PLANNING COMMISSION AGENDA
CITY OF PRAIRIE VILLAGE
MUNICIPAL BUILDING - 7700 MISSION ROAD
TUESDAY, DECEMBER 6, 2011
Council Chambers
7:00 P. M.

I. ROLL CALL

II. APPROVAL OF PC MINUTES - November 1, 2011

III. PUBLIC HEARINGS

PC2011-08 Proposed Revisions to PVMC 19.44.025
Entitled "Fences"
Applicant: City of Prairie Village

IV. NON-PUBLIC HEARINGS

PC2011-122 Site Plan Approval for Wireless Antennae
7231 Mission Road
Zoning: R-1a
Applicant: Pete Akers, Wave Wireless for Sprint

PC2011-121 Site Plan Approval for Wireless Antennae
9011 Roe Avenue
Zoning: R-1a
Applicant: Pete Akers, Wave Wireless for Sprint

PC2011-120 Site Plan Approval for Wireless Antennae
7700 Mission Road
Zoning: R-1a
Applicant: Pete Akers, Wave Wireless for Sprint

V. OTHER BUSINESS

PC91-108 Revision to Site Plan - Southminster Presbyterian Church

Discussion of possible revisions to zoning regulations on "Alternative Energy"

VI. ADJOURNMENT

Plans available at City Hall if applicable
If you can not be present, comments can be made by e-mail to
Cityclerk@Pvkansas.com

*Any Commission members having a conflict of interest, shall acknowledge that conflict prior to the hearing of an application, shall not participate in the hearing or discussion, shall not vote on the issue and shall vacate their position at the table until the conclusion of the hearing.

PLANNING COMMISSION MINUTES
November 1, 2011

ROLL CALL
The Planning Commission of the City of Prairie Village met in regular session on Tuesday, November 1, 2011, in the Council Chamber, 7700 Mission Road. Chairman Ken Vaughn called the meeting to order at 7:00 p.m. with the following members present: Randy Kronblad, Bob Lindeblad, Marlene Nagel, Nancy Wallerstein and Nancy Vennard.

The following persons were present in their advisory capacity to the Planning Commission: Ron Williamson, Planning Consultant; Dennis Enslinger, Assistant City Administrator; Al Herrera, Council Liaison; Jim Brown, City Building Official and Joyce Hagen Mundy, City Clerk/Planning Commission Secretary.

Chairman Ken Vaughn welcomed students from UMKC Henry W. Bloch School of Management. Instructor Sara Copeland noted the students are graduate students in her *Urban Planning & Development Class.* The students introduced themselves and their field of study.

APPROVAL OF MINUTES
Nancy Wallerstein moved for the approval of the minutes of October 4, 2011 as written. The motion was seconded by Bob Lindeblad and passed 4-0 with Randy Kronblad and Nancy Vennard abstaining as they did not attend the October 4th meeting.

PUBLIC HEARINGS
There were no Public Hearings scheduled before the Commission

NON PUBLIC HEARINGS
Discussion of Fence & Retaining Wall Ordinance
This section was analyzed in depth by the Planning Commission in 2005 and amended in 2006. The impetus at that time to amend the fence regulations was a result of variance requests. Retaining walls were not previously addressed and the amended ordinance also included them. One of the main issues was the management of stormwater runoff and the impact of fences and retaining walls on adjacent properties.

Because of the topography of Prairie Village and uniqueness of some lots, the Planning Commission included a section for site plan approval to make adjustments for height and location of fences and walls that do not meet the standard requirements. The Site Plan Approval process was chosen rather than the variance process because the

Planning Commission felt that this issue could be addressed more effectively through site plan approval.

At its regular meeting on April 5, 2011, the following items were discussed:

1. Information from other Communities;
2. Retaining wall setback of two feet from the property line potentially creating a dead space;
3. Impact on front, side and rear yards; and
4. Fences and walls that change the character of the area.

1. Other Communities:
Ordinances were reviewed from Overland Park, Olathe, Leawood, Shawnee, Lee's Summit, Liberty as well as a general search was conducted on the internet. The fence regulations in other cities, for the most part, are very similar to those of Prairie Village. The definitions are similar and none of them separate a fence from a wall.

In reviewing the ordinances from other communities, there were a few regulations that differed. Some allow the maximum fence height in addition to the height of the retaining wall and measure the height from the finished grade on the high side of the fence/wall. The Prairie Village regulation measures the maximum height of the combined retaining wall and fence.

Some ordinances also allow fences to be eight feet in height at the property line while the Prairie Village height is six feet. Prairie Village only allows eight foot high fences within the building envelope.

2. Retaining Wall Setback:
There is the potential that a retaining wall could be constructed and along with a fence on adjoining property which would create an unmaintainable dead space. This was discussed at length in 2005-2006 when the regulations were revised and it was the consensus of the Planning Commission that the more important issue was controlling the storm water runoff. So far there have not been any maintenance problems between fences and walls.

3. Impact on Front, Side and Rear Yards:
This was discussed when the regulations were revised in 2006 and new fence and retaining wall diagrams were prepared and incorporated into the ordinance. These were prepared in close consultation with the Building Official who is responsible for issuing permits and deals with these issues daily.

4. Fences and Walls that Change the Character of the Area:
The fence and retaining wall constructed at 8162 Delmar changed the character of the area. Defining fences and walls differently could prevent this from reoccurring. In addition to the definitions, site plan approval by the Planning Commission for walls prior to construction should alleviate the problem. Construction of walls should be a very infrequent event and therefore should not affect many residences in Prairie Village. The

problem is that construction of walls on one lot in neighborhood can negatively affect the adjacent property. A definition for retaining wall should also be added.

Mr. Williamson reviewed the following proposed revisions:

1. Revise the fence definition as follows:

   19.02.235 Fence
   "Fence" means a free standing structure, which is for the purpose of blocking a view or providing privacy; providing aesthetics; preventing intrusion, escape or trespass; or redirecting a person's direction of travel. A fence generally consists of ~~posts~~ woven fabric, (including chain link), boards, pickets, ~~stone, brick, block or~~ iron bars *or similar materials and posts and columns made of wood stone, brick, concrete or iron. This definition does not include solid walls as defined by this ordinance.*

2. Add new definitions:

   Solid Wall - "Solid Wall" means a free standing structure, which is for the purpose of blocking a view or providing privacy; providing aesthetics; preventing intrusion, escape or trespass; or redirecting a person's direction of travel. A solid wall generally is constructed of brick, stone, concrete, block or similar materials or materials that are similar in appearance.

   Retaining Wall - A wall which may be constructed of wood, stone, brick, concrete, block or similar materials designed or built to retain soil or other materials from slumping, sliding or falling.

3. The Site Plan Approval section as follows:

G. Site Plan Approval
   1. As a part of the site plan approval process as set out in Section 19.32 Site Plan Approval, the Planning Commission may *approve solid walls or* make adjustments to the height and location of fences, solid walls and retaining walls provided that it results in a project that is more compatible, provides better screening, provides better storm drainage management, or provides a more appropriate utilization of the site.
   2. An application may be made to the Planning Commission for site plan approval of *a solid wall, retaining wall or* a fence that is unique and does not have the locational or design characteristics set out in these regulations. (Ord. 2117, Sec. 2, 2006)

4. Clarify the types of fences prohibited:
   Section 19.44.025 B.2. could be amended as follows:

      2. Prohibited Fences - The installation of barbed wire, *chicken wire, agricultural type fencing*, electric and razor ribbon fence*s* or any similar fences shall be prohibited.

5. Consider changing how the height of fences on retaining walls is measured:

    3. Height - No fence shall exceed six (6) feet in height except tennis court enclosures which may not exceed twelve (12) feet in height and except fences which are located within the building envelope of a lot shall not exceed eight (8) feet in height. The height of the fence shall be deemed to be the average distance from the finished grade to the highest point on the fence panel, excluding posts which may project above the fence panel not more than eight (8) inches. Where the terrain is not level, the average dimension may, at the discretion of the Building Official, be applied to each eight (8) foot section of the fence. Fences built in combination with retaining walls and/or berms shall *be measured from the finished grade on the high side of the wall* ~~shall not exceed the required height restrictions~~. In addition, fences and walls built on slopes shall comply with the required height measurement along the line of the fence location.

6. Consider whether to increase the maximum fence height at the property line from six feet to eight feet.

Ken Vaughn stated he does not support increasing fence height to 8 feet and feels site plan review of solid walls to be reasonable. He noted a new development may come into the City wanting walls surrounding their development. Mr. Enslinger advised under the current regulations these would be considered as a fence.

Bob Lindeblad stated he does not want walls to come before the Planning Commission but supports the development of clear standards that can be administered through staff. Nancy Vennard noted the problems with the Delmar application were because regulations were not followed.

Randy Kronblad confirmed current regulations do not separate by definition walls and fences and stated he feels they are distinctly different. Marlene Nagel feels it is reasonable to separate fences and walls with there being additional regulation on walls. Nancy Wallerstein stated she does not want to have them separated.

Ken Vaughn said his concern with solid walls is the greater impact they have on adjacent properties and easements/right-of-ways. There need to be standards that can be administered by staff.

Nancy Vennard noted under the proposed regulations walls would require site plan approval. Mrs. Vennard asked how the "building envelop" was defined. Mr. Williamson responded it is defined by the established setbacks.

Bob Lindeblad stated the term "agricultural type fencing" was too objective. He suggested staff add language identifying more clearly what is meant by the term - "such as . . . " Dennis Enslinger stated staff could handle this administratively with clearer

definitions. Ron Williamson noted if the request was denied by staff it could be appealed by the applicant to the Board of Zoning Appeals.

The consensus of the Commission was not to increase fence height.

Nancy Wallerstein moved the Planning Commission authorize a public hearing on the proposed revisions to fence regulations as presented and discussed with the exception of an increase to fence height from six to eight feet for the December 6, 2011 Planning Commission meeting. The motion was seconded by Randy Kronblad and passed unanimously.

Discussion of Lot Coverage Regulations

In 2001, the Planning Commission recommended and the City Council adopted a maximum lot coverage requirement of 25%. The primary concern at that time was the overbuilding of lots either by expansions or teardown/rebuilds. There was also a discussion about including all impervious areas which would include patios, driveways, etc., in order to address stormwater runoff. The Planning Commission ultimately just addressed building lot coverage. The 25% lot coverage requirement resulted in the request for variances to increase coverage. The Planning Commission revisited the issue in 2003 and increased the maximum lot coverage for buildings from 25% to 30% and excluded decks that were 30" or less in height. Decks 30" or less in height are considered similar to a patio in the building code while decks over 30" in height require railings.

The current definition of Lot Coverage is as follows:

19.02.306 Lot Coverage

"Lot coverage" means that portion of a lot, which is covered by a structure or structures, excluding the first four (4) feet of projecting roof eaves and excluding open, unenclosed and uncovered decks 30 inches or less in height. (Ord. 2019, Sec. I, 2001; Ord. 2048, Sec. II 2003)

Mr. Williamson noted recent instances where swimming pools have been added to residences creating the appearance of over development. Bath houses and other structures related to the pool are included in the maximum lot coverage, but the pool itself is not. Private pools generally range from 300 - 800 square feet and the deck surrounding the pool is usually at least the same size. Many of the lots in Prairie Village are small and a swimming pool installation with its associated improvements can encompass a backyard. This issue became apparent at the installation at 8162 Delmar. The lot at 8162 Delmar is 15,959 sq. ft. and 30% for lot coverage equals 4,787.7 sq. ft. The house is 3,250 and the pool and deck is approximately 3,100 sq. ft. for a total of 6,350 sq. ft. Therefore, the pool and house coverage exceeds the 30% by (6,350 - 4,788) = 1,562 sq. ft. for a total lot coverage of 39.8%.

The ordinance requires the swimming pools be a minimum of 10 feet from any interior side or rear lot line and at least 20 feet from an adjacent residence. The setbacks do control the location but do not control the intensity of development.

Ken Vaughn said he supported including pools. Bob Lindeblad noted that tennis courts are not included and questioned why pools should be included. Nancy Vennard confirmed structures with roofs are included in the lot coverage computation. Mr. Lindeblad stated he never felt it was the intention of the Commission to include patios and pools. He does not want to see the city over-regulating back yards. Randy Kronblad stated his only concern is with the stormwater impact.

Bob Lindeblad stated the 30% lot coverage has not been an issue. Randy Kronblad agreed that lot coverage exceeding 30% would be a rare exception. The Commission agreed that the lot coverage regulations should remain as written.

Discussion of Renewable Energy Regulations

Ron Williamson stated the Planning Commission discussed solar energy regulations in September, 2009. He noted this is an evolving industry and changes are occurring in the design of the installation that makes solar installations more compatible in residential areas.

Wind energy was not really discussed at that time, but since then the City of Overland Park did extensive research and adopted a comprehensive wind energy ordinance in December 2010. The Cities of Lee's Summit, Liberty, Blue Springs and Raymore have also adopted wind energy ordinances.

The Prairie Village Environmental Committee made a detailed review to the Solar Energy Ordinance in August of 2009 and made several suggestions for change.

Ron Williamson advised that Prairie Village is one of the numerous cities across the country that voted to sign the U.S. Mayors Climate Protection Agreement. The overall goal of the agreement is a 7% reduction in greenhouse gas emissions from 1990 levels by 2012. Communities are addressing this in many different ways including land use policies, transportation, utilities, green buildings, renewable energy, etc. He suggested that at some point, the Planning Commission may want to add a Sustainability Chapter to the Village Vision that is all inclusive.

In August 2008, the Board of Zoning Appeals denied a variance for the installation of solar panels based on the current ordinance and requested that the Planning Commission review the ordinance to determine if it needed to be updated. The current ordinance, Chapter 19.50 Solar Energy Systems, was adopted in 1983, so it is over 25 years old. Mr. Williamson noted if the Planning Commission decides to amend this Chapter, it should be renamed "Renewable Energy Systems" and include solar, wind and geothermal.

The major issue that emerges–particularly with solar and wind sources–is the conflict between the commitment to energy reduction and the aesthetics or appearance of the actual installation. Maintaining the quality and character of residential areas has been a priority of the Planning Commission and will be a critical factor in this discussion.

Another issue that emerges is minimizing cost and time to process permits so that people are actually encouraged to reduce energy consumption. Essentially, this means more approvals at Staff level and fewer instances of the Planning Commission and Council approval.

Solar Energy

Mr. Williamson noted the current ordinance only addresses solar collectors as an accessory use. This is very similar to Overland Park and Leawood. Both Overland Park and Leawood ordinances address solar collectors in the accessory use chapter and not as a stand-alone chapter as in Prairie Village. Because Prairie Village is a mature city and has a mature tree canopy, the potential for solar energy for residential properties may be more limited than in other communities. Commercial areas on the other hand have a good potential for incorporating solar energy.

The primary concern with the ordinance as it exists today is that it requires the solar collectors to be integrated into the roof and does not permit the collectors to be installed on racks or project above the roofline. In some instances, in order to take full advantage of the sun, the collectors need to be elevated and turned rather than being integrated into the roof. Some of the more sophisticated installation automatically changes position in order to follow the sun.

The ordinance also prohibits freestanding panels or panel racks. Some of these are small such as those used by utility companies to monitor their systems and those used for outdoor residential lighting. The Overland Park solar regulations allow the installation of solar collectors on the front, rear and side roofs of a building.

The City continues to receive requests from residents to install solar panels. Recently there was a request to install panels on the side of a house rather than the rear. One of the more common requests is to install solar panels in order to charge electric vehicles. The power generated is not tied into the electrical system in the house but is for a single purpose.

The Planning Commission provided the following direction to Staff regarding solar energy:

1. The current ordinance requires all collectors to be roof mounted. Should ground and mounted panels be permitted? Should panels be permitted on the front or roof side of the house? **Not in residential areas for single family residences.**

2. All collectors are required to be integrated into the roof which limits the opportunities to use solar panels because the angle of the dwelling and the pitch of the roof to the sun may not have the best orientation to use solar. Many

ordinances now allow collectors to be placed on a frame with certain height limitations. **No change for single family residences.**

3. Because the current ordinance requires the collectors to be integrated into the roof, they are not permitted to extend above the peak of the roofline. Some newer ordinances permit collectors to extend above the roof line, but generally not in this region. **No change for single family residences.**

4. Utilities are currently using small solar collectors to monitor their installations. These are normally installed in easements or street rights-of-way but are not addressed in the ordinance. These are small units that should be reviewed and permitted by Staff. **Approved.**

Dennis Enslinger confirmed the Commission was supportive of connecting the regulations to the land use, not the zoning district, allowing for non-residential uses on residential zoned property.

Nancy Vennard noted the city needs to continue to look at solar regulations as the industry changes, noting the development of solar shingles. It is important that the city not continue to put up road blocks for residents who want to make energy improvements. Mr. Enslinger noted the biggest obstacle is the current regulations only allow installations in the rear, not on front or on the sides. Also the pitches on many residential roofs are not acceptable for effective solar installations. Ken Vaughn feels the industry will make improvements that will allow for residential installations in the future.

Randy Kronblad asked how solar applications on commercial properties would be addressed. Dennis Enslinger responded by site plan approval or administratively by staff.

The Commission directed staff to prepare revisions to the solar regulations for non-residential uses, no changes to the regulations for single-family homes.

