session at 8:09pm. Unanimously carried.

Discussion and possible action on the request by T-Mobile to upgrade certain communications equipment on the Olive Street Water Tower

It was the consensus of the Committee to notify T-Mobile that the tower will be repainted in 2 years. The Village engineer will send their recommendation and request an acknowledgment of the information received.

Adjourn

D'Alessandro/Wright motion to adjourn at 8:30pm. Unanimously carried.

/s/ Lori Peternell, Village Treasurer

These are not official minutes until approved by the Finance & Personnel Committee

A Staffing Analysis of the Village of Williams Bay Police Department

More than twenty years ago, professionals in PSAPs (Public Safety Answering Points – Dispatch) and the emergency communications field got together to discuss the issues of high turnover rates and to determine what is proper staffing. APCO (the Association of Public Safety Communications Officials) took on this issue, which resulted in Project 40. Also known as Project RETAINS (**R**esponsive **E**fforts **T**o **A**ddress **I**ntegral **N**eeds in **S**taffing), it was created and promulgated in 1999, in order to address the issue of high turnover in public-safety communications. A best practice in determining the appropriate staffing levels is to use a system that has been extensively detailed, researched and based on facts. **I have taken that process and modified it for police officers.**

There are several steps to complete that must be based on data from the organization in order to determine the appropriate staffing levels. The key is to collect at least three years of data, then average the numbers to help eliminate any anomalies such as a significant event that might affect the data one way or another. While not all the data required for dispatching is pertinent to the staffing of police officers, the Chief has been able to provide sufficient data to analyze his department's staffing needs.

First the schedule worked:

Over the years, I have come across a variety of schedules used by PSAPs and Police departments. Some as simple as the following examples and some much more complicated. Each has its advantages and disadvantages; some favor management in that the employees work closer to the 2,080-hours a year that a traditional 5-day a week schedule provides, and some favor the employees desire to have as much time off as possible.

The following chart contains the most typical schedules found in PSAPs and Police Departments and are based on a 365-day year, not 365.25 if you were to include a leap year in with a 4-year average:

Examples of Staffing Schedules	Days Working	Days Off	Days in Rotation	Rotations per Year	Days Worked	Hours Worked	Days Off
5/2-5/2	10	4	14	26.07	260.71	2085.71	104.29
5/2-5/2-6/3	16	7	23	15.87	253.91	2031.30	111.09
5/2-6/3	11	5	16	22.81	250.94	2007.50	114.06
5/2-5/2-5/3	15	7	22	16.59	248.86	1990.91	116.14
5/2-5/3	10	5	15	24.33	243.33	1946.67	121.67
4/2-4/2	8	4	12	30.42	243.33	1946.67	121.67

A Staffing Analysis of the Village of Williams Bay Police Department

Some highlights of the impact of each of these schedules and insight as to what, in my professional experience, helps to retain staff and provide the best working environment:

The 5/2-5/2 rotation results in fixed days off.

- Some employees always get the weekends off, while others never get weekends off. Benefits and punishes a portion of the staff.
- The employees work the greatest number of days a year.
- This schedule is not recommended by because newer employees typically do not get any weekends off for years, which leads to a higher turnover rate.

The 5/2-5/2-6/3 rotation provides for the second most hours worked in a year.

- Provides for rotating days off.
- 3-days off in a row each rotation,
- Requires the employee to work 6-days in a row at least 15.87 times a year.
- I do not recommend employees work 6-days in a row before any voluntary or mandatory overtime. Without the ability to have time off, employees experience burn-out and the quality of their work may suffer.

The 5/2-6/3 rotation

- Changes days off more quickly than the current schedule,
- Employees are schedule to work 6-days in a row 22.81 times a year.
- I do not recommend a schedule that has employees' constantly working 6-days in a row before any voluntary or mandatory overtime. Without the ability to have time off, employees experience burn-out and the quality of their work may suffer.

The 5/2-5/2-5/3 schedule (Currently used by Williams Bay)

- Changes days off after each rotation.
- 3-days off in a row 16.59 times a year.
- Employees work only 248.86 days a year.
- I believe that this is an advantageous schedule for the police officers, with management reaping the operational and financial benefit of staff that have a good work and personal life balance.

The 5/2-5/3 schedule

- Changes days off most often,
- 3-days off in a row 24.33 times a year,
- Employees work only 243.33 days a year.
- I believe that this is an advantageous schedule for police officers that provide days off changing every 15-days, but management would need additional personnel because of the smaller number of hours scheduled to worked in a year.

A Staffing Analysis of the Village of Williams Bay Police Department

The 4/2-4/2 schedule is utilized more on the east coast than the Midwest.

- Provides the employees with as many days off as the 5/2-5/3 schedule,
- No 3-days off in a row.
- Most often found where personnel work 10 or 12-hour shifts.
- I believe that this is another advantageous schedule for police officers that provide days off changing every 15-days, but management would need additional personnel because of the smaller number of hours worked in a year.

The Williams Bay Police Department is using one of the better scheduling models in that employees are both working enough hours and getting sufficient time off (including the occasional weekends) and, it is cost effective to the Village.

How many positions to review:

One of the first factors to look at is how many officers work and when. Since the Chief does not normally perform patrol duties but does occasionally fill in when an officer is not available, and is not replaced when he is in training, on vacation, or performing other tasks, we will not use his position in determining the full-time equivalents needed.

The Lieutenants position is assigned to patrol duties and should be used in calculating staffing needs. We understand that currently if he is unavailable for his assigned shift he may not be replaced, but if you are trying to determine your actual staffing needs each position must be used.

Williams Bay, being a resort Village in the summer months, adjusts the number of officers on duty based on time of year. Since 269 days (74% of the year) are considered the “non-summer schedule”, and 96 days (26% of the year) are considered the “summer schedule” and it requires additional staffing for a power shift, we need account for the differences when calculating hours needed and establishing FTEs (full time equivalents).

The Chief is scheduled to work a fixed, 5-day schedule, while the Lieutenant and police officers work the 5/2, 5/2, 5/3 schedule on assigned shifts. These shifts can be designated as days, mids and nights, each 8-hours in length.

For non-summer days you have one officer assigned per shift:

8-hours per shift per 7-days a week = 56 hours. Times three shifts = 168 hours a week or 24- hours a day.

If we add the Lieutenant’s average weekly scheduled 38.29 hours, for the 6 PM to 2 AM shift, that will add 38.29 hours a week to the 168 hours for patrol offices which increases that to 206.29 hours a week and adds 5.71 more hours per day for a total average of 29.47 hours a day.

A Staffing Analysis of the Village of Williams Bay Police Department

For summer days schedule:

You have the same schedule of shifts and hours as the non-summer schedule with the addition of a power or swing shift from 10 AM to 6 PM, again focused on the weekends.

Adding another shift for 38.29 hours a week brings the average of hours for the week from 206.29 to 244.58 or an average of 34.94 hours a day.

This results in:

29.47 hours a day are required 74% of the time or $(269 \text{ days} \times 29.47) = 7,927.43$ hours

34.94 hours a day are required 26% of the time or $(96 \text{ days} \times 34.94) = 3,354.24$ hours

Adding $(7,927.43 + 3,354.24) = 11,281.67$ total annual hours to be covered.

Since a year includes 8,760 hours, we must divide the total hours to be covered of 11,281.67 by that which gives us an average of **1.3 positions**. This number will then be used in the RETAINS formular for number of positions needed.

Project RETAINS formulars:

Determining Net Available Hours:

A best practice in determining the appropriate staffing levels is to use a system that has been extensively detailed, researched and based on facts.

The process to determine the recommended staffing begins with calculating the Net Available Work Hours per employee. The first step is to determine the total number of hours an employee is available for work in a year and then subtract all vacation and holiday leaves, as well as training and other times when a staff member is not available to work at their position or schedule. I have not deducted hours for meal breaks, as the department does not hire additional staff to cover those times.

The following table is the first step in determining the appropriate staffing levels. This table includes historical data for 3-years, which is then averaged in order to mitigate any anomalies. I obtained data from the Police Chief through interviews and phone calls.

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A Staffing Analysis of the Village of Williams Bay Police Department

Average Hours	Current
Number of hours per employee	8
5/2-5/2-5/3 schedule = 248 days a year	248
Available work hours	
A. Total hours for one full time employee	1,984.00
B. Average vacation and leave in hours	132.00
C. Average sick leave in hours	5.00
D. Average personal leave in hours	24.00
E. Average training leave in hours	35.00
F. Average Military, FMLA, etc. in hours	294.67
G. Average time in court in hours	12.50
H. Average other hours	0.00
I. Total unavailable time in hours (B through H)	503.17
J. Net available work hours (NAWH = A-I)	1,480.83

On average an employee (LT. and Officers) is available to work their assigned shift/hours 1,481-hours a year. Since their scheduled amount is 1,984-hours, they are available to work their scheduled hours only 75% of the time.

Determining retention or turnover rate:

The second step involves calculating the **Average Turnover Rate** of those employees serving in the Lieutenant and patrol officer positions. Turnover rate refers to the percentage of personnel who leave in a year. The column is based on the agency's three-year historical data. While I know the most recent turnover rate for telecommunicators national is 29%, I do not know what it is for law enforcement personnel but believe it could be slightly less.

Average turnover rate	Current
A. Number of full-time police officers	7
B. Number of full timers who quit or were fired	1.66
C. Number of experienced dispatchers who retired	0.00
D. Turnover rate (B/C/A)	23.71%
E. Retention rate	76.29%

Determining number of positions needed:

The third step in calculating the appropriate staffing requirements is to identify how many positions need to be staffed and then determine how many days and hours are needed to handle that requisite during a 12-month period. Staffing can then be calculated based on the number of positions needed, the available hours of the employees and the turnover rate. This provides the required appropriate full-time equivalent ("FTE") number.

A Staffing Analysis of the Village of Williams Bay Police Department

Cover positions not effected by activity	<u>Current</u>
A. Number of positions to be covered	1.30
B. Number of hours per day	24.00
C. Number of days per week	7.00
D. Number of weeks per year	52.00
E. Total hours needing coverage (AxBxCxD)	11,356.80
Employee availability:	
F. Net available hours	1,480.83
Staff needed:	
G. Full time equivalent (E/F)	7.67
H. Turnover rate (in decimal)	0.24
I. FTE with adjustments (Gx1/H)	9.49

As the data shows, if fully staffed, the number of employees needed to cover the three standard shifts and the Lieutenant's split shift for the non-summer days, plus the 96 days in the summer months for the additional power shift, amounts to an average of 1.3 positions every day. When turnover rate is factored in the number of FTE's for the 7-full time positions is 9.49. This is 2.49 FTEs short of what the Village currently has.

If the one individual, you have on extended military leave was gone for only one third the time he currently has been your FTE would equal 8.38, but we must use actual data to be as accurate as possible.

What have you done to address this shortage?

- You can the hire overtime – which is expensive.
- You cannot fill some of those hours – which you have been doing.
- You can utilize part time employees – turnover is too high.
- You can and have done all four.

The police department turnover rate for part timers is extremely high (you lost 11 in three years). In addition, currently only one of the four-part timers on the roster is working almost a full schedule while one works only 8 hours a year, another works 8 hours a month, and one has basically not worked for a couple of years. It takes 12-weeks to train a part timer and if they are not productive members of the department, they are not an effective nor efficient method to cover the needed hours.

You certainly have the justification to consider hiring one more full-time officer instead of not filling some of those hours and trying to cover so many hours with overtime and part timers.

**LEASE AGREEMENT BETWEEN
VILLAGE OF WILLIAMS BAY AND
T-MOBILE CENTRAL LLC**

Lease Agreement dated May 11, 2009 ("Effective Date") by and between the Village of Williams Bay ("Village"), a Wisconsin municipal corporation, and T-Mobile Central LLC, a Delaware limited liability company, with an office at 2001 Butterfield Road, Suite 1900, Downers Grove, IL 60515 ("Company").

RECITALS

A. Village of Williams Bay owns the northwest water tower on Olive Street and the surrounding property, located in the Village of Williams Bay, Walworth County, Wisconsin, as more particularly described in the attached Exhibit A (the "Property").

B. Company desires to construct, install, maintain and operate on the Property, at its expense, certain communications facilities, including, but not limited to, antennas, panels, mounting equipment, and an equipment shelter building specifically described in Exhibit B (the "Communications Facilities").

NOW, THEREFORE, FOR VALUABLE CONSIDERATION AND INTENDING TO BE BOUND, VILLAGE AND COMPANY AGREE AS FOLLOWS:

1. Recitals. The Recitals are incorporated and form a part of this Agreement.
2. Lease. Village hereby grants Company a nonexclusive lease to construct, install, maintain, remove and operate the Communications Facilities, as described in Exhibit B, on part of the Property, in the specific location designated on construction plans and drawings approved by Village, which shall be attached hereto and incorporated herein as Exhibit C (the "Premises"). Village further authorizes Company, where appropriate, to attach the Communications Facilities to a water tower located on Premises, which structure also shall be designated on the construction plans and drawings approved by the Village and attached hereto as Exhibit C (the "Water Tower"). Company shall make no other use of the Premises. The parties expressly understand and agree that this Agreement shall not be revoked or otherwise terminated except by expiration of its terms or as provided in this Agreement.
3. Term. The initial term of this Agreement shall be for a period of five (5) years, commencing on the date Company obtains all necessary Village, State, Local and Federal approvals (the "Commencement Date"), and ending on the fifth anniversary thereof. Thereafter, the Company shall have the right to renew this Lease for up to five (5) successive five (5) year renewal terms. The renewals shall be automatic unless Company provides the Village with written notice of non-renewal at least sixty (60) days prior to the expiration of the then current term. Village may then pursue an alternate carrier for the site and the Company may upon providing the Village with written notice of non-renewal, pursue an alternative private site. The Village agrees it will process applications for conditional use permits and/or any other necessary government approvals for alternate sites in a timely and cooperative manner.
4. Fees Per Site.
 - a) Rent shall be paid in annual installments. The initial annual rent shall be Fourteen Thousand Four Hundred and 00/100 Dollars (\$14,400.00). The first payment of rent, which shall be pro-rated for any partial year, shall be paid within thirty (30) days of the Commencement Date and thereafter, rent shall be paid on or before the 10th day of January each year, to the Village c/o Williams Bay Water Department or to such other person, firm, or place as Village may from time to time designate in writing at least thirty days in advance of any rental payment due. Commencing on the 1st of each year, the annual rent shall be increased by five percent (5%) or an amount equal to the percentage change from the previous year in the Consumer Price Index published by the US Department of Labor, Bureau of Labor Statistics (U.S. City Average), whichever is greater.

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b) All consideration to be provided by Company to Village, or Village's assignee, shall be paid without offset. The fee hereunder is reserved on an absolute net basis. Company shall pay to the persons entitled thereto all taxes, assessments, insurance premiums, maintenance charges and any other charges, costs and expenses directly attributable to the Communication Facilities identified in this Agreement. Village agrees to provide a completed IRS Form W-9 to Company within twenty (20) days of the full execution of this Agreement.

5. Compliance With Laws. Throughout the term of this Agreement, Company shall continuously use the Premises for the purpose of constructing, maintaining, removing and operating facilities for the transmission and reception of radio communication signals in such frequencies as may be assigned to Company by the Federal Communications Commission ("FCC"). Company, at its expense, shall diligently, faithfully and promptly obey and conform with all federal, state and local orders, rules, regulations and laws, including all FCC and Federal Aviation Administration rules, in relation to any of its business, activities or other operations conducted upon, above or adjacent to the Premises and including the American National Standards Institute's ("ANSI") "Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields" as set forth in the current ANSI standard or any FCC standard which supersedes this standard. Company shall pay, as they become due and payable, all fees, charges, taxes and expenses required for licenses and permits required for Company's use of the Premises.

6. Installation and Maintenance of Communication Facilities.

a) Company shall, at its sole cost and expense, construct, install, operate, and maintain the Communications Facilities on the Premises. Company's installation of the Communications Facilities shall be completed in a neat and workmanlike manner in accordance with sound engineering practices, applicable rules, regulations and laws and in strict compliance with Exhibit C. All work shall be performed either by Company or by a fully qualified independent contractor who carries all insurance required under Paragraph 11 and who has been reasonably approved in writing by Village before such contractor has done any work on the Premises.

Regarding any independent contractor employed by Company to work on the Premises, certificates of all insurance coverages required under this Agreement shall be provided to Village by Company prior to the commencement of any work upon the Premises by such contractor. All of the Communications Facilities are and shall remain the exclusive property of Company.

b) Company, at its expense, and within ninety (90) days after the installation of the Communications Facilities, shall provide to Village "as built," planning and engineering drawings of the Communications Facilities, which shall not include any proprietary information. Such drawings shall be accompanied by a complete and detailed inventory of all Communications Facilities actually placed on the Water Tower, all of which shall be attached hereto and incorporated herein as Exhibit D.

c) Any damage done to the Property by Company or its contractors during installation or during operations due to the Company's actions, shall be immediately repaired by Company at Company's expense and returned to the condition in which it existed immediately prior to the damage. In the event of any damage to the interior of the Water Tower caused by the installation of the Communication Facilities, Village shall cause same to be repaired by a contractor of its choice and Company shall promptly reimburse the Village for such cost. Company shall pay all costs and expenses in relation to repairing any damage caused by its installation or operation of the Communications Facilities on the Water Tower. Company shall not permit any claim or lien to be placed against any part of the Property that arises out of work, labor, material or supplies provided or supplied to Company, its contractors or subcontractors, for the installation, construction, operation, maintenance or use of the Premises or Communications Facilities.

d) Company shall design, place and improve all of its Communications Facilities in a manner that will keep aesthetic impact held to a minimum practical level. Village reserves the right to require Company to paint the Communications Facilities on the Water Tower and shield the Communications Facilities on the ground from view and take such other reasonable and appropriate action as Village determines necessary or convenient to minimize the aesthetic impact to the Water Tower.

e) Company shall separately meter charges for the consumption of electricity and any other utilities associated with its use of the Premises and shall pay all costs associated therewith.

f) Company, at its expense, shall have sole responsibility for the maintenance, repair, and security of its Communications Facilities and shall keep the same in good repair and condition during the term of this Agreement.

g) A landscaping plan for the site shall be proposed and approved by Village prior to the Commencement Date. Company, at its expense, shall install and maintain its landscaping according to the approved landscape plan, which shall be attached hereto and incorporated herein as Exhibit E.

h) Village shall notify Company at least forty-five (45) days in advance of the date when the Water Tower is scheduled to be painted. Village shall decide, after consulting with Company, which of the following two options shall be used.

Option 1: Shortly before the painting date, Company, at its sole expense, shall place a temporary antenna array on a crane parked near the site. Company shall then remove the antennas from the Water Tower and the painting shall proceed as it normally does. Once the painting is finished, Company, at its sole expense, shall then re-attach the antennas where they were and shall have them painted to match the newly painted Water Tower.

Option 2: The painting contractor will bid on the cost of painting the Water Tower without the Communications Facilities. The contractor will then bid on the cost of painting the Water Tower with the Company's antennas left in place. The contractor will then proceed to paint the Water Tower with Company's antennas left in place. Company shall reimburse Village for the difference between the two bids, or if there is more than one (1) carrier on the Water Tower, then each carrier shall pay an equal pro-rata share of the difference between the two bids.

i) Any additional costs for servicing or maintaining the Water Tower that are due to the presence of the Communications Facilities, including additional driveway asphalt and snow plowing/ice control (if requested by Company), shall be the responsibility of Company and shall be paid by Company. Company shall abate or remove graffiti from the Communications Facilities within thirty (30) days of receipt of Village's written notice regarding same.

7. Modifications. Company shall not expand the Premises beyond the space shown in Exhibit C, nor shall it make any additions, alterations or improvements to the Water Tower or Property without the Village's prior written approval. Company shall submit to Village a proposal for any such modifications and any supplemental materials as may be requested for Village's prompt evaluation and approval. If approved, such modifications shall be made at Company's sole expense and only upon it first obtaining all necessary governmental approvals and permits for such modifications, which the Village nor any department thereof shall unreasonably delay. On making such modifications, Company shall provide to Village updated "as built" planning and engineering drawings as specified in Paragraph 6 (b). Modifications that result in expansion of Premises described in Exhibit C or an increase in the number of antennas, panels or feedlines may result in a demand for an increased fee. Notwithstanding any provision in this paragraph to the contrary, without obtaining Village's prior consent, Company shall have the right to replace or repair and maintenance purposes equipment installed on or about the Property with replacement equipment of a substantially similar kind which is installed in substantially the same place and position as the replaced equipment.

8. Studies. Prior to approving any installation under Paragraph 6 or modification under Paragraph 7, Company shall provide studies consistent with ANSI standards, to determine whether Company's proposed installation or modification will interfere with the electronic equipment of Village or other licensees of the Village operating on the Property as of the installation or modification date, as the case may be, or adjacent property owners who are operating lawfully within their electronic equipment's intended use.. Prior to installation of its antennas on the Water Tower, Company will also provide a Wisconsin PE stamped structural engineering study to determine whether the proposed installation or modification will adversely affect the structural integrity of any part of the Water Tower and, upon Village's

request, Company will pay for an independent review of that study by an engineering consultant chosen by the Village.

9. Access.

a) Subject to Paragraph 9 (e), Company shall have unlimited access to all parts of the Premises including those parts designated as access areas in Exhibit C.

b) Notwithstanding the above, nothing in this Agreement shall preclude Village from licensing or leasing other space on the Water Tower or Property to a personal communications service or cellular provider ("Other Provider") that may be in competition with Company or to any other entity, provided that such Other Provider(s) or other entity does not interfere with Company's facility or operations. Other Providers shall also have the right to construct and use such ancillary equipment shelter buildings or other facilities on the Property as may be reasonably necessary in connection with the communications operations of the Other Providers, except in no event may such Other Provider use Company's facilities without first obtaining Company's prior written approval, which may be withheld in its sole discretion.

c) Company shall supply to the Village a list of types of categories of professionals that it requests be given access to the Water Tower ("Designated Professionals"). Village shall not give access to the Water Tower to any person who does not provide adequate credentials as a Designated Professional at the time access is required.

d) If Company or a Designated Professional requires access to the Water Tower or any part thereof, Company shall contact the Williams Bay Water Department at the following telephone number: (262) 949-2808. Company shall, on demand, pay to Village the rate of Thirty Dollars (\$30.00) per hour for the person who provides Company with such access. Village shall respond to Company's request with two (2) hours, 24 hours/day and 7 days/week. This shall not include access by Company to the equipment shelter building, which Company may access at anytime without notice to Village.

e) Company shall admit Village, its employees or its agents to any part of the Communications Facilities used or occupied by the Company, upon reasonable notice, not less than two (2) business days.

10. Interference.

a) Company's installation, operation, and use of the Communications Facilities shall not damage or interfere in any way with the Village's operations or related repair and maintenance activities of the Water Tower. In the event it is determined that interference exists, Company, at its expense, shall eliminate such interference within forty-eight (48) hours of receiving notice from Village. In the event of an emergency which threatens the public health and safety, Village reserves the right to take any action it deems necessary, in its sole discretion, to respond to the emergency and to temporarily interfere with Company's Communications Facilities as may be necessary in order to protect the public health and safety, provided that it also notify Company of its actions and the emergency as soon as reasonably practicable thereafter. For all maintenance and repair of the Water Tower, Village agrees to give Company at least sixty (60) days advance written notice of such activities to Company and to reasonably cooperate with Company to carry out such activities with a minimum amount of interference with Company's transmission operations.

b) Company warrants and represents that the Communications Facilities and the installation, operation and maintenance of the Communications Facilities shall not interfere with the operation of Village's existing electronic equipment as of the date of the Effective Date, wherever located on the Property, or with the electronic equipment of any other of Village's existing licensees or lessees operating on the Property as of the Effective Date, wherever located on the Property, or of adjacent property owners as stated above in Paragraph 8. If such interference occurs, upon Company's receipt of written notice from Village, Company shall promptly investigate the same. If investigation reveals that the Company is causing the interference, Company shall promptly take all steps necessary to correct and eliminate the interference at Company's cost; if the interference cannot be alleviated, Company shall cease operation of the interfering equipment. Company shall not resume operation of said equipment until such time as Company has effectively eliminated the interference, except to allow for necessary testing. If Company is unable to eliminate the interference within a reasonable period of time, Company shall have the option to

terminate this Agreement and remove the Communications Facilities from the Premises. Upon such termination, Company will not receive a refund of any monies paid to date but will not be required to pay any further annual lease fees.

c) Village makes no warranties regarding Company's exclusive use of the Property, except as to the Premises, or non-interference with Company's transmission operations or that the Property or utilities serving the Property, if any, are fit for Company's intended use and all such warranties are hereby disclaimed.

Notwithstanding the above, Village agrees that each of its agreements with other licensees or lessees shall contain a provision substantially the same as Paragraph 10 (b) and that Village shall enforce such provision in a nondiscriminatory manner with respect to all of its licensees or lessees. In the event interference from Village's other licensees or lessees on the Property does not cease promptly, the parties acknowledge that continuing interference may cause irreparable injury and, Company shall have the right, in addition to any other rights that it may have at law or in equity, to bring a court action to enjoin such interference or to terminate this Agreement immediately upon thirty (30) days written notice and Village's failure to cure in such time period.

11. Insurance.

a) General. At all times during the term of this Agreement, Company shall keep in force and effect all insurance policies as outlines below. The insurer must be authorized to do business under the laws of the State of Wisconsin and have an "A-" or better rating in Best's Guide. All contractors and all of their subcontractors who perform work on the Property shall carry, in full force and effect, workers' compensation, commercial general liability and automobile liability insurance coverages of the type the Company is required to obtain under this paragraph with the same limits. Prior to the execution of this Agreement and prior to each insurance policy expiration date during the term of this Agreement, Company will furnish Village with a Certificate of Insurance. The Certificate shall reference this Agreement and worker's compensation required by this Agreement. Village will be given thirty (30) days advance notice of cancellation or non-renewal of insurance during the term of this Agreement and any language relieving insurer of its obligation to provide such notice shall be deleted. Village, its council, boards, Villages, agencies, officers, employees and representatives (collectively "Additional Insureds") shall be named as additional insureds under all of the policies, except workers' compensation policies, which shall be so stated on the Certificate of Insurance and such insurance shall be primary as to Company's negligence. All policies, other than workers' compensation, shall be written on an occurrence and not on a claims-made basis.

All policies may be written with deductibles. Company shall defend, indemnify and hold harmless Village and Additional Insureds from and against payment of any deductible and payment of any premium on any policy required under this paragraph.

b) Workers' Compensation and Employers' Liability Insurance. Statutory workers' compensation benefits and employers' liability insurance with a limit of liability no less than \$100,000 each accident. Company shall require subcontractors and others not protected under its insurance to obtain and maintain such insurance.

c) Commercial General Liability Insurance ("CGLI"). Policy will be written to provide coverage for, but not limited to, the following: premises and operations, products and completed operations, personal injury, blanket contractual coverage, broad form property damage, independent contractor's coverage and coverage for property damage from perils of explosion, collapse or damage to underground utilities (commonly know as XCU coverage). Limits of liability not less than \$1,000,000 general aggregate, \$1,000,000 products/completed operations aggregate, \$1,000,000 personal injury, \$1,000,000 each occurrence. Coverage shall not contain a standard form pollution exclusion, nor shall it exclude claims or suits that arise from the effects of electromagnetic field or radiation. To the extent such coverage cannot be obtained through CGLI, Company shall obtain equivalent insurance to insure the property against environmental hazards.

d) Automobile Liability Insurance. Business automobile policy covering all owned, hired and non-owned private passenger autos and commercial vehicles. Limits of liability not less than \$1,000,000 each occurrence, \$1,000,000 aggregate.

e) Umbrella Liability Insurance. Coverage to be in excess of employers' liability, commercial general liability, and automobile liability insurance required above. Limits of liability not less than \$3,000,000 each occurrence, \$3,000,000 aggregate.

The aforesaid limits of liability may be increased or decreased by mutual consent of the parties, which consent will not be unreasonably withheld by either party, in the event of any factors or occurrences, including substantial increases in the level of jury verdicts or judgments or the passage of state, federal or other governmental compensation plans, or laws which would materially increase or decrease Village's or Company's exposure to risk.

f) Worker's Compensation. Village shall not be liable to Company, Company's contractors or their subcontractors, for any injuries to Company's employees or those of its contractors or their subcontractors arising out of or in connection with the grant of this Agreement, including any and all work of any type performed upon the Premises or Property, including injuries arising during equipment installation, alteration, modification, improvement, maintenance, repair, replacement, or use, or ingress or egress to or from the Property unless caused by the willful acts of bad faith or the negligence of Village, its agents or employees.

Company, for itself and its contractors and their subcontractors, agrees that the indemnification and hold harmless provisions with this Agreement extends to any such claims brought by or on behalf of any employee of Company, any contractor of Company or their subcontractors.

g) Property Insurance. Each party will be responsible for maintaining property insurance on its own building and other improvements, including all equipment, fixtures, utility structure, fencing, or support systems that may be built or placed upon the Property to fully protect against hazards of fire, vandalism and malicious mischief, and such other perils as are covered by policies of insurance commonly referred to and known as "extended coverage" insurance or self-insure such exposures. To the extent covered by property insurance, Company and Village hereby release each other from and waive all rights against each other for any loss or damage to property caused by fire or other peril if the property is insured for such loss or damage in any policy of insurance even if such loss or damage is caused by the fault or negligence of the other party or anyone for whom such party is responsible.

12. Damage or Destruction of Property. If the Water Tower or Premises are destroyed or damaged, in no way due to the fault of Company, to an extent that in the sole judgment of Company, materially and substantially limits Company's effective use of the Communications Facilities, the Company may terminate this Agreement by giving thirty (30) days notice to the Village. As of the date of such notice, Company's payments shall be pro-rated for that year and returned at that time and Company's payments shall only resume if the Water Tower is restored. Regardless of any other provisions contained in this Agreement, Village shall have no obligation to rebuild or restore any part of the Water Tower in the event of any such damage or destruction. In the event of damage or destruction of property, Company shall have the right to erect and maintain temporary communications facilities on the Property at a location as close as reasonably possible to the location of the Water Tower for a period of up to one (1) year at the then current rental rate for the purpose of continuing to provide service to the community while Company seeks to permit another site.

13. Indemnification. Company shall defend, indemnify and hold harmless Village and all associated, affiliated, allied and subsidiary entities of Village, whether existing now or in the future, and their respective officials, officers, departments, agencies, counties, boards, representatives, employees, agents, contractors and attorneys (collectively "indemnified Parties") against any and all liability, claims, costs, damages, expenses, demands, lawsuits or disputes (including reasonable attorney fees of counsel selected by Village and all other costs and expenses of litigation) to the extent caused by (i) Company's negligence or willful misconduct which causes injury or illness to any person or persons whomsoever or damage to personal property on the Premises and/or the Water Tower, unless caused by the willful misconduct, bad faith or the negligence of Village, its associated, affiliated, allied and subsidiary entities of

Village, whether existing now or in the future, and their respective officials, officers, departments, agencies, counties, boards, representatives, employees, agents and contractors; (ii) work, labor, material or supplies provided or supplied to Company, its contractors or subcontractors, for the installation construction, operation, maintenance or use of the Premises or Communications Facilities, including any claim or lien arising there from; (iii) Company's breach of any warranty, representation, obligation or other provision of this Agreement; (iv) any financing or securities offering by Company or its affiliates for violations of common law or any laws, statutes, or regulations of the State of Wisconsin or United States, including those of the Federal Securities and Exchange Commission, whether by Company or otherwise; and (v) personal injuries due to electromagnetic fields specifically caused by Company.

14. Environmental. Village represents and warrants that (a) no portion of the Property constitutes protected wetland or any similar environmental critical area, (b) no Hazardous Substances are located in, upon or under the Property and (c) no petroleum products are now or (to the best of Village's knowledge) have in the past been stored (whether in tanks or otherwise) on or under the Property or on other lands owned by Village and immediately next to the Property. For purpose of this provision, "Hazardous Substances" includes any substance identified as hazardous, toxic or dangerous in any applicable federal, state, or local law or regulation. Village and Company each represent and covenant to the other that neither will cause contamination of the Property by any Hazardous Substances brought in or upon the Property or on adjacent lands. Each party to this agreement agrees to indemnify and hold the other harmless from any cost, liability or expense (including without limitation, cost of cleanup or fines, reasonable attorney fees, and court or administrative proceedings) (collectively "Claims") incurred by the other on account of contamination by such party of the Property by any Hazardous Substance. Village agrees to defend, indemnify and hold Company harmless from claims resulting from the spill or release of Hazardous Substances in, on or about the Property not caused by Village or Company prior to the Commencement Date of this Agreement. The indemnifications in this section specifically include, without limitation, costs incurred in connection with any investigation of site conditions or any cleanup, remedial, removal or restoration work required by any governmental authority.

15. Taxes; No Liens. Company shall pay and be responsible for any and all personal and real estate taxes and assessments, general and special, levied and assessed against, or with respect to, or measured by, the Premises and the Communications Facilities. If any sales or use, tax is ever assessed or levied against the lease fee, charges payable by Company under this Agreement, Company shall pay that tax within thirty (30) days of receipt of written demand and supporting documentation from Village. Village hereby grants to Company the right to challenge, whether in a Court, Administrative Proceeding, or other venue, on behalf of Village and/or Company, any personal property or real property tax assessments that may affect Company. If Village receives notice of any personal property or real property tax assessment against the Village, which may affect Company and is directly attributable to Company's installation, Village shall provide timely notice of the assessment to Company sufficient to allow Company to consent to or challenge such assessment. Further, Village shall provide to Company any and all documentation associated with the assessment and shall execute any and all documents reasonably necessary to effectuate the intent of this Section 15. Company shall not do anything which might cause or result in shall not permit the filing of a lien against any part of the Property, whether filed against Village or Company. Company shall cause all construction to occur lien-free and in compliance with all applicable laws and ordinances, and shall discharge or bond any mechanic's lien filed or recorded.

16. Limitations. Company undertakes and assumes for its officers, agents, affiliates, contractors and subcontractors and employees (collectively "Company" for the purpose of this Paragraph), all risk of dangerous conditions, if any, on or about the Property. Village shall not be liable for and Company shall defend, indemnify and hold harmless Indemnified Parties from any damage or threat of damage allegedly caused Company, unless caused by the intentions, acts or negligence of the Village or its respective officials, agents, employees or contractors.

Note: No provision of this Agreement is intended, or shall be construed, to be a waiver for any purpose by Village of the provision of Section 893.80 of the Wisconsin Statutes or other applicable limits on municipal liability.

17. Default. Company shall be deemed in default hereunder upon occurrence of any of the following events: (a) Company defaults in the payment of the fee or any other sums to Village when due, and does not cure that default within fifteen (15) days after receipt of written notice; (b) Company defaults in the performance of any other term of this Agreement and Village and does not cure that default within thirty (30) days after written notice thereof by Village, provided that such period shall be extended as reasonably necessary in the event that Company is proceeding in good faith with due diligence to cure such default but is unable to do so within thirty (30) days; (c) Company abandons or vacates the Premises for a period of more than six (6) months; (d) Company files for relief under federal bankruptcy laws or makes any assignment for the benefit of creditors; or (e) Company becomes insolvent.

18. Remedies on Default. In the event of a default by Company which remains uncured after the expiration of all applicable cure periods, Village may, in addition to any other remedy it may have under law, serve a written notice upon Company that Village elects to terminate this Lease upon a specified date not less than ten (10) calendar days after the date of serving such notice, and this Lease shall expire on the date so specified as if that date had been originally fixed as the expiration date of the term granted herein. In the event this Lease is terminated by Village under this provision, Company shall not be entitled to a refund of any rent previously paid to Village.

19. No Nuisances. Company shall not knowingly perform any acts or carry on any practices upon the Premises which may endanger or injure the Water Tower, Premises, Property, or surrounding areas or any person or be a nuisance or menace to adjoining property owners and shall keep the Premises free and clear of its debris, rubbish, junk and garbage.

20. Assignability. Company may assign this Lease to an Affiliate (as defined below) without the consent of Village. If the assignment occurs to a non-affiliate, such assignment shall require the prior written consent of the Village, which shall not be unreasonably withheld or delayed. Upon assignment by Company, Company shall be relieved of all liabilities and obligations hereunder and Village shall look solely to the assignee for performance under this Agreement and all obligations hereunder. "Affiliate" means any present or future, direct or indirect, parent entity, subsidiary or successor of Company's business in Wisconsin or any other partnership, limited liability company, corporation, trust or other entity which is controlled by, controls or is under common control of Company.

21. Termination of Lease.

a) Upon termination or expiration of this Agreement, Company shall at its expense, promptly and diligently remove all of the Communications Facilities and any other personal property installed in or on the Premises and leave the Premises in the same or better condition as existed prior to the date of this Agreement, reasonable wear, tear and damage not caused by Company excepted.

b) If, after the expiration of the first renewal term, if any, Village's governing body votes to redevelop the Property or discontinue use of the Water Tower, which redevelopment requires the removal of Company's Communications Facilities and all other similar uses by any party other than Village itself, then Village may terminate this Lease upon six (6) months' written notice to Company. In the event of such termination, Company shall have the right to erect and maintain temporary communications facilities on the Property at a location as close as reasonably possible to the location of the Water Tower for a period of up to one (1) year at the then current rental rate for the purpose of continuing to provide service to the community while Company seeks to permit another site. Company shall not be obligated to pay any fee hereunder after vacation of the Property and the fee Company paid for the year in which termination occurs shall be prorated from the date Company becomes unable to provide the services and balance shall be refunded to Company within thirty (30) days of termination action by the Village.

c) Company may terminate this Agreement at any time during the term hereof by providing written notice to Village in the event that either (i) any license, permit or other governmental approval of the location or authority cannot be obtained or is canceled, revoked or terminated by the government agency and Company is no longer authorized or able to operate its Communication Facilities from the Premises in the manner contemplated by the Company, or (ii) Village requires relocation pursuant to Paragraph 23 of this Agreement. In addition to the above termination rights, at any time after the initial term, Company may terminate this Agreement upon thirty (30) days written notice if Company determines that the

Property or Water Tower are inappropriate or unnecessary for Company's operations due to economic reasons, or if the Water Tower or the Communications Facilities are, or become unacceptable under Company's design or engineering specifications for its Communications Facilities or the communications system to which the Communications Facilities belong. In the event Company terminates this Agreement for reasons cited in the preceding sentence, Village shall be entitled to keep any prepaid rent for the calendar year, if any, as liquidated damages. Upon the date of termination, Company shall cease operations and have no further obligations under this Agreement.

22. Security for Removal. Company shall provide to Village prior to commencement of the initial term of this Agreement a performance bond, in the amount of Ten Thousand Dollars (\$10,000) when the Communications Facilities are attached to the Water Tower and Twenty Thousand Dollars (\$20,000) if Company constructs its own foundation and tower or monopole, which will be renewed as necessary, to ensure that the Communications Facilities will be removed and the Premises restored at termination or expiration of this Agreement. The Village will be named as the obligee in the bond.

23. Relocation. If, after the expiration of the initial term, if any, unforeseeable and unusual circumstances beyond Village's control necessitate the relocation of the Communications Facilities, Village may, once during the term of this Agreement, including any renewal terms of this Agreement, require Company to relocate the Communications Facilities, to another location on the Property, or, to other property owned or controlled by Village that is located in the general vicinity of the Premises and suitable for Company's Communications Facilities, as determined by the Company, which new location shall then constitute the Premises.

Village shall be responsible for 100% of the relocation costs during the first renewal term of this Agreement.

24. Cost Recovery. Company covenants and agree to pay and discharge all reasonable costs, attorney fees, engineering fees and expenses actually incurred by the Village in the negotiation and preparation of this Lease, however, in no event shall Company be responsible for any fees (including costs and expenses) in excess of Three Thousand Five Hundred Dollars (\$3,500.00). The parties understand that payment of this amount by Company under this paragraph shall be in satisfaction of any obligations to pay attorney fees, engineering fees and expenses under any of the agreements or conditions named in this paragraph.

25. Regulatory Filings. Within sixty (60) days of Village's request, Company shall provide Village with copies of all non proprietary petitions, applications, reports and communications submitted by Company to the FCC, Securities and Exchange Commission or any other federal or state regulatory commission or agency having jurisdiction in respect to any matter affecting this Lease or Company's operation of its Communications Facilities.

26. Survival of Provision. All indemnification obligations under this Agreement, including Paragraphs 11, 13, 14, and 16, shall survive the expiration or earlier termination of this Agreement for a period of three (3) years.

27. Subordination. Company agrees that this Agreement shall be subject and subordinate to any and all mortgages, including all extensions, renewals, amendments, and supplements thereto now or hereafter affecting any part of the Property. Company agrees to execute and deliver promptly any instrument requested by Village or any mortgage, provided that such agreement contains reasonable consent, non-disturbance and attornment provisions to guaranty Company's continued right to use the Premises and access areas in accordance with this Agreement, satisfactory to Company's counsel, in the event that the mortgagee or trustee takes control of the Property.

28. Estoppel Certificate. Company shall, at any time and from time to time upon not less than ten (10) business days prior request by Village, deliver to Village a statement in writing certifying that (i) this Agreement is unmodified and in full force (or if there have been modifications, that the Agreement is in full force as modified and identifying the modifications); (ii) the dates to which the fee and other charges hereunder have been paid; (iii) so far as the person making the certificate knows, Village is not in default under any provision of this Agreement; and (iv) such other matters as Village may reasonably request.

29. No Limitation on Authority. Nothing contained in this Agreement shall limit or interfere with or be construed to limit or interfere with any of Village's rights or powers, including Village's authority in enforcement of its municipal ordinances, including its zoning code.

30. Memorandum of Agreement. The parties hereby agree to execute and record a short form memorandum of this Agreement outlining the basic provisions of this Agreement relating to the initial term, the Company's renewal options and access rights and such other basic terms mutually agreed upon by the parties.

31. Applicable Law and Severability. This Agreement and any interpretation thereof shall be interpreted under the laws and in the courts of the State of Wisconsin. If one or more of the terms hereof are found to be void or invalid, those terms shall be deemed inoperative and null and void, and shall be deemed modified to conform to such rule of law, all without invalidating any of the remaining provisions of this Agreement or the enforceability thereof, which shall continue in full force and effect.

32. Miscellaneous. This Agreement constitutes the entire agreement and understanding of the parties, and supersedes all offers, negotiations, and other agreements of any kind. There are no representations or understandings of any kind not set forth herein. Any modification of or amendment to this Agreement must be in writing and executed by both parties. Company and Village represent that each has full right, power and authority to sign this Agreement.

33. Notices. All notices hereunder shall be in writing and shall be deemed given if personally delivered or mailed, certified mail, return receipt requested, or sent by next-business-day delivery via a nationally recognized overnight courier, to the following address:

If to Village, to: Village Administrator
Village of Williams Bay
P.O. Box 580
Williams Bay, WI 53191

If to Company, to: T-Mobile USA, Inc.
Attn: PCS Lease Administrator
12920 SE 38th Street
Bellevue, WA 98006

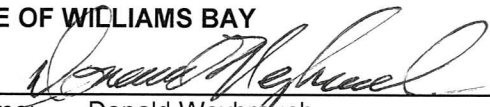
With a copy to: Attn: Legal Dept.

And with a copy to: T-Mobile Central LLC
Attn: Lease Administration Manager
2001 Butterfield Road, Suite 1900
Downers Grove, IL 60515

With a copy to: Attn: Legal Dept.

IN WITNESS THEREOF, the parties have caused this Agreement to be executed on the date and year first written above.

VILLAGE OF WILLIAMS BAY

By: 
Print Name: Donald Weyhrauch

Title: VILLAGE PRESIDENT

Date: 4/29/09

T-MOBILE CENTRAL LLC

By: _____

Print Name: Kevin Kulaga

Title: AREA DIRECTOR, NETWORK ENGINEERING AND OPERATIONS

Date: _____

May 11, 2009

EXHIBIT A

Legal Description:

The following described real estate, situated in the County of Walworth and State of Wisconsin, to-wit:

A parcel of land located in the Northwest quarter of Section 1, Township 1 North, Range 16 East, Village of Williams Bay, described as follows, to-wit:

Commencing at the Northwest corner of said Section 1; thence South 2° 54' West, 334.89 feet; thence South 88° 45' East, 1299.28 feet; thence South 89° 11 ¾' East, 1123.43 feet to the place of beginning; thence continue South 89° 11 ¾' East, 200 feet; thence South 2° 17 ½' West, 217.80 feet; thence North 89° 11 ¾' West, 200 feet; thence North 2° 17 ½' East, 217.890 feet to the place of beginning, containing 1.0 acre of land.

Together with a perpetual easement over a strip of land twenty feet in width, located in said Northwest Quarter, the centerline of which is described as follows, to-wit:

Commencing at the Northwest corner of Section 1, Township 1 North, Range 16 East; thence South 2° 54' West, 334.39 feet; thence South 88° 45' East, 1299.28 feet; thence South 89° 11 ¾' East, 1313.43 feet to the place of beginning; thence South 2° 17 ½' West, 1155.05 feet to the end of said easement; excepting therefrom the Northerly 217.8 feet.

AND BEING the same property conveyed to the Village of Williams Bay, a municipal corporation, from Glenn H. Johnson and Irene T. Johnson, his wife by Warranty Deed dated March 10, 1969 and recorded March 20, 1969 in Deed Book 5, Page 225.

Tax Parcel No. WWUP 00003A

LEASE PARCEL

A part of the Northeast Quarter (NE1/4) of the Northwest Quarter (NW1/4) of Section One (1), Township One (1) North, Range Sixteen (16) East, Village of Williams Bay, Walworth County, Wisconsin containing 416 square feet (0.010 acres) of land and being described by:

Commencing at the Northwest Corner of said Section 1; thence S02°-54'-11"W 335.18 feet (Recorded as S02°-54"W 334.89 feet) along the West line of the NW1/4 of said Section 1; thence S88°-43'-12"E 1299.16 feet (Recorded as S88°-45"E 1299.28 feet); thence S89°-10'-25"E 1121.93 feet (Recorded as S89°-11'-45"E 1123.43 feet); thence S02°-13'-20"W (Recorded as S02°-17'-30"W) 73.49 feet; thence S89°-12'-32"E 87.02 feet to the point of beginning; thence N00°-47'-28"E 16.00 feet; thence S89°-12'-32"E 26.00 feet; thence S00°-47'-28"W 16.00 feet; thence N89°-12'-32"W 26.00 feet to the point of beginning; being subject to any and all easements and restrictions of record.

12 FOOT WIDE UTILITY AND INGRESS/EGRESS EASEMENT

A 12 foot wide Utility and Ingress/Egress Easement being a part of Outlot 1, Lots 13 and 14, in Block 8 of LAKEWOOD TRAILS SUBDIVISION, a plat of record, and a part of the Northeast Quarter (NE1/4) of the Northwest Quarter (NW1/4) of Section One (1), Township One (1) North, Range Sixteen (16) East, Village of Williams Bay, Walworth County, Wisconsin containing 8,133 square feet (0.187 acres) of land and being 6 feet either side of and parallel to a line described by:

Commencing at the Northwest Corner of said Section 1; thence S02°-54'-11"W 335.18 feet (Recorded as S02°-54"W 334.89 feet) along the West line of the - NW1/4 of said Section 1; thence S88°-43'-12"E 1299.16 feet (Recorded as S88°-45"E 1299.28 feet); thence S89°-10'-25"E 1121.93 feet (Recorded as S89°-11'-45"E 1123.43 feet); thence S02°-13'-20"W (Recorded as S02°-17'-30"W) 73.49 feet; thence S89°-12'-32"E 103.02 feet to the point of beginning; thence S30°-21'-17"E 79.75 feet; thence S28°-10'-41"E 86.89 feet to a point in the North line of Outlot 1, of said Block 8; thence S02°-14'-21"W (Recorded as S02°-17'-30"W) 501.07 feet on a line parallel and 10.00 feet West measured at right angles from the East line of said LAKEWOOD TRAILS SUBDIVISION; thence S87°-45'-39"E 10.00 feet to a point in said East line, also being the West line of Olive Street and the point of termination.

8 FOOT WIDE UTILITY EASEMENT

An 8 foot wide Utility Easement being a part of the Northeast Quarter (NE1/4) of the Northwest Quarter (NW1/4) of Section One (1), Township One (1) North, Range Sixteen (16) East, Village of Williams Bay, Walworth County, Wisconsin containing 1,049 square feet (0.024 acres) of land and being 4 feet either side of and parallel to a line described by:

Commencing at the Northwest Corner of said Section 1; thence S02°-54'-11"W 335.18 feet (Recorded as S02°-54"W 334.89 feet) along the West line of the NW1/4 of said Section 1; thence S88°-43'-12"E 1299.16 feet (Recorded as S88°-45"E 1299.28 feet); thence S89°-10'-25"E 1121.93 feet (Recorded as S89°-11'-45"E 1123.43 feet); thence S02°-13'-20"W (Recorded as S02°-17'-30"W) 73.49 feet; thence S89°-12'-32"E 103.02 feet to the point of beginning; thence S30°-21'-17"E 79.75 feet; thence S78°-20'-36"E 51.33 feet to the point of termination.

4 FOOT WIDE COAX EASEMENT

A 4 foot wide Coax Easement being a part of the Northeast Quarter (NE1/4) of the Northwest Quarter (NW1/4) of Section One (1), Township One (1) North, Range Sixteen (16) East, Village of Williams Bay, Walworth County, Wisconsin containing 80 square feet (0.002 acres) of land and being 2 feet either side of and parallel to a line described by:

Commencing at the Northwest Corner of said Section 1; thence S02°-54'-11"W 335.18 feet (Recorded as S02°-54"W 334.89 feet) along the West line of the NW1/4 of said Section 1; thence S88°-43'-12"E 1299.16 feet (Recorded as S88°-45"E 1299.28 feet); thence S89°-10'-25"E 1121.93 feet (Recorded as S89°-11'-45"E 1123.43 feet); thence S02°-13'-20"W (Recorded as S02°-17'-30"W) 73.49 feet; thence S89°-12'-32"E 100.02 feet to the point of beginning; thence S00°-45'-18"W 20.00 feet to the point of termination.

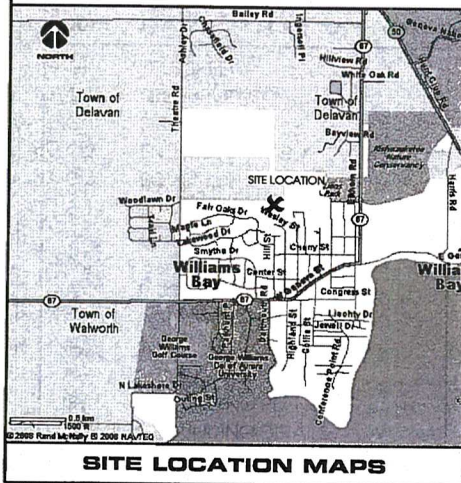
EXHIBIT B

The following equipment together with any associated wires, cables, pipes, conduit attached thereto and supporting structures associated therewith shall be located on the Premises.

- I. Six (6) panel antennas measuring approximately 82.9" height x 6.6" width x 3.3" depth.
Equipment shelter contained within Premises.

EXHIBIT C

Plans for construction of the Communications Facilities attached here:



SITE LOCATION MAPS

FROM 8550 W. BRYN MAWR AVE, CHICAGO, IL 60631:

Turn LEFT onto IL-171 go 0.6 mi
 Bear RIGHT onto I-90 W go 1.9 mi
 Bear RIGHT onto I-294 N go 41.9 mi
 Take EXIT 344 on RIGHT (WI-60) go 0.3 mi
 Turn LEFT onto WI-50 W go 31.3 mi
 Turn LEFT onto WI-67 go 1.4 mi
 Turn RIGHT onto WI-67 (Genova St) go 0.5 mi
 Turn RIGHT onto Hill St go 0.4 mi
 Turn LEFT onto Olive St go 0.1 mi
 Please note walking distance (200') required to access site

TRIP DISTANCE:
 79 miles, Time: 1 hour 50 mins

DISTANCE TO NEAREST INTERSECTION:
 OLIVE ST & HILL ST - APPROX 400' SOUTH OF SITE

DRIVING DIRECTIONS

T-Mobile

NORHTWEST WT [#ML70553B] WILLIAMS BAY, WISCONSIN CONSTRUCTION DRAWINGS

**123' WATER TOWER COLO
 DECEMBER 2008**

SHEET INDEX:

NO.:	PAGE TITLE:
T-1	TITLE SHEET
I-2	SITE SURVEY*
C-1	SITE PLAN
C-2	ENLARGED SITE PLAN
C-3	EQUIPMENT DETAILS
A-1	TOWER ELEVATION
A-2	TOWER CROSS-SECTIONS
A-3	TOWER CROSS-SECTIONS
A-4	ROOF/RAILING SECTION
A-5	INSTALLATION DETAILS
A-6	INSTALLATION DETAILS
A-7	SYSTEM CABLING
G-1	GROUNDING PLAN
G-2	GROUNDING DETAILS
E-1	ELECTRICAL DETAILS
N-1	GENERAL NOTES
N-2	GENERAL NOTES
N-3	GENERAL NOTES

* PREPARED BY OTHERS

PROJECT DIRECTORY:

CLIENT:
 T-MOBILE
 8550 W. BRYN MAWR AVE.
 FIRST FLOOR
 CHICAGO, IL 60631
 CONTACT: LUIS GONZALEZ
 PHONE: 224.659.8899
 FAX: 773.444.5495

ENGINEERING COMPANY:
 EDGE CONSULTING ENGINEERS, INC
 624 WATER STREET
 PRAIRIE DU SAC, WI 53578
 CONTACT: DAVE LYSHEK
 PHONE: 608.644.1449
 FAX: 262.364.3000

SITE ACQUISITION:
 FMHC CORPORATION
 5344 S. 48TH STREET
 GREENFIELD, WI 53220
 CONTACT: ROSEMARIE BARRETTE
 PHONE: 414.423.6781
 MOBILE: 414.659.6781

SURVEYOR:
 MERIDIAN SURVEYING, LLC
 N8774 FIRELANE 1
 MENASHA, WI 54952
 CONTACT: CRAIG KEACH
 PHONE: 920.993.0881
 FAX: 920.273.6037

**UTILITY INFORMATION
 (TO BE VERIFIED BY CONTRACTOR)**

ELECTRIC SERVICE PROVIDER: ALLIANT ENERGY
 1.800.862.6222

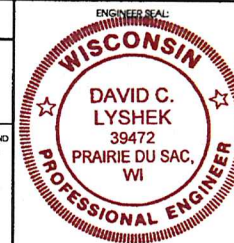
TELEPHONE SERVICE PROVIDER: AT&T
 1.800.660.3000



TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND
 FACILITIES BEFORE YOU DIG IN WISCONSIN, CALL
 DIGGERS HOTLINE

TOLL FREE
 1-800-242-6511
 FAX A LOCATE 1-800-336-3860

WE STATUTE 182.0175 (1974) REQUIRES MIN. OF
 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE.



I HEREBY CERTIFY THAT THIS PLAN SET WAS
 PREPARED BY ME OR UNDER MY DIRECT
 SUPERVISION OTHER THAN THE APPLICABLE
 STRUCTURAL DETAILED NOTES PROVIDED BY
 OTHERS AND THAT I AM A DULY LICENSED
 PROFESSIONAL ENGINEER UNDER THE LAWS OF
 THE STATE OF WISCONSIN.

Signature: *[Signature]*

Date: 12/1/08

APPROVED FOR CONSTRUCTION

PROPERTY OWNER OR REP. _____ RF _____
 ZONING _____ NETWORK _____
 CONSTRUCTION _____ CONTRACTOR _____
 OPERATIONS _____ SITE ACQ. _____

PROJECT TYPE: GSM & UMTS

TWOBLE TO INITIALLY INSTALL: (8) PANEL ANTENNAS & (12) 1 5/8" COAX.
 OCCUPY EXISTING EQUIPMENT BUILDING.



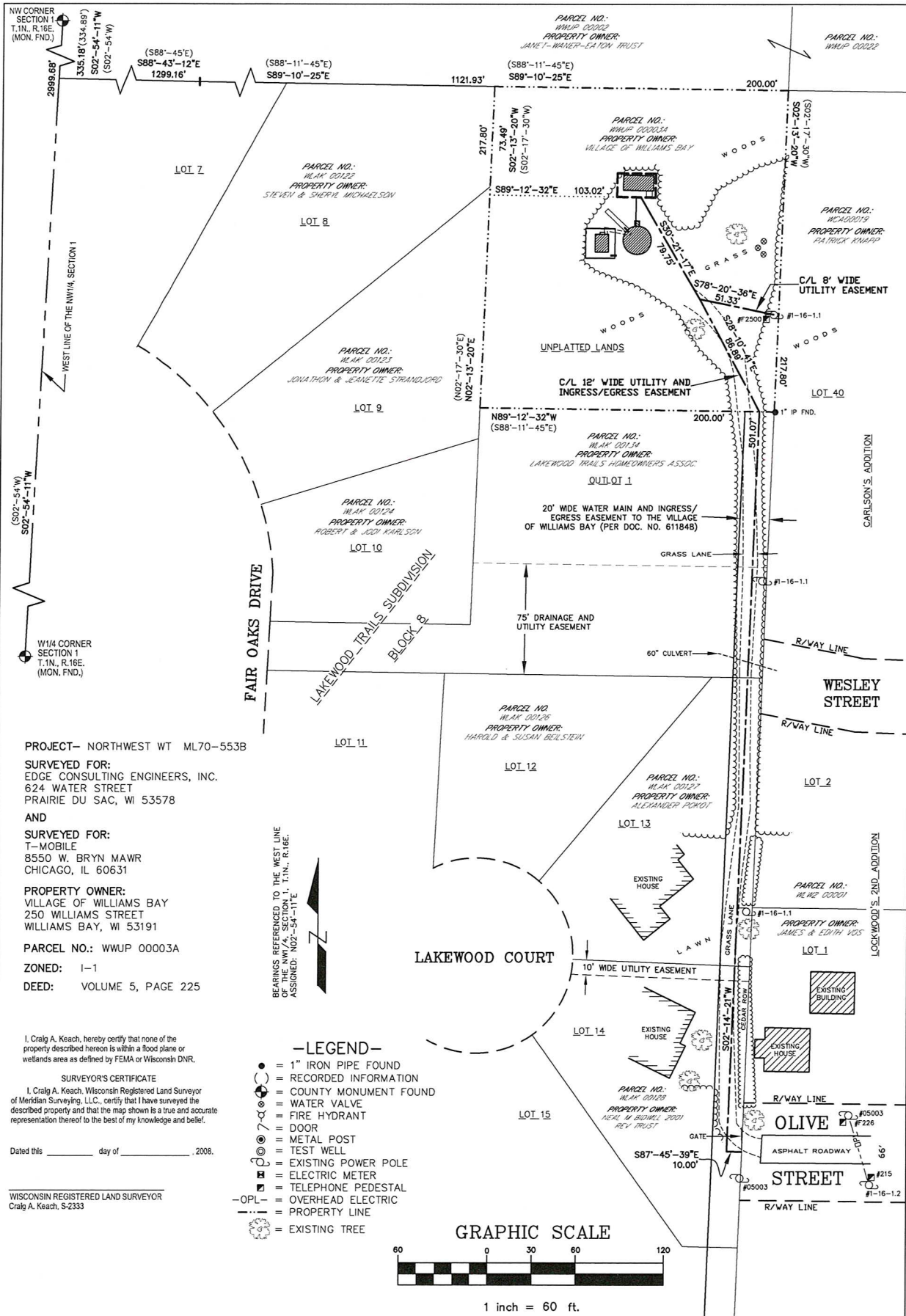
TITLE SHEET
NORTHWEST WT [#ML70553B]
WILLIAMS BAY, WISCONSIN

SHEET TITLE

ISSUE DATE:
 LEASE DIBET - 11/04/08
 PRELIMINARY CD - 11/14/08
 FINAL CD - 12/01/08

REVISIONS:

DRAWN BY:
 DML CV
 CHECKED BY:
 DCL
 PLOT DATE:
 12/1/2008
 PROJECT NUMBER:
 3749
 FILE NAME:
 T1.dgn
 SHEET NUMBER:
T-1



PROJECT- NORTHWEST WT ML70-553B

SURVEYED FOR:
EDGE CONSULTING ENGINEERS, INC.
624 WATER STREET
PRAIRIE DU SAC, WI 53578

AND

SURVEYED FOR:
T-MOBILE
8550 W. BRYN MAWR
CHICAGO, IL 60631

PROPERTY OWNER:
VILLAGE OF WILLIAMS BAY
250 WILLIAMS STREET
WILLIAMS BAY, WI 53191

PARCEL NO.: WWUP 00003A

ZONED: I-1

DEED: VOLUME 5, PAGE 225

I, Craig A. Keach, hereby certify that none of the property described hereon is within a flood plane or wetlands area as defined by FEMA or Wisconsin DNR.

SURVEYOR'S CERTIFICATE

I, Craig A. Keach, Wisconsin Registered Land Surveyor of Meridian Surveying, LLC, certify that I have surveyed the described property and that the map shown is a true and accurate representation thereof to the best of my knowledge and belief.

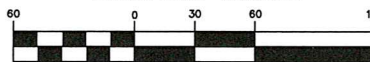
Dated this _____ day of _____, 2008.

WISCONSIN REGISTERED LAND SURVEYOR
Craig A. Keach, S-2333

LEGEND

- = 1" IRON PIPE FOUND
- = RECORDED INFORMATION
- ⊙ = COUNTY MONUMENT FOUND
- ⊕ = WATER VALVE
- ⊖ = FIRE HYDRANT
- ⊗ = DOOR
- ⊘ = METAL POST
- ⊙ = TEST WELL
- ⊕ = EXISTING POWER POLE
- ⊖ = ELECTRIC METER
- ⊗ = TELEPHONE PEDESTAL
- ⊘ = OVERHEAD ELECTRIC
- = PROPERTY LINE
- ⊙ = EXISTING TREE

GRAPHIC SCALE



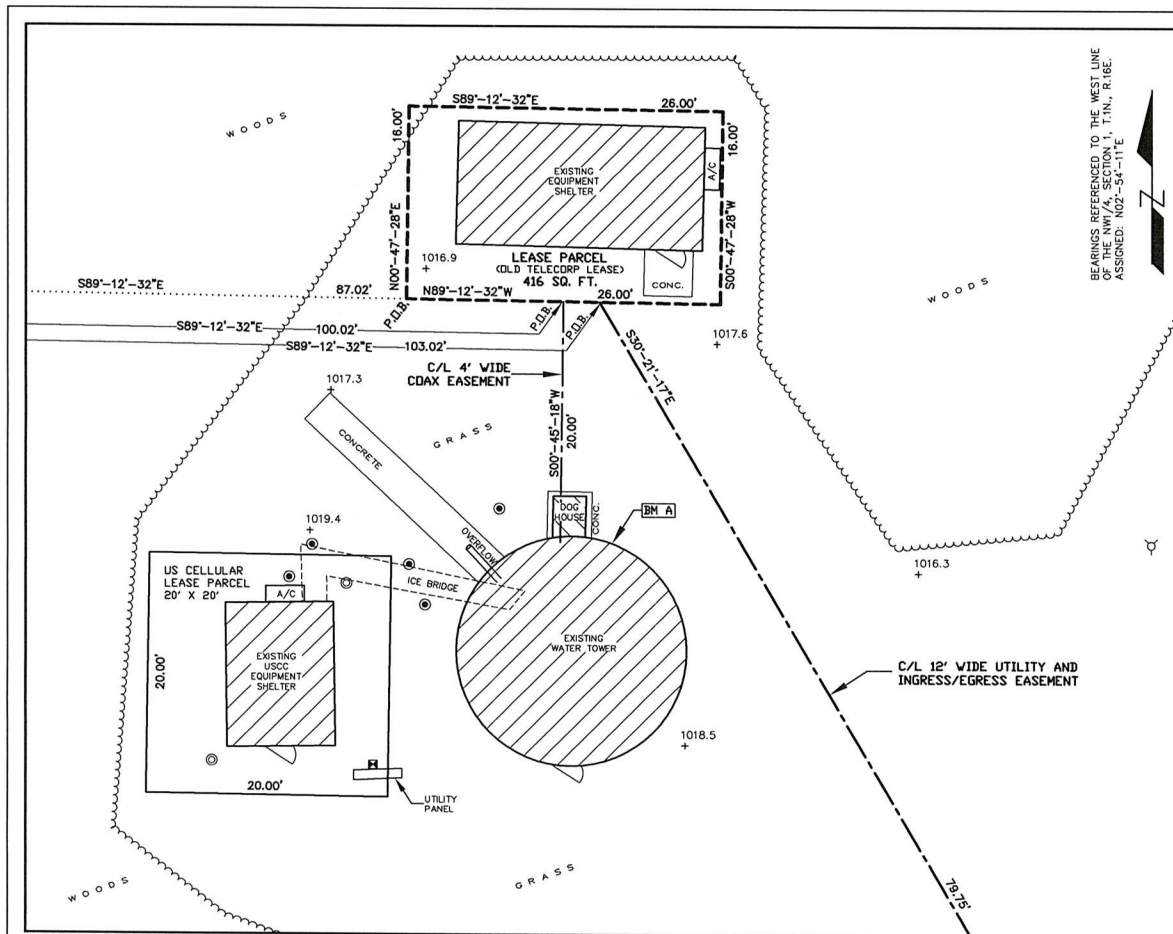
1 inch = 60 ft.

SITE NAME: NORTHWEST WT	SITE ADDRESS: 250 OLIVE STREET
SITE NUMBER: ML70-553B	WILLIAMS BAY, WI 53191
MERIDIAN	
SURVEYING, LLC	
N8774 Firelane 1 Menasha, WI 54952	Office: 920-993-0881 Fax: 920-273-6037

SITE SURVEY FOR T-MOBILE

BEING A PART OF THE NE1/4 OF THE
NW1/4, SECTION 1, T.1N., R.16E.,
VILLAGE OF WILLIAMS BAY,
WALWORTH COUNTY, WISCONSIN

NO.	DATE	DESCRIPTION	BY
DRAWN BY:	J.D.	DATE:	10-08-08
CHECKED BY:	C.A.K.	FIELD BOOK:	M-12, PG. 75
JOB NO.:	5627-B410	SHEET	1 of 2



LEASE PARCEL

A part of the Northeast Quarter (NE1/4) of the Northwest Quarter (NW1/4) of Section One (1), Township One (1) North, Range Sixteen (16) East, Village of Williams Bay, Walworth County, Wisconsin containing 416 square feet (0.010 acres) of land and being described by:

Commencing at the Northwest Corner of said Section 1; thence S02°-54'-11"W 335.18 feet (Recorded as S02°-54'-11"W 334.89 feet) along the West line of the NW1/4 of said Section 1; thence S88°-43'-12"E 1299.16 feet (Recorded as S88°-45'E 1299.28 feet); thence S89°-10'-25"E 1121.93 feet (Recorded as S89°-11'-45"E 1123.43 feet); thence S02°-13'-20"W (Recorded as S02°-17'-30"W) 73.49 feet; thence S89°-12'-32"E 87.02 feet to the point of beginning; thence N00°-47'-28"E 16.00 feet; thence S89°-12'-32"E 26.00 feet; thence S00°-47'-28"W 16.00 feet; thence N89°-12'-32"E 26.00 feet to the point of beginning; being subject to any and all easements and restrictions of record.

12 FOOT WIDE UTILITY AND INGRESS/EGRESS EASEMENT

A 12 foot wide Utility and Ingress/Egress Easement being a part of Outlot 1, Lots 13 and 14, in Block 8 of LAKEWOOD TRAILS SUBDIVISION, a plat of record, and a part of the Northeast Quarter (NE1/4) of the Northwest Quarter (NW1/4) of Section One (1), Township One (1) North, Range Sixteen (16) East, Village of Williams Bay, Walworth County, Wisconsin containing 8.133 square feet (0.187 acres) of land and being 6 feet either side of and parallel to a line described by:

Commencing at the Northwest Corner of said Section 1; thence S02°-54'-11"W 335.18 feet (Recorded as S02°-54'-11"W 334.89 feet) along the West line of the NW1/4 of said Section 1; thence S88°-43'-12"E 1299.16 feet (Recorded as S88°-45'E 1299.28 feet); thence S89°-10'-25"E 1121.93 feet (Recorded as S89°-11'-45"E 1123.43 feet); thence S02°-13'-20"W (Recorded as S02°-17'-30"W) 73.49 feet; thence S89°-12'-32"E 103.02 feet to the point of beginning; thence S30°-21'-17"E 79.75 feet; thence S28°-10'-41"E 86.89 feet to a point in the North line of Outlot 1, of said Block 8; thence S02°-14'-21"W (Recorded as S02°-17'-30"W) 501.07 feet on a line parallel and 10.00 feet West measured at right angles from the East line of said LAKEWOOD TRAILS SUBDIVISION; thence S87°-45'-39"E 10.00 feet to a point in said East line, also being the West line of Olive Street and the point of termination.