Wind Energy

Currently there is a lot of discussion regarding the use of wind turbines in urban areas. The primary issues are design/aesthetics, noise and wind availability. Prior to pursuing wind energy an applicant needs to have a wind analysis to determine whether enough wind is available in a specific location and how high the unit needs to be in order to produce power. The typical windmill design used to generate commercial power probably is not acceptable in Prairie Village even in a reduced size. Fortunately there are many designs that are sculptured in appearance that would fit into a residential community. Some are very small and might generate only enough power to run individual small appliances while others may be much larger. Many units can be attached to buildings and others may require a pole mounting. The difficult part is determining whether the design is compatible in a residential area. Mr. Williamson

noted the use of smaller applications for individual urban residential use is evolving and it would be difficult to prepare a design standard that would be all inclusive, but still be protective of neighborhood aesthetics. Noise has also been an issue with wind generating units, but as in aesthetic design, this has been addressed and units are now on the market that has a rating of less than 60 Db, which is the level of normal conversation. The application for commercial buildings may be better because it would be easier to integrate them into the design of the buildings.

At this point in time, the request for wind energy systems will probably be minimal, but the design of aesthetically compatible units is evolving rapidly and the demand may increase. Currently wind driven devices are permitted as a Conditional Use Permit for both residential and business uses, but there are no standards. Also the Conditional Use Permit allows an application for any structure while the new Overland Park Ordinance limits the application to non-residential structures but the structures could be located in residential zoning districts on schools, churches, water towers, etc.

Before wind turbines become an issue, it is suggested that a separate listing be included in the Conditional Use Chapter for Wind Turbines on non-residential structures with some standards. In the Overland Park Ordinance, they appear to be treated similar to a cell tower. Depending on the location, a wind turbine may need to be 150 feet in the air in order to reach the height where wind is available.

Ken Vaughn stated the City of Overland Park did an extensive analysis on wind energy. He would like to see their regulations implemented in commercial and office areas, but not in residential areas. Mr. Williamson noted Overland Park does not allow wind turbine installations for single family residences; however, does allow them for non-residential uses in residential areas such as churches and schools.

The Commission directed staff to prepare revisions based on the City of Overland Park regulations.

Geothermal Energy

Geothermal is a below surface installation and has very little effect on the above ground aesthetics in a neighborhood. There are basically two types of installations, vertical loop and horizontal loop. Horizontal requires a large lot area and probably will be used infrequently in Prairie Village. Since most of the lots are small in Prairie Village the vertical loop system will be more common. The holes will probably be bored in the front or side yards and the only negative aspect of a geothermal system is during installation. The drilling rigs are large because the holes may need to be several hundred feet deep and the removal of the drilled out material needs to be properly removed.

Ron Williamson noted there are at least two residential installations in Prairie Village plus the major installation at City Hall and they were handled by Staff approval. It is agreed by the Commission that Geothermal Energy be included in the zoning ordinance and that it remain as a staff approval.

Hybrid Energy

It should be noted that one energy source may not provide all that is required for a particular user and that it is becoming more common to use a combination of the energy sources rather than just one. A provision should be included in the ordinance that permits hybrid installations, i.e. solar, wind and geothermal or a combination thereof.

The Planning Commission authorized Staff to prepare proposed amendments for discussion at the December meeting addressing the following:

1. Change the "Solar Energy Systems" Chapter to "Alternative Energy Systems" and include solar, wind and geothermal in one Chapter.
2. Amendments to the Solar Energy Chapter as recommended by the Planning Commission.
3. Create a separate listing for Wind Turbines as either a Conditional Use Permit or Special Use Permit and include standards.
4. Clarify geothermal as Staff approval.

Annual review of Village Vision

Ron Williamson stated the Kansas Planning Statutes require that the Planning Commission perform an annual review of the Comprehensive Plan (Village Vision) to determine whether it is still valid or whether it should be amended. The Village Vision was officially adopted by the Governing Body May 21, 2007. Village Vision is both a Comprehensive Plan and a Strategic Investment Plan and therefore many of the actions contained within it are items that would not normally be addressed by the Planning Commission.

The Planning Commission reviewed Village Vision at its June 2, 2009 meeting and authorized a public hearing to incorporate the Parks and Recreation Plan 2009 into Village Vision and this was completed in July 2009. The Planning Commission did not recommend other changes in Village Vision, but it was their consensus that the Implementation Chapter needed further discussion and that it would be most appropriate in a joint meeting with the Governing Body which was held September 21, 2009.

Since Village Vision was adopted in 2007, there have been several changes in major properties in Prairie Village that may have a significant impact in the future. The following is a brief discussion of each:

1. Lane4 purchased Prairie Village Center and Corinth Square. The owners have submitted future conceptual plans for both centers and established a Community Improvement District (CID). The Village Vision recommended upgrading of both centers and an entire Chapter was devoted to Corinth Square being redeveloped in a "Town Center" configuration. The current owners are upgrading the center at this time and view the Town Center concept as a long term plan perhaps 30 years from now.

2. Meadowbrook Country Club was sold to new owners who are reestablishing the golf course and club facilities at this time. Because of the economy, future redevelopment are years away, but a redevelopment plan still needs to be prepared.

3. Shawnee Mission School District finally ended its need for Somerset Elementary School. Village Vision recommended the reuse of this property for residential purposes and an assisted living project has been approved for it.

4. The closing and sale of Mission Valley Middle School was not anticipated in 2007 when Village Vision was prepared. This is an 18 acre site that has not been addressed in the Comprehensive Plan and needs to be addressed through a thorough community involvement process. The Planning Area should include a larger area surrounded by Somerset Drive on the west, 83rd Street on the north, Mission Road on the east and the south property line of the school on the south. The City is currently working on an amendment regarding this area.

As the City has been implementing the Bike/Trail Plan as part of the Park Master Plan, it appears that Nall Avenue will be the trail route rather than Roe Avenue as shown in the Park Master Plan. The Park Master Plan will need to be amended to show this change. Input from the Parks & Recreation Committee will be necessary.

If no other changes are suggested, the Park Master Plan will need to be amended to change the trail route from Roe Avenue to Nall Avenue. Mr. Enslinger noted that the trail cannot be constructed the entire length desired along Roe Avenue. The City of Mission has already set a trail in place along their section of Nall. The City of Overland Park has stated they would support a trail along Nall. The proposed trail will have connections at 91st Street with Franklin Park and to Corinth Square Shopping Center.

Bob Lindeblad moved the Planning Commission authorize a public hearing to amend Village Vision at a date to be determined later. The motion was seconded by Nancy Vennard and passed unanimously.

OTHER BUSINESS

Approval of 2012 Meeting and Submittal Schedule

Dennis Enslinger reviewed the proposed 2012 Meeting and Submittal Schedule noting the requirement for submittal approximately three weeks prior to the meeting necessitates the calendar be adopted prior to December for distribution to potential applicants.

Due to the difficulty of staff being required to attend City Council meetings as well as Planning Commission meetings, the conflicting Planning Commission meetings have been moved to the second Tuesday of the Month. In 2012, these are the January, July and September meetings.

The Planning Commission members approved the 2012 meeting schedule as presented.

Next Meeting
Joyce Hagen Mundy announced the December agenda will include site plan approvals for additional antennas on existing towers at St. Ann's, City Hall and the Fire Station at Roe. Dennis Enslinger added there will also be a building line modification and a variance request for a rear yard setback in addition to the public hearing approved this evening.

Mr. Enslinger noted the request for qualifications for the amendment to the comprehensive plan will be sent out November 1st. It is anticipated the meetings in conjunction with the study will be held in January, 2012.

Student Questions
The Commission members answered questions from the UMKC students in attendance.

ADJOURNMENT
With no further business to come before the Planning Commission, Chairman Ken Vaughn adjourned the meeting at 8:30 p.m.

Ken Vaughn
Chairman

LOCHNER

MEMORANDUM

TO:	Prairie Village Planning Commission	
FROM:	Ron Williamson, Lochner, Planning Consultant	
SUBJECT:	**PC 2011-08: Proposed Amendments to Chapter 19.02 Definitions and Section 19.44.025 Fences**	
DATE:	December 6, 2011 Planning Commission Meeting	Project # 011002401

COMMENTS:

At its meeting on November 1, 2011, the Planning Commission authorized a public hearing to consider amending the fence regulations of the Zoning Ordinance. The following is the proposed language for the amended ordinance. New text is in italics and text to be deleted is lined out.

1. Revise the fence definition as follows:

   19.02.235 Fence

   "Fence" means a free standing structure, which is for the purpose of blocking a view or providing privacy; providing aesthetics; preventing intrusion, escape or trespass; or redirecting a person's direction of travel. A fence generally consists of ~~posts~~ woven fabric, (including chain link), boards, pickets, ~~stone, brick, block or~~ iron bars ***or similar materials and posts and columns made of wood stone, brick, concrete or iron. This definition does not include solid walls as defined by this ordinance.***

2. Add new definitions:

   19.02.502 Wall, Retaining - A wall which may be constructed of wood, stone, brick, concrete, block or similar materials designed or built to retain soil or other materials from slumping, sliding or falling.

   19.02.503 Wall, Solid – A free standing structure, which is for the purpose of blocking a view or providing privacy; providing aesthetics; preventing intrusion, escape or trespass; or redirecting a person's direction of travel. A solid wall generally is constructed of brick, stone, concrete, block or similar materials or materials that are similar in appearance.

3. Amend section 19.44.025 as follows:

19.44.025 Fences *and Walls*

A. Purpose and Intent
   1. To buffer or screen uses that may have negative impact on adjacent uses.
   2. To provide privacy in outdoor spaces.
   3. To provide safety from hazards such as swimming pools, hot tubs, spas and other similar facilities.

B. Design
   1. Appearance – Those fences which have surface material, whether it be wood, chain link, metal bars or other permitted material, attached on one side of posts and/or rails, thus producing a finished side and an unfinished side, shall be installed with the finished sides exposed toward the street and adjacent properties. When doubt exists as to which way the surface of the proposed fence shall face, the Building Official shall make the final determination.
   2. Prohibited Fences – The installation of ***farm type fences such as barbed wire, high tensile wire, wire mesh, welded wire, woven wire, pipe and cable***, electric and razor ribbon fences or any similar type fence shall be prohibited.
   3. Height – No fence shall exceed six (6) feet in height except tennis court enclosures which may not exceed twelve (12) feet in height and except fences which are located within the building envelope of a lot shall not exceed eight (8) feet in height. The height of the fence shall be deemed to be the average distance from the finished grade to the highest point on the fence panel, excluding posts which may project above the fence panel not more than eight (8) inches. Where the terrain is not level, the average dimension may, at the discretion of the Building Official, be applied to each eight (8) foot section of the fence. Fences built in combination with retaining walls and/or berms shall ***be measured from the finished grade on the high side of the wall*** ~~shall not exceed the required height restrictions~~. In addition, fences and walls built on slopes shall comply with the required height measurement along the line of the fence location.
   4. Decorative Fences – Decorative fences shall be designed so that they are at least 50% open and do not exceed two and a half (2 ½) feet in height. Split rail and wrought iron fences are examples of this type of fence. (Ord. 2117, Sec. 2, 2006)

C. Location
   1. Decorative fences may be located in the front yard but shall be located no closer than ten (10) feet from a street right-of-way line.
   2. Fences, other than decorative fences, shall not be located in the front yard and may be attached to or extended from the front corner of the dwelling.
   3. Fences located on the side street of a corner lot shall not be less than five (5) feet from the right-of-way line except that if an adjacent lot faces the side street, the fence shall be setback from the right-of-way line a distance of fifteen (15) feet or not less than one-half the depth of the front yard of an adjacent building, whichever is the greater setback.
   4. If the rear of a through lot is fenced, a gate shall be installed to provide access to the right-of-way.
   5. Diagrams depicting the location of fences on various types of lots are attached. (Ord. 2117, Sect. 2, 2006)

D. Retaining Walls

1. Retaining walls shall be designed and constructed to support lateral loads. Applications for retaining walls exceeding four (4) feet in height, whether terraced or not, shall be accompanied by design calculations and plans sealed by a professional engineer licensed in the State of Kansas. Said plans shall be reviewed prior to the issuance of a building permit. Retaining walls shall setback a minimum of two (2) feet from side and rear property lines, and retaining walls exceeding six (6) feet in height shall be required to be setback from side and rear property lines an additional one (1) foot for each two (2) feet, or part thereof, in excess of six (6) feet in height, e.g. a ten (10) foot high retaining wall would be required to set back a minimum of four (4) feet from the property line. Allowances will be made for tie backs to existing grade. Diagrams depicting the location of retaining walls on various types of situations are attached. Any exceptions or deviations from this formula shall require site plan approval by the Planning Commission. (Ord. 2117, sec. 2, 2006)

E. Drainage and Utility Easements

1. Fences and walls shall not restrict natural surface drainage nor be constructed to divert or channel water flow with increased velocity. Fences shall not be constructed in drainage easements if they affect the flow of stormwater.

F. Permits Required

1. All fences, and retaining walls as defined herein, unless otherwise excepted, shall require a building permit. No fence may be erected, constructed or replaced until said permit has been procured from the Building Official. The Building Official may allow minor deviations and adjustments relative to the dimensions set out in this section where topographic or other natural features, utility locations, meters, trees or other conditions so warrant and where the spirit and intent of this section will be preserved.
2. Enclosures erected around compost piles in compliance with the conditions set forth in Chapter 15. Articles 3 of the City Code are excluded from these regulations and shall not require a permit. (Ord. 2117, Sect. 2, 2006)

G. Site Plan Approval

1. As a part of the site plan approval process as set out in Section 19.32 Site Plan Approval, the Planning Commission may ***approve solid walls or*** make adjustments to the height and location of fences, ***solid walls*** and retaining walls provided that it results in a project that is more compatible, provides better screening, provides better storm drainage management, or provides a more appropriate utilization of the site.
2. An application may be made to the Planning Commission for site plan approval of ***a solid wall, retaining wall or*** a fence that is unique and does not have the locational or design characteristics set out in these regulations. (Ord. 2117, Sect. 2, 2006)

RECOMMENDATION:

It is the recommendation of Staff that the Planning Commission recommend approval of the proposed amendments to the fence regulations to the Governing Body.

LOCHNER

STAFF REPORT

TO: Prairie Village Planning Commission
FROM: Ron Williamson, Lochner, Planning Consultant
DATE: December 6, 2011 Planning Commission Meeting Project # 010002401

Application: **PC 2011-122**

Request: **Site Plan Approval to Replace Three Existing Antennas, Add Three New Antennas and Replace Equipment Cabinets.**

Property Address: **7231 Mission Road (St. Ann's Church)**

Applicant: **Sprint**

Current Zoning and Land Use: **R-1B Single-Family Residential District - Church**

Surrounding Zoning and Land Use:

North R-1 B Single-Family Residential District – Windsor Park
RP-3 Planned Garden Apartment District - Apartments
West: R-1 B Single-Family Residential District – Single-Family Dwellings
South: R-1 B Single-Family Residential District – Single-Family Dwellings
C-O – Office Building District - Offices
East: R-1 B Single-Family Residential District – Single-Family Dwellings

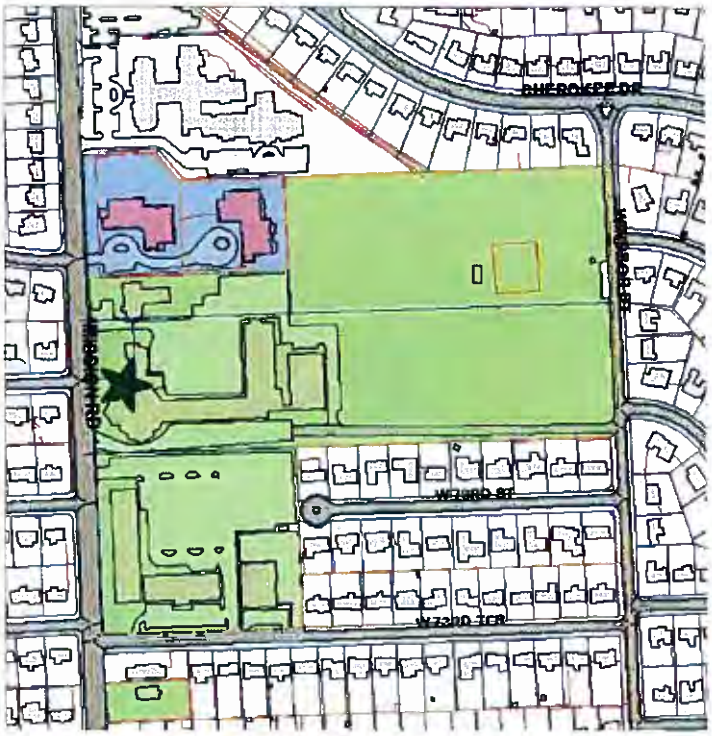
Legal Description: **Metes and Bounds - Unplatted**

Property Area: **9.70 Acres**

Related Case Files:
PC 2010-113 Monument Sign Approval – Windsor Street
PC 2009-209 Site Plan Approval for Clearwire
PC 2007-120 Monument Sign Approval
PC 2006-11 Special Use Permit Renewal Sprint/Nextel
PC 2001-06 Special Use Permit for Nextel
PC 96-06 Conditional Use Permit for Sprint
PC 87-104 Site Plan Approval for Church Expansion

Attachments: **Application, Site Plan, Project Photos**

General Location Map



Aerial Map

COMMENTS:

Sprint is requesting Site Plan Approval to replace three antenna panels, add three new antenna panels and replace three equipment boxes with two. Initially the three existing equipment boxes will be relocated and the two new boxes will be installed. The existing boxes will remain in the equipment compound until such time as the new equipment boxes are tested and approved. This could take as long as two years. There will be no changes in the size of the equipment compound. The purpose of this new installation is to enable Sprint to provide 4G coverage which is faster mobile broadband speed. Sprint is implementing a nationwide upgrade to increase its capacity in order to accommodate the demand for increased cell phone coverage, particularly smart phones, and to process more data faster.

The existing 12 antennas on the steeple are located at the 75' elevation. The plan proposes to install six new antennas at the 65' elevation. After testing is complete six existing antennas will be removed at the 75' elevations.