8 FOOT WIDE UTILITY EASEMENT

An 8 foot wide Utility Easement being a part of the Northeast Quarter (NE1/4) of the Northwest Quarter (NW1/4) of Section One (1), Township One (1) North, Range Sixteen (16) East, Village of Williams Bay, Walworth County, Wisconsin containing 1.049 square feet (0.024 acres) of land and being 4 feet either side of and parallel to a line described by:

Commencing at the Northwest Corner of said Section 1; thence S02°-54'-11"W 335.18 feet (Recorded as S02°-54'-11"W 334.89 feet) along the West line of the NW1/4 of said Section 1; thence S88°-43'-12"E 1299.16 feet (Recorded as S88°-45'E 1299.28 feet); thence S89°-10'-25"E 1121.93 feet (Recorded as S89°-11'-45"E 1123.43 feet); thence S02°-13'-20"W (Recorded as S02°-17'-30"W) 73.49 feet; thence S89°-12'-32"E 103.02 feet to the point of beginning; thence S30°-21'-17"E 79.75 feet; thence S78°-20'-36"E 51.33 feet to the point of termination.

4 FOOT WIDE COAX EASEMENT

A 4 foot wide Coax Easement being a part of the Northeast Quarter (NE1/4) of the Northwest Quarter (NW1/4) of Section One (1), Township One (1) North, Range Sixteen (16) East, Village of Williams Bay, Walworth County, Wisconsin containing 80 square feet (0.002 acres) of land and being 2 feet either side of and parallel to a line described by:

Commencing at the Northwest Corner of said Section 1; thence S02°-54'-11"W 335.18 feet (Recorded as S02°-54'-11"W 334.89 feet) along the West line of the NW1/4 of said Section 1; thence S88°-43'-12"E 1299.16 feet (Recorded as S88°-45'E 1299.28 feet); thence S89°-10'-25"E 1121.93 feet (Recorded as S89°-11'-45"E 1123.43 feet); thence S02°-13'-20"W (Recorded as S02°-17'-30"W) 73.49 feet; thence S89°-12'-32"E 100.02 feet to the point of beginning; thence S00°-45'-18"W 20.00 feet to the point of termination.

EXISTING WATER TOWER

LATITUDE: 42°-34'-53.12"
LONGITUDE: 88°-33'-04.08"
(Per North American Datum of 83/91)

Top of Whip Antenna Elevation: 1162.2'
(Highest Point)

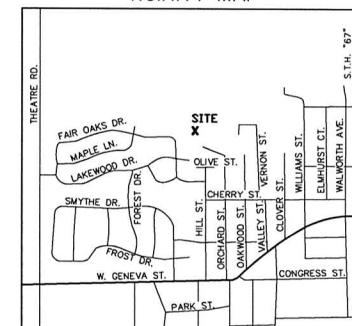
Top of Antenna Elevation: 1155.8'
Top of Lightning Rod Elevation: 1153.3'
Top of Light Elevation: 1148.1'
Top of Panel Antenna Elevation: 1146.7'
Bottom of Panel Antenna Elevation: 1140.8'
Top of Rail Elevation: 1142.3'
Top of Tower Elevation: 1141.5'
Bottom of Rail Elevation: 1140.4'
Point Ring Elevation: 1106.1'
Point Ring Elevation: 1101.0'

Ground Elevation: 1019.0'
(Per National Geodetic Vertical Datum of 1929)

BENCHMARK INFORMATION

SITE BENCHMARK: (BM A)
FOUND CHISELED "X" ON TOP OF ANCHOR BOLT FOR WATER TOWER BASE, LOCATED ON N. SIDE OF WT
ELEVATION: 1019.35'

-VICINITY MAP-



GRAPHIC SCALE



1 inch = 10 ft.

-LEGEND-

- = 1" IRON PIPE FOUND
- = RECORDED INFORMATION
- ⊙ = COUNTY MONUMENT FOUND
- ⊕ = WATER VALVE
- ⊖ = FIRE HYDRANT
- ⊗ = DOOR
- ⊘ = METAL POST
- ⊙ = TEST WELL
- ⊕ = EXISTING POWER POLE
- ⊖ = ELECTRIC METER
- ⊗ = TELEPHONE PEDESTAL
- ⊘ = OVERHEAD ELECTRIC
- ⊙ = PROPERTY LINE
- ⊕ = EXISTING TREE

I, Craig A. Keach, hereby certify that none of the property described herein is within a flood plain or wetlands area as defined by FEMA or Wisconsin DNR.

SURVEYOR'S CERTIFICATE

I, Craig A. Keach, Wisconsin Registered Land Surveyor of Meridian Surveying, LLC, certify that I have surveyed the described property and that the map shown is a true and accurate representation thereof to the best of my knowledge and belief.

Dated this _____ day of _____, 2008.

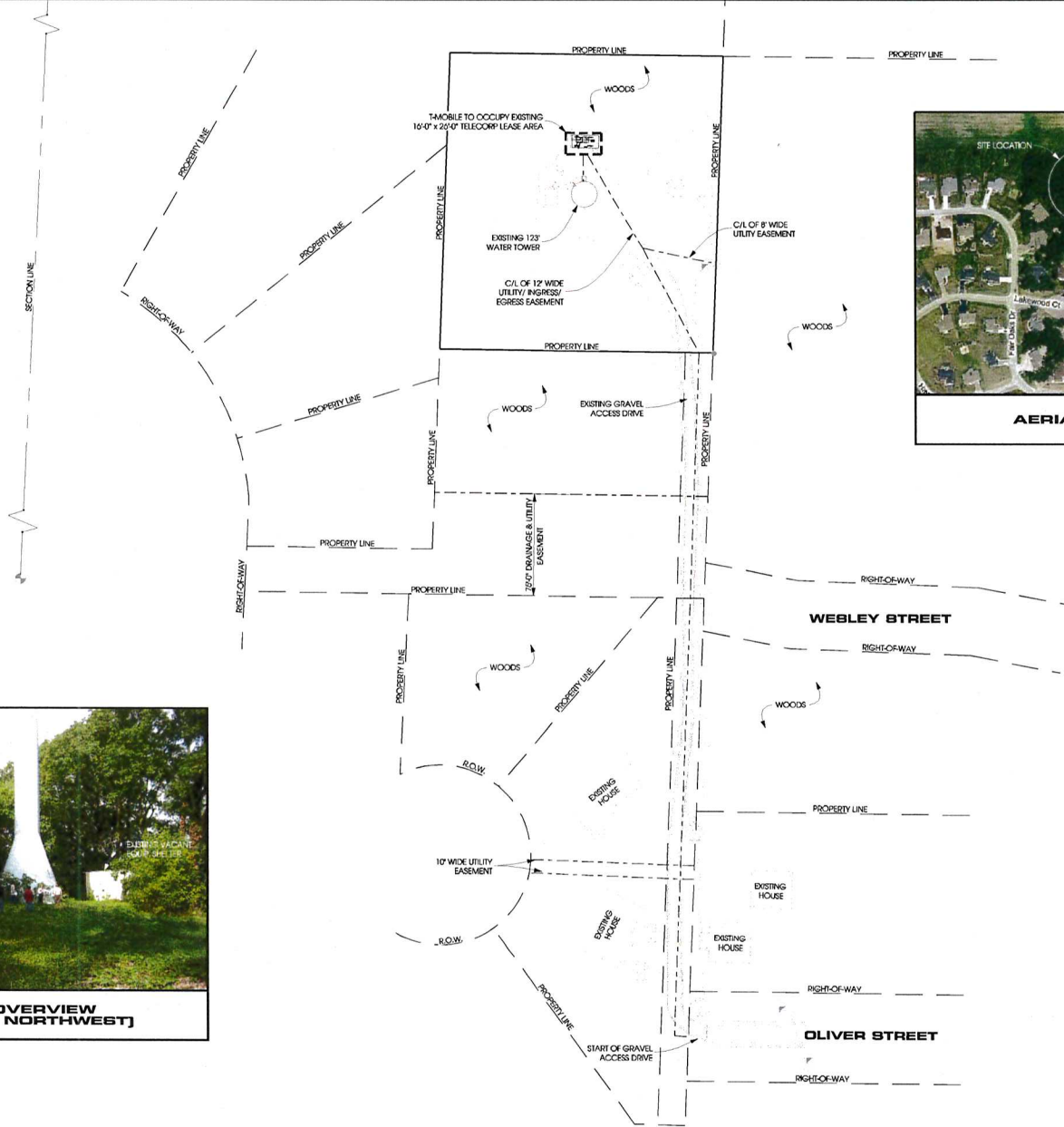
WISCONSIN REGISTERED LAND SURVEYOR
Craig A. Keach, S-2333

SITE NAME: NORTHWEST WT	SITE ADDRESS: 250 OLIVE STREET
SITE NUMBER: ML70-553B	WILLIAMS BAY, WI 53191
MERIDIAN SURVEYING, LLC	
N8774 Firelane 1 Menasha, WI 54952	Office: 920-993-0881 Fax: 920-273-6037

SITE SURVEY FOR T-MOBILE

BEING A PART OF THE NE1/4 OF THE NW1/4, SECTION 1, T.1N., R.16E., VILLAGE OF WILLIAMS BAY, WALWORTH COUNTY, WISCONSIN

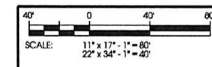
NO.	DATE	DESCRIPTION	BY
DRAWN BY: J.D. DATE: 10-08-08			
CHECKED BY: C.A.K.		FIELD BOOK: M-12, PG. 75	
JOB NO.: 5627-B410		SHEET 2 OF 2	



AERIAL OVERVIEW



SITE OVERVIEW
(LOOKING NORTHWEST)

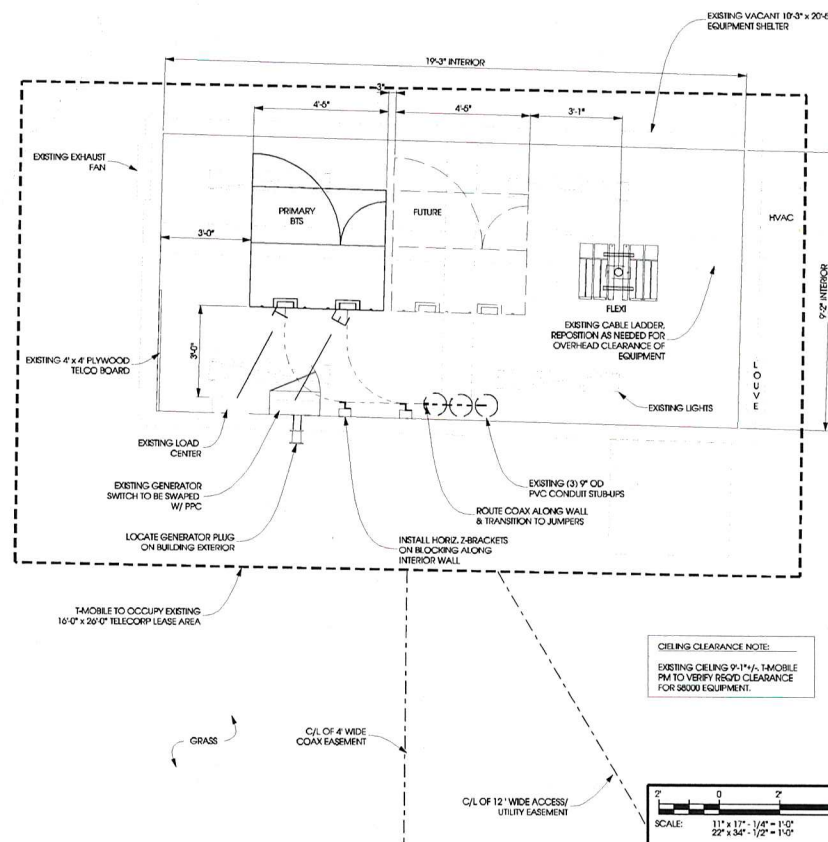
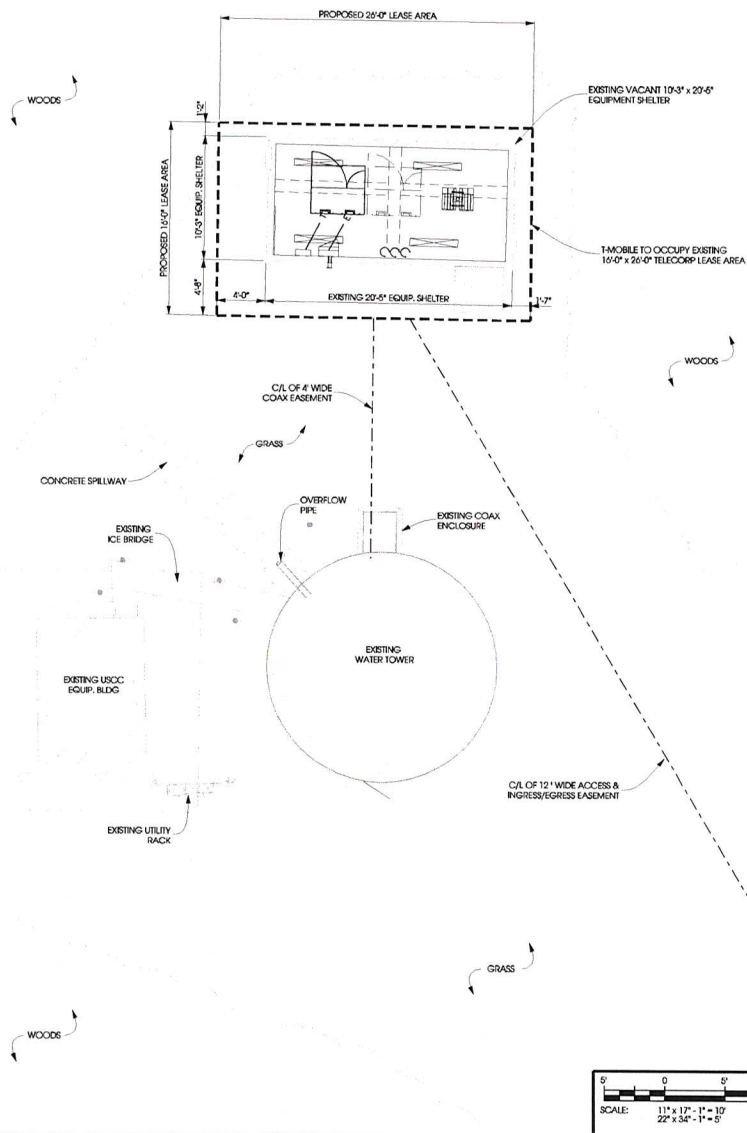


Edge
Consulting Engineers, Inc.
1000 Lakeside Dr., Suite 200
Plymouth, WI 53076
608.544.1467 ext. 200
www.edgecorpwi.com

SITE PLAN
NORTHWEST WT (#ML70553B)
WILLIAMS BAY, WISCONSIN

SHEET TITLE
ISSUE DATE
LEASE EXPIRE - 11/04/09
PRELIMINARY CD - 11/14/08
FINAL CD - 12/01/08
REVISIONS
DRAWN BY: DHN, CV
CHECKED BY: DCL
PLOT DATE: 12/1/2008
PROJECT NUMBER: 3730
FILE NAME: C1.dgn
SHEET NUMBER: C-1

I:\3730\3730.dgn (last modified) C:\dgn



ENLARGED SITE PLAN **NORTHWEST WT (#ML70553B)** **WILLIAMS BAY, WISCONSIN**

SHEET TITLE	ISSUE DATE
	LEASE ENHANC - 11/04/08
	PRELIMINARY CD - 11/14/08
	FINAL CD - 12/01/08
REVISIONS	
DRAWN BY:	DHL, CV
CHECKED BY:	DCI
PLOT DATE:	12/1/2008
PROJECT NUMBER:	3749
FILE NAME:	C2.dgn
SHEET NUMBER:	C-2

1. ANDREW UNITS INSTALLED ON SITE
2. DUAL MIA TMAS INSTALLED ON THE CENTER PIPE
3. SET CABLES BETWEEN FROM ANTENNA TO ANTENNA AND THEN INTO THE AMS SIDE OF THE TMA.
4. UNITS COLORED CODED WITH GREEN TAPE (566 OR 788 LINES)
5. UNITS CUT BACK TO THE THIRD CABINET LOCATION AND COLOR CODED WITH GREEN TAPE
6. FLEX POST INSTALLED IN THIRD CABINET LOCATION
7. (1) 30MM X 1/2" DIA. MOUNTING BEARING IN THE FLEX FOR THE FLEX.
8. RUN ONE "1" CONDUIT FROM THE PPC TO THE PPC LOCATION AND THEN REDUCE IT TO A 1/2" SGL. TIGHT. INSTALL CO. (2) 1/2" WIRES WITH GROUND.
9. RUN ONE "2" GROUND FROM THE TEGO FULL BOX TO THE FLEXI LOCATION. INSTALL.
10. RUN ONE "1" CONDUIT FROM THE ALPHA PULL TO THE FLEX LOCATION & REDUCE IT TO A 1/2" SGL. TIGHT. INSTALL PULL ROPS.
11. RUN TWO #2 GND STRANDED GROUNDS FROM THE GROUND RING TO THE FLEX LOCATION. FROM THE BROWN CHAUCUS LUGS FOR TERMINATION.
12. LEAVE TWO 1/2" SGL. TIGHT CONNECTIONS ON SITE.



WITH COAX & UTILITY ROUTING
CONDUIT LOCATION 4'-6" O.C.

7'-0"

NOKIA FLEXI
EQUIPMENT

FUTURE
BTS

PRIMARY
3800
BTS

6'-3 1/2" BTS

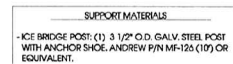
7'-0" TOTAL HEIGHT

9'-0" MIN. HEAD CLEARANCE

10K-BLOCK TO BE UTILIZED FOR COAX ONLY.

18 1/2"

B
C-3

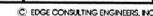


FLEXI SUPPORT FRAME
 11X17 - 1/2" = 1'-0"
 22X34 - 1'-0" = 1'-0"

EQUIPMENT DETAILS
NORTHWEST WT [#ML70553B]
WILLIAMS BAY, WISCONSIN

SHEET NUMBER:

C-3



Edge
Consulting Engineers, Inc.
624 Walker Street
Proffitt c/o Soc. Wt. 53578
508.644.1449 voice
762.364.3000 fax
www.edgeinc.com

TOWER ELEVATION
NORTHWEST WT [#ML70553B]
WILLIAMS BAY, WISCONSIN

ISSUE DATE:
LEASE EXPIRY - 11/04/01
PRELIMINARY CD# - 11/14
FINAL CD# - 12/01/06

REVISIONS

DRAWN BY:
DHN CV

CHECKED BY:
DCI

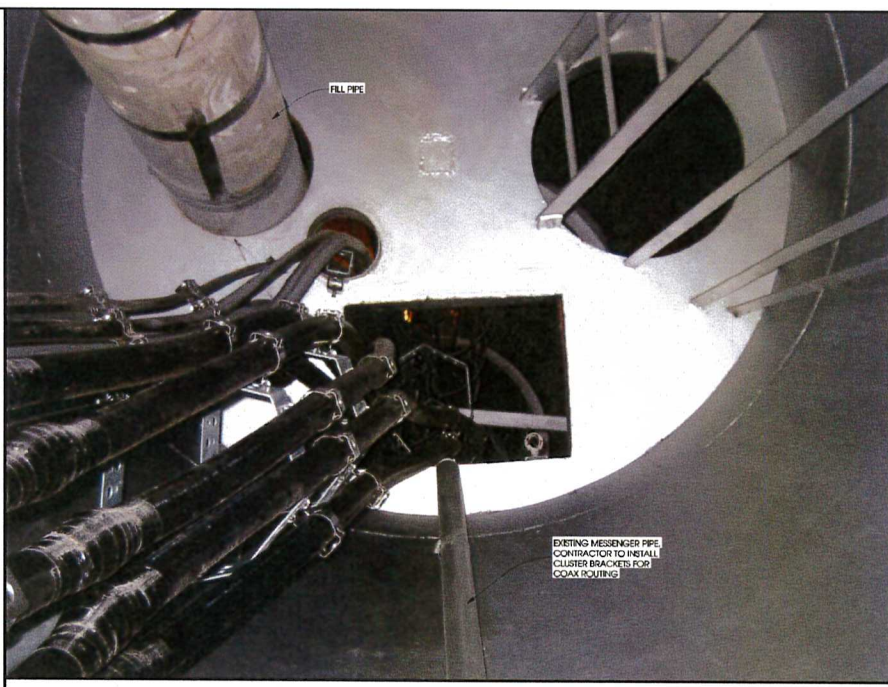
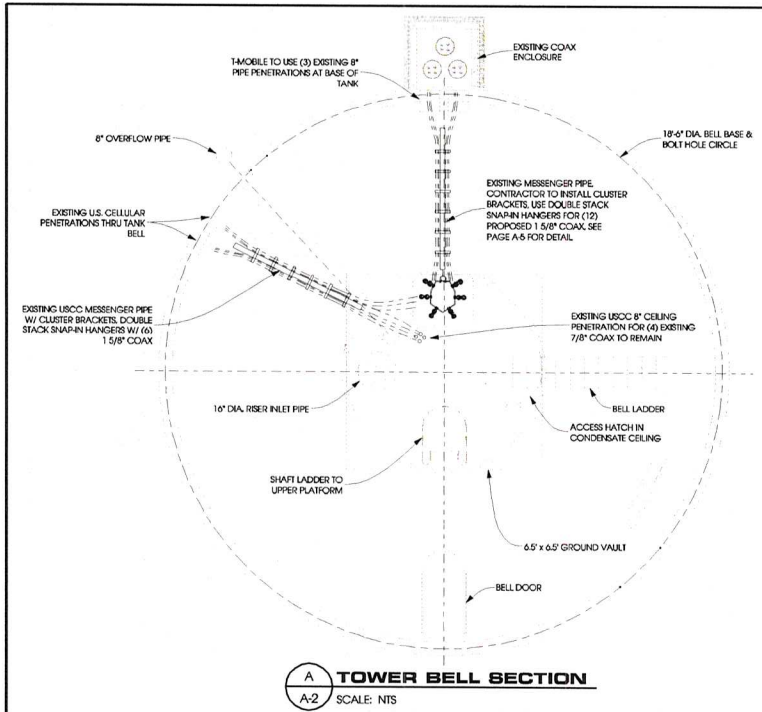
PLOT DATE:
12/1/2008

PROJECT NUMBER	3740
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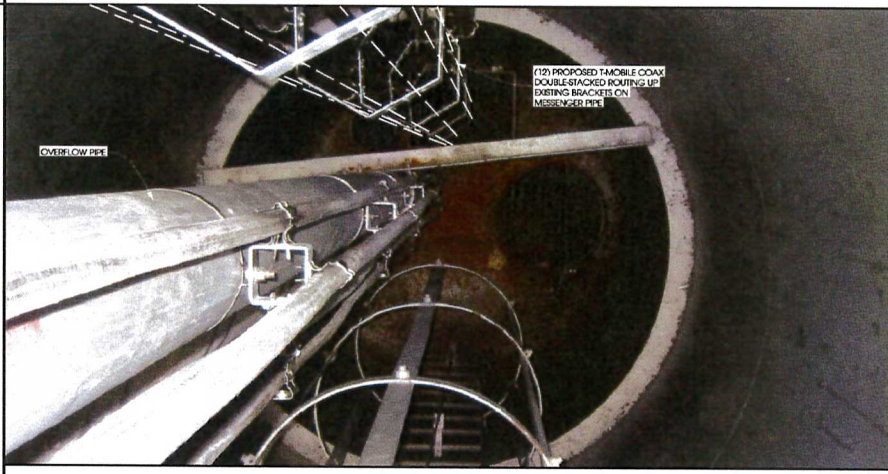
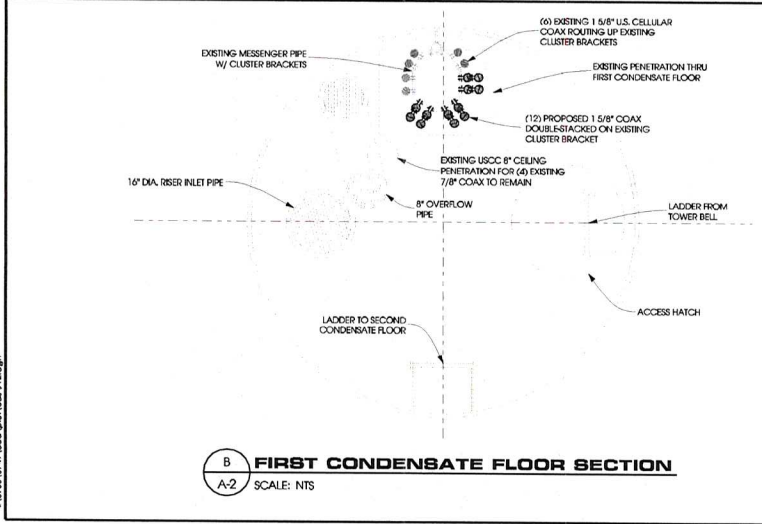
FILE NAME:

SHEET

A



TOWER BELL (LOOKING UP)



FIRST CONDENSATE FLOOR (LOOKING DOWN)

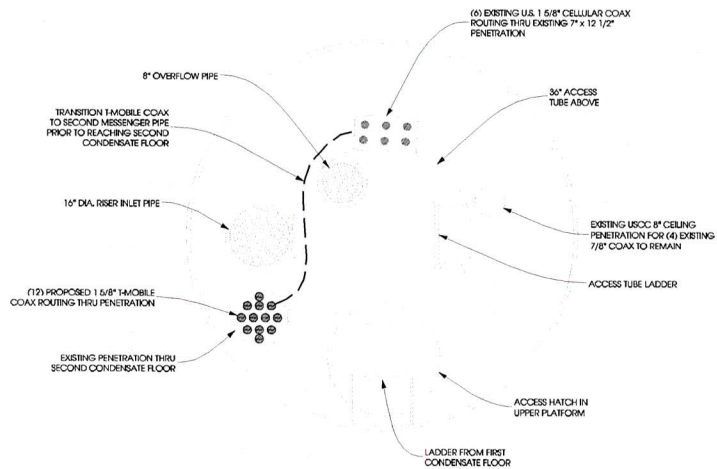
Edge
Consulting Engineers, Inc.
654 West Street
P.O. Box 100
Williams Bay, WI 53091
262.344.3300 fax
www.edgecorp.com

TOWER CROSS-SECTIONS
NORTHWEST WT (#ML70563B)
WILLIAMS BAY, WISCONSIN

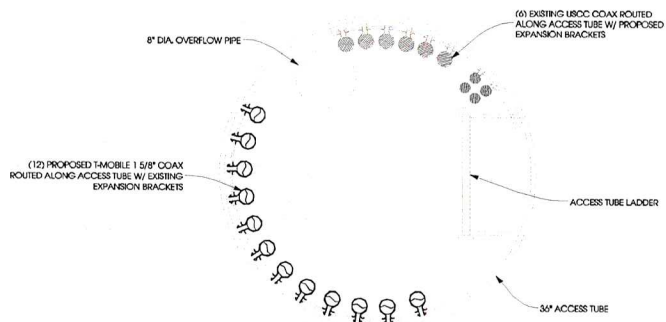
SHEET TITLE	
ISSUE DATE:	
LEAD ENGINEER - 11/04/06	
PRELIMINARY CD - 11/14/06	
FINAL CD - 12/01/06	
REVISIONS:	
DRAWN BY:	DHN, CV
CHECKED BY:	DCL
PLOT DATE:	12/1/2006
PROJECT NUMBER:	3789
FILE NAME:	A2.dgn
SHEET NUMBER:	A-2

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I:\3789\3789\0001\0001\0001\A2.dgn



A SECOND CONDENSATE FLOOR SECTION
SCALE: NTS



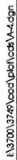
B ACCESS TUBE SECTION
SCALE: NTS



SECOND CONDENSATE FLOOR (LOOKING DOWN)



ACCESS TUBE (LOOKING UP)



A photograph taken from a high vantage point, looking down at a white, curved metal structure, possibly a water tower or antenna. The structure is made of white-painted metal beams and brackets. In the background, a residential neighborhood with houses and trees is visible, suggesting a suburban or rural setting. The trees have some autumn-colored foliage.

Edge
Consulting Engineers, Inc.

624 Water Street
Prairie du Sac, WI 53578
608.644.1449 voice
262.354.3000 fax
www.edgeconsulting.com

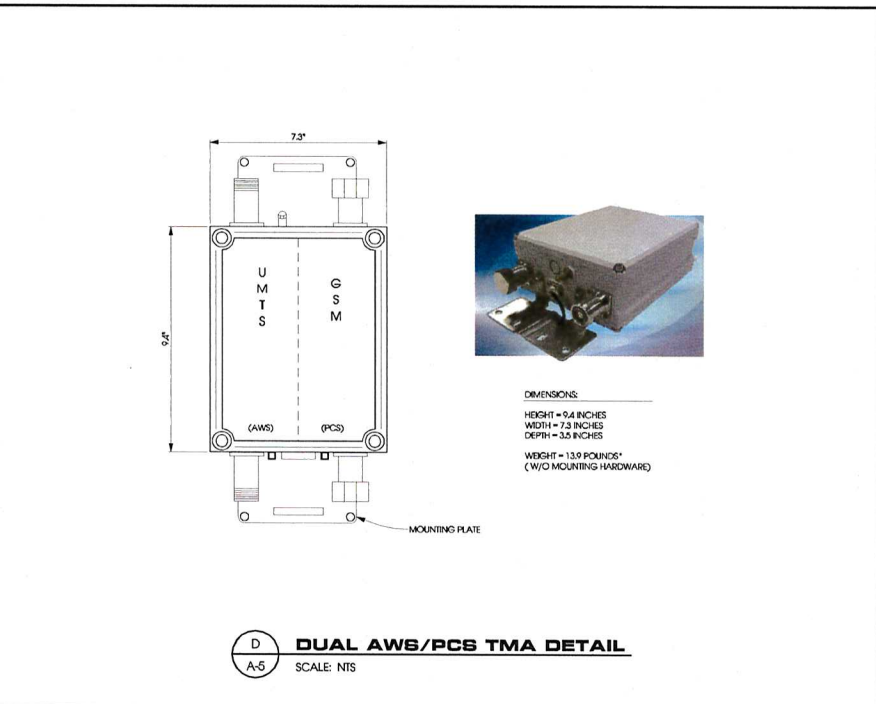
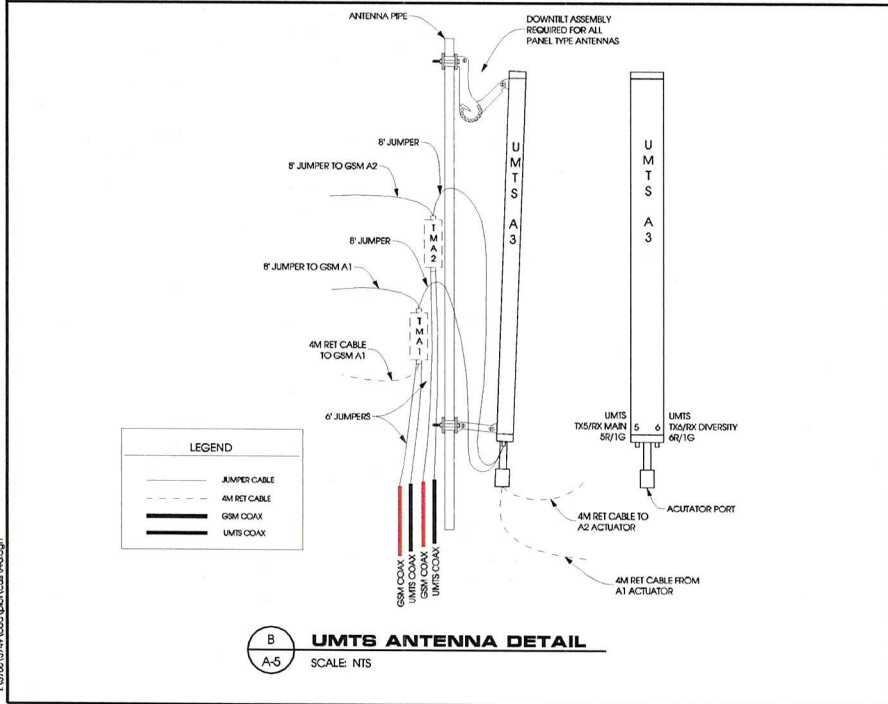
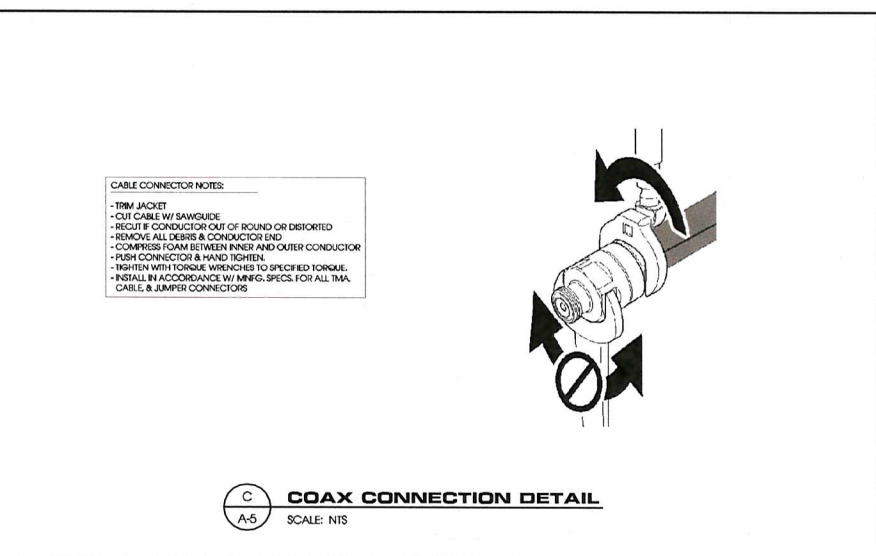
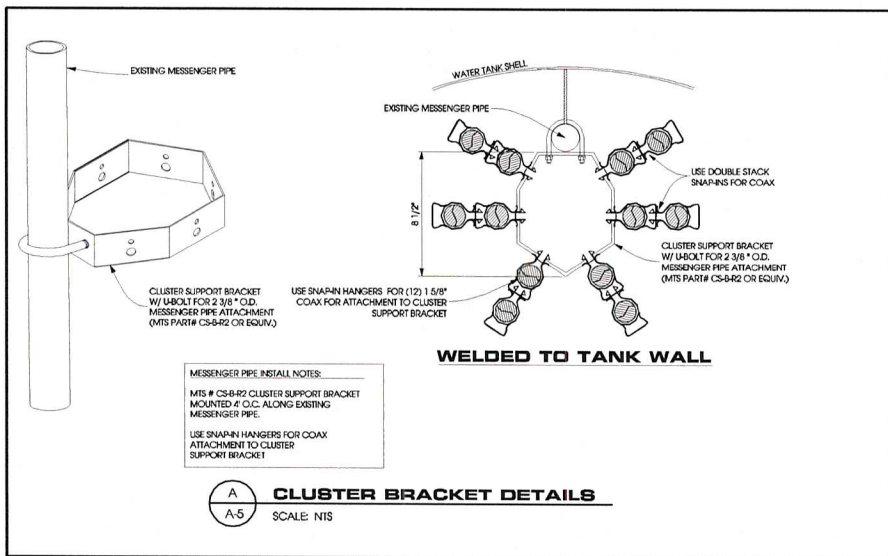
ROOF/RAILING SECTION
NORTHWEST WT [#ML70553B]
WILLIAMS BAY, WISCONSIN

ISSUE DATE:
LEASE EXHIBIT - 11/04/08
PRELIMINARY CDs - 11/14/08
FINAL CDs - 12/01/08

REVISIONS:

DRAWN BY:	HN, CV
CHECKED BY:	CL
LOT DATE:	2/1/2008
PROJECT NUMBER:	149
FILE NAME:	

SHEET NUMBER:
A-4



Edge Consulting Engineers, Inc.
 634 W. Main Street
 Williams Bay, WI 53197
 262.344.3300 fax
 www.edgecorp.com

INSTALLATION DETAILS
NORTHWEST WT (#ML70553B)
WILLIAMS BAY, WISCONSIN

SHEET TITLE:

ISSUE DATE:
 LEASE EXHIBIT - 11/04/08
 PRELIMINARY CD - 11/14/08
 FINAL CD - 12/01/08

REVISIONS:

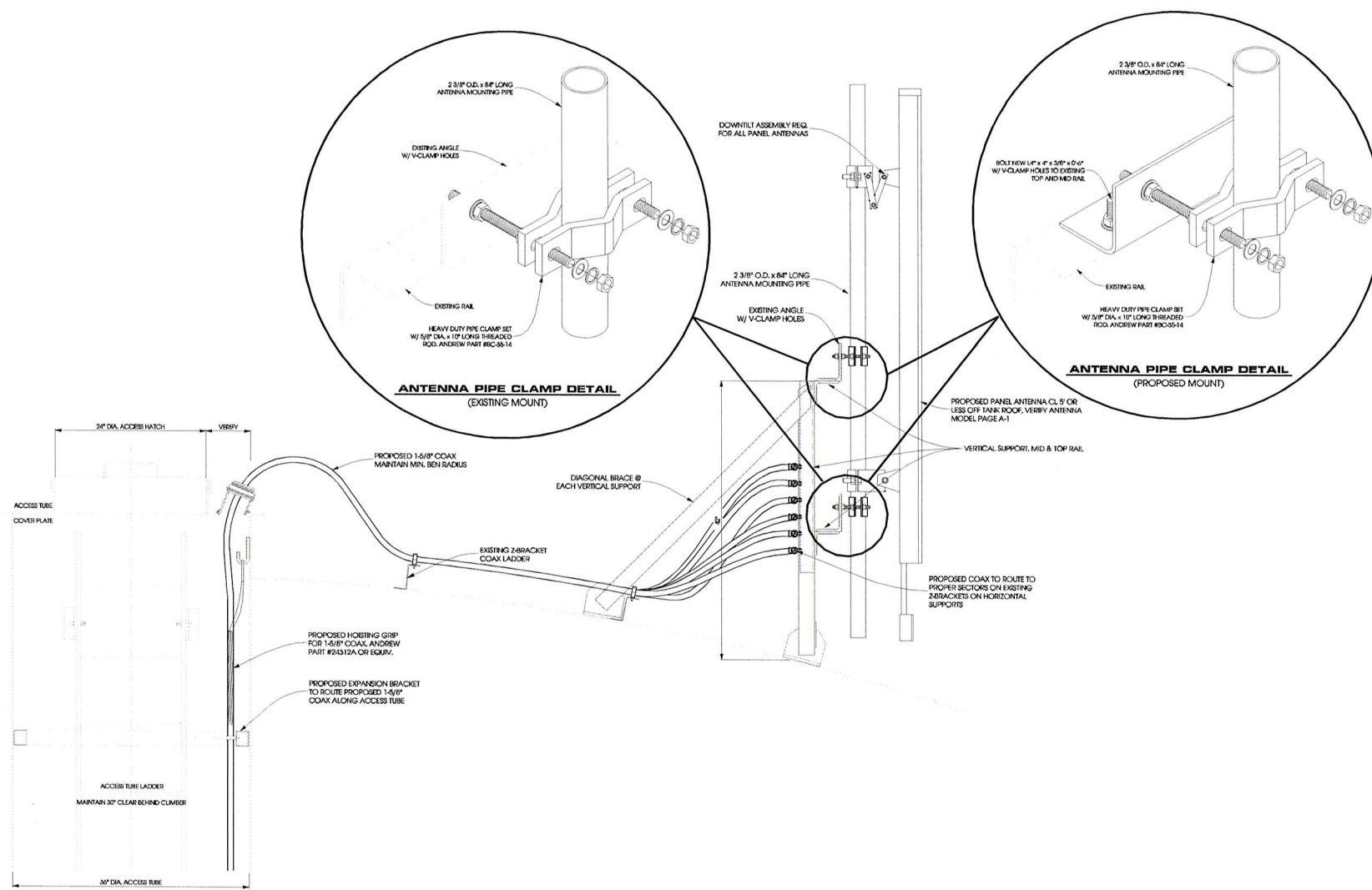
DRAWN BY:
 CHN, CV
 CHECKED BY:
 DCL
 PLOT DATE:
 12/1/2008
 PROJECT NUMBER:
 3789
 FILE NAME:
 A-5.dgn
 SHEET NUMBER:
A-5

INSTALLATION DETAILS
NORTHWEST WT [#ML70553B]
WILLIAMS BAY, WISCONSIN

SHEET TITLE:	
ISSUE DATE:	
LEAD EDRB# - 11/04/08	
PRELIMINARY CD# - 11/14/08	
FINAL CD# - 12/01/08	
REVISIONS:	
DRAWN BY:	DHL CV
CHECKED BY:	DCL
PLOT DATE:	12/1/2008
PROJECT NUMBER:	3789
FILE NAME:	A-6.dgn
SHEET NUMBER:	

A-6

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SECTION THRU TOP OF WATER TOWER
SCALE: NTS

1:\3789\3789.dgn\edge\A-6.dgn

SYSTEM CABLING
NORTHWEST WT [#ML70553B]
WILLIAMS BAY, WISCONSIN

SHEET TITLE	ISSUE DATE
	LEAD: 08/08 - 11/04/08
	PRELIMINARY CD: 11/14/08
	FINAL CD: 12/01/08
REVISIONS	
DRAWN BY	CHKD BY
CHECKED BY	ECN
PLOT DATE	12/1/2008
PROJECT NUMBER	3789
FILE NAME	A7.dgn
SHEET NUMBER	A-7

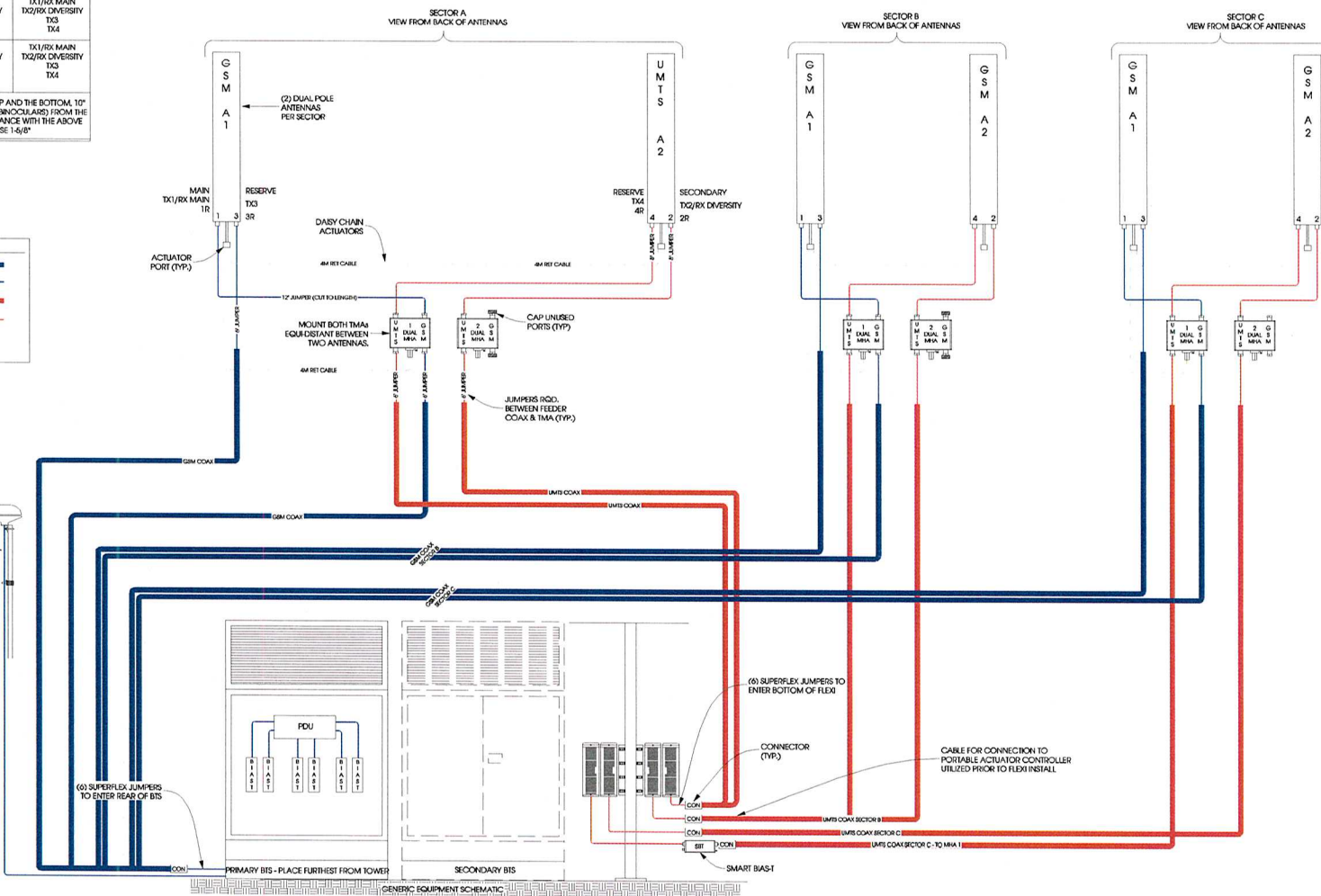
COLOR CODE CHART			
ANTENNA	COLOR	REFERENCE	FUNCTION
A1	1 RED	MAIN	TX1/RX MAIN
A2	2 RED	SECONDARY	TX2/RX DIVERSITY
A1	3 RED	UMTS	TX3
A2	4 RED	UMTS	TX4
B1	1 BLUE	MAIN	TX1/RX MAIN
B2	2 BLUE	SECONDARY	TX2/RX DIVERSITY
B1	3 BLUE	UMTS	TX3
B2	4 BLUE	UMTS	TX4
C1	1 WHITE	MAIN	TX1/RX MAIN
C2	2 WHITE	SECONDARY	TX2/RX DIVERSITY
C1	3 WHITE	UMTS	TX3
C2	4 WHITE	UMTS	TX4

COAX & JUMPERS MUST BE MARKED AT BOTH THE TOP AND THE BOTTOM 10" FROM EA. END. THE MARKINGS MUST BE VISIBLE (W/ BINOCULARS) FROM THE GROUND AND BE COLORED & Banded IN ACCORDANCE WITH THE ABOVE TABLE. FOR COAX, 1/4" USE 7/8", FOR COAX > 1/4" USE 1-1/8"

KEY:	
GSM COAX	
GSM JUMPER	
UMTS COAX	
UMTS JUMPER	
ACTUATOR	
RET CABLE	

GPS ANTENNA ELEVATE
MIN 7' AGL W/ CLEAR
SOUTHERN EXPOSURE

EXTEND CABLE TO BTS



GSM/UMTS SYSTEM CABLING [9] ANTENNAS [18] COAX CONFIGURATION
SCALE: NIS

\\3700\3789\Local\A7\A7.dgn

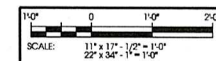
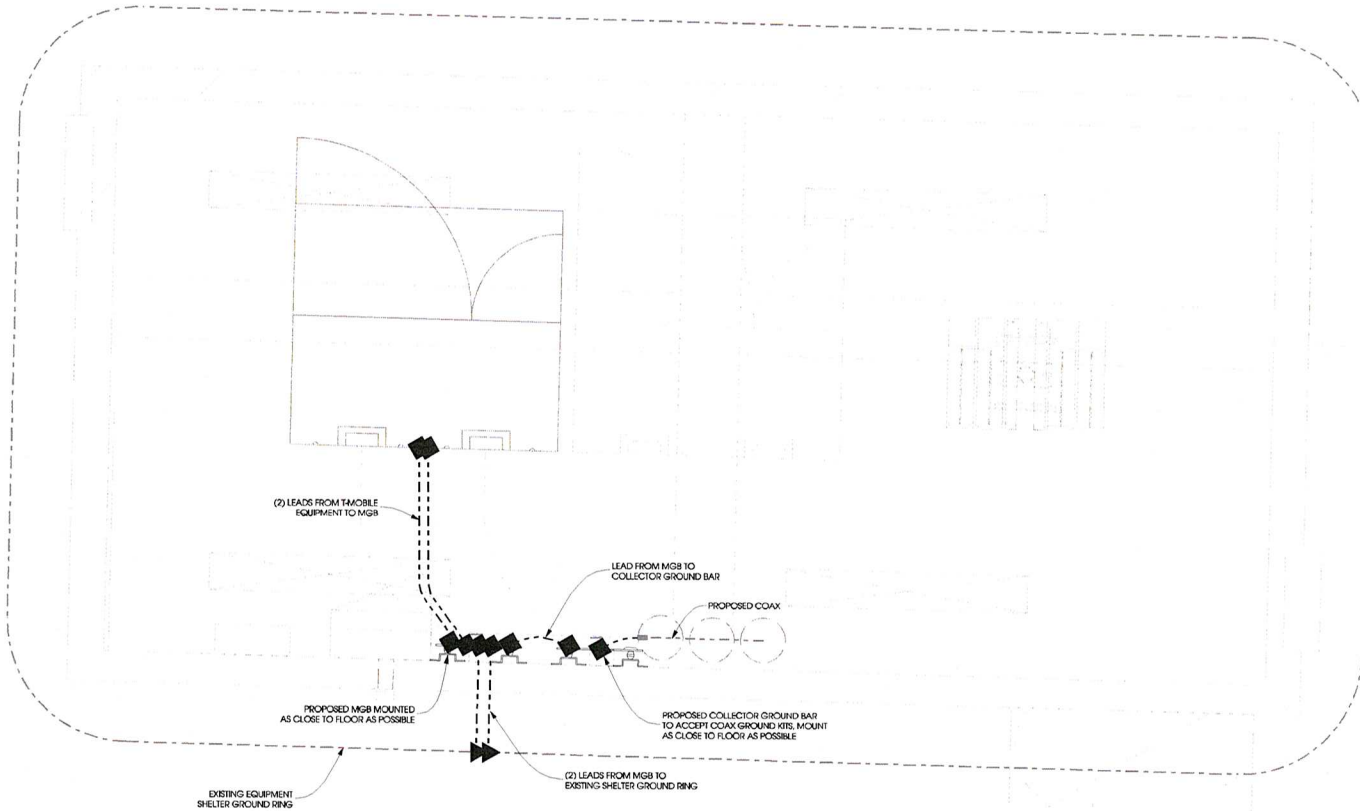


NOTE:

- THE GROUNDING SHALL BE TESTED PRIOR TO FINAL BACKFILLING. DOCUMENTATION OF 5 OHM OR LESS RESISTANCE TO BE PROVIDED TO PROJECT MANAGER.
- ALL NON-INSULATED GROUND LEADS EXTENDING ABOVE GROUND LEVEL SHALL BE ENCASED IN 3/4" PVC & SEALED WITH SILICONE

LEGEND

- ▲ EXOTHERMIC CONNECTION (CADCWELD OR EQUIVALENT)
- MECHANICAL CONNECTION (BUNNY OR EQUIVALENT)
- - - #2 AWG INSULATED COPPER CONDUCTOR
- - - EXISTING SHELTER GROUND RING



GROUNDING PLAN
NORTHWEST WT [#ML70553B]
WILLIAMS BAY, WISCONSIN

SHEET TITLE:

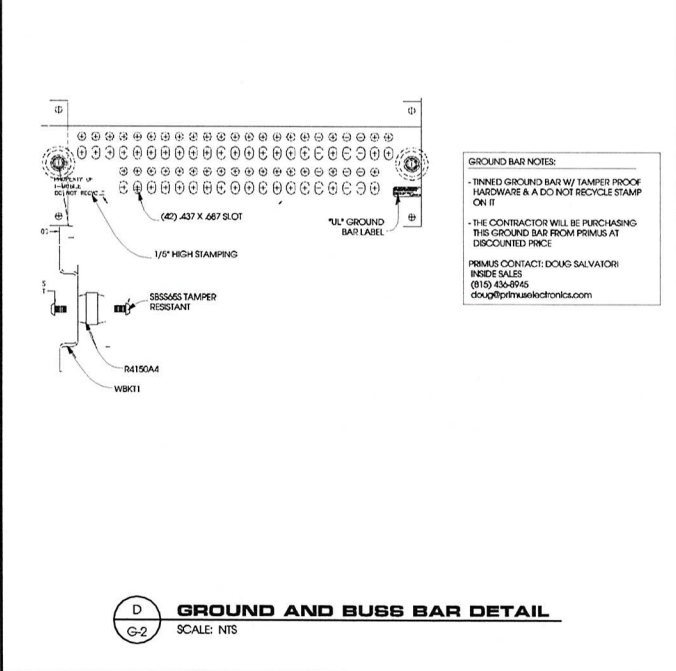
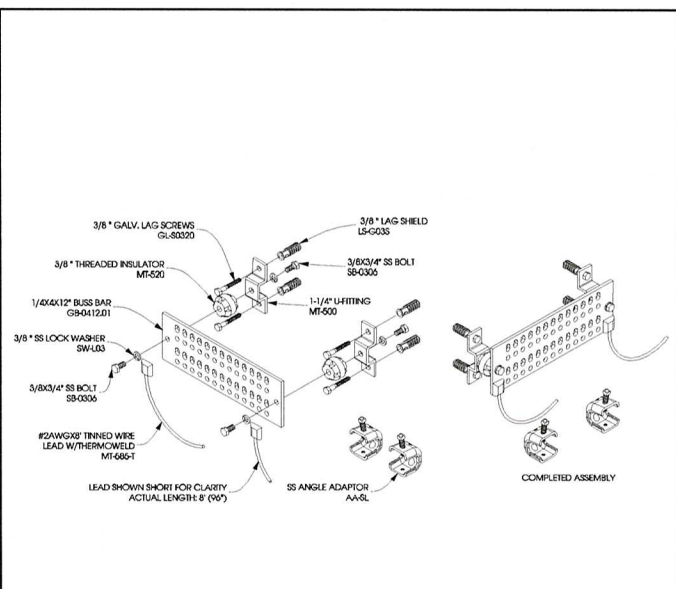
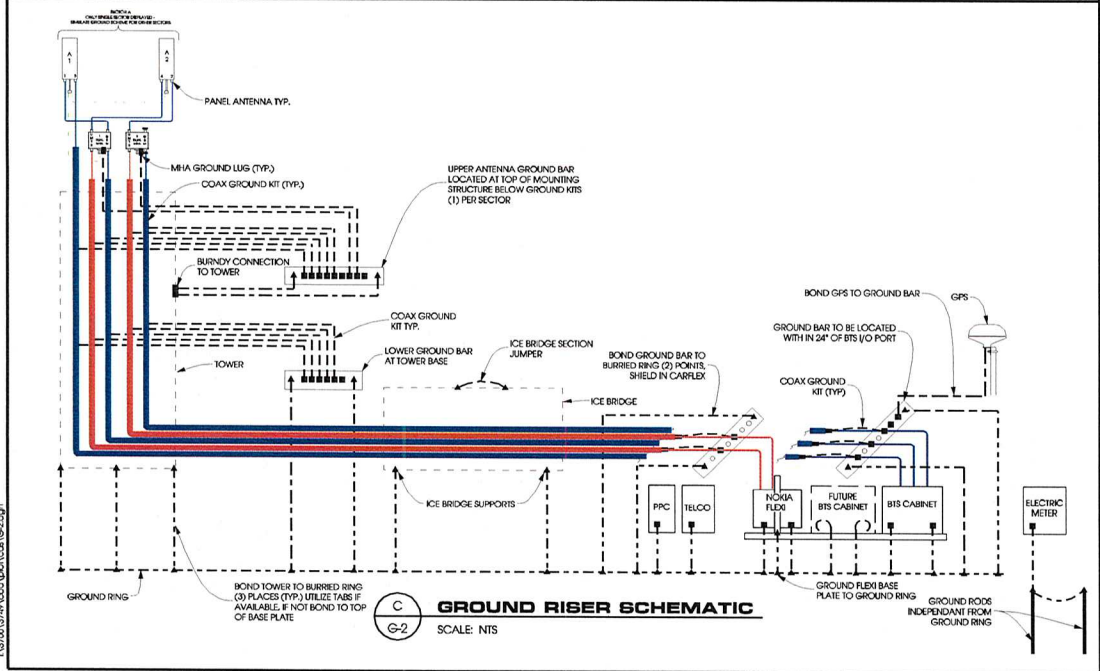
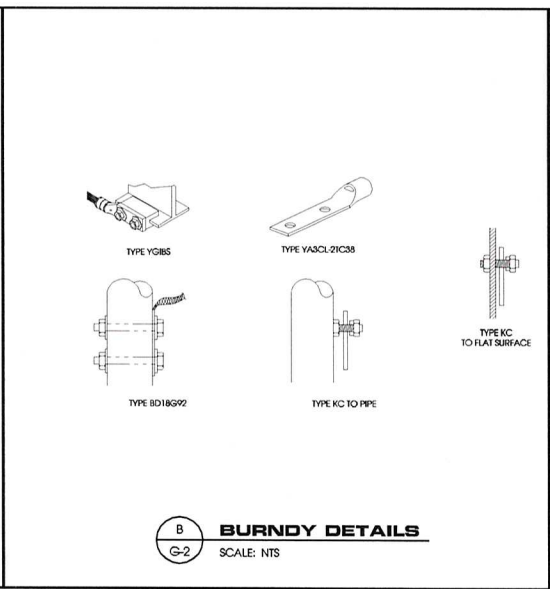
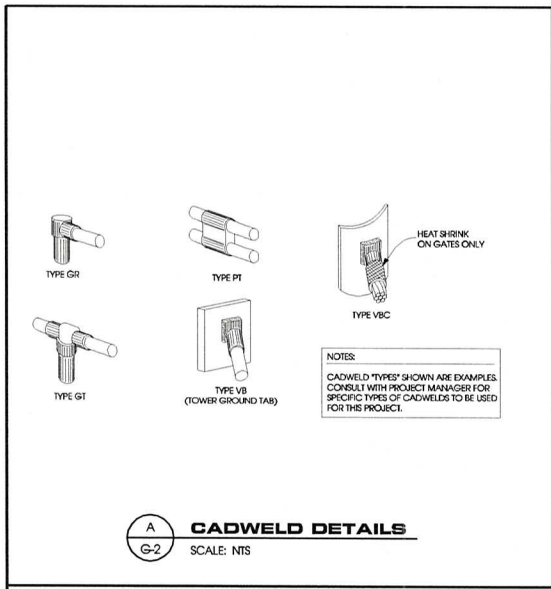
ISSUE DATE:
LEAVE EXHIBIT - 11/04/08
PRELIMINARY CD - 11/14/08
FINAL CD - 12/01/08

REVISIONS:

DRAWN BY:
DHL CV
CHECKED BY:
DCL
PLOT DATE:
12/1/2008
PROJECT NUMBER:
3749
FILE NAME:
G-1.dgn
SHEET NUMBER:

G-1

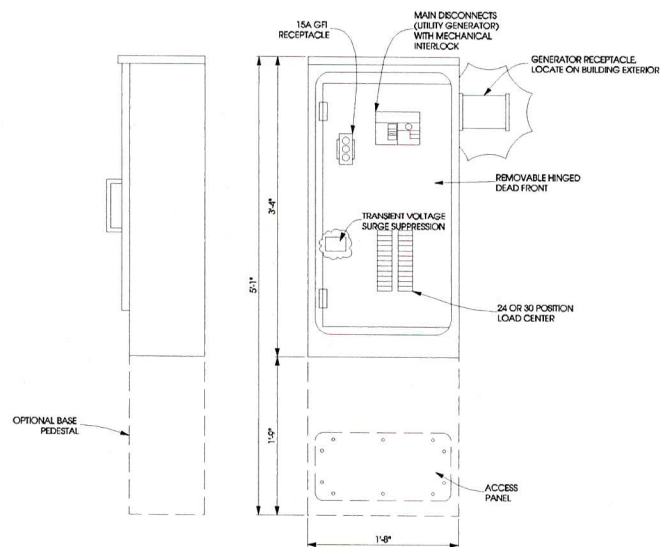
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133720(3749)cadweld1cad16-2.dgn

SPECIFICATIONS:
 40"H x 20"W x 10"D
 WGT: N/A
 GEN. RECEPTACLE: N/A

NOTE:
 PROVIDED BY T-MOBILE AND
 INSTALLED BY CONTRACTOR



PPC CABINET DETAILS
 SCALE: NTS



EXISTING TELCO BOARD (INSIDE SHELTER)



EXISTING ELECTRIC (INSIDE SHELTER)

ELECTRICAL NOTES
NORTHWEST WT (#ML70553B)
WILLIAMS BAY, WISCONSIN

SHEET TITLE	ISSUE DATE
	LEASE EXHIBIT - 11/04/08
	PRELIMINARY CD - 11/14/08
	FINAL CD - 12/01/08
REVISIONS	
DRAWN BY:	DHN, CV
CHECKED BY:	DCJ
PLOT DATE:	12/1/2008
PROJECT NUMBER:	3789
FILE NAME:	E-1.dgn
SHEET NUMBER:	E-1

DIVISION 1 - GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 INTENT

- A. THE SPECIFICATIONS AND THE CONSTRUCTION DRAWINGS ACCOMPANYING THEM DISCLOSE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION.
- B. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN OR SPECIFIED ON BOTH.
- C. THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.
- D. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.
- E. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY THE OWNER WITHOUT ISSUING A CHANGE ORDER.

- F. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.

- G. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.

1.2 CONFLICTS

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DONE ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN THE ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.
- B. THE BIDDERS, IF AWARDED THE CONTRACT, WILL NOT BE ALLOWED ANY EXTRA COMPENSATION BY REASON OF ANY MATTER OR THING CONCERNING WHICH SUCH BIDDERS MIGHT HAVE FULLY INFORMED THEMSELVES PRIOR TO THE BIDDING.
- C. NO REASON OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF OBTUSITY OF CONDITIONS THAT MAY BE ENCOUNTERED OR OF ANY OTHER RELEVANT MATTER CONCERNING THE WORK TO BE PERFORMED IN THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FURNISH EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS GOVERNING THE WORK.

1.3 CONTRACTS AND WARRANTIES

- A. CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYMENT OF CONTRACTOR LICENSES AND BONDS.
- B. BIDDERS MUST SUBMIT CONTRACT BIDDERS AGREEMENT FOR ADDITIONAL DETAILS.

1.4 STORAGE

- A. ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY BROADCAST METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

1.5 CLEANUP

- A. THE CONTRACTOR SHALL AT ALL TIMES KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK. THEY SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL THEIR TOOLS, SCAFFOLDING AND SURPLUS MATERIALS AND SHALL LEAVE THEIR WORK CLEAN AND READY FOR USE.
- B. EXTERIOR VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, BROADCASTS AND OTHER FOREIGN MATTER.
1. REMOVE ALL TRACES OF SPILLED MATERIALS FROM ADJACENT SURFACES.
2. IF NECESSARY TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.
- C. INTERIOR VISUALLY INSPECT INTERIOR SURFACE AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, BROADCASTS AND OTHER FOREIGN MATTER FROM WALLS/DOORWAYS.
1. REMOVE ALL TRACES OF SPILLED MATERIAL FROM ADJACENT SURFACES.
2. REMOVE PAINT DROPPINGS, SPOTS, STAINS AND DIRT FROM FINISHED SURFACES.

1.6 CHANGE ORDER PROCEDURE

- A. CHANGE ORDERS MAY BE INITIATED BY THE OWNER AND/OR THE CONTRACTOR INVOLVED. THE CONTRACTOR, UPON WRITTEN REQUEST FROM THE OWNER SHALL PREPARE A WRITTEN PROPOSAL CONCERNING THE CHANGE IN WORK OR MATERIALS AND ANY CHANGES IN THE CONTRACT AMOUNT AND PRESENT TO THE OWNER WITHIN 72 HRS FOR APPROVAL. SUBMIT REQUESTS FOR SUBSTITUTIONS IN THE FORM AND IN ACCORDANCE WITH PROCEDURES REQUIRED FOR CHANGE ORDER PROPOSALS. ANY CHANGES IN SCOPE OF WORK OR MATERIALS WHICH ARE PERFORMED BY THE CONTRACTOR WITHOUT A WRITTEN CHANGE ORDER AS DESCRIBED AND APPROVED BY THE OWNER SHALL PLACE FULL RESPONSIBILITY ON THESE ACTIONS ON THE CONTRACTOR.

1.7 RELATED DOCUMENTS AND COORDINATION

- A. GENERAL CARPENTRY, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED. A PERFORMANCE OF THE WORK, THE CONTRACTOR MUST REFER TO ALL DRAWINGS. ALL COORDINATION TO BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.8 SHOP DRAWINGS

- A. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR APPROVAL.
- B. ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER.

1.9 PRODUCTS AND SUBSTITUTIONS

- A. SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION. IN EACH REQUEST IDENTIFY THE PRODUCT OR FABRICATION OR INSTALLATION METHOD TO BE REPLACED BY THE SUBSTITUTION. INCLUDE RELATED SPECIFICATION SECTION AND DRAWING NUMBER AND COMPLETE DOCUMENTATION SHOWING CONFORMANCE WITH THE REQUIREMENTS FOR SUBSTITUTIONS.
- B. SUBMIT ALL NECESSARY PRODUCT DATA AND CUT SHEETS WHICH PROPERLY INDICATE AND DESCRIBE THE ITEMS. CONTRACTOR SHALL, IF DEMAND NECESSARY BY THE PRODUCTS AND MATERIALS BEING INSTALLED, BE OBLIGED TO SUBMIT ACTUAL SAMPLES TO THE OWNER FOR APPROVAL IN LIEU OF CUT SHEETS.

1.10 QUALITY ASSURANCE

- A. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE BUT NOT BE LIMITED TO THE LATEST VERSION OF THE FOLLOWING:
ANSI/ASCE - 222 - F
UNIFORM BUILDING CODE (UBC) 1994
BUILDING OFFICIALS AND CODE ADMINISTRATORS (BOCA) 1996
NATIONAL ELECTRICAL CODE (NEC) WITH LOCAL AMENDMENTS 1999
UNDERWATER LABORER'S APPROVED ELECTRICAL PRODUCTS
AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
LIFE SAFETY CODE NFPA - 101-1997

1.11 ADMINISTRATION

- A. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.
- B. SUBMIT A BAR TYPE PROGRESS CHART NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK ON THE SCHEDULE INDICATING A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK AND SHOWING COMPLETION OF THE WORK SUBSEQUENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.
- C. PRIOR TO COMMENCING CONSTRUCTION, THE OWNER SHALL SCHEDULE AN ON-SITE MEETINGS WITH ALL MAJOR PARTIES. THIS WOULD INCLUDE (THOUGH NOT LIMITED TO) THE OWNER, PROJECT MANAGER, CONSTRUCTION LAND OWNER REPRESENTATIVE, LOCAL TELEPHONE COMPANY, TOWER ERECTION FOREMAN (IF SUBCONTRACTED).
- D. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A REFER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY THE OWNER. NOR WILL WIRELESS SERVICE BE ARRANGED.

- E. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES. CONTRACTOR WILL COMPLY WITH ALL WIFE SAFETY REQUIREMENTS IN THEIR AGREEMENT.
- F. PROVIDE WRITTEN DAILY UPDATES ON SITE PROGRESS TO THE OWNER.
- G. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.
- H. NOTIFY THE OWNER / PROJECT MANAGER IN WRITING NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND EQUIPMENT CANNET PLACEMENTS.

1.12 INSURANCE AND BONDS

- A. CONTRACTOR SHALL AT THEIR OWN EXPENSE CARRY AND MAINTAIN FOR THE DURATION OF THE PROJECT ALL INSURANCE AS REQUIRED AND LISTED AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE STATING ALL COVERAGE TO THE OWNER. REFER TO THE MASTER AGREEMENT FOR INSURED INSURANCE LIMITS.
- B. THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES.
- C. CONTRACTOR MUST PROVIDE PROOF OF INSURANCE.

DIVISION 2 - SITE WORK AND DRAINAGE

02000 EARTHWORK, EXCAVATION AND GRADING

PART 1 GENERAL

- 1.1 WORK INCLUDED: REFER TO THE SURVEY AND SET PLAN FOR WORK INCLUDED.

1.3 RELATED WORK

- A. CONSTRUCTION FOR EQUIPMENT FOUNDATION
- B. INSTALLATION OF ANTENNA SUPPORT SYSTEM
- C. ERECTION OF FENCE

1.3 DESCRIPTIONS

- A. ACCESS ROAD, TURNAROUND AREAS, AND SITES ARE CONSTRUCTED TO PROVIDE A WELL DRAINED, EASILY MAINTAINED, EVEN SURFACE FOR MATERIAL AND EQUIPMENT DELIVERIES AND MAINTENANCE PERSONNEL ACCESS.

1.4 QUALITY ASSURANCE

- A. VEGETATION LANDSCAPING, IF INCLUDED WITHIN THE CONTRACT, WILL BE PLACED AND MAINTAINED AS RECOMMENDED BY NURSERY INDUSTRY STANDARDS.

1.5 EQUIPMENT

- A. CONFIRM SURVEY STAKES AND SET ELEVATION STAKES PRIOR TO ANY CONSTRUCTION.
- B. GRUB THE COMPLETE ROAD AND SITE AREA PRIOR TO FOUNDATION CONSTRUCTION OR PLACEMENT OF BACKFILL OR SUB-BASE MATERIAL.
- C. CONSTRUCT TEMPORARY CONSTRUCTION ZONE ALONGS ACCESS DRIVE, IN ACCORDANCE WITH ALL LOCAL, STATE A FEDERAL RULES.
- D. THE SITE AREA WILL BE BROUGHT TO SUB-BASE COURSE ELEVATION AND THE ACCESS ROAD TO BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS.
- E. IF REQUIRED, GRADE, SEED, FERTILIZE AND MULCH SITE AND ACCESS ROAD TO BASE COURSE ELEVATION. DISTURBED AREAS IMMEDIATELY AFTER BRINGING THE WATER TO INSURE GROWTH.
- F. REMOVE GRAVEL FROM TEMPORARY CONSTRUCTION ZONE.

1.6 WARRANTY

- A. IN ADDITION TO THE WARRANTY ON ALL CONSTRUCTION COVERED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL FURNISH ALL DAMAGE OF SURROUNDING PROPERTY CAUSED BY CONSTRUCTION.
- B. DISTURBED AREAS WILL RESPECT GROWTH OF NEW GRASS COVER PRIOR TO FINAL INSPECTION.
- C. LANDSCAPING, IF INCLUDED WITHIN THE SCOPE OF THE CONTRACT, WILL BE GUARANTEED FOR ONE YEAR FROM DATE OF FINAL INSPECTION.

PART 2 PRODUCTS

2.1 MATERIALS

- A. ROAD AND SITE MATERIALS: FILL MATERIAL - ACCEPTABLE SELECT FILL SHALL BE IN ACCORDANCE WITH LOCAL DEPARTMENT OF HIGHWAY AND PUBLIC TRANSPORTATION STANDARD SPECIFICATION.
- B. SOIL STABILIZER FABRIC SHALL BE MIMAF - 550G.
- C. NON STRUCTURAL, SET CONCRETE SHALL BE 3000 PSI BREAKING STRENGTH AT 28 DAYS. COMPLY WITH GENERAL PROVISIONS OF DIVISION 3 CONCRETE SPECIFICATIONS.

2.2 EQUIPMENT

- A. CONTRACTING SHALL BE ACCOMPLISHED BY MECHANICAL MEANS. LARGER AREAS SHALL BE COMPACTED BY BREKERS FOOT, VIBRATORY OR RUBBER TIED ROLLERS WEIGHING AT LEAST FIVE TONS. WATER TREATMENT MAY BE REQUIRED TO OBTAIN COMPACTION. SMALLER AREAS SHALL BE COMPACTED BY POWERS DRIVEN, HAND HELD TAMPERS.

PART 3 EXCAVATION

- 3.1. OPTICAL LOCAL BUILDING INSPECTION SHALL BE NOTIFIED NO LESS THAN 48 HRS IN ADVANCE OF CONCRETE POURS.

3.2 PREPARATION

- A. CLEAR TREES, BRUSH AND DEBRIS FROM SITE AREA AND ACCESS ROAD RIGHT OF WAY AS REQUIRED.
- B. PRIOR TO OTHER EXCAVATION AND CONSTRUCTION EFFORTS GRUB ORGANIC MATERIAL TO A MINIMUM OF SIX INCHES BELOW ORIGINAL GROUND LEVEL.

- C. UNLESS OTHERWISE INSTRUCTED BY THE OWNER, REMOVE TREES, BRUSH AND DEBRIS FROM THE PROPERTY TO AN AUTHORIZED LANDFILL.
- D. PRIOR TO PLACEMENT OF FILL OR BASE MATERIALS, REMOVE JOINT SPODS AND CONNECT TO 80% BENCHMARK PROVISION.
- E. WHERE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, LINE THE EXPOSED AREAS WITH EROSION MAT PRIOR TO PLACEMENT OF FILL OR BASE MATERIAL.

3.3 INSTALLATION

- A. THE SITE AND TURNAROUND AREAS SHALL BE AT THE SUB-BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS. GRADE, CUT/FILL THE SITE AND ACCESS ROAD AS REQUIRED WITH THE SOIL, RESULTING FROM EXCAVATING THE FOUNDATIONS (PROVIDE EVEN DISTRIBUTION). THE ELEVATIONS ARE TO BE CALCULATED FROM THE RESULTING GRADE.
- B. CLEAR EXCESS SPOKE, IF ANY, FROM JOB SITE AND DO NOT BRUSH BEYOND THE LIMITS OF THE OWNERS LEASE PROPERTY UNLESS AUTHORIZED BY PROJECT MANAGER, IN WRITING.
- C. THE ACCESS ROAD SHALL BE BROUGHT TO BASE COURSE ELEVATION PRIOR TO FOUNDATION CONSTRUCTION.
- D. AVOID CREATING DEPRESSIONS WHERE WATERS MAY FLOW.
- E. THE CONTRACT INCLUDES ALL NECESSARY GRADING, BENCHMARK, EROSION AND UNLESS OTHERWISE INDICATED, COVERING TWO INCHES OF SUB-BASE COURSE. ALL ROADS OR ROUTES UTILIZED FOR ACCESS TO THE SITE, COMMENCING AT THE POINT OF INTERSECTION WITH THE NEAREST PUBLIC THOROUGHFARE, ARE INCLUDED IN SCOPE UNLESS OTHERWISE NOTED.
- F. WHEN IMPROVING AN EXISTING ACCESS ROAD, GRADE THE EXISTING ROAD TO REMOVE ANY ORGANIC MATERIAL AND SMOOTH THE SURFACE BEFORE PLACING FILL OR STONE.
- G. PLACE FILL OR STONE IN SIX INCH MAXIMUM LIFTS AND COMPACT BEFORE PLACING NEXT LIFT.
- H. THE FINISH GRADE, INCLUDING TOP SURFACE COURSE, SHALL EXCEED A MINIMUM OF ONE FOOT BEYOND THE SITE FENCE AND SHALL COVER THE AREA AS INDICATED.
- I. GRAP SHALL BE APPLIED TO THE SLOPE SLOPS OR ALL EXPOSED SITE AREAS, FACING AREAS AND TO ALL OTHER SLOPS GREATER THAN 2:1.
- J. PRIMP SHALL BE APPLIED TO THE SEEDS OF DITCHES OR DRAINAGE SWALES AS INDICATED ON PLANS.
- K. PRIMP EXIST DITCH FOR SIX FEET IN ALL DIRECTIONS AT CULVERT OPENINGS.
- L. SEED, FERTILIZED AND FRESH COVER SHALL BE APPLIED TO ALL OTHER DISTURBED AREAS AND DITCHES, DRAINAGE, SWALES, NOT OTHERWISE SPECIFIED.
- M. UNDER NO CIRCUMSTANCES WILL DITCHES, SWALES OR CULVERTS BE PLACED SO THEY DRAIN WATER TOWARDS, OR PERMIT STANDING WATER IMMEDIATELY ADJACENT TO SITE. IF OWNER DESIGNS OR ELEVATIONS, CONTACT WITH THIS GUIDANCE ADVISE THE OWNER IMMEDIATELY, IN WRITING.
- N. IF DITCH LIES WITH SLOPES GREATER THAN TEN PERCENT, MOUND DIVERSIONARY HEADWALLS IN THE DITCH AT UPSTREAM UPRAMP SIDE OF THE HEADWALL AS WELL AS THE DITCH FOR SIX FEET ABOVE THE CULVERT ENTRANCE.
- O. SEED AND FERTILIZER SHALL BE APPLIED TO SURFACE CONDITIONS WHICH WILL ENCOURAGE ROOTING. BARE AREAS TO BE SEeded TO EVEN THE SURFACE AND LOOSEN THE SOIL.
- P. ROW SEED IN TWO DIRECTIONS IN TWICE THE QUANTITY RECOMMENDED BY THE SEED PRODUCER.
- Q. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE GROWTH OF SEEDS AND LANDSCAPED AREAS BY WATERING UP TO THE POINT OF RELEASE FROM THE CONTRACT. CONTINUE TO REWORK BARE AREAS UNTIL COMPLETE COVERAGE IS OBTAINED.

3.4 FIELD QUALITY CONTROL

- A. COMPACTION SHALL BE 90% MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D-1557 FOR SITE WORK AND 95% UNDER ROAD AREAS. AREAS OF SETTLEMENT WILL BE EXCAVATED AND REFILLED AT CONTRACTORS EXPENSE.

3.5 PROTECTION

- A. PROTECT SEEDED AREAS FROM EROSION BY SPREADING STRAW TO A UNIFORM COARSE DEPTH OF 12 INCHES. STAY AND THE DOWN AN EROSION. USE OF EROSION CONTROL MATS OR MULCH NET WILL BE AN ACCEPTABLE ALTERNATE.
- B. ALL TREES PLACED IN CONJUNCTION WITH A LANDSCAPE CONTRACT WILL BE WRAPPED, TIED WITH HOPE PROTECTED WIRE AND SECURED TO 2 INCH X 2 INCH X 4 FOOT STEEL ANGLE EXTENDING TWO FEET INTO THE GROUND ON FOUR SIDES OF THE TREE.
- C. ALL EXPOSED AREAS SHALL BE PROTECTED AGAINST WASHOUTS AND SOIL EROSION.



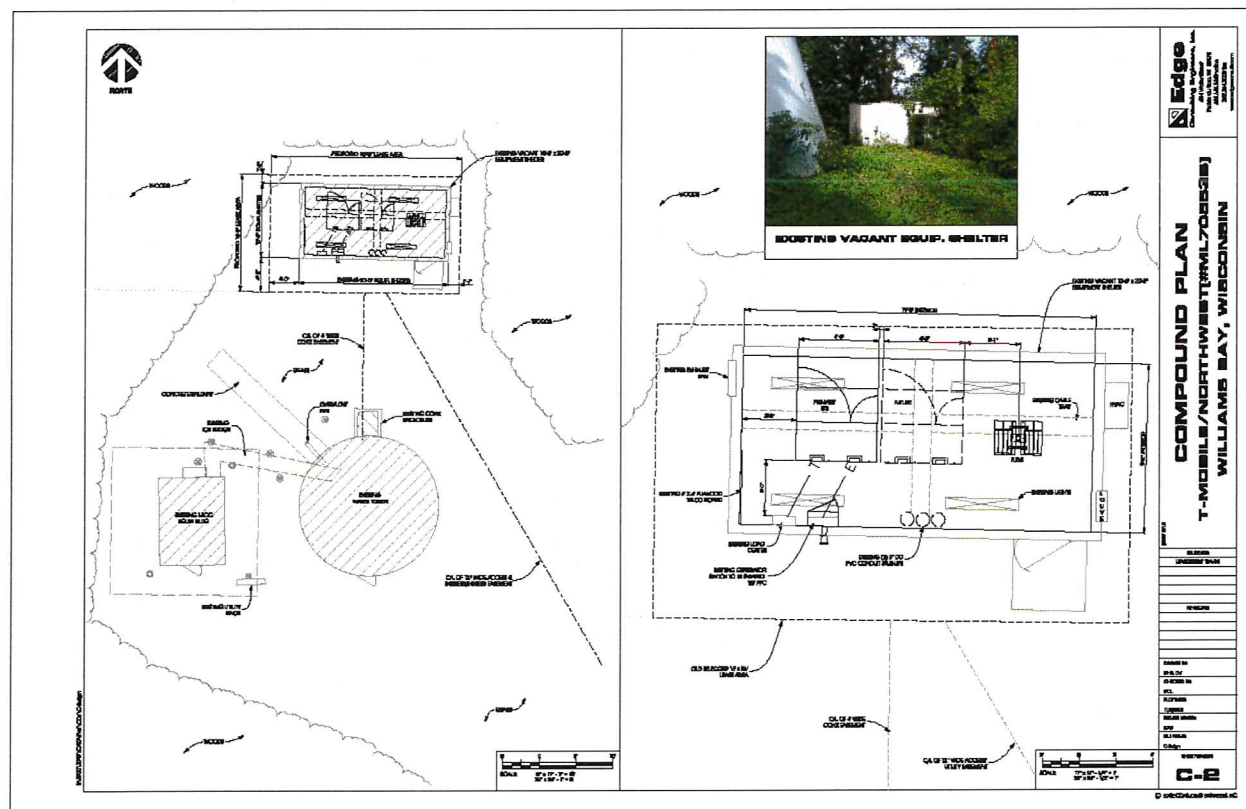
GENERAL NOTES
NORTHWEST WT (#ML70553B)
WILLIAMS BAY, WISCONSIN

SHEET TITLE:	ISLE DATE:
	LEAVE DORMIT - 1/10/06
	PRELIMINARY CD - 1/1/10/06
	FINAL CD - 12/01/06
REVISIONS:	
DRAWN BY:	DIV. CIV.
CHECKED BY:	DIV.
DATE:	12/1/2006
PROJECT NUMBER:	3789
FILE NAME:	N-1.dgn
SHEET NUMBER:	N-1

Page 59 of 205

EXHIBIT D

Exact location of the Communication Facilities in reference to the Water Tower attached here:



Recommendation of Conditional Approval T-Mobile Upgrade:

**ANCHOR - INSTALLATION OF (6) NEW ANTENNAS, (3) RRUS
& (2) HCS 2.0 BREAKOUT BOXES ON EXISTING HANDRAIL
ON TOP OF WATER TANK AND UPGRADE OF GROUND
EQUIPMENT INSIDE LEASE AREA**

Northwest Water Tower – Near Olive Street

Village of Williams Bay

February 8, 2021

T-Mobile is requesting approval to install six new antennas, and other miscellaneous components, on the existing handrails on the Northwest Water Tower. Enclosed are the reviewed structural calculations and plan improvements dated October 7, 2020, sealed by Seemesh M. Sethi, PE, KCS Corporation for T-Mobile. Ms. Karol Fahey from Insite Inc., consultant to T-Mobile, provided the submittal. We recommend approval of the planned improvements with the following conditions:

1. There are existing OSHA clearance issues with the existing and proposed equipment; the clearance issues would not exist except for the equipment of the carriers, including T-Mobile; Make T-Mobile responsible for the OSHA issues until their facilities are removed from the tank at the time of repainting of this water tower in approximately 2023.
2. Provide a letter from T-Mobile agreeing to be part of the installation of a new structure and new access to the structure in approximately 2023, as part of the repainting of the existing Northwest Water Tower; see the attached Concept Plan dated 12-16-20. The project is expected to cost \$360,000; the available carriers would split the actual project cost. We were unable to obtain this letter from Karol Fahey; we are unsure if T-Mobile is even aware of the request.
3. That the Village allow the self-supported tower shown on the Concept Plan dated 12-16-20.

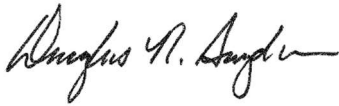
Background

- In April of 2020, the Village requested T-Mobile (and other carriers) to relocate their facilities from the Northwest Tower to the recently repainted Theatre Road Water Tank. In June of 2020, Insite Inc. responded on behalf of T-Mobile, noting that T-Mobile would prefer to be on a separate structure on the same site. The Northwest Water Tower site is geographically preferred to the Theatre Road Water Tower site. See the attached April 6, 2020, June 16, 2020, and June 22, 2020 correspondence.
- In August of 2020, Insite, Inc. requested record information on the existing Northwest Water Tower.
- After October 7, 2020 the Village received the plans for the proposed six new antennas; this surprised us because of the June 16, 2020 correspondence. This was the first we were aware that T-Mobile wanted to modify the existing facilities on the existing tank in advance of the planned relocation at the time of repainting of the Northwest Water Tower.
- In December of 2020, we forwarded the attached Concept Plan for the separate antenna structure and requested the letter from T-Mobile. This would enable T-Mobile (other carrier

also) to pay to remove their facilities once. It would prevent the need for them to install their own temporary pole, remove their existing facilities from the water tower, and then reinstall their facilities on the repainted water tower.

- Since October of 2020, Karol has made several attempts with several staff members to separate this approval from the commitment of T-Mobile to participate in the attached Concept Plan at the time of the Northwest Tower repainting; she cites the existing May 11, 2009 lease agreement and ignores the June 16, 2020 correspondence. She may be present at upcoming meetings to better explain T-Mobile's position on this issue. We ask that you consider having the Village Attorney review the lease agreement and be part of the discussions.

Status of Engineer's Approval: Recommended for Approval with Noted Conditions



Douglas R. Snyder, PE

WWUP 00022

Area to be cleared

WWUP 00002

WWUP 00022

Proposed self-supported tower
for antenna carriers
50' to north and west
lot lines

WLAK 00122

0003A
240
WWUP 00003A

Existing water tower
and antenna
location

WLAK 00123

Provide a site design
that allows for an
additional carrier

WLAK 00124

WLAK 00134

Proposed access from
Wesley Street.
Requires basement.

WESLEY

WESLEY ST

LOCKWOOD

WLAK 00126

WLAK 00126

WLAK 00125

WLAK 00127

NOTE: Existing access extends
from Olive Street.

WLAK 00128

NW Tower

WALWORTH COUNTY, WISCONSIN

1 inch = 65 feet

Author:
Map Produced on: 12/9/2020

Wisconsin State Plane Coordinate System, South Zone

Horizontal Datum: NAD83/2011

Walworth County Information Technology Department
Land Information Division

1800 County Trunk Rd
Elkhorn, WI 53121-4001

DATE: 12/9/2020 THE INFORMATION PROVIDED HEREIN IS FOR INFORMATIONAL PURPOSES ONLY. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE. THE INFORMATION CONTAINED HEREIN IS NOT TO BE USED FOR ANY OTHER PURPOSE.

Improvement Description and Preliminary Opinion of Probable Cost

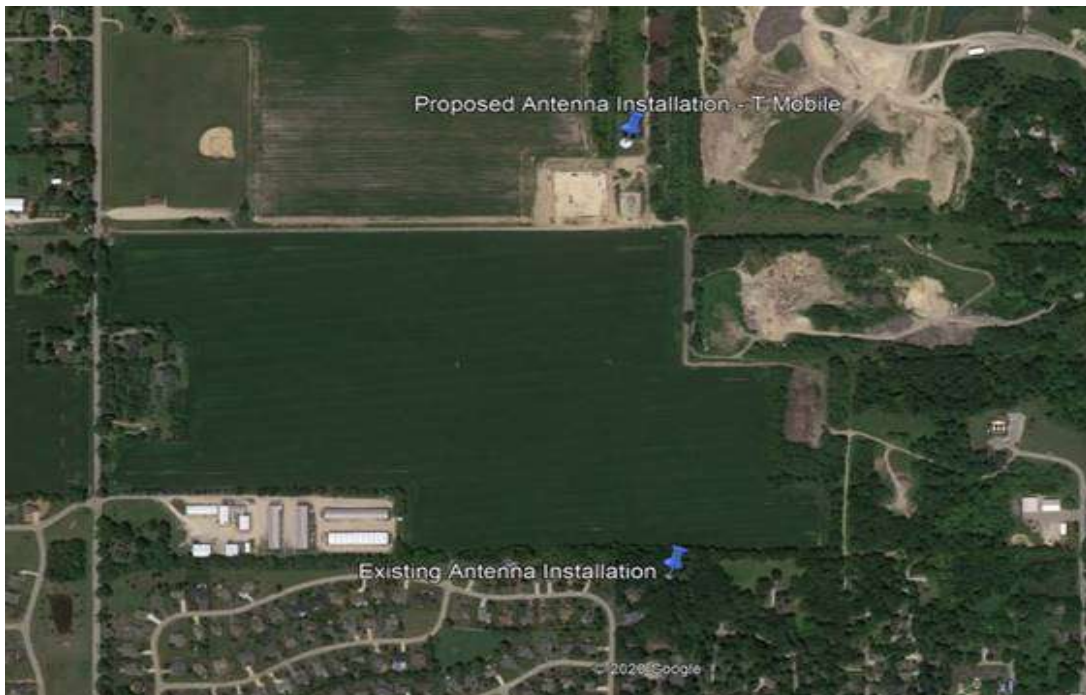
Northwest Water Tower - Antenna Carrier Improvements
Village of Williams Bay

Item	Approximate Quantity	Unit Price	Amount
Tree Clearing and Site Access Drive	1 LS	\$ 45,000	\$45,000
Geotechnical Investigations and Legal Survey	1 LS	\$ 9,000	\$9,000
Antenna and Foundation	1 LS	\$145,000	\$145,000
Security Fence at Antenna Base	1 LS	\$ 8,000	\$8,000
Access to Wesley Street and Easement	1 LS	\$ 50,000	\$50,000
Coordination of Carriers / Design Requirements	1 LS	\$ 10,000	\$10,000
Permitting and Review	1 LS	\$ 10,000	\$10,000
Construction Cost			\$277,000
Engineering and Contingencies (30%)			\$83,000
Project Cost			\$360,000

Improvement Description

There are at least two antenna carriers on the water tower at the Northwest Tower site and one carrier on the water tower at the Potawatomi site. The Village's long-term plan is to consolidate the carriers either on the water tower on the Theatre Road site or on a self-supported tower at the Northwest Tower site. The carriers prefer the Northwest Tower site. This improvement will allow the Village to comply with safety regulations required for the climbers at the Northwest Tower site and allow the Village to either repair and repaint or remove the individual water towers from service in the future. The current plan is to keep the Theatre Road and Northwest locations for elevated storage; see below for a aerial photo showing these locations. The improvements at the Northwest Tower site include construction of a 125 foot antenna at the northwest corner of the Northwest Water Tower Site and access improvements to get to the site. These improvements will save the carriers cost associated with removal and replacement of the antennas and cables in order to repaint the elevated storage tanks. See the December 16, 2020 Concept Plan for the Northwest Tower Antenna Carrier Improvements.

Location Sketch



Douglas R. Snyder

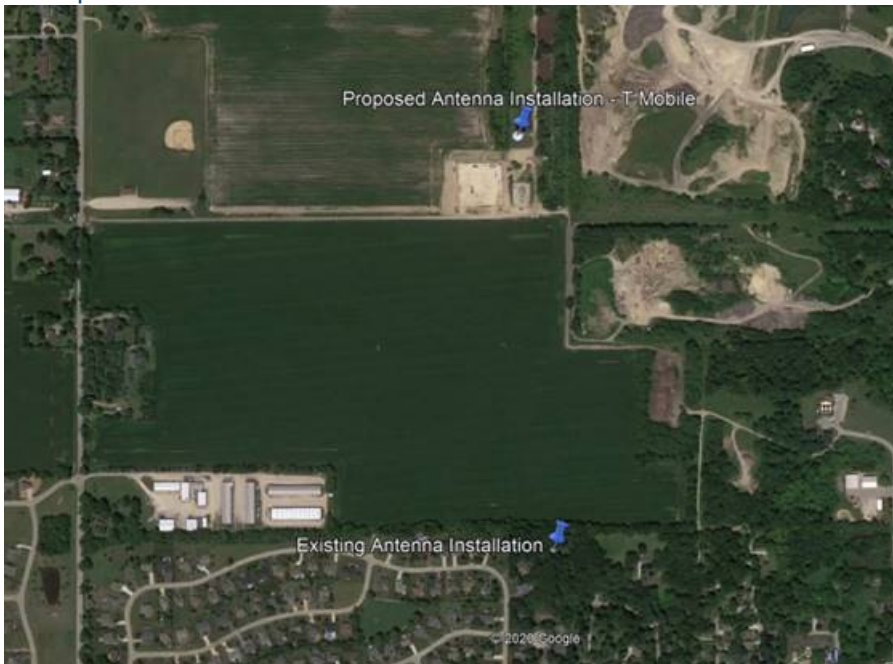
From: Douglas R. Snyder
Sent: Monday, April 6, 2020 4:46 PM
To: Tina.Whelan@t-mobile.com
Cc: James Weiss (admin@williamsbay.org); Wayne Edwards
Subject: FW: ML70553B Williams Bay Cell Tower T-Mobile
Attachments: Northwest Tower - T-Mobile.pdf; North - Utility.pdf; Tank and Foundation Design Calculations.pdf; Tank Drawings.pdf; T - Mobile Antenna Move.kmz

Hi Tina,

Thanks for taking my call this afternoon; we are the Village Engineer for Williams Bay. Attached is a Google Earth map (also snip below) showing both your existing site and the site I would like you to relocate to after the summer of 2021. Also attached is a recent inspection report containing photos, the original tank calculations and drawings, and the plans you prepared in 2009 for the current installation. The Village is blasting and repainting the tank at the proposed location prior to the summer of 2021 and has plans to do something similar to the tank you currently occupy in the next 3 years.

We are hoping that this move will prevent you from the costs associated with installing a temporary pole and temporary antennas when the Village blasts and repaints the tank you are currently on in about 3 years. Your antennas are also creating space and safety issues within the access tube of the tank you currently occupy.

Please have someone contact us to confirm that you are able to make the site change, your proposed schedule, and let us know what you need from the Village for that to occur. This is a lot of material and a big request—let me know if you have questions.



Douglas R. Snyder, P.E.
Regional Manager



direct: 815.444.3349 | mobile: 262.492.1462

email: dsnyder@baxterwoodman.com

www.baxterwoodman.com

256 S. Pine St., Burlington, WI 53105

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From: James Weiss <admin@williamsbay.org>
Sent: Monday, April 6, 2020 3:37 PM
To: Douglas R. Snyder <dsnyder@baxterwoodman.com>
Subject: Fwd: ML70553B Williams Bay Cell Tower T-Mobile

Hi Doug,

Do you wish to speak to this lady to discuss your proposed future changes?

Jim

----- Forwarded message -----

From: Whelan, Tina <Tina.WheLAN@t-mobile.com>
Date: Mon, Apr 6, 2020 at 3:29 PM
Subject: RE: ML70553B Williams Bay Cell Tower T-Mobile
To: James Weiss <admin@williamsbay.org>

Good afternoon Mr. Weiss, this has been forwarded to me. How can I help you? Below you mention that you are contemplating some changes with our water towers and our engineer would like to discuss these changes with T-Mobile. I am available to speak to you or find out what type of changes you are contemplating so I can direct you to the appropriate department if necessary. Please feel free to call or email me at your earliest convenience.

Regards,

Tina Whelan
Sr. Specialist, Technology Property Management

425-383-9588

T-Mobile

[National Development Portal](#)

Douglas R. Snyder

From: Ryan Mouw <mouw@insite-inc.com>
Sent: Tuesday, June 16, 2020 11:49 AM
To: Douglas R. Snyder
Cc: Karol Fahey
Subject: ML70553B (Northwest Water Tank - 250 Olive Street, Williams Bay, WI) - Re-painting of Water Tank Discussion

Doug –

Thank you for your time over the phone this morning. To summarize our discussion, the re-painting of above referenced water tank in Williams Bay, WI will commence sometime 2022. There are currently multiple cellular providers with equipment on this water tank and you indicated at some point prior to 2022 you'd like to see a separate structure built to accommodate all the carriers. This proposed separate structure would be a permanent relocation, even after the water tank is re-painted, and built/maintained by Williams Bay (government). You also cited safety concerns with the existing antenna facility at this water tank. In terms of the proposed modification and upgrade work T-Mobile was beginning to plan at this water tank site, they will be the ones assessing the situation based on this information and ultimately deciding whether to move forward or delay work – we can certainly keep you updated.

I have copied my colleague Karol on this message as you've requested to communicate directly with T-Mobile with the hopes of facilitating directly with them. As mentioned we handle all the leasing and site work on behalf of T-Mobile however Karol would perhaps be able to further assist/direct you.

Lastly, thank you for confirming your firm, Baxter & Woodman, is the 3rd party reviewer for Williams Bay, WI. We have made note.

Please feel free to add anything I may have missed & please don't hesitate to reach out to us anytime. Thank you Doug.

Best Regards,

Ryan Mouw



1s660 Midwest Road, Suite 140
Oakbrook Terrace, IL 60181
Mobile: 708-638-1723
mouw@insite-inc.com
www.Insite-Inc.com

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Douglas R. Snyder

From: Douglas R. Snyder
Sent: Monday, June 22, 2020 12:29 PM
To: Wayne Edwards
Cc: James Weiss (admin@williamsbay.org)
Subject: Main Contacts at T-Mobile and US Cellular

Jim and Wayne,

TMobile is also interested in relocating off of the NW water tower if the Village is willing to get approval for a self-supporting tower on the same parcel that is about 10 feet higher than the top of the NW tower. They are also willing to share this structure with US Cellular. Supposedly the two contact persons listed below work together often. I informed him that Maguire offered to build the tower. Ray noted that he doubted that it would be without cost to the Village. TMobile wanted reduced monthly payments if they were to invest in the self-supported tower.

I will put a common request into both parties for a joint meeting at the Village if we can agree internally that we can get the zoning permit for permanent self-supported tower on that same site.

This structure: T-Mobile Site Number ML70553B; US Cellular Site Number 786318. We need to reference this when we talk to each of them.

Ray Shinkle, Insite Inc., T-Mobile Representative
Phone: 773-960-8781
shinkle@insite-inc.com

David G. Elke, Senior Director, Maguire Development
Phone: 224-856-8101
delke@maguiredevcorp.com

Doug

From: Wayne Edwards <wedwards@williamsbay.org>
Sent: Monday, June 22, 2020 11:42 AM
To: Douglas R. Snyder <dsnyder@baxterwoodman.com>
Subject: Fwd: ML70553B (Northwest WT, 250 Olive Street, Williams Bay, WI) - Please confirm no permitting

Doug, did you get the chance to talk to this company? I see they are still asking permit information.

Best Regards,
Wayne Edwards DPW
Village of Williams Bay

----- Forwarded message -----

From: **Ryan Mouw** <mouw@insite-inc.com>

Date: Mon, Jun 22, 2020, 11:38 AM

Subject: ML70553B (Northwest WT, 250 Olive Street, Williams Bay, WI) - Please confirm no permitting

To: pbipermit@icloud.com <pbipermit@icloud.com>

Cc: wedwards@williamsbay.org <wedwards@williamsbay.org>, Karol Fahey <kfahey@insite-inc.com>

Joe –

As you may recall we spoke back on 6/9 and at the time you mentioned there is no Williams Bay permitting required for the planned T-Mobile modification and upgrade work at the above referenced site. Please confirm.

Thank You,

Ryan Mouw



1s660 Midwest Road, Suite 140

Oakbrook Terrace, IL 60181

Mobile: 708-638-1723

mouw@insite-inc.com

www.Insite-Inc.com

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Structural Analysis of Existing Antenna Mount & Existing Water Tank

ML70553B – Northwest WT
250 Olive St.,
Williams Bay, WI 53191

Date Prepared: 10/07/2020



1125 Remington Rd.,
Schaumburg, IL 60173



CALCULATION COVER SHEET

CLIENT: T-Mobile CALC. No. 0

PROJECT: Northwest WT REVISION 0 DATE 10/07/20

PROJECT No.: ML70553B

Designed By: FC
Reviewed By: VD

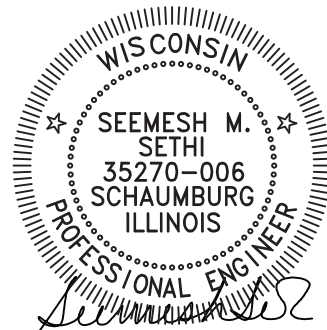
TITLE: Structural Analysis of Existing Antenna Mount & Existing Water Tank

CONTENTS:

Ser. No.	Description	Rev. (0 U.N.)	Page No.
1	Introduction, Codes & Standards, Design Criteria, Appurtenance Loading Schedule, References, Summary		1
2	Antenna Mount Analysis		2-37
3	Water Tank Analysis		38-44

APPENDIX

A	Mapping Report by Total Service Telecom	A1-A17
B	Reference Drawings by KCS Corporation	B1-B2
C	Past Structural Analysis by Edge Consulting Engineers, Inc.	C1-C9
A	Past Structural Analysis by Edge Consulting Engineers, Inc.	D1-D8



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Date 10/07/2020
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Expires: 7/31/2022

Water Tank & Antenna Mount Analysis

SITE ADDRESS: 250 Olive St., Williams Bay, WI 53191
SITE NUMBER : ML70553B
SITE NAME: Northwest WT
DESCRIPTION: Modification Site (Equipment Upgrade)

INTRODUCTION

T-Mobile proposes to upgrade existing equipment with the installation of (3) new antennas, (3) new radio support units and (2) breakout boxes/pendants on existing water tank handrail. Existing T-Mobile equipment will be removed per construction drawings indications.

The purpose of this analysis is to determine if the existing antenna mount & water tank are structurally capable of supporting the proposed antenna installation in addition to the existing tank loads.

APPLICABLE CODES AND STANDARDS

- ANSI/AWWA-D100-05
- ANSI/TIA-222-H

DESIGN CRITERIA

- Basic Wind Speed of 107 mph
w/o ice (ANSI/TIA-222-H)
- Exposure Category C

REFERENCES

- 1 - Latest Construction drawings by KCS Corporation as of 10/7/2020.
- 2 - Latest T-Mobile RFDS (ML70553B_Anchor_2_draft_2020_05-28, Last Modified: 5/18/2020).
- 3 - Structural Analysis performed by Edge Consulting Engineers, Inc. dated 2/26/2009.
- 4 - Mapping Report by Total Service Telecom, dated 9/30/2020.

ANTENNA AND APPURTENANCE INFORMATION

APPURTENANCE SCHEDULE & DESCRIPTION						
Proposed T-Mobile Antennas & RRUs	CL Elevation	QTY	HEIGHT (IN.)	WIDTH (IN.)	DEPTH (IN.)	UNIT WT. (LBS.)
HBXX-6517DS-A2M	123'	3	75	12	6.5	40.8
AAHF Active Antenna Massive MIMO	123'	3	25.6	19.7	10.3	103.6
AHFIG RRU	123'	3	28.7	12.9	5.6	70.5
Breakout Box/Pendant	123'	2	14	9.3	5	4.0
Existing By Others Antennas & RRUs	CL Elevation	QTY	HEIGHT (IN.)	WIDTH (IN.)	DEPTH (IN.)	UNIT WT. (LBS.)
KMW AM-X-CW-16-65-00T-RET	123'	3	72	11.8	5.9	41.8
KMW AM-X-CW-18-65-00T-RET	123'	3	96	11.8	6	52.9
ASP 705K	123'	1	220	3	3	22.0
Lighting Rod	123'	1	180	2.5	2.5	15.0
Light Beacon	123'	1	144	3	3	20.0

WATER TANK ANALYSIS SUMMARY

Wind loading and stability analysis checks have been performed and results indicate that the existing **water tower is structurally capable** of supporting the proposed T-Mobile equipment upgrade installation on existing T-Mobile antenna mount. **Water tank capacity is at 99.7%** by anchor bolt allowable stress per AWWA-D100-05.

ANTENNA MOUNT ANALYSIS SUMMARY

The existing antenna mount (existing handrails) **is adequate** to support the proposed appurtenance. Antenna mount member **capacity is at 69.4%**.

Mount Analysis

Calculation of Wind Load on Equipment (per TIA-222-H)

T-Mobile Antennas @ CL. 123 ft. AGL w/o Ice

$$V := 107 \text{ mph}$$

$$\alpha := 9.5 \quad Z_g := 900 \text{ ft}$$

$$Z_{\text{ant}} := 123 \text{ ft} \quad z_s := 1011 \text{ ft}$$

$$K_z := 2.01 \cdot \left(\frac{Z_{\text{ant}}}{Z_g} \right)^{\frac{2}{\alpha}} \quad K_z = 1.32$$

$$K_{zt} := 1.0$$

$$K_e := e^{-0.0000362 \cdot z_s} = 0.96$$

$$K_d := 0.95$$

$$K_s := 1.0$$

$$G_h := 1.0$$

$$q_{z_{\text{ant}}} := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot V^2 \cdot G_h \cdot \frac{\text{psf}}{\text{mph}^2} = 35.49 \cdot \text{psf}$$

Note:

- member wind pressure used 53 psf to account for shape factors.

T-Mobile Antennas @ CL. 123 ft. AGL w/ Ice

$$V := 40 \text{ mph}$$

$$I_{\text{factor}} := 1.15$$

$$q_{z_{\text{ant_ice}}} := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_e \cdot K_d \cdot V^2 \cdot G_h \cdot \frac{\text{psf}}{\text{mph}^2} = 4.96 \cdot \text{psf}$$

$$t_i := 1.50 \text{ in}$$

$$K_{iz} := \left(\frac{Z_{\text{ant}}}{33} \right)^{0.10} \cdot \text{ft}^{-0.1} = 1.14$$

$$t_{iz} := t_i \cdot I_{\text{factor}} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.97 \cdot \text{in}$$

$$\gamma_{\text{ice}} := 56 \frac{\text{lb}}{\text{ft}^3}$$

Wind Speed per TIA-222-H

For exposure category "C", Risk category II

Above-ground height to center line
of antenna & ASMLVelocity Pressure coefficient
(Section 2.6.5.2)Topographic factor, Section 2.6.6.2.1
(Category 1)

Wind Directionality factor, Table 2-2

Rooftop wind speed-up factor, Section 2.6.7

Gust effect factor, Section 2.6.9

Velocity pressure

Basic Wind Speed

Importance factor, Table 2-3

Velocity pressure

Design ice thickness

Height escalation factor for ice thickness
per Sec. 2.6.10

factored ice thickness per Sec. 2.6.10

Ice density per Sec. 2.6.10

Note: For calculation purposes ice wind load used a ratio of 0.22 on wind load without ice @ 107mph to account for decrease in wind pressure and shape factors. (see Risa Report).

Proposed Telecom Equipment Load Calculations For All sectors - T-Mobile
Antenna 1 - HBXX-6517DS-A2M

$$H_{ANT} := 75\text{in} \quad W_{ANT} := 12\text{in} \quad D_{ANT} := 6.5\text{in}$$

$$A_{A1} := H_{ANT} \cdot W_{ANT} = 6.25\text{ft}^2$$

Projected area of antenna (Front)

$$A_{A1_S} := H_{ANT} \cdot D_{ANT} = 3.39\text{ft}^2$$

Projected area of antenna (Side)

$$C_{\text{shape}} := 1.37 \quad C_{\text{shape_S}} := 1.55 \quad W_{ANT1} := 40.8\text{lb}$$

Antenna Weight

$$EPA_{A1} := C_{\text{shape}} \cdot A_{A1} \quad EPA_{A1} = 8.6\text{ft}^2$$

Effective projected area of antenna (Front)

$$F_{A1} := EPA_{A1} \cdot q_{z_ant} \quad F_{A1} = 303.86\text{lb}$$

Force due to Wind on Antenna (Front)

$$EPA_{A1_S} := C_{\text{shape_S}} \cdot A_{A1_S} \quad EPA_{A1_S} = 5.2\text{ft}^2$$

Effective projected area of antenna (Side)

$$F_{A1_S} := EPA_{A1_S} \cdot q_{z_ant} \quad F_{A1_S} = 186.21\text{lb}$$

Force due to Wind on Antenna (Side)

$$W_{Iz_A1} := \pi \cdot t_{iz} \cdot \left(\sqrt{W_{ANT}^2 + D_{ANT}^2} + t_{iz} \right) \cdot H_{ANT} \cdot \gamma_{ice} = 234.6\text{lb}$$

Ice Weight per Sec. 2.6.10

Antenna 2 - AAHF Active Antenna Massive MIMO

$$H_{ANT} := 25.6\text{in} \quad W_{ANT} := 19.7\text{in} \quad D_{ANT} := 10.3\text{in}$$

$$A_{A2} := H_{ANT} \cdot W_{ANT} = 3.5\text{ft}^2$$

Projected area of antenna (Front)

$$A_{A2_S} := H_{ANT} \cdot D_{ANT} = 1.83\text{ft}^2$$

Projected area of antenna (Side)

$$C_{\text{shape}} := 1.2 \quad C_{\text{shape_S}} := 1.2 \quad W_{ANT2} := 103.6\text{lb}$$

Antenna Weight

$$EPA_{A2} := C_{\text{shape}} \cdot A_{A2} \quad EPA_{A2} = 4.2\text{ft}^2$$

Effective projected area of antenna (Front)

$$F_{A2} := EPA_{A2} \cdot q_{z_ant} \quad F_{A2} = 149.14\text{lb}$$

Force due to Wind on Antenna (Front)

$$EPA_{A2_S} := C_{\text{shape_S}} \cdot A_{A2_S} \quad EPA_{A2_S} = 2.2\text{ft}^2$$

Effective projected area of antenna (Side)

$$F_{A2_S} := EPA_{A2_S} \cdot q_{z_ant} \quad F_{A2_S} = 77.98\text{lb}$$

Force due to Wind on Antenna (Side)

$$W_{Iz_A2} := \pi \cdot t_{iz} \cdot \left(\sqrt{W_{ANT}^2 + D_{ANT}^2} + t_{iz} \right) \cdot H_{ANT} \cdot \gamma_{ice} = 124.09\text{lb}$$

Ice Weight per Sec. 2.6.10

BOB - HCS 2.0 Break-Out-Box

$$h_{\text{BOB}} := 14\text{in} \quad w_{\text{BOB}} := 9.3\text{in} \quad d_{\text{BOB}} := 5\text{in}$$

$$A_{\text{BOB}} := h_{\text{BOB}} \cdot w_{\text{BOB}} = 0.9\text{ft}^2 \quad \text{Projected area of antenna (Front)}$$

$$A_{\text{BOB}_S} := h_{\text{BOB}} \cdot d_{\text{BOB}} = 0.49\text{ft}^2 \quad \text{Projected area of antenna (Side)}$$

$$C_{\text{shape}} := 1.2$$

$$C_{\text{shape}_S} := 1.2$$

$$W_{\text{BOB}} := 4\text{lb}$$

Equipment Weight

$$\text{EPA}_{\text{BOB}} := h_{\text{BOB}} \cdot w_{\text{BOB}} \cdot C_{\text{shape}} = 1.08\text{ft}^2$$

Effective projected area of BOB (Front)

$$F_{\text{BOB}} := \text{EPA}_{\text{BOB}} \cdot q_{z_{\text{ant}}} = 38.5\text{lb}$$

Force due to Wind on BOB (Front)

$$\text{EPA}_{\text{BOB}_S} := h_{\text{BOB}} \cdot d_{\text{BOB}} \cdot C_{\text{shape}_S} = 0.58\text{ft}^2$$

Effective projected area of BOB (Side)

$$F_{\text{BOB}_S} := \text{EPA}_{\text{BOB}_S} \cdot q_{z_{\text{ant}}} = 20.7\text{lb}$$

Force due to Wind on BOB (Side)

$$W_{i_{z_{\text{BOB}}}} := \pi \cdot t_{i_{z_{\text{BOB}}}} \cdot \left(\sqrt{w_{\text{BOB}}^2 + d_{\text{BOB}}^2} + t_{i_{z_{\text{BOB}}}} \right) \cdot h_{\text{BOB}} \cdot \gamma_{\text{ice}} = 35.13\text{lb}$$

Ice Weight per Sec. 2.6.10

RRU 1 - AHFIG

$$h_{\text{RRU}} := 28.7\text{in} \quad w_{\text{RRU}} := 12.9\text{in} \quad d_{\text{RRU}} := 5.6\text{in}$$

$$A_{\text{RRU1}} := h_{\text{RRU}} \cdot w_{\text{RRU}} = 2.57\text{ft}^2$$

Projected area of RRU 1 (Front)

$$A_{\text{RRU1}_S} := h_{\text{RRU}} \cdot d_{\text{RRU}} = 1.12\text{ft}^2$$

Projected area of RRU 1 (Side)

$$C_{\text{shape}} := 1.2$$

$$C_{\text{shape}_S} := 1.2$$

$$W_{\text{RRU1}} := 70.5\text{lb}$$

RRU1 Weight

$$\text{EPA}_{\text{RRU1}} := A_{\text{RRU1}} \cdot C_{\text{shape}} = 3.09\text{ft}^2$$

Effective projected area of RRU 1 (Front)

$$F_{\text{RRU1}} := \text{EPA}_{\text{RRU1}} \cdot q_{z_{\text{ant}}} = 109.49\text{lb}$$

Force due to Wind on RRU 1 (Front)

$$\text{EPA}_{\text{RRU1}_S} := A_{\text{RRU1}_S} \cdot C_{\text{shape}_S} = 1.34\text{ft}^2$$

Effective projected area of RRU 1 (Side)

$$F_{\text{RRU1}_S} := \text{EPA}_{\text{RRU1}_S} \cdot q_{z_{\text{ant}}} = 47.53\text{lb}$$

Force due to Wind on RRU 1 (Side)

$$W_{i_{z_{\text{RRU1}}}} := \pi \cdot t_{i_{z_{\text{RRU1}}}} \cdot \left(\sqrt{w_{\text{RRU}}^2 + d_{\text{RRU}}^2} + t_{i_{z_{\text{RRU1}}}} \right) \cdot h_{\text{RRU}} \cdot \gamma_{\text{ice}} = 92.16\text{lb}$$

Ice Weight per Sec. 2.6.10

OTHER CARRIER ANTENNAS**KMW AM-X-CW-16-65-00T-RET**

$$h_{KMW} := 72\text{in} \quad w_{KMW} := 11.8\text{in} \quad d_{KMW} := 5.9\text{in}$$

$$A_{KMW1} := h_{KMW} \cdot w_{KMW} = 5.9\text{ft}^2$$

Projected area of KMW 1 (Front)

$$A_{KMW1_S} := h_{KMW} \cdot d_{KMW} = 2.95\text{ft}^2$$

Projected area of KMW 1 (Side)

$$C_{\text{shape}} := 1.28 \quad C_{\text{shape_S}} := 1.39 \quad W_{KMW1} := 41.8\text{lb}$$

KMW Weight

$$EPA_{KMW1} := A_{KMW1} \cdot C_{\text{shape}} = 7.55\text{ft}^2$$

Effective projected area of KMW 1 (Front)

$$F_{KMW1} := EPA_{KMW1} \cdot q_{z_ant} = 268\text{lb}$$

Force due to Wind on KMW 1 (Front)

$$EPA_{KMW1_S} := A_{KMW1_S} \cdot C_{\text{shape_S}} = 4.1\text{ft}^2$$

Effective projected area of KMW 1 (Side)

$$F_{KMW1_S} := EPA_{KMW1_S} \cdot q_{z_ant} = 145.51\text{lb}$$

Force due to Wind on KMW 1 (Side)

$$W_{iz_KMW1} := \pi \cdot t_{iz} \cdot \left(\sqrt{w_{RRU}^2 + d_{RRU}^2} + t_{iz} \right) \cdot h_{RRU} \cdot \gamma_{ice} = 92.16\text{lb}$$

Ice Weight per Sec. 2.6.10

KMW AM-X-CW-18-65-00T-RET

$$h_{KMW} := 96\text{in} \quad w_{KMW} := 11.8\text{in} \quad d_{KMW} := 6.0\text{in}$$

$$A_{KMW2} := h_{KMW} \cdot w_{KMW} = 7.87\text{ft}^2$$

Projected area of KMW 2 (Front)

$$A_{KMW2_S} := h_{KMW} \cdot d_{KMW} = 4\text{ft}^2$$

Projected area of KMW 2 (Side)

$$C_{\text{shape}} := 1.3 \quad C_{\text{shape_S}} := 1.62 \quad W_{KMW2} := 52.9\text{lb}$$

KMW Weight

$$EPA_{KMW2} := A_{KMW2} \cdot C_{\text{shape}} = 10.23\text{ft}^2$$

Effective projected area of KMW 2 (Front)

$$F_{KMW2} := EPA_{KMW2} \cdot q_{z_ant} = 362.91\text{lb}$$

Force due to Wind on KMW 2 (Front)

$$EPA_{KMW2_S} := A_{KMW2_S} \cdot C_{\text{shape_S}} = 6.48\text{ft}^2$$

Effective projected area of KMW 2 (Side)

$$F_{KMW2_S} := EPA_{KMW2_S} \cdot q_{z_ant} = 229.95\text{lb}$$

Force due to Wind on KMW 2 (Side)

$$W_{iz_KMW2} := \pi \cdot t_{iz} \cdot \left(\sqrt{w_{KMW}^2 + d_{KMW}^2} + t_{iz} \right) \cdot h_{KMW} \cdot \gamma_{ice} = 292.41\text{lb}$$

Ice Weight per Sec. 2.6.10

ASP 705K Antenna

$$h_{ASP} := 220\text{in} \quad d_{ASP} := 3\text{in}$$

$$A_{ASP} := h_{ASP} \cdot d_{ASP} = 4.58\text{ft}^2$$

$$C_{\text{shape}} := 1.2 \quad W_{ASP} := 22\text{lb}$$

$$EPA_{ASP} := A_{ASP} \cdot C_{\text{shape}} = 5.5\text{ft}^2$$

$$F_{ASP} := EPA_{ASP} \cdot q_{z_ant} = 195.18\text{lb}$$

$$W_{iz_ASP} := \pi \cdot t_{iz} \cdot (3\text{in} + t_{iz}) \cdot h_{ASP} \cdot \gamma_{ice} = 218.92\text{lb}$$

Projected area

Shape factor & weight

Effective projected area

Force due to Wind

Ice Weight per Sec. 2.6.10

Lightning Rod

$$h_{rod} := 180\text{in} \quad d_{rod} := 2.5\text{in}$$

$$A_{rod} := h_{rod} \cdot d_{rod} = 3.13\text{ft}^2$$

$$C_{\text{shape}} := 1.2 \quad W_{rod} := 15\text{lb}$$

$$EPA_{rod} := A_{rod} \cdot C_{\text{shape}} = 3.75\text{ft}^2$$

$$F_{rod} := EPA_{rod} \cdot q_{z_ant} = 133.08\text{lb}$$

$$W_{iz_rod} := \pi \cdot t_{iz} \cdot (2.5\text{in} + t_{iz}) \cdot h_{rod} \cdot \gamma_{ice} = 161.09\text{lb}$$

Projected area

Shape factor & weight

Effective projected area

Force due to Wind

Ice Weight per Sec. 2.6.10

Handrail & Mounting Pipes Ice Loads

$$W_{iz_ant_Pipe} := \pi \cdot t_{iz} \cdot (2.5\text{in} + t_{iz}) \cdot \gamma_{ice} = 10.74 \cdot \text{plf}$$

2-3/8" Pipe

$$W_{iz_L3x3} := \pi \cdot t_{iz} \cdot \left[\sqrt{(3\text{in})^2 + (3\text{in})^2} + t_{iz} \right] \cdot \gamma_{ice} = 14.93 \cdot \text{plf}$$

L3x3 Angle

$$W_{iz_L2x2} := \pi \cdot t_{iz} \cdot \left[\sqrt{(2\text{in})^2 + (2\text{in})^2} + t_{iz} \right] \cdot \gamma_{ice} = 11.53 \cdot \text{plf}$$

L2x2 Angle

Basic Wind Speed = 107mph															
Sector: 1															
Appurtenance	Wind Front	Wind Side	Node	0 Degree Wind X	0 Degree Wind Z	30 Degree Wind X	30 Degree Wind Z	60 Degree Wind X	60 Degree Wind Z	90 Degree Wind X	90 Degree Wind Z	120 Degree Wind X	120 Degree Wind Z	150 Degree Wind X	150 Degree Wind Z
HBXX-6517DS-A2M (Top Connection)	151.93	93.11	HBA1	-151.93	0.00	-171.89	-112.34	-116.28	-146.42	0.00	-93.11	116.28	-146.42	171.89	-112.34
HBXX-6517DS-A2M (Bottom Connection)	151.93	93.11	HBA2	-151.93	0.00	-171.89	-112.34	-116.28	-146.42	0.00	-93.11	116.28	-146.42	171.89	-112.34
AAHF	149.14	77.98	AAA1	-149.14	0.00	-162.93	-103.57	-108.34	-132.11	0.00	-77.98	108.34	-132.11	162.93	-103.57
AHFIG	109.49	47.53	AHFIGA1	-109.49	0.00	-115.40	-71.18	-75.33	-88.57	0.00	-47.53	75.33	-88.57	115.40	-71.18
KWM AM-X-CW-16-65-00T-RET (Top Connection)	134.00	72.76	16A1	-134.00	0.00	-147.55	-94.40	-98.50	-121.03	0.00	-72.76	98.50	-121.03	147.55	-94.40
KWM AM-X-CW-16-65-00T-RET (Bottom Connection)	134.00	72.76	16A2	-134.00	0.00	-147.55	-94.40	-98.50	-121.03	0.00	-72.76	98.50	-121.03	147.55	-94.40
KWM AM-X-CW-18-65-00T-RET (Top Connection)	181.46	114.98	18A1	-181.46	0.00	-206.93	-136.06	-140.51	-178.14	0.00	-114.98	140.51	-178.14	206.93	-136.06
KWM AM-X-CW-18-65-00T-RET (Bottom Connection)	181.46	114.98	18A2	-181.46	0.00	-206.93	-136.06	-140.51	-178.14	0.00	-114.98	140.51	-178.14	206.93	-136.06
Breakout Box 1	38.50	20.70	BOBA1	-38.50	0.00	-42.31	-27.02	-28.21	-34.60	0.00	-20.70	28.21	-34.60	42.31	-27.02
Breakout Box 2	38.50	20.70	BOBA2	-38.50	0.00	-42.31	-27.02	-28.21	-34.60	0.00	-20.70	28.21	-34.60	42.31	-27.02
ASP 705K	195.18	195.18	ASP705K	-195.18	0.00	-169.03	-97.59	-97.59	-169.03	0.00	-195.18	-169.03	-169.03	97.59	-169.03

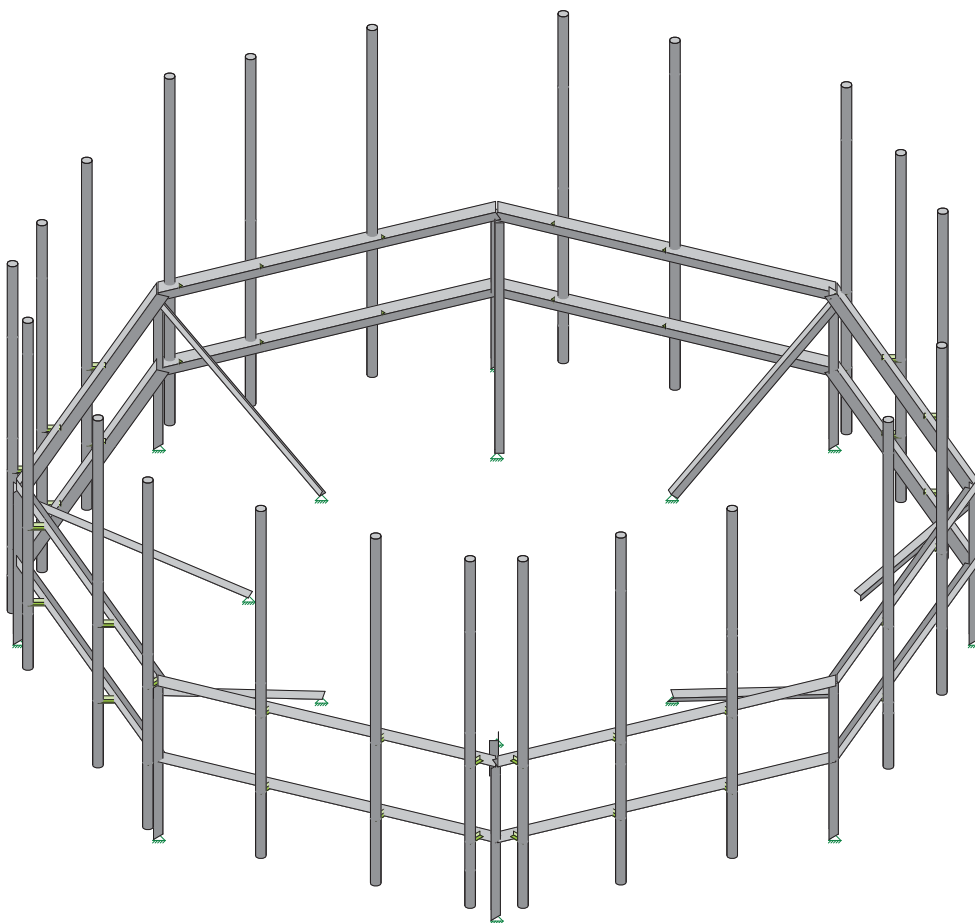
Appurtenance	Wind Front	Wind Side	Node	180 Degree Wind X	180 Degree Wind Z	210 Degree Wind X	210 Degree Wind Z	240 Degree Wind X	240 Degree Wind Z	270 Degree Wind X	270 Degree Wind Z	300 Degree Wind X	300 Degree Wind Z	330 Degree Wind X	330 Degree Wind Z
HBXX-6517DS-A2M (Top Connection)	151.93	93.11	HBA1	151.93	0.00	171.89	112.34	116.28	146.42	0.00	93.11	-116.28	146.42	-171.89	112.34
HBXX-6517DS-A2M (Bottom Connection)	151.93	93.11	HBA2	151.93	0.00	171.89	112.34	116.28	146.42	0.00	93.11	-116.28	146.42	-171.89	112.34
AAHF	149.14	77.98	AAA1	149.14	0.00	162.93	103.57	108.34	132.11	0.00	77.98	-108.34	132.11	-162.93	103.57
AHFIG	109.49	47.53	AHFIGA1	109.49	0.00	115.40	71.18	75.33	88.57	0.00	47.53	-75.33	88.57	-115.40	71.18
KWM AM-X-CW-16-65-00T-RET (Top Connection)	134.00	72.76	16A1	134.00	0.00	147.55	94.40	98.50	121.03	0.00	72.76	-98.50	121.03	-147.55	94.40
KWM AM-X-CW-16-65-00T-RET (Bottom Connection)	134.00	72.76	16A2	134.00	0.00	147.55	94.40	98.50	121.03	0.00	72.76	-98.50	121.03	-147.55	94.40
KWM AM-X-CW-18-65-00T-RET (Top Connection)	181.46	114.98	18A1	181.46	0.00	206.93	136.06	140.51	178.14	0.00	114.98	-140.51	178.14	-206.93	136.06
KWM AM-X-CW-18-65-00T-RET (Bottom Connection)	181.46	114.98	18A2	181.46	0.00	206.93	136.06	140.51	178.14	0.00	114.98	-140.51	178.14	-206.93	136.06
Breakout Box 1	38.50	20.70	BOBA1	38.50	0.00	42.31	27.02	28.21	34.60	0.00	20.70	-28.21	34.60	-42.31	27.02
Breakout Box 2	38.50	20.70	BOBA2	38.50	0.00	42.31	27.02	28.21	34.60	0.00	20.70	-28.21	34.60	-42.31	27.02
ASP 705K	195.18	195.18	ASP705K	195.18	0.00	169.03	97.59	97.59	169.03	0.00	195.18	-169.03	169.03	-97.59	169.03

Sector: 2															
Appurtenance	Wind Front	Wind Side	Node	0 Degree Wind X	0 Degree Wind Z	30 Degree Wind X	30 Degree Wind Z	60 Degree Wind X	60 Degree Wind Z	90 Degree Wind X	90 Degree Wind Z	120 Degree Wind X	120 Degree Wind Z	150 Degree Wind X	150 Degree Wind Z
HBXX-6517DS-A2M (Top Connection)	151.93	93.11	HBB1	-156.60	0.00	-80.63	-46.55	-78.30	-89.06	0.00	-156.60	75.97	-131.58	154.26	-78.30
HBXX-6517DS-A2M (Bottom Connection)	151.93	93.11	HBB2	-156.60	0.00	-80.63	-46.55	-78.30	-89.06	0.00	-156.60	75.97	-131.58	154.26	-78.30
AAHF	149.14	77.98	AAB1	-142.10	0.00	-67.53	-38.99	-71.05	-84.07	0.00	-142.10	74.57	-129.16	145.62	-71.05
AHFIG	109.49	47.53	AHFIGB1	-95.91	0.00	-41.16	-23.77	-47.95	-59.29	0.00	-95.91	54.75	-94.82	102.70	-47.95
KWM AM-X-CW-16-65-00T-RET (Top Connection)	134.00	72.76	16B1	-130.01	0.00	-63.01	-36.38	-65.00	-76.21	0.00	-130.01	67.00	-116.05	132.00	-65.00
KWM AM-X-CW-16-65-00T-RET (Bottom Connection)	134.00	72.76	16B2	-130.01	0.00	-63.01	-36.38	-65.00	-76.21	0.00	-130.01	67.00	-116.05	132.00	-65.00
KWM AM-X-CW-18-65-00T-RET (Top Connection)	181.46	114.98	18B1	-190.30	0.00	-99.57	-57.49	-95.15	-107.32	0.00	-190.30	90.73	-157.14	185.88	-95.15
KWM AM-X-CW-18-65-00T-RET (Bottom Connection)	181.46	114.98	18B2	-190.30	0.00	-99.57	-57.49	-95.15	-107.32	0.00	-190.30	90.73	-157.14	185.88	-95.15
Lightning Rod	133.08	133.08	LROD	-133.08	0.00	-115.25	-66.54	-66.54	-115.25	0.00	-133.08	66.54	-115.25	115.25	-66.54

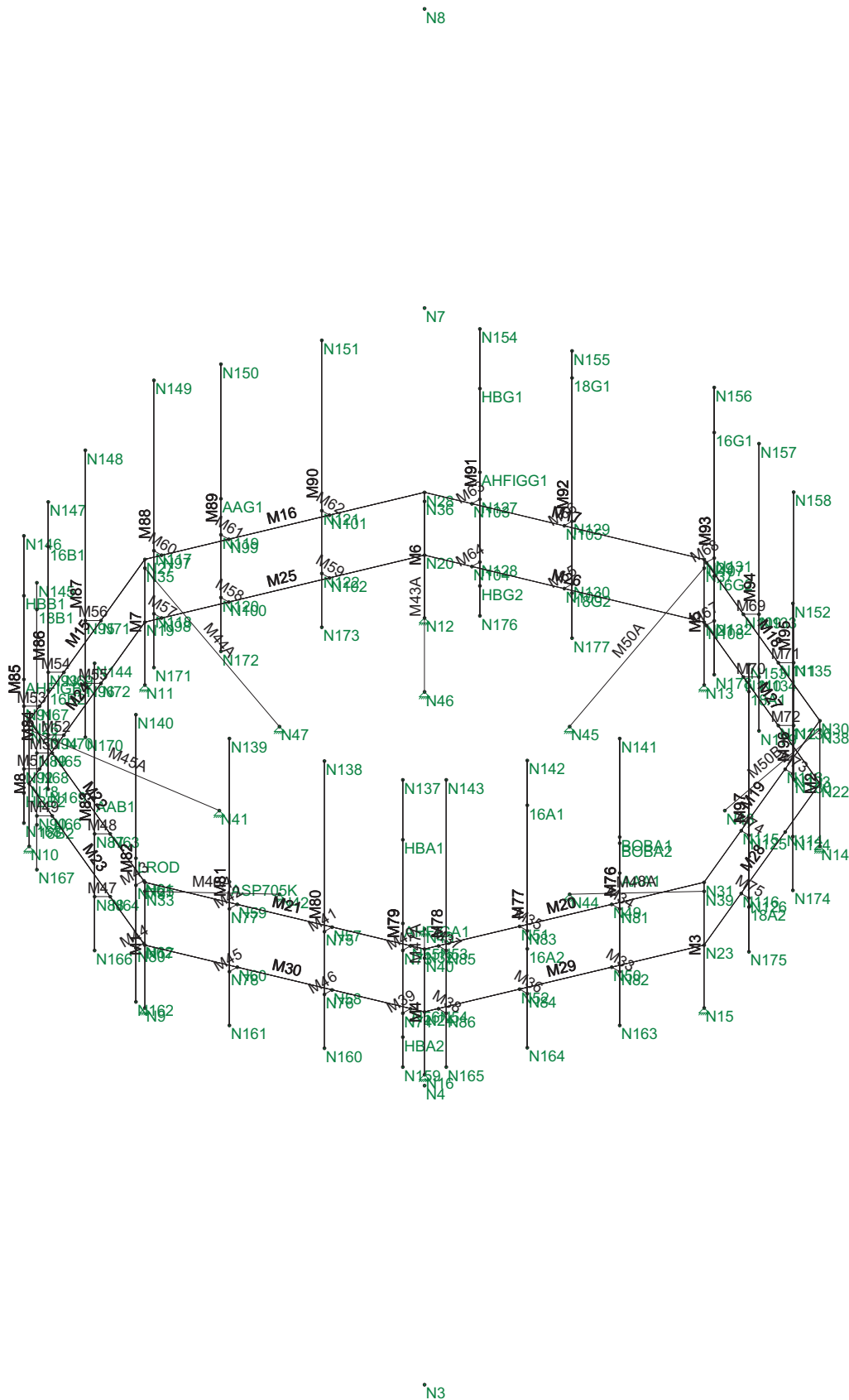
Appurtenance	Wind Front	Wind Side	Node	180 Degree Wind X	180 Degree Wind Z	210 Degree Wind X	210 Degree Wind Z	240 Degree Wind X	240 Degree Wind Z	270 Degree Wind X	270 Degree Wind Z	300 Degree Wind X	300 Degree Wind Z	330 Degree Wind X	330 Degree Wind Z
HBXX-6517DS-A2M (Top Connection)	151.93	93.11	HBB1	156.60	0.00	80.63	46.55	78.30	89.06	0.00	156.60	-75.97	131.58	-154.26	78.30
HBXX-6517DS-A2M (Bottom Connection)	151.93	93.11	HBB2	156.60	0.00	80.63	46.55	78.30	89.06	0.00	156.60	-75.97	131.58	-154.26	78.30
AAHF	149.14	77.98	AAB1	142.10	0.00	67.53	38.99	71.05	84.07	0.00	142.10	-74.57	129.16	-145.62	71.05
AHFIG	109.49	47.53	AHFIGB1	95.91	0.00	41.16	23.77	47.95	59.29	0.00	95.91	-54.75	94.82	-102.70	47.95
KWM AM-X-CW-16-65-00T-RET (Top Connection)	134.00	72.76	16B1	130.01	0.00	63.01	36.38	65.00	76.21	0.00	130.01	-67.00	116.05	-132.00	65.00
KWM AM-X-CW-16-65-00T-RET (Bottom Connection)	134.00	72.76	16B2	130.01	0.00	63.01	36.38	65.00	76.21	0.00	130.01	-67.00	116.05	-132.00	65.00
KWM AM-X-CW-18-65-00T-RET (Top Connection)	181.46	114.98	18B1	190.30	0.00	99.57	57.49	95.15	107.32	0.00	190.30	-90.73	157.14	-185.88	95.15
KWM AM-X-CW-18-65-00T-RET (Bottom Connection)	181.46	114.98	18B2	190.30	0.00	99.57	57.49	95.15	107.32	0.00	190.30	-90.73	157.14	-185.88	95.15
Lightning Rod	133.08	133.08	LROD	133.08	0.00	115.25	66.54	66.54	115.25	0.00	133.08	-66.54	115.25	-115.25	66.54

Sector: 3															
Appurtenance	Wind Front	Wind Side	Node	0 Degree Wind X	0 Degree Wind Z	30 Degree Wind X	30 Degree Wind Z	60 Degree Wind X	60 Degree Wind Z	90 Degree Wind X	90 Degree Wind Z	120 Degree Wind X	120 Degree Wind Z	150 Degree Wind X	150 Degree Wind Z
HBXX-6517DS-A2M (Top Connection)	151.93	93.11	HBG1	-156.60	0.00	-80.63	-46.55	-78.30	-89.06	0.00	-156.60	75.97	-131.58	154.26	-78.30
HBXX-6517DS-A2M (Bottom Connection)	151.93	93.11	HBG2	-156.60	0.00	-80.63	-46.55	-78.30	-89.06	0.00	-156.60	75.97	-131.58	154.26	-78.30
AAHF	149.14	77.98	AAG1	-142.10	0.00	-67.53	-38.99	-71.05	-84.07	0.00	-142.10	74.57	-129.16	145.62	-71.05
AHFIG	109.49	47.53	AHFIGG1	-95.91	0.00	-41.16	-23.77	-47.95	-59.29	0.00	-95.91	54.75	-94.82	102.70	-47.95
KWM AM-X-CW-16-65-00T-RET (Top Connection)	134.00	72.76	16G1	-130.01	0.00	-63.01	-36.38	-65.00	-76.21	0.00	-130.01	67.00	-116.05	132.00	-65.00
KWM AM-X-CW-16-65-00T-RET (Bottom Connection)	134.00	72.76	16G2	-130.01	0.00	-63.01	-36.38	-65.00	-76.21	0.00	-130.01	67.00	-116.05	132.00	-65.00
KWM AM-X-CW-18-65-00T-RET (Top Connection)	181.46	114.98	18G1	-190.30	0.00	-99.57	-57.49	-95.15	-107.32	0.00	-190.30	90.73	-157.14	185.88	-95.15
KWM AM-X-CW-18-65-00T-RET (Bottom Connection)	181.46	114.98	18G2	-190.30	0.00	-99.57	-57.49	-95.15	-107.32	0.00	-190.30	90.73	-157.14	185.88	-95.15