The existing three equipment cabinets will be temporarily relocated and will be removed after the new cabinets have been tested and approved. This may take up to two years. Similarly, the existing antennas will be relocated and used until they have been tested and approved. This seems to be a long time for testing and it should be reduced.

In 1996, the Planning Commission approved a Conditional Use Permit for Sprint in the St. Ann's steeple/tower with the equipment boxes contained within a brick wall extending from the building. In 2001, a Special Use Permit was approved for Nextel. Nextel and Sprint merged and a renewal of the Special Use Permit was approved for Sprint/Nextel in 2006. In 2009 a site plan was approved for a Clearwire installation under the new Wireless Communications Ordinance. St. Ann's Church is a stealth wireless communication installation and therefore, under the new ordinance, only requires Site Plan Approval.

Since this is a minor change in the installation, the applicant was not required to hold a neighborhood meeting.

The Planning Commission shall give consideration to the following criteria, in approving or disapproving a site plan:

A. The site is capable of accommodating the building, parking areas and drives with appropriate open space and landscape.

The capability of the site to accommodate the equipment compound was addressed in the previous approval of the Conditional Use and Special Use Permits.

B. Utilities are available with adequate capacity to serve the proposed development.

Adequate utilities are available to serve this location.

C. The plan provides for adequate management of stormwater runoff.

The amount of impervious area will not be changed and therefore will not have an impact on stormwater runoff.

D. The plan provides for safe and easy ingress, egress and internal traffic circulation.

The site utilizes the existing driveway and parking lot for circulation that currently serves it and no changes are proposed.

E. The plan is consistent with good land planning and good site engineering design principles.

This is a stealth installation and the details of the overall design of the equipment compound and antennas were worked out on the approval of the Conditional Use and subsequent Special Use Permits.

F. An appropriate degree of compatibility will prevail between the architectural quality of the proposed installation and the surrounding neighborhood.

This is a stealth installation and the antennas have a very minor impact on the appearance of the Church steeple. The equipment cabinets have been incorporated into a brick walled area that is attached to the building and it is not noticeable from the street. The installation has been incorporated into the steeple in a manner so that its visual impact is minimal.

G. The plan represents an overall development pattern that is consistent with the comprehensive plan (Village Vision) and other adopted planning policies.

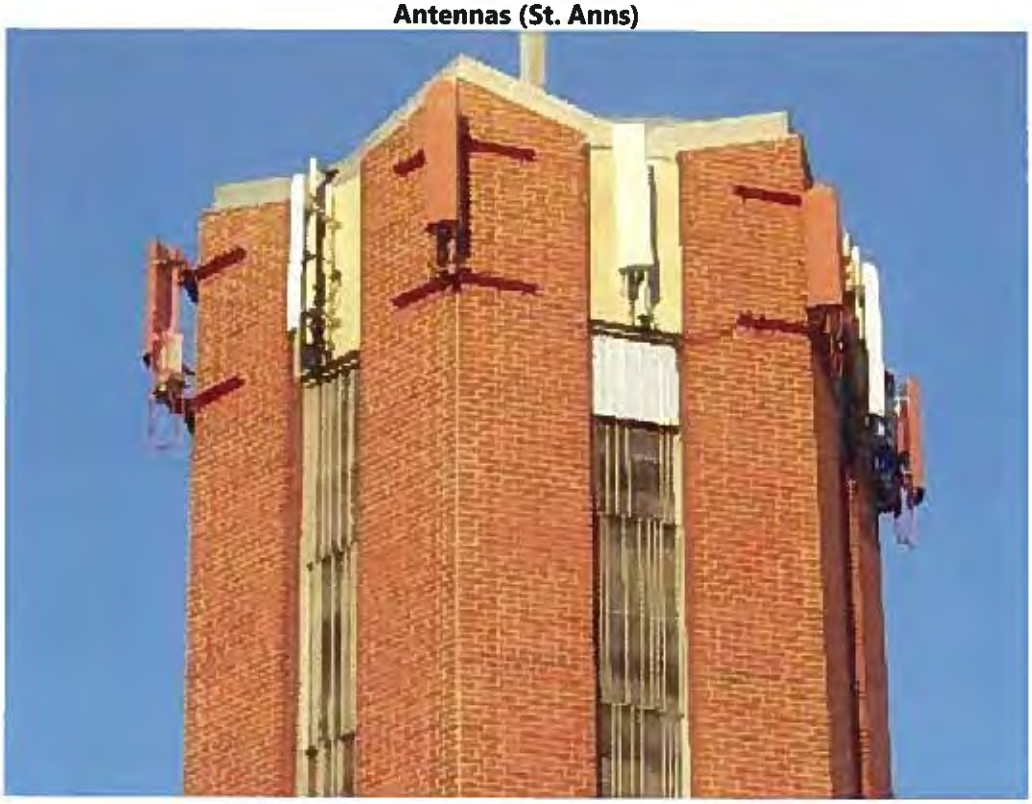
Wireless communications are not specifically addressed in Village Vision. Generally it falls into maintaining and improving infrastructure.

RECOMMENDATION:

It is the recommendation of the Staff that the Planning Commission approve this Site Plan for Sprint subject to the following conditions:

1) That the antennas be installed as shown on the proposed site plan.
2) That all wiring be contained inside the church steeple.
3) That all equipment and wiring shall be below the screening wall.
4) That the three existing equipment cabinets shall be removed immediately after the operation of the new cabinets has been approved but in no event longer than 12 months from the date of Planning Commission approval of this application.
5) That the six existing antennas at the 75' elevation shall be removed immediately after the operation of the new antennas has been approved but in no event longer than 12 months from the date of Planning Commission approval of this application.
6) That the antennas shall be painted a color that blends with the brick on the Church steeple so that their visibility is minimized.
7) That the applicant shall submit a letter from a structural engineer licensed in the State of Kansas, stating that the antenna installation has not caused any adverse effect to the structure of the steeple.

Antennas (St. Anns)



Equipment Compound (St. Anns)

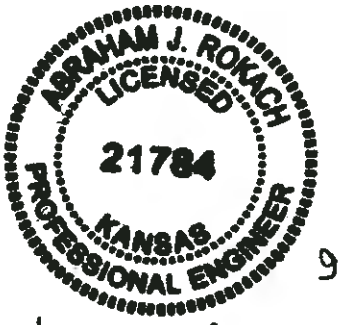
Structural Calculations

Prepared for: Ericsson/Sprint – Network Vision Project

New Antenna and Equipment Installation on Existing Structure

Site No. KC03XC182
St. Ann's Church
7231 Mission Road
Prairie Village, KS 66208

September 23, 2011



9/23/11

Abraham J. Rokach, PE
Kansas PE License No. 21784
Expires April 30, 2013

I certify that this report was prepared by me, or under my direct supervision and control, and, to the best of my knowledge and belief, complies with the requirements of the applicable building code.

Fullerton
Engineering Consultants

9600 Bryn Mawr Ave, Suite 200, Rosemont, IL 60018
Phone: (847) 292 0200 **Fax: (847) 292 0205**
Certificate of Authorization #E-1939 **Expires 12/31/2012**

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Rosemont, IL 60018
(847) 292-0200

Project Summary

Project

Sprint Network Vision
Site Name: *St. Ann's Church*
Site No.: *KC03XC182*
Site Address: *7231 Mission Road*
Prairie Village, KS 66208

Owner

Sprint
6391 Sprint Parkway
Overland Park, KS 66251

Design Codes & References

(1) 2006 International Building Code
(2) TIA/EIA-222-F, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, 1996
(3) ASCE7-05, Minimum Design Loads for Buildings and Other Structures
(4) ACI530-05 Building Code Requirements for Masonry Structures
(5) AISC 360-05, Specification for Structural Steel Buildings, 2005
(6) Roark's Formulas for Stress and Strain, 7th Edition
(7) Hilti catalog
(8) Andrew Steel Catalog

Scope:

Check the structural integrity of the following:

- *Existing structure for proposed and existing antenna configuration*
- *Existing slab on grade for proposed and existing equipment cabinet configuration*

Conclusion:

- *The existing structure is **adequate** to support proposed and existing antenna configuration*
- *The existing slab on grade is **adequate** to support proposed and existing equipment cabinet configuration*

Proposed Loading

Antenna 1-2 (Az.: 40 deg.)

New antenna elevation:	*65 ft.*
New antenna data:	*(1) RFS APXVERR18-C w/ RRU's* *(1) Argus HPX311R w/ RRU's*
Proposed installation:	*New antenna will be installed on new 2" diameter Sch.40 mounting pipe on existing steeple wall.*

Antenna 3-4 (Az.: 200 deg.)

New antenna elevation:	*65 ft.*
New antenna data:	*(1) RFS APXVERR18-C w/ RRU's* *(1) Argus HPX311R w/ RRU's*
Proposed installation:	*New antenna will be installed on new 2" diameter Sch.40 mounting pipe on existing steeple wall.*

Antenna 5-6 (Az.: 320 deg.)

New antenna elevation:	*65 ft.*
New antenna data:	*(1) RFS APXVERR18-C w/ RRU's* *(1) Argus HPX311R w/ RRU's*
Proposed installation:	*New antenna will be installed on new 3" diameter Sch.40 mounting pipe on existing steeple wall.*

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Calculations

Units

$psf := \frac{lbf}{ft^2}$ $plf := \frac{lbf}{ft}$ $pcf := \frac{lbf}{ft^3}$

$kip := 1000 \cdot lbf$ $kips := 1000 \cdot lbf$ $ksi := 1000 \cdot psi$

$E := 29000 \cdot ksi$

Determine the Wind Loads

$z := 65 \cdot ft$ *The height of the antennas above grade*

$CC := \left(\frac{z}{33ft}\right)^{\frac{2}{7}}$ $CC = 1.21$

$K_z := \begin{cases} 1 & \text{if } CC \le 1 \\ CC & \\ 2.58 & \text{if } CC \ge 2.58 \end{cases}$ $K_z = 1.21$

$V := 76$ *mph* *According to Ref (1), (Fig 1609, Table 1609.3.1) design for 90 mph (3-second gust), which is equivalent to 76 mph fastest mile*

$q_z := 0.00256 \cdot K_z \cdot V^2 \cdot psf$ $q_z = 17.95 \cdot psf$

$h := z$ *Total height of the structure*

$G_H := 0.65 + \frac{0.6}{\left(\frac{h}{33ft}\right)^{\frac{1}{7}}}$ $G_H = 1.19$ *1.0 < G_H < 1.25, OK*

New RRU Loads

$H := 17.8 \cdot in$ $W := 17 \cdot in$

$Aspect := \frac{H}{W}$ $Aspect = 1.05$

$$C_A := \begin{cases} 1.4 & \text{if } Aspect \le 7 \\ 1.4 + 0.6 \cdot \frac{Aspect - 7}{25 - 7} & \text{if } 7 < Aspect < 25 \\ 2.0 & \text{if } Aspect \ge 25 \end{cases}$$ $C_A = 1.4$

$A_{rru} := H \cdot W$ $A_{rru} = 2.1\,ft^2$

$F_{rru} := q_z \cdot G_H \cdot C_A \cdot A_{rru}$ $F_{rru} = 63.07 \cdot lbf$

$W_{rru} := 54 \cdot lbf$

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New Antenna Loads

RFS APXVERR18-C

$H := 72\,in$ $D := 11.8\,in$

$Aspect := \frac{H}{D}$ $Aspect = 6.1$

$$C_A := \begin{cases} 1.4 & \text{if } Aspect \le 7 \\ 1.4 + 0.6 \cdot \frac{Aspect - 7}{25 - 7} & \text{if } 7 < Aspect < 25 \\ 2.0 & \text{if } Aspect \ge 25 \end{cases}$$ $C_A = 1.4$

$A_{ant.new} := H \cdot D$ $A_{ant.new} = 5.9\,ft^2$

$F_{ant.new} := q_z \cdot G_H \cdot C_A \cdot A_{ant.new}$ $F_{ant.new} = 177.09 \cdot lbf$

$W_{ant.new} := 33 \cdot lbf$

Argus HPX311R

$H := 69.5\,in$ $D := 6.9\,in$

$Aspect := \frac{H}{D}$ $Aspect = 10.04$

$$C_A := \begin{cases} 1.4 & \text{if } Aspect \le 7 \\ 1.4 + 0.6 \cdot \frac{Aspect - 7}{25 - 7} & \text{if } 7 < Aspect < 25 \\ 2.0 & \text{if } Aspect \ge 25 \end{cases}$$ $C_A = 1.5$

$A_{ant.new2} := H \cdot D$ $A_{ant.new2} = 3.32\,ft^2$

$F_{ant.new2} := q_z \cdot G_H \cdot C_A \cdot A_{ant.new2}$ $F_{ant.new2} = 106.89 \cdot lbf$

$W_{ant.new2} := 12lbf$

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New Mounting Pipes (Pipe 2.0 STD)

$H_{pipe} := 10 \cdot ft$ $\quad$ Pipe = 2.0

$$Aspect := \frac{H_{pipe}}{D_{pipe}} \qquad Aspect = 50.42$$

$$C_A := \begin{cases} 0.8 & \text{if } Aspect \le 7 \\ 0.8 + 0.4 \cdot \frac{Aspect - 7}{25 - 7} & \text{if } 7 < Aspect < 25 \\ 1.2 & \text{if } Aspect \ge 25 \end{cases} \qquad C_A = 1.2$$

$$A_{pipe} := H_{pipe} \cdot D_{pipe} \qquad A_{pipe} = 1.98\,ft^2$$

$$F_{pipe} := q_z \cdot G_H \cdot C_A \cdot A_{pipe} \qquad F_{pipe} = 51.03 \cdot lbf$$

$$W_{pipe} := LW_{pipe} \cdot H_{pipe} \qquad W_{pipe} = 36.6 \cdot lbf$$

Wall Mount Calculations

Loading Case 1 (RFS Antenna w/ (3) RRU's

$W_{new1} := W_{pipe} + W_{ant.new} + 3 \cdot W_{rru}$ $W_{new1} = 231.6 \cdot lbf$ *Total new weight*

$F_{new1} := F_{pipe} + F_{ant.new} + 3 \cdot F_{rru}$ $F_{new1} = 417.33 \cdot lbf$ *Total new wind load*

Loading Case 2 (Argus Antenna w/ (2) RRU's

$W_{new2} := W_{pipe} + W_{ant.new2} + 2W_{rru}$ $W_{new2} = 156.6 \cdot lbf$ *Total new weight*

$F_{new2} := F_{pipe} + F_{ant.new2} + 2F_{rru}$ $F_{new2} = 284.06 \cdot lbf$ *Total new wind load*

Check Worst-Case - Loading Case 1

Maximum tension on each wall support

Distance from top support to center of

$d_{rru1} := 7.5ft$ $d_{rru1} = 7.5\,ft$ *RRU 1*

$d_{rru2} := 8.25ft$ $d_{rru2} = 8.25\,ft$ *RRU 2*

$d_{pipe} := 4.25ft$ $d_{pipe} = 4.25\,ft$ *Pipe*

$d_{ant} := 2.5ft$ $d_{ant} = 2.5\,ft$ *Antenna*

$d_{BS} := 4ft$ $d_{BS} = 4\,ft$ *Bottom Support*

Moment about top support

$F_{bs} := \dfrac{F_{pipe} \cdot d_{pipe} + F_{ant.new} \cdot d_{ant} + 2F_{rru} \cdot d_{rru1} + F_{rru} \cdot d_{rru2}}{d_{BS}}$ $F_{bs} = 531.51\,lbf$ *Force in Bottom Support*

$F_{ts} := F_{ant.new} + 3F_{rru} + F_{pipe} - F_{bs}$ $F_{ts} = -114.17\,lbf$ *Force in Top Support (negative denotes direction change)*

$P := \max(|F_{ts}|, |F_{bs}|)$ $P = 531.51\,lbf$ *Maximum force at support*

Maximum tension on each U-bolt

$D_{U.bolt} := 0.375in$ $F_y = 35ksi$

$A_{U.bolt} := .25\pi \cdot D_{U.bolt}^2$ $A_{U.bolt} = 0.11 \cdot in^2$

$T_{U.bolt} := \dfrac{P}{2A_{U.bolt}} = 2.41 \cdot ksi$ $< 0.66 \cdot 1.33 \cdot F_y = 30.72 \cdot ksi$, *OK* *The U-bolts are adequate.*

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Maximum shear on each wall support

$n_{support} := 2$ *Number of Supports*

$n_{bolt} := 3$ *Number of anchor bolts in the wall mounts*

$V_{weight} := \frac{W_{ant.new} + 3W_{rru} + W_{pipe}}{n_{support}}$ $V_{weight} = 115.8 \cdot lbf$ *Shear from weight at each support*

$V_{wind} := \frac{F_{ant.new} + 3F_{rru} + F_{pipe}}{n_{support}}$ $V_{wind} = 208.67 \cdot lbf$ *Shear from wind at each support*

Maximum tension on each wall support

$T_{A.bolt} := \max\left(\left|V_{weight}\right|, \left|V_{wind}\right|, P\right) = 531.51\,lbf$

Use (2) 3/8" ϕ Hilti HAS-E Rods with HY-20 adhesive and 6" embedment per support

$T_{all} := 685lbf$ $n_{bolt} \cdot T_{all} > T_{A.bolt} = 1$, *OK* *Tension check*

$V_{all} := 590lbf$ $n_{bolt} \cdot V_{all} > \max\left(V_{weight}, V_{wind}\right) = 1$, *OK* *Shear check*

$\frac{T_{A.bolt}}{n_{bolt} \cdot T_{all}} + \frac{\max\left(V_{weight}, V_{wind}\right)}{n_{bolt} \cdot V_{all}} = 0.38$ *< 1.0, OK*