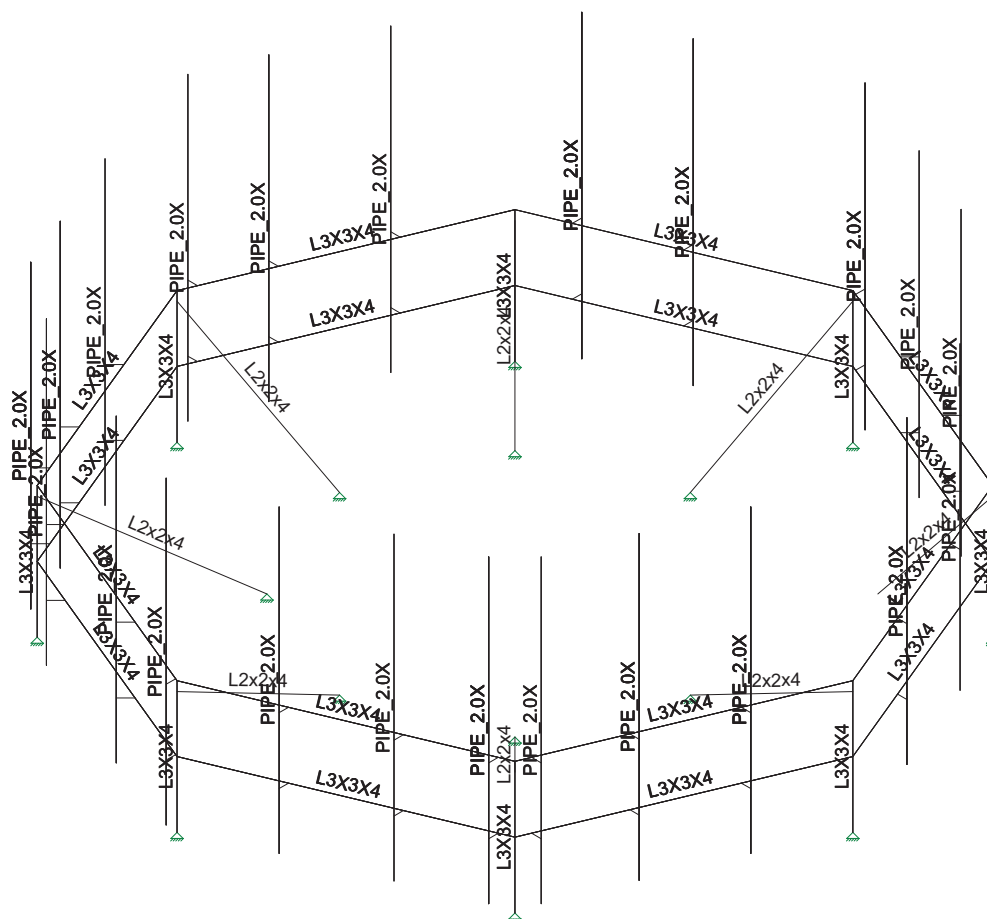
Appurtenance	Wind Front	Wind Side	Node	180 Degree Wind X	180 Degree Wind Z	210 Degree Wind X	210 Degree Wind Z	240 Degree Wind X	240 Degree Wind Z	270 Degree Wind X	270 Degree Wind Z	300 Degree Wind X	300 Degree Wind Z	330 Degree Wind X	330 Degree Wind Z
HBXX-6517DS-A2M (Top Connection)	151.93	93.11	HBG1	156.60	0.00	80.63	46.55	78.30	89.06	0.00	156.60	-75.97	131.58	-154.26	78.30
HBXX-6517DS-A2M (Bottom Connection)	151.93	93.11	HBG2	156.60	0.00	80.63	46.55	78.30	89.06	0.00	156.60	-75.97	131.58	-154.26	78.30
AAHF	149.14	77.98	AAG1	95.91	0.00	41.16	23.77	47.95	59.29	0.00	95.91	-54.75	94.82	-102.70	47.95
AHFIG	109.49	47.53	AHFIGG1	130.01	0.00	63.01	36.38	65.00	76.21	0.00	130.01	-67.00	116.05	-132.00	65.00
KWM AM-X-CW-16-65-00T-RET (Top Connection)	134.00	72.76	16G1	130.01	0.00	63.01	36.38	65.00	76.21	0.00	130.01	-67.00	116.05	-132.00	65.00
KWM AM-X-CW-16-65-00T-RET (Bottom Connection)	134.00	72.76	16G2	130.01	0.00	63.01	36.38	65.00	76.21	0.00	130.01	-67.00	116.05	-132.00	65.00
KWM AM-X-CW-18-65-00T-RET (Top Connection)	181.46	114.98	18G1	190.30	0.00	99.57	57.49	95.15	107.32	0.00	190.30	-90.73	157.14	-185.88	95.15
KWM AM-X-CW-18-65-00T-RET (Bottom Connection)	181.46	114.98	18G2	190.30	0.00	99.57	57.49	95.15	107.32	0.00	190.30	-90.73	157.14	-185.88	95.15



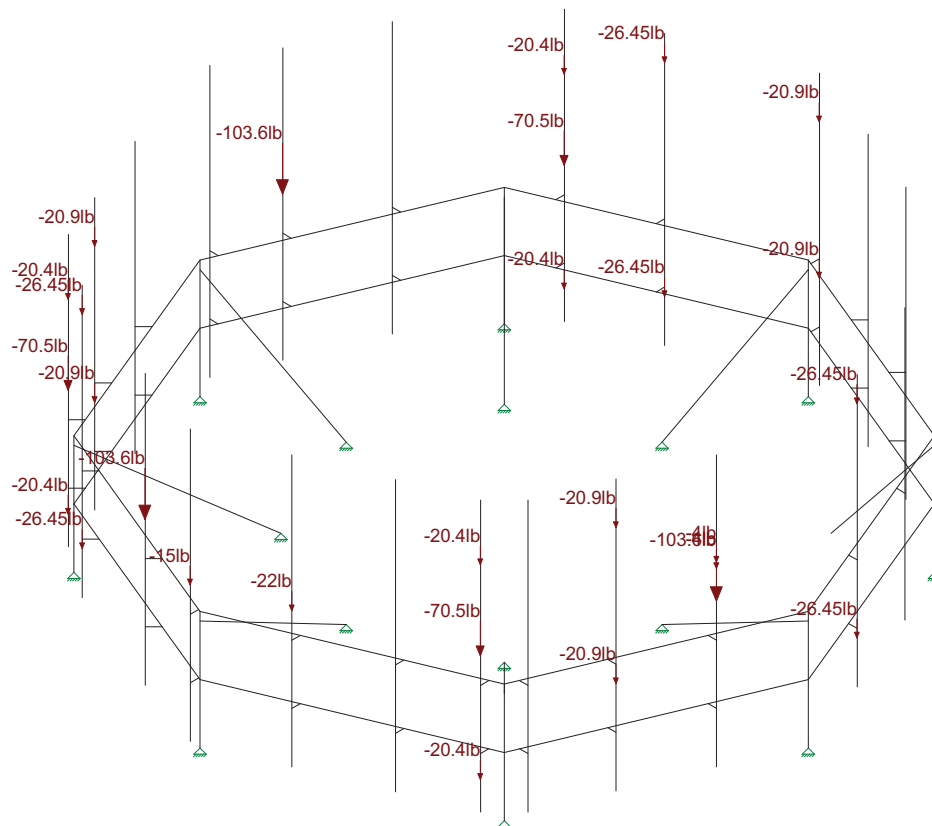
KCS Corporation	Antenna Mount Analysis 3D Render	SK - 1
FC		Oct 7, 2020 at 9:45 AM
ML70553B		Antenna Mount Analysis (HR).r3d



KCS Corporation	Antenna Mount Analysis Member Labels & Nodes	SK - 2
FC		Oct 7, 2020 at 9:47 AM
ML70553B		Antenna Mount Analysis (HR).r3d

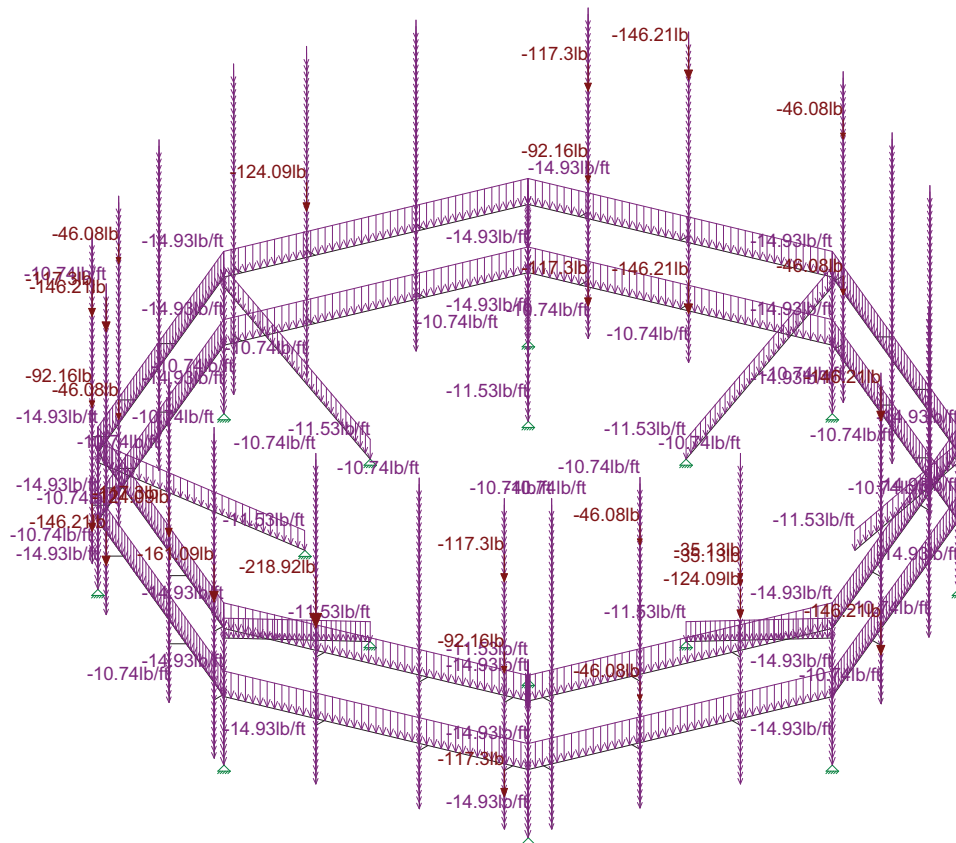


KCS Corporation	Antenna Mount Analysis Member Shapes	SK - 3
FC		Oct 7, 2020 at 9:48 AM
ML70553B		Antenna Mount Analysis (HR).r3d



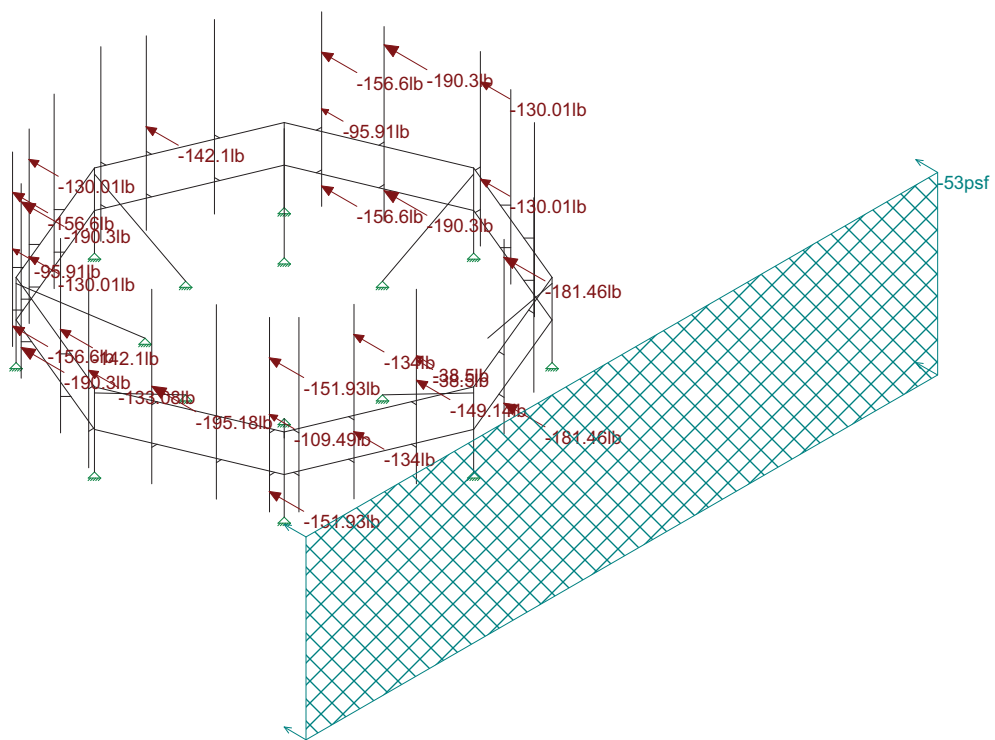
Loads: BLC 1, Dead Load

KCS Corporation	Antenna Mount Analysis Dead Loads	SK - 4
FC		Oct 7, 2020 at 4:36 PM
ML70553B		Antenna Mount Analysis (HR).r3d



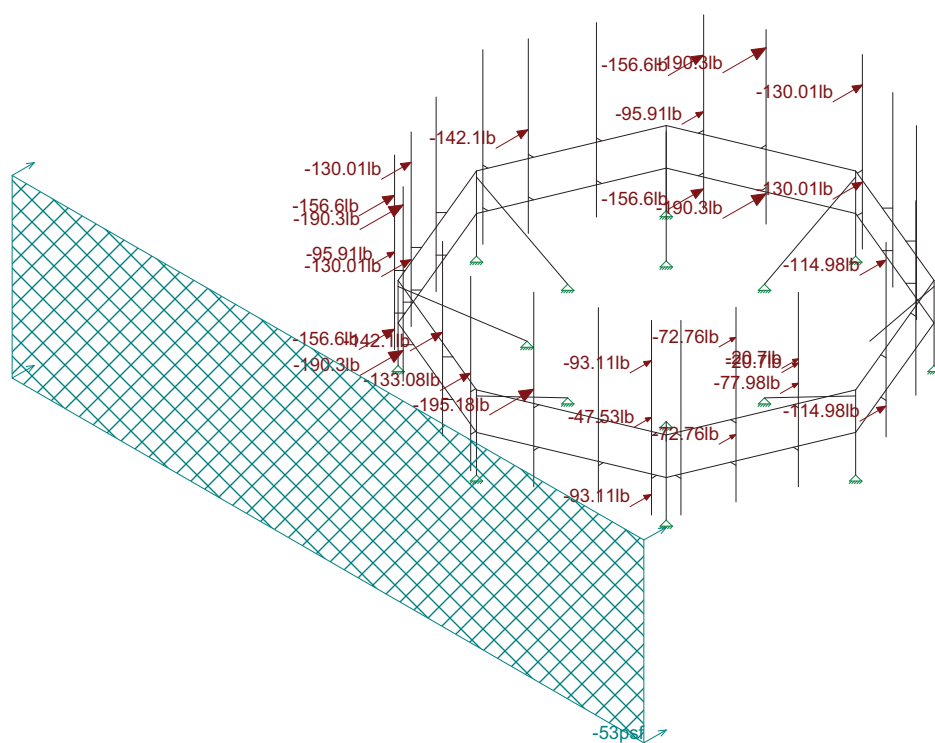
Loads: BLC 2, Dead Load Ice

KCS Corporation	Antenna Mount Analysis Ice Loads	SK - 5
FC		Oct 7, 2020 at 4:36 PM
ML70553B		Antenna Mount Analysis (HR).r3d

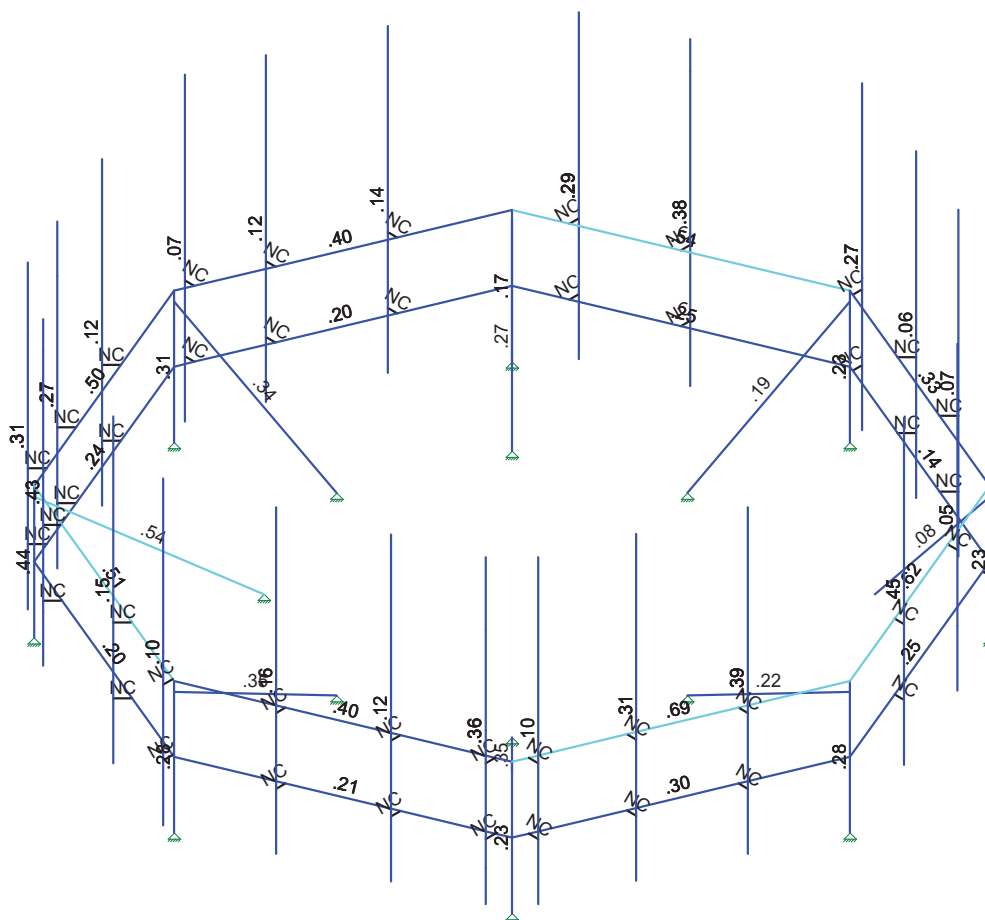


Loads: BLC 3, WL(0)

KCS Corporation	Antenna Mount Analysis Wind Load (X-Direction)	SK - 6
FC		Oct 7, 2020 at 4:36 PM
ML70553B		Antenna Mount Analysis (HR).r3d



Antenna Mount Analysis (HR).r3d



KCS Corporation	Antenna Mount Analysis Unity	SK - 8
FC		Oct 7, 2020 at 4:38 PM
ML70553B		Antenna Mount Analysis (HR).r3d

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Top Handrail	L3X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	.031
2	Mid Handrail	L3X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	.031
3	Post	L3X3X4	Column	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	.031
4	Antenna Pipe	PIPE 2.0X	Column	Pipe	A53 Gr.B	Typical	1.4	.827	.827	1.65
5	Kick Plate	PL1/4x4	HBrace	BAR	A36 Gr.36	Typical	1.5	.018	2	.066
6	Diagonal	L2x2x4	VBrace	Single Angle	A36 Gr.36	Typical	.944	.346	.346	.021

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
1	N1	-180	0	180	0	
2	N2	-180	100	180	0	
3	N3	180	0	180	0	
4	N4	180	100	180	0	
5	N5	180	0	-180	0	
6	N6	180	100	-180	0	
7	N7	-180	0	-180	0	
8	N8	-180	100	-180	0	
9	N9	0	0	108	0	
10	N10	-76.368	0	76.368	0	
11	N11	-108	0	0	0	
12	N12	-76.368	0	-76.368	0	
13	N13	0	0	-108	0	
14	N14	76.368	0	-76.368	0	
15	N15	108	0	0	0	
16	N16	76.368	0	76.368	0	
17	N17	0	21	108	0	
18	N18	-76.368	21	76.368	0	
19	N19	-108	21	0	0	
20	N20	-76.368	21	-76.368	0	
21	N21	0	21	-108	0	
22	N22	76.368	21	-76.368	0	
23	N23	108	21	0	0	
24	N24	76.368	21	76.368	0	
25	N25	0	42	108	0	
26	N26	-76.368	42	76.368	0	
27	N27	-108	42	0	0	
28	N28	-76.368	42	-76.368	0	
29	N29	0	42	-108	0	
30	N30	76.368	42	-76.368	0	
31	N31	108	42	0	0	
32	N32	76.368	42	76.368	0	
33	N33	0	39	108	0	
34	N34	-76.368	39	76.368	0	
35	N35	-108	39	0	0	
36	N36	-76.368	39	-76.368	0	
37	N37	0	39	-108	0	
38	N38	76.368	39	-76.368	0	
39	N39	108	39	0	0	
40	N40	76.368	39	76.368	0	
41	N41	-39.63	12	39.63	0	
42	N42	0	12	56.045	0	
43	N43	39.63	12	39.63	0	
44	N44	56.045	12	0	0	
45	N45	0	12	-56.045	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
46	N46	-39.63	12	-39.63	0	
47	N47	-56.045	12	0	0	
48	N48	57.999	12	-57.999	0	
49	N49	97.56144	42	25.20144	0	
50	N50	97.56144	21	25.20144	0	
51	N51	87.12288	42	50.40288	0	
52	N52	87.12288	21	50.40288	0	
53	N53	77.9496	42	72.5496	0	
54	N54	77.9496	21	72.5496	0	
55	N55	72.5496	42	77.9496	0	
56	N56	72.5496	21	77.9496	0	
57	N57	51.16656	42	86.80656	0	
58	N58	51.16656	21	86.80656	0	
59	N59	25.20144	42	97.56144	0	
60	N60	25.20144	21	97.56144	0	
61	N61	-0.76368	42	107.68368	0	
62	N62	-0.76368	21	107.68368	0	
63	N63	-22.9104	42	98.5104	0	
64	N64	-22.9104	21	98.5104	0	
65	N65	-61.0944	42	82.6944	0	
66	N66	-61.0944	21	82.6944	0	
67	N67	-79.21488	42	69.49488	0	
68	N68	-79.21488	21	69.49488	0	
69	N69	-85.8576	42	53.4576	0	
70	N70	-85.8576	21	53.4576	0	
71	N71	-95.97984	42	29.01984	0	
72	N72	-95.97984	21	29.01984	0	
73	N73	72.5496	42	80.9496	0	
74	N74	72.5496	21	80.9496	0	
75	N75	51.16656	42	89.80656	0	
76	N76	51.16656	21	89.80656	0	
77	N77	25.20144	42	100.56144	0	
78	N78	25.20144	21	100.56144	0	
79	N79	-0.76368	42	110.68368	0	
80	N80	-0.76368	21	110.68368	0	
81	N81	100.56144	42	25.20144	0	
82	N82	100.56144	21	25.20144	0	
83	N83	90.12288	42	50.40288	0	
84	N84	90.12288	21	50.40288	0	
85	N85	80.9496	42	72.5496	0	
86	N86	80.9496	21	72.5496	0	
87	N87	-25.9104	42	101.5104	0	
88	N88	-25.9104	21	101.5104	0	
89	N89	-64.0944	42	85.6944	0	
90	N90	-64.0944	21	85.6944	0	
91	N91	-82.21488	42	72.49488	0	
92	N92	-82.21488	21	72.49488	0	
93	N93	-88.8576	42	56.4576	0	
94	N94	-88.8576	21	56.4576	0	
95	N95	-98.97984	42	32.01984	0	
96	N96	-98.97984	21	32.01984	0	
97	N97	-106.10208	42	-4.58208	0	
98	N98	-106.10208	21	-4.58208	0	
99	N99	-98.5104	42	-22.9104	0	
100	N100	-98.5104	21	-22.9104	0	
101	N101	-87.12288	42	-50.40288	0	
102	N102	-87.12288	21	-50.40288	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
103	N103	-63.38544	42	-81.74544	0	
104	N104	-63.38544	21	-81.74544	0	
105	N105	-38.184	42	-92.184	0	
106	N106	-38.184	21	-92.184	0	
107	N107	1.52736	42	-107.36736	0	
108	N108	1.52736	21	-107.36736	0	
109	N109	25.96512	42	-97.24512	0	
110	N110	25.96512	21	-97.24512	0	
111	N111	48.87552	42	-87.75552	0	
112	N112	48.87552	21	-87.75552	0	
113	N113	85.8576	42	-53.4576	0	
114	N114	85.8576	21	-53.4576	0	
115	N115	97.87776	42	-24.43776	0	
116	N116	97.87776	21	-24.43776	0	
117	N117	-109.10208	42	-4.58208	0	
118	N118	-109.10208	21	-4.58208	0	
119	N119	-101.5104	42	-22.9104	0	
120	N120	-101.5104	21	-22.9104	0	
121	N121	-90.12288	42	-50.40288	0	
122	N122	-90.12288	21	-50.40288	0	
123	N123	88.8576	42	-53.4576	0	
124	N124	88.8576	21	-53.4576	0	
125	N125	100.87776	42	-24.43776	0	
126	N126	100.87776	21	-24.43776	0	
127	N127	-63.38544	42	-84.74544	0	
128	N128	-63.38544	21	-84.74544	0	
129	N129	-38.184	42	-95.184	0	
130	N130	-38.184	21	-95.184	0	
131	N131	1.52736	42	-110.36736	0	
132	N132	1.52736	21	-110.36736	0	
133	N133	28.96512	42	-100.24512	0	
134	N134	28.96512	21	-100.24512	0	
135	N135	51.87552	42	-90.75552	0	
136	N136	51.87552	21	-90.75552	0	
137	N137	72.5496	99	80.9496	0	
138	N138	51.16656	99	89.80656	0	
139	N139	25.20144	99	100.56144	0	
140	N140	-0.76368	99	110.68368	0	
141	N141	100.56144	99	25.20144	0	
142	N142	90.12288	99	50.40288	0	
143	N143	80.9496	99	72.5496	0	
144	N144	-25.9104	99	101.5104	0	
145	N145	-64.0944	99	85.6944	0	
146	N146	-82.21488	99	72.49488	0	
147	N147	-88.8576	99	56.4576	0	
148	N148	-98.97984	99	32.01984	0	
149	N149	-109.10208	99	-4.58208	0	
150	N150	-101.5104	99	-22.9104	0	
151	N151	-90.12288	99	-50.40288	0	
152	N152	88.8576	99	-53.4576	0	
153	N153	100.87776	99	-24.43776	0	
154	N154	-63.38544	99	-84.74544	0	
155	N155	-38.184	99	-95.184	0	
156	N156	1.52736	99	-110.36736	0	
157	N157	28.96512	99	-100.24512	0	
158	N158	51.87552	99	-90.75552	0	
159	N159	72.5496	3	80.9496	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
160	N160	51.16656	3	89.80656	0	
161	N161	25.20144	3	100.56144	0	
162	N162	-0.76368	3	110.68368	0	
163	N163	100.56144	3	25.20144	0	
164	N164	90.12288	3	50.40288	0	
165	N165	80.9496	3	72.5496	0	
166	N166	-25.9104	3	101.5104	0	
167	N167	-64.0944	3	85.6944	0	
168	N168	-82.21488	3	72.49488	0	
169	N169	-88.8576	3	56.4576	0	
170	N170	-98.97984	3	32.01984	0	
171	N171	-109.10208	3	-4.58208	0	
172	N172	-101.5104	3	-22.9104	0	
173	N173	-90.12288	3	-50.40288	0	
174	N174	88.8576	3	-53.4576	0	
175	N175	100.87776	3	-24.43776	0	
176	N176	-63.38544	3	-84.74544	0	
177	N177	-38.184	3	-95.184	0	
178	N178	1.52736	3	-110.36736	0	
179	N179	28.96512	3	-100.24512	0	
180	N180	51.87552	3	-90.75552	0	
181	AAA1	100.56144	54	25.20144	0	
182	HBA1	72.5496	79	80.9496	0	
183	AAB1	-25.9104	54	101.5104	0	
184	HBB1	-82.21488	79	72.49488	0	
185	AAG1	-101.5104	54	-22.9104	0	
186	HBG1	-63.38544	79	-84.74544	0	
187	BOBA1	100.56144	66	25.20144	0	
188	BOBA2	100.56144	64	25.20144	0	
189	HBA2	72.5496	13	80.9496	0	
190	HBB2	-82.21488	13	72.49488	0	
191	HBG2	-63.38544	13	-84.74544	0	
192	AHFIGA1	72.5496	51	80.9496	0	
193	AHFIGB1	-82.21488	51	72.49488	0	
194	AHFIGG1	-63.38544	51	-84.74544	0	
195	ASP705K	25.20144	51	100.56144	0	
196	LROD	-0.76368	51	110.68368	0	
197	16A1	90.12288	84	50.40288	0	
198	18B1	-64.0944	90	85.6944	0	
199	16B1	-88.8576	84	56.4576	0	
200	18A1	100.87776	90	-24.43776	0	
201	18G1	-38.184	90	-95.184	0	
202	16G1	1.52736	84	-110.36736	0	
203	18B2	-64.0944	18	85.6944	0	
204	18A2	100.87776	18	-24.43776	0	
205	18G2	-38.184	18	-95.184	0	
206	16A2	90.12288	36	50.40288	0	
207	16B2	-88.8576	36	56.4576	0	
208	16G2	1.52736	36	-110.36736	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1						
2	N2						
3	N3						

Joint Boundary Conditions (Continued)

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
4	N4						
5	N5						
6	N6						
7	N7						
8	N8						
9	N9	Reaction	Reaction	Reaction			
10	N10	Reaction	Reaction	Reaction			
11	N11	Reaction	Reaction	Reaction			
12	N12	Reaction	Reaction	Reaction			
13	N13	Reaction	Reaction	Reaction			
14	N14	Reaction	Reaction	Reaction			
15	N15	Reaction	Reaction	Reaction			
16	N16	Reaction	Reaction	Reaction			
17	N41	Reaction	Reaction	Reaction			
18	N42	Reaction	Reaction	Reaction			
19	N43	Reaction	Reaction	Reaction			
20	N44	Reaction	Reaction	Reaction			
21	N45	Reaction	Reaction	Reaction			
22	N46	Reaction	Reaction	Reaction			
23	N47	Reaction	Reaction	Reaction			

Joint Loads and Enforced Displacements (BLC 1 : Dead Load)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...]
1	HBA1	L	Y	-20.4
2	HBA2	L	Y	-20.4
3	AAA1	L	Y	-103.6
4	AHFIGA1	L	Y	-70.5
5	16A1	L	Y	-20.9
6	16A2	L	Y	-20.9
7	18A1	L	Y	-26.45
8	18A2	L	Y	-26.45
9	BOBA1	L	Y	-4
10	BOBA2	L	Y	-4
11	ASP705K	L	Y	-22
12	HBB1	L	Y	-20.4
13	HBB2	L	Y	-20.4
14	AAB1	L	Y	-103.6
15	AHFIGB1	L	Y	-70.5
16	16B1	L	Y	-20.9
17	16B2	L	Y	-20.9
18	18B1	L	Y	-26.45
19	18B2	L	Y	-26.45
20	LROD	L	Y	-15
21	HBG1	L	Y	-20.4
22	HBG2	L	Y	-20.4
23	AAG1	L	Y	-103.6
24	AHFIGG1	L	Y	-70.5
25	16G1	L	Y	-20.9
26	16G2	L	Y	-20.9
27	18G1	L	Y	-26.45
28	18G2	L	Y	-26.45

Joint Loads and Enforced Displacements (BLC 2 : Dead Load Ice)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...]
1	HBA1	L	Y	-117.3

Joint Loads and Enforced Displacements (BLC 2 : Dead Load Ice) (Continued)

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
2	HBA2	L	Y	-117.3
3	AAA1	L	Y	-124.09
4	AHFIGA1	L	Y	-92.16
5	16A1	L	Y	-46.08
6	16A2	L	Y	-46.08
7	18A1	L	Y	-146.21
8	18A2	L	Y	-146.21
9	BOBA1	L	Y	-35.13
10	BOBA2	L	Y	-35.13
11	ASP705K	L	Y	-218.92
12	HBB1	L	Y	-117.3
13	HBB2	L	Y	-117.3
14	AAB1	L	Y	-124.09
15	AHFIGB1	L	Y	-92.16
16	16B1	L	Y	-46.08
17	16B2	L	Y	-46.08
18	18B1	L	Y	-146.21
19	18B2	L	Y	-146.21
20	LROD	L	Y	-161.09
21	HBG1	L	Y	-117.3
22	HBG2	L	Y	-117.3
23	AAG1	L	Y	-124.09
24	AHFIGG1	L	Y	-92.16
25	16G1	L	Y	-46.08
26	16G2	L	Y	-46.08
27	18G1	L	Y	-146.21
28	18G2	L	Y	-146.21

Joint Loads and Enforced Displacements (BLC 3 : WL(0))

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	-151.93
2	HBA2	L	X	-151.93
3	AAA1	L	X	-149.14
4	AHFIGA1	L	X	-109.49
5	16A1	L	X	-134
6	16A2	L	X	-134
7	18A1	L	X	-181.46
8	18A2	L	X	-181.46
9	BOBA1	L	X	-38.5
10	BOBA2	L	X	-38.5
11	ASP705K	L	X	-195.18
12	HBB1	L	X	-156.6
13	HBB2	L	X	-156.6
14	AAB1	L	X	-142.1
15	AHFIGB1	L	X	-95.91
16	16B1	L	X	-130.01
17	16B2	L	X	-130.01
18	18B1	L	X	-190.3
19	18B2	L	X	-190.3
20	LROD	L	X	-133.08
21	HBG1	L	X	-156.6
22	HBG2	L	X	-156.6
23	AAG1	L	X	-142.1
24	AHFIGG1	L	X	-95.91
25	16G1	L	X	-130.01
26	16G2	L	X	-130.01

Joint Loads and Enforced Displacements (BLC 3 : WL(0)) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...
27	18G1	L	X	-190.3
28	18G2	L	X	-190.3
29	N1	L	Y	0
30	HBA1	L	Z	0
31	HBA2	L	Z	0
32	AAA1	L	Z	0
33	AHFIGA1	L	Z	0
34	16A1	L	Z	0
35	16A2	L	Z	0
36	18A1	L	Z	0
37	18A2	L	Z	0
38	BOBA1	L	Z	0
39	BOBA2	L	Z	0
40	ASP705K	L	Z	0
41	HBB1	L	Z	0
42	HBB2	L	Z	0
43	AAB1	L	Z	0
44	AHFIGB1	L	Z	0
45	16B1	L	Z	0
46	16B2	L	Z	0
47	18B1	L	Z	0
48	18B2	L	Z	0
49	LROD	L	Z	0
50	HBG1	L	Z	0
51	HBG2	L	Z	0
52	AAG1	L	Z	0
53	AHFIGG1	L	Z	0
54	16G1	L	Z	0
55	16G2	L	Z	0
56	18G1	L	Z	0
57	18G2	L	Z	0

Joint Loads and Enforced Displacements (BLC 4 : WL(30))

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	-171.89
2	HBA2	L	X	-171.89
3	AAA1	L	X	-162.93
4	AHFIGA1	L	X	-115.4
5	16A1	L	X	-147.55
6	16A2	L	X	-147.55
7	18A1	L	X	-206.93
8	18A2	L	X	-206.93
9	BOBA1	L	X	-42.31
10	BOBA2	L	X	-42.31
11	ASP705K	L	X	-169.03
12	HBB1	L	X	-80.63
13	HBB2	L	X	-80.63
14	AAB1	L	X	-67.53
15	AHFIGB1	L	X	-41.16
16	16B1	L	X	-63.01
17	16B2	L	X	-63.01
18	18B1	L	X	-99.57
19	18B2	L	X	-99.57
20	LROD	L	X	-115.25
21	HBG1	L	X	-80.63
22	HBG2	L	X	-80.63

Joint Loads and Enforced Displacements (BLC 4 : WL(30)) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...
23	AAG1	L	X	-67.53
24	AHFIGG1	L	X	-41.16
25	16G1	L	X	-63.01
26	16G2	L	X	-63.01
27	18G1	L	X	-99.57
28	18G2	L	X	-99.57
29	N1	L	Y	0
30	HBA1	L	Z	-112.34
31	HBA2	L	Z	-112.34
32	AAA1	L	Z	-103.57
33	AHFIGA1	L	Z	-71.18
34	16A1	L	Z	-94.4
35	16A2	L	Z	-94.4
36	18A1	L	Z	-136.06
37	18A2	L	Z	-136.06
38	BOBA1	L	Z	-27.02
39	BOBA2	L	Z	-27.02
40	ASP705K	L	Z	-97.59
41	HBB1	L	Z	-46.55
42	HBB2	L	Z	-46.55
43	AAB1	L	Z	-38.99
44	AHFIGB1	L	Z	-23.77
45	16B1	L	Z	-36.38
46	16B2	L	Z	-36.38
47	18B1	L	Z	-57.49
48	18B2	L	Z	-57.49
49	LROD	L	Z	-66.54
50	HBG1	L	Z	-46.55
51	HBG2	L	Z	-46.55
52	AAG1	L	Z	-38.99
53	AHFIGG1	L	Z	-23.77
54	16G1	L	Z	-36.38
55	16G2	L	Z	-36.38
56	18G1	L	Z	-57.49
57	18G2	L	Z	-57.49

Joint Loads and Enforced Displacements (BLC 5 : WL(60))

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	-116.28
2	HBA2	L	X	-116.28
3	AAA1	L	X	-108.34
4	AHFIGA1	L	X	-75.33
5	16A1	L	X	-98.5
6	16A2	L	X	-98.5
7	18A1	L	X	-140.51
8	18A2	L	X	-140.51
9	BOBA1	L	X	-28.21
10	BOBA2	L	X	-28.21
11	ASP705K	L	X	-97.59
12	HBB1	L	X	-78.3
13	HBB2	L	X	-78.3
14	AAB1	L	X	-71.05
15	AHFIGB1	L	X	-47.95
16	16B1	L	X	-65
17	16B2	L	X	-65
18	18B1	L	X	-95.15

Joint Loads and Enforced Displacements (BLC 5 : WL(60)) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...]
19	18B2	L	X	-95.15
20	LROD	L	X	-66.54
21	HBG1	L	X	-78.3
22	HBG2	L	X	-78.3
23	AAG1	L	X	-71.05
24	AHFIGG1	L	X	-47.95
25	16G1	L	X	-65
26	16G2	L	X	-65
27	18G1	L	X	-95.15
28	18G2	L	X	-95.15
29	N1	L	Y	0
30	HBA1	L	Z	-146.42
31	HBA2	L	Z	-146.42
32	AAA1	L	Z	-132.11
33	AHFIGA1	L	Z	-88.57
34	16A1	L	Z	-121.03
35	16A2	L	Z	-121.03
36	18A1	L	Z	-178.14
37	18A2	L	Z	-178.14
38	BOBA1	L	Z	-34.6
39	BOBA2	L	Z	-34.6
40	ASP705K	L	Z	-169.03
41	HBB1	L	Z	-89.06
42	HBB2	L	Z	-89.06
43	AAB1	L	Z	-84.07
44	AHFIGB1	L	Z	-59.29
45	16B1	L	Z	-76.21
46	16B2	L	Z	-76.21
47	18B1	L	Z	-107.32
48	18B2	L	Z	-107.32
49	LROD	L	Z	-115.25
50	HBG1	L	Z	-89.06
51	HBG2	L	Z	-89.06
52	AAG1	L	Z	-84.07
53	AHFIGG1	L	Z	-59.29
54	16G1	L	Z	-76.21
55	16G2	L	Z	-76.21
56	18G1	L	Z	-107.32
57	18G2	L	Z	-107.32

Joint Loads and Enforced Displacements (BLC 6 : WL(90))

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...]
1	HBA1	L	X	0
2	HBA2	L	X	0
3	AAA1	L	X	0
4	AHFIGA1	L	X	0
5	16A1	L	X	0
6	16A2	L	X	0
7	18A1	L	X	0
8	18A2	L	X	0
9	BOBA1	L	X	0
10	BOBA2	L	X	0
11	ASP705K	L	X	0
12	HBB1	L	X	0
13	HBB2	L	X	0
14	AAB1	L	X	0

Joint Loads and Enforced Displacements (BLC 6 : WL(90)) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...
15	AHFIGB1	L	X	0
16	16B1	L	X	0
17	16B2	L	X	0
18	18B1	L	X	0
19	18B2	L	X	0
20	LROD	L	X	0
21	HBG1	L	X	0
22	HBG2	L	X	0
23	AAG1	L	X	0
24	AHFIGG1	L	X	0
25	16G1	L	X	0
26	16G2	L	X	0
27	18G1	L	X	0
28	18G2	L	X	0
29	N1	L	Y	0
30	HBA1	L	Z	-93.11
31	HBA2	L	Z	-93.11
32	AAA1	L	Z	-77.98
33	AHFIGA1	L	Z	-47.53
34	16A1	L	Z	-72.76
35	16A2	L	Z	-72.76
36	18A1	L	Z	-114.98
37	18A2	L	Z	-114.98
38	BOBA1	L	Z	-20.7
39	BOBA2	L	Z	-20.7
40	ASP705K	L	Z	-195.18
41	HBB1	L	Z	-156.6
42	HBB2	L	Z	-156.6
43	AAB1	L	Z	-142.1
44	AHFIGB1	L	Z	-95.91
45	16B1	L	Z	-130.01
46	16B2	L	Z	-130.01
47	18B1	L	Z	-190.3
48	18B2	L	Z	-190.3
49	LROD	L	Z	-133.08
50	HBG1	L	Z	-156.6
51	HBG2	L	Z	-156.6
52	AAG1	L	Z	-142.1
53	AHFIGG1	L	Z	-95.91
54	16G1	L	Z	-130.01
55	16G2	L	Z	-130.01
56	18G1	L	Z	-190.3
57	18G2	L	Z	-190.3

Joint Loads and Enforced Displacements (BLC 7 : WL(120))

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	116.28
2	HBA2	L	X	116.28
3	AAA1	L	X	108.34
4	AHFIGA1	L	X	75.33
5	16A1	L	X	98.5
6	16A2	L	X	98.5
7	18A1	L	X	140.51
8	18A2	L	X	75.97
9	BOBA1	L	X	75.97
10	BOBA2	L	X	74.57

Joint Loads and Enforced Displacements (BLC 7 : WL(120)) (Continued)

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
11	ASP705K	L	X	169.03
12	HBB1	L	X	75.97
13	HBB2	L	X	75.97
14	AAB1	L	X	74.57
15	AHFIGB1	L	X	54.75
16	16B1	L	X	67
17	16B2	L	X	67
18	18B1	L	X	90.73
19	18B2	L	X	90.73
20	LROD	L	X	66.54
21	HBG1	L	X	75.97
22	HBG2	L	X	75.97
23	AAG1	L	X	74.57
24	AHFIGG1	L	X	54.75
25	16G1	L	X	67
26	16G2	L	X	67
27	18G1	L	X	90.73
28	18G2	L	X	90.73
29	N1	L	Y	0
30	HBA1	L	Z	-146.42
31	HBA2	L	Z	-146.42
32	AAA1	L	Z	-132.11
33	AHFIGA1	L	Z	-88.57
34	16A1	L	Z	-121.03
35	16A2	L	Z	-121.03
36	18A1	L	Z	-178.14
37	18A2	L	Z	-178.14
38	BOBA1	L	Z	-34.6
39	BOBA2	L	Z	-34.6
40	ASP705K	L	Z	-169.03
41	HBB1	L	Z	-131.58
42	HBB2	L	Z	-131.58
43	AAB1	L	Z	-129.16
44	AHFIGB1	L	Z	-94.82
45	16B1	L	Z	-116.05
46	16B2	L	Z	-116.05
47	18B1	L	Z	-157.14
48	18B2	L	Z	-157.14
49	LROD	L	Z	-115.25
50	HBG1	L	Z	-131.58
51	HBG2	L	Z	-131.58
52	AAG1	L	Z	-129.16
53	AHFIGG1	L	Z	-94.82
54	16G1	L	Z	-116.05
55	16G2	L	Z	-116.05
56	18G1	L	Z	-157.14
57	18G2	L	Z	-157.14

Joint Loads and Enforced Displacements (BLC 8 : WL(150))

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	171.89
2	HBA2	L	X	171.89
3	AAA1	L	X	162.93
4	AHFIGA1	L	X	115.4
5	16A1	L	X	147.55
6	16A2	L	X	147.55

Joint Loads and Enforced Displacements (BLC 8 : WL(150)) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...
7	18A1	L	X	206.93
8	18A2	L	X	154.26
9	BOBA1	L	X	154.26
10	BOBA2	L	X	145.62
11	ASP705K	L	X	97.59
12	HBB1	L	X	154.26
13	HBB2	L	X	154.26
14	AAB1	L	X	145.62
15	AHFIGB1	L	X	102.7
16	16B1	L	X	132
17	16B2	L	X	132
18	18B1	L	X	185.88
19	18B2	L	X	185.88
20	LROD	L	X	115.25
21	HBG1	L	X	154.26
22	HBG2	L	X	154.26
23	AAG1	L	X	145.62
24	AHFIGG1	L	X	102.7
25	16G1	L	X	132
26	16G2	L	X	132
27	18G1	L	X	185.88
28	18G2	L	X	185.88
29	N1	L	Y	0
30	HBA1	L	Z	-112.34
31	HBA2	L	Z	-112.34
32	AAA1	L	Z	-103.57
33	AHFIGA1	L	Z	-71.18
34	16A1	L	Z	-94.4
35	16A2	L	Z	-94.4
36	18A1	L	Z	-136.06
37	18A2	L	Z	-136.06
38	BOBA1	L	Z	-27.02
39	BOBA2	L	Z	-27.02
40	ASP705K	L	Z	-169.03
41	HBB1	L	Z	-78.3
42	HBB2	L	Z	-78.3
43	AAB1	L	Z	-71.05
44	AHFIGB1	L	Z	-47.95
45	16B1	L	Z	-65
46	16B2	L	Z	-65
47	18B1	L	Z	-95.15
48	18B2	L	Z	-95.15
49	LROD	L	Z	-66.54
50	HBG1	L	Z	-78.3
51	HBG2	L	Z	-78.3
52	AAG1	L	Z	-71.05
53	AHFIGG1	L	Z	-47.95
54	16G1	L	Z	-65
55	16G2	L	Z	-65
56	18G1	L	Z	-95.15
57	18G2	L	Z	-95.15

Joint Loads and Enforced Displacements (BLC 9 : WL(180))

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	151.93
2	HBA2	L	X	151.93

Joint Loads and Enforced Displacements (BLC 9 : WL(180)) (Continued)

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
3	AAA1	L	X	149.14
4	AHFIGA1	L	X	109.49
5	16A1	L	X	134
6	16A2	L	X	134
7	18A1	L	X	181.46
8	18A2	L	X	181.46
9	BOBA1	L	X	38.5
10	BOBA2	L	X	38.5
11	ASP705K	L	X	195.18
12	HBB1	L	X	156.6
13	HBB2	L	X	156.6
14	AAB1	L	X	142.1
15	AHFIGB1	L	X	95.91
16	16B1	L	X	130.01
17	16B2	L	X	130.01
18	18B1	L	X	190.3
19	18B2	L	X	190.3
20	LROD	L	X	133.08
21	HBG1	L	X	156.6
22	HBG2	L	X	156.6
23	AAG1	L	X	142.1
24	AHFIGG1	L	X	95.91
25	16G1	L	X	130.01
26	16G2	L	X	130.01
27	18G1	L	X	190.3
28	18G2	L	X	190.3
29	N1	L	Y	0
30	HBA1	L	Z	0
31	HBA2	L	Z	0
32	AAA1	L	Z	0
33	AHFIGA1	L	Z	0
34	16A1	L	Z	0
35	16A2	L	Z	0
36	18A1	L	Z	0
37	18A2	L	Z	0
38	BOBA1	L	Z	0
39	BOBA2	L	Z	0
40	ASP705K	L	Z	0
41	HBB1	L	Z	0
42	HBB2	L	Z	0
43	AAB1	L	Z	0
44	AHFIGB1	L	Z	0
45	16B1	L	Z	0
46	16B2	L	Z	0
47	18B1	L	Z	0
48	18B2	L	Z	0
49	LROD	L	Z	0
50	HBG1	L	Z	0
51	HBG2	L	Z	0
52	AAG1	L	Z	0
53	AHFIGG1	L	Z	0
54	16G1	L	Z	0
55	16G2	L	Z	0
56	18G1	L	Z	0
57	18G2	L	Z	0

Joint Loads and Enforced Displacements (BLC 10 : WL(210))

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	171.89
2	HBA2	L	X	171.89
3	AAA1	L	X	162.93
4	AHFIGA1	L	X	115.4
5	16A1	L	X	147.55
6	16A2	L	X	147.55
7	18A1	L	X	206.93
8	18A2	L	X	206.93
9	BOBA1	L	X	42.31
10	BOBA2	L	X	42.31
11	ASP705K	L	X	169.03
12	HBB1	L	X	80.63
13	HBB2	L	X	80.63
14	AAB1	L	X	67.53
15	AHFIGB1	L	X	41.16
16	16B1	L	X	63.01
17	16B2	L	X	63.01
18	18B1	L	X	99.57
19	18B2	L	X	99.57
20	LROD	L	X	115.25
21	HBG1	L	X	80.63
22	HBG2	L	X	80.63
23	AAG1	L	X	67.53
24	AHFIGG1	L	X	41.16
25	16G1	L	X	63.01
26	16G2	L	X	63.01
27	18G1	L	X	99.57
28	18G2	L	X	99.57
29	N1	L	Y	0
30	HBA1	L	Z	112.34
31	HBA2	L	Z	112.34
32	AAA1	L	Z	103.57
33	AHFIGA1	L	Z	71.18
34	16A1	L	Z	94.4
35	16A2	L	Z	94.4
36	18A1	L	Z	136.06
37	18A2	L	Z	136.06
38	BOBA1	L	Z	27.02
39	BOBA2	L	Z	27.02
40	ASP705K	L	Z	97.59
41	HBB1	L	Z	46.55
42	HBB2	L	Z	46.55
43	AAB1	L	Z	38.99
44	AHFIGB1	L	Z	23.77
45	16B1	L	Z	36.38
46	16B2	L	Z	36.38
47	18B1	L	Z	57.49
48	18B2	L	Z	57.49
49	LROD	L	Z	66.54
50	HBG1	L	Z	46.55
51	HBG2	L	Z	46.55
52	AAG1	L	Z	38.99
53	AHFIGG1	L	Z	23.77
54	16G1	L	Z	36.38
55	16G2	L	Z	36.38
56	18G1	L	Z	57.49
57	18G2	L	Z	57.49

Joint Loads and Enforced Displacements (BLC 11 : WL(240))

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	116.28
2	HBA2	L	X	116.28
3	AAA1	L	X	108.34
4	AHFIGA1	L	X	75.33
5	16A1	L	X	98.5
6	16A2	L	X	98.5
7	18A1	L	X	140.51
8	18A2	L	X	140.51
9	BOBA1	L	X	28.21
10	BOBA2	L	X	28.21
11	ASP705K	L	X	97.59
12	HBB1	L	X	78.3
13	HBB2	L	X	78.3
14	AAB1	L	X	71.05
15	AHFIGB1	L	X	47.95
16	16B1	L	X	65
17	16B2	L	X	65
18	18B1	L	X	95.15
19	18B2	L	X	95.15
20	LROD	L	X	66.54
21	HBG1	L	X	78.3
22	HBG2	L	X	78.3
23	AAG1	L	X	71.05
24	AHFIGG1	L	X	47.95
25	16G1	L	X	65
26	16G2	L	X	65
27	18G1	L	X	95.15
28	18G2	L	X	95.15
29	N1	L	Y	0
30	HBA1	L	Z	146.42
31	HBA2	L	Z	146.42
32	AAA1	L	Z	132.11
33	AHFIGA1	L	Z	88.57
34	16A1	L	Z	121.03
35	16A2	L	Z	121.03
36	18A1	L	Z	178.14
37	18A2	L	Z	178.14
38	BOBA1	L	Z	34.6
39	BOBA2	L	Z	34.6
40	ASP705K	L	Z	169.03
41	HBB1	L	Z	89.06
42	HBB2	L	Z	89.06
43	AAB1	L	Z	84.07
44	AHFIGB1	L	Z	59.29
45	16B1	L	Z	76.21
46	16B2	L	Z	76.21
47	18B1	L	Z	107.32
48	18B2	L	Z	107.32
49	LROD	L	Z	115.25
50	HBG1	L	Z	89.06
51	HBG2	L	Z	89.06
52	AAG1	L	Z	84.07
53	AHFIGG1	L	Z	59.29
54	16G1	L	Z	76.21
55	16G2	L	Z	76.21
56	18G1	L	Z	107.32
57	18G2	L	Z	107.32

Joint Loads and Enforced Displacements (BLC 12 : WL(270))

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	0
2	HBA2	L	X	0
3	AAA1	L	X	0
4	AHFIGA1	L	X	0
5	16A1	L	X	0
6	16A2	L	X	0
7	18A1	L	X	0
8	18A2	L	X	0
9	BOBA1	L	X	0
10	BOBA2	L	X	0
11	ASP705K	L	X	0
12	HBB1	L	X	0
13	HBB2	L	X	0
14	AAB1	L	X	0
15	AHFIGB1	L	X	0
16	16B1	L	X	0
17	16B2	L	X	0
18	18B1	L	X	0
19	18B2	L	X	0
20	LROD	L	X	0
21	HBG1	L	X	0
22	HBG2	L	X	0
23	AAG1	L	X	0
24	AHFIGG1	L	X	0
25	16G1	L	X	0
26	16G2	L	X	0
27	18G1	L	X	0
28	18G2	L	X	0
29	N1	L	Y	0
30	HBA1	L	Z	93.11
31	HBA2	L	Z	93.11
32	AAA1	L	Z	77.98
33	AHFIGA1	L	Z	47.53
34	16A1	L	Z	72.76
35	16A2	L	Z	72.76
36	18A1	L	Z	114.98
37	18A2	L	Z	114.98
38	BOBA1	L	Z	20.7
39	BOBA2	L	Z	20.7
40	ASP705K	L	Z	195.18
41	HBB1	L	Z	156.6
42	HBB2	L	Z	156.6
43	AAB1	L	Z	142.1
44	AHFIGB1	L	Z	95.91
45	16B1	L	Z	130.01
46	16B2	L	Z	130.01
47	18B1	L	Z	190.3
48	18B2	L	Z	190.3
49	LROD	L	Z	133.08
50	HBG1	L	Z	156.6
51	HBG2	L	Z	156.6
52	AAG1	L	Z	142.1
53	AHFIGG1	L	Z	95.91
54	16G1	L	Z	130.01
55	16G2	L	Z	130.01
56	18G1	L	Z	190.3
57	18G2	L	Z	190.3

Joint Loads and Enforced Displacements (BLC 13 : WL(300))

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	-116.28
2	HBA2	L	X	-116.28
3	AAA1	L	X	-108.34
4	AHFIGA1	L	X	-75.33
5	16A1	L	X	-98.5
6	16A2	L	X	-98.5
7	18A1	L	X	-140.51
8	18A2	L	X	-75.97
9	BOBA1	L	X	-75.97
10	BOBA2	L	X	-74.57
11	ASP705K	L	X	-169.03
12	HBB1	L	X	-75.97
13	HBB2	L	X	-75.97
14	AAB1	L	X	-74.57
15	AHFIGB1	L	X	-54.75
16	16B1	L	X	-67
17	16B2	L	X	-67
18	18B1	L	X	-90.73
19	18B2	L	X	-90.73
20	LROD	L	X	-66.54
21	HBG1	L	X	-75.97
22	HBG2	L	X	-75.97
23	AAG1	L	X	-74.57
24	AHFIGG1	L	X	-54.75
25	16G1	L	X	-67
26	16G2	L	X	-67
27	18G1	L	X	-90.73
28	18G2	L	X	-90.73
29	N1	L	Y	0
30	HBA1	L	Z	146.42
31	HBA2	L	Z	146.42
32	AAA1	L	Z	132.11
33	AHFIGA1	L	Z	88.57
34	16A1	L	Z	121.03
35	16A2	L	Z	121.03
36	18A1	L	Z	178.14
37	18A2	L	Z	178.14
38	BOBA1	L	Z	34.6
39	BOBA2	L	Z	34.6
40	ASP705K	L	Z	169.03
41	HBB1	L	Z	131.58
42	HBB2	L	Z	131.58
43	AAB1	L	Z	129.16
44	AHFIGB1	L	Z	94.82
45	16B1	L	Z	116.05
46	16B2	L	Z	116.05
47	18B1	L	Z	157.14
48	18B2	L	Z	157.14
49	LROD	L	Z	115.25
50	HBG1	L	Z	131.58
51	HBG2	L	Z	131.58
52	AAG1	L	Z	129.16
53	AHFIGG1	L	Z	94.82
54	16G1	L	Z	116.05
55	16G2	L	Z	116.05
56	18G1	L	Z	157.14
57	18G2	L	Z	157.14

Joint Loads and Enforced Displacements (BLC 14 : WL(330))

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
1	HBA1	L	X	-171.89
2	HBA2	L	X	-171.89
3	AAA1	L	X	-162.93
4	AHFIGA1	L	X	-115.4
5	16A1	L	X	-147.55
6	16A2	L	X	-147.55
7	18A1	L	X	-206.93
8	18A2	L	X	-154.26
9	BOBA1	L	X	-154.26
10	BOBA2	L	X	-145.62
11	ASP705K	L	X	-97.59
12	HBB1	L	X	-154.26
13	HBB2	L	X	-154.26
14	AAB1	L	X	-145.62
15	AHFIGB1	L	X	-102.7
16	16B1	L	X	-132
17	16B2	L	X	-132
18	18B1	L	X	-185.88
19	18B2	L	X	-185.88
20	LROD	L	X	-115.25
21	HBG1	L	X	-154.26
22	HBG2	L	X	-154.26
23	AAG1	L	X	-145.62
24	AHFIGG1	L	X	-102.7
25	16G1	L	X	-132
26	16G2	L	X	-132
27	18G1	L	X	-185.88
28	18G2	L	X	-185.88
29	N1	L	Y	0
30	HBA1	L	Z	112.34
31	HBA2	L	Z	112.34
32	AAA1	L	Z	103.57
33	AHFIGA1	L	Z	71.18
34	16A1	L	Z	94.4
35	16A2	L	Z	94.4
36	18A1	L	Z	136.06
37	18A2	L	Z	136.06
38	BOBA1	L	Z	27.02
39	BOBA2	L	Z	27.02
40	ASP705K	L	Z	169.03
41	HBB1	L	Z	78.3
42	HBB2	L	Z	78.3
43	AAB1	L	Z	71.05
44	AHFIGB1	L	Z	47.95
45	16B1	L	Z	65
46	16B2	L	Z	65
47	18B1	L	Z	95.15
48	18B2	L	Z	95.15
49	LROD	L	Z	66.54
50	HBG1	L	Z	78.3
51	HBG2	L	Z	78.3
52	AAG1	L	Z	71.05
53	AHFIGG1	L	Z	47.95
54	16G1	L	Z	65
55	16G2	L	Z	65
56	18G1	L	Z	95.15
57	18G2	L	Z	95.15

Member Area Loads (BLC 3 : WL(0))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N6	N5	N3	N4	X	Open Structure	-53

Member Area Loads (BLC 4 : WL(30))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N4	N3	N1	N2	Z	Open Structure	-26.5
2	N6	N4	N3	N5	X	Open Structure	-45.9

Member Area Loads (BLC 5 : WL(60))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N6	N5	N3	N4	X	Open Structure	-26.5
2	N2	N1	N3	N4	Z	Open Structure	-45.9

Member Area Loads (BLC 6 : WL(90))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N3	N4	N2	N1	Z	Open Structure	-53

Member Area Loads (BLC 7 : WL(120))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N1	N2	N8	N7	X	Open Structure	26.5
2	N2	N4	N3	N1	Z	Open Structure	-45.9

Member Area Loads (BLC 8 : WL(150))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N1	N2	N8	N7	X	Open Structure	45.9
2	N4	N3	N1	N2	Z	Open Structure	-26.5

Member Area Loads (BLC 9 : WL(180))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N7	N8	N2	N1	X	Open Structure	53

Member Area Loads (BLC 10 : WL(210))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N8	N7	N1	N2	X	Open Structure	45.9
2	N7	N5	N6	N8	Z	Open Structure	26.5

Member Area Loads (BLC 11 : WL(240))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N8	N7	N1	N2	X	Open Structure	26.5
2	N7	N5	N6	N8	Z	Open Structure	45.9

Member Area Loads (BLC 12 : WL(270))

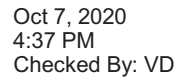
	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N8	N6	N5	N7	Z	Open Structure	53

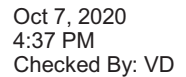
Member Area Loads (BLC 13 : WL(300))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N6	N5	N3	N4	X	Open Structure	-26.5
2	N7	N5	N6	N8	Z	Open Structure	45.9

Member Area Loads (BLC 14 : WL(330))

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
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Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	M1	L3X3X4	.283	38.938	6	.157	39.375	z	12	35567.973	46656	1.688	3.756	2...	H2-1
2	M2	L3X3X4	.225	21	13	.028	21	z	13	35567.973	46656	1.688	3.696	1...	H2-1
3	M3	L3X3X4	.281	39.375	3	.138	39.375	y	13	35567.973	46656	1.688	3.745	1...	H2-1
4	M4	L3X3X4	.230	39.375	4	.170	39.375	y	3	35567.973	46656	1.688	3.756	2...	H2-1
5	M5	L3X3X4	.231	39.375	11	.153	39.375	z	5	35567.973	46656	1.688	3.684	1...	H2-1
6	M6	L3X3X4	.173	38.938	8	.144	39.375	z	5	35567.973	46656	1.688	3.756	2...	H2-1
7	M7	L3X3X4	.311	38.938	7	.175	39.375	y	7	35567.973	46656	1.688	3.756	1...	H2-1
8	M8	L3X3X4	.445	38.938	7	.194	39.375	z	6	35567.973	46656	1.688	3.666	1...	H2-1
9	M15	L3X3X4	.498	0	13	.099	0	z	7	16293.883	46656	1.688	3.387	1...	H2-1
10	M16	L3X3X4	.402	0	13	.041	0	z	7	16293.883	46656	1.688	3.529	2...	H2-1
11	M17	L3X3X4	.538	41.33	5	.113	0	z	5	16293.883	46656	1.688	3.317	1...	H2-1
12	M18	L3X3X4	.328	0	5	.145	.861	y	7	16293.883	46656	1.688	3.756	3...	H2-1
13	M19	L3X3X4	.620	82.66	7	.203	0	z	7	16293.883	46656	1.688	3.625	2...	H2-1
14	M20	L3X3X4	.694	0	7	.091	78.355	z	9	16293.883	46656	1.688	3.49	1...	H2-1
15	M21	L3X3X4	.396	0	10	.097	0	z	10	16293.883	46656	1.688	3.702	2...	H2-1
16	M22	L3X3X4	.506	82.66	13	.228	0	y	5	16293.883	46656	1.688	3.406	1...	H2-1
17	M23	L3X3X4	.201	82.66	13	.180	0	y	11	16293.883	46656	1.688	3.595	2...	H2-1
18	M24	L3X3X4	.241	6.888	13	.072	0	y	13	16293.883	46656	1.688	3.642	2...	H2-1
19	M25	L3X3X4	.197	82.66	5	.026	0	y	7	16293.883	46656	1.688	3.756	3...	H2-1
20	M26	L3X3X4	.248	0	29	.050	0	y	5	16293.883	46656	1.688	3.422	1...	H2-1
21	M27	L3X3X4	.136	82.66	5	.173	0	y	5	16293.883	46656	1.688	3.756	3...	H2-1
22	M28	L3X3X4	.246	82.66	31	.044	82.66	y	6	16293.883	46656	1.688	3.569	2...	H2-1
23	M29	L3X3X4	.301	0	7	.067	79.216	z	9	16293.883	46656	1.688	3.612	2...	H2-1
24	M30	L3X3X4	.214	0	9	.071	0	y	10	16293.883	46656	1.688	3.756	3...	H2-1
25	M43A	L2x2x4	.266	35.375	8	.004	58.552	y	37	9316.38	30585.6	.691	1.407	1...	H2-1
26	M44A	L2x2x4	.336	46.354	7	.004	58.552	y	37	9316.487	30585.6	.691	1.452	1...	H2-1
27	M45A	L2x2x4	.540	58.552	19	.005	58.552	y	37	9316.38	30585.6	.691	1.498	1...	H2-1
28	M46A	L2x2x4	.346	40.254	6	.004	58.552	y	35	9316.487	30585.6	.691	1.415	1...	H2-1
29	M47A	L2x2x4	.349	58.552	16	.004	58.552	y	35	9316.38	30585.6	.691	1.485	1...	H2-1
30	M48A	L2x2x4	.222	58.552	15	.004	58.552	y	31	9316.487	30585.6	.691	1.456	1...	H2-1
31	M50A	L2x2x4	.191	58.552	23	.004	58.552	y	37	9316.487	30585.6	.691	1.482	1...	H2-1
32	M50B	L2x2x4	.078	37.468	35	.003	37.468	y	35	18672.905	30585.6	.691	1.577	2...	H2-1
33	M76	PIPE 2.0X	.393	57	7	.123	57	9	19844.858	44100	2.531	2.531	2...	H1-1b	
34	M77	PIPE 2.0X	.310	57	9	.143	57	9	19844.858	44100	2.531	2.531	1...	H1-1b	
35	M78	PIPE 2.0X	.099	78	9	.123	57	9	19844.858	44100	2.531	2.531	2...	H1-1b	
36	M79	PIPE 2.0X	.362	57	9	.095	57	7	19844.858	44100	2.531	2.531	2...	H1-1b	
37	M80	PIPE 2.0X	.122	78	7	.052	57	10	19844.858	44100	2.531	2.531	2...	H1-1b	
38	M81	PIPE 2.0X	.161	78	13	.051	78	13	19844.858	44100	2.531	2.531	2...	H1-1b	
39	M82	PIPE 2.0X	.104	57	11	.044	57	2	19844.858	44100	2.531	2.531	3...	H1-1b	
40	M83	PIPE 2.0X	.147	39	13	.067	18	7	19844.858	44100	2.531	2.531	2...	H1-1b	
41	M84	PIPE 2.0X	.433	57	13	.089	57	11	19844.858	44100	2.531	2.531	1...	H1-1b	
42	M85	PIPE 2.0X	.306	39	13	.117	39	13	19844.858	44100	2.531	2.531	2...	H1-1b	
43	M86	PIPE 2.0X	.273	39	12	.080	39	13	19844.858	44100	2.531	2.531	2...	H1-1b	
44	M87	PIPE 2.0X	.119	18	5	.066	39	13	19844.858	44100	2.531	2.531	4...	H1-1b	
45	M88	PIPE 2.0X	.072	39	8	.023	18	10	19844.858	44100	2.531	2.531	2...	H1-1b	
46	M89	PIPE 2.0X	.118	39	5	.040	39	7	19844.858	44100	2.531	2.531	3...	H1-1b	
47	M90	PIPE 2.0X	.140	18	5	.038	18	4	19844.858	44100	2.531	2.531	3...	H1-1b	
48	M91	PIPE 2.0X	.295	39	7	.175	39	5	19844.858	44100	2.531	2.531	2...	H1-1b	
49	M92	PIPE 2.0X	.381	39	7	.042	39	5	19844.858	44100	2.531	2.531	1...	H1-1b	
50	M93	PIPE 2.0X	.271	39	7	.081	39	5	19844.858	44100	2.531	2.531	1...	H1-1b	
51	M94	PIPE 2.0X	.062	39	4	.021	18	4	19844.858	44100	2.531	2.531	2...	H1-1b	
52	M95	PIPE 2.0X	.065	39	7	.015	18	7	19844.858	44100	2.531	2.531	1...	H1-1b	
53	M96	PIPE 2.0X	.048	39	7	.004	39	7	19844.858	44100	2.531	2.531	1...	H1-1b	
54	M97	PIPE 2.0X	.450	39	7	.118	39	7	19844.858	44100	2.531	2.531	1...	H1-1b	