The maximum bending moment in the mounting pipe

$d_{EqF} := \frac{F_{pipe} \cdot d_{pipe} + F_{ant.new} \cdot d_{ant} + 2F_{rru} \cdot d_{rru1} + F_{rru} \cdot d_{rru2}}{F_{pipe} + F_{ant.new} + 3F_{rru}}$ $d_{EqF} = 5.09\,ft$ *Distance to equivalent force*

$M_{pipe} := \begin{cases} F_{ts} \cdot d_{EqF} - ft \cdot d_{EqF} < d_{BS} \\ F_{ts} \cdot d_{BS} - ft \cdot d_{EqF} > d_{BS} \end{cases}$

$M_{pipe} = -456.7 \cdot lbf \cdot ft$

$S_z := \begin{cases} 0.561 \cdot in^3 & \text{if } M_{pipe} < 0 \\ 0.561 \cdot in^3 & \text{if } M_{pipe} > 0 \end{cases}$ $F_y := 35 \cdot ksi$

$\frac{M_{pipe}}{S_z} = 9.77 \cdot ksi$ $< 0.66 \cdot 1.33F_y = 30.72 \cdot ksi$, *OK* *The mounting pipe is adequate.*

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Cabinet on Slab on Grade

$W_{batt} := 2557lbf$ *Weight of cabinet*

$W_{RBS} := 700lbf$ *Weight of RBS*

$L_{cab} := 4.25ft$

$D_{cab} := 2.333ft$

$C_{cab} := 0.667ft$

$F_{cab} := 3in$

$$W_{cab.bearing} := \frac{\max(W_{batt}, W_{RBS})}{(L_{cab} + 2C_{cab})\cdot(D_{cab} + C_{cab} + F_{cab})} = 76.33\cdot psf$$ *Loading on slab*

$d_{slab} := 4in$ *Thickness of slab*

IBC 2006

$$W_{slab.bearing} := 1500psf - \frac{d_{slab}}{12in}\cdot 150pcf\cdot 1ft = 1450\cdot psf$$ *As per Ref (1), Table 1804.2 (p. 346), the net available bearing pressure of soil is a minimum of 1500psf.*

$W_{slab.bearing} = 1450\cdot psf > W_{cab.bearing} = 76.33\cdot psf$ *OK*

*The slab is **adequate** to support proposed cabinets*

Conclusion:

- *The existing structure is **adequate** to support proposed and existing antenna configuration*
- *The existing slab on grade is **adequate** to support proposed and existing equipment cabinet configuration*

Structural Mapping Report

Prepared for: Ericsson/Sprint – Network Vision Project

Site Number: KC03XC182
Site Name: St. Ann's Church
7231 Mission Road
Prairie Village, Jackson Co., KS 66208

September 16, 2011

ABRAHAM J. ROKACH LICENSED 21784 KANSAS PROFESSIONAL ENGINEER

9/16/11

Abraham J. Rokach, PE
Kansas PE License No. 21784
Expires April 30, 2013

Fullerton Engineering Consultan
9600 West Bryn Mawr Avenue, Suite 200, Rosemont, IL 60018
Phone: (847) 292 0200 Fax: (847) 292 0205
Certificate of Authorization #E-1939 Expires 12/31/2012

Summary

The field investigation was performed, at the following:

Location: 7231 Mission Road
Kansas City, KS 66208

Date: September 9, 2011

Field Representative: **Sargiz Mirzaei** – Project Manager
Fullerton Engineering Consultants

Description of the existing building/structure

The building use is 1-story institutional (church). The building is a reinforced concrete frame with a standard column, beam configuration. The bell tower is a 8" thick CMU with 8" multi-wythe brick.

Description of Sprint's equipment platform

Sprint's equipment is located on slab on grade concrete at the base of the church.

Description of Sprint's antenna supports

All antennas are supported on the existing bell tower with standard wall mounts and anchor bolts.

Observation of existing structure condition

According to our field observations, we found that all supporting structures affected by proposed installation are in satisfactory condition.

Attachments

- Site Photographs
- Site Sketch

Sector 2 Location

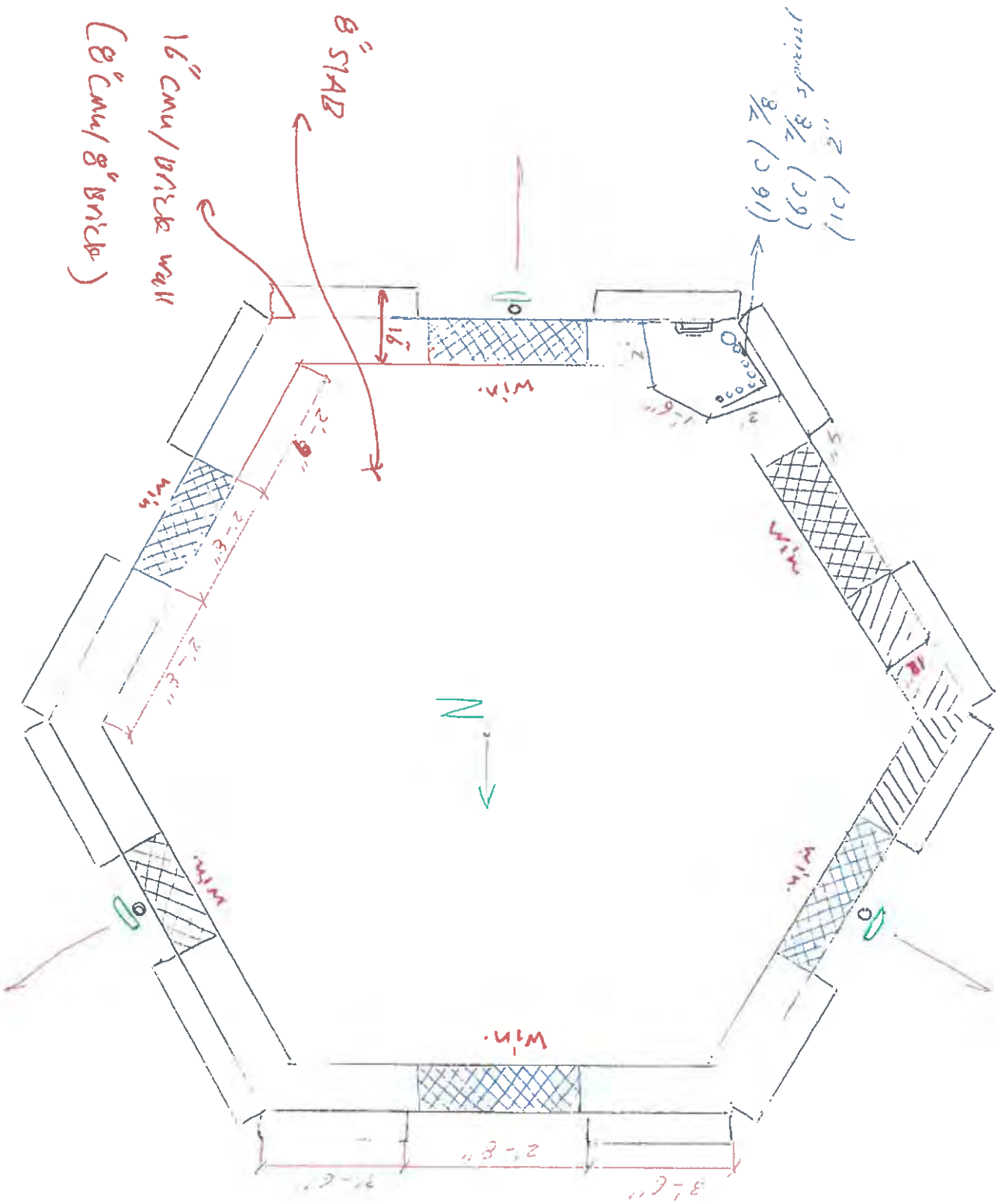
Sector 3 Location

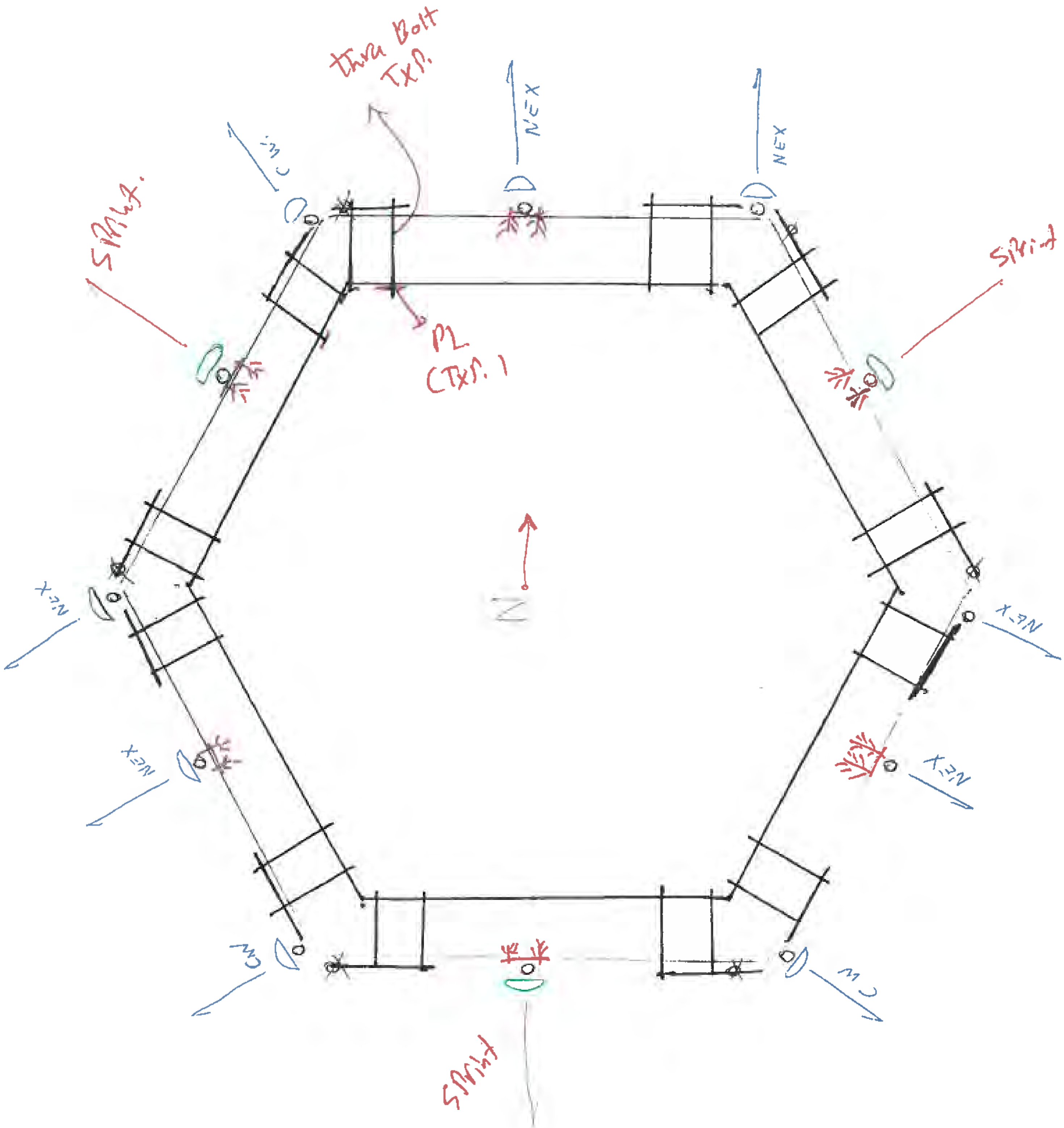
View Inside Bell Tower

Bell Tower Thickness

Inside Sprint Equipment Area

KC03XC182





Thru Bolt
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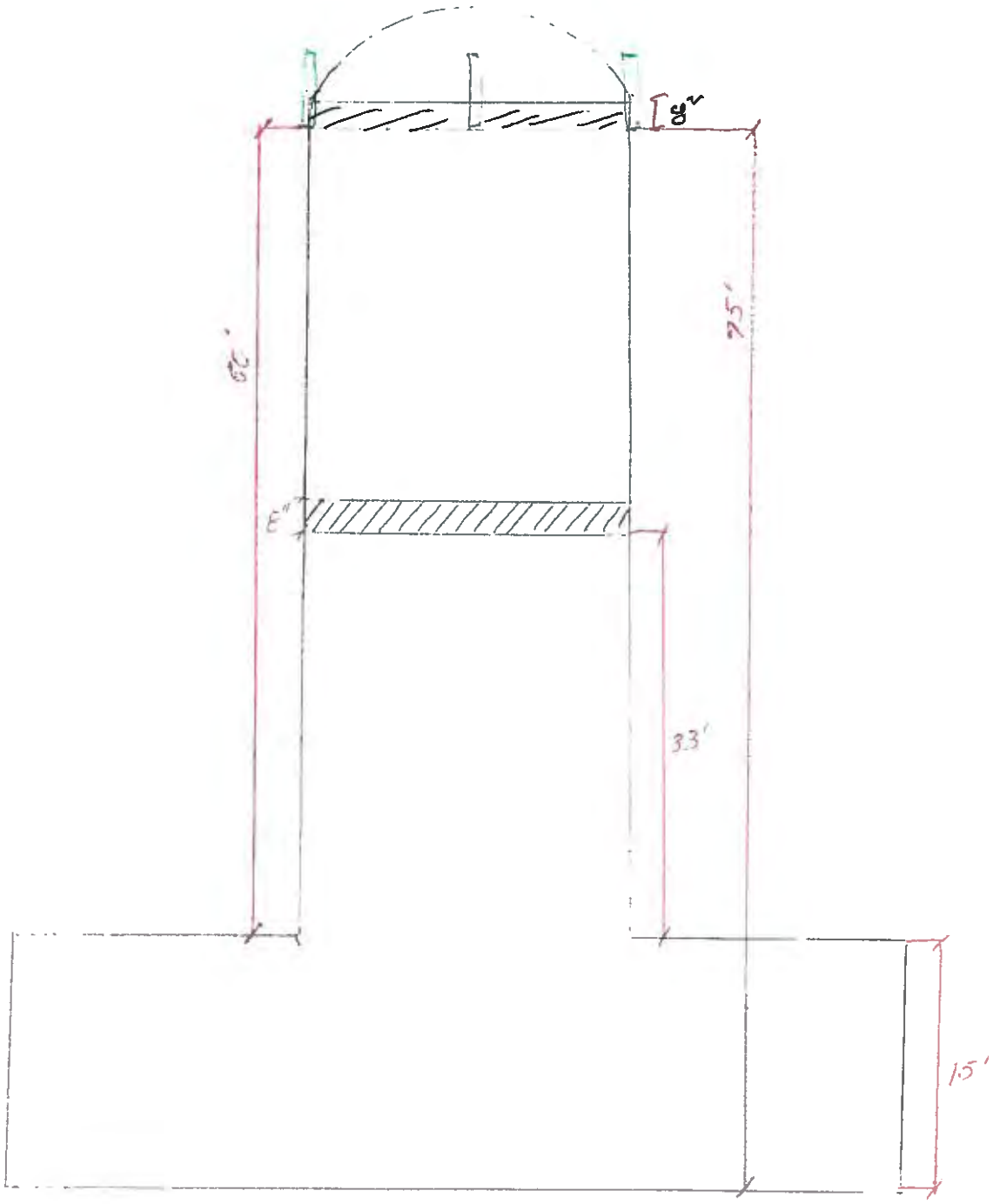
8"
25'
23'
8"
33'
15'

Sprint

SITE NAME:

ST. ANN'S CHURCH

SITE NUMBER:

KC03XC182

SITE ADDRESS:

7231 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

RECEIVED
OCT 14 2011
By

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

ERICSSON
6100 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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COA# E-1939
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DRAWN BY:	CHECKED BY:	APPROVED BY:
TP	RI	MB

NO	DESCRIPTION	BY	DATE
	ZONING	TP	7/27/11
	REV. ZONING	TP	9/13/11

DRIVING DIRECTIONS

DEPART FROM SPRINT OFFICE:
6391 SPRINT PARKWAY, OVERLAND PARK, KS 66251
DEPART ON SPRINT PKWY (SOUTH). TURN LEFT (EAST) ONTO W 117TH ST. TURN LEFT (NORTH) ONTO NALL AVE TURN RIGHT (EAST) ONTO W 75TH ST. TURN LEFT (NORTH) ONTO MISSION RD. ARRIVE AT SITE.

SITE INFORMATION

PROJECT TYPE:	SITE TYPE:	MARKET:
NETWORK VISION	STEEPLE	KANSAS CITY

SITE NAME:	ST. ANN'S CHURCH	APPLICANT:	SPRINT PCS 6391 SPRINT PARKWAY OVERLAND PARK, KS 66251
SITE NO:	KC03XC182		
SITE ADDRESS:	7231 MISSION ROAD PRAIRIE VILLAGE, KS 66208	LANDLORD:	ROMAN CATHOLIC ARCHBISHOP DIOCESE
COUNTY:	JOHNSON, KS		
JURISDICTION:	CITY OF PRAIRIE VILLAGE, KS		
APN:	–	BUILDING CODE:	INTERNATIONAL BUILDING CODE, 2006 EDITION
ZONING:	–		
SITE COORDINATES	(FROM RF SHEET)		
LATITUDE:	N. 39.9972° (NAD 83)	ELECTRICAL CODE:	NATIONAL ELECTRICAL CODE, 2005 EDITION
LONGITUDE:	W. 94.63000° (NAD 83)		
GROUND ELEVATION:	– (AMSL)		

LIST OF DRAWINGS

NO.	TITLE
T1	TITLE SHEET
Z1	SITE PLAN
Z2	CONCRETE PAD LAYOUT
Z3	SITE ELEVATION
Z4	ANTENNA LAYOUT

SITE ACCESS PROCEDURES

NOTE_POINT_2: ~ ACCESS_TYPE_3: CABINET DOOR~ LOCK_3: COMBO LOCK~ COMBO_3: 6985~ LOCK_3B: ~ COMBO_3B: ~ NOTE_POINT_3: ~ ACCESS_TYPE_4: CABINET DOOR~ LOCK_4: COMBO LOCK~ COMBO_4: 9111~ LOCK_4B: ~ COMBO_4B: ~ NOTE_POINT_4: ~ 24X7 (NO NOTIFICATION REQUIRED) LOCK BOX COMBO=6985 CONTAINING A P1 KEY THAT IS NEEDED TO OPEN UP THE GRAY COMPOUND DOOR. THE DOOR STICKS, SO YOU HAVE TO KICK THE BOTTOM AT THE SAME TIME THAT YOU ARE TURNING THE P1 KEY (NOT THE DOORKNOB) TO THE RIGHT.