Analysis of Existing Water Tank

Water Tank Analysis

Wind Loads on Water Tank (per AWWAA100-05)

At WT Bell Centroid

$$Z_{\text{bell}} := 7.32\text{ft} \quad V := 90\text{mph}$$

$$K_z := 1.09$$

$$I := 1.15$$

$$G_h := 1$$

$$C_{f_flat} := 1.0 \quad C_{f_cyl} := 0.60 \quad C_{f_round} := 0.50$$

$$q_z := 0.00256 \cdot K_z \cdot I \cdot V^2 \cdot \frac{\text{psf}}{\text{mph}^2} = 25.99 \cdot \text{psf}$$

$$P_w := q_z \cdot G_h \cdot C_{f_cyl} = 15.6 \cdot \text{psf}$$

$$P_{w_bell} := \max(P_w, 30\text{psf} \cdot C_{f_cyl}) = 18 \cdot \text{psf}$$

For exposure category "C"

Velocity Pressure coefficient
(per AWWA Table 3, sec 3.1.4)

Wind Importance Factor
(per AWWA, sec 3.1.4)

Gus-effect factor
(per AWWA, sec 3.1.4)

Force Coefficient
(per AWWA Table 2, sec 3.1.4)

Velocity Pressure
(per AWWA eq 3-2, sec 3.1.4)

Per AWWA (Eq 3-1)

Velocity Pressure at Water Tank
Bell centroid

At WT Shaft Centroid

$$Z_{\text{shaft}} := 52.7\text{ft}$$

$$K_z := 1.10$$

$$q_z := 0.00256 \cdot K_z \cdot I \cdot V^2 \cdot \frac{\text{psf}}{\text{mph}^2} = 26.23 \cdot \text{psf}$$

$$P_w := q_z \cdot G_h \cdot C_{f_cyl} = 15.74 \cdot \text{psf}$$

$$P_{w_shaft} := \max(P_w, 30\text{psf} \cdot C_{f_cyl}) = 18 \cdot \text{psf}$$

Above-ground height to Centroid

Velocity Pressure coefficient
(per AWWA Table 3, sec 3.1.4)

Velocity Pressure
(per AWWA eq 3-2, sec 3.1.4)

Per AWWA (Eq 3-1)

Velocity Pressure at Water Tank
shaft centroid

At WT Reducer Centroid

$$Z_{\text{reducer}} := 89.86\text{ft}$$

$$K_z := 1.24$$

$$q_z := 0.00256 \cdot K_z \cdot I \cdot V^2 \cdot \frac{\text{psf}}{\text{mph}^2} = 29.57 \cdot \text{psf}$$

$$P_w := q_z \cdot G_h \cdot C_{f_cyl} = 17.74 \cdot \text{psf}$$

$$P_{w_reducer} := \max(P_w, 30\text{psf} \cdot C_{f_cyl}) = 18 \cdot \text{psf}$$

Above-ground height to Centroid

Velocity Pressure coefficient
(per AWWA Table 3, sec 3.1.4)

Velocity Pressure
(per AWWA eq 3-2, sec 3.1.4)

Per AWWA (Eq 3-1)

Velocity Pressure at Water Tank
Reducer centroid

At WT Ball Centroid

$$Z_{\text{ball}} := 105.75\text{ft}$$

Above-ground height to Centroid

$$K_z := 1.28$$

Velocity Pressure coefficient
(per AWWA Table 3, sec 3.1.4)

$$q_z := 0.00256 \cdot K_z \cdot I \cdot V^2 \cdot \frac{\text{psf}}{\text{mph}^2} = 30.52 \cdot \text{psf}$$

Velocity Pressure
(per AWWA eq 3-2, sec 3.1.4)

$$P_w := q_z \cdot G_h \cdot C_{f_round} = 15.26 \cdot \text{psf}$$

Per AWWA (Eq 3-1)

$$P_{w_ball} := \max(P_w, 30\text{psf} \cdot C_{f_round}) = 15.26 \cdot \text{psf}$$

Velocity Pressure at Water Tank
Ball centroid

At Handrail

$$Z_{\text{hr}} := 122\text{ft}$$

Above-ground height to Centroid

$$K_z := 1.32$$

Velocity Pressure coefficient
(per AWWA Table 3, sec 3.1.4)

$$q_z := 0.00256 \cdot K_z \cdot I \cdot V^2 \cdot \frac{\text{psf}}{\text{mph}^2} = 31.48 \cdot \text{psf}$$

Velocity Pressure
(per AWWA eq 3-2, sec 3.1.4)

$$P_w := q_z \cdot G_h \cdot C_{f_flat} = 31.48 \cdot \text{psf}$$

Per AWWA (Eq 3-1)

$$P_{w_hr} := \max(P_w, 30\text{psf} \cdot C_{f_flat}) = 31.48 \cdot \text{psf}$$

Velocity Pressure at Water Tank
Ball centroid

At Antennas

$$Z_{\text{ant}} := 123\text{ft}$$

Above-ground height to Centroid

$$K_z := 1.32$$

Velocity Pressure coefficient
(per AWWA Table 3, sec 3.1.4)

$$q_z := 0.00256 \cdot K_z \cdot I \cdot V^2 \cdot \frac{\text{psf}}{\text{mph}^2} = 31.48 \cdot \text{psf}$$

Velocity Pressure
(per AWWA eq 3-2, sec 3.1.4)

$$P_w := q_z \cdot G_h \cdot C_{f_flat} = 31.48 \cdot \text{psf}$$

Per AWWA (Eq 3-1)

$$P_{w_ant} := \max(P_w, 30\text{psf} \cdot C_{f_flat}) = 31.48 \cdot \text{psf}$$

Velocity Pressure at antenna CL

$$P_{w_ant_pipe} := q_z \cdot G_h \cdot C_{f_cyl} = 18.89 \cdot \text{psf}$$

Appurtenance Wind Loads per AWWA100-05

$$A_{\text{sector}_N} := A_{A1} + A_{A2} + A_{\text{BOB}} + A_{\text{RRU1}} + A_{\text{KMW1}} + A_{\text{KMW2}} = 26.99 \text{ ft}^2$$

$$A_{\text{sector}_T} := A_{A1_S} + A_{A2_S} + A_{\text{BOB}_S} + A_{\text{RRU1}_S} + A_{\text{KMW1}_S} + A_{\text{KMW2}_S} = 13.77 \text{ ft}^2$$

$$A_{\text{beacon}} := 3 \text{ ft}^2$$

$$A_{\text{pipes}} := 2.375 \text{ in} \cdot 7.5 \text{ ft} \cdot 22 = 32.66 \text{ ft}^2$$

$$A_{\text{RND}} := A_{\text{ASP}} + A_{\text{rod}} + A_{\text{beacon}} + A_{\text{pipes}} = 43.36 \text{ ft}^2$$

$$F_{\text{sector}_N} := A_{\text{sector}_N} \cdot P_{w_ant} = 849.7 \text{ lb}$$

$$F_{\text{sector}_T} := A_{\text{sector}_T} \cdot P_{w_ant} = 433.4 \text{ lb}$$

$$F_{\text{sector}_{60}} := F_{\text{sector}_N} \cdot \cos(60\text{deg}) + F_{\text{sector}_T} \cdot \sin(60\text{deg}) = 800.19 \text{ lb}$$

$$F_{\text{app}} := F_{\text{sector}_N} + 2F_{\text{sector}_{60}} + A_{\text{RND}} \cdot P_{w_ant_pipe} = 3269.07 \text{ lb}$$

$$W_{\text{app}} := 3W_{\text{ANT1}} + 3W_{\text{ANT2}} + 3W_{\text{KMW1}} + 3W_{\text{KMW2}} + W_{\text{ASP}} + W_{\text{rod}} + 2W_{\text{BOB}} + 3W_{\text{RRU1}} = 973.8 \text{ lb}$$

Handrail Wind Loads per AWWA100-05

$$A_{\text{hr_pf}} := 1.10 \frac{\text{ft}^2}{\text{ft}} \quad D_{\text{hr}} := 18 \text{ ft}$$

$$A_{\text{hr}} := A_{\text{hr_pf}} \cdot \pi \cdot D_{\text{hr}} = 62.2 \text{ ft}^2$$

$$F_{\text{hr}} := A_{\text{hr}} \cdot P_{w_hr} = 1958 \text{ lb}$$

$$W_{\text{hr}} := 1635 \text{ lb}$$

$$W_{\text{EQ}} := W_{\text{app}} + W_{\text{hr}} = 2608.8 \text{ lb}$$

WT Dimensions

$$t_{\text{shaft}} := 0.431 \text{ in}$$

$$D_{\text{shaft}} := 6.571833 \text{ ft}$$

Thickness & dia. are assumed per
ref. 3

$$D_{\text{Inner}} := D_{\text{shaft}} - 2t_{\text{shaft}} = 78 \cdot \text{in}$$

$$D_{\text{shaft}} = 78.86 \cdot \text{in}$$

Inner and Outer shaft diameter

$$d_{\text{bell}} := 18.5 \text{ ft}$$

Diameter of the Bell

$$d_{\text{shaft}} := 6.571833 \text{ ft} \quad h_{\text{shaft}} := 70.6 \text{ ft}$$

Diameter of the shaft

$$h_{\text{bell}} := 17.4 \text{ ft}$$

Height of the Bell including base
plate

$$A_{\text{bell}} := (d_{\text{bell}} - d_{\text{shaft}}) \cdot .5 \cdot h_{\text{bell}} + h_{\text{bell}} \cdot d_{\text{shaft}} = 218.12 \text{ ft}^2$$

Area of the Bell

$$Y_{\text{bell}} := \frac{(d_{\text{bell}} - d_{\text{shaft}}) \cdot (h_{\text{bell}})^2 \cdot \left(\frac{1}{6}\right) + h_{\text{bell}}^2 \cdot d_{\text{shaft}} \cdot 0.5}{A_{\text{bell}}} = 7.32 \text{ ft}$$

Distance from bottom of the Bell to
the Centroid

$$d_{\text{seat}} := 9.5 \text{ ft}$$

Diameter of the reducer

$$h_{\text{reducer}} := 3.5 \text{ ft}$$

Height of the reducer

$$A_{\text{reducer}} := (d_{\text{seat}} - d_{\text{shaft}}) \cdot \frac{h_{\text{reducer}}}{2} + h_{\text{reducer}} \cdot d_{\text{shaft}} = 28.126 \text{ ft}^2$$

Area of the reducer

$$Y_{\text{reducer}} := \frac{(d_{\text{seat}} - d_{\text{shaft}}) \cdot (h_{\text{reducer}})^2 \cdot \left(\frac{1}{3}\right) + h_{\text{reducer}}^2 \cdot d_{\text{shaft}} \cdot 0.5}{A_{\text{reducer}}} + h_{\text{bell}} + h_{\text{shaft}}$$

$$Y_{\text{reducer}} = 89.86 \text{ ft}$$

AGL centroid EL

$$A_{\text{shaft}} := D_{\text{shaft}} \cdot h_{\text{shaft}} = 463.97 \text{ ft}^2$$

Area of shaft

$$Y_{\text{shaft}} := h_{\text{bell}} + 0.5 \cdot h_{\text{shaft}} = 52.7 \text{ ft}$$

AGL centroid EL

$$A_{\text{ball}} := 712 \cdot \text{ft}^2$$

Area of ball

$$Y_{\text{ball}} := h_{\text{bell}} + h_{\text{shaft}} + h_{\text{reducer}} + 0.5 \cdot 28.5 \text{ ft} = 105.75 \text{ ft}$$

AGL centroid EL

Wind load Calculations

$$P_{W.ball} := A_{ball} \cdot P_{w_ball} = 10.87 \cdot \text{kip}$$

Wind force on ball

$$P_{W.seat} := A_{reducer} \cdot P_{w_reducer} = 0.51 \cdot \text{kip}$$

Wind force on seat

$$P_{W.shaft} := A_{shaft} \cdot P_{w_shaft} = 8.35 \cdot \text{kip}$$

Wind force on shaft

$$P_{W.bell} := A_{bell} \cdot P_{w_bell} = 3.93 \cdot \text{kip}$$

Wind force on bell

$$M_{base.WT} := P_{W.ball} \cdot Y_{ball} + P_{W.seat} \cdot Y_{reducer} + P_{W.shaft} \cdot Y_{shaft} + P_{W.bell} \cdot Y_{bell} = 1663.47 \cdot \text{ft} \cdot \text{kip}$$

$$M_{base.ant} := F_{app} \cdot Z_{ant} + F_{hr} \cdot Z_{hr} = 640.97 \cdot \text{ft} \cdot \text{kip}$$

$$M_{base} := M_{base.WT} + M_{base.ant} = 2304.44 \cdot \text{ft} \cdot \text{kip}$$

Max moment at base

$$W_{metal} := 70.9 \text{ kip}$$

Total WT metal weight
per ref. 3

$$W_{water} := 839.8 \text{ kip}$$

Total WT water weight per ref. 3

$$W_{EQ} = 2608.8 \text{ lb}$$

Total equipment weight

$$W_{tot} := W_{metal} + W_{water} + W_{EQ} = 913.31 \cdot \text{kip}$$

Total weight

Check Stress at Top of Bell

$$h_{bell} = 17.4 \text{ ft}$$

$$Y_{ball.b} := Y_{ball} - h_{bell} = 88.35 \text{ ft}$$

$$Y_{reducer.b} := Y_{reducer} - h_{bell} = 72.46 \text{ ft}$$

$$Y_{shaft.b} := Y_{shaft} - h_{bell} = 35.3 \text{ ft}$$

$$M_{base.shaft.tel} := F_{app} \cdot (Z_{ant} - h_{bell}) + F_{hr} \cdot (Z_{hr} - h_{bell}) = 550.02 \text{ ft} \cdot \text{kip}$$

$$M_{base.shaft} := P_{W.ball} \cdot Y_{ball.b} + P_{W.seat} \cdot Y_{reducer.b} + P_{W.shaft} \cdot Y_{shaft.b} + M_{base.shaft.tel}$$

$$M_{base.shaft} = 1841.55 \cdot \text{kip} \cdot \text{ft}$$

$$f_a := \frac{W_{tot}}{\pi \cdot d_{shaft} \cdot t_{shaft}} = 8.55 \cdot \text{ksi}$$

Axial stress in shaft @ top of Bell

$$f_b := \frac{M_{base.shaft}}{\pi \cdot \frac{1}{4} (d_{shaft})^2 \cdot t_{shaft}} = 10.5 \cdot \text{ksi}$$

Bending stress in shaft @ top of
Bell

$$f_{total} := f_a + f_b = 19.05 \cdot \text{ksi}$$

Total applied Stress

Allowable Axial and Bending Stress in Shaft

$$L := h_{\text{shaft}} \quad K := 1 \quad E := 29000 \text{ ksi}$$

$$t := t_{\text{shaft}} = 0.43 \text{ in} \quad R := 0.5 d_{\text{shaft}} = 39.43 \text{ in}$$

$$r := \frac{\left[d_{\text{shaft}}^2 + (d_{\text{shaft}} - 2t_{\text{shaft}})^2 \right]^{0.5}}{4} = 27.73 \text{ in} \quad \text{Radius of Gyration}$$

$$SR := \frac{K \cdot L}{r} = 30.55 \quad \text{Slenderness Ratio}$$

$$tRc := 0.00035372 \quad \text{Thickness to radius ratio change from elastic to inelastic (per AWWA)}$$

$$FL := \begin{cases} 17.5(10^5) \cdot \frac{t}{R} \left[1 + 50000 \cdot \left(\frac{t}{R} \right)^2 \right] \text{ psi} & \text{if } 0 \leq \frac{t}{R} \leq tRc \\ \left[6925 + 886(10)^3 \cdot \frac{t}{R} \right] \text{ psi} & \text{if } tRc \leq \frac{t}{R} \leq 0.0125 \\ (18000 \text{ psi}) & \text{otherwise} \end{cases}$$

Allowable local compressive stress (per AWWA sec. 3.4.3.1.1) for a Class 2 material (Eq 3-11 & Eq 3-13)

$$FL = 16.61 \cdot \text{ksi}$$

$$C_c := \sqrt{\frac{\pi^2 \cdot E}{FL}} = 131.27$$

Column Slenderness ratio at beginning of elastic column buckling (per AWWA sec. 3.4.1.6) (Eq 3-10)

$$K\phi := \begin{cases} 1 - \frac{1}{2} \left(\frac{SR}{C_c} \right)^2 & \text{if } 25 < SR \leq C_c \\ \frac{1}{2} \left(\frac{SR}{C_c} \right)^2 & \text{if } SR \geq C_c \\ (1) & \text{otherwise} \end{cases} \quad K\phi = 0.97$$

Slenderness reduction factor $K\phi$ (per AWWA sec. 3.4.1.6) (Eq 3-7, Eq 3-8 & Eq 3-9)

$$FL_{\text{allowable}} := 1.33 FL \cdot K\phi = 21.49 \cdot \text{ksi}$$

Allowable local compressive buckling stress of leg column.
With 33% increase
(per AWWA sec. 3.3.3)

Shaft Stress is OK

$$\text{if } \left(\frac{f_{\text{total}}}{FL_{\text{allowable}}} \leq 1, \text{"PASS"}, \text{"FAIL"} \right) = \text{"PASS"}$$

$$\text{Shaft_Capacity} := \frac{f_{\text{total}}}{FL_{\text{allowable}}} = 88.64 \cdot \%$$

Shaft capacity OK

Anchor Bolt Check

$$d_{\text{bolt}} := 1.75\text{in}$$

Diameter of anchor bolts

$$n_{\text{bolt}} := 12$$

Number of anchor bolts

$$A_{\text{bolt_tensile}} := 1.90\text{in}^2$$

Area of steel per anchor bolt

$$d_{\text{base}} := 18.5\text{ft}$$

diameter at base

$$V_{\text{base}} := P_{W.\text{ball}} + P_{W.\text{seat}} + P_{W.\text{shaft}} + P_{W.\text{bell}} + F_{\text{app}} + F_{\text{hr}} = 28.88\cdot\text{kip}$$

$$P_W := \frac{4M_{\text{base}}}{n_{\text{bolt}} \cdot d_{\text{base}}} - \frac{W_{\text{metal}} + W_{\text{EQ}}}{n_{\text{bolt}}} = 35.4\cdot\text{kip}$$

Uplift force per anchor from wind
(per AWWA sec.3.8.9.1)(Eq 3-41)

$$T_{\text{actual}} := \frac{P_W}{A_{\text{bolt_tensile}}} + \frac{V_{\text{base}}}{n_{\text{bolt}} \cdot A_{\text{bolt_tensile}}} = 19.9\cdot\text{ksi}$$

Stress in anchor bolt due to uplift
force & Shear force

$$T_{\text{allow}} := 15\text{ksi} \cdot 1.33 = 19.95\cdot\text{ksi}$$

Allowable tension (per AWWA table
4) & allowable increase for wind
resistance (per AWWA sec. 3.3.3)

$$\text{if} \left(\frac{T_{\text{actual}}}{T_{\text{allow}}} \leq 1, \text{"PASS"}, \text{"FAIL"} \right) = \text{"PASS"}$$

Anchor bolt check OK, anchor bolts
capable of resisting applied forces
per ANSI/TIA & AWWA guidelines for
Uplift and overturning.

$$AB_Capacity := \frac{T_{\text{actual}}}{T_{\text{allow}}} = 99.7\cdot\%$$

Anchor bolt capacity OK

Overturning Check

$$d_{\text{out_foot}} := 24.5\text{ft}$$

Foundation diameter per ref. 3

$$W_{\text{metal}} = 70.9\cdot\text{kip}$$

Weight of metal per ref. 3

$$W_{\text{fnd}} := 41.08\text{kip}$$

Weight of foundation per ref. 3

$$W_{\text{soil}} := 230.5\text{kip}$$

Weight of soil per ref. 3

$$W_{\text{EQ}} = 2.61\cdot\text{kip}$$

Weight of equipment

$$M_{\text{resist}} := 0.5 \cdot d_{\text{out_foot}} \cdot (W_{\text{metal}} + W_{\text{fnd}} + W_{\text{soil}} + W_{\text{EQ}}) = 4227.34\cdot\text{kip}\cdot\text{ft}$$

Resisting moment

$$M_{\text{overturning}} := M_{\text{base}} = 2304.44\cdot\text{kip}\cdot\text{ft}$$

Overturning Moment

$$\frac{M_{\text{resist}}}{M_{\text{overturning}}} = 1.83 \quad > 1.5 \text{ Overturning is OK}$$

Overturning resistance of water tank
is OK at worst case scenario (empty
water tank at full wind loading).

APPENDIX



Field Mapping Report

T-Mobile Site No:

ML70553B

T-Mobile Site Name:

Northwest WT

Site Address:

**250 Olive Street
Williams Bay, WI 53191**

Date: September 30, 2020

Total Service Telecom

531 Bonnie Lane Elk Grove Village, IL 60007

Phone: 312.376.3120 | Fax: 312.376.3125

www.GOTST.com

A1



September 30, 2020

Philip Arceo
KCS Corporation
Consulting Engineers

RE: ML70553B Northwest WT Mapping Report

Dear Mr. Arceo,

Total Service Telecom, Inc. has conducted an inspection of the existing Water Tower at the Williams Bay, WI Water Tank, located at 250 Olive Street, Williams Bay, WI 53191. The items below reference our observations.

1. TOWER STRUCTURE

A. The tower is a Spheroid Water Tank with coax cables routed up through the tank and 36" riser to the roof. Coax exits the riser cover via seven 4" conduits welded in.

B. The tank top roof plates are .258" thick where the handrail corral kickers are welded down. The next level of plates are .308" thick where the corral handrail posts are all welded down.

2. ANTENNAS AND MOUNTS

A. There are currently two carrier's antennas on the tank, T-Mobile with six antennas and US Cellular with six antennas. There is one omni antenna belonging to the jurisdiction. All antennas are mounted to the 18' diameter handrail welded to the tank roof. Antenna spacing varies between all antennas and empty mount pipes. See the antenna details in the accompanying antenna chart and dimensions in the Page 1 sketch.

B. Antenna mount is an 18' diameter handrail, 42" tall, of angle iron construction. The handrail is welded down the tank rooftop. The rail is supported via eight angle iron kickers around the interior of the rail. There are 22 mount locations on the handrail with 14 occupied and the remaining empty. The TMO mount pipes are attached to the top and mid rails via clamp sets drilled and bolted into place. The remainder of pipes are bolted

Total Service Telecom
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Phone: 312.376.3120 | Fax: 312.376.3125
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A2



to 6" long 4" x 4" angles welded or bolted to the top and mid rails. See the details in the accompanying field sketches that identify all locations on the handrail as well as the dimensions of the railing structure.

Please let us know if you have any questions regarding this summary.

Photos are attached for reference.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeff McLendon".

Jeff McLendon

Total Service Telecom, Inc

Total Service Telecom

531 Bonnie Lane Elk Grove Village, IL 60007

Phone: 312.376.3120 | Fax: 312.376.3125

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A3

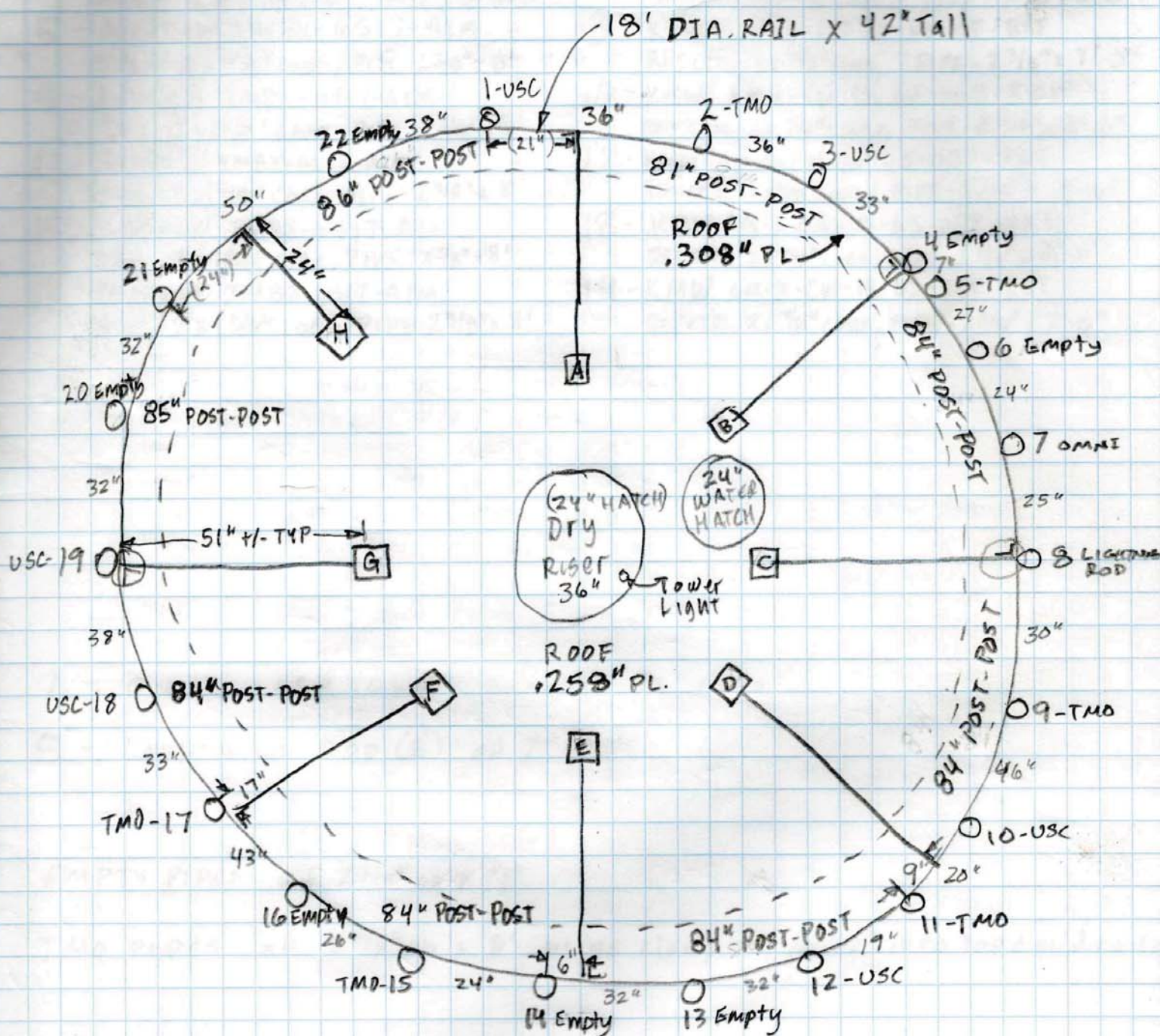
ML70553B Northwest WT
 250 Olive Street
 Williams Bay, WI 53191
 Spheriod Water Tank

NOTE: Position numbers reference the Page 1 top view sketch

Mount Elevation	Antenna Type	Location	Coax, cable	Antenna Model	Mount type	RRUS, TMA	Carrier (if known)
	panel	Position # 1	2 x 7/8"	KMW AM-X-CW-18-65-00T-RET	2-3/8" OD x 8'-6"	BIAS T	USC
	panel	Position # 2	2 x 1-5/8"	Andrew TMBX-6517-A1M	2-3/8" OD x 8'-0"	TWIN TMA	TMO
	panel	Position # 3	2 x 7/8"	KMW AM-X-CW-16-65-00T-RET	2-3/8" OD x 7'-0"	BIAS T	USC
	none	Position # 4		empty	2-3/8" OD x 7'-0"		
	panel	Position # 5	2 x 1-5/8"	Andrew TMBX-6517-A1M	2-3/8" OD x 8'-0"	TWIN TMA	TMO
	none	Position # 6		empty	2-3/8" OD x 7'-0"		
	Omni	Position # 7	1 x 1/2"	ASP 705K	2-3/8" OD x 7'-0"		Williams Bay
	none	Position # 8		Lightning Rod	2-3/8" OD x 7'-0"		
	panel	Position # 9	2 x 1-5/8"	Andrew TMBX-6517-A1M	2-3/8" OD x 8'-0"	TWIN TMA	TMO
	panel	Position # 10	2 x 7/8"	KMW AM-X-CW-18-65-00T-RET	2-3/8" OD x 8'-6"	BIAS T	USC
	panel	Position # 11	2 x 1-5/8"	Andrew TMBX-6517-A1M	2-3/8" OD x 8'-0"	TWIN TMA	TMO
	panel	Position # 12	2 x 7/8"	KMW AM-X-CW-16-65-00T-RET	2-3/8" OD x 7'-0"	BIAS T	USC
	none	Position # 13		empty	2-3/8" OD x 7'-0"		
	none	Position # 14		empty	2-3/8" OD x 7'-0"		
	panel	Position # 15	2 x 1-5/8"	Andrew TMBX-6517-A1M	2-3/8" OD x 8'-0"	TWIN TMA	TMO
	none	Position # 16		empty	2-3/8" OD x 7'-0"		
	panel	Position # 17	2 x 1-5/8"	Andrew TMBX-6517-A1M	2-3/8" OD x 8'-0"	TWIN TMA	TMO
	panel	Position # 18	2 x 7/8"	KMW AM-X-CW-18-65-00T-RET	2-3/8" OD x 8'-6"	BIAS T	USC
	panel	Position # 19	2 x 7/8"	KMW AM-X-CW-16-65-00T-RET	2-3/8" OD x 7'-0"	BIAS T	USC
	none	Position # 20		empty	2-3/8" OD x 7'-0"		
	none	Position # 21		empty	2-3/8" OD x 7'-0"		
	none	Position # 22		empty	2-3/8" OD x 7'-0"		

FIELD SKETCHES

PAGE 1



TMO COLOR

Red = Alpha

Blue = Beta

White = Gamma

USC COLOR

Red = Alpha

White = Beta

Blue = Gamma

- 2 - ANDREW TMBX-6517-AIM
TMA - 2 x 1 5/8" COAX, PIPE 2 3/8" x 8'
- 5 - ANDREW TMBX-6517-AIM
TMA - 2 x 1 5/8" COAX, PIPE 2 3/8" x 8'
- 9 - ANDREW TMBX-6517-AIM
TMA, 2 x 1 5/8" COAX, PIPE 2 3/8" x 8'
- 11 - ANDREW TMBX-6517-AIM
TMA, 2 x 1 5/8" COAX, PIPE 2 3/8" x 8'
- 15 - ANDREW TMBX-6517-AIM
TMA, 2 x 1 5/8" COAX, PIPE 2 3/8" x 8'
- 17 - ANDREW TMBX-6517-AIM
TMA, 2 x 1 5/8" COAX, PIPE 2 3/8" x 8'

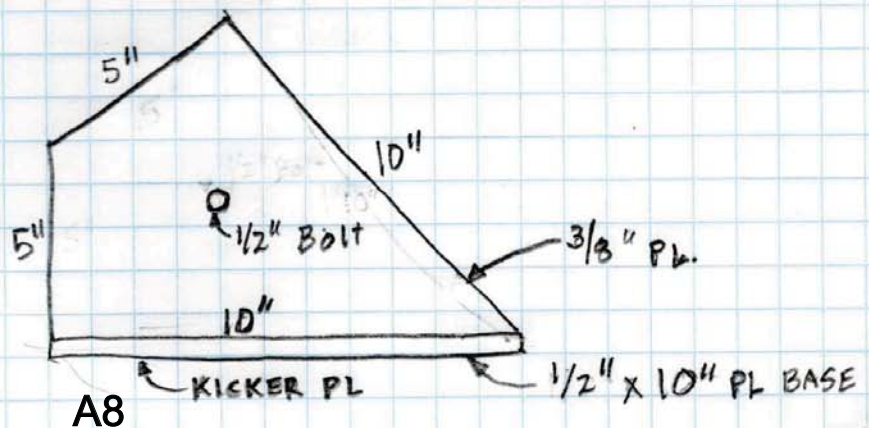
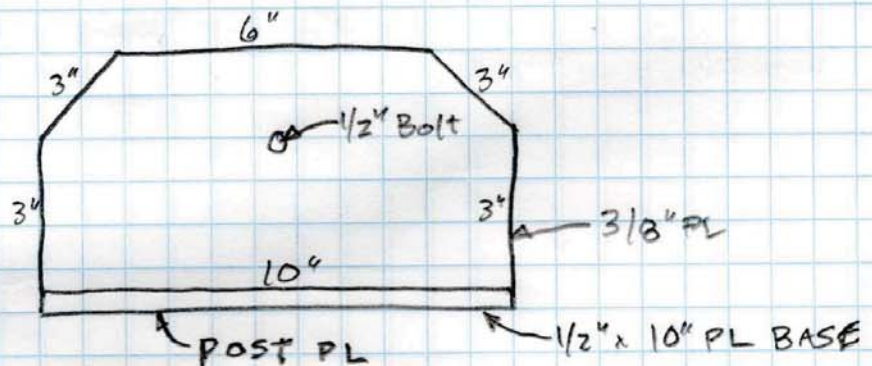
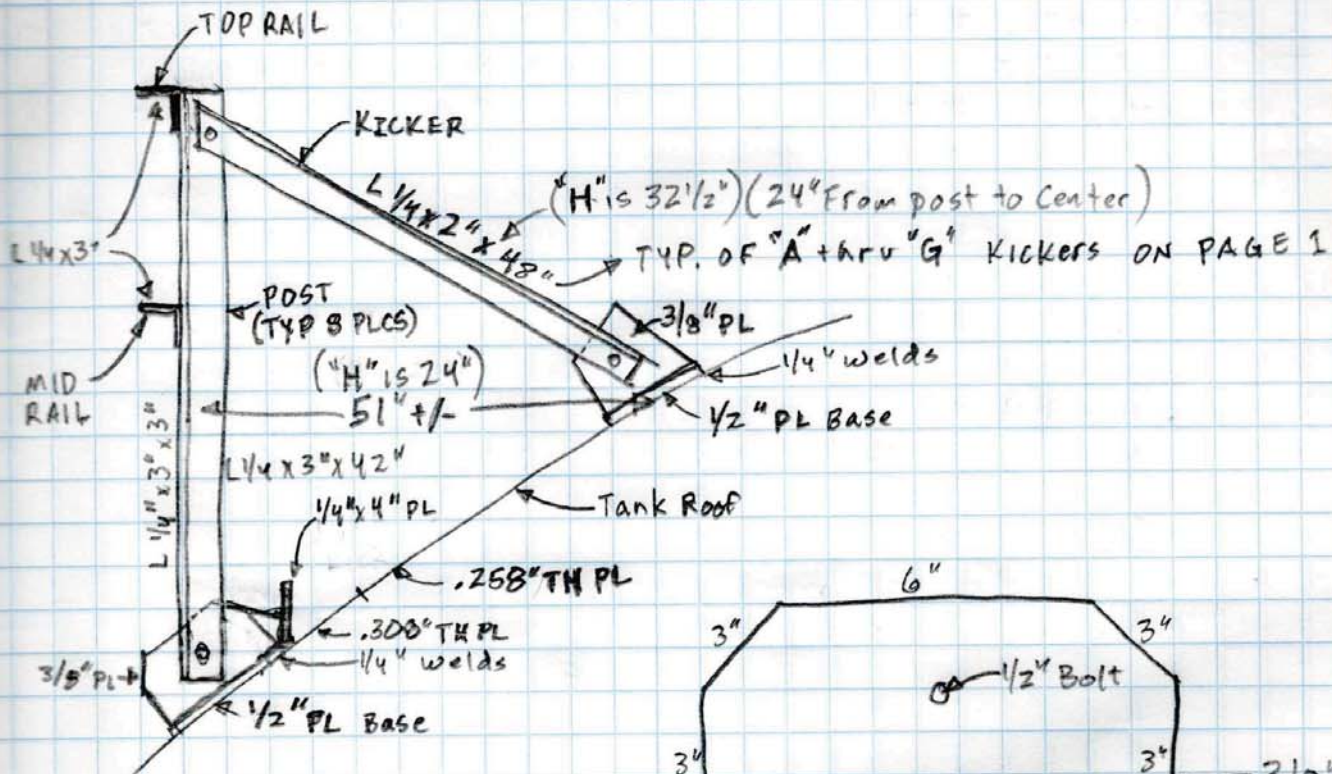
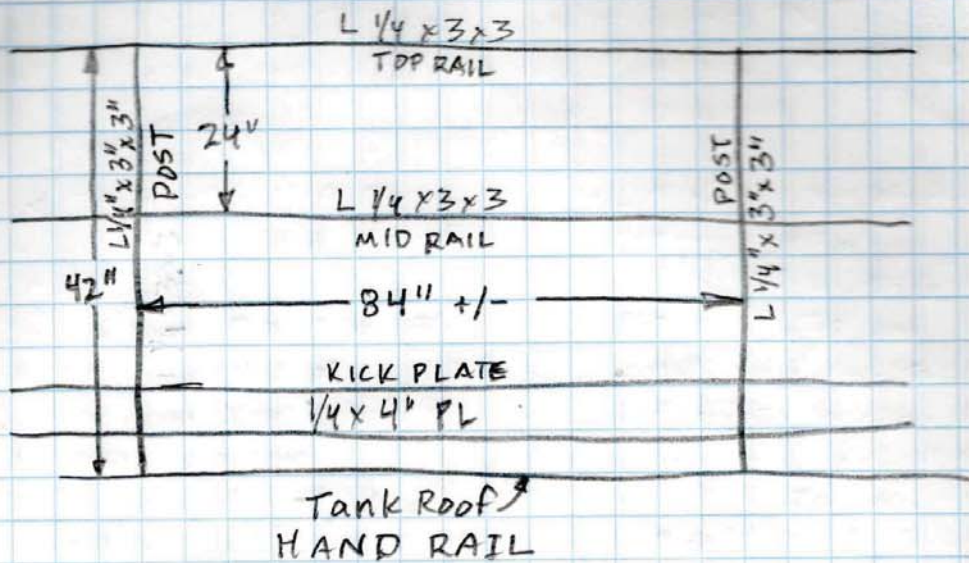
- 1 - KMW AM-X-CW-18-65-00T-RET
RET CTRL, 2 x 7/8" COAX, PIPE - 2 3/8" x 8'-6"
- 3 - KMW AM-X-CW-16-65-00T-RET
RET CTRL, 2 x 7/8" COAX, PIPE - 2 3/8" x 7'-0"
- 10 - KMW AM-X-CW-18-65-00T-RET
RET CTRL, 2 x 7/8" COAX, PIPE - 2 3/8" x 8'-6"
- 12 - KMW AM-X-CW-16-65-00T-RET
RET CTRL, 2 x 7/8" COAX, PIPE - 2 3/8" x 7'-0"
- 18 - KMW AM-X-CW-18-65-00T-RET
RET CTRL, 2 x 7/8" COAX, PIPE - 2 3/8" x 8'-6"
- 19 - KMW AM-X-CW-16-65-00T-RET
RET CTRL, 2 x 7/8" COAX, PIPE - 2 3/8" x 7'-0"

7 - OMNI ASP 705K ANDREW 1/2" COAX

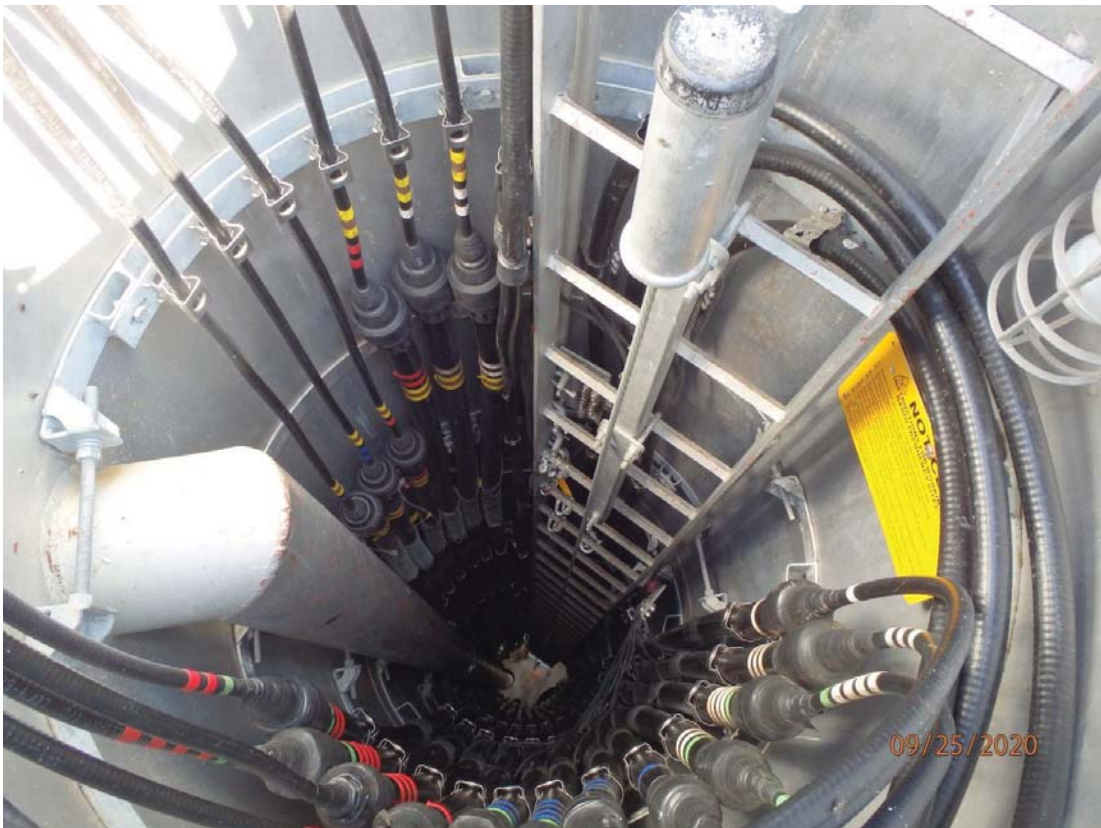
8 - LIGHTNING ROD (8') ON 7' PIPE

EMPTY PIPES all 2 3/8" OD x 7'

TMO PIPES all 2 3/8" OD x 8' using clampsets drilled into top & mid rails



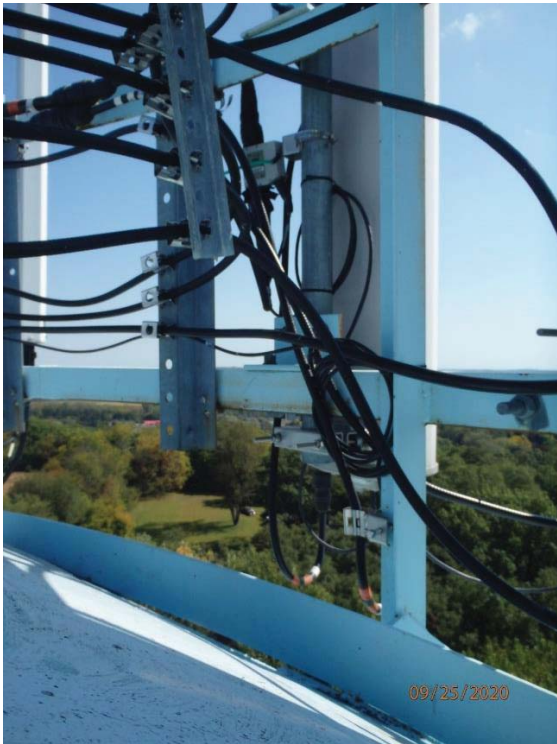
PHOTOS







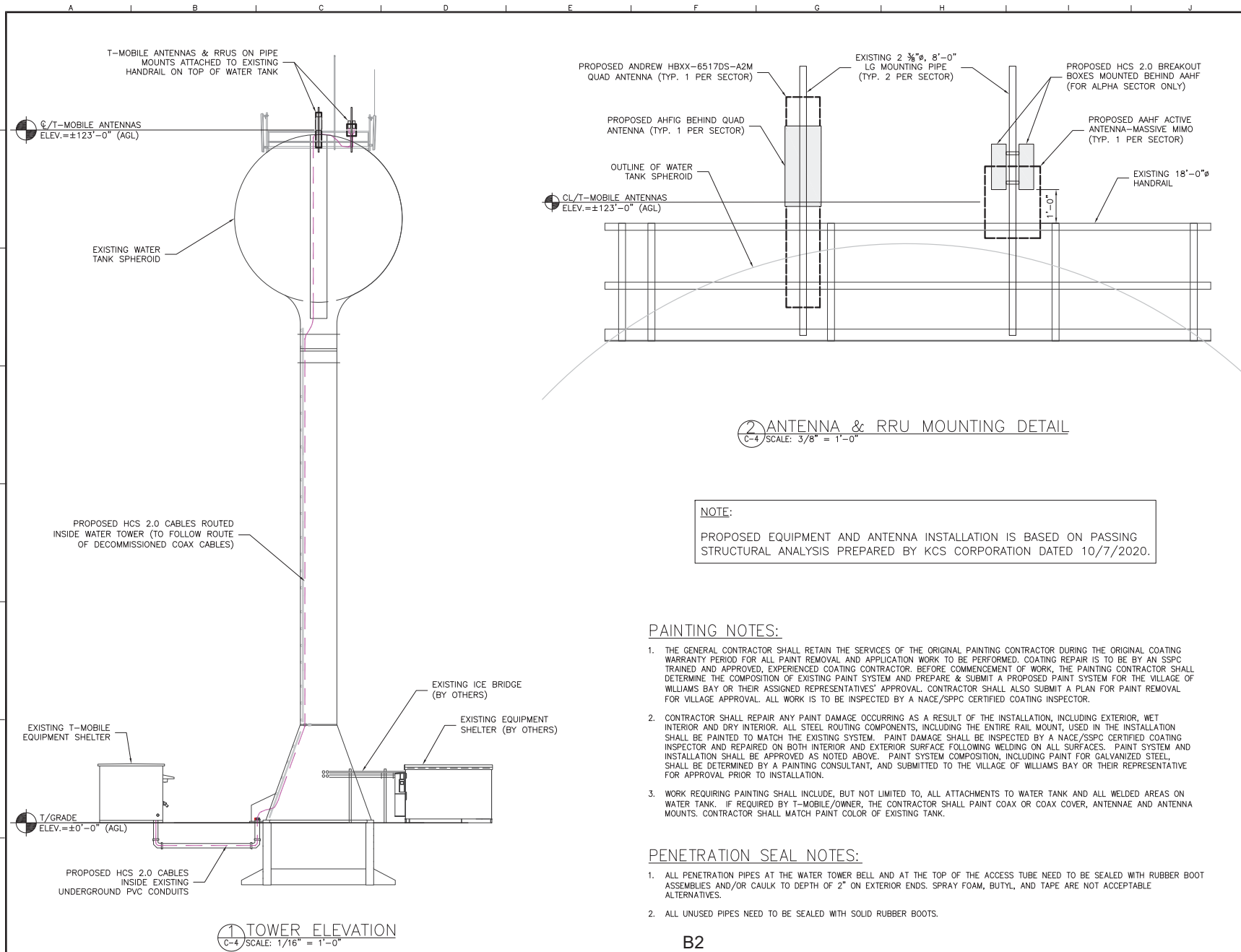












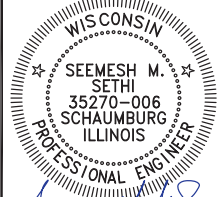
T-Mobile

1400 ORUS PLACE, SUITE 700
DOWNERS GROVE, IL 60555
PHONE:
FAX:

KCS CORPORATION
CONSULTING ENGINEERS

ILLINOIS DESIGN FIRM REGISTRATION NO.: 184-002139
1125 REUNTON RD., SCHAMBURG, IL 60173
PHONE: 847-400-8200, FAX: 847-400-8225
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SIGNATURES:
DATE: 10/7/20 EXPIRES: 7/31/22

0	ISSUED FOR PERMIT	10/7/20
A	ISSUED FOR REVIEW	7/6/20
REV.	DESCRIPTION	DATE

ML70553B
NORTHWEST WT

250 OLIVE STREET,
WILLIAMS BAY, WI 53191

Drawing Title:
**TOWER ELEVATION,
ANTENNA & RRU
MOUNTING DETAIL**

Project Number:	Drawn by: JLS
Client Project Number:	Checked by: PK
Scale:	Approved by: MS
Drawing Number	Date:

C-4



HBXX-6517DS-VTM | HBXX-6517DS-A2M

4-port sector antenna, 4x 1710–2180 MHz, 65° HPBW, RET compatible

- Superior azimuth tracking and pattern symmetry with excellent passive intermodulation suppression

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS (First Lobe), dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	21	22	21
CPR at Sector, dB	10	11	9
Isolation, dB	30	30	30
VSWR Return Loss, dB	1.4 15.6	1.4 15.6	1.4 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
	0 ° 18.4	0 ° 18.4	0 ° 18.7
Gain by Beam Tilt, average, dBi	3 ° 18.7	3 ° 18.7	3 ° 18.9
	6 ° 18.4	6 ° 18.5	6 ° 18.6
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
USLS, beampeak to 20° above beampeak, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, [download the whitepaper Time to Raise the Bar on BSAs.](#)

HBXX-6517DS-VTM | HBXX-6517DS-A2M

General Specifications

Operating Frequency Band	1710 – 2180 MHz
Antenna Type	Sector
Band	Single band
Performance Note	Outdoor usage

Mechanical Specifications

RF Connector Quantity, total	4
RF Connector Quantity, high band	4
RF Connector Interface	7-16 DIN Female
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Location	Bottom
Wind Loading, frontal	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Loading, lateral	175.0 N @ 150 km/h 39.3 lbf @ 150 km/h
Wind Speed, maximum	241 km/h 150 mph

Dimensions

Length	1906.0 mm 75.0 in
Width	305.0 mm 12.0 in
Depth	166.0 mm 6.5 in
Net Weight, without mounting kit	18.5 kg 40.8 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator HBXX-6517DS-A2M

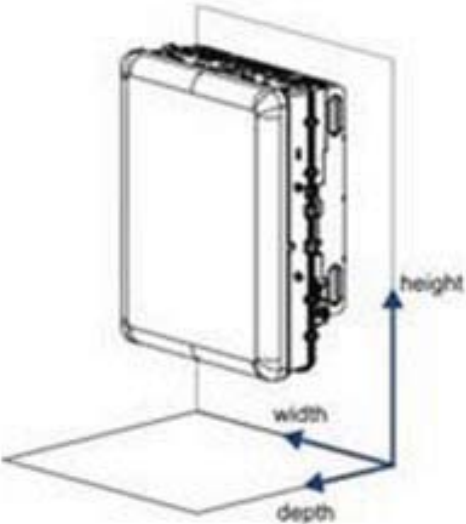
Packed Dimensions

Length	2036.0 mm 80.2 in
Width	402.0 mm 15.8 in
Depth	292.0 mm 11.5 in
Shipping Weight	28.2 kg 62.2 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

PRODUCT DESCRIPTION

Band	B41 – 2496-2690 MHz	
Supported Modulation schemes	(DL) BPSK, QPSK, 16 QAM, 64 QAM, 256 QAM (UL) BPSK, QPSK, 16 QAM, 64 QAM	
No. of ports	32TX32RX and 64TX64RX	
MIMO Streams	16	
Instantaneous IBW	60MHz on Band 41	
Total Avg EIRP	74.8 dBm	
Supported bandwidths	LTE 1.4,3,5,10,15,20 MHz	
Output Power	120W Total (3x40W)	
Power Consumption	850 W typical (ETSI average)	
Optical Ports	3 x QSFP+ (each 4* Gbps CPRI)	
Connector Type	DC -40.5V ... -57V/2 Pole connector	
Installation Options	4.3-10+	
AISG	AISG on all ports, DC on ANT1 and ANT3	
Dimensions (H x W x D)	25.6 x 10.3 x 19.7	
Weight lbs	103.6 lb	
HW/SW Availability	Sept'19 – SRAN19A	
5G NR Support	YES	
Material Description	AAHF AirScale2 Dual RRH 4T4R B25/66 480W	AAHF 474715A

C3

LTE5213/SR002411: Nokia Airscale Dual RRH 4T4R B25/B66 Module AHFIG



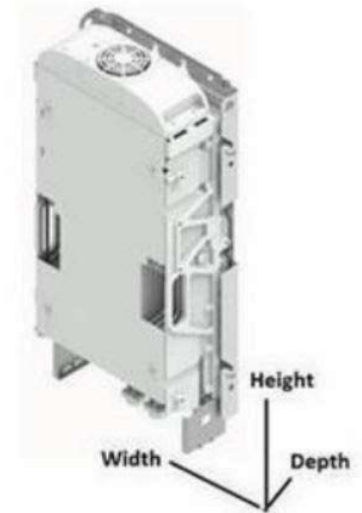
Description

LTE5213/SR002411: Nokia AirScale Dual RRH 4T4R B25/66 480 W AHFIG feature in release LTE19A/SRAN19A introduces the new Nokia AirScale Multiband Remote Radio Head with four transmitters and four receivers for 3GPP Band 25 and Band 66 enabling it to support one sector and two bands simultaneously with up to 4x40 W for B66 and 4x80 W for B25 at the antenna connector.

AHFIG is an updated version of the AHFIB with an improvement in the output PA power for B25 to 4x80 W as compared to 4x40 W in AHFIB. Output PA power for B66 is same as AHFIB (4x40 W).

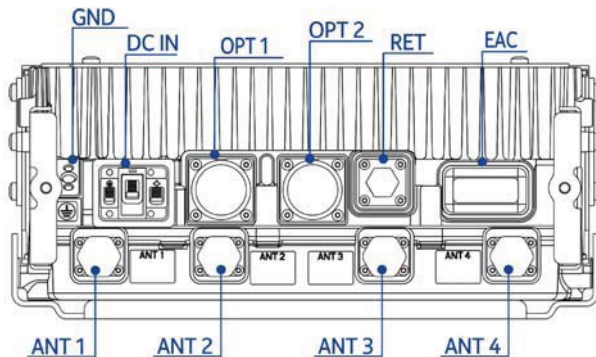
This radio can be used in LTE only or LTE/WCDMA/GSM using the SRAN functionality. Classical RF sharing with WCDMA or GSM is not supported with this radio. The AHFIG radio will work only with AirScale system module. The AHFIG is a 5G capable radio.

The AHFIG is a 4TX/4RX RRH for Band 25 and Band 66. There are four ports on the RRH. It is a one sector radio optimized for macro BTS installations.



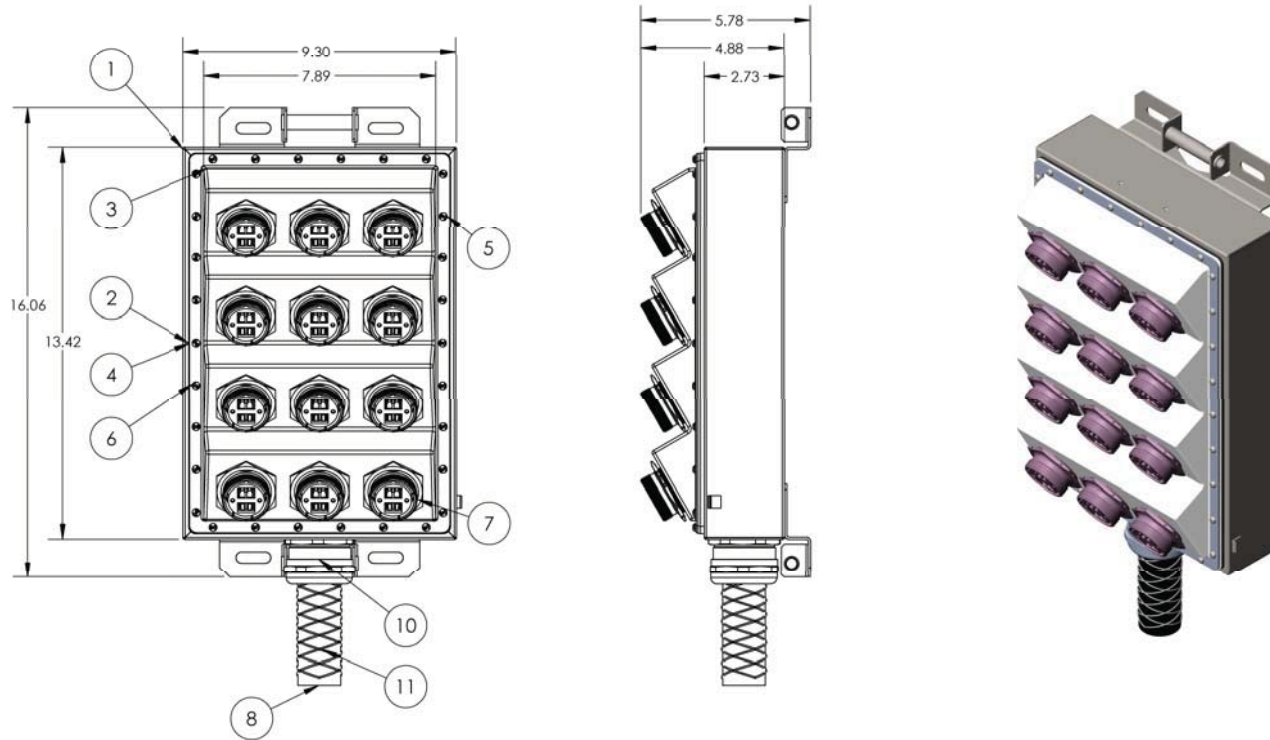
AHFIG Interfaces

The ports of the AHFIG are shown below



Dimensions and Weight

Property	Value
Height	Core RRH: 695 mm (27.4 in.) With upper and lower mounting brackets: 730 mm (28.7 in.)
Width	Core RRH: 308 mm (12.1 in.) With mounting cover: 327 mm (12.9 in.)
Depth	Core RRH: 131 mm (5.2 in.) With mounting cover: 142 mm (5.6 in.)
Weight	Core RRH: 32 kg (70.5 lb)



ITEM NO.	PART NUMBER	DESCRIPTION	AC-DIST08-6IP-SHIR/QTY.
1	AC-DIST05-24IP-DC	IP SHEETMETAL BOX	1
2	AC-GKT05-FB-HICAP	GASKET EPDM	1
3	AC-FB-FRONT-4STEP-3CON	HYBRID MODULE INCLINE MOUNT THERMO SHELL	1
4	AC-STR05-HICAP	METAL O-RING	1
5	Regular LW 0.125	WASHER	30
6	3GMRB06058	TAMPERED PROOF #6-32 SCREW	30
7	CF-970850-101_106_W/LC	JAM NUT RECEPTACLE	12
8	ASU9325TYP02	HYBRID CABLE HI-CAP	1
9	6000428	LOCKNUT FOR CABLE GLAND	1
10	4220342	CABLE GLAND	1
11	HOIST GRIP	CABLE HOIST GRIP	1

NOTE:
1. TOTAL VOLUME IS Max 480.6 CUBIC INCH.

CUSTOMER APPROVAL

NAME:

SIGNATURE:

DATE:



THE POWER OF BEING CONNECTED.

SIGNATURE CYCLE DATE

DRAWN: HSHIN 20170526

CHECKED: DOB 20170526

APPROVED: DOB 20170526

DIM: ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE SPECIFIED.

DESCRIPTION:

HYBRID CABLE HI-CAP
BREAKOUT BOXMATERIAL: AS PER SPECIFIED
REQUIREMENTS

WEIGHT 3.59

FINISH:

COLOUR:

SHEET NO: 1 OF 1

DWG NO:

AC-HCS05-HICAP-24IP

SCALE:

TOLERANCE: X.X ± 0.020"
X.XX ± 0.010"
X.XXX ± 0.005"

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AM-X-CW-16-65-00T-RET(6' 65° Broadband Antenna)

Single Band Electrical DownTilt Antenna

698 ~ 894MHz, X-pol., H65° / V11.5°

Electrical Specification

Frequency Range	698~806MHz	806~894MHz
Impedance	50Ω	
Polarization	Dual, Slant ±45°	
Gain	15.5dBi / 13.35dBd	16.0dBi / 13.85dBd
Beamwidth	Horizontal	67.5°
	Vertical	11.8°
VSWR	≤1.4:1	
Front-to-Back Ratio	≥27 dB	
Electrical Downtilt Range	2° ~ 16°	
Isolation Between Ports	≥30 dB	
Cross Pole Discrimination	10.0 dB @ ±60° 15.0 dBi @ 0°	
First Upper Side Lobe Suppression	16dB	
Side Lobe Suppression	> 16dB @ 0-6° Tilt > 18 dB @ 7-12° Tilt(Up to 10° from Boresight)	
Passive Intermodulation	≤ -150 dBc @ 2x20w	
Input Maximum CW Power	500 W	
Environmental Compliance	IP65 for Radome IP67 for Connectors	
RET Motor Configuration	Field Replaceable RET Electronic Control Module / RET Motor is internal to antenna & not field replaceable	
Compliant with AISG 1.1 and 2.0	AISG 1.1 and 2.0	

Mechanical Specification

Dimension (W×D×H)	11.8×5.9×72 inches (300×150×1829mm)
Weight (Without clamp)	41.8 lbs (19.0 kg)
Connector	2 x 7/16 DIN(F), Long Neck
Max Wind Speed	150 mph
Wind Load (@150 mph)	1891 N

AM-X-CW-18-65-00T-RET (8' 65° Broadband Antenna)

Single Band Electrical DownTilt Antenna

698 ~ 894MHz, X-pol., H65° / V8.0°

Electrical Specification

Frequency Range	698~806MHz	806~894MHz
Impedance	50Ω	
Polarization	Dual, Slant ±45°	
Gain	16.8 dBi / 14.55dBd	17.5 dBi / 15.35dBd
Beamwidth	Horizontal	68°
	Vertical	9.2°
VSWR	≤1.4:1	
Front-to-Back Ratio	≥27 dB	
Electrical Downtilt Range	2° ~ 16°	
Isolation Between Ports	≥30 dB	
Cross Pole Discrimination	10.0 dB @ ±60° 15.0 dBi @ 0°	
First Upper Side Lobe Suppression	16dB	
Side Lobe Suppression	> 16dB @ 0-6° Tilt > 18 dB @ 7-12° Tilt(Up to 10° from Boresight)	
Passive Intermodulation	≤ -150 dBc @ 2x20w	
Input Maximum CW Power	500 W	
Environmental Compliance	IP65 for Radome IP67 for Connectors	
RET Motor Configuration	Field Replaceable RET Electronic Control Module / RET Motor is internal to antenna & not field replaceable	
Compliant with AISG 1.1 and 2.0	AISG 1.1 and 2.0	

Mechanical Specification

Dimension (W×D×H)	11.8×6.0×96 inches
Weight (Without clamp)	52.9 lbs (24.0 kg)
Connector	2 x 7/16 DIN(F), Long Neck
Max Wind Speed	150 mph
Wind Load (@150 mph)	2521 N

ASP705K



1-port omni antenna, 450–470 MHz, 360° HPBW, fixed electrical tilt

- Invert mountable

General Specifications

Antenna Type	Omni
Band	Single band
Color	Off-white
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radome Material	Fiberglass, UV resistant
Radiator Material	Brass
RF Connector Interface	N Female
RF Connector Location	Bottom
RF Connector Quantity, low band	1
RF Connector Quantity, total	1

Dimensions

Length	5588 mm 220 in
Outer Diameter	76.2 mm 3 in

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	450 – 470 MHz
Polarization	Vertical

Electrical Specifications

Frequency Band, MHz	450–470
Gain, dBi	12.1

ASP705K

Beamwidth, Horizontal, degrees	360
Beamwidth, Vertical, degrees	7
Beam Tilt, degrees	0
VSWR Return loss, dB	1.5 14.0
Input Power per Port, maximum, watts	500

Mechanical Specifications

Wind Loading at Velocity, maximum	364.8 N @ 100 mph 82.0 lbf @ 100 mph
Wind Speed, maximum	201 km/h 124.896 mph

Packaging and Weights

Net Weight, without mounting kit	10 kg 22.046 lb
----------------------------------	-------------------

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system



Included Products

ASPR616 — Pipe Mounting Kit for 1.25 - 3.5 in (35 - 89.0 mm) OD round members

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance
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February 26, 2009

Rosemarie Barrette
FMHC in care of T-Mobile
5344 S. 48th Street
Greenfield, WI 53220

**SUBJECT: T-MOBILE TELECOMMUNICATIONS COLLOCATION
WILLIAMS BAY NORTHWEST WT [ML70553B]
WALWORTH COUNTY, WISCONSIN
STRUCTURAL ASSESSMENT**

Dear Ms Barrette:

It is understood that part of the permitting process requires a structural assessment of the existing water tower with respect to the proposed installation. **The aggregate change in wind loading is considered de minimis and the existing rail is considered adequate for this application.** In the following passages, I will address the scope of the project, existing conditions, and will follow-up with an evaluation of the loading conditions.

Project Background:

The subject tank is a 100-MG watersphere. The tank is located off of Hill Rd, in Williams Bay, WI. The tank is owned by the Village of Williams Bay.

T-Mobile is proposing to install their equipment inside of a decommissioned shelter which was formerly occupied by AT&T. Likewise, they shall route their coax through the existing underground conduits and through the existing penetrations at the bell of the water tower. Coax shall be routed up the interior of the water tower and through the access tube up to the existing rooftop railing. Antennas shall be secured to the existing rooftop railing as well.

The existing bell penetrations consist of (3) 8" schedule 80 pipes and associated stiffeners. The stiffeners and penetrations were specified by Marathon Engineers as part of the previous AT&T/TeleCorp installation. Although not specifically re-analyzed by Edge Consulting, the existing penetrations and reinforcing is considered to be adequate. As the existing penetrations have been evacuated, no additional penetrations of the tank bell are required for the T-Mobile installation.

The existing handrail was originally designed as a multi-carrier support structure for USCC and AT&T/Telecorp as a replacement to (2) existing rail systems. This was completed to better accommodate antenna installations and resulted in reduced wind loading on the tower. The previous structural analysis was completed by Bow Tech, Ltd. and was reviewed as part of this assessment. A total of (9) US Cellular and (9) AT&T antennas were modeled during this analysis. The AT&T antennas have been removed and shall be replaced with the same quantity of T-Mobile antennas and US Cellular has installed (6) antennas. In addition to the US Cellular

antennas the municipality has (4) omni type antennas installed on the rail which contributes relatively minor wind load.

Loading Evaluation:

The proposed T-Mobile antennas have a maximum wind area of 1.8 ft^2 (54 lbs). The previous AT&T antennas had a wind area of 2.8 ft^2 (84 lbs). As the T-Mobile replacement antennas match the quantity of the previous AT&T antennas a 64% reduction in wind loading would occur. This decrease does not account for the reduced number of US Cellular antennas.

Although the exact model numbers of the existing municipal antennas were not legible, a standard 12' omni antenna 2.5 inches in diameter was considered. The related wind area of such an omni is 2.5 ft^2 . The net increase in wind area for the (4) municipal antennas is approximately 10 ft^2 which is nearly comparable to the net loss of wind area associated with replacing the AT&T antennas with the T-Mobile antennas (-9 ft^2). The aggregate change in wind loading is considered de minimis and the existing rail is considered adequate for this application. Furthermore, this assessment is considered conservative in nature as the reduced number of US Cellular antennas modeled versus actually installed was not considered in the summation of wind load.

Antenna cut-sheets have been attached along with select portions of the original Bowtech Ltd. analysis.

Sincerely,

Edge Consulting Engineers, Inc.