PROJECT SUMMARY

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED
- FACILITY HAS NO PLUMBING
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS

SCOPE OF WORK

WORK CONSIST OF MODIFYING THE EXISTING WIRELESS INSTALLATION:

- DECOMMISSIONING OF EXISTING ANTENNAS AND BASE STATION EQUIPMENT
- INSTALLATION OF NEW ANTENNAS, ANTENNA SUPPORTS AND BASE STATION EQUIPMENT
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. CABINETS, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR

LOCATION MAP

PROJECT CONTACTS

APPLICANT: SPRINT NEXTEL PROPERTY SERVICES	MAILSTOP KSOPHT0101-Z2650 6391 SPRINT PARKWAY OVERLAND PARK, KS 66251-2650
TOWER/LANDORD:	ROMAN CATHOLIC ARCHBISHOP DIOCESE
ENGINEERING CONSULTANTS: FULLERTON ENGINEERING	RAFIK ISHAYA (847) 292-0200 EX (241)
LEASING: MD7	10590 WEST OCEAN AIR DR., SUITE 300 SAN DIEGO, CA 92130 JOE O'CONNER (858) 799-7850
ZONING PM: NETWORK BUILDING & CONSULTING, LLC	7380 COCA COLA DR., SUITE 106 HANOVER, MD 21076 RON EBERZ (215) 527-0199
SAM:	JOSEPH MARKUS (314) 952-5636
CM:	RUSSELL McCALMENT (417) 777-0918
RF ENGINEER:	AARON SCARBOROUGH 913-219-4175

ENGINEER'S LICENSE

I CERTIFY THAT THESE DRAWING WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, 2006 EDITION

LICENSED ENGINEER – STATE OF KANSAS

SIGNED DATE: _____
EXPIRES: _____ LICENSE#: _____

811 Know what's below. Call before you dig.

ONE CALL KANSAS
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DRAWINGS SCALED TO 11"x17"

SITE NAME
ST. ANN'S CHURCH

SITE NO.
KC03XC182

SITE ADDRESS
7231 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

SHEET NAME
TITLE SHEET

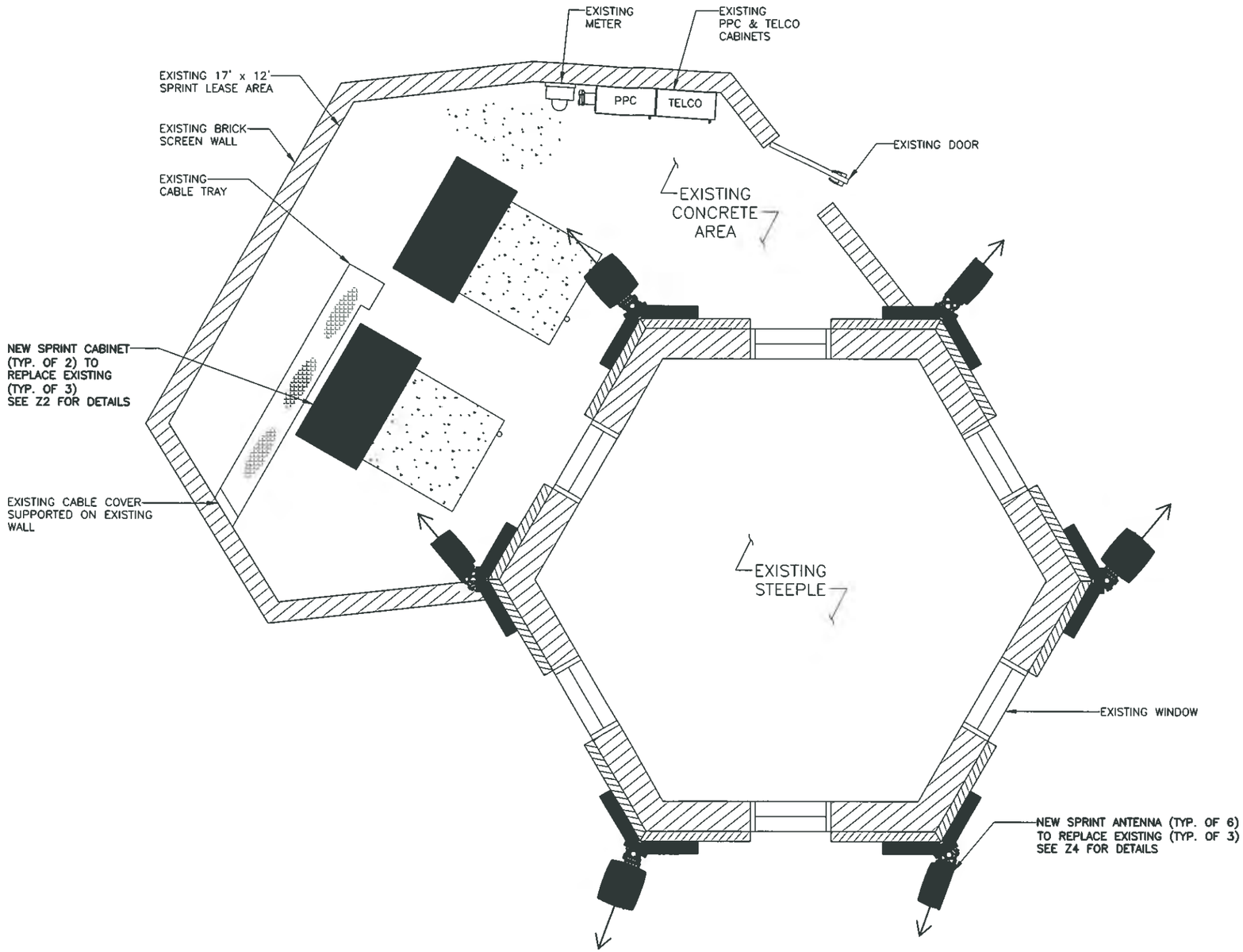
SHEET NUMBER
T1

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
RBS	RADIO BASED STATION
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S)	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER
#	POUND(S)

SYMBOLS

- REVISION
- WORK POINT
- UTILITY POLE
- BRICK
- COMPRESSED STONE
- CONCRETE
- EARTH
- GRAVEL
- MASONRY
- STEEL
- CENTERLINE
- PROPERTY LINE
- LEASE LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- WOOD FENCE
- UE — BELOW GRADE ELECTRIC
- UT — BELOW GRADE TELEPHONE
- OE/OT — OVERHEAD ELECTRIC/ TELEPHONE
- SECTION REFERENCE



1 SITE PLAN
SCALE: 1/4" = 1'-0"
NORTH
0 1' 2' 4' 6'

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

ERICSSON
6100 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

FEC
Fullerton Engineering Consultants
9600 W. BRYN MAWR AVE.
SUITE 200
ROSEMONT, ILLINOIS 60018
TEL: 847-292-0200
FAX: 847-292-0206
COA# E-1939
www.FullertonEngineering.com

DRAWN BY:	CHECKED BY:	APPROVED BY:
TP	RI	MB

NO	DESCRIPTION	BY	DATE
	ZONING	TP	7/27/11
	REV. ZONING	TP	9/13/11

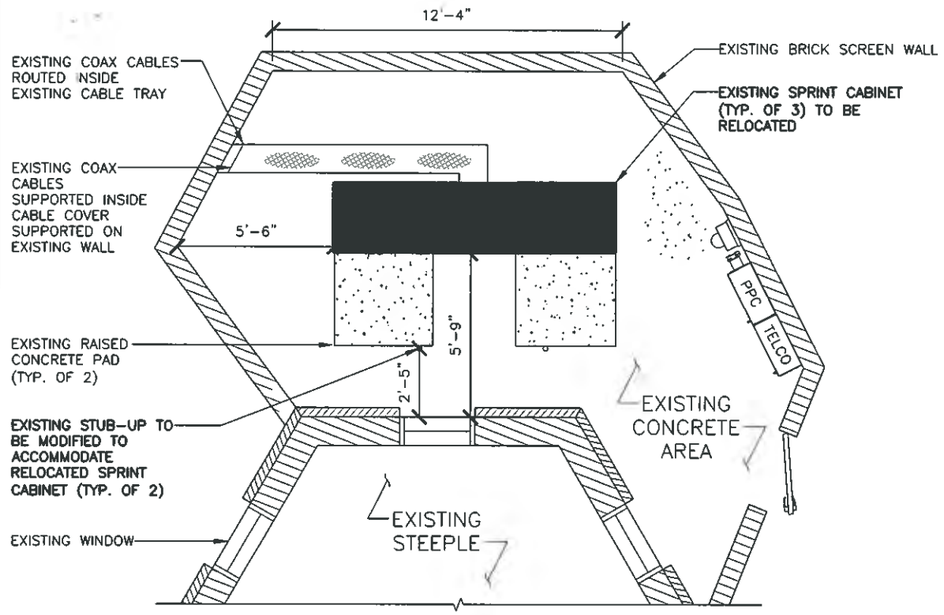
SITE NAME
ST. ANN'S CHURCH

SITE NO.
KC03XC182

SITE ADDRESS
7231 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

SHEET NAME
SITE PLAN

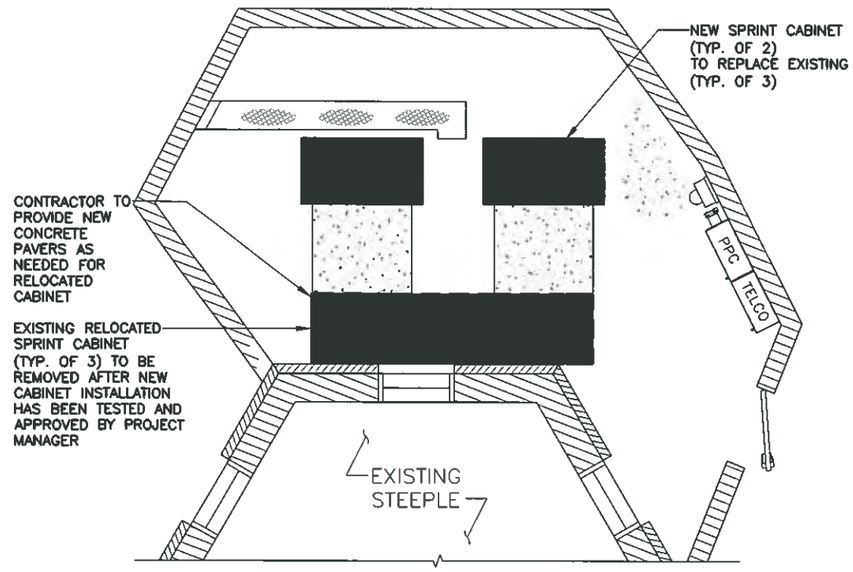
SHEET NUMBER
Z1



1 EXISTING CONCRETE PAD LAYOUT

SCALE: 3/16" = 1'-0"

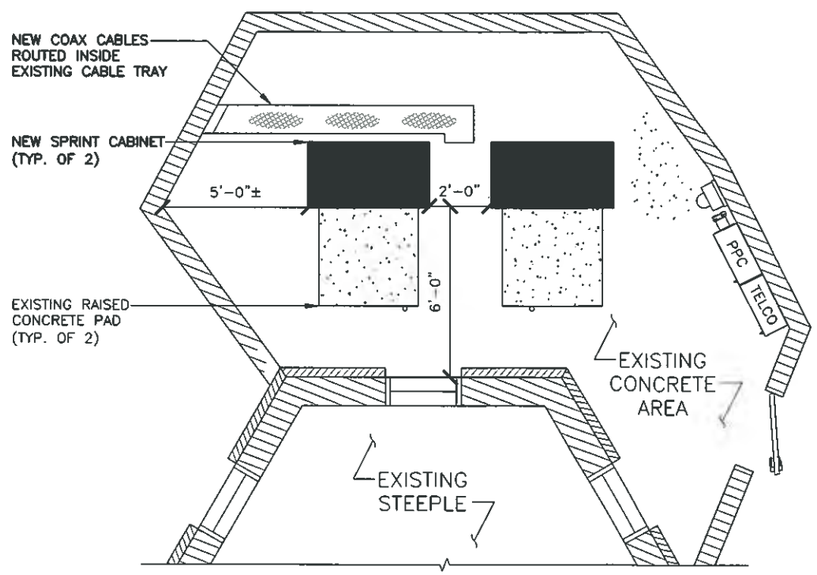
NORTH 0 1' 2' 4' 8'



2 TEMPORARY CONCRETE PAD LAYOUT

SCALE: 3/16" = 1'-0"

NORTH 0 1' 2' 4' 8'



3 FINAL CONCRETE PAD LAYOUT

SCALE: 3/16" = 1'-0"

NORTH 0 1' 2' 4' 8'

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

ERICSSON
6100 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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COA# E-1939
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DRAWN BY:	CHECKED BY:	APPROVED BY:
TP	RI	MB

NO	DESCRIPTION	BY	DATE
	ZONING	TP	7/27/11
	REV. ZONING	TP	9/13/11

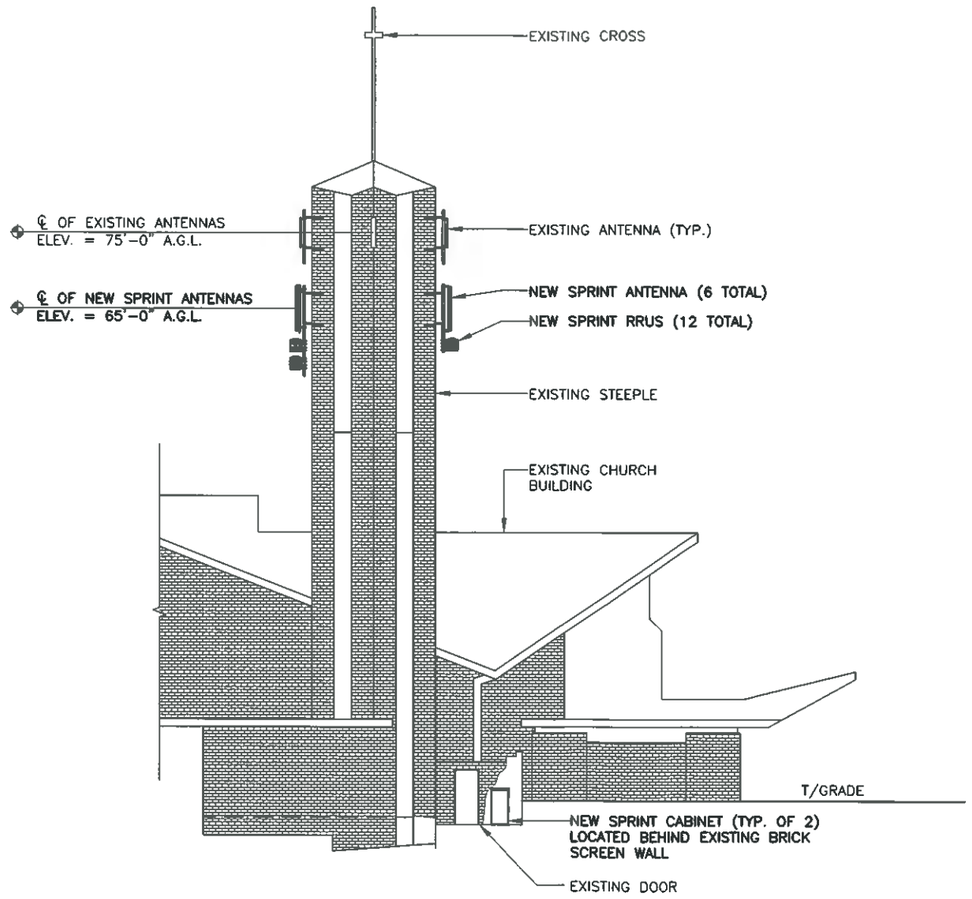
SITE NAME
ST. ANN'S CHURCH

SITE NO.
KC03XC182

SITE ADDRESS
7231 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

SHEET NAME
CONCRETE PAD LAYOUT

SHEET NUMBER
Z2



1 ELEVATION
SCALE: 1" = 20'-0"
0 10 20 30

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COA# E-1939
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DRAWN BY:	CHECKED BY:	APPROVED BY:
TP	RI	MB

NO	DESCRIPTION	BY	DATE
	ZONING	TP	7/27/11
	REV. ZONING	TP	9/13/11

SITE NAME
ST. ANN'S CHURCH

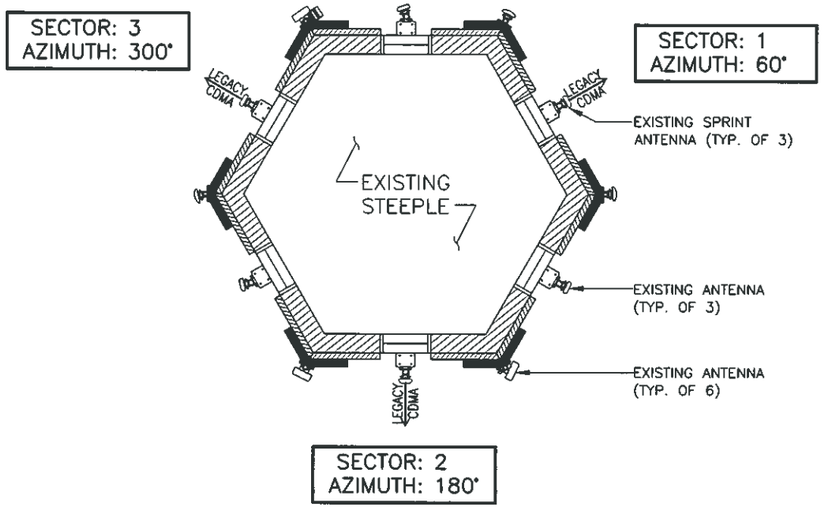
SITE NO.
KC03XC182

SITE ADDRESS
7231 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

SHEET NAME
SITE ELEVATION

SHEET NUMBER
Z3

ANTENNAS LOCATED AT 75' A.G.L.