David Lyshek, P.E.
Project Manager



Attachments: Bow Tech LTD Structural Analysis Sections
Antenna Cut Sheets

100MG WATERSPHERE ANTENNA CHECK (ANT101.DAT) 5-20-04
 WILLIAMS BAY WI AT&T/U S CELLULAR SITES

CHECK SHAFT FOR STRESSES AT

KEY DESIGN POINTS :

CHECK POINT 5

BASE DESIGN TANK WIND ONLY:

$Va = (Wm + Ww) / (2 * \pi * Rs) = 3.57$
 $Vb = Mw * 12. / (\pi * Rs^2) = .81$
 STRESS $Va / Ts = 11.34$ KSI OK
 SUM V = 4.39 K/IN
 SUM STRESS = 13.92 KSI OK
 T/R = .00808
 S-ALLOW = 11.80 S-W/WIND = 15.74 KSI

DESIGN WIND TANK AND ANTENNA:

$Vaw = (Wm + Ww) / (2 * \pi * Rs) = 3.58$
 STRESS $Va / Ts = 11.38$ KSI OK
 $Vbw = Mw * 12. / (\pi * Rs^2) = 1.12$
 SUM Vw = 4.70 K/IN
 SUM STRESS = 14.92 KSI OK
 T/R = .00808
 S-ALLOW = 11.80 S-W/WIND = 15.74 KSI

CHECK PT.6.0

OUTPUT DATA:

W-SHFT	V-SHFT	M-SHFT	SUM-MW	SUM-MWA
22.1	8.2	284.2	1523.1	1838.2

ALL UNITS IN KIPS AND FT-KIPS

BASE DESIGN TANK WIND ONLY:

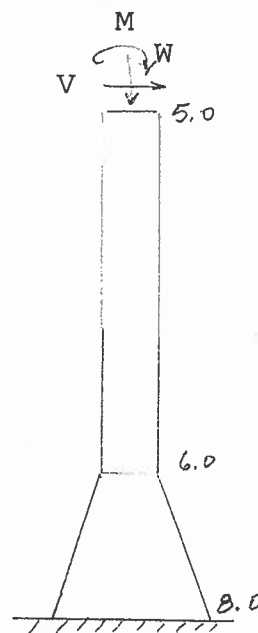
$Va6 = (Wm + Ww + Wshft) / (2 * \pi * Rs) = 3.66$
 STRESS $Va6 / TS6 = 8.49$ KSI OK
 $Vb6 = Mw * 12. / (\pi * Rs^2) = 3.82$
 SUM V6 = 7.49 K/IN
 STRESS = 17.37 KSI OK
 T/R = .01105
 S-ALLOW = 13.96 S-W/WIND = 18.61 KSI

DESIGN WIND TANK AND ANTENNA:

$Vaw6 = (Wm + Ww + Wa + Wshft) / (2 * \pi * Rs) = 3.67$
 STRESS $Vaw6 / TS6 = 8.52$ KSI OK
 $Vbw6 = Mwa * 12. / (\pi * Rs^2) = 4.62$
 SUM Vwa6 = 8.29 K/IN
 STRESS = 19.23 KSI O.S. = 3.3%
 T/R = .01105
 S-ALLOW = 13.96 S-W/WIND = 18.61 KSI

$Wa = 3.0$ kips
 $Wm = 35.3$ kips
 $Ww = 839.8$ kips

$Va = 2.8$ kips
 $Vb = 11.1$ kips
 $Ma = 120$ ft-kips
 $Mb = 206.2$ ft-kips

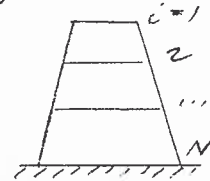


Wa = antenna wt.
 Wm = metal wt.
 Ww = water wt.
 Va = wind on antenna
 Vb = wind of ball
 Ma = antenna wind Mom to pt.5.0
 Mb = ball Mom to pt.5.0

BELL PROPERTIES:

BELL HT. (FT)	BELL ANG (DEG)	NO.A.B **	BOLT DIA. (IN)	MISC.WT (KIPS)
18.100	18.50	12	1.750	1.50

DEL-WT (KIPS)	TB (K) (IN)	DB (K) (FT)	HB (K) (FT)
5.7	.438	6.50	9.92
6.3	.359	12.97	8.28



BASE DIAMETER = 18.50FT

BELL LAYOUT

MTL WT KIPS	MTL+WTR WT KIPS	MOMe AT 8 KIP-FT	MOMe W/ANT AT 8 KIP-FT
70.9	910.7	1654.3	2020.2
MOMf AT 8 1910.5	MOMf W/ANT AT 8 2276.4		

ANCHOR BOLT FORCE NEGATIVE DENOTES UPLIFT
 NUM.OF A.BOLTS = 12 BOLT DIA. =1.750
 BOLT FORCE = -23.37 KIPS
 BOLT FORCE w ANT= -29.85 KIPS
 ANCHOR BOLTS STRESS LEVEL=29.85/34.8=85.8%

RINGWALL FOUNDATION PROPERTIES

RWi	RWo	RFi	RFo	Ho	Hw	Tfs
FT	FT	FT	FT	FT	FT	FT
8.67	9.83	5.33	12.25	6.67	7.17	1.417
WT-CONC		WT-EARTH				
PCF		PCF				
.15		.11				

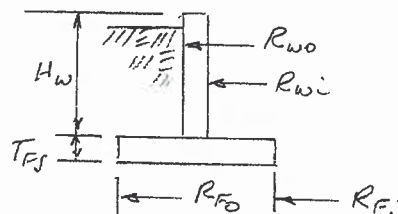
ALL DIMENSIONS IN FT

HAUN-IN	HAUNX-IN	HAUN-OUT	HAUNX-OUT	HY-IN
.00	3.17	.00	2.33	.50

FDTN AREA	FDTN S.M.
FT-2	FT-3
382.1	1391.9

VOLUMES:

STEM= 485.7 FT-3
 BASE= 541.3 FT-3
 HAUNCH-IN= .0 FT-3
 HAUNCH-OUT= .0 FT-3
 SUM CONC= 1027.0 FT-3
 CU-YDS= 38.04
 WT-CONC= 154.05 KIPS
 CONC NET= 41.08 KIPS



FOUNDATION LAYOUT

EARTH-OUT= 1117.9 FT-3
 EARTH-IN= 977.6 FT-3
 SUM EARTH= 2095.6 FT-3
 WT EARTH= 230.5 KIPS
 TOTAL C+E= 384.6 KIPS

ALL UNITS KSF AND FT-KIPS

BRG-E	BRGA-E	BRG-F	MOM-E	MOM-F
1.192	1.200	2.491	1754.4	2010.7

MOMA-E	MOMA-F	BRGM-E	BRGM-F	BRGMA-E	BRGMA-F
2132.3	2388.5	1.260	1.445	1.532	1.716

ALL UNITS IN KSF NEGATIVE DENOTES UPLIFT

BRG MIN-E	BRG MAX-E	BRGA MIN-E	BRGA MAX-E
-.068	2.452	-.332	2.732

CHECK UPLIFT

BRG MAX-F	BRGA MAX-F
3.936	4.207

PCT INCREASE FOR ANTENNA= 6.90 % (271 PSF)

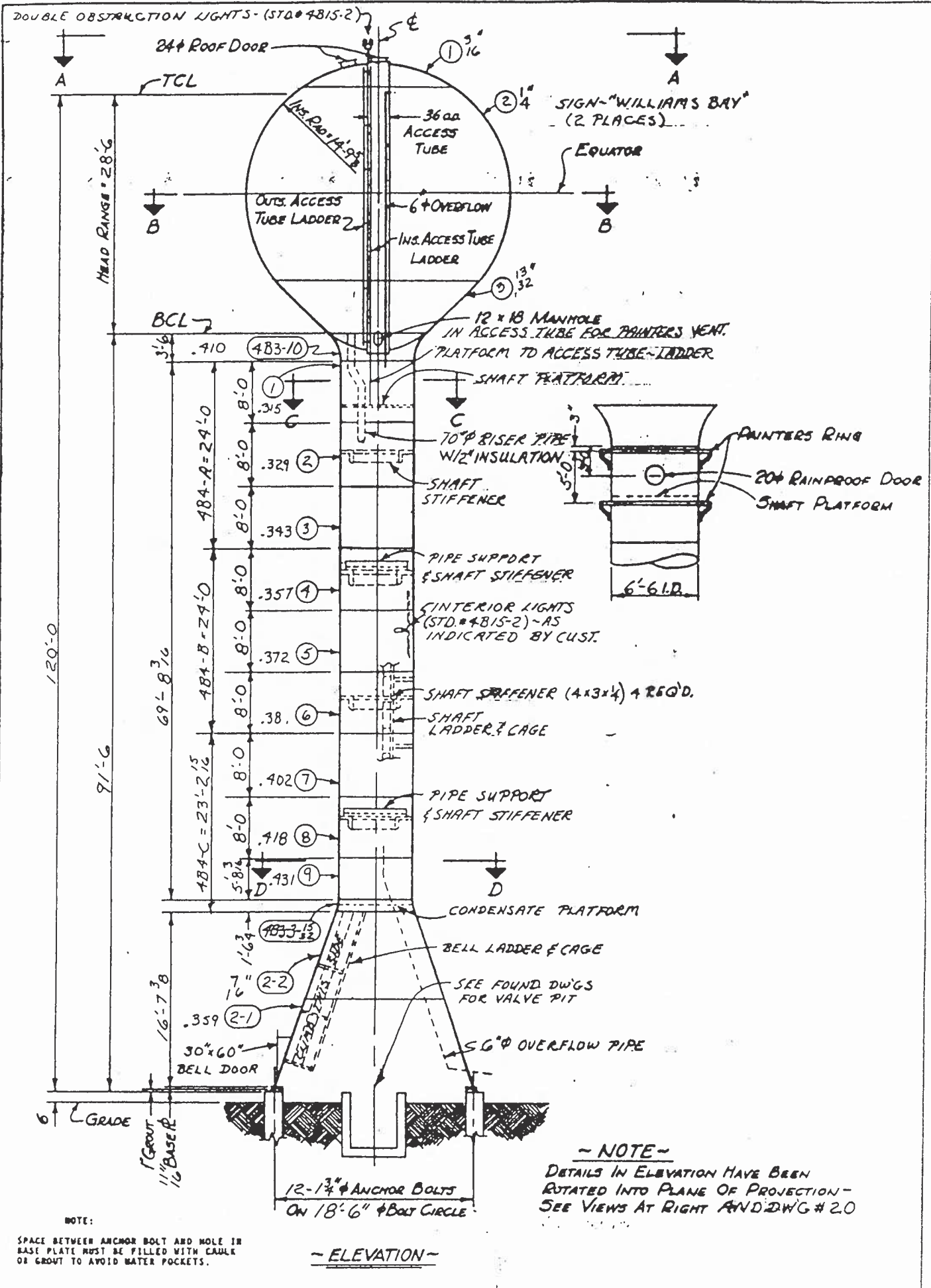
$2 \times R_o = 2 \times 12.25 = 24.5'$
 $R_o + R_s = 12.25 + 9.25 = 21.5'$
 $\text{Sum Brg} = 2.732 + .332 = 3.064 \text{ K/FT}^2$
 $\text{Contact Brg} = 2.732 / 3.064 \times 24.5 = 21.85'$
 $21.85' > 21.5' \text{ OK}$

Ant-wind

[illegible]

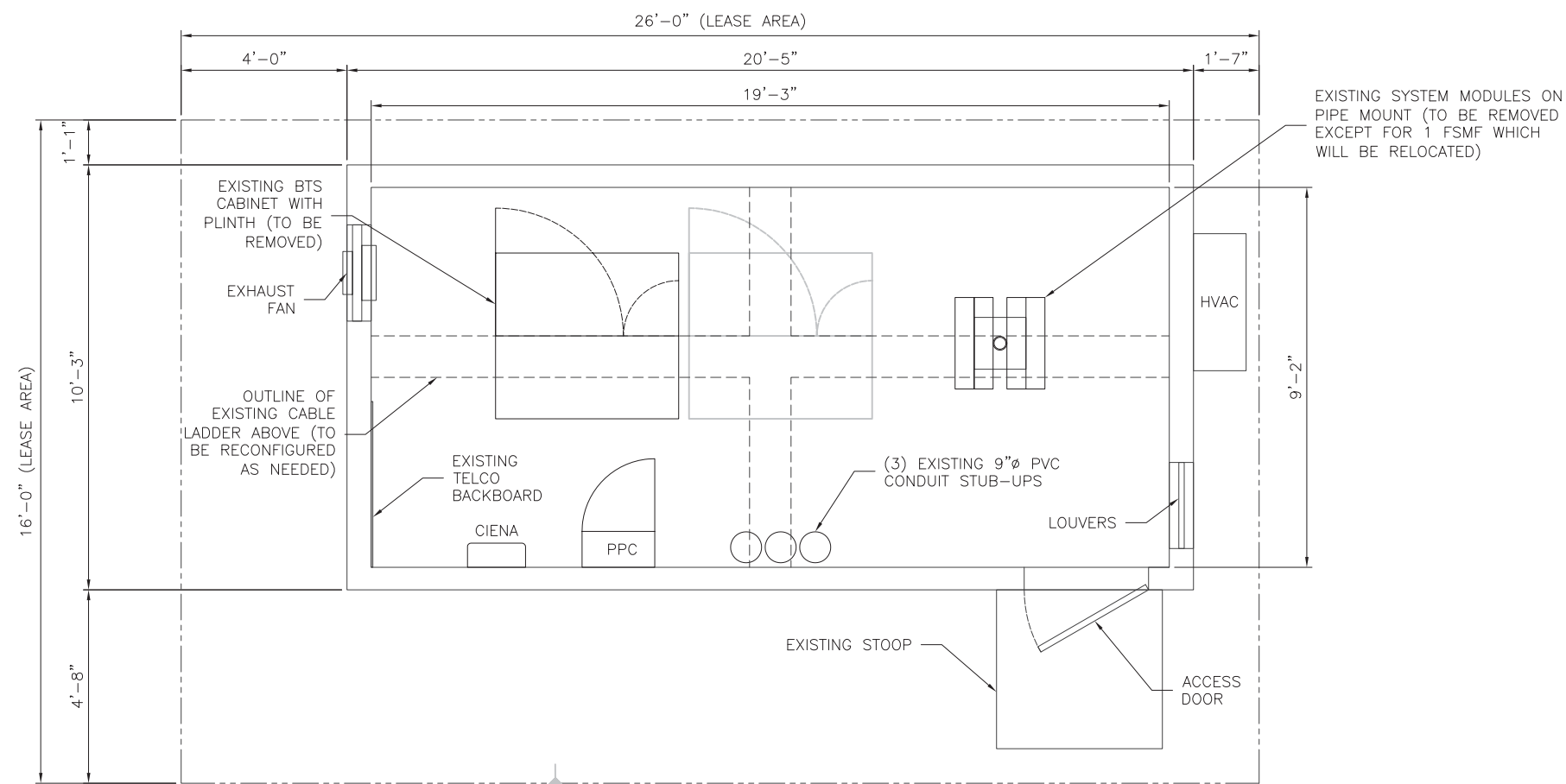
D7

July 1997
Plans
came from
Jerry Mehring
Dir. of
Public Works
Vill.
Williams Bay

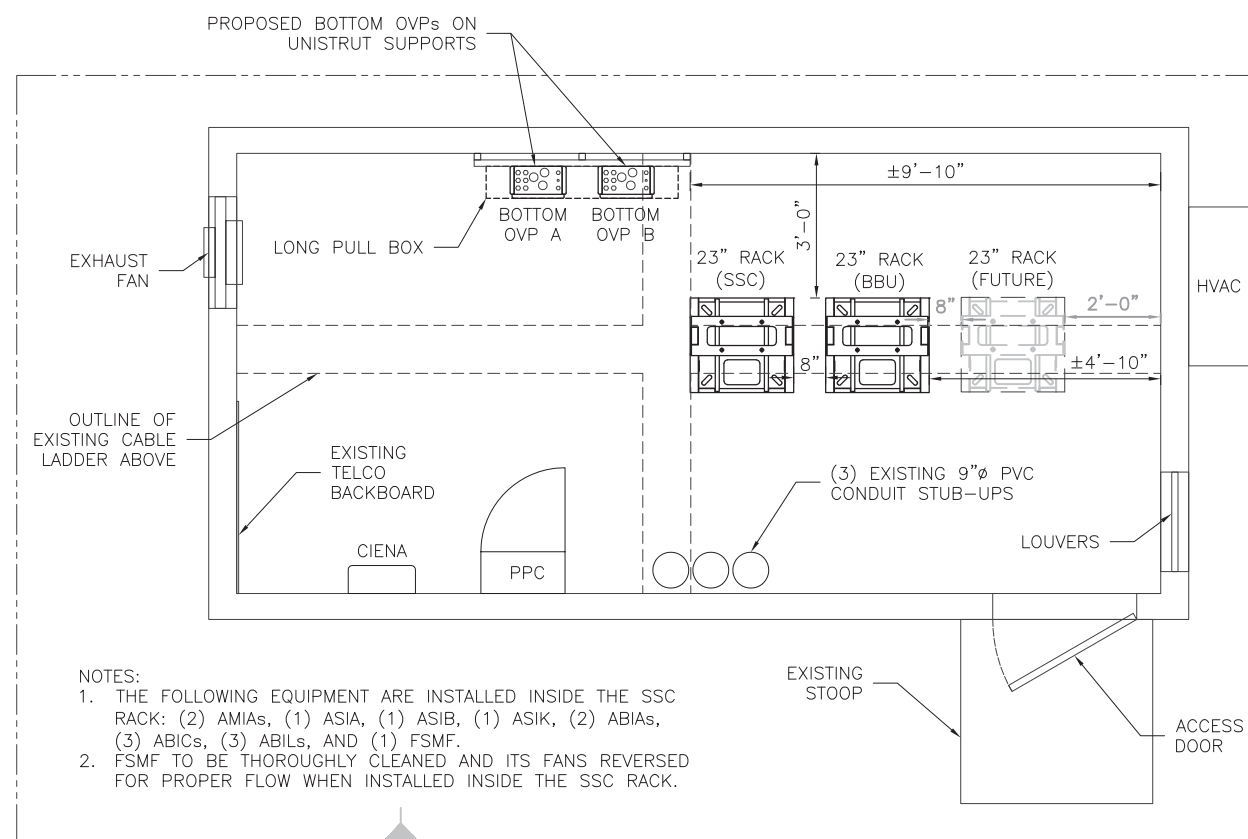


STANDARD
DRAWING
NO. 9D1-5
DATE 10/1/97
BY JRM
CHECKED BY JRM
APPROVED BY JRM

REVIEWED BY:			T-Mobile® SITE NAME NORTHWEST WT SITE NUMBER ML70553B SITE ADDRESS 250 OLIVE STREET, WILLIAMS BAY, WI 53191 PROJECT TYPE ANCHOR - INSTALLATION OF (6) NEW ANTENNAS, (3) RRUS & (2) HCS 2.0 BREAKOUT BOXES ON EXISTING HANDRAIL ON TOP OF WATER TANK AND UPGRADE OF GROUND EQUIPMENT INSIDE LEASE AREA GEOGRAPHIC COORDINATES (NAD 83) LATITUDE: 42°-34'-53.12"N LONGITUDE: 88°-33'-04.08"W GROUND ELEVATION: 1019' (NGVD 29)			SITE DIRECTIONS FROM T-MOBILE OFFICE: - GET ON I-88 W - TAKE I-355 N, I-290 W AND I-90 W TO IL-47 N IN RUTLAND TOWNSHIP. TAKE EXIT 47 FROM I-90 W - FOLLOW IL-47 N TO US-14 W IN WOODSTOCK - TURN LEFT ONTO US-14 W - TAKE ALDEN RD AND WI-67 N TO OLIVE ST IN WILLIAMS BAY SITE LOCATION			T-Mobile® 1400 OPUS PLACE, SUITE 700 DOWNERS GROVE, IL 60515 PHONE: FAX: KCS CORPORATION CONSULTING ENGINEERS ILLINOIS DESIGN FIRM REGISTRATION NO.: 184.002139 1125 REMINGTON RD., SCHAUMBURG, IL 60173 PHONE: 847-490-8200; FAX: 847-490-8225 www.kscorp.com THIS DRAWING IS COPYRIGHTED AND IS THE SOLE PROPERTY OF KCS CORPORATION. IT IS PRODUCED FOR USE BY OWNER AT THE BELOW REFERENCED PROJECT ONLY. REPRODUCTION AND OTHER USE OF THIS DRAWING OR THE INFORMATION CONTAINED HEREIN WITHOUT THE WRITTEN PERMISSION OF KCS CORPORATION IS PROHIBITED. WISCONSIN SEEMESH M. SETHI 35270-006 SCHAUMBURG ILLINOIS PROFESSIONAL ENGINEER SIGNATURES: DATE: 10/7/20EXPIRES: 7/31/22																																																											
SHEET INDEX <table><thead><tr><th>SHEET NO:</th><th>SHEET TITLE</th><th>REV. NO:</th></tr></thead><tbody><tr><td>T-1</td><td>TITLE SHEET</td><td>0</td></tr><tr><td>C-1</td><td>OVERALL SITE PLAN</td><td>0</td></tr><tr><td>C-2</td><td>EXISTING & PROPOSED GROUND EQUIPMENT PLAN</td><td>0</td></tr><tr><td>C-3</td><td>EXISTING & PROPOSED ANTENNA LAYOUT</td><td>0</td></tr><tr><td>C-4</td><td>ELEVATION, ANTENNA & RRU MOUNTING DETAIL</td><td>0</td></tr><tr><td>C-5</td><td>ANTENNA & CABLE SCHEDULE</td><td>0</td></tr><tr><td>C-6</td><td>ANTENNA INFORMATION</td><td>0</td></tr><tr><td>C-7</td><td>EQUIPMENT INFORMATION</td><td>0</td></tr><tr><td>C-8</td><td>EQUIPMENT INFORMATION</td><td>0</td></tr><tr><td>C-9</td><td>EQUIPMENT INFORMATION</td><td>0</td></tr><tr><td>C-10A</td><td>RF DATA CONFIGURATION SHEET</td><td>0</td></tr><tr><td>C-10B</td><td>RF DATA CONFIGURATION SHEET</td><td>0</td></tr><tr><td>E-1</td><td>ELECTRICAL NOTES, LEASE AREA UTILITY PLAN</td><td>0</td></tr><tr><td>E-2</td><td>GROUNDING NOTES, GROUNDING PLAN & DIAGRAM</td><td>0</td></tr><tr><td>E-3</td><td>GROUNDING DETAILS</td><td>0</td></tr><tr><td>N-1</td><td>NOTES</td><td>0</td></tr><tr><td>N-2</td><td>NOTES</td><td>0</td></tr></tbody></table>			SHEET NO:	SHEET TITLE	REV. NO:	T-1	TITLE SHEET	0	C-1	OVERALL SITE PLAN	0	C-2	EXISTING & PROPOSED GROUND EQUIPMENT PLAN	0	C-3	EXISTING & PROPOSED ANTENNA LAYOUT	0	C-4	ELEVATION, ANTENNA & RRU MOUNTING DETAIL	0	C-5	ANTENNA & CABLE SCHEDULE	0	C-6	ANTENNA INFORMATION	0	C-7	EQUIPMENT INFORMATION	0	C-8	EQUIPMENT INFORMATION	0	C-9	EQUIPMENT INFORMATION	0	C-10A	RF DATA CONFIGURATION SHEET	0	C-10B	RF DATA CONFIGURATION SHEET	0	E-1	ELECTRICAL NOTES, LEASE AREA UTILITY PLAN	0	E-2	GROUNDING NOTES, GROUNDING PLAN & DIAGRAM	0	E-3	GROUNDING DETAILS	0	N-1	NOTES	0	N-2	NOTES	0	PROJECT SUMMARY APPLICABLE CODES - ICC INTERNATIONAL BUILDING CODE, LATEST EDITION - NFPA NATIONAL ELECTRICAL CODE, LATEST EDITION APPLICANT T-MOBILE L.L.C. 1400 OPUS PLACE, SUITE 700 DOWNERS GROVE, IL 60515 PHONE: FAX: CONSTRUCTION CONTACT: CHRISTOPHER LYTLÉ PHONE NO.: OPERATIONAL CONTACT: PHONE NO.: DIGGERS HOTLINE Dial 811 or (800) 242-8511 www.DiggersHotline.com			UTILITIES POWER: TELEPHONE:			CONTRACTOR			PROFESSIONAL LICENSE I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED ENGINEER UNDER THE LAWS OF THE STATE OF WISCONSIN WISCONSIN SEEMESH M. SETHI 35270-006 SCHAUMBURG ILLINOIS PROFESSIONAL ENGINEER SIGNATURE: SIGNED: 10/7/20EXPIRES: 7/31/22		
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			NOTES FOR CONTRACTOR			HANDICAP ACCESS REQUIREMENTS			NOTES																																																											
			CONTRACTOR SHALL VERIFY ALL PLANS & EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.			SITE IS UNOCCUPIED AND NOT FOR HUMAN HABITATION. HANDICAP ACCESS NOT REQUIRED.			THE DRAWINGS ARE FULL ON 11"x17" SHEET SIZE AND ARE NOT REDUCED IN SIZE U.N.O. THESE PLANS HAVE BEEN PREPARED FOR THE PURPOSE OF DESIGN AND DETAILING OF ANY AND ALL CIVIL AND ELECTRICAL ENGINEERING ASPECT OF THIS PROJECT,																																																											
			EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED IN FIELD. IF SIGNIFICANT DEVIATIONS OR DETERIORATION ARE ENCOUNTERED AT THE TIME OF CONSTRUCTION, A REPAIR PERMIT WILL BE OBTAINED AND CONTRACTOR SHALL NOTIFY STRUCTURAL ENGINEER IMMEDIATELY.																																																																	



1 EXISTING EQUIPMENT LAYOUT
C-2 / SCALE: 1/4" = 1'-0"



2 PROPOSED EQUIPMENT LAYOUT
C-2 SCALE: 3/8" = 1'-0"

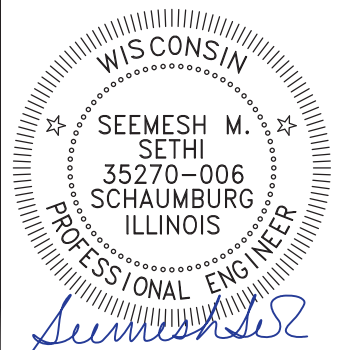
T-Mobile®

1400 OPUS PLACE, SUITE 700
DOWNERS GROVE, IL 60515
PHONE:
FAX:



ILLINOIS DESIGN FIRM REGISTRATION NO.: 184.002139
1125 REMINGTON RD., SCHAUMBURG, IL 60173
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SIGNATURES: _____
DATE: 10/7/20 EXPIRES: 7/31/22

0	ISSUED FOR PERMIT	10/7/20
A	ISSUED FOR REVIEW	7/6/20
REV.	DESCRIPTION	DATE

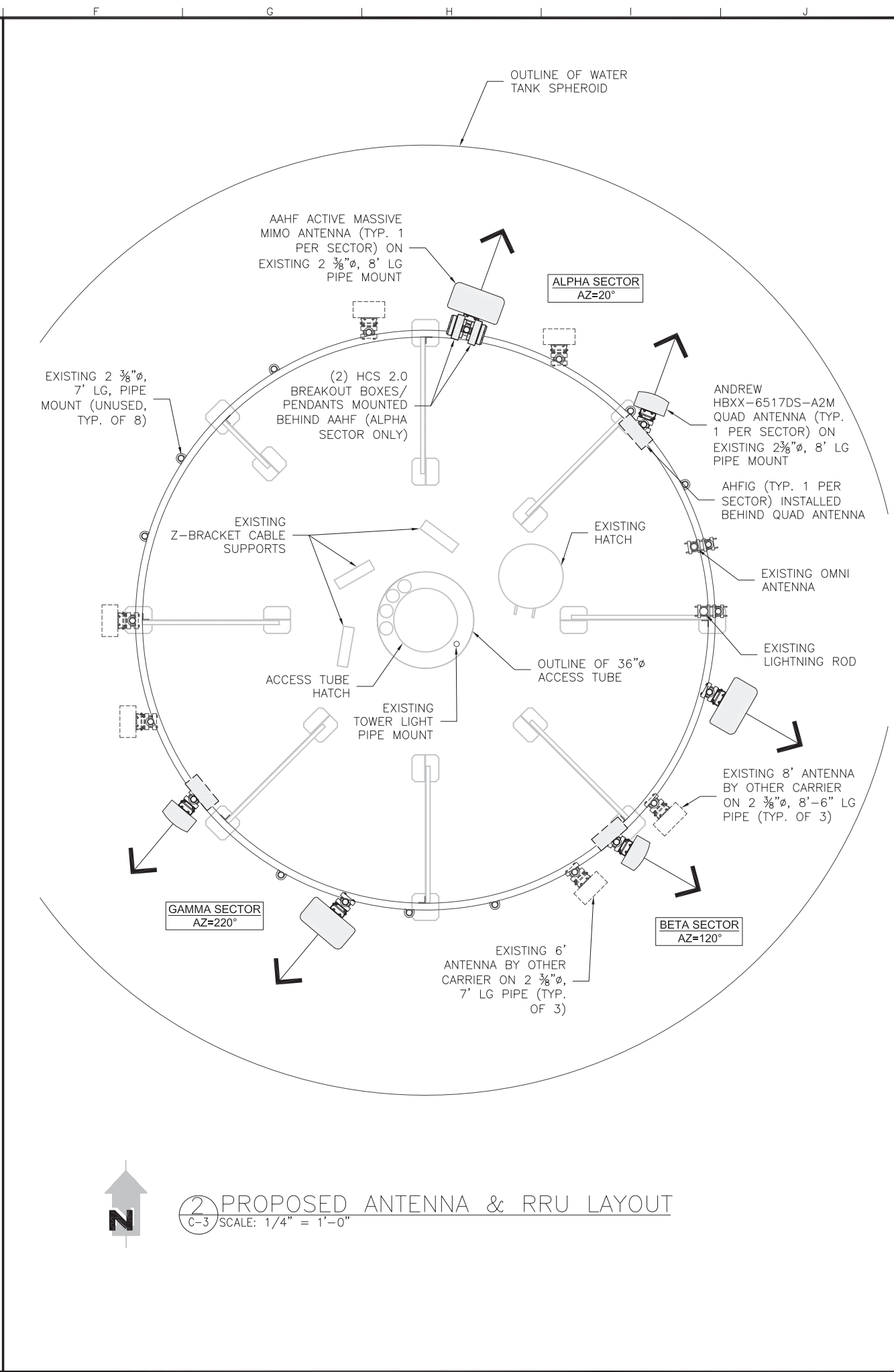
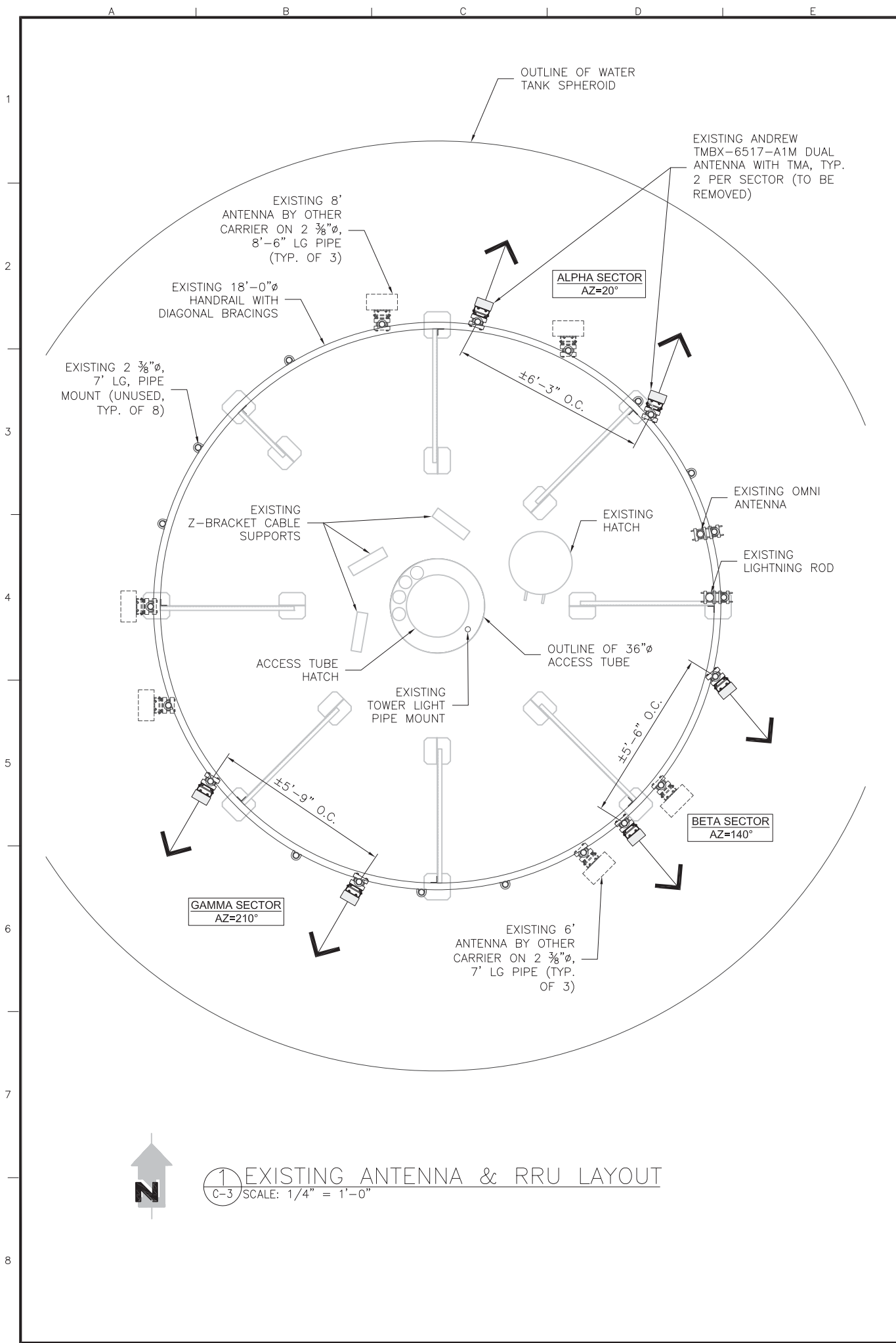
ML70553B
NORTHWEST WT

250 OLIVE STREET,
WILLIAMS BAY, WI 53191

Drawing Title:

EQUIPMENT PLAN

Project Number:	Drawn by: AS Date:
Client Project Number:	Checked by: PA Date:
Scale:	Approved by: MS Date:
Drawing Number C-2	



T-Mobile

1400 OPUS PLACE, SUITE 700
DOWNERS GROVE, IL 60515
PHONE:
FAX:

KCS CORPORATION
CONSULTING ENGINEERS
ILLINOIS DESIGN FIRM REGISTRATION NO.: 184.002139
1125 REMINGTON RD., SCHAUMBURG, IL 60173
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WISCONSIN
SEEMESH M. SETHI
35270-006
SCHAUMBURG ILLINOIS
PROFESSIONAL ENGINEER
Seemesh S
SIGNATURES: _____
DATE: 10/7/20 EXPIRES: 7/31/22

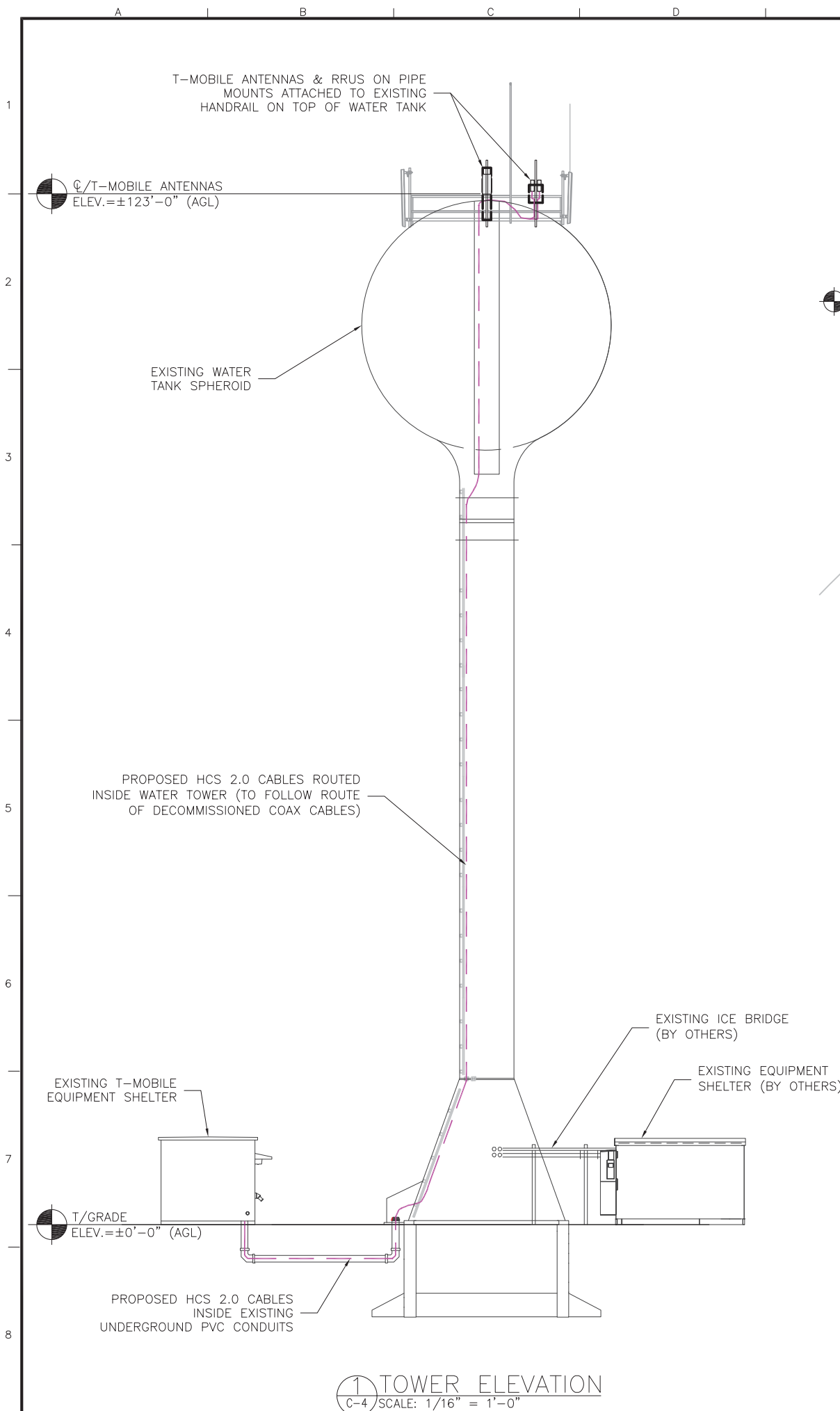
0	ISSUED FOR PERMIT	10/7/20
A	ISSUED FOR REVIEW	7/6/20
REV.	DESCRIPTION	DATE

ML70553B
NORTHWEST WT
250 OLIVE STREET,
WILLIAMS BAY, WI 53191

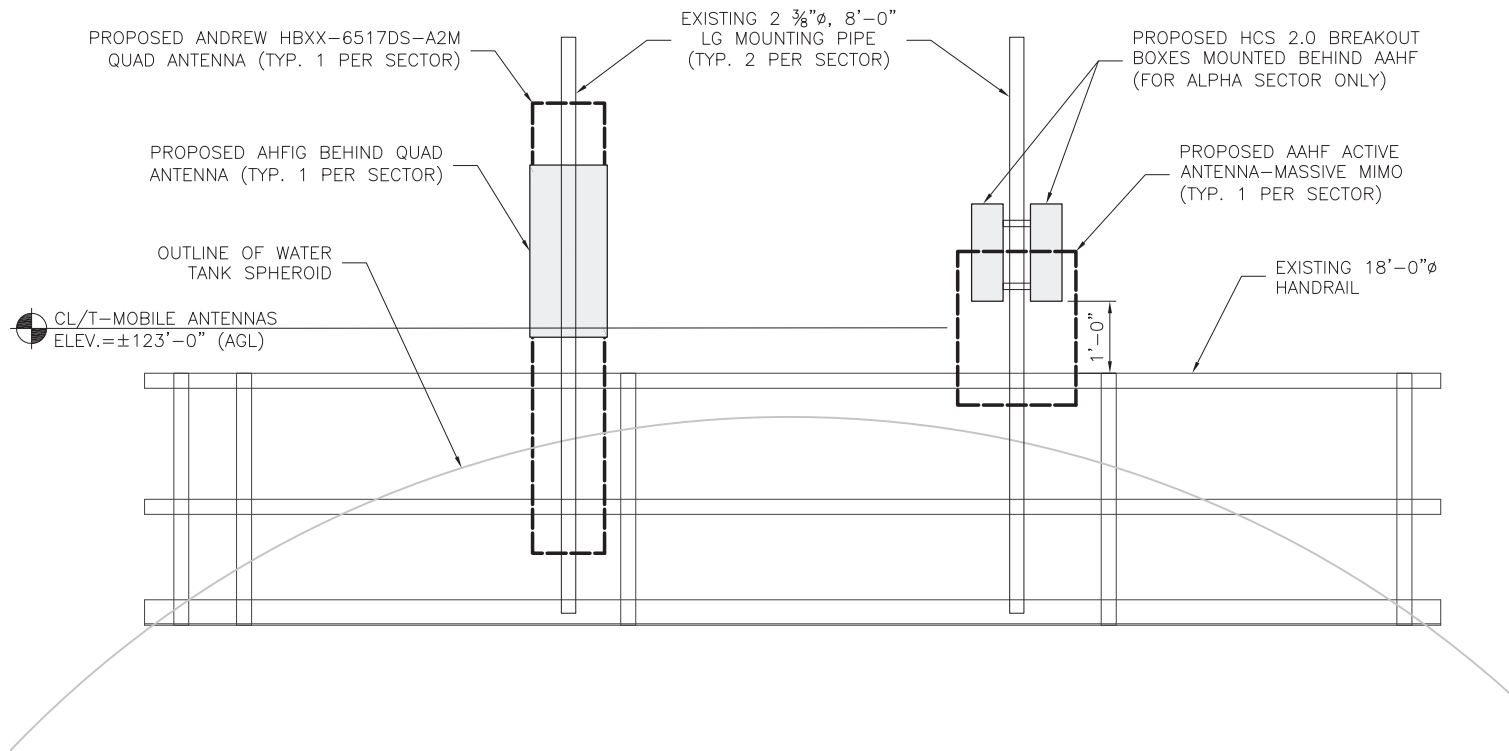
Drawing Title:
ANTENNA & RRU LAYOUT

Project Number:	Drawn by: AS
Client Project Number:	Date:
Scale:	Checked by: PA
Drawing Number	Date:
	Approved by: MS

C-3



1 TOWER ELEVATION
C-4 SCALE: 1/16" = 1'-0"



2 ANTENNA & RRU MOUNTING DETAIL
C-4 SCALE: 3/8" = 1'-0"

NOTE:
PROPOSED EQUIPMENT AND ANTENNA INSTALLATION IS BASED ON PASSING STRUCTURAL ANALYSIS PREPARED BY KCS CORPORATION DATED 10/7/2020.

PAINING NOTES:

1. THE GENERAL CONTRACTOR SHALL RETAIN THE SERVICES OF THE ORIGINAL PAINTING CONTRACTOR DURING THE ORIGINAL COATING WARRANTY PERIOD FOR ALL PAINT REMOVAL AND APPLICATION WORK TO BE PERFORMED. COATING REPAIR IS TO BE BY AN SSPC TRAINED AND APPROVED, EXPERIENCED COATING CONTRACTOR. BEFORE COMMENCEMENT OF WORK, THE PAINTING CONTRACTOR SHALL DETERMINE THE COMPOSITION OF EXISTING PAINT SYSTEM AND PREPARE & SUBMIT A PROPOSED PAINT SYSTEM FOR THE VILLAGE OF WILLIAMS BAY OR THEIR ASSIGNED REPRESENTATIVES' APPROVAL. CONTRACTOR SHALL ALSO SUBMIT A PLAN FOR PAINT REMOVAL FOR VILLAGE APPROVAL. ALL WORK IS TO BE INSPECTED BY A NACE/SPPC CERTIFIED COATING INSPECTOR.
2. CONTRACTOR SHALL REPAIR ANY PAINT DAMAGE OCCURRING AS A RESULT OF THE INSTALLATION, INCLUDING EXTERIOR, WET INTERIOR AND DRY INTERIOR. ALL STEEL ROUTING COMPONENTS, INCLUDING THE ENTIRE RAIL MOUNT, USED IN THE INSTALLATION SHALL BE PAINTED TO MATCH THE EXISTING SYSTEM. PAINT DAMAGE SHALL BE INSPECTED BY A NACE/SSPC CERTIFIED COATING INSPECTOR AND REPAIRED ON BOTH INTERIOR AND EXTERIOR SURFACE FOLLOWING WELDING ON ALL SURFACES. PAINT SYSTEM AND INSTALLATION SHALL BE APPROVED AS NOTED ABOVE. PAINT SYSTEM COMPOSITION, INCLUDING PAINT FOR GALVANIZED STEEL, SHALL BE DETERMINED BY A PAINTING CONSULTANT, AND SUBMITTED TO THE VILLAGE OF WILLIAMS BAY OR THEIR REPRESENTATIVE FOR APPROVAL PRIOR TO INSTALLATION.
3. WORK REQUIRING PAINTING SHALL INCLUDE, BUT NOT LIMITED TO, ALL ATTACHMENTS TO WATER TANK AND ALL WELDED AREAS ON WATER TANK. IF REQUIRED BY T-MOBILE/OWNER, THE CONTRACTOR SHALL PAINT COAX OR COAX COVER, ANTENNAE AND ANTENNA MOUNTS. CONTRACTOR SHALL MATCH PAINT COLOR OF EXISTING TANK.

PENETRATION SEAL NOTES:

1. ALL PENETRATION PIPES AT THE WATER TOWER BELL AND AT THE TOP OF THE ACCESS TUBE NEED TO BE SEALED WITH RUBBER BOOT ASSEMBLIES AND/OR CAULK TO DEPTH OF 2" ON EXTERIOR ENDS. SPRAY FOAM, BUTYL, AND TAPE ARE NOT ACCEPTABLE ALTERNATIVES.
2. ALL UNUSED PIPES NEED TO BE SEALED WITH SOLID RUBBER BOOTS.

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ILLINOIS DESIGN FIRM REGISTRATION NO.: 184.002139
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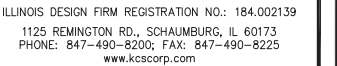
WISCONSIN
SEEMESH M. SETHI
35270-006
SCHAUMBURG ILLINOIS
PROFESSIONAL ENGINEER
Seemesh M. Sethi
SIGNATURES: _____
DATE: 10/7/20 EXPIRES: 7/31/22

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A	ISSUED FOR REVIEW	7/6/20
REV.	DESCRIPTION	DATE

ML70553B
NORTHWEST WT
250 OLIVE STREET,
WILLIAMS BAY, WI 53191

Drawing Title:
**TOWER ELEVATION,
ANTENNA & RRU
MOUNTING DETAIL**

Project Number:	Drawn by: AS
Client Project Number:	Date:
Scale:	Checked by: PA
Drawing Number	Date:
	Approved by: MS
	Date:
	C-4



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250 OLIVE STREET,
WILLIAMS BAY, WI 53191

ANTENNA & CABLE SCHEDULE

Drawing Number 05

SECTOR	1			2			3		
SECTOR NAME	ALPHA			BETA			GAMMA		
ANTENNA	1		2	1		2	1		2
MODEL #	ANDREW HBXX-6517DS-A2M (QUAD)		AAHF (ACTIVE ANTENNA MASSIVE MIMO)	ANDREW HBXX-6517DS-A2M (QUAD)		AAHF (ACTIVE ANTENNA MASSIVE MIMO)	ANDREW HBXX-6517DS-A2M (QUAD)		AAHF (ACTIVE ANTENNA MASSIVE MIMO)
AZIMUTH	20°			120°			220°		
RAD CENTER	±123.0'			±123.0'			±123.0'		
MECH. DOWNTILT									
PORTS	P1	P2	P3	P1	P2	P3	P1	P2	P3
ACTIVE TECHNOLOGY	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500
DARK TECHNOLOGY									
ELEC. DOWNTILT									
RRU TYPE	(1) AHFIG			(1) AHFIG			(1) AHFIG		
DIPLEXERS/COMBINERS			SFC4 (AT CABINET) (X2)			SFC4 (AT CABINET) (X2)			SFC4 (AT CABINET) (X2)
CABLES									
CABLE TYPE FROM PLATFORM BOTTOM OVP TO TOWER BREAKOUT BOX	NWS-HCS2-HC4-250: NOKIA HCS 2.0 TRUNK HICAP 12 RRU 12X4AWG CABLE								
HCS ACTUAL LENGTH	(2) 246.0'								
HCS FACTORY LENGTH	(2) 250.0'								
JUMPER TYPE FROM BREAKOUT BOX TO RRU	HYBRID JUMPER		HYBRID JUMPER	HYBRID JUMPER		HYBRID JUMPER	HYBRID JUMPER		HYBRID JUMPER
ACTUAL JUMPER LENGTH	(1) 12'-0"		(2) 9'-0"	(1) 28'-0"		(2) 25'-0"	(1) 32'-0"		(2) 36'-0"
FACTORY JUMPER LENGTH	(1) 15'-0"		(2) 15'-0"	(1) 30'-0"		(2) 30'-0"	(1) 60'-0"		(2) 60'-0"
JUMPER TYPE FROM RRU TO ANTENNA	RF JUMPER	RF JUMPER		RF JUMPER	RF JUMPER		RF JUMPER	RF JUMPER	
JUMPER LENGTH	(2) 10'-0"	(2) 10'-0"		(2) 10'-0"	(2) 10'-0"		(2) 10'-0"	(2) 10'-0"	

Product Specifications

COMMSCOPE®



HBXX-6517DS-VTM | HBXX-6517DS-A2M
4-port sector antenna, 4x 1710–2180 MHz, 65° HPBW, RET compatible
• Superior azimuth tracking and pattern symmetry with excellent passive intermodulation suppression

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS (First Lobe), dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	21	22	21
CPR at Sector, dB	10	11	9
Isolation, dB	30	30	30
VSWR Return Loss, dB	1.4 15.6	1.4 15.6	1.4 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0° 18.4 3° 18.7 6° 18.4	0° 18.4 3° 18.7 6° 18.5	0° 18.7 3° 18.9 6° 18.6
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
USLS, beampeak to 20° above beampeak, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the [whitepaper Time to Raise the Bar on BSAs](#).

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page 1 of 3
March 30, 2018

Product Specifications

COMMSCOPE®

HBXX-6517DS-VTM | HBXX-6517DS-A2M

General Specifications

Operating Frequency Band	1710 – 2180 MHz
Antenna Type	Sector
Band	Single band
Performance Note	Outdoor usage

Mechanical Specifications

RF Connector Quantity, total	4
RF Connector Quantity, high band	4
RF Connector Interface	7-16 DIN Female
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Location	Bottom
Wind Loading, frontal	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Loading, lateral	175.0 N @ 150 km/h 39.3 lbf @ 150 km/h
Wind Speed, maximum	241 km/h 150 mph

Dimensions

Length	1906.0 mm 75.0 in
Width	305.0 mm 12.0 in
Depth	166.0 mm 6.5 in
Net Weight, without mounting kit	18.5 kg 40.8 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator HBXX-6517DS-A2M

Packed Dimensions

Length	2036.0 mm 80.2 in
Width	402.0 mm 15.8 in
Depth	292.0 mm 11.5 in
Shipping Weight	28.2 kg 62.2 lb

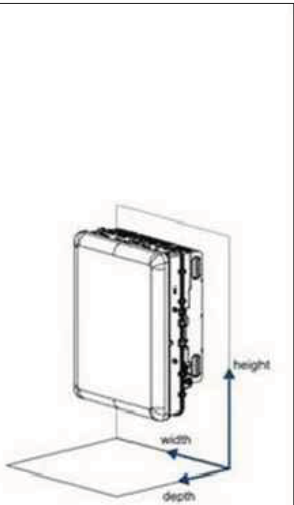
Regulatory Compliance/Certifications

Agency RoHS 2011/65/EU China RoHS SJ/T 11364-2006 ISO 9001:2008	Classification Compliant by Exemption Above Maximum Concentration Value (MCV) Designed, manufactured and/or distributed under this quality management system
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page 2 of 3
March 30, 2018

1 QUAD ANTENNA SPECIFICATIONS
SCALE: N.T.S.

Band	B41 – 2496-2690 MHz
Supported Modulation schemes	(DL) BPSK, QPSK, 16 QAM, 64 QAM, 256 QAM (UL) BPSK, QPSK, 16 QAM, 64 QAM
No. of ports	32TX32RX and 64TX64RX
MIMO Streams	16
Instantaneous IBW	60MHz on Band 41
Total Avg EIRP	74.8 dBm
Supported bandwidths	LTE 1.4,3,5,10,15,20 MHz
Output Power	120W Total (3x40W)
Power Consumption	850 W typical (ETSI average)
Optical Ports	3 x QSFP+ (each 4* Gbps CPRI)
Connector Type	DC -40.5V ... -57V/2 Pole connector
Installation Options	4.3-10+
AISG	AISG on all ports, DC on ANT1 and ANT3
Dimensions (H x W x D)	25.6 x 10.3 x 19.7
Weight lbs	103.6 lb
HW/SW Availability	Sept'19 – SRAN19A
5G NR Support	YES
Material Description	AAHF AirScale2 Dual RRH 4T4R B25/66 480W



AAHF 474715A

2 AAHF – MASSIVE MIMO ANTENNA SPECIFICATIONS
SCALE: N.T.S.

T-Mobile®

1400 OPUS PLACE, SUITE 700
DOWNERS GROVE, IL 60515
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REV.	DESCRIPTION	DATE

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NORTHWEST WT

250 OLIVE STREET,
WILLIAMS BAY, WI 53191

ANTENNA INFORMATION

Project Number:	Drawn by: AS
Client Project Number:	Checked by: PA
Scale:	Approved by: MS
	Date:

Drawing Number
C-6

Nokia AirScale SM Indoor Technical Datasheet

AirScale SM Indoor general specification	
Capacity	Per Capacity plug-in unit in LTE16A: 8 LTE cells (FDD)
Multi-RAT capable platform	
Minimum configuration	1 Common PIU (transport and control), 1 Capacity PIU (baseband processing)
Maximum configuration	2 Common PIU , 6 Capacity PIU
Installation options	19 inch standard rack, pole and wall (with mounting plinth), inside Outdoor Enclosure

AirScale SM Indoor mechanical specifications	
Dimensions	(3U) H 128 mm x W 447 mm x D 400 mm H 5.04" x W 17.60" x D 15.75"
Installation Depth	400mm + cooling air space 50mm
Weight	Minimum (Common PIU + Capacity PIU): 10.1kg 22.27 LBS. Maximum (2 Common PIU + 6 Capacity PIU): 23.5kg 51.81 LBS.
Ingress protection	IP20
Operational Temperature Range	-5°C to 55°C

AirScale SM Indoor electrical specifications	
Supply Voltage / Voltage Range	Nominal: -48V DC / -40.5V to -57V
Power consumption	1 Common PIU & 1 Capacity PIU: typ 210W 1 Common PIU & 3 Capacity PIU: typ 420W 2 Common PIU & 6 Capacity PIU: typ 840W



Minimum configuration (1x BTS)



Minimum configuration (2x BTS, 1 BTS per half subrack)



Maximum AirScale SM Indoor configuration (FL16A: 1 BTS per half subrack)

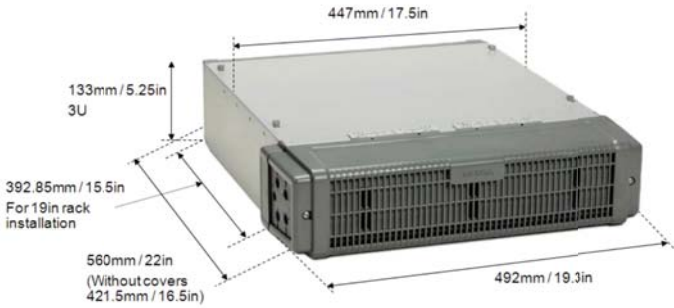
One logical BTS in full subrack (Future releases)

NOKIA

1-DETAIL-AMIA
SCALE: N.T.S.

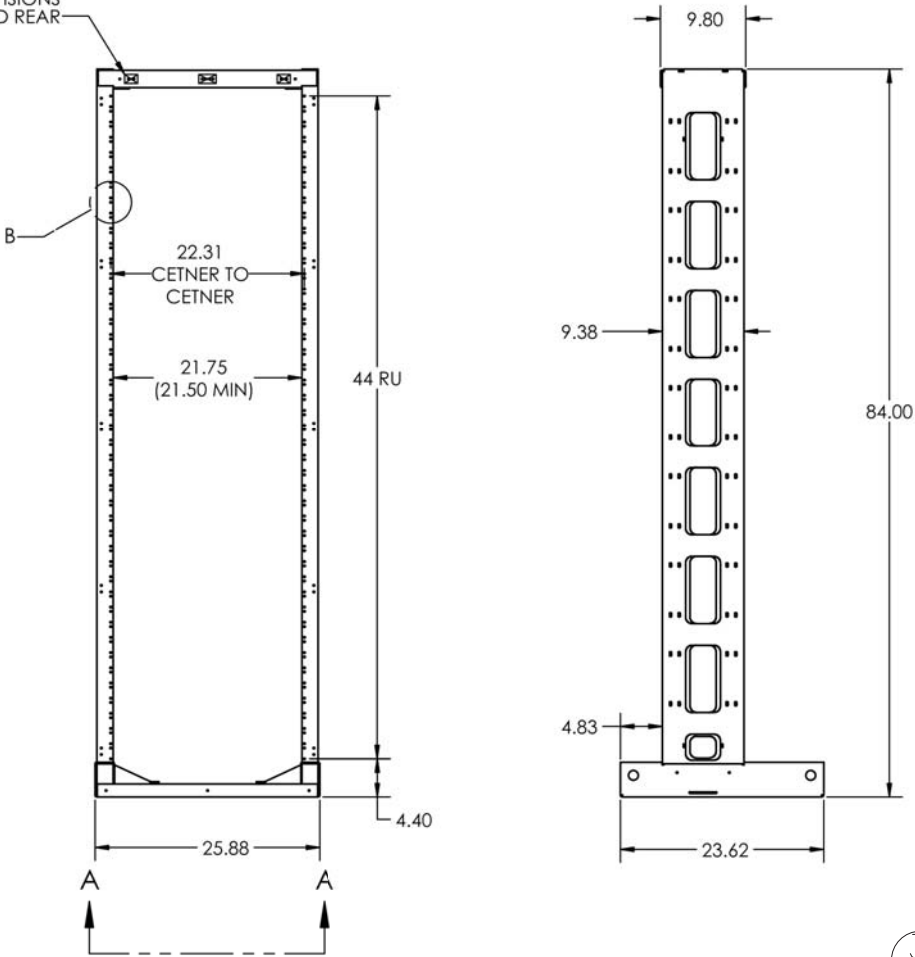
Flexi Multiradio BTS System Module FSMF

- < 15 liters
- < 15 kg
- 3 height units
- IP65
- 35 to +55 °C

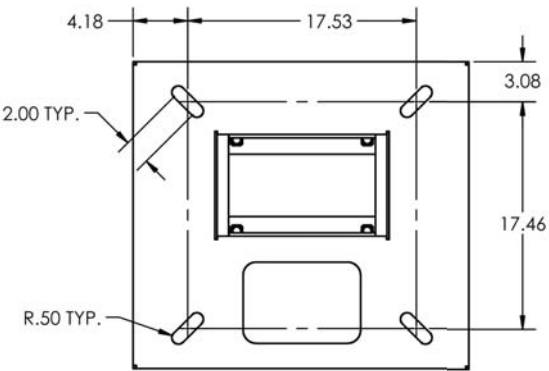


2-DETAIL-FSMF
SCALE: N.T.S.

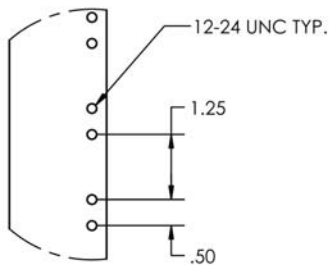
MASKED GROUND PROVISIONS FRONT AND REAR



3-DETAIL-DELTA 23 INCH EQUIPMENT RACK
SCALE: N.T.S.



SECTION A-A
SCALE 1 : 8



DETAIL B
SCALE 1 : 2

DESCRIPTION

- 23" PANEL MOUNTING
- 600MM DEEP BASE
- 7' RACK
- 44 RACK UNITS (RU)
- EIA RACK HOLE SPACING
- TELCO GRAY

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DELTA GREENTECH		2925 E. Plano Pkwy. Plano, TX 75074 PH. 214-431-3550	
DRAWN	NAME	DATE	TITLE
ENG APPR	RNA	03-16-15	23" RACK, 7', ZONE 4
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.		SIZE	DWG. NO.
PROJECTION:		C	3921866700
SCALE: 1:12		REV	A
SHEET 1 OF 1			

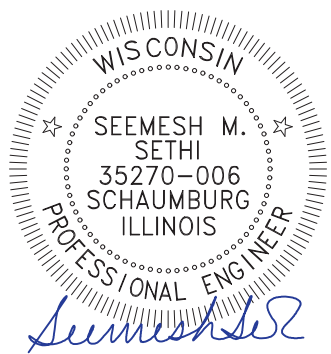
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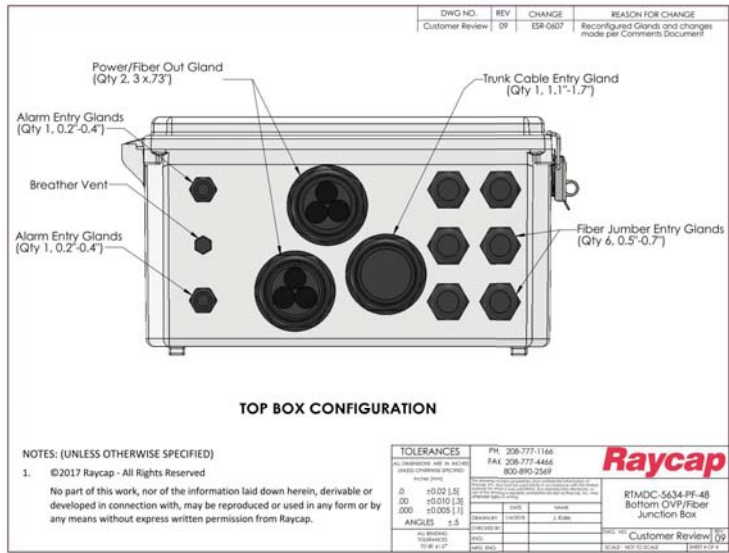
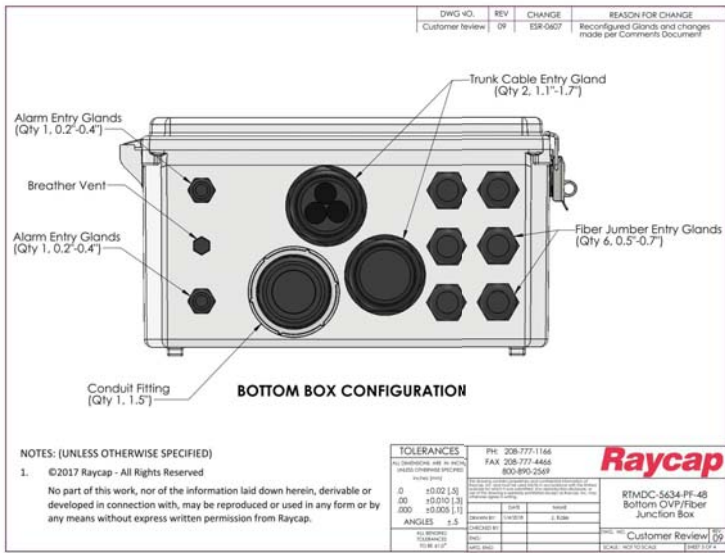
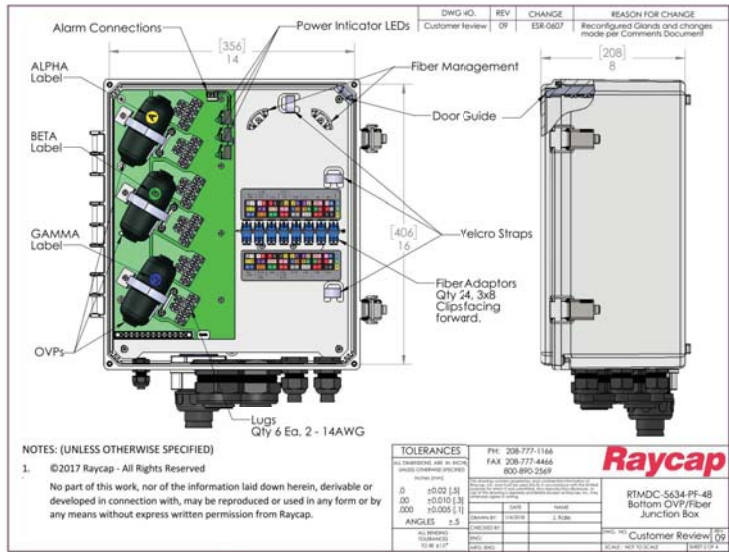
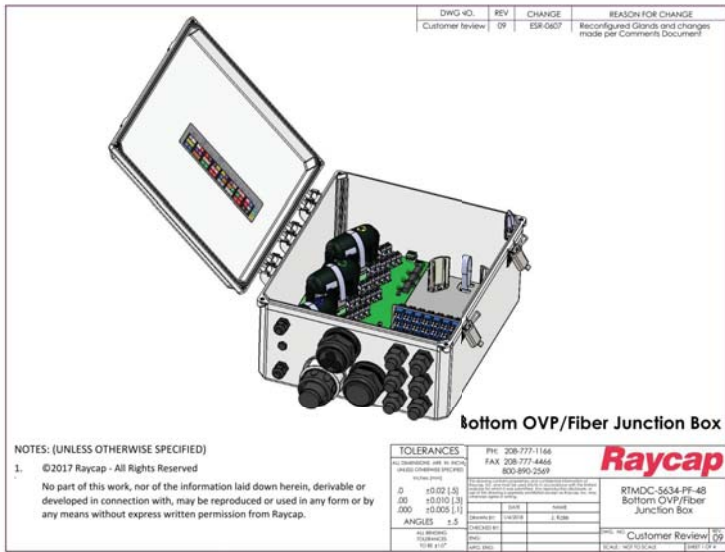
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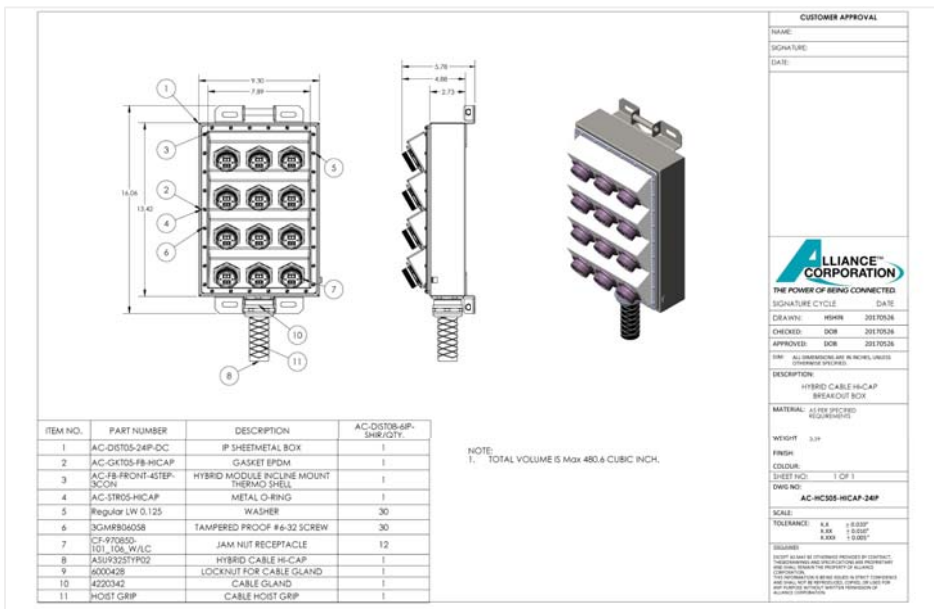
Equipment Title:
EQUIPMENT
INFORMATION

Project Number:	Drawn by: AS
Client Project Number:	Checked by: PA
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Drawing Number	Date:

C-7



1-DETAIL-BOTTOM OVP
SCALE: N.T.S.

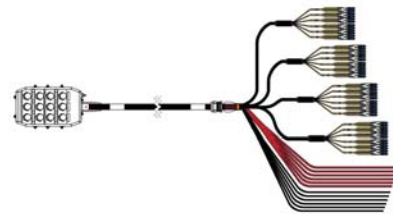


2-DETAIL-HYBRID CABLE BREAKOUT BOX/TOWER JUNCTION BOX
SCALE: N.T.S.