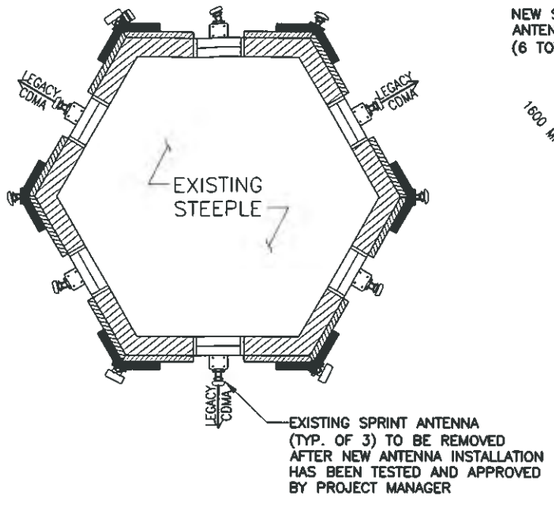


1 EXISTING ANTENNA LAYOUT

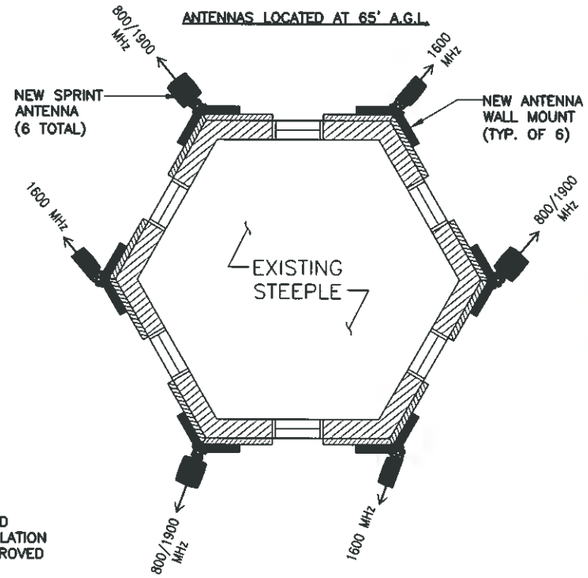
SCALE: 1/8" = 1'-0"

NORTH 0 2' 4' 8' 12'

ANTENNAS LOCATED AT 75' A.G.L.



ANTENNAS LOCATED AT 65' A.G.L.



2 TEMPORARY ANTENNA LAYOUT

SCALE: 1/8" = 1'-0"

NORTH 0 2' 4' 8' 12'

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

ERICSSON
6100 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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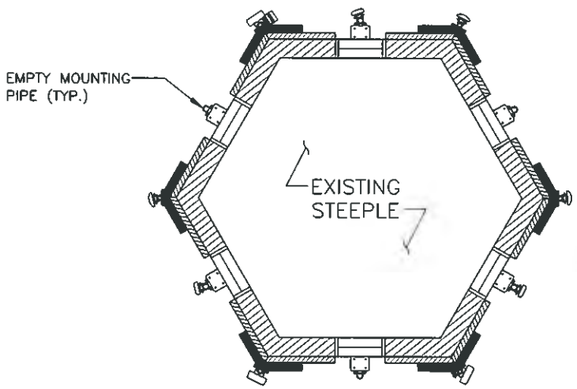
DRAWN BY:	CHECKED BY:	APPROVED BY
TP	RI	MB

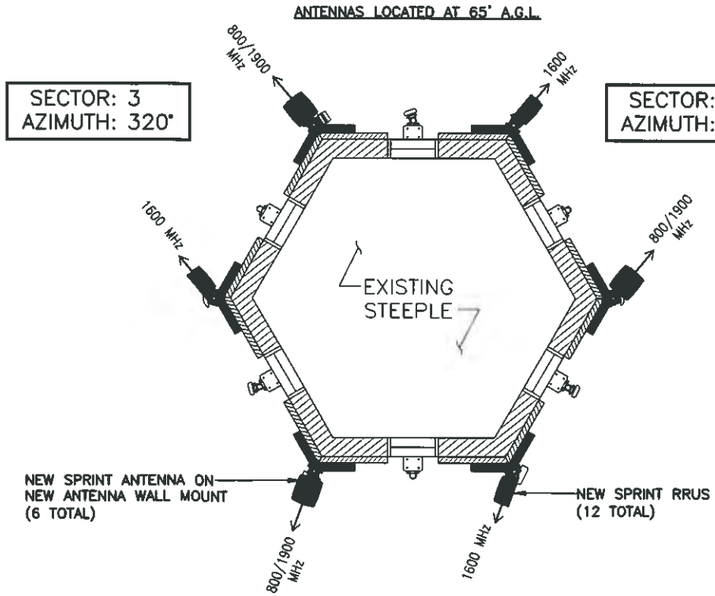
NO	DESCRIPTION	BY	DATE
	ZONING	TP	7/27/11
	REV. ZONING	TP	9/13/11

TRUE NORTH
MAGNETIC NORTH
DECLINATION 2°19' E

ANTENNAS LOCATED AT 75' A.G.L.



ANTENNAS LOCATED AT 65' A.G.L.



3 FINAL ANTENNA LAYOUT

SCALE: 1/8" = 1'-0"

NORTH 0 2' 4' 8' 12'

ANTENNA LEGEND

EXISTING SPRINT ANTENNAS

NEW SPRINT ANTENNAS

RFS: APXVERR18-C
ARGUS: HPX311R

NOTES:
1. FINAL AZIMUTHS ARE SUBJECT TO REVISIONS AND ARE TO BE VERIFIED WITH LATEST RF DATA SHEET.
2. CONTRACTOR TO VERIFY EXISTING ANTENNA FRAMES ARE ADEQUATE TO MEET MINIMUM SEPARATION REQUIREMENTS. SEPARATION IS TYPICAL PER SECTOR UNLESS NOTED OTHERWISE. NOTIFY PROJECT MANAGER IF SEPARATION CAN NOT BE MET

NOTE:
FINAL ANTENNA LOCATION TO BE APPROVED BY LANDLORD & RF ENGINEER

SITE NAME
ST. ANN'S CHURCH

SITE NO.
KC03XC182

SITE ADDRESS
7231 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

SHEET NAME
ANTENNA LAYOUT

SHEET NUMBER
Z4

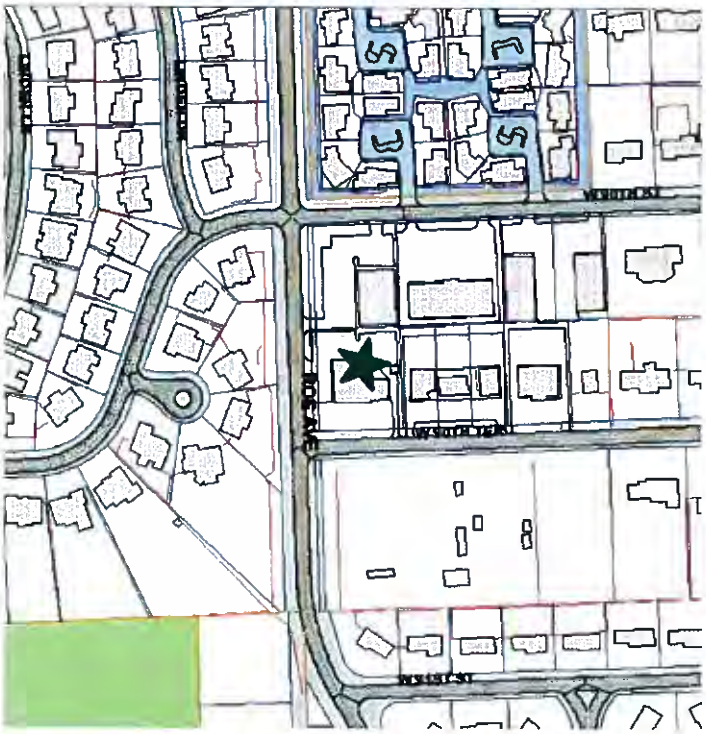
LOCHNER

STAFF REPORT

TO:	Prairie Village Planning Commission	
FROM:	Ron Williamson, Lochner, Planning Consultant	
DATE:	December 6, 2011 Planning Commission Meeting	Project # 010002401

Application:	**PC 2011-121**
Request:	**Site Plan Approval to replace three existing antennas, add three new antennas and replace the equipment cabinets.**
Property Address:	**9011 Roe Avenue, Fire Station**
Applicant:	**Sprint**
Current Zoning and Land Use:	**C-1 Restricted Business District – Fire Station**
Surrounding Zoning and Land Use:	**North C-2 General Business District - Offices** **West: R-1A Single-Family Residential District – Single-family Dwelling** **South: R-1A Single-Family Residential District – Church** **East: C-1 Restricted Business District – KCP&L Substation**
Legal Description:	**Lot 11 Blk 7 Somerset Acres West**
Property Area:	**0.73 Acres**
Related Case Files:	**PC 2009-16 Special Use Permit for Clearwire** **PC 2004-10 Special Use Permit for Cingular Wireless (Now AT&T)** **PC 1996- 06 Conditional Use Permit for Sprint Wireless**
Attachments:	**Application, Site Plan, Project Photos**

General Location Map



Aerial Map

COMMENTS:

Sprint is requesting Site Plan Approval to replace three antennas, add three new antennas and replace three equipment boxes with two equipment boxes. This monopole is 100 feet tall and the sprint installation is at the top of the monopole. The equipment compound at the base of the tower will not be enlarged or increased in size. The purpose of these antennas is to increase capacity and to enable Sprint to provide 4G capacity in order to accommodate the demand for increased cell phone coverage, particularly smart phones, and to process more data faster.

This is the first monopole approved in Prairie Village and at that time approval was by Conditional Use Permit. In 2004, a Special Use Permit was granted to Cingular (now AT&T) to install antennas at the 90 feet elevation along with equipment cabinets in the compound at the base of the antenna. In 2009, a Special Use Permit was granted to Clearwire to install antennas and equipment cabinets. Sprint is a major shareholder in Clearwire and the Clearwire antennas were installed as a modification to the Sprint antennas at the top of the tower. The Clearwire antennas will remain as installed, but the three companion Sprint antennas will be replaced with new panels. The three new Sprint antennas will be mounted below the existing antennas. The three new antennas will have panels approximately 8" wide by 69" long with a total weight of 33.5 pounds. The replacement panels will be approximately 12" wide by 72" long.

The existing three equipment cabinets will be temporarily relocated and will be removed after the new cabinets have been tested and approved. This may take up to two years. Similarly, the existing antennas will be relocated and used until they have been tested and approved. This seems to be a long time for testing and it should be reduced. Since no neighbors have appeared at previous neighborhood meetings and the changes were not major, the applicant was not required to hold a neighborhood meeting.

The Planning Commission shall give consideration to the following criteria, in approving or disapproving a site plan:

A. The site is capable of accommodating the building, parking areas and drives with appropriate open space and landscape.

The capability of the site to accommodate the equipment compound was addressed in the approval of the Special Use Permit. The proposed improvements will occur on the existing tower and within the existing equipment compound.

B. Utilities are available with adequate capacity to serve the proposed development.

Adequate utilities are available to serve this location.

C. The plan provides for adequate management of stormwater runoff.

No additional impervious area that will be created and therefore a stormwater management plan is not required.

D. The plan provides for safe and easy ingress, egress and internal traffic circulation.

The site utilizes the existing driveway and parking lot for circulation that currently serves it and no changes are proposed.

E. The plan is consistent with good land planning and good site engineering design principles.

The details of the overall design of the equipment compound were worked out on the approval of the Conditional Use Permit. That applicant needs to prepare a structural analysis to confirm that the tower is sufficient to carry the additional load.

F. An appropriate degree of compatibility will prevail between the architectural quality of the proposed installation and the surrounding neighborhood.

The tower has been at this location for approximately twenty-five years and the proposed external installation consists of three additional antennas that are minor in size compared to the size of the tower. The tower is located at the Fire Station and has very little impact on surrounding residential areas. All the equipment will be located within the equipment compound. The existing ice bridge will be used. The wiring will be inside the tower.

It should be pointed out that when the original approval for the cell tower occurred in 1996, it was the intent that the equipment be screened. A six foot high fence was required at that time. Obviously, the equipment boxes are much taller and the six foot tall fence is inadequate. In 2009, the Special Use Permit approved for Clearwire required adequate screening of the equipment. A new taller fence or wall should replace the existing fence in order to improve the appearance of the installation and make this installation more consistent with others in the City. It should also be noted that the ice bridge is much higher and more visible than other installations.

G. The plan represents an overall development pattern that is consistent with the comprehensive plan (Village Vision) and other adopted planning policies.

Wireless communications are not specifically addressed in Village Vision. Generally it falls into maintaining and improving infrastructure.

RECOMMENDATION:

It is the recommendation of the Staff that the Planning Commission approve this Site Plan for Sprint subject to the following conditions:

1) That the antennas be installed as shown on the proposed site plan.
2) That all wiring be contained inside the tower.
3) That all equipment and wiring shall be below the screening fence.
4) That the three existing cabinets shall be removed immediately after the operation of the new cabinets has been approved but in no event longer than 12 months from the date of Planning Commission approval of this application.
5) That the three existing antennas shall be removed immediately after the operation of the new antennas has been approved but in no event longer than 12 months from the date of Planning Commission approval of this application.
6) That the applicant prepare a structural analysis of the tower to confirm that it is sufficient to carry the additional load.
7) That the applicant replace the existing wood fence with a brick wall that is tall enough to screen the equipment boxes. The brick shall match the fire station brick as close as possible and plans for the wall shall be submitted to Staff for review and approval prior to obtaining a permit.

Antennas (9011 Roe)

Equipment Compound (9011 Roe)

OZ 4017

Date: **September 16, 2011**

Branden Woodard
Crown Castle USA Inc.
2000 Corporate Drive
Canonsburg, PA 15317

FDH Engineering, Inc.
2730 Rowland Road
Raleigh, NC 27615
(919) 755-1012
info@fdh-inc.com

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* – Interim Loading Co-Locate**	
	Carrier Site Number:	KC03XC183
	Carrier Site Name:	KC03XC183
Crown Castle Designation:	**Crown Castle BU Number:**	877791
	Crown Castle Site Name:	PRAIRIE VILLAGE FIRE STATION
	Crown Castle JDE Job Number:	165790
	Crown Castle Work Order Number:	434864

Engineering Firm Designation: **FDH Engineering, Inc. Project Number:** 11-09210E S1 (R1)

Site Data: **9011 ROE AVE., PRAIRIE VILLAGE, Johnson County, KS**
Latitude *38° 57' 55.25"*, Longitude *-94° 38' 20.76"*
97 Foot - Monopole Tower

Dear Branden Woodard,

FDH Engineering, Inc. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 430122, in accordance with application 130451, revision 2.

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

LC1: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standards based upon a wind speed of 75 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Respectfully submitted by:

Sean O'Sullivan, EI
Project Engineer

Reviewed by:

Neil J. Kuplic, PE
Vice President
KS PE License No.18908

NEIL J. KUPLIC LICENSED 18908 KANSAS PROFESSIONAL ENGINEER

9/16/11

RISA Tower Report - version 5.4.2.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 97 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in July of 1996. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-E.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 75 mph with no ice, 28.1 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
97	100	3	argus technologies	HPX311R w/ Mount Pipe	3	1-1/2	1
		3	rfs celwave	APXVERR18-C w/ Mount Pipe			
	97	6	ericsson	1600 MHz SARSAT FILTER			
		6	ericsson	1600MHz MAT FILTER			
		6	ericsson	800MHZ SMR FILTER			
		3	ericsson	RRUS A2 MODULE			
		15	ericsson	RRUS-11			
		9	rfs celwave	ACU-A20-N			
		6	rfs celwave	IBC1900HG-1			
		1	tower mounts	T-Arm Mount [TA 901-3]			
		6	---	Stealth Canister			

Notes:
1) Proposed Equipment

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
97	104	1	andrew	VHLP2-18	6 6 2	1-5/8 3/8 1/2	1
		1	andrew	VHLP2-23			
	101	2	---	Pipe Mount			
	100	3	ems wireless	FV65-14-00NA2 w/ Mount Pipe			
	97	3	argus technologies	LLPX310R-V1 w/ Mount Pipe			
		2	dragonwave	HORIZON DUO			
		6	---	Stealth Canister			
		3	motorola	WAP 450			
		1	tower mounts	T-Arm Mount [TA 901-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
90	90	3	alcatel lucent	RRH2x40-07-L	1 2 1 12	3/8 3/4 5/16 1-5/8	1
		6	kathrein	800 10121 w/ Mount Pipe			
		1	kathrein	800 10766 w/ Mount Pipe			
		1	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		9	---	Stealth Canister			
		6	powerwave technologies	TT08-19DB111-001			
		1	tower mounts	T-Arm Mount [TA 601-3]			

Notes:
1) Existing Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
97	97	6	Generic	Cobra Arms w/ 72" Radomes	---	---
		12	Scala	AP17-1900		
80	80	6	Generic	Cobra Arms w/ 72" Radomes	---	---
		12	Scala	AP17-1900		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Terracon (Job No. 02965183) dated July 9, 1996	2094236	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors Incorporated (Project No. KS 1771) dated July 9, 1996	1462113	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors Incorporated (Job No. KS1771) dated June 28, 1996	1548504	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors Incorporated (Drawing No. GS49713) dated July 10, 1996	1549698	CCISITES

3.1) Analysis Method

RISATower (version 5.4.2.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	97 - 60	Pole	TP24.61x15x0.2188	1	-9.07	893.37	88.9	Pass
L2	60 - 25.62	Pole	TP33.53x24.61x0.2813	2	-12.65	1507.62	79.3	Pass
L3	25.62 - 0	Pole	TP39.5x31.735x0.3125	3	-17.82	2008.07	76.8	Pass
							Summary	
						Pole (L1)	88.9	Pass
						RATING =	88.9	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	76.8	Pass
1	Base Plate	0	82.4	Pass
1	Base Foundation	0	51.2	Pass
1	Base Foundation Soil Interaction	0	22.2	Pass
1	Flange Bolts	60	53.7	Pass
1	Flange Plate	60	61.9	Pass

Structure Rating (max from all components) =	88.9%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Capacities up to 105% are considered acceptable based on analysis methods used.

4.1) Recommendations

1. All coax must be installed inside the monopole's shaft.
2. All proposed antennas and TMAs should be installed inside stealth containers.

SITE NAME:

PRAIRIE VILLAGE FIRE STATION

SITE NUMBER:

KC03XC183

(CROWN ID:#877791)

SITE ADDRESS:

9011 ROE AVENUE
PRAIRIE VILLAGE, KS 66207

DRIVING DIRECTIONS

DEPART FROM SPRINT OFFICE:
6391 SPRINT PARKWAY, OVERLAND PARK, KS 66251

DEPART 6100 SPRINT PKWY, OVERLAND PARK, KS 66251 ON SPRINT PKWY (SOUTH), TURN LEFT (EAST) ONTO W 117TH ST, TURN LEFT (NORTH) ONTO NALL AVE, TURN RIGHT (EAST) ONTO RAMP, I-435 / US-50, AT EXIT 77A, KEEP RIGHT TO STAY ON RAMP ROE AVENUE, KEEP LEFT TO STAY ON RAMP, KEEP STRAIGHT ONTO LOCAL ROAD(S), TURN LEFT (NORTH) ONTO ROE AVE, TURN RIGHT (EAST) ONTO LOCAL ROAD(S), ARRIVE AT SITE.

SITE INFORMATION

PROJECT TYPE:	SITE TYPE:	MARKET:
NETWORK VISION	MONOPOLE	KANSAS CITY

SITE NAME:	PRAIRIE VILLAGE FIRE STATION	APPLICANT:	SPRINT PCS 6391 SPRINT PARKWAY OVERLAND PARK, KS 66251
SITE NO: TOWER NO:	KC03XC183 GS49713		
SITE ADDRESS:	9011 ROE AVENUE PRAIRIE VILLAGE, KS 66207	LANDLORD:	CROWN CASTLE (#877791)
COUNTY: JURISDICTION:	JOHNSON, KS CITY OF PRAIRE VILLAGE	BUILDING CODE:	INTERNATIONAL BUILDING CODE, 2006 EDITION
ZONING:	–		
SITE COORDINATES LATITUDE: LONGITUDE: GROUND ELEVATION:	(FROM RF SHEET) N. 38.9656° W. 94.63920° 966'	 (NAD 83) (NAD 83) (AMSL)	ELECTRICAL CODE: NATIONAL ELECTRICAL CODE, 2005 EDITION

LIST OF DRAWINGS

NO.	TITLE
T1	TITLE SHEET
Z1	SITE PLAN
Z2	CONCRETE PAD LAYOUT
Z3	SITE ELEVATION
Z4	ANTENNA LAYOUT

SITE ACCESS PROCEDURES

ACCESS_TYPE_1: COMPOUND GATELOCK_1: COMBO LOCKCOMBO_1: 6985LOCK_1B: COMBO_1B: NOTE_POINT_1: LOOK FOR COMBO LOCK THAT HAS A SPRINT STICKER ON IT. ONCE YOU ENTER 6985, SQUEEZE THE LOCK SHUT AND THEN YANK IT OPEN.ACCESS_TYPE_2: CABINET DOORLOCK_2: KEYED LOCKCOMBO_2: CH751LOCK_2B: COMBO_2B: NOTE_POINT_2: TO ACCESS THE BTS DOORS, THEY EITHER ARE LOCKED WITH A P1 LOCK THAT A P1 KEY WILL UNLOCK, A BUILT IN LOCK THAT A CH751 KEY WILL UNLOCK, OR A COMBO LOCK THAT AFTER YOU ENTER 6985, YOU HAVE TO SQUEEZE THE LOCK CLOSED AND THEN YOU CAN YANK IT OPEN.24X7 (NO NOTIFICATION REQUIRED)GATE & TELCO CABINET COMBO = 6985

PROJECT SUMMARY

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED
- FACILITY HAS NO PLUMBING
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS

SCOPE OF WORK

WORK CONSIST OF MODIFYING THE EXISTING WIRELESS INSTALLATION:

- DECOMMISSIONING OF EXISTING ANTENNAS AND BASE STATION EQUIPMENT
- INSTALLATION OF NEW ANTENNAS, ANTENNA SUPPORTS AND BASE STATION EQUIPMENT
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. CABINETS, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR

LOCATION MAP

PROJECT CONTACTS

APPLICANT: SPRINT NEXTEL PROPERTY SERVICES	MAILSTOP KSOPHT0101-Z2650 6391 SPRINT PARKWAY OVERLAND PARK, KS 66251-2650
TOWER/LANDORD: CROWN CASTLE	
ENGINEERING CONSULTANTS: FULLERTON ENGINEERING	RAFIK ISHAYA (847) 292-0200 EX (241)
LEASING: MD7	10590 WEST OCEAN AIR DR., SUITE 300 SAN DIEGO, CA 92130 JOE O'CONNER (858) 799-7850
ZONING PM: NETWORK BUILDING & CONSULTING, LLC	7380 COCA COLA DR., SUITE 106 HANOVER, MD 21076 RON EBERZ (215) 527-0199
SAM:	JOSEPH MARKUS (314) 952-5636
CM:	RUSSELL McCALMENT (417) 777-0918
RF ENGINEER:	AARON SCARBOROUGH 913-219-4175

ENGINEER'S LICENSE

I CERTIFY THAT THESE DRAWING WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, 2006 EDITION

LICENSED ENGINEER – STATE OF KANSAS

SIGNED DATE: _____
EXPIRES: _____ LICENSE#: _____

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DRAWINGS SCALED TO 11"x17"

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6100 SPRINT PARKWAY
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FAX: 847-292-0206
COA# E-1939
www.FullertonEngineering.com

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AA	RI	MB

NO	DESCRIPTION	BY	DATE
	ZONING	AA	7/20/11
	REV. ZONING	AA	10/07/11

SITE NAME
PRAIRIE VILLAGE FIRE STATION

SITE NO.
KC03XC183

SITE ADDRESS
9011 ROE AVENUE
PRAIRIE VILLAGE, KS 66207

SHEET NAME
TITLE SHEET

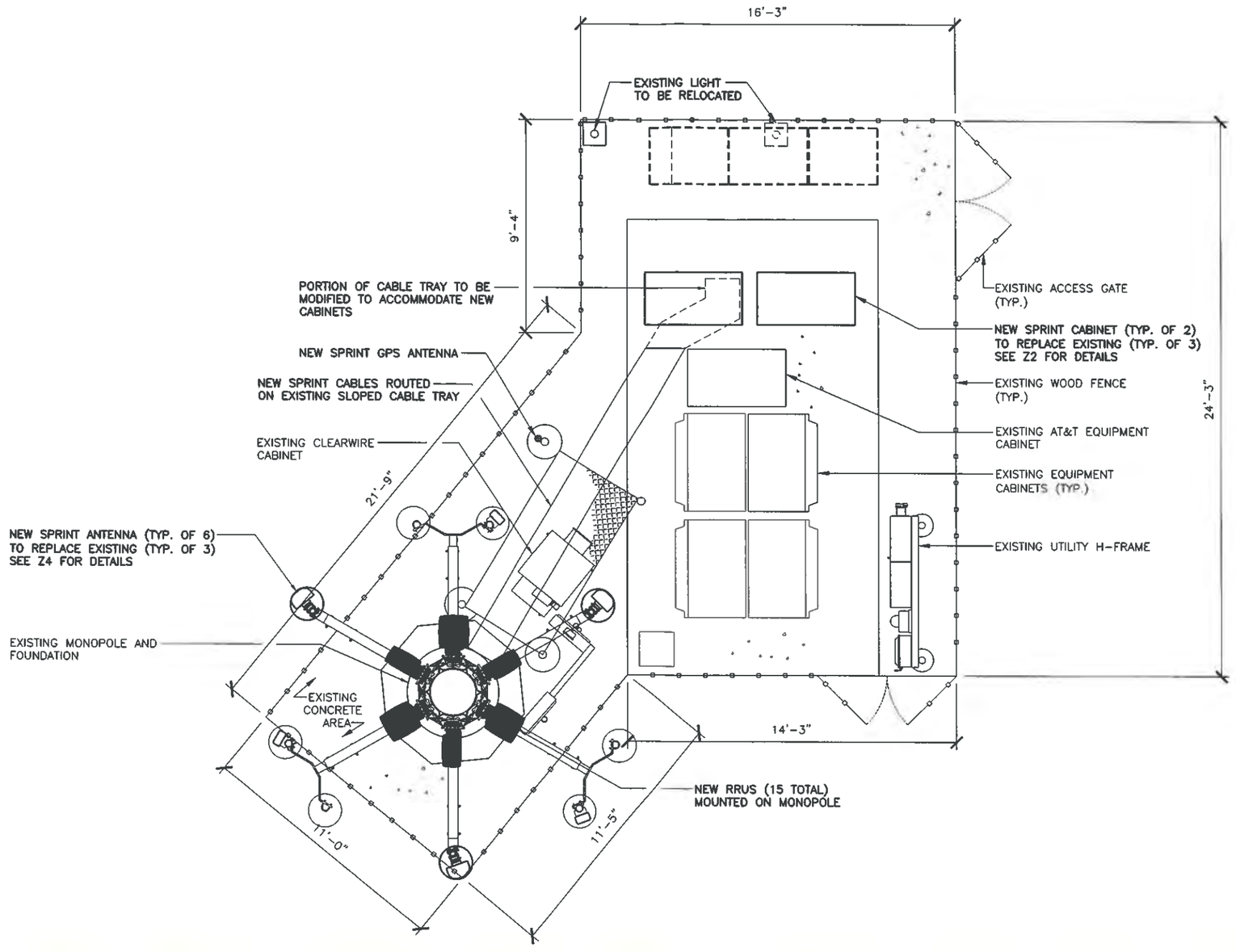
SHEET NUMBER
T1

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
RBS	RADIO BASED STATION
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S)	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER
#	POUND(S)

SYMBOLS

- REVISION
- WORK POINT
- UTILITY POLE
- BRICK
- COMPRESSED STONE
- CONCRETE
- EARTH
- GRAVEL
- MASONRY
- STEEL
- CENTERLINE
- PROPERTY LINE
- LEASE LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- WOOD FENCE
- UE — BELOW GRADE ELECTRIC
- UT — BELOW GRADE TELEPHONE
- OE/OT — OVERHEAD ELECTRIC/ TELEPHONE
- SECTION REFERENCE



1 SITE PLAN
SCALE: 3/16" = 1' - 0"
NORTH
0 1' 2' 4' 8'

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	REV. ZONING	AA	10/07/11

SITE NAME
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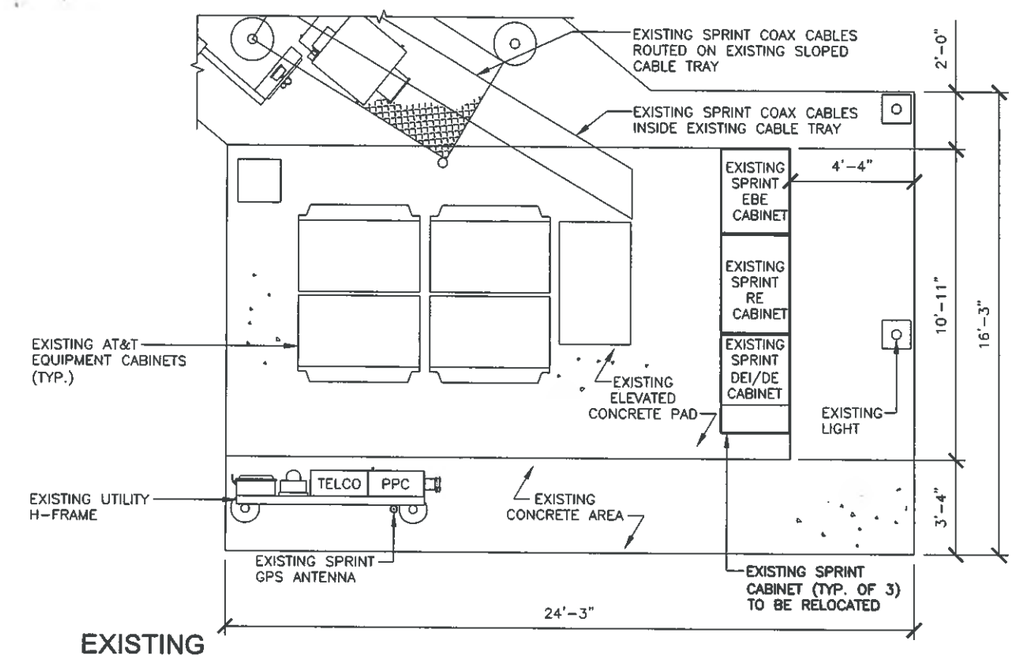
SITE NO.
KC03XC183

SITE ADDRESS
9011 ROE AVENUE
PRAIRIE VILLAGE, KS 66207

SHEET NAME
SITE PLAN

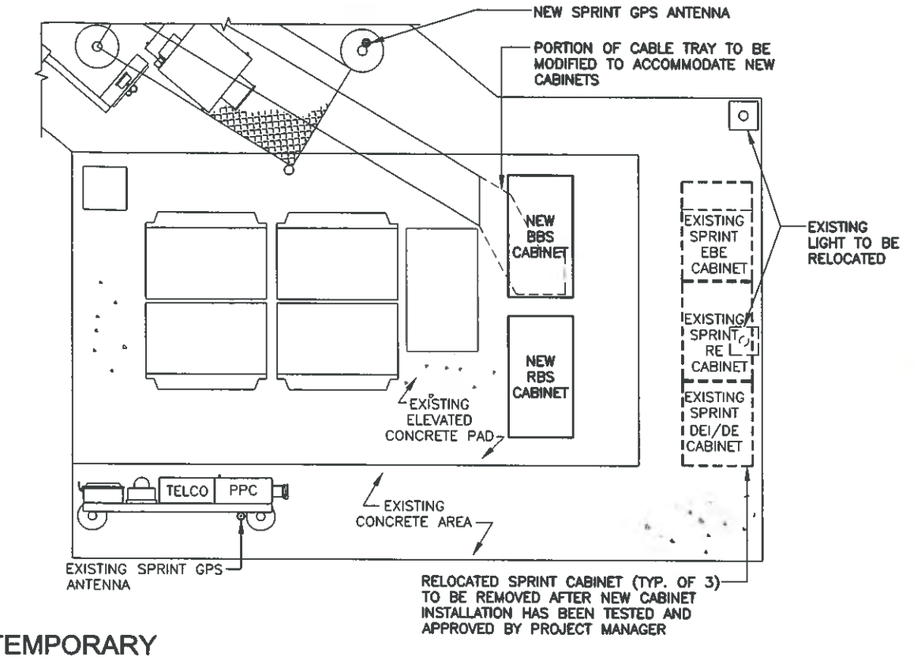
SHEET NUMBER
Z1



1 EXISTING CONCRETE PAD LAYOUT

SCALE: 3/16" = 1' - 0"

NORTH 0 1' 2' 4' 8'



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SCALE: 3/16" = 1' - 0"

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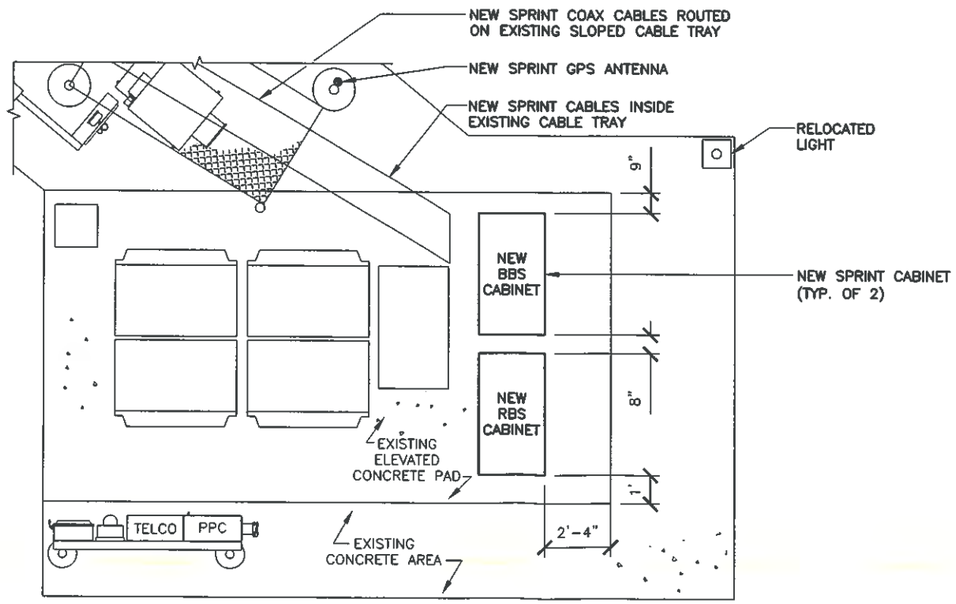