HybridConnect

NWS-HCS2-HC4-XXX
HCS 2.0 Trunk HiCap 12 RRU 12X4AWG



General Specifications			
Nominal OD	1.790 in (45.21 mm)		
Cable Weight	2480 lb/mt (3690 kg/km)		
Jacket Color	Black		
Minimum Bend Radius: Installed	16.25"		
Fiber Optic Cable Specifications			
Fiber Pairs	24		
Fiber Type	Singlemode G.657.A2		
Insertion Loss	1.5 db MAX per channel (2 connectors)		
Breakout Length: End 1	31 in (775 mm), 33 in (826 mm), 35 in (889 mm), 39 in (992 mm)		
Breakout Length: End 2	Molded Enclosure		
Termination: End 1	DLC connectors		
Termination: End 2	U Hybrid 25		
DC Cable Specifications			
DC Pairs	6		
DC Conductor Size	4 AWG		
DC Resistance: Maximum	0.264 Ohms / 1000ft.		
Breakout Length: End 1	31 in (775 mm)		
Breakout Length: End 2	Molded Enclosure		
Color Code	Black & Red colored, Number printed		
Environmental Specifications			
Operating Temperature	-40°C to 90°C (dry) / 75°C (wet)		
Installation Temperature	-20°C to 60°C		
Thermal Cycle	-40°C to 80°C		
Ingress Protection	IP67		
Standards and Compliance			
UL 83: Thermoplastic-Insulated Wires and Cables			
UL 1277: Electrical Power and Control Tray Cables with Optional Optical-Fiber Members			
UL THHN/THWN 600V			
UL Type TC 600V			
End Face Visual Inspection Per IEC61300-3-35			
Product Ordering			
Part Number	Description	T-Mobile SKU	
NWS-HCS2-HC4-250	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 250 FT	TBD	
NWS-HCS2-HC4-275	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 275 FT	TBD	
NWS-HCS2-HC4-300	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 300 FT	TBD	
NWS-HCS2-HC4-325	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 325 FT	TBD	
NWS-HCS2-HC4-350	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 350 FT	TBD	
NWS-HCS2-HC4-375	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 375 FT	TBD	
NWS-HCS2-HC4-400	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 400 FT	TBD	
NWS-HCS2-HC4-425	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 425 FT	TBD	
NWS-HCS2-HC4-450	HCS 2.0 Trunk HiCap 12 RRU 12x4AWG 450 FT	TBD	
Installation Accessories			
Part Number	Description	UOM	T-Mobile SKU
AA-34-SS	Angle Adapter, 3/4" Thru Hole for Snap-In Hangers, Stainless Steel	10PK	TBD
SO-34-SS	Stand-off Adapter, 3/4" Thru Hole for Snap-In Hangers, Stainless Steel	10PK	TBD
SO3-34-SS	3-Way Stand-off Adapter, 3/4" Thru Hole for Snap-In Hangers, Stainless Steel	10PK	TBD
HDW-INSERT-SS	Insert for Adapters, 3/8" Threaded Hole, Stainless Steel	10PK	TBD
SH-158	Snap-In Hanger for 1-5/8" Cable	10PK	TBD
CB2-158	Cable Block for 1-5/8" Cable, Double Run	10PK	TBD
CG-1-43-158	Cable Grommet for (1) 4AWG Hi Cap HCS 2.0 Trunk, Fits 1-5/8" Hangers	10PK	TBD
GK-UT	Universal Ground Kit w/ 5' Lead, Tinned Copper	EA	TBD
HOIST-114-L	Hoisting Grip for 4AWG Hi Cap HCS 2.0 Trunk, Lace-Up	EA	TBD
HOIST-114-PL	Hoisting Grip for 4AWG Hi Cap HCS 2.0 Trunk, Pre-Laced	EA	TBD

3-DETAIL-HCS 2.0 TRUNK CABLE
SCALE: N.T.S.

T-Mobile

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C-8

Product Specifications

COMMSCOPE



HFT410-4SNOK2-150

HELIX® FiberFeed® Hybrid Cable Assembly, HQLC. End 1: 4 fibers terminated DLC for Nokia RRUs with flush cut power cord (red / black conductors). End 2: 4 fibers terminated LC and 4 X 10 AWG conductors terminated at hybrid trunk connector. 150 ft

Construction Materials

Fiber Type	Bend insensitive singlemode fiber (G.657.A2)
Total Fibers, quantity	4
Armor Type	Corrugated aluminum
Jacket Color	Black

Dimensions

Cord Length	45.72 m 150.00 ft
Breakout Length, Fiber, end 1	815 mm 32 in
Breakout Length, Power, end 1	895 mm 35 in
Breakout Length, Fiber, end 2	600 mm 24 in

Environmental Specifications

Environmental Space	Wireless installation
Operating Temperature	-40 °C to +75 °C (-40 °F to +167 °F)

General Specifications

Conductors, quantity	4
Construction Type	Hybrid standard tail
Center Conductor Gauge	10 AWG
Interface Body Style, connector A	Flex angle
Interface Body Style, connector B	Straight
Interface Feature, connector A	Nokia boot
Interface Feature, connector B	Outdoor
Interface, connector A	DLC
Interface, connector B	HQLC

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system



Included Products

760234195 | HTC-4SM-410-APVA (Product Component—not orderable) — HELIX® FiberFeed® Hybrid Cable, UL Type TC-OF-ER

- CS-8G-MP (Product Component—not orderable) — Enhanced Low Macrobending, Zero Water Peak, Dispersion-Unshifted Singlemode Fiber (ITU-T G.657.A2, B2)

760234195 | HTC-4SM-410-APVA

HELIX® FiberFeed® Hybrid Cable, UL Type TC-OF-ER

Representative Image



General Specifications

Conductor Gauge	10 AWG
Conductors, quantity	4
Construction Type	Shielded
Application	Remote radio head
Brand	HELIX® FiberFeed®
Cable Type	Wireless feeder
Inner Shield (Tape) Material	Corrugated aluminum
Outer Shield (Tape) Material	PVC
Ripcord Material	Para-aramid synthetic fiber
Strength Member	Glass reinforced plastic rod
Water Blocking Method	Water blocking tape(s) Water blocking threads

Construction Materials

Fiber Type Solution	Bend insensitive singlemode fiber (G.657.A2/B2)
Total Fiber Count	4
Fiber Type	Bend insensitive singlemode fiber (G.657.A2/B2)
Fiber Type, quantity	4
Fibers per Subunit, quantity	2
Jacket Color	Black

Electrical Specifications

dc Resistance, maximum	1.039 ohms/kft 5.430 ohms/km
dc Resistance Note	Maximum value based on a standard condition of 20 °C (68 °F)

Dimensions

Buffer Tube/Subunit Diameter	3.60 mm 0.14 in
Cable Weight	456.1 kg/km 306.5 lb/kft
Diameter Over Jacket	18.31 mm 0.72 in
Subunit, quantity	2

Physical Specifications

Minimum Bend Radius, multiple bends, loaded	365.8 mm 14.4 in
Minimum Bend Radius, multiple bends, unloaded	221.0 mm 8.7 in
Minimum Bend Radius, single bend, unloaded	127.0 mm 5.0 in
Tensile Load, long term, maximum	801 N 180 lbf
Tensile Load, short term, maximum	2669 N 600 lbf

Environmental Specifications

Environmental Space	Wireless installation
Installation Temperature	-30 °C to +70 °C (-22 °F to +158 °F)
Operating Temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Storage Temperature	-40 °C to +70 °C (-40 °F to +158 °F)

Mechanical Test Specifications

Compression	22 N/mm 126 lb/in
Compression Test Method	FOTP-41
Flex	25 cycles
Flex Test Method	FOTP-104
Impact	2.94 N-m 2.17 ft lb
Impact Test Method	FOTP-25
Twist	10 cycles
Twist Test Method	FOTP-85

Qualification Specifications

Cable Qualification Standards	ANSI/ICEA 5-87-640 Telcordia GR-20 Telcordia GR-409
-------------------------------	---

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system



Included Products

CS-8G-MP (Product Component—not orderable) — Enhanced Low Macrobending, Zero Water Peak, Dispersion-Unshifted Singlemode Fiber (ITU-T G.657.A2, B2)

* Footnotes

Operating Temperature Specification applicable to non-terminated bulk fiber cable

CS-8G-MP

Enhanced Low Macrobending, Zero Water Peak, Dispersion-Unshifted Singlemode Fiber (ITU-T G.657.A2, B2)

Optical Specifications, Wavelength Specific

Standards Compliance	ITU-T G.657.A2 ITU-T G.657.B2
Attenuation, maximum	0.50 dB/km @ 1310 nm 0.50 dB/km @ 1385 nm 0.50 dB/km @ 1550 nm
Dispersion, maximum	18 ps/(nm-km) at 1550 nm 3.5 ps/(nm-km) from 1285 nm to 1330 nm at 1310 nm
Mode Field Diameter	8.8 µm @ 1310 nm 10.4 µm @ 1310 nm
Mode Field Diameter Tolerance	1.467 @ 1310 nm 1.467 @ 1385 nm 1.468 @ 1550 nm
Index of Refraction	
Polarization Mode Dispersion Link Design Value, maximum	0.06 ps/sqrt(km)

Physical Specifications

Cladding Diameter	125.0 µm
Cladding Diameter Tolerance	±0.7 µm
Cladding Non-Circularity, maximum	0.7 %
Coating Diameter (Colored)	254 µm
Coating Diameter (Uncolored)	240 µm
Coating Diameter Tolerance (Colored)	±7 µm
Coating Diameter Tolerance (Uncolored)	±5 µm
Coating/Cladding Concentricity Error, maximum	12 µm
Core/Clad Offset, maximum	0.5 µm

Optical Specifications, General

Cabled Cut-off Wavelength, maximum	1260 nm
Point Defects, maximum	0.10 dB
Zero Dispersion Slope, maximum	0.092 ps/(km-nm-nm)
Zero Dispersion Wavelength, maximum	1322 nm
Zero Dispersion Wavelength, minimum	1302 nm

Mechanical Specifications

Coating Strip Force, maximum	8.9 N 2.0 lbf
Coating Strip Force, minimum	1.3 N 0.3 lbf
Dynamic Fatigue Parameter, minimum	20
Fiber Curl, minimum	4.0 m 13.1 ft
Macrobending, 15 mm mandrel, 1 turn	0.50 dB @ 1550 nm 1.00 dB @ 1625 nm
Macrobending, 20 mm mandrel, 1 turn	0.10 dB @ 1550 nm 0.20 dB @ 1625 nm
Macrobending, 30 mm mandrel, 10 turns	0.03 dB @ 1550 nm 0.10 dB @ 1625 nm
Proof Test	689.48 N/mm² 100000.00 psi

Environmental Specifications

Heat Aging, maximum	0.05 dB/km @ 85 °C
Temperature Dependence, maximum	0.05 dB/km
Temperature Humidity Cycling, maximum	0.05 dB/km
Water Immersion, maximum	0.05 dB/km @ 23 °C

1 DETAIL—HYBRID JUMPER CABLE
SCALE: N.T.S.

LTE5213/SR002411: Nokia Airscale Dual RRH
4T4R B25/B66 Module AHFIG

Description

LTE5213/SR002411: Nokia AirScale Dual RRH 4T4R B25/66 480 W AHFIG feature in release LTE19A/SRAN19A introduces the new Nokia AirScale Multiband Remote Radio Head with four transmitters and four receivers for 3GPP Band 25 and Band 66 enabling it to support one sector and two bands simultaneously with up to 4x40 W for B66 and 4x80 W for B25 at the antenna connector.

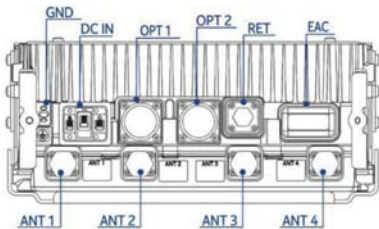
AHFIG is an updated version of the AHFIB with an improvement in the output PA power for B25 to 4x80 W as compared to 4x40 W in AHFIB. Output PA power for B66 is same as AHFIB (4x40 W).

This radio can be used in LTE only or LTE/WCDMA/GSM using the SRAN functionality. Classical RF sharing with WCDMA or GSM is not supported with this radio. The AHFIG radio will work only with AirScale system module. The AHFIG is a 5G capable radio.

The AHFIG is a 4TX/4RX RRH for Band 25 and Band 66. There are four ports on the RRH. It is a one sector radio optimized for macro BTS installations.

AHFIG Interfaces

The ports of the AHFIG are shown below



Dimensions and Weight

Property	Value
Height	Core RRH: 695 mm (27.4 in.) With upper and lower mounting brackets: 730 mm (28.7 in.)
Width	Core RRH: 308 mm (12.1 in.) With mounting cover: 327 mm (12.9 in.)
Depth	Core RRH: 131 mm (5.2 in.) With mounting cover: 142 mm (5.6 in.)
Weight	Core RRH: 32 kg (70.5 lb)

2 DETAIL—AHFIG
SCALE: N.T.S.

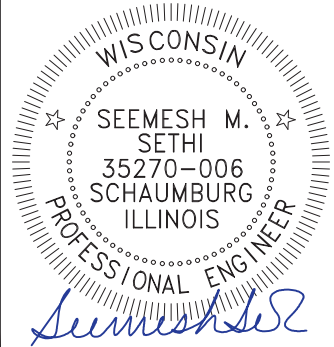
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REV.	DESCRIPTION	DATE

ML70553B
NORTHWEST WT

250 OLIVE STREET,
WILLIAMS BAY, WI 53191

Drawing Title:

EQUIPMENT
INFORMATION

Project Number:	Drawn by: AS
Client Project Number:	Checked by: PA
Scale:	Approved by: MS
	Date:

Drawing Number

C-9

RAN Template: 50090X_SR

A&L Template: 50090X_SR

ML70553B_Anchor_2.draft

Print Name: Standard

PORs: Anchor_Phase 3

Section 1 - Site Information

Site ID: ML70553B

Site Name: Northwest WT

Latitude: 42.5814220

Status: Draft

Site Class: Water tank

Longitude: -88.5511300

Version: 2

Project Type: Anchor

Plan Year: 2020

Address: 250 Olive Street

Approved: Not Approved

Market: MILWAUKEE WI

City, State: Williams Bay, WI

Approved By: Not Approved

Vendor: Nokia

Region: CENTRAL

Last Modified: 5/28/2020 10:46:13 AM

Landlord: Not Specified

RAN Template: 50090X_SR

AL Template: 50090X_SR

Sector Count: 3

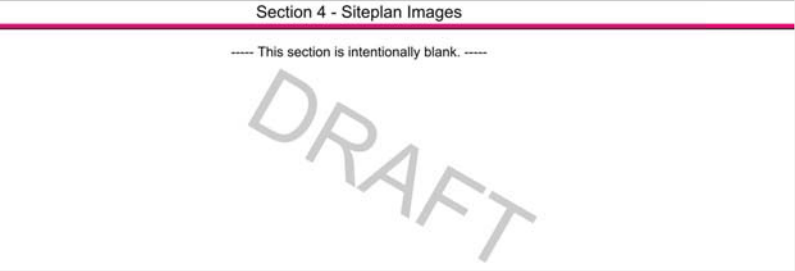
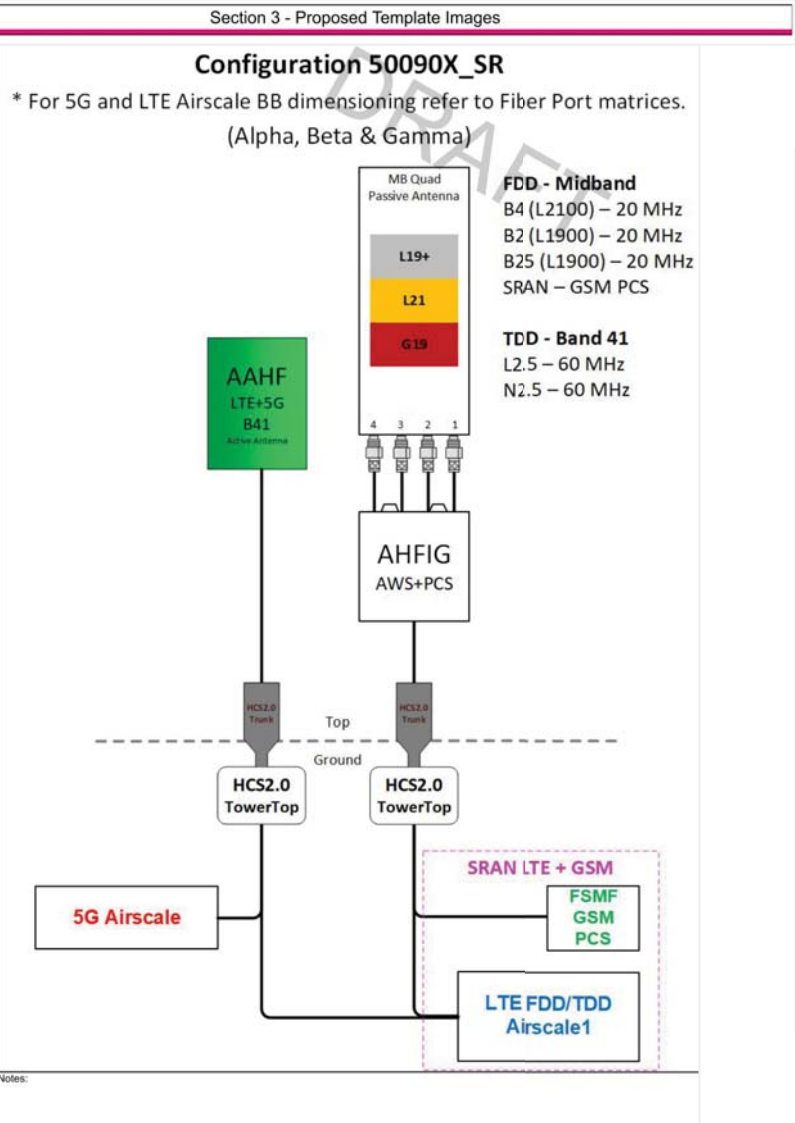
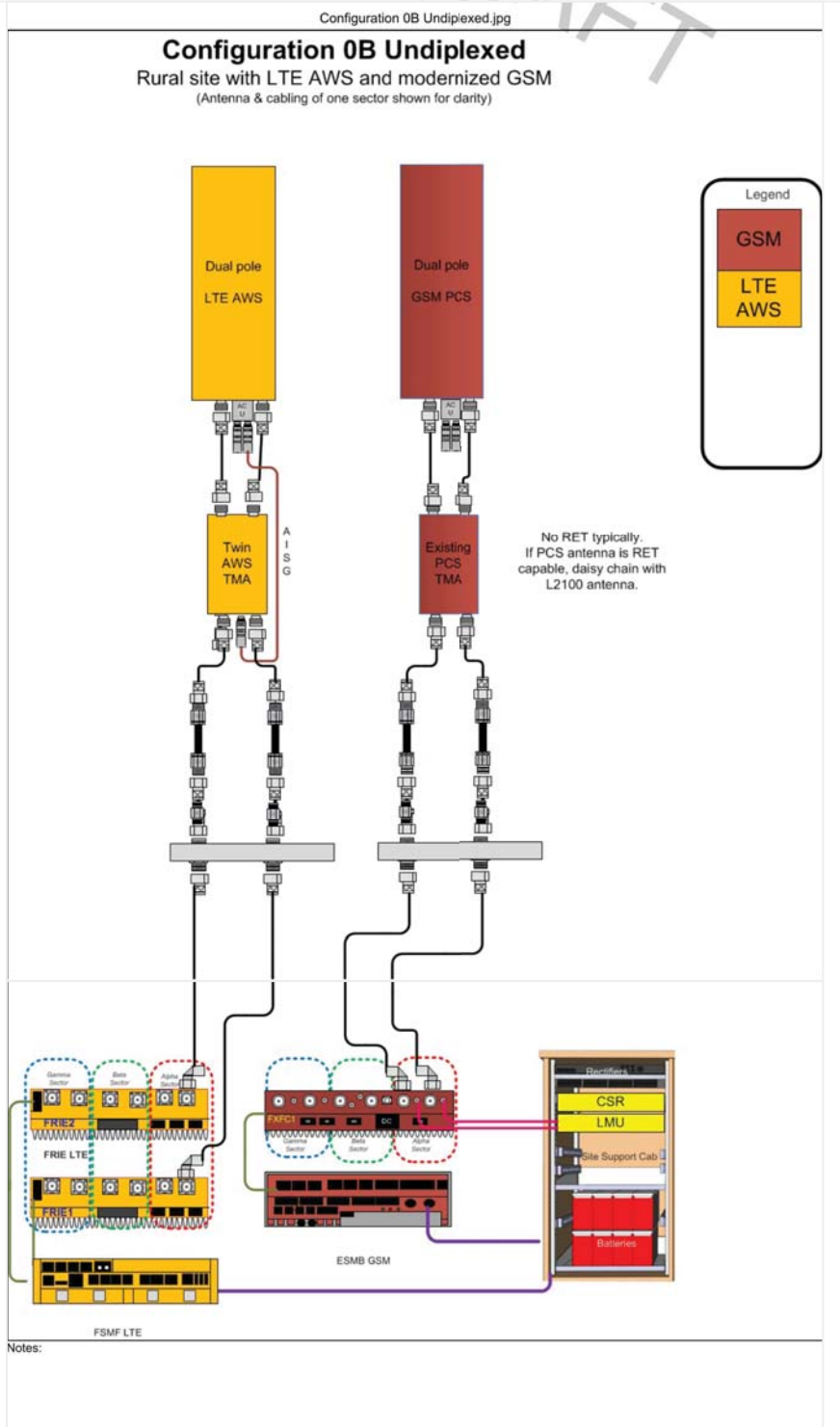
Antenna Count: 6

Coax Line Count: 0

TMA Count: 0

RRU Count: 3

Section 2 - Existing Template Images



Section 5 - RAN Equipment

Existing RAN Equipment

Template: 0B Undiplexed

Enclosure	1
Enclosure Type	Generic Cabinet (Nokia)
Baseband	ESMB (G1900) FSMF (L2100)
Radio	FRIE (x 2) FXFC (L2100 G1900)

Proposed RAN Equipment

Template: 50090X_SR

Enclosure	1	2	3	4
Enclosure Type	Generic 600A Site Support Cabinet	Tower Top Mount (Nokia)	Ancillary Equipment (Nokia)	Generic Battery Cabinet for 600A SSC
Baseband	ASIA (L2100 L1900) ASIK (N2500) ASIB (L2500) FSMF (G1900)			
Baseband Submodule	ABIA (x 2) L2100 L1900 ABIL (x 3) N2500 ABIC (x 3) L2500			
Baseband Subrack	AMIA (x 2)			
Hybrid Cable System			175' HCS 2.0 Trunk - 12#6AWG 24 SM FIBER PR (x 2)	
Junction Box			Nokia HCS 2.0 Tower Junction Box (x 2)	
Power subsystem	Rectifier Shelf "Select size" Breakers "Select size"			Batteries "Select size"
Radio		AHFIG (x 3) L2100 L1900 G1900		
Transport System	CSR IXRe			

RAN Scope of Work:

5/28/2020: As per Sanjay, update azimuths to 20-120-220.

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PROFESSIONAL ENGINEER

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REV.	DESCRIPTION	DATE
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A	ISSUED FOR REVIEW	7/6/20

ML70553B

NORTHWEST WT

250 OLIVE STREET,
WILLIAMS BAY, WI 53191

Drawing Title:

RF DATA
CONFIGURATION SHEET

Project Number:

Drawn by: AS

Client Project Number:

Checked by: PA

Scale:

Approved by: MS

Drawing Number

C-10A

1

2

3

4

5

6

7

8

Section 6 - A&L Equipment

Existing Template: 08 Undiplexed
Proposed Template: 50090X_SR

Sector 1 (Existing) view from front (Note: the images show view from behind)

Coverage Type	A - Outdoor Macro	
Antenna	1	2
Antenna Model	Andrew - TMBX-6517-A1M (Dual)	Andrew - TMBX-6517-A1M (Dual)
Azimuth	20	20
M. Tilt	0	0
Height	123	123
Ports	P1	P2
Active Tech.	G1900	L2100
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables		
TMA's	CommScope Style 2 - ETT19V2S12UB (E15S08P78) (AtAntenna)	CommScope Style 2 - ETT19V2S12UB (E15S08P78) (AtAntenna)
Diplexers / Combiners		
Radio		
Sector Equipment		
Unconnected Equipment:		
Scope of Work:		

Sector 1 (Proposed) view from front (Note: the images show view from behind)

Coverage Type	A - Outdoor Macro		
Antenna	1	2	
Antenna Model	Andrew - HBXX-6517DS-A2M (Quad)	AAHF (Active Antenna - Massive MIMO)	
Azimuth	20	20	
M. Tilt			
Height	123	123	
Ports	P1	P2	P3
Active Tech.	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt			
Cables			
TMA's			
Diplexers / Combiners			SFC4 (AtCabinet) (x2)
Radio			
Sector Equipment			
Unconnected Equipment:			
Scope of Work:			

Sector 2 (Existing) view from front (Note: the images show view from behind)

Coverage Type	A - Outdoor Macro	
Antenna	1	2
Antenna Model	Andrew - TMBX-6517-A1M (Dual)	Andrew - TMBX-6517-A1M (Dual)
Azimuth	140	140
M. Tilt	0	0
Height	123	123
Ports	P1	P2
Active Tech.	L2100	G1900
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables		
TMA's	CommScope Style 2 - ETT19V2S12UB (E15S08P78) (AtAntenna)	CommScope Style 2 - ETT19V2S12UB (E15S08P78) (AtAntenna)
Diplexers / Combiners		
Radio		
Sector Equipment		
Unconnected Equipment:		
Scope of Work:		

Sector 2 (Proposed) view from front (Note: the images show view from behind)

Coverage Type	A - Outdoor Macro		
Antenna	1	2	
Antenna Model	Andrew - HBXX-6517DS-A2M (Quad)	AAHF (Active Antenna - Massive MIMO)	
Azimuth	120	120	
M. Tilt			
Height	123	123	
Ports	P1	P2	P3
Active Tech.	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt			
Cables			
TMA's			
Diplexers / Combiners			SFC4 (AtCabinet) (x2)
Radio			
Sector Equipment			
Unconnected Equipment:			
Scope of Work:			

Sector 3 (Existing) view from front (Note: the images show view from behind)

Coverage Type	A - Outdoor Macro	
Antenna	1	2
Antenna Model	Andrew - TMBX-6517-A1M (Dual)	Andrew - TMBX-6517-A1M (Dual)
Azimuth	210	210
M. Tilt	0	0
Height	123	123
Ports	P1	P2
Active Tech.	L2100	G1900
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables		
TMA's	CommScope Style 2 - ETT19V2S12UB (E15S08P78) (AtAntenna)	CommScope Style 2 - ETT19V2S12UB (E15S08P78) (AtAntenna)
Diplexers / Combiners		
Radio		
Sector Equipment		
Unconnected Equipment:		
Scope of Work:		

Sector 3 (Proposed) view from front (Note: the images show view from behind)

Coverage Type	A - Outdoor Macro		
Antenna	1	2	
Antenna Model	Andrew - HBXX-6517DS-A2M (Quad)	AAHF (Active Antenna - Massive MIMO)	
Azimuth	220	220	
M. Tilt			
Height	123	123	
Ports	P1	P2	P3
Active Tech.	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt			
Cables			
TMA's			
Diplexers / Combiners			SFC4 (AtCabinet) (x2)
Radio			
Sector Equipment			
Unconnected Equipment:			
Scope of Work:			

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

----- This section is intentionally blank. -----

Proposed Power Systems Equipment

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Sumesh S

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Drawing Title:

RF DATA
CONFIGURATION SHEET

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Drawn by: AS

Client Project Number:

Checked by: PA

Scale:

Approved by: MS

Drawing Number

C-10B

ELECTRICAL NOTES:

THE GENERAL NOTES AND ACCOMPANYING DRAWINGS ARE TO INDICATE THE PROVISIONS AND REQUIREMENTS IN BY THE ELECTRICAL CONTRACTOR OF ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO INSTALL THE ELECTRICAL WORK COMPLETE IN CONNECTION WITH THIS SITE AND SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:

1. THE INSTALLATION, PROVISION, AND CONNECTION OF A GROUND ROD (ELECTRODE) SYSTEM AS INDICATED IN THE DRAWINGS.
2. THE INSTALLATION AND PROVISION OF AN ELECTRICAL SERVICE (OVERHEAD OR UNDERGROUND) AND ALL CONDUIT AND WIRE ASSOCIATED WITH IT AS INDICATED AND/OR REQUIRED ON PLANS.
3. THE INSTALLATION, PROVISION OF CONDUIT AND CONNECTIONS FOR LOCAL TELEPHONE SERVICE.
4. CONDUITS SHALL BE PVC SCHED. 40 UNLESS OTHERWISE NOTED.
5. ALL FISH LINE SHALL BE LEFT IN CONDUITS (PVC) FOR FUTURE USE.
6. THE CONTRACTOR SHALL FURNISH AND INSTALL ELECTRICAL SERVICE ENTRANCE CONDUCTORS, CONDUIT AND METER SOCKET AND MAKE THE NECESSARY CONNECTION TO THE SERVICE EQUIPMENT WITHIN THE BUILDING.

PRIOR TO THE SUBMISSION OF BIDS, THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL DETAILS AND SCHEDULES ON THE DRAWINGS AND SPECIFICATIONS PROVIDED BY THE OWNER. FOR MEANING OF ABBREVIATIONS AND ADDITIONAL REQUIREMENTS AND INFORMATION, CHECK STRUCTURAL AND OTHER MECHANICAL AND ELECTRICAL DRAWINGS FOR SCALE, SPACE LIMITATIONS, BEAMS, DOOR SWINGS, WINDOWS, COORDINATION, AND ADDITIONAL INFORMATION, ETC. REPORT ANY DISCREPANCIES, CONFLICTS, ETC. TO THE OWNER BEFORE SUBMITTING BID.

UNLESS OTHERWISE NOTED, THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE NECESSARY MOTOR STARTERS, DISCONNECTS, CONTROLS, ETC. FOR ALL EQUIPMENT FURNISHED BY OTHER (FBO). ALL

ASSOCIATED EQUIPMENT SHALL BE INSTALLED AND COMPLETELY WIRED BY THE ELECTRICAL CONTRACTOR IN ACCORDANCE WITH MANUFACTURER'S WIRE DIAGRAMS AND AS REQUIRED FOR A COMPLETE OPERATING INSTALLATION. ELECTRICAL CONTRACTOR SHALL VERIFY AND COORDINATE CHARACTERISTICS AND REQUIREMENTS OF (FBO) EQUIPMENT PRIOR TO ROUGH-IN OF CONDUIT AND WIRINGS TO AVOID CONFLICT.

CONTRACTOR RESPONSIBILITIES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND SECURING ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, APPROVALS, AND PAYMENT OF ALL FEES.
2. THE INSTALLATION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE: STATE, LOCAL, AND NATIONAL CODES AS WELL AS THE LATEST ISSUE OF THE VARIOUS APPLICABLE STANDARD SPECIFICATIONS OF THE FOLLOWING RECOGNIZED AUTHORITIES:

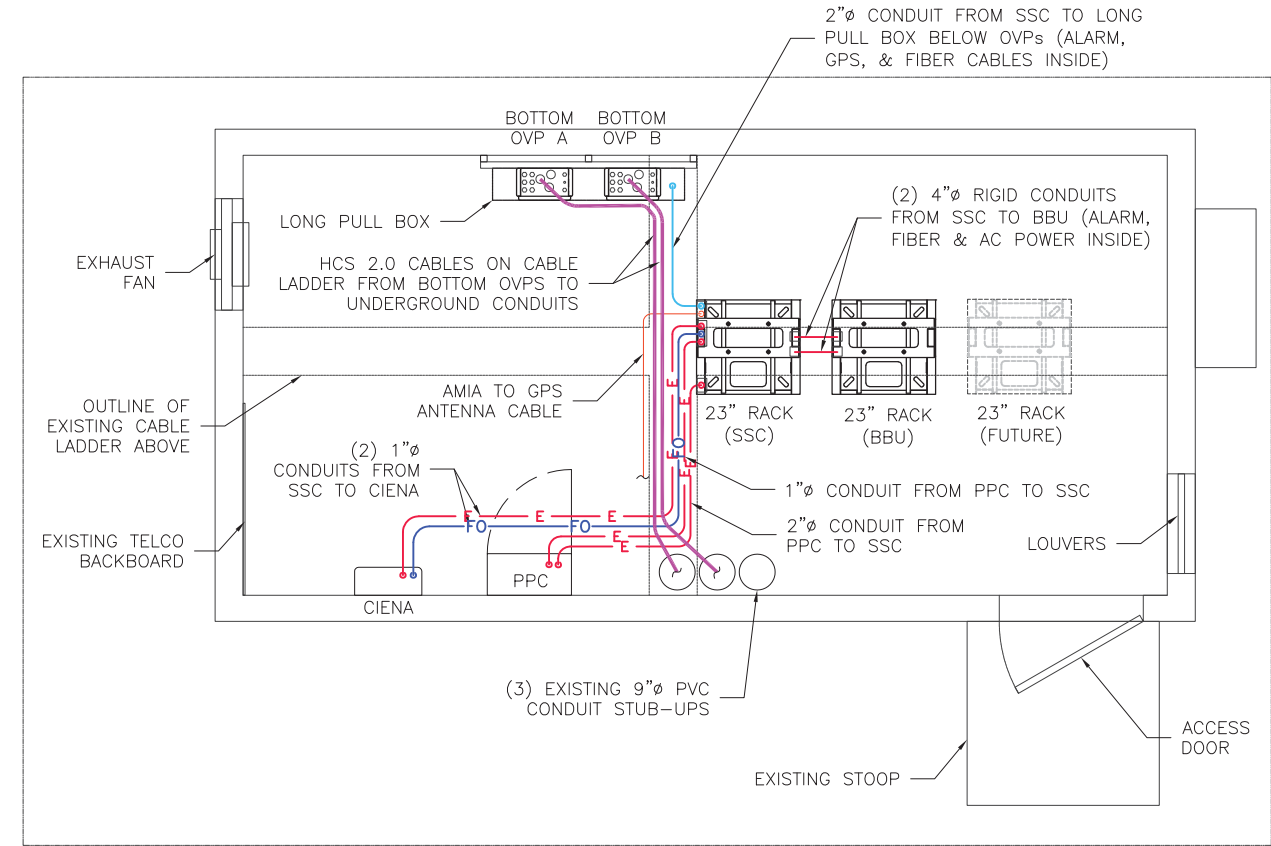
NEC – NATIONAL ELECTRIC CODE
ANSI – AMERICAN NATIONAL STANDARD INSTITUTE
IEEE – INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
ASTM – AMERICAN SOCIETY FOR TESTING MATERIALS
NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
UL – UNDERWRITERS LABORATORY, INC.
3. PRIOR TO COMMENCING WORK, THE ELECTRICAL CONTRACTOR SHALL CONFORM TO THE LOCAL UTILITY COMPANY'S REGULATIONS AND SHALL GET THE APPROVAL FROM THE SAME, BEFORE SUBMITTING HIS BID, TO DETERMINE FROM EACH UTILITY ADDITIONAL COSTS THEY MAY REQUIRE, AND SHALL BE INCLUDED IN HIS BID FOR CONTRACT.

UTILITIES GENERAL NOTES

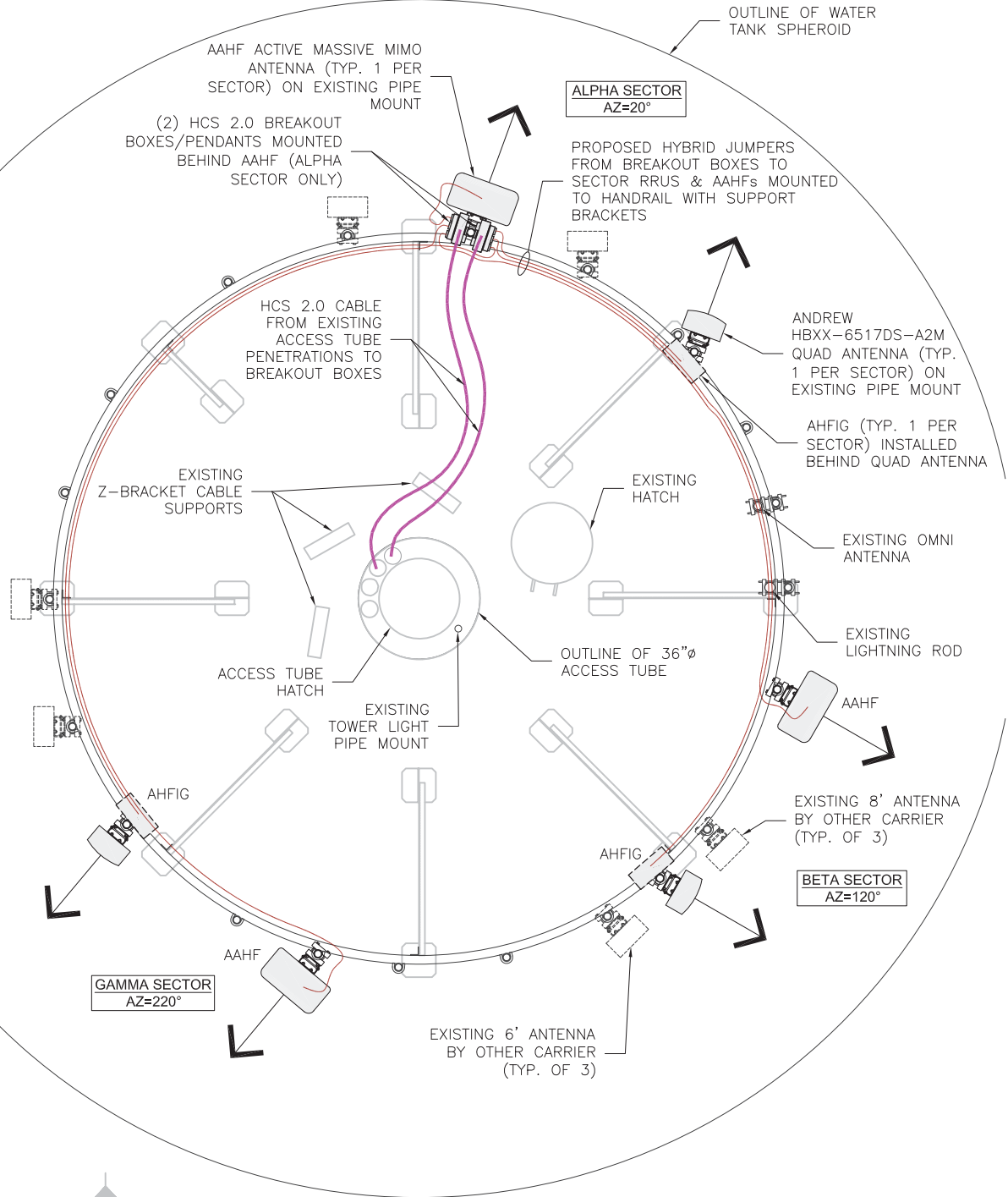
1. UTILITY POINTS OF SERVICE AND WORK/MATERIALS SHOWN ARE BASED ON PRELIMINARY INFORMATION ONLY, PROVIDED BY THE UTILITY COMPANIES AND ARE FOR BID PURPOSES ONLY.
2. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR FINAL AND EXACT WORK/MATERIALS REQUIREMENTS AND CONSTRUCT TO UTILITY COMPANY PLANS AND SPECIFICATIONS ONLY. CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT, PULL WIRES, CABLES, PULL BOXES, CONCRETE ENCASEMENT OF CONDUIT (IF REQUIRED), TRANSFORMER PAD, BARRIERS, POLE RISERS, TRENCHING, BACKFILL.
3. PAY ALL UTILITY COMPANY FEES AND INCLUDE ALL REQUIREMENTS IN SCOPE OF WORK.

LEGEND

- FO FIBER CONDUIT
- HCS 2.0 HYBRID CABLE
- LONG HYBRID JUMPER
- E POWER CONDUIT
- G ELECTRICAL GROUNDING CONDUIT
- RF JUMPER



1 LEASE AREA UTILITY PLAN
E-1 SCALE: 1/4" = 1'-0"



2 CABLE ROUTING AT WATER TANK ROOF
E-1 SCALE: 1/4" = 1'-0"

T-Mobile

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UTILITY PLANS &
ELECTRICAL NOTES

Project Number:	Drawn by: AS
Client Project Number:	Date:
Scale:	Checked by: PA
Drawing Number	Date:

E-1

GROUNDING NOTES:

1. GROUNDING CONNECTIONS SHALL BE EXOTHERMIC TYPE ("CADWELD") TO ANTENNA MASTS, FENCE POSTS, MONOPOLE, AND THE GROUND RODS, REMAINING GROUNDING CONNECTIONS SHALL BE COMPRESSION FITTINGS.
2. GROUND CABLE SHIELDS AT BOTH ENDS WITH CABLE GROUNDING KITS.
3. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE, ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY.
4. CONTRACTOR TO PROVIDE GROUND WIRES, BARS AND CONNECTIONS AS SHOWN ON GROUNDING RISER DIAGRAM. CONTRACTOR SHALL TEST AND VERIFY THAT THE IMPEDANCE DOES NOT EXCEED 5 OHMS TO GROUND BY MEANS OF A 4 POINT BIDDLE-MEGGER TESTER. GROUNDING AND OTHER OPERATIONAL TESTING SHALL BE WITNESSED BY THE OWNER'S REPRESENTATIVE.
5. GROUNDING CONDUCTORS SHALL BE COPPER ONLY. ABOVE GROUND EITHER SOLID OR STRANDED CONDUCTORS ARE PERMITTED. IGR AND ALL EXTERNAL CONDUCTORS (W/ THE

EXCEPTION FOR GROUND WIRE BETWEEN THE TOP AND THE BOTTOM OF THE ANTENNA TOWER) MUST BE BARE. EQUIPMENT GROUND LEADS IN CABLE TRAYS MUST BE GREEN INSULATED. BELOW GROUND BARE SOLID TINNED WIRE SHALL BE USED. ALL WIRES MUST BE #2 AWG MIN. WITH THE EXCEPTION OF GROUND WIRES FOR MISCELLANEOUS METALLIC OBJECTS IN THE EQUIPMENT SHELTER, WHERE #6 WIRES CAN BE USED.

6. THE GROUND ELECTRODE SYSTEM SHALL CONSIST OF DRIVEN GROUND RODS UNIFORMLY SPACED AROUND CELL SITE. THE GROUND RODS SHALL BE 5/8"x10'-0" COPPER CLAD STEEL. THE RODS SHALL BE INTERCONNECTED WITH #2 AWG BARE SOLID TINNED COPPER GROUND WIRE BURIED 42" BELOW THE SURFACE OF THE SOIL. MINIMUM DISTANCE BETWEEN GROUND RODS - 8', MAXIMUM - 16'.
7. METALS WITHIN 6' OF THE GROUND RING SHALL BE BONDED TO THE GROUND RING.
8. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER WHEN THE GROUNDING IS COMPLETE. THE CONSTRUCTION MANAGER SHALL INSPECT THE GROUNDING SYSTEM PRIOR TO BACKFILLING.

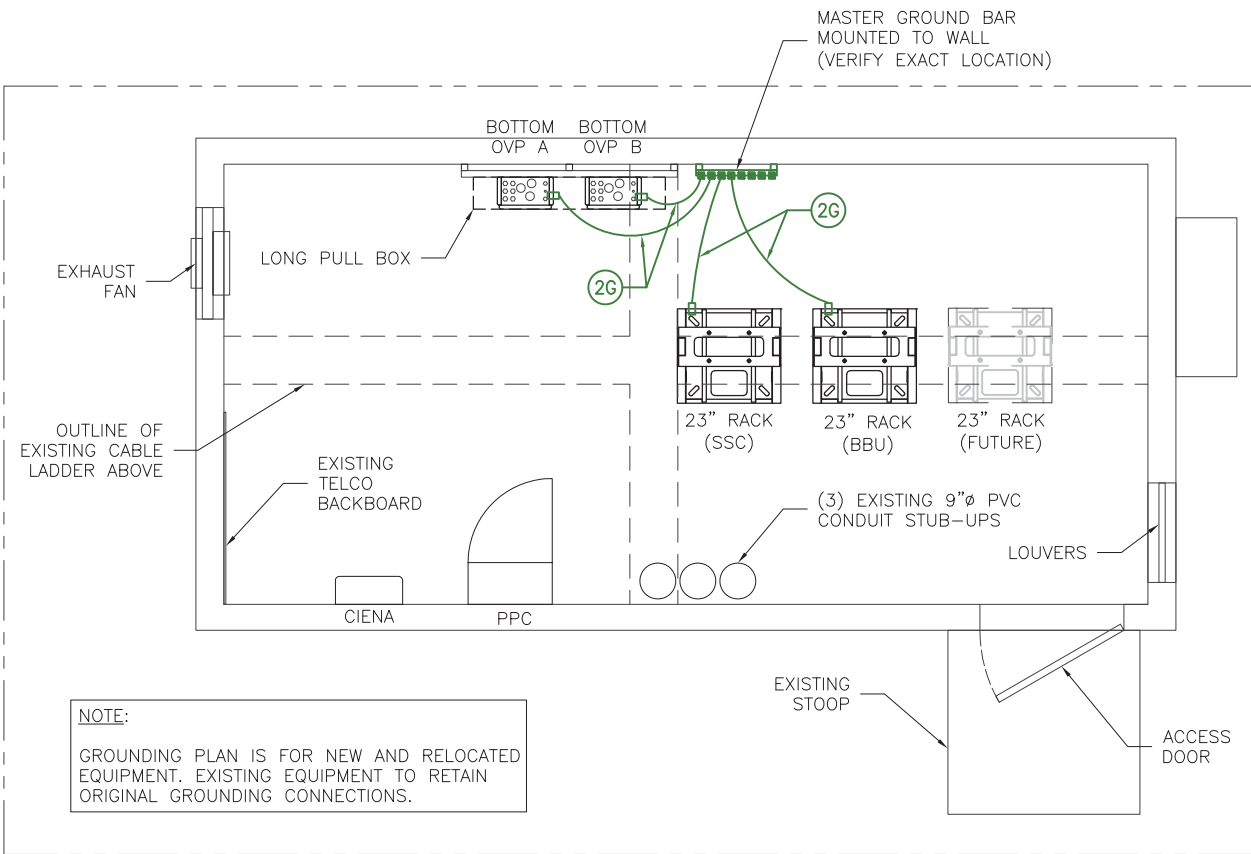
9. VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO ANY DIGGING.
10. GROUND CONDUCTOR BENDS SHALL NOT BE LESS THAN 8" RADIUS.
11. GROUND CONDUCTORS TO THE GROUND RING SHALL BE IN 3/4" "LIQUID-TITE" FLEX DUCT AND SEALED AT EXIT W/ SILICONE CAULK.
12. ANTENNA INSTALLATION CONTRACTOR TO PROVIDE & INSTALL TOP, RF BUSBARS & BUSBAR BELOW CENTERLINE.

LEGEND

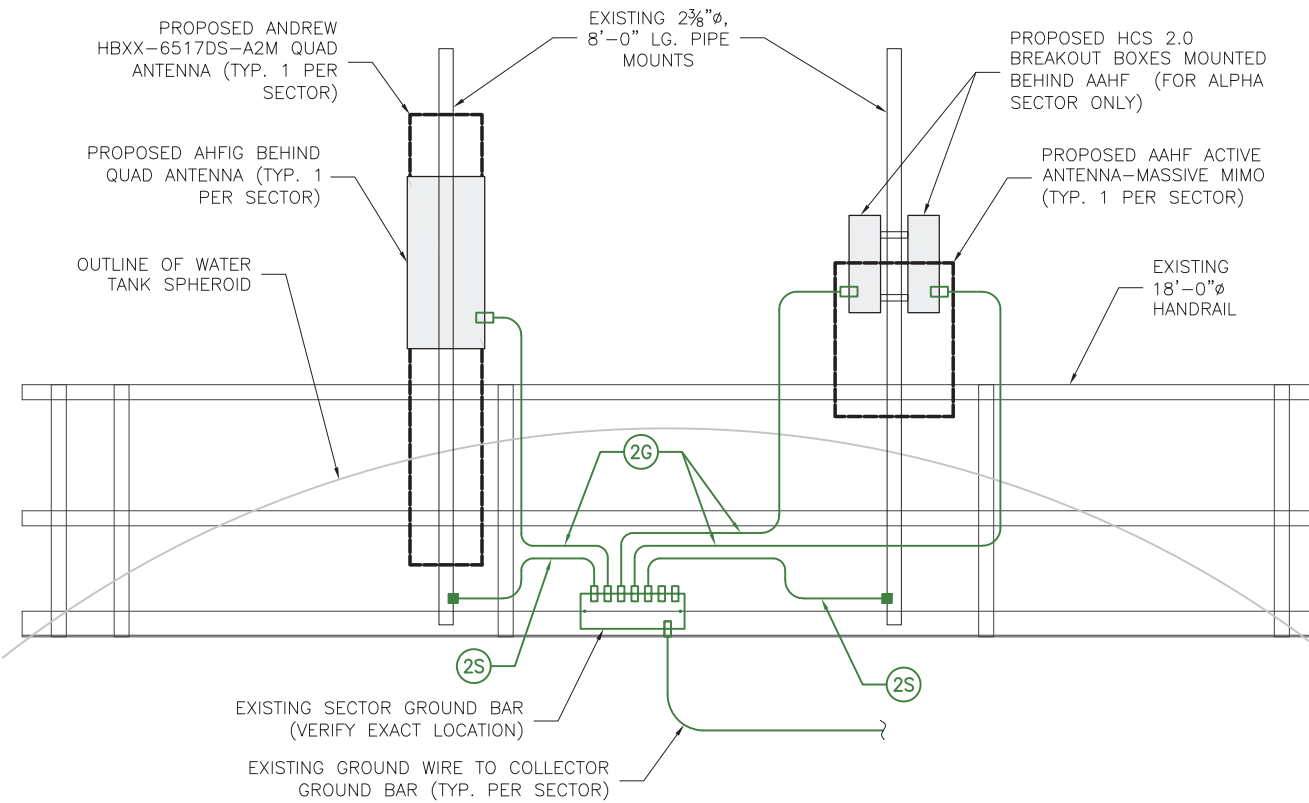
- GROUND BAR
- CADWELD OR APPROVED CONNECTION
- SPARE GROUND LEAD
- MECHANICAL CONNECTION

KEY NOTES

2G	#2 AWG GREEN STRANDED GROUND COPPER WIRE
2S	#2 AWG SOLID, TINNED BARE COPPER GROUND WIRE
6G	#6 AWG GREEN STRANDED GROUND COPPER WIRE



1 LEASE AREA GROUNDING PLAN
E-2 SCALE: 1/4" = 1'-0"



2 SECTOR GROUNDING RISER DIAGRAM
E-2 SCALE: N.T.S.

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CORPORATION

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DATE: 10/7/20 EXPIRES: 7/31/22

REV.	DESCRIPTION	DATE
0	ISSUED FOR PERMIT	10/7/20
A	ISSUED FOR REVIEW	7/6/20

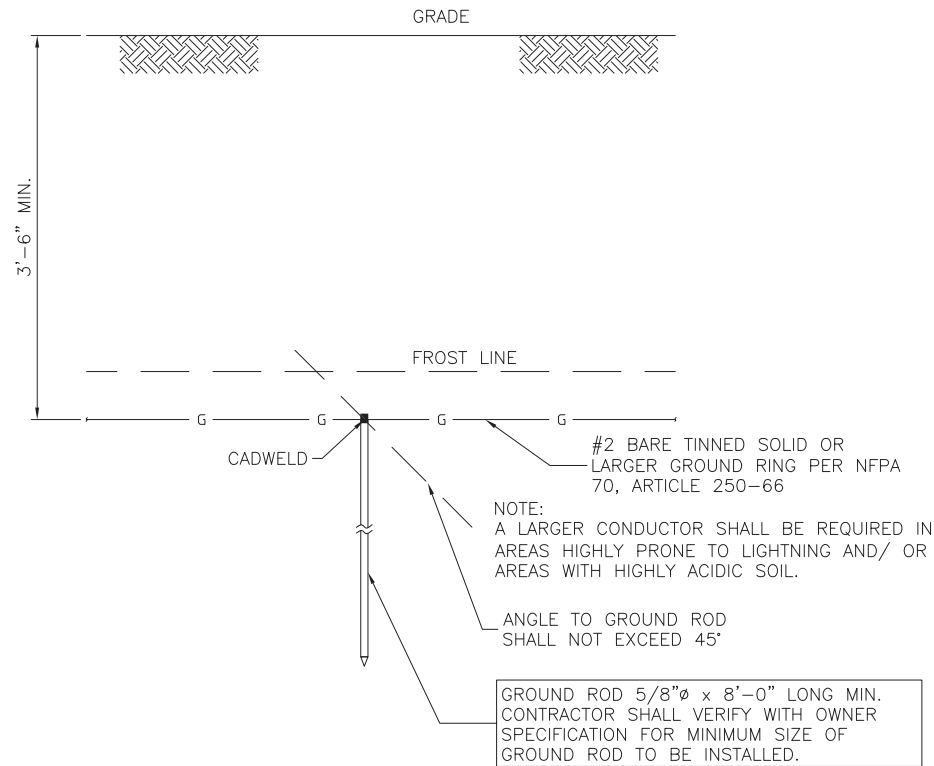
ML70553B
NORTHWEST WT

250 OLIVE STREET,
WILLIAMS BAY, WI 53191

Drawing Title:
GROUNDING NOTES,
GROUNDING PLANS

Project Number:	Drawn by: AS
Client Project Number:	Checked by: PA
Scale:	Approved by: MS
Drawing Number	Date:

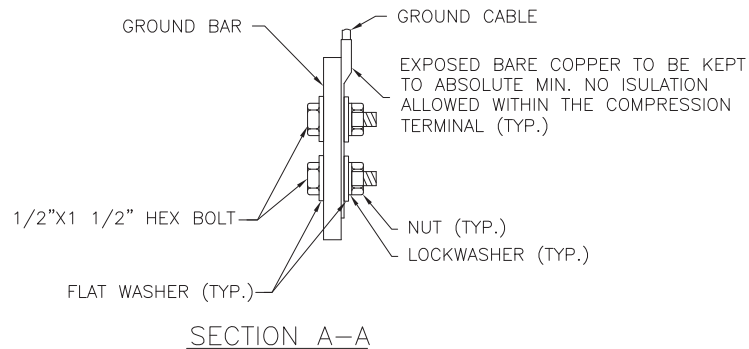
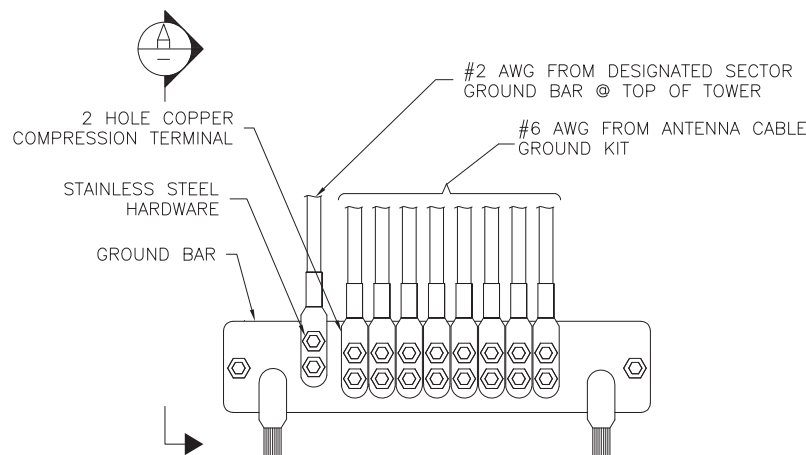
E-2



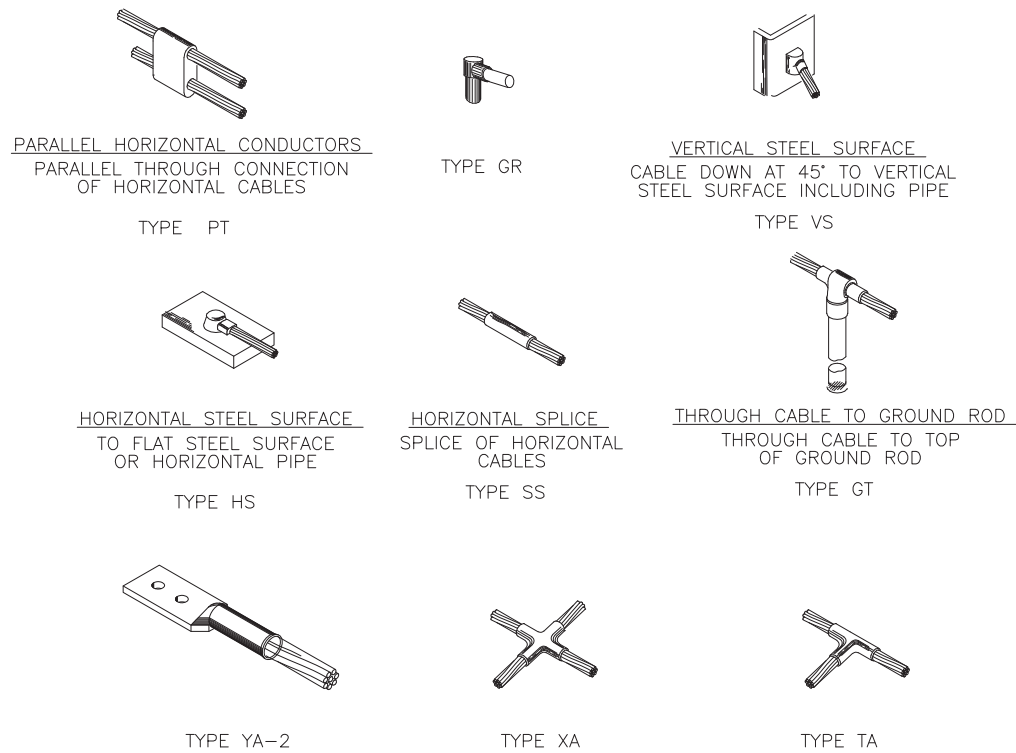
NOTES:

1. GROUND RODS MAY BE:
-COPPER CLAD STEEL
- SOLID COPPER
2. GROUND RODS SHALL HAVE A MAX. SPACING TWICE THE LENGTH OF ROD
3. SEE RESISTIVITY REPORT FOR VERIFICATION AS AVAILABLE
4. GROUND RODS INSTALLED WITHIN CLOSE PROXIMITY TO TOWER OR WHEN SOIL IS AT OR BELOW 2,000 OHM-CM, SHALL BE GALVANIZED TO PREVENT GALVANIC CORROSION OF TOWER (SEE ANSI/TIA-EIA-222-G)

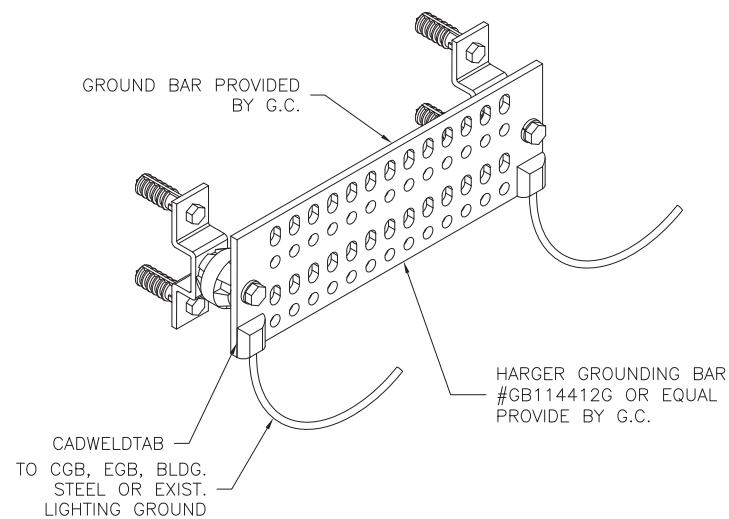
1 GROUNDING ROD (IF REQUIRED)
E-6 SCALE: N.T.S.



2 GROUNDING BAR CONNECTION
E-6 SCALE: N.T.S.



4 CADWELD TYPES
E-6 SCALE: N.T.S.



3 COLLECTOR GROUND BAR (CGB)
E-6 SCALE: N.T.S.

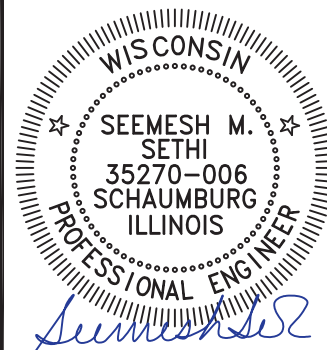
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NORTHWEST WT

250 OLIVE STREET,
WILLIAMS BAY, WI 53191

Drawing Title:
GROUNDING DETAILS

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	Approved by: MS
	Date:

Drawing Number
E-3

DIVISION 1 – GENERAL REQUIREMENTS

PART 1 – GENERAL

1.1 INTENT

THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION.

THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH.

THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.

THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.

MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY THE OWNER WITHOUT ISSUING A CHANGE ORDER.

1.2 CONFLICTS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.

THE BIDDER, IF AWARDED THE CONTRACT, WILL NOT BE ALLOWED ANY EXTRA COMPENSATION BY REASON OF ANY MATTER OR THING CONCERNING WHICH SUCH BIDDER MIGHT HAVE FULLY INFORMED THEMSELVES PRIOR TO THE BIDDING.

NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF DIFFICULTIES OR CONDITIONS THAT MAY BE ENCOUNTERED OR OF ANY OTHER RELEVANT MATTER CONCERNING THE WORK TO BE PERFORMED IN THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS GOVERNING THE WORK.

1.3 CONTRACTS AND WARRANTIES

CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYMENT OF CONTRACTOR LICENSES AND BONDS.

SEE MASTER CONSTRUCTION SERVICES AGREEMENT FOR ADD'L DETAILS.

1.4 STORAGE

ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

1.5 CLEAN UP

THE CONTRACTORS SHALL AT ALL TIMES KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK, THEY SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL THEIR TOOLS, SCAFFOLDING AND SURPLUS MATERIALS AND SHALL LEAVE THEIR WORK CLEAN AND READY FOR USE.

EXTERIOR: VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER.

1. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.

2. IF NECESSARY TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.

INTERIOR:

VISUALLY INSPECT INTERIOR SURFACE AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER FROM WALLS/FLOOR/CEILING.

1. REMOVE ALL TRACES OF SPLASHED MATERIAL FROM ADJACENT SURFACES.

2. REMOVE PAINT DROPPINGS, SPOTS, STAINS AND DIRT FROM FINISHED SURFACES.

1.6 CHANGE ORDER PROCEDURE

CHANGE ORDERS MAY BE INITIATED BY THE OWNER AND/OR THE CONTRACTOR INVOLVED. THE CONTRACTOR, UPON VERBAL REQUEST FROM THE OWNER SHALL PREPARE A WRITTEN PROPOSAL DESCRIBING THE CHANGE IN WORK OR MATERIALS AND ANY CHANGES IN THE CONTRACT AMOUNT AND PRESENT TO THE OWNER WITHIN 72 HRS FOR APPROVAL. SUBMIT REQUESTS FOR SUBSTITUTIONS IN THE FORM AND IN ACCORDANCE WITH PROCEDURES REQUIRED FOR CHANGE ORDER PROPOSALS. ANY CHANGES IN SCOPE OF WORK OR MATERIALS WHICH ARE PERFORMED BY THE CONTRACTOR WITHOUT A WRITTEN CHANGE ORDER AS DESCRIBED AND APPROVED BY THE OWNER SHALL PLACE FULL RESPONSIBILITY OF THESE ACTIONS ON THE CONTRACTOR.

1.7 RELATED DOCUMENTS AND COORDINATION

GENERAL NOTES, CIVIL, STRUCTURAL, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED. IN PERFORMANCE OF THE WORK; THE CONTRACTOR MUST REFER TO ALL DRAWINGS. ALL COORDINATION TO BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.8 SHOP DRAWINGS

A. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR APPROVAL.

B. ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER.

1.9 PRODUCTS AND SUBSTITUTIONS

A. SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION. IN EACH REQUEST IDENTIFY THE PRODUCT OR FABRICATION OR INSTALLATION METHOD TO BE REPLACED BY THE SUBSTITUTION. INCLUDE RELATED SPECIFICATION SECTION AND DRAWING NUMBERS AND COMPLETE DOCUMENTATION SHOWING COMPLIANCE WITH THE REQUIREMENTS FOR SUBSTITUTIONS.

B. SUBMIT ALL NECESSARY PRODUCT DATA AND CUT SHEETS WHICH PROPERLY INDICATE AND DESCRIBE THE ITEMS, PRODUCTS AND MATERIALS BEING INSTALLED. THE CONTRACTOR SHALL, IF DEEMED NECESSARY BY THE OWNER SUBMIT ACTUAL SAMPLES TO THE OWNER FOR APPROVAL IN LIEU OF CUT SHEETS.

1.10 QUALITY ASSURANCE

ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE BUT NOT BE LIMITED TO THE LATEST VERSION OF THE FOLLOWING:

ANSI/EIA – 222 – G
INTERNATIONAL BUILDING CODE: 2012 IBC
ELECTRICAL CODE: 2014 NEC
UNDERWRITER LABORATORIES APPROVED ELECTRICAL PRODUCTS
AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
LIFE SAFETY CODE NFPA – 101–2012

1.11 ADMINISTRATION

A. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.

B. SUBMIT A BAR TYPE PROGRESS CHART NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK ON THE SCHEDULE, INDICATING A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK AND SHOWING COMPLETION OF THE WORK SUFFICIENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.

- C. PRIOR TO COMMENCING CONSTRUCTION, THE OWNER SHALL SCHEDULE AN ON–SITE MEETING WITH ALL MAJOR PARTIES. THIS WOULD INCLUDE (THOUGH NOT LIMITED TO) THE OWNER, PROJECT MANAGER, CONTRACTOR, LAND OWNER REPRESENTATIVE, LOCAL TELEPHONE COMPANY, TOWER ERECTION FOREMAN (IF SUBCONTRACTED).
- D. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A BEEPER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY THE OWNER, NOR WILL WIRELESS SERVICE BE ARRANGED.
- E. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES. CONTRACTOR WILL COMPLY WITH ALL SAFETY REQUIREMENTS IN THEIR AGREEMENT.
- F. PROVIDE WRITTEN DAILY UPDATES ON SITE PROGRESS TO THE OWNER.
- G. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.
- H. NOTIFY THE OWNER / PROJECT MANAGER IN WRITING NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND EQUIPMENT CABINET PLACEMENTS.
- 1.12 INSURANCE AND BONDS
- A. CONTRACTOR SHALL AT THEIR OWN EXPENSE CARRY AND MAINTAIN FOR THE DURATION OF THE PROJECT ALL INSURANCE AS REQUIRED AND LISTED AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE STATING ALL COVERAGES TO THE OWNER. REFER TO THE MASTER AGREEMENT FOR REQUIRED INSURANCE LIMITS.
- B. THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES.
- C. CONTRACTOR MUST PROVIDE PROOF OF INSURANCE.

DIVISION 13 – SPECIAL CONSTRUCTION

13100 TOWER & ANTENNA INSTALLATION

PART 1 – GENERAL

- 1.1 WORK INCLUDED
- A. INSTALL ANTENNAE AS INDICATED ON DRAWINGS AND OWNER SPECIFICATIONS.
- B. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.
- C. SUPPLY AND INSTALL ONE ISOLATED GROUND BAR AT EQUIPMENT CABINET.
- D. SUPPLY AND INSTALL GROUNDING STRAP KITS WITH LONG BARREL COMPRESSION LUGS (SIM. TO ANDREW–223700TBD OR APPROVED EQUAL) ATOP TOWER BASE BEFORE ENTERING THE EQUIPMENT. GROUNDING STRAPS TO BE CONNECTED TO INSULATED GROUND BAR.
- E. ASSIST OWNER TECHNICIANS IN PERFORMING SWEEP TEST OF INSTALLED COAX.
- 1.2 REQUIREMENTS OF REGULATORY AGENCIES
- A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE, INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.
- B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
- 1.3 APPLICABLE STANDARDS
- A. EIA – ELECTRONIC INDUSTRIES ASSOCIATION EIA/TIA–222 – G STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

- B. FAA – FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460–IH, OBSTRUCTION MARKING AND LIGHTING.
- C. FCC – FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.
- D. AISC – AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.
- E. NATIONAL ELECTRIC CODE, 2014 – ON TOWER LIGHTING KITS.
- F. UL – UNDERWRITER’S LABORATORIES APPROVED ELECTRICAL PRODUCTS.
- G. IN ALL CASES, PART 77 OR THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.
- H. LIFE SAFETY CODE NFPA – 101–1997.