3 FINAL CONCRETE PAD LAYOUT

SCALE: 3/16" = 1' - 0"

NORTH 0 1' 2' 4' 8'

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SITE NAME
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SITE NO.
KC03XC183

SITE ADDRESS
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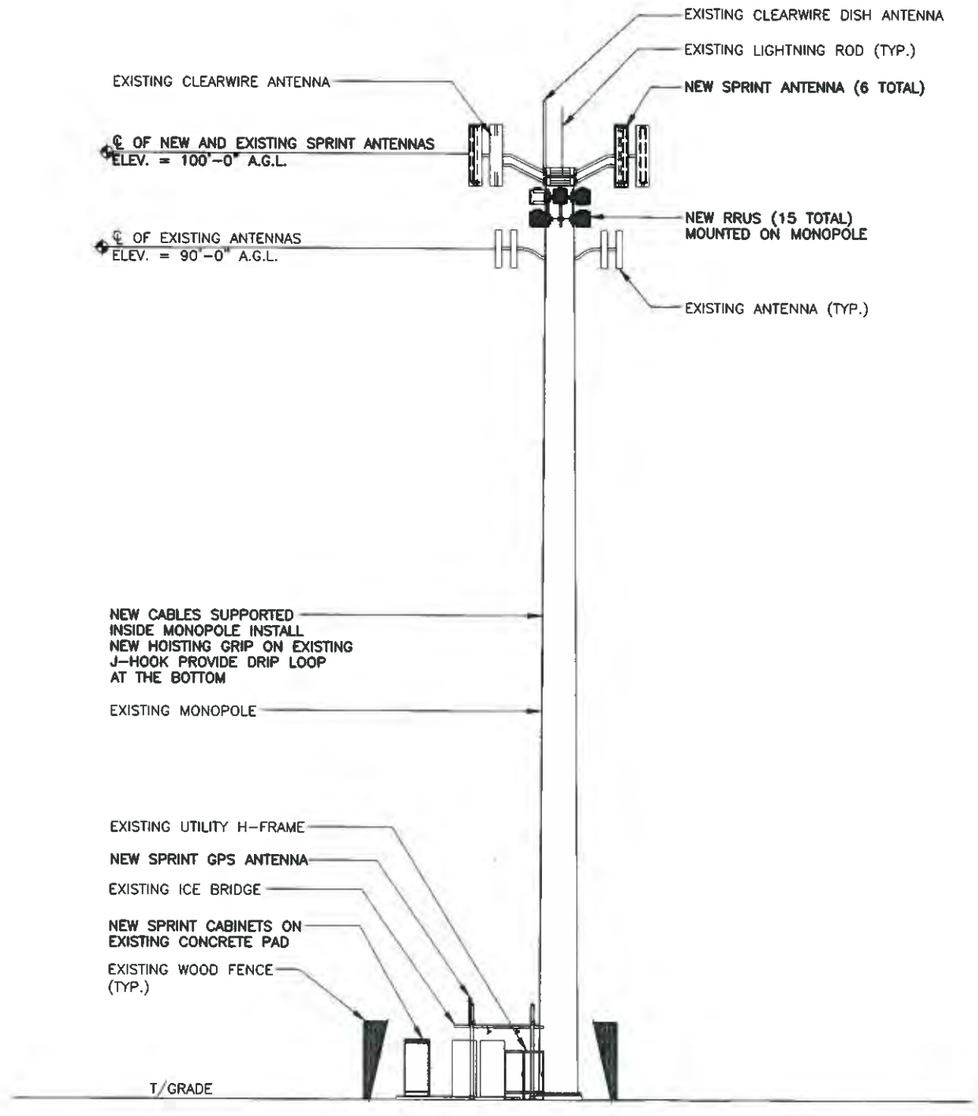
SHEET NAME
CONCRETE PAD\PLATFORM\ SHELTER LAYOUT

SHEET NUMBER
Z2



1 ELEVATION
SCALE: 1/16" = 1' - 0"
0

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FIRE STATION

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KC03XC183

SITE ADDRESS
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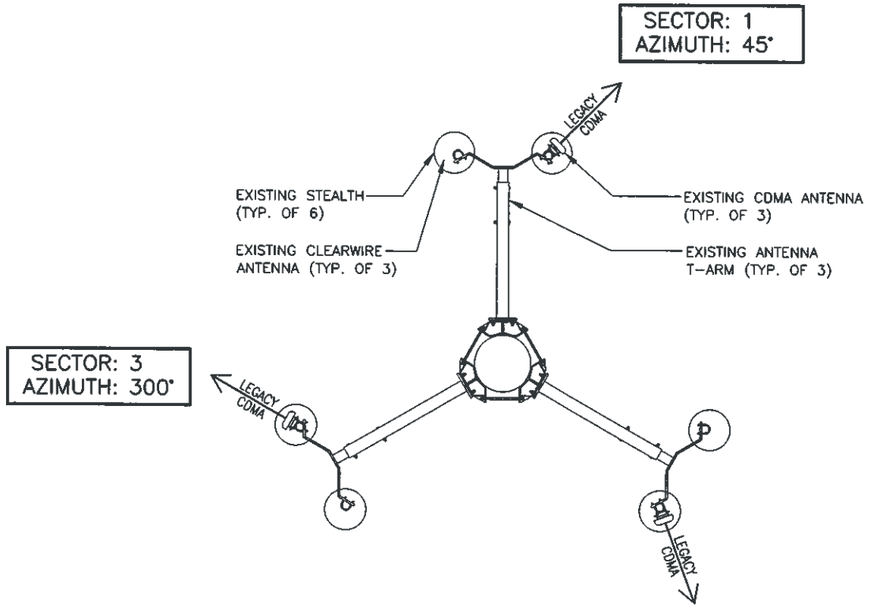
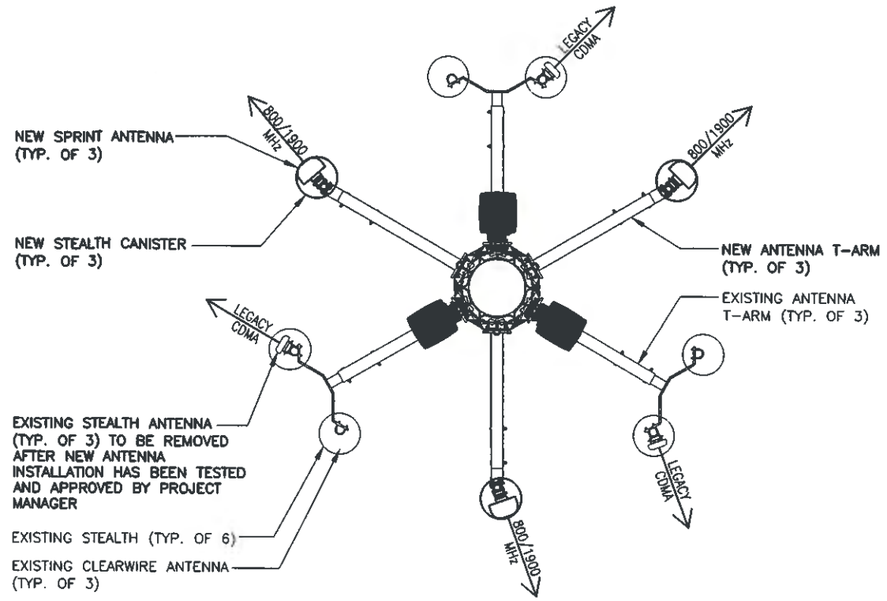
PRAIRIE VILLAGE, KS 66207

SHEET NAME
SITE ELEVATION

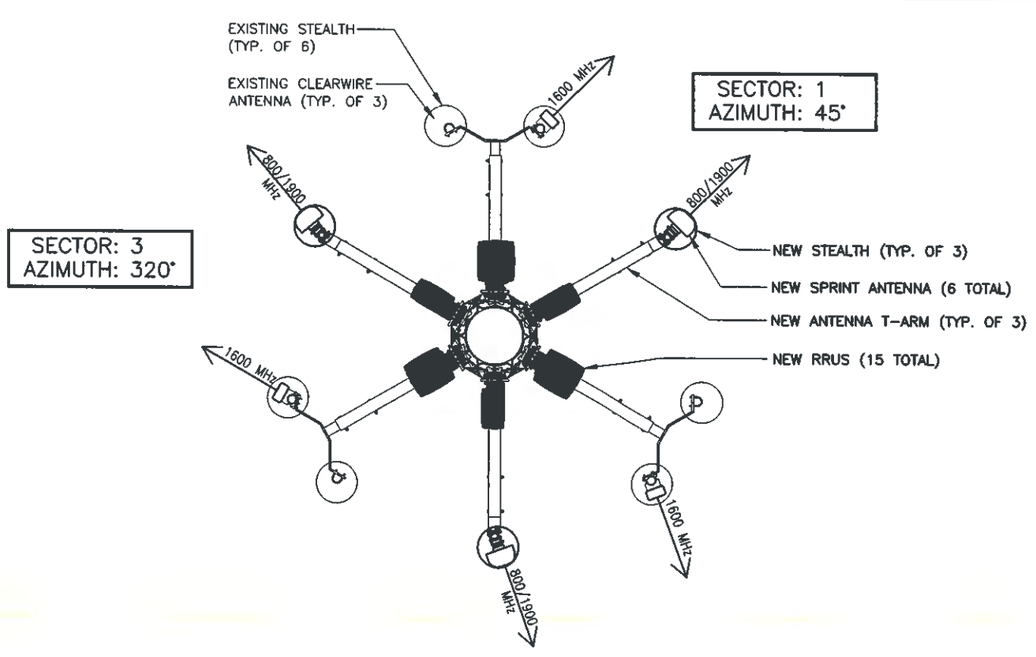
SHEET NUMBER
Z3



1 EXISTING ANTENNA LAYOUT
SCALE: 3/16" = 1' - 0"
NORTH
0 1' 2' 4' 8'



2 TEMPORARY ANTENNA LAYOUT
SCALE: 3/16" = 1' - 0"
NORTH
0 1' 2' 4' 8'



3 FINAL ANTENNA LAYOUT
SCALE: 3/16" = 1' - 0"
NORTH
0 1' 2' 4' 8'

ANTENNA LEGEND	
EXISTING SPRINT ANTENNAS	
NEW SPRINT ANTENNAS	
RFS: APXVERR18-C	ARGUS: HPX311R

NOTES:
1. FINAL AZIMUTHS ARE SUBJECT TO REVISIONS AND ARE TO BE VERIFIED WITH LATEST RF DATA SHEET.
2. CONTRACTOR TO VERIFY EXISTING ANTENNA FRAMES ARE ADEQUATE TO MEET MINIMUM SEPARATION REQUIREMENTS. SEPARATION IS TYPICAL PER SECTOR UNLESS NOTED OTHERWISE. NOTIFY PROJECT MANAGER IF SEPARATION CAN NOT BE MET

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SITE NAME
PRAIRIE VILLAGE
FIRE STATION

SITE NO.
KC03XC183

SITE ADDRESS
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PRAIRIE VILLAGE, KS 66207

SHEET NAME
ANTENNA LAYOUT

SHEET NUMBER
Z4

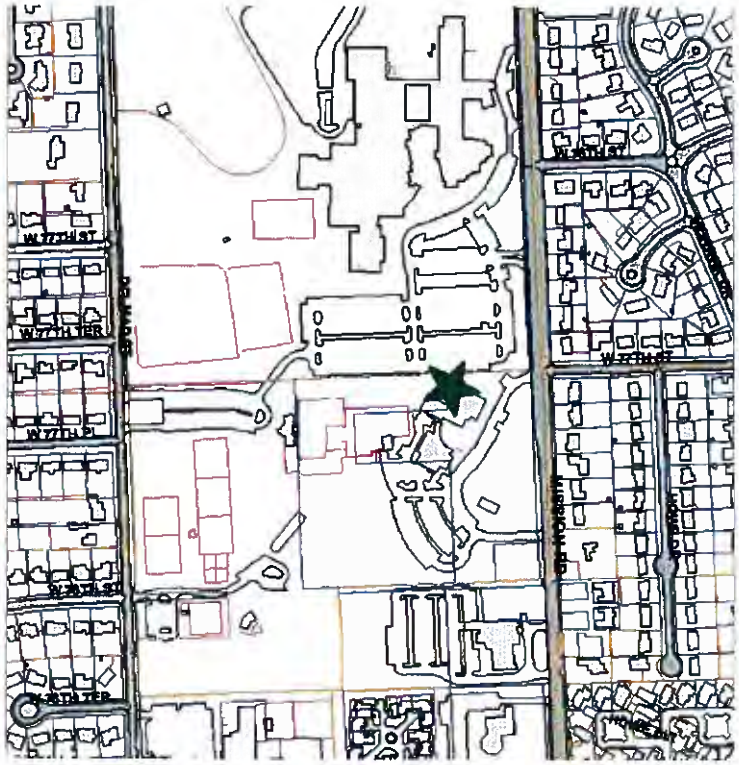
LOCHNER

STAFF REPORT

TO: Prairie Village Planning Commission
FROM: Ron Williamson, Lochner, Planning Consultant
DATE: December 6, 2011 Planning Commission Meeting Project # 010002401

Application:	**PC 2011-120**
Request:	**Site Plan Approval to add Antennas to the Cell Tower and replace equipment cabinets in the Equipment Compound.**
Property Address:	**7700 Mission Road, City Hall**
Applicant:	**Sprint**
Current Zoning and Land Use:	**R-1A Municipal Office Complex**
Surrounding Zoning and Land Use:	**North** R-1A Single-Family Residential District – Shawnee Mission East High School **West:** R-1A Single-Family Residential District – Single-family Dwellings **South:** R-1A Single-Family Residential District – Church **East:** R-1A Single-Family Residential District – Single-family Dwellings
Legal Description:	**Prairie Village Municipal Office Complex Tract 1**
Property Area:	**Cell Tower Compound Approximately 3,200 sq. ft. 0.07 Acres** **Municipal Office Complex 16.75 Acres**
Related Case Files:	**PC 2011-114 Site Plan Approval to add Antennas and Standby Generator for AT&T** **PC 2009-17 Special Use Permit Renewal for Sprint** **PC 2006-19 Special Use Permit Renewal for Cingular Wireless** **PC 2005-115 Final Plat Municipal Office Complex** **PC 2004-09 Special Use Permit for Sprint** **PC 2001-05 Special Use Permit for AT&T** **PC 2000-05 Special Use Permit for General Dynamics/Metricom** **PC 1997-04 Special Use Permit to Replace Tower**
Attachments:	**Application, Site Plan, Project Photos**

General Location Map



Aerial Map

COMMENTS:

Sprint is proposing to replace three antennas and the platform and add three additional antenna installations at the 110' elevation on the tower behind City Hall. The purpose of these antennas is to increase capacity and enable Sprint to provide 4G coverage which is faster mobile broadband speed. Sprint is implementing a nationwide upgrade to increase its capacity in order to accommodate the demand for increased cell phone coverage, particularly smart phones, and to process more data faster.

The applicant proposes to replace the existing platform and replace it with a new low profile antenna platform. The new platform will be a triangular shape in plan view with replacement antennas on each of the three points and new antennas located on the platform midway between the points. The three replacement antennas will have a panel approximately 12" wide by 72" long with a weight of 62.5 pounds. The three new antennas will have panels approximately 8" wide by 69" long with weight of 38.5 pounds.

Sprint is also proposing to replace the three existing equipment cabinets with two new equipment cabinets which will be approximately 2'4"x4'3"x4'2" in height. These cabinets are small and will be well below the height of the existing brick screening wall which is approximately 8' in height.

The existing three equipment cabinets will be temporarily relocated and will be removed after the new cabinets have been tested and approved. This may take up to two years. Similarly, the existing antennas will be relocated and used until they have been tested and approved. This seems to be a long time for testing and it should be reduced.

In August 2011, the Planning Commission approved a similar antenna change out for AT&T on the platform at the top of the monopole.

In October 2009, the Planning Commission approved the Special Use Permit Renewal for this tower and the approval was based on the new Wireless Communications Ordinance. Changes in the installation for carriers are required to be submitted to the Planning Commission for site plan review and approval.

Since no neighbors have appeared at previous neighborhood meetings and the changes were not major, the applicant was not required to hold a neighborhood meeting.

The Planning Commission shall give consideration to the following criteria, in approving or disapproving a site plan:

A. The site is capable of accommodating the building, parking areas and drives with appropriate open space and landscape.

The capability of the site to accommodate the equipment compound was addressed in the approval of the Special Use Permit. The proposed improvements will occur on the existing tower and within the existing equipment compound. It should be noted that three steel posts extend above the screening wall and they should be reduced into the height of the screening wall with the new installation.

B. Utilities are available with adequate capacity to serve the proposed development.
Adequate utilities are available to serve this location.

C. The plan provides for adequate management of stormwater runoff.
The amount of impervious area will not be changed and therefore will not have an impact on stormwater runoff.

D. The plan provides for safe and easy ingress, egress and internal traffic circulation.
The site utilizes the existing driveway and parking area for access and no changes are proposed.

E. The plan is consistent with good land planning and good site engineering design principles.
The details of the overall design of the equipment compound were worked out on the approval of the Special Use Permit. That applicant has prepared a structural analysis and the tower is sufficient to carry the additional load.

F. An appropriate degree of compatibility will prevail