DIVISION 16 – GENERAL ELECTRIC

GENERAL ELECTRICAL PROVISION

1. SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT.
2. CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATION TEST, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ARCHITECT LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.
3. HEIGHTS SHALL BE VERIFIED WITH OWNER PRIOR TO INSTALLATION.
4. THESE PLANS ARE DIAGRAMMATIC ONLY, FOLLOW AS CLOSELY AS POSSIBLE.
5. ELECTRICAL SERVICE SHALL BE 120/240 VAC SINGLE PHASE 3 WIRE 200 AMP SERVICE
6. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULL BOX, J–BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.).
7. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
8. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED "J" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF THE DIVISION OF INDUSTRIAL SAFETY AND ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.
9. ALL CONDUIT INSTALLED SHALL BE SURFACE MOUNTED OR DIRECT BURIAL UNLESS OTHERWISE NOTED.
10. CONTRACTOR SHALL CARRY OUT THEIR WORK IN ACCORDANCE WITH ALL GOVERNING STATE,COUNTY AND LOCAL CODES AND O.S.H.A.
11. CONTRACTOR SHALL SECURE ALL NECESSARY BUILDING PERMITS AND PAY ALL REQUIRED FEES.
12. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF JOB ACCEPTANCE BY OWNER. ANY WORK, MATERIAL OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR.
13. ALL CONDUIT ONLY SHALL HAVE A PULL WIRE OR ROPE.
14. PROVIDE PROJECT MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS AND CIRCUITS.

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WISCONSIN

SEEMESH M. SETHI

35270-006

SCHAUMBURG ILLINOIS

PROFESSIONAL ENGINEER

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VILLAGE OF WILLIAMS BAY

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Phone: 262-245-2700 | Fax: 262-245-2705

UNOFFICIAL MINUTES STREETS AND HIGHWAYS COMMITTEE MONDAY, FEBRUARY 10, 2021 AT 6:30 PM VIA TELECONFERENCE

Call to Order

Meeting was called to order by Trustee McMannamy at 8:38pm.

Roll Call

Trustees McMannamy, Vlach and Umans

Also Present: President Duncan, Trustees D'Alessandro, Parker, Wright, Interim Administrator Bretl, Treasurer Peternell, Public Works Director Edwards, Police Chief Timm, Recreation Director Rowland, Engineer Snyder and Michael O'Brien.

Meeting Minutes

Vlach/Umans motion to approve meeting minutes of January 13, 2021. Unanimously carried.

Adjourn

Umans/Vlach motion to adjourn at 8:39pm. Unanimously carried.

/s/ Lori Peternell, Village Treasurer

These are not official minutes until approved by the Streets & Highways Committee

March 3, 2021

Dave Bretl, Administrator
Village of Williams Bay
250 Williams Street
Williams Bay, WI 53191

Subject: Culvert Installation – 7 Cedar Point Drive

Dear Mr. Bretl,

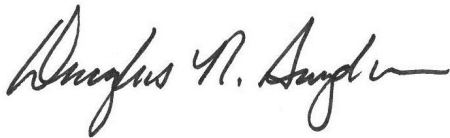
As required by the enclosed developer agreement, we observed the construction of the culvert installation under the public roadway at 7 Cedar Point Drive. Enclosed is a final lien waiver from RJ Underground, contractor for the developer, product information on the culvert end sections, photos of the upstream and downstream ends of the installation, a note from the developer that the installation appears to be operating properly, and record drawings for the installation.

Please verify that recorded easements exist for 7 Cedar Point Drive and 14 Cedar Point Drive prior to acceptance.

We recommend that the Village accept the culvert installation and release the guarantee to the Developer.

Sincerely,

BAXTER & WOODMAN, INC.
CONSULTING ENGINEERS



Douglas R. Snyder, P.E.

DRS/drs
Encs.

C: Michael Rutkowski, Developer
Wayne Edwards, DPW

I:\CRYSTAL LAKE\WLMSV\191098- 7 CEDAR POINT DR\CONSTRUCTION\RECOMMENDATION TO ACCEPT FINAL INSTALLATION.DOC

FINAL WAIVER OF LIEN

STATE OF WISCONSIN
COUNTY OF KENOSHA

TO WHOM IT MAY CONCERN:

WHEREAS the undersigned has been employed by

to furnish
for the premises known as
of which

Miller Morgan LLC

Directional Drilling

Williams Bay 12" Culvert

Village of Williams Bay

is the Owner.

THE undersigned, for and in consideration of

Twenty Thousand 00/100

(\$ 20,000.00) Dollars, and other good and valuable considerations, the receipt whereof is hereby acknowledged

does hereby waive and release any and all lien, or claim of lien, or right to lien, with respect to and on the above described premises, and the improvements thereon, and on the material, fixtures, apparatus or machinery furnished, and on the monies, funds or other consideration due or to become due from the Owner, on account of labor, services, material, fixtures, apparatus or machinery, heretofore furnished, by the undersigned for the above-described premises, INCLUDING EXTRAS.*

2/2/2021

Signature and Seal:

Company Name & Address: RJ Underground Inc., 5330 50th Street, Ste 200, Kenosha, WI 53144

* EXTRAS INCLUDE BUT ARE NOT LIMITED TO CHANGE ORDERS, BOTH ORAL AND WRITTEN, TO THE CONTRACT

CONTRACTOR'S AFFIDAVIT

STATE OF WISCONSIN
COUNTY OF KENOSHA

TO WHOM IT MAY CONCERN:

The undersigned (NAME) Michael McCormick

being duly sworn, deposes and says that he is (position) Vice President

of the (Company) RJ Underground, Inc

who is the contractor furnishing Directional Drilling

work on the building located at Williams Bay 12" Culvert

owned by Village of Williams Bay

That the total amount of the contract including extras* is \$ 20,000.00

on which he has received payment of

\$ -

prior to this payment. That all waivers are true, correct and genuine and

delivered unconditionally and that there is no claim either legal or equitable to defeat the validity of said waivers. That the following are the names and address of all parties who have furnished material or labor, or both, for said work and all parties having contracts for specific portions of said work or for material entering into the construction thereof and the amount due or to become due to each, and that the items mentioned include all labor and material required to complete said work according to plans and specifications:

NAMES AND ADDRESS	WHAT FOR	CONTRACT PRICE	AMOUNT PAID	THIS PAYMENT	BALANCE DUE
RJ Underground, Inc	Directional Drilling	\$ 20,000.00	\$ -	\$ 20,000.00	\$ -
TOTAL LABOR AND MATERIAL INCLUDING EXTRAS* TO COMPLETE		\$ 20,000.00	\$ -	\$ 20,000.00	\$ -

That there are no other contracts for said work outstanding, and that there is nothing due or to become due to any person for material, labor or other work of any kind done or to be done upon or in connection with said work other than above stated.

Signed this

2

day of

February

2021

Signature:

Subscribed and sworn to before me this

2

day of

February

2021

Signature:

Notary Signature & Seal

* EXTRAS INCLUDE BUT ARE NOT LIMITED TO
CHANGE ORDERS, BOTH ORAL AND WRITTEN, TO
THE CONTRACT

FINAL WAIVER OF LIEN

STATE OF WISCONSIN
COUNTY OF KENOSHA

TO WHOM IT MAY CONCERN:

WHEREAS the undersigned has been employed by Miller Morgan LLC
to furnish Directional Drilling
for the premises known as 7 Cedar Point Drive
of which Michael & Mark Rutowski is the Owner.

THE undersigned, for and in consideration of Twenty Thousand 00/100
(\$ 20,000.00) Dollars, and other good and valuable considerations, the receipt whereof is hereby acknowledged ,

does hereby waive and release any and all lien, or claim of lien, or right to lien, with respect to and on the above described premises, and the improvements thereon, and on the material, fixtures, apparatus or machinery furnished, and on the monies, funds or other consideration due or to become due from the Owner, on account of labor, services, material, fixtures, apparatus or machinery, heretofore furnished, by the undersigned for the above-described premises, INCLUDING EXTRAS.*

2/2/2021

Signature and Seal:

Company Name & Address: RJ Underground Inc., 5330 50th Street, Ste 200, Kenosha, WI 53144

* EXTRAS INCLUDE BUT ARE NOT LIMITED TO CHANGE ORDERS, BOTH ORAL AND WRITTEN, TO THE CONTRACT

CONTRACTOR'S AFFIDAVIT

STATE OF WISCONSIN
COUNTY OF KENOSHA

TO WHOM IT MAY CONCERN:

The undersigned (NAME) Michael McCormick
being duly sworn, deposes and says that he is (position) Vice President
of the (Company) RJ Underground, Inc
who is the contractor furnishing Directional Drilling
work on the building located at 7 Cedar Point Drive
owned by Michael & Mark Rutowski

That the total amount of the contract including extras* is \$ 20,000.00
on which he has received payment of \$ - prior to this payment. That all waivers are true, correct and genuine and delivered unconditionally and that there is no claim either legal or equitable to defeat the validity of said waivers. That the following are the names and address of all parties who have furnished material or labor, or both, for said work and all parties having contracts for specific portions of said work or for material entering into the construction thereof and the amount due or to become due to each, and that the items mentioned include all labor and material required to complete said work according to plans and specifications:

NAMES AND ADDRESS	WHAT FOR	CONTRACT PRICE	AMOUNT PAID	THIS PAYMENT	BALANCE DUE
RJ Underground, Inc	Directional Drilling	\$ 20,000.00	\$ -	\$ 20,000.00	\$ -
TOTAL LABOR AND MATERIAL INCLUDING EXTRAS* TO COMPLETE		\$ 20,000.00	\$ -	\$ 20,000.00	\$ -

That there are no other contracts for said work outstanding, and that there is nothing due or to become due to any person for material, labor or other work of any kind done or to be done upon or in connection with said work other than above stated.

Signed this 2 day of February 2021

Signature: [Signature]

Subscribed and sworn to before me this 2 day of February 2021

Signature: [Signature]

Notary Signature & Seal

* EXTRAS INCLUDE BUT ARE NOT LIMITED TO CHANGE ORDERS, BOTH ORAL AND WRITTEN, TO THE CONTRACT

FINAL WAIVER OF LIEN

STATE OF WISCONSIN
COUNTY OF KENOSHA

TO WHOM IT MAY CONCERN:

WHEREAS the undersigned has been employed by Miller Morgan LLC
to furnish Directional Drilling
for the premises known as 14 Cedar Point Drive
of which Miller Morgan LLC is the Owner.

THE undersigned, for and in consideration of Twenty Thousand 00/100
(\$ 20,000.00) Dollars, and other good and valuable considerations, the receipt whereof is hereby acknowledged ,

does hereby waive and release any and all lien, or claim of lien, or right to lien, with respect to and on the above described premises, and the improvements thereon, and on the material, fixtures, apparatus or machinery furnished, and on the monies, funds or other consideration due or to become due from the Owner, on account of labor, services, material, fixtures, apparatus or machinery, heretofore furnished, by the undersigned for the above-described premises, INCLUDING EXTRAS.*

2/2/2021

Signature and Seal:

Company Name & Address: RJ Underground Inc., 5330 50th Street, Ste 200, Kenosha, WI 53144

* EXTRAS INCLUDE BUT ARE NOT LIMITED TO CHANGE ORDERS, BOTH ORAL AND WRITTEN, TO THE CONTRACT

CONTRACTOR'S AFFIDAVIT

STATE OF WISCONSIN
COUNTY OF KENOSHA

TO WHOM IT MAY CONCERN:

The undersigned (NAME) Michael McCormick
being duly sworn, deposes and says that he is (position) Vice President
of the (Company) RJ Underground, Inc
who is the contractor furnishing Directional Drilling
work on the building located at 14 Cedar Point Drive
owned by Miller Morgan LLC

That the total amount of the contract including extras* is \$ 20,000.00
on which he has received payment of \$ - prior to this payment. That all waivers are true, correct and genuine and delivered unconditionally and that there is no claim either legal or equitable to defeat the validity of said waivers. That the following are the names and address of all parties who have furnished material or labor, or both, for said work and all parties having contracts for specific portions of said work or for material entering into the construction thereof and the amount due or to become due to each, and that the items mentioned include all labor and material required to complete said work according to plans and specifications:

NAMES AND ADDRESS	WHAT FOR	CONTRACT PRICE	AMOUNT PAID	THIS PAYMENT	BALANCE DUE
RJ Underground, Inc	Directional Drilling	\$ 20,000.00	\$ -	\$ 20,000.00	\$ -
TOTAL LABOR AND MATERIAL INCLUDING EXTRAS* TO COMPLETE		\$ 20,000.00	\$ -	\$ 20,000.00	\$ -

That there are no other contracts for said work outstanding, and that there is nothing due or to become due to any person for material, labor or other work of any kind done or to be done upon or in connection with said work other than above stated.

Signed this 2 day of February 2021

Signature:

Subscribed and sworn to before me this 2 day of February 2021

Signature:

Notary Signature & Seal

* EXTRAS INCLUDE BUT ARE NOT LIMITED TO
CHANGE ORDERS, BOTH ORAL AND WRITTEN, TO
THE CONTRACT



WS-1212-6235



Douglas R. Snyder

From: Michael Rutkowski <mrutkowski@condomanagement.com>
Sent: Tuesday, March 2, 2021 7:37 PM
To: Douglas R. Snyder
Cc: Village Administrator
Subject: Re: Culvert Deposit

None that I am aware of.

Kind Regards,

Michael E. Rutkowski | President | First Community Management | 312.829.8900

> On Mar 2, 2021, at 6:03 PM, Douglas R. Snyder <dsnyder@baxterwoodman.com> wrote:

>

> Mike,

> I need to get my recommendation for acceptance in front of committee yet. Are there any issues with the function that you are aware of?

>

> Doug

>

> Sent from my iPhone

>

>> On Mar 2, 2021, at 4:22 PM, Michael Rutkowski <mrutkowski@condomanagement.com> wrote:

>>

>> Can either of you give me an ETA on the return of my \$30,000 deposit or let me know if there is something I need to do to make it happen?

>>

>> Kind Regards,

>>

>> Michael E. Rutkowski | President | First Community Management | 312.829.8900



Steel end section with trash guard.



STEEL END SECTIONS FOR HDPE

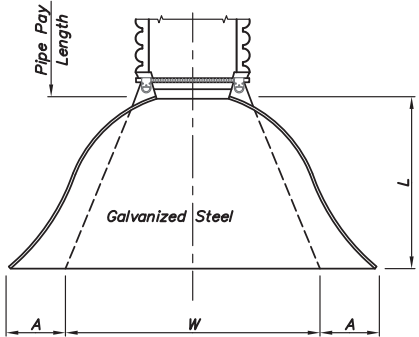


END SECTIONS FOR HDPE PIPE								
Dia.	Gauge	Weight	* A	* H	* L	* W	Slope	Overall Width
6"	18	10	4	3	8	12	2	20"
8"	18	14	5 3/4	4	14 1/2	16	2 1/4	27 1/2"
10"	18	17	7 5/8	6	14 1/2	20	2 1/2	35 1/4"
12"	16	25	7	6	21	24	2 1/2	38"
15"	16	33	8	6	26	30	2 1/2	46"
18"	16	42	8	6	31	36	2 1/2	52"
21"	16	49	9	6	36	42	2 1/2	60"
24"	16	65	10	6	41	48	2 1/2	68"
30"	14	123	12	8	51	60	2 1/2	84"
36"	14	135	14	9	60	72	2 1/2	100"
42"	12	320	16	11	69	84	2 1/2	116"
48"	12	375	18	12	78	90	2 1/4	126"
54"	12	440	18	12	84	102	2 1/4	138"
60"	12/10	610	18	12	87	114	2	150"

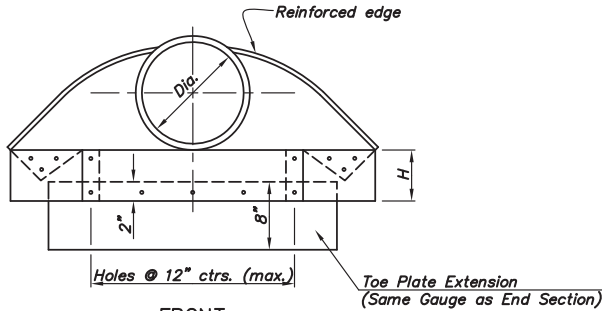
Toe plate extensions where specified, to be punched to match holes in apron lip. 3/8" bolts to be furnished. The length of toe plate to be as follows: W + 10" for 12" to 30" diameter pipes inclusive. W + 20" for 36" to 60" diameter pipes inclusive.

Multiple panel end sections shall have lap seams which are to be tightly jointed by bolts. Corner plate, and toe plate to be same gauge as end section.

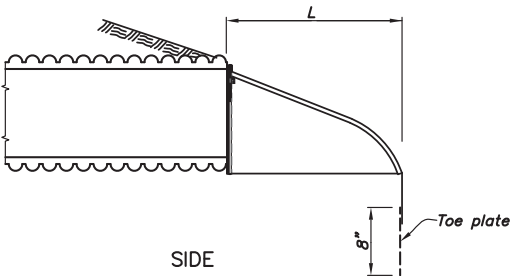
* - Dimensions in Inches Plus or Minus Standard Shop Tolerance.



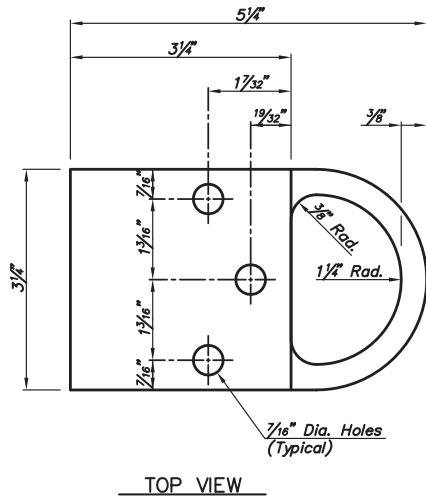
PLAN



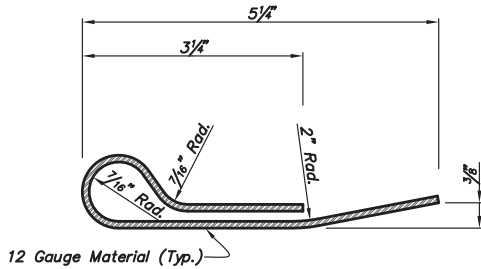
FRONT



SIDE

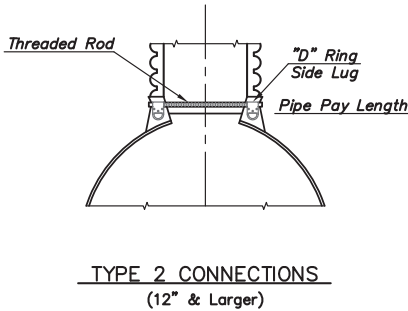


TOP VIEW



SIDE VIEW

"D" RING SIDE LUG
TYPE 2 ATTACHMENT DETAILS



No.	Date	Revisions
STANDARD END SECTION FOR HDPE PIPES		

INSTALLATION OF STEEL END SECTIONS ON HDPE PIPE

Steel end sections for HDPE pipe will be supplied with a type 2 rod connection. This connection consists of a threaded rod with two flanged nuts.

The "D-Ring" side lug on the steel end section will prove to be very useful during the installation process. The "D-Ring" can be used when lifting or moving the end section and it will be instrumental in pulling the top of the end section snugly onto the HDPE.

Upon delivery the "D-Ring" will be nearly flush against the ears of the end section. The "D-Ring" on each side lug can be easily bent up with the use of ordinary tools. Once the "D-Ring" is bent up, install the end section on the first corrugation of the HDPE pipe. With the steel end section in place and the floor of the end section level use a come-along. The hooks of the come-along should be inserted into the "D-Rings". When you begin tightening, the ears of the end section will move closer together. It's important you do not over-tighten - just make the fit snug.

When you have achieved a snug fit, insert the threaded rod through the 3/4" hole on each side lug. After making sure the rod rests in the corrugation of the HDPE, tighten the flanged nuts on the ends of the rod. When the end section is securely installed remove the come-along.



Specifications: the material used in manufacturing steel end sections was fabricated in compliance with the specification requirements of AASHTO M218, AASHTO M36 and the State Highway Department. The manufacture conforms to "BUY AMERICA" using only domestic steel.

**DEVELOPMENT AGREEMENT FOR
STORM WATER/SURFACE WATER DRAINAGE SYSTEM**

This Agreement made this 23RD day of DECEMBER, 2020 between Michael Rutkowski and Mark Rutkowski hereinafter called "Developer," Miller Morgan Co., LLC, hereinafter called "LLC" and the Village of Williams Bay, a Municipal Corporation of the State of Wisconsin, located in Walworth County, hereinafter called the "Village".

WHEREAS, Developer is the owner of land in the Village, hereinafter called "Parcel 1," which is described as follows:

Tax Parcel Number WCP 00002:

Lot 2 and the N. ½ of Lot 3 of Cedar Point Park, according to the recorded plat thereof to the Village of Williams Bay, Walworth County, Wisconsin.

WHEREAS, LLC is the owner of land in the Village, hereinafter called "Parcel 2," which is described as follows:

Tax Parcel Number WCP2 00001:

Lot 101 of Second Addition Cedar Point Park, according to the recorded plat thereof to the Village of Williams Bay, Walworth County, Wisconsin.

WHEREAS, Developer desires to develop Parcel 1; and

WHEREAS, the development of Parcel 1 requires the design and construction of a storm water/surface water drainage system including the installation of a culvert under Cedar Point Drive in order to facilitate the movement of storm water/surface water from Parcel 1 to Parcel 2; and

WHEREAS, the Village is willing to facilitate the design and construction of a storm water/surface water drainage system to enable the development of Parcel 1 pursuant to the terms of this Agreement.

NOW, THEREFORE, it is hereby agreed by and between Developer and LLC and the Village as follows:

I. Storm Water/Surface Water Drainage

The Developer agrees to construct, install, furnish and provide adequate facilities for storm and surface water drainage from Parcel 1 to Parcel 2 in accordance with the plans and specifications designed and prepared by the engineer retained by Developer. The plans and specifications will be subject to review and approval of the Village Engineer. This shall include but is not limited to the installation of a culvert under Cedar Point Drive to convey surface water from Parcel 1 to Parcel 2. The construction of all such facilities shall be subject to inspection and final approval of the Village Engineer.

II. Conveyance of Easements

Upon final approval of the storm and surface water drainage facilities by the Village Engineer, the Developer and LLC agree to convey to the Village storm water/surface water facility easements for Parcel 1 and Parcel 2 in the form as set forth in Exhibits 1 and 2 attached to this Agreement. Said easements shall provide the Village with the authority to maintain the storm and surface water drainage system located on Parcel 1 and Parcel 2.

III. Dedication/Security

Subject to all of the other provisions of this Agreement, Developer shall, without charge to the Village, upon completion of the above described storm and surface water improvements, convey and dedicate to the Village the culvert installed under Cedar Point Drive. The culvert shall be conveyed free and clear of all encumbrances whatsoever together with any and all necessary easements for access thereto. Further, Developer agrees to file with the Village either an irrevocable letter of credit from a lending institution approved by the Village or a certified check or other cash equivalent (Security) prior to the commencement of construction of the storm and surface water system including the installation of the culvert, in the amount of \$30,000. No construction shall commence until such Security is on file with the Village. Dedication shall not constitute acceptance of any improvement by the Village. The improvements will be accepted by the Village by separate resolution at such time as said improvements are in an acceptable form in accordance with the Village specifications after the issuance of an appropriate letter of acceptance by the Village Engineer.

If at any time the Developer is in default of any aspect of this Agreement or does not complete the installation of all storm and surface water improvements within one year from the Village's acceptance of the Security, or the Security on file with the Village is stated to expire within 60 days and the same has not been extended, renewed or replaced, the Developer shall be deemed in violation of this Agreement and the Village shall have authority to draw upon the Security. In the event that the Village is unable to draw upon the Security, in whole or in part, the Village shall provide written notice to the Developer, who shall have 72 hours to remedy the violation. Failure to remedy the violation shall result in the Village having the power in addition to its other remedies, without notice or hearing, to impose special assessments in the amount of the cost of completion of the improvements, upon Parcel 1 and Parcel 2 payable in the next succeeding tax roll. The Village will not release the Security until the Village approves the improvement work.

IV. Reimbursement of Village Costs

As a part of the anticipated \$30,000 budget for the storm and surface water improvements, Developer agrees to reimburse the Village for any costs incurred by the Village for engineering, inspection, administrative and legal expenses in connection with this Agreement.

- A. Engineering and administrative costs shall be based on regular Village pay rates plus the hourly rate for overhead and fringe benefits for any time actually spent on administering this Agreement. Any costs for outside consultants shall be charged at the rate the consultant charges the Village.
- B. Legal costs shall be based on the statements of the Village Attorney with no overhead added by the Village.

V. General Indemnity

Developer shall indemnify and save harmless the Village, its officers, agents, independent contractors and employees and shall defend the same from and against any and all liability, claims, losses, damages, interests, actions, suits, judgments, costs, expenses and attorney fees and the like to whomever owed and by whomever and whenever brought or maintained that result from or arise in the cause of, out of, or as a result of, the acts or omissions of Developer or its contractors in the performance of this Agreement.

VI. General Conditions

All provisions of the Village's ordinances are incorporated herein by reference, and all such provisions shall bind the parties hereto and be a part of this Agreement as if set forth in full herein. This Agreement and all work and improvements shall be performed and carried out in strict accordance with and subject to the provisions of said ordinances.

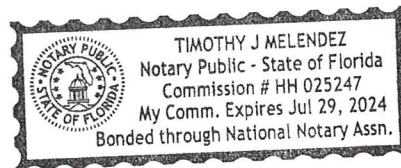
IN WITNESS WHEREOF, Developer has caused this Agreement to be signed this 15 day of December, 2020.

By: Mark Rutkowski
Mark Rutkowski

By: Michael Rutkowski
Michael Rutkowski

Subscribed and sworn to before me this 15th day of December, 2020

Notary Public, Florida, County, Pinellas
My commission expires: 07/29/2024



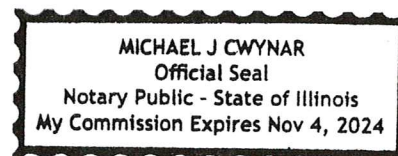
IN WITNESS WHEREOF, LLC has caused this Agreement to be signed this 23rd day of December, 2020

MILLER MORGAN CO., LLC

By: Michael E. Rutkowski
MICHAEL E. RUTKOWSKI, Member

Subscribed and sworn to before me this 23rd day of December, 2020

Michael J. Cwynar
Notary Public, Illinois County, Cook
My commission expires: Nov 4th 2024



Accepted pursuant to resolution adopted by the Village Board of the Village of Williams Bay
this 4th day of January, 2021.

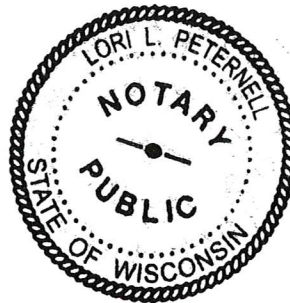
VILLAGE OF WILLIAMS BAY

By: William B Duncan
William Duncan, Village President

ATTEST

By: Jackelyn Pankau
Jackelyn Pankau, Clerk

Subscribed and sworn to before me this
4th day of January, 2021.
Lori L. Peterzell
Notary Public, Walworth County, Wisconsin
My commission expires 5-19-2021





VILLAGE OF WILLIAMS BAY

250 Williams Street | PO Box 580 | Williams Bay | WI | 53191 | williamsbay.org
Phone: 262-245-2700 | Fax: 262-245-2705

UNOFFICIAL MINUTES PARKS AND LAKEFRONT COMMITTEE MONDAY, FEBRUARY 10, 2020 AT 6:30 PM VIA ZOOM WEBINAR

Call to Order

Meeting was called to order by Chairman D'Alessandro at 6:30pm

Roll Call

Present: Trustees D'Alessandro, McMannamy and Wright

Also Present: President Duncan, Trustees Parker and Umans, Interim Administrator Bretl, Treasurer Peternell, Public Works Director Edwards, Police Chief Timm, Recreation Director Rowland and Lions Club Representative Jess Haak.

Meeting Minutes

Wright/McMannamy motion to approve meeting minutes of January 13, 2021. Unanimously carried.

Lions Club Edgewater Park Request

Jess Haak was present to discuss the Lions Club Edgewater Park application for the 2021 Corn & Brat festival. They are requesting the street to be shut down in front of Edgewater Park so that they can expand the footprint of the event to provide social distancing. After lengthy discussion, it was the consensus of the Committee to send the street closure request to the Protective Services Committee for discussion and recommendation. No action taken.

OWL (Video Conference System) set-up and procedure

It was the consensus of the Committee to setup a mock meeting prior to March 3rd to test the system.

Dog Park rules and procedures review

Discussion was held regarding the proposed rules and procedure, no action taken

Preliminary discussion of beach rules

Staff was seeking direction of what the beach rules for 2021 will be as we are approaching the time of year when tags and other beach items will be available for sale. It was the consensus of the Committee to purchase daily wrist bands (if needed) and begin selling to residents and when they are available and hold off on selling to Town of Linn and non-residents at this time. Further decision will be held at a later meeting.

Adjourn

Wright/D'Alessandro motion to adjourn at 7:35pm. Unanimously carried.

/s/ Lori Peternell, Village Treasurer

These are not official minutes until approved by the Parks and Lakefront Committee



VILLAGE OF WILLIAMS BAY

250 Williams Street | PO Box 580 | Williams Bay | WI | 53191 | williamsbay.org
Phone: 262-245-2700 | Fax: 262-245-2705

UNOFFICIAL MINUTES PARKS AND LAKEFRONT COMMITTEE MONDAY, FEBRUARY 15, 2021 AT 6:45 PM VIA ZOOM WEBINAR

Call to Order

Meeting was called to order by Chairman D'Alessandro at 6:45pm

Roll Call

Present: Trustees D'Alessandro, McMannamy and Wright

Also Present: President Duncan, Trustees Parker and Vlach, Interim Administrator Bretl, Treasurer Peternell and Police Chief Timm.

Opening of Village Hall for Customer Counter Service

Discussion was held regarding opening the Village Hall for customer counter service at the Administration Offices and the Police Department. D'Alessandro stated that he discussed it with staff and was told that with the office renovations staff felt that it could be done safely. Wright/McMannamy motion to recommend Village Board approval of opening the Village Hall for customer counter service. Unanimously carried.

Adjourn

Wright/McMannamy motion to adjourn at 6:50pm. Unanimously carried.

/s/ Lori Peternell, Village Treasurer

These are not official minutes until approved by the Parks and Lakefront Committee

February 4, 2021

Village of Williams Bay | 250 Williams Street | PO Box 580 | Williams Bay | WI | 53191

Parks and Lakefront Committee,

To introduce myself, I am Jess Haak, chairman of the Lions Corn and Brat Committee. The Club has decided to tentatively proceed with the Corn and Brat festival in 2021. There is still the possibility that the festival could be cancelled given our current regulations, but we are moving forward with all of our permitting and contracts in an effort to be prepared in the event that the festival moves forward.

In an effort to minimize the close contact protocol, we would like to request for the street to be shut down in front of Edgewater Park in order to expand our footprint and provide more social distancing opportunities. In years past the beer tent has had a stationary bar service area. Our desire is to have several smaller satellite bar service areas to eliminate crowding. We still plan to fence off the perimeter of the overall space in accordance to the standards from years past. As well as security and wristband requirements.

We have been in communication with the LaCroix's in regards to how this will affect their businesses, and they have expressed their support for this new format.

Another benefit of the street shut down, is the alleviation of the traffic congestion that typically take place around the event. We plan on continuing the satellite parking and shuttle service to and from the high school.

We appreciate your consideration in this matter. If you have any further questions please feel free to contact me on my cell phone at 262.749.6563. We look forward to working with the Village towards a successful and safe event for the community.

Jess Haak



EDGEWATER PARK USE AND POLICY CONTRACT

The Village of Williams Bay will allow use of the park, shelter building, some park equipment, electricity, water and sewer, natural gas and waiver of alcoholic beverage license fees.

IN RETURN THE UNDERSIGNED AGREES TO THE FOLLOWING:

- 1) You must specify, in writing, your purpose for using the park with date and time requested and documentation for the event a minimum of four (4) weeks prior to the event.
- 2) Organizations requesting the park must be non-profit, civic-minded Williams Bay based groups or have a constituency composed primarily of Williams Bay residents. Organization must also possess liability and worker's compensation insurance as required by the Village Board for your particular event.
- 3) A Five Hundred Dollar (\$500.00) refundable deposit shall accompany this signed contract to assure compliance with the following rules governing use of the park
- 4) Organization using the Park agrees to repair or replace any items broken, stolen or lost, such as mops, brooms or cleaning equipment; lights or bathroom fixtures, lawn turf, etc. during the time the Park is used.
- 5) Organization using the Park must keep the park clean and orderly during your event, including allowing others to freely access the park and the bathrooms. Also, agrees to pick up litter as it accumulates and clean rest rooms during the time of your event. All clean up must be performed by 10:00 AM of the day following the event unless specifically changed by the Village Administrator.
- 7) Organization must supply chairs, garbage receptacles and dumpster and must be responsible for removing trash and garbage at close of event and to leave that portion of the park in a clean manner. All park tables shall be returned to their original placement in the park.
- 8) These rules apply to beer and/or wine sales. Beer and/or Wine requests must be submitted to the Village Clerk a minimum of four (4) weeks prior to the event
 - a) Use of alcoholic beverages on village property is prohibited. However, when fermented malt beverages and/or wine are to be sold and/or served at any event authorized by the village board, a valid license shall be obtained and the provisions of village ordinance Chapter 8.01 shall be in full compliance. The license must be held by the person who filed the original application and shall be presented to any law enforcement officer upon request. Prior to the issuance of a license, the applicant must attend a pre-event informational meeting to be held prior to the Village Board meeting preceding this event with the Chief of Police and the Director of Public Works. This meeting is required as specific requirements are to be met for license approval that will be outlined and reviewed.
 - b) It is expected that an organization issued such a license will post in one or more conspicuous locations, including sales outlet, signs disclosing that no fermented malt beverages or wine will be served to any underage person or any person without adequate age identification.
 - c) A fence is to be installed around the licensed premises to control ingress and egress with designated personnel posted at the entrance for the purpose of checking age identification.
 - d) No underage person is allowed to assist in the sale of beer and/or wine, nor are they allowed to loiter in the area of beer/wine sales.

Applicant initials

J.H.



Page 2 EDGEWATER PARK USE AND POLICY CONTRACT

e) There shall be one point of sale only. Licensee shall comply with regulations specified in Wisconsin Statutes for Class "B" licenses

f) A list of those serving alcoholic beverages at this event must accompany this contract.

9) All group members must be informed and agree to abide by these rules prior to the occurrence of the event.

After approval of a park request has been granted, the Village Board, Village Administrator, Chief of Police, or Public Works Director may revoke same if it is deemed that such action is justified by an actual or potential emergency due to weather, fire, riot, administrative or clerical error or likelihood of a breach of the peace.

The applicant agrees by signing this Park Application that the security deposit, when required, shall be held by the Village of Williams Bay, and may be applied to property damage to the premises resulting during the time of the activity or may be forfeited as a result of police action required at the activity. The Village may also seek further action to recover damages to the occupied premises. The applicant agrees not to use the premises for any unlawful activity including those posted in the parks, and also agrees to abide by park rules, regulations and ordinances of the Village of Williams Bay.

The applicant agrees to indemnify the Village and hold it harmless for all expenses, liability and claims of any kind arising out of harm to or activities of attendees to the event. For certain events, the Village may require the applicant to file evidence of insurance in force or other evidence of adequate financial responsibility. The Village may also require the applicant to provide trained security personnel at the event.

Indemnification:

Prior to approving any application for reserved use of any village facility, the village may require the applicant to file evidence of good and sufficient sureties, insurance in force or other evidence of adequate financial responsibility, protecting third parties as may be injured or damaged and naming the Village of Williams Bay as an additional insured, in any amount depending upon the likelihood of injury or damage as a direct and proximate result of the reserved use sufficient to indemnify the Village and such third parties as may be injured or damaged thereby, caused by the applicant, its agents or participants.

General Information

Name: Jess Hark Organization: W. Bay Lions Club

Address: [REDACTED]

Phone: [REDACTED] Email: [REDACTED]

Date requested: 8.13-15/2021 Is event open to public? (circle one) yes no

Contact Information (if different than above)

Name: _____ Organization: _____

Address: _____

Phone: _____ Email: _____

Applicant initials J.H.



Page 3 EDGEWATER PARK USE AND POLICY CONTRACT

VILLAGE USE ONLY

Date application received: 2/5/2021 Received by: Hickie

All documentation attached? yes/no → Need Certificate of Insurance

Date and time of pre-event informational meeting: _____

Committee approval? yes/no Date: _____

Village Board approval? yes/no Date: _____

Comments:

Need to set up Liquor and Operator Licenses

STATEMENT CONCERNING LIABILITY AND WORKER'S COMPENSATION INSURANCE
FOR USE OF EDGEWATER PARK

We hereby acknowledge and confirm that the undersigned non-profit group or organization, together with all of its members, are not acting or serving in the service of the Village of Williams Bay in any respect in connection with the use we are about to make of or event we are about to hold in Edgewater Park. Our organization, including all members thereof, is not acting under any contract of hire, express or implied with the Village of Williams Bay nor is our organization, or any members thereof serving the Village of Williams Bay as an independent contractor. Our organization, including all members thereof, will not employ any other persons or firms in connection with the use we are about to make of or event we are about to hold in Edgewater Park as our use or event will be run using our membership or immediate family members of our membership only. This statement is made to clarify and confirm that our organization, including all members thereof, is not subject to Worker's Compensation coverage of the Village of Williams Bay.

We further acknowledge and confirm that the undersigned non-profit group or organization has liability insurance coverage of at least \$1,000,000 (one million dollars) and liquor liability insurance coverage (if applicable) in the same amount of coverage provided to it by its parent organization as set forth below that does provide liability insurance coverage to our local group or organization for the use or event about to take place under our exclusive control in Edgewater Park. We acknowledge that we are responsible, and all of our members and our member's immediate family who may also be participating in our event, for the safe and careful conduct of our event. As an express condition of our event therein under our exclusive use and control we do hereby agree to indemnify the Village of Williams Bay and all of its officials, agents and employees against all liability or loss that the Village of Williams Bay may sustain as a result of claims, demands, costs or judgments arising from the use or event we are about to hold in Edgewater Park.

DATED this 5th day of February, 2021

Group or organization Lions Club

Our liability insurance provided by: West Bend
(a certificate of insurance is attached hereto naming the Village of Williams Bay as an additional named insured)

Signed by: [Signature]
President or other authorized signatory

Applicant initials J. H.

From: **Terry Soltow** <terry@tlswindsled.com>
Date: Fri, Feb 26, 2021 at 8:40 AM
Subject: Re: Hovercraft contact information
To: Village Administrator <admin@williamsbay.org>

Dave

Lake Geneva Winterfest was brutal. Not only was the crowd reduced due to Covid but the weather reduced the attendance and our ability to provide rides with the hovers we were using. Thank you for understanding the situation, the rider count was about 1/6th of what it was the year prior.

However something interesting happened; the email and FB inquiries were much larger than I expected. We had over 900 people who, in spite of the weather and Covid, wanted rides that we could not provide, the openings we had were scheduled a week prior to the event.

I reached out to all of those who did not get a ride at Winterfest and around 80 of those came to an event we did in Wauconda IL this past weekend.

The response at Wauconda was also interesting, last year only about 200-300 people attended Wauconda Winterfest, this year we gave 266 rides at the event and many more people came out just to see the hovers, we were the talk of the event. I continue to get emails from people whose friends rode in the hovers asking when and where we are doing more.

There is indication from all of this that if we had a permanent winter site people would come. Based on what we experienced and the ongoing inquiries for ride locations, it looks like we could draw 200-300 customers per day operating two 6 passenger hovers. Operations would begin next winter, starting with just a Saturday Sunday operation and potentially building from there.

Is this something Williams Bay would be interested in discussing? My insurance company would prefer the solid ground loading of passengers so I know the launch

Best Regards
Terry R Soltow
TLS WindSled Inc



VILLAGE OF WILLIAMS BAY

250 Williams Street | PO Box 580 | Williams Bay | WI | 53191 | williamsbay.org
Phone: 262-245-2700 | Fax: 262-245-2705

UNOFFICIAL MINUTES WATER AND SEWER COMMITTEE MONDAY, FEBRUARY 10, 2021 AT 6:30 PM VIA TELECONFERENCE

Call to Order

Meeting was called to order by Chairman Umans at 8:39pm

Roll Call

Trustees Umans, Parker and Vlach

Also Present: President Duncan, Trustee D'Alessandro, McMannamy, Wright, Interim Administrator Bretl, Treasurer Peternell, Public Works Director Edwards, Police Chief Timm and Recreation Director Rowland.

Meeting Minutes

Umans/Parker motion to approve the January 13, 2021 and January 14, 2021 meeting minutes. Vlach abstained; motion carried.

Parker/Vlach motion to approve the January 28, 2021 meeting minutes. Unanimously carried.

Adjourn

Parker/Vlach motion to adjourn at 8:40pm. Unanimously carried.

/s/ Lori Peternell, Village Treasurer

These are not official minutes until approved by the Water and Sewer Committee



VILLAGE OF WILLIAMS BAY

250 Williams Street | PO Box 580 | Williams Bay | WI | 53191 | williamsbay.org
Phone: 262-245-2700 | Fax: 262-245-2705

UNOFFICIAL MINUTES WATER AND SEWER COMMITTEE WEDNESDAY, FEBRUARY 17, 2021 AT 5:00 PM VIA TELECONFERENCE

Call to Order

Meeting was called to order by Chairman Umans at 5:00pm.

Roll Call

Trustees Umans, Parker and Vlach

Also Present: Trustee D'Alessandro, Interim Administrator Bretl, Treasurer Peternell and Village Engineer Snyder.

Water Main Condition Study

Snyder discussed the water main asset management plan proposal. The purpose of the study is to provide a plan to rehabilitate or replace the existing water mains that are older than 1950. The proposal stated a lump sum fee of \$22,000. Discussion was held that prior estimate was \$20,000; Snyder agreed to honor the \$20,000 cost. Parker/Vlach motion to recommend Village Board approval of the water main asset management plan with the correction on the cost of \$20,000. Unanimously carried.

Loch Vista Water Main Replacement Project

Angie Kimes from Loch Vista was present to discuss the Association's street replacement plan and coordinating with the Village to have the water mains replaced in conjunction with their project. Snyder stated that he would need more detailed information from Loch Vista to create the bid packet and recommended that the Village have a Developer's agreement in place before proceeding. Discussion was held regarding the timing of the project and whether it could be done in 2021 or 2022. It was the consensus of the Committee to start working on a Developer's agreement with the Loch Vista Homeowner's Association.

2020 Water & Sewer Budget/Actual

The Committee reviewed the 2020 budget to actual reports noting that the final numbers will be available after the 2020 audit is completed in early April.

2021 Water & Sewer Budget

The Committee reviewed the 2021 proposed water & sewer budgets. Umans stated that the sewer revenues need to be adjusted to reflect the rate increase that took effect in October 2020. The Committee reviewed the water capital outlay line item of \$762,000 and the water tower repair/maintenance line item on \$165,000 to determine what projects will be included in 2021 and what projects can be moved to a future year. It was the consensus of the Committee to remove \$230,000 from the capital outlay line item and remove the Northwest Tower repainting of \$165,000 from the water tower repair/maintenance line item. The water treatment chemical line item will be

increased from \$115,000 to \$125,000. Peternell will make the changes and the Committee will review it again at the March 10th committee meeting for a recommendation to the Board at the March 15th meeting.

North West Water Tower Repainting Project

Snyder stated that the North West tower will be scheduled for repainting in 2023.

Adjourn

Parker/Vlach motion to adjourn at 6:01pm. Unanimously carried.

/s/ Lori Peternell, Village Treasurer

These are not official minutes until approved by the Water and Sewer Committee

2021 SEWER UTILITY BUDGET

<u>2021 PROPOSED REVENUES</u>											
GL Account Num	Title	Budget 12/31/2020	Actual 12/31/2020	2021 Proposed Budget	Total Variance						
300-44460	SEWER RESIDENTAL SALES	\$780,000.00	\$850,971.00	\$1,016,060.00	\$236,060.00						
300-44461	SEWER COMMERCIAL SALES	\$145,000.00	\$133,372.00	\$153,932.00	\$8,932.00						
300-44464	SEWER PUBLIC AUTHORITY SALES	\$11,000.00	\$10,865.00	\$13,490.00	\$2,490.00						
300-44470	SEWER FORFEITED DISCOUNTS	\$5,800.00	\$4,816.00	\$4,800.00	-\$1,000.00						
300-44475	SEWER CONNECTION FEES	\$45,000.00	\$81,256.00	\$90,000.00	\$45,000.00	ESTIMATED 20 NEW HOMES AT \$4500 EA					
	TOTAL PUBLIC CHARGES FOR REVENUE	\$986,800.00	\$1,081,280.00	\$1,278,282.00	\$291,482.00						
300-48004	INTEREST ON INVESTMENTS	\$21,000.00	\$6,633.00	\$6,500.00	-\$14,500.00						
300-48005	PROPERTY RENTAL INCOME	\$9,400.00	\$9,400.00	\$9,400.00	\$0.00	FARM LEASE					
	TOTAL COMMERCIAL	\$30,400.00	\$16,033.00	\$15,900.00	-\$14,500.00						
	TRANSFER FROM REPLACEMENT FUND	\$21,000.00	\$4,372.00	\$5,500.00							
	TOTAL REVENUES	\$1,038,200.00	\$1,101,685.00	\$1,299,682.00	\$261,482.00						
<u>2021 PROPOSED EXPENDITURES</u>											
GL Account Num	Title	Budget 12/31/2020	Actual 12/31/2020	2021 Proposed Budget	Total Variance						
300-58801-000	IT SUPPORT/ANNUAL FEES	\$5,000.00	\$6,202.00	\$6,200.00	\$1,200.00						
300-58929	SEWER SYSTEM MAPPING	\$250.00	\$0.00	\$250.00	\$0.00						
300-58930-000	DEBT ISSUANCE COSTS	\$0.00	\$4,438.00	\$0.00	\$0.00						
300-58960-000	SEWER DEBT SERVICE	\$22,324.40	\$17,078.00	\$21,670.00	-\$654.40	DEBT SCHEDULE					
300-58964-110	SEWER ACCOUNTING WAGES	\$43,452.00	\$37,064.00	\$47,790.00	\$4,338.00						
300-58964-121	SEWER ACCOUNTING-FICA	\$3,325.00	\$2,958.00	\$3,656.00	\$331.00						
300-58964-122	SEWER ACCOUNTING-RETIREMENT	\$5,900.00	\$2,677.00	\$3,704.00	-\$2,196.00						
300-58964-123	SEWER ACCOUNTING-HEALTH INSURAN	\$9,111.00	\$9,717.00	\$16,824.00	\$7,713.00						
300-58964-127	SEWER ACCOUNTING - HSA FUNDING	\$2,500.00	\$2,500.00	\$4,375.00	\$1,875.00						
300-58965-110	SEWER ADMIN-WAGES	\$30,724.38	\$30,674.00	\$31,278.00	\$553.62						
300-58965-121	SEWER ADMIN-FICA	\$2,350.41	\$2,224.00	\$2,393.00	\$42.59						
300-58965-122	SEWER ADMIN-RETIREMENT	\$2,381.14	\$2,216.00	\$2,424.00	\$42.86						
300-58965-123	SEWER ADMIN-HEALTH INS	\$7,234.22	\$7,219.00	\$7,789.00	\$554.78						
300-58965-124	SEWER ADMIN-LIFE INS	\$140.55	\$0.00	\$0.00	-\$140.55						
300-58965-127	SEWER ADMIN - HSA FUNDING	\$2,000.00	\$2,000.00	\$2,000.00	\$0.00						
300-58966-160	SEWER OPERATING SUPPLIES	\$500.00	\$159.00	\$500.00	\$0.00						
300-58966-170	SEWER UTILITIES-NATURAL GAS	\$2,300.00	\$1,361.00	\$1,500.00	-\$800.00						
300-58966-171	SEWER UTILITIES-ELECTRIC	\$11,000.00	\$10,943.00	\$11,000.00	\$0.00						
300-58967-000	SEWER TRANSPORTATION EXPENSE	\$3,400.00	\$803.00	\$3,400.00	\$0.00						
300-58967-150	SEWER VEHICLE REPAIRS & MAINT	\$1,500.00	\$0.00	\$1,500.00	\$0.00						
300-58968-150	SEWER COLLECTION SYSTEM MAINT	\$7,500.00	\$11,741.00	\$7,500.00	\$0.00						

2021 SEWER UTILITY BUDGET

GL Account Num	Title	Budget 12/31/2020	Actual 12/31/2020	2021 Proposed Budget	Total Variance					
300-58969-160	SEWER OFFICE SUPPLIES	\$7,500.00	\$10,191.00	\$10,000.00	\$2,500.00					
300-58969-200	SEWER TELEPHONE	\$600.00	\$1,060.00	\$1,100.00	\$500.00					
300-58970-000	SEWER ATTORNEY EXPENSE	\$500.00	\$0.00	\$500.00	\$0.00					
300-58972-000	SEWER AUDIT EXPENSE	\$12,000.00	\$29,038.00	\$9,000.00	-\$3,000.00					
300-58973-000	SEWER ENGINEERING EXPENSE	\$5,000.00	\$23,172.00	\$30,000.00	\$25,000.00					
300-58974-000	SEWER INSURANCE EXPENSE	\$32,000.00	\$31,666.00	\$32,000.00	\$0.00					
300-58975-130	SEWER DRUG TESTING EXPENSE	\$200.00	\$105.00	\$200.00	\$0.00					
300-58975-190	SEWER TRAINING EXPENSE	\$250.00	\$300.00	\$250.00	\$0.00					
300-58976-000	SEWER REPLACEMENT FUND	\$21,000.00	\$4,372.00	\$5,500.00	-\$15,500.00	CONFERENCE PT LIFT STATION ROOF				
300-58978-000	SLIP LINERS	\$50,000.00	\$47,266.00	\$50,000.00	\$0.00					
300-58979-000	TRANSFER TO REPLACEMENT FUND	\$0.00	\$0.00	\$0.00	\$0.00					
300-58980-300	WALCOMET SEWERAGE EXPENSES	\$823,000.00	\$781,875.00	\$800,000.00	-\$23,000.00					
300-58980-310	WALCOMET SEWER CONNECTION FEES	\$40,000.00	\$44,000.00	\$80,000.00	\$40,000.00	ESTIMATED 20 NEW HOMES AT \$4000 EA				
300-58996	I&I REDUCTION	\$35,500.00	\$20,886.00	\$35,000.00	-\$500.00	1) ENGINEERING ASSISTANCE \$20,000				
						2) SMOKE TESTING \$15,000				
	TOTAL EXPENDITURES	\$1,190,443.10	\$1,145,905.00	\$1,229,303.00	\$38,859.90					
	TOTAL SEWER FUND REVENUES	\$1,038,200.00	\$1,101,685.00	\$1,299,682.00	\$261,482.00					
	TOTAL SEWER FUND EXPENDITURES	\$1,190,443.10	\$1,145,905.00	\$1,229,303.00	\$38,859.90					
	TOTAL REVENUES	\$1,038,200.00	\$1,101,685.00	\$1,299,682.00	\$261,482.00					
	TOTAL EXPENDITURES	\$1,190,443.10	\$1,145,905.00	\$1,229,303.00	\$38,859.90					
	VARIANCE	-\$152,243.10	-\$44,220.00	\$70,379.00	\$222,622.10					

2021 WATER UTILITY BUDGET

2021 PROPOSED REVENUES											
GL Account Num	Title	Budget 12/31/2020	Actual 12/31/2020	2021 Proposed Budget	Total Variance						
200-44460	WATER RESIDENTIAL SALES	\$430,000.00	\$450,000.00	\$459,000.00	\$29,000.00						
200-44461	WATER COMMERCIAL SALES	\$84,000.00	\$71,000.00	\$72,420.00	-\$11,580.00						
200-44463	WATER PUBLIC FIRE PROTECTION	\$178,000.00	\$183,000.00	\$183,600.00	\$5,600.00						
200-44464	WATER PUBLIC AUTH SALES	\$10,000.00	\$11,656.00	\$11,890.00	\$1,890.00						
200-44465	PRIVATE FIRE REVENUE	\$3,600.00	\$3,617.00	\$3,672.00	\$72.00						
200-44466	MULTIFAMILY REIDENTIAL	\$21,000.00	\$19,511.00	\$19,901.00	-\$1,099.00						
200-44470	WATER FORFEITRED DISCOUNTS	\$4,000.00	\$3,769.00	\$3,700.00	-\$300.00						
200-44472	INVOICE SERVICE PAYMENTS		\$762.00	\$800.00	\$800.00						
200-44474	WATER OTHER REVENUE	\$4,000.00	\$4,167.00	\$4,000.00	\$0.00	WATER TAP FEES \$800/EA, NEW METERS \$150/EA, BULK WATER FEES					
200-44475	IMPACT FEES	\$10,600.00	\$21,200.00	\$21,200.00	\$10,600.00	ESTIMATED 20 NEW HOMES AT \$1060/EA					
	TOTAL PUBLIC CHARGES FOR REVENUE	\$745,200.00	\$768,682.00	\$780,183.00	\$34,983.00						
200-48004	INTEREST ON INVESTMENTS	\$43,000.00	\$11,985.00	\$12,000.00	-\$31,000.00						
200-48005	PROPERTY RENTAL/TOWER LEASE	\$56,000.00	\$57,984.00	\$57,000.00	\$1,000.00						
200-48420	IMPACT FEE INTEREST INCOME	\$380.00	\$214.00	\$220.00	-\$160.00						
200-49999	DEBT PROCEEDS	\$0.00	\$520,000.00	\$0.00	\$0.00						
	TOTAL COMMERCIAL	\$99,380.00	\$590,183.00	\$69,220.00	-\$30,160.00						
	TOTAL REVENUES	\$844,580.00	\$1,358,865.00	\$849,403.00	\$4,823.00						
2021 PROPOSED EXPENDITURES											
GL Account Num	Title	Budget 12/31/2020	Actual 12/31/2020	2021 Proposed Budget	Total Variance						
200-57346-000	NEW WATER METERS	\$25,000.00	\$14,012.00	\$25,000.00	\$0.00						
200-57346-100	METER REPLACEMENT PROGRAM	\$30,000.00	\$1,375.00	\$30,000.00	\$0.00						
200-57400-000	BILLABLE SERVICES	\$0.00	\$360.00	\$300.00	\$300.00						
200-57408-000	WATER TAX EQUIVALENT	\$109,000.00	\$105,500.00	\$100,800.00	-\$8,200.00						
200-57427-000	INTEREST ON LT DEBT	\$5,526.00	\$3,915.00	\$12,135.00	\$6,609.00	DEBT SCHEDULE (INCREASE DUE TO WATER TOWER REPAINTING LOAN)					
200-57599-000	WATER INSURANCE EXPENSE	\$32,000.00	\$31,667.00	\$32,000.00	\$0.00						
200-57600-150	WELL #3 - REPAIRS	\$800.00	\$243.00	\$800.00	\$0.00						
200-57601-150	WELL #1 - REPAIRS	\$800.00	\$0.00	\$800.00	\$0.00						
200-57602-150	WELL #2 - REPAIRS	\$800.00	\$0.00	\$800.00	\$0.00						

2021 WATER UTILITY BUDGET

GL Account Num	Title	Budget 12/31/2020	Actual 12/31/2020	2021 Proposed Budget	Total Variance						
						2021 PROJECTS: 1) CO2 UPGRADE \$30,000 2) SCADA SOFTWARE \$10,000 3) ENG TECH ASST I&I \$20,000 4) SOUTHWICK CREEK \$10,000 5) HWY 67 ENGINEERING \$58,000 6) LIME REACTOR CLEANING \$150,000 7) LEAK DETECTION & REPAIR \$100,000 8) WELL #2 PUMP REPLACE \$120,000 9) SECURITY CAMERAS \$4,000 10) CHLORINATION IMPROVEMENTS \$200,000(MOVE TO 2022) 11) WATER MAIN CONDITION STUDY \$20,000 12) WATER TOWER REPAINTING ENGINEERING \$10,000					
200-57610-140	WATER FUND CAPITAL OUTLAY	\$205,300.00	\$72,027.00	\$532,000.00	\$326,700.00						
200-57622-170	WATER POWER - NATURAL GAS	\$2,600.00	\$1,553.00	\$2,000.00	-\$600.00						
200-57622-171	WATER POWER - ELECTRIC	\$67,000.00	\$55,455.00	\$58,000.00	-\$9,000.00						
200-57623-160	WATER PUMPING SUPPLIES	\$200.00	\$0.00	\$200.00	\$0.00						
200-57623-170	WATER TESTING	\$3,000.00	\$2,448.00	\$3,000.00	\$0.00						
200-57630-110	WATER TREATMENT - WAGES	\$45,564.00	\$49,909.00	\$47,468.00	\$1,904.00						
200-57630-121	WATER TREATMENT - FICA	\$3,486.00	\$3,743.00	\$3,631.00	\$145.00						
200-57630-122	WATER TREATMENT - RETIREMENT	\$3,532.00	\$3,868.00	\$3,679.00	\$147.00						
200-57630-123	WATER TREATMENT - HEALTH INS	\$7,457.00	\$7,938.00	\$7,883.00	\$426.00						
200-57630-124	WATER TREATMENT - LIFE INS	\$42.00	\$133.00	\$140.00	\$98.00						
200-57630-127	WATER TREATMENT HSA FUNDING	\$2,500.00	\$2,500.00	\$2,500.00	\$0.00						
200-57631-160	WATER TREATMENT CHEMICALS	\$95,000.00	\$114,668.00	\$125,000.00	\$30,000.00						
200-57632-160	WATER TREATMENT SUPPLIES	\$1,250.00	\$1,424.00	\$1,250.00	\$0.00						
200-57635-150	WATER TREATMENT REPAIR/MAINT	\$5,000.00	\$1,693.00	\$5,000.00	\$0.00						
200-57640-110	WATER DISTRIBUTION - WAGES	\$45,564.00	\$49,925.00	\$47,468.00	\$1,904.00						
200-57640-121	WATER DISTRIBUTION - FICA	\$3,486.00	\$3,744.00	\$3,631.00	\$145.00						
200-57640-122	WATER DISTRIBUTION - RETIREMENT	\$3,532.00	\$3,869.00	\$3,679.00	\$147.00						
200-57640-123	WATER DISTRIBUTION - HLTH INS	\$7,457.00	\$7,939.00	\$7,883.00	\$426.00						
200-57640-124	WATER DISTRIBUTION - LIFE INS	\$42.00	\$114.00	\$140.00	\$98.00						
200-57640-127	WATER DISTRIBUTION HSA FUNDING	\$2,500.00	\$2,500.00	\$2,500.00	\$0.00						
200-57641-160	WATER DISTRIBUTION SUPPLIES	\$6,000.00	\$6,438.00	\$6,000.00	\$0.00						
						1) NORTHWEST TOWER (OLIVE RD) \$300,000; 2023 2) COLLIE ST TOWER \$165,000; 2022 3) POTAWATOMI RD TOWER \$165,000; 2023					
200-57650-150	WATER TOWER REPAIR/MAINT	\$47,500.00	\$509,830.00	\$0.00	-\$47,500.00						
200-57651-150	WATER MAINS - REPAIR/MAINT	\$40,000.00	\$12,260.00	\$40,000.00	0						
200-57652-150	WATER SERVICES - REPAIR/MAINT	\$5,000.00	\$2,110.00	\$5,000.00	\$0.00						
200-57653-151	WATER METER TESTING	\$2,500.00	\$20.00	\$2,500.00	\$0.00						
200-57654-150	HYDRANT REPAIR/MAINT	\$10,000.00	\$0.00	\$10,000.00	\$0.00						

2021 WATER UTILITY BUDGET

GL Account Num	Title	Budget 12/31/2020	Actual 12/31/2020	2021 Proposed Budget	Total Variance						
200-57656-150	CROSS CONNECTION INSPECTION	\$23,000.00	\$23,000.00	\$23,000.00	\$0.00						
200-57902-110	WATER ACCOUNTING - WAGES	\$43,452.00	\$37,064.00	\$47,790.00	\$4,338.00						
200-57902-121	WATER ACCOUNTING - FICA	\$3,325.00	\$2,959.00	\$3,656.00	\$331.00						
200-57902-122	WATER ACCOUNTING - RETIREMENT	\$5,900.00	\$2,677.00	\$3,704.00	-\$2,196.00						
200-57902-123	WATER ACCOUNTING - HEALTH INS	\$9,111.00	\$9,716.00	\$16,824.00	\$7,713.00						
200-57902-124	WATER ACCOUNTING - LIFE INS	\$51.00	\$0.00	\$0.00	-\$51.00						
200-57902-127	WATER ACCOUNTING - HSA FUNDING	\$2,500.00	\$2,500.00	\$4,375.00	\$1,875.00						
200-57903-125	WATER METERING READING-UNIFORMS	\$5,500.00	\$4,427.00	\$5,500.00	\$0.00						
200-57920-110	WATER ADMIN - WAGES	\$30,724.38	\$30,673.00	\$31,278.00	\$553.62						
200-57920-121	WATER ADMIN - FICA	\$2,350.41	\$2,225.00	\$2,393.00	\$42.59						
200-57920-122	WATER ADMIN - RETIREMENT	\$2,381.14	\$2,216.00	\$2,424.00	\$42.86						
200-57920-123	WATER ADMIN - HEALTH INS	\$7,234.22	\$7,219.00	\$7,789.00	\$554.78						
200-57920-124	WATER ADMIN - LIFE INS	\$140.55	\$0.00	\$0.00	-\$140.55						
200-57920-127	WATER ADMIN - HSA FUNDING	\$2,000.00	\$2,000.00	\$2,000.00	\$0.00						
200-57921-160	WATER OFFICE SUPPLIES	\$10,000.00	\$10,623.00	\$10,000.00	\$0.00						
200-57921-200	WATER TELEPHONE	\$600.00	\$2,337.00	\$2,500.00	\$1,900.00						
200-57923-000	WATER ATTORNEY EXPENSE	\$2,000.00	\$5,380.00	\$2,000.00	\$0.00						
200-57924-000	WATER ENGINEERING EXPENSE	\$7,500.00	\$27,092.00	\$7,500.00	\$0.00						
200-57925-000	WATER AUDIT EXPENSE	\$12,000.00	\$29,038.00	\$9,000.00	-\$3,000.00						
200-57925-100	WATER RATE STUDY	\$0.00	\$2,000.00	\$10,000.00	\$10,000.00						
200-57928-000	WATER REGULATORY EXPENSE	\$760.00	\$838.00	\$840.00	\$80.00						
200-57930-130	WATER DRUG TEST EXPENSE	\$500.00	\$443.00	\$500.00	\$0.00						
200-57930-140	WATER DIGGERS HOTLINE EXPENSE	\$2,900.00	\$1,357.00	\$2,900.00	\$0.00						
200-57930-190	WATER TRAINING EXPENSE	\$3,000.00	\$1,170.00	\$3,000.00	\$0.00						
200-57933-150	WATER TRANSPORTATION REP/MAINT	\$1,500.00	\$1,150.00	\$1,500.00	\$0.00						
200-57933-180	WATER TRANSPORTATION GASOLINE	\$1,100.00	\$270.00	\$1,100.00	\$0.00						
200-57934-000	WATER DEBT SERVICE	\$16,567.00	\$12,439.00	\$65,886.00	\$49,319.00	DEBT SCHEDULE					
200-57935-150	WATER PLANT REPAIR/MAINT	\$20,000.00	\$9,866.00	\$20,000.00	\$0.00						
200-57940-000	DEBT ISSUANCE COST	\$0.00	\$5,276.00	\$0.00	\$0.00						
200-57951-000	WATER SHOP TOOLS	\$500.00	\$559.00	\$500.00	\$0.00						
200-57952-000	WATER LAB EQUIPMENT	\$3,000.00	\$1,261.00	\$3,000.00	\$0.00						
200-57988	WATER CAP PROJ/STUDY	\$5,600.00	\$4,373.00	\$5,600.00	\$0.00						
200-58801-000	IT SUPPORT/ANNUAL FEES	\$5,000.00	\$6,390.00	\$7,000.00	\$2,000.00						
200-58802	IT HARDWARE	\$2,500.00	\$0.00	\$0.00	-\$2,500.00						
	TOTAL EXPENDITURES	\$1,052,134.70	\$1,321,718.00	\$1,426,746.00	\$374,611.30						
	TOTAL WATER FUND REVENUES	\$844,580.00	\$1,358,865.00	\$849,403.00	\$4,823.00						
	TOTAL WATER FUND EXPENDITURES	\$1,052,134.70	\$1,321,718.00	\$1,426,746.00	\$374,611.30						
	TOTAL REVENUES	\$844,580.00	\$1,358,865.00	\$849,403.00	\$4,823.00						
	TOTAL EXPENDITURES	\$1,052,134.70	\$1,321,718.00	\$1,426,746.00	\$374,611.30						

2021 WATER UTILITY BUDGET

GL Account Num	Title	Budget 12/31/2020	Actual 12/31/2020	2021 Proposed Budget	Total Variance						
	VARIANCE	-\$207,554.70	\$37,147.00	-\$577,343.00	-\$369,788.30						
	WATER TOWER REPAIRS:										
	1) NORTHWEST TOWER INTERIOR PAINTING DONE IN 1988; EXTERIOR PAINTING DONE IN 2002. (THIS IS ALSO A CELL TOWER)										
	2) COLLIE ST TOWER INTERIOR AND EXTERIOR PAINTING DONE IN 2002										
	3) POTAWATOMI TOWER INTERIOR AND EXTERIOR PAINTING DONE IN 1998. (THIS IS ALSO A CELL TOWER)										
	4) THEATRE ROAD WATER TOWER INTERIOR AND EXTERIOR PAINTING DONE IN 2020										



VILLAGE OF WILLIAMS BAY

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UNOFFICIAL MINUTES BUILDING, ZONING AND ORDINANCE COMMITTEE MONDAY, FEBRUARY 10, 2021 AT 6:30 PM VIA TELECONFERENCE

Call to Order

Meeting was called to order by Chairman Wright at 8:41pm

Roll Call

Trustees Wright, Parker and Umans.

Also Present: President Duncan, Trustee D'Alessandro and McMannamy, Interim Administrator Bretl, Treasurer Peternell, Public Works Director Edwards, Police Chief Timm and Recreation Director Rowland.

Meeting Minutes

Parker/Umans motion to approve the meeting minutes from January 13, 2021. Unanimously carried.

Adjourn

Umans/Parker motion to adjourn at 8:41pm. Unanimously carried.

/s/ Lori Peternell, Village Treasurer

These are not official minutes until approved by the BZO Committee

1.04 APPOINTED OFFICIALS.

(1) The following officials shall be appointed by the Village President and confirmed by the Village Board for terms of one year commencing on May 1 in the year of appointment.

(a) Village Attorney.

(b) Village Engineer.

(c) Clerk.

(d) Treasurer.

(e) Assessor.

6 1. CONFIDENTIALITY OF INFORMATION ABOUT INCOME AND EXPENSES PROVIDED TO ASSESSOR (a) Whenever the assessor, in the performance of the assessor's duties, requests or obtains income and expense information pursuant to Section 70.47(7)(af), Wis. Stats., or any successor statute thereto, such income and expense information that is provided to the assessor shall be held by the assessor on a confidential basis, except, however, that the information may be revealed to and used by persons in the discharging of duties imposed by law; in the discharge of duties imposed by office (including, but not limited to, use by the assessor in the performance of official duties of the assessor's office and use by the Board of Review in the performance of its official duties): or pursuant to Order of a Court. Income and expense information provided to the assessor under Section 70.47(7)(af), unless a Court determines that it is inaccurate, is per Section 70.47(7)(af), not subject to the right of inspection and copying under Section 19.35(1), Wis. Stats.

(f) Weed and Tree Commissioner.

(g) Civil Defense Commissioner.

(h) Building and Zoning Inspector.

(i) Auditor.

](j) Village Administrator.

(2) Whenever the term Clerk-Treasurer is used, it shall refer to either the Clerk or Treasurer according to the duties assigned by law to the office or to the nature of the office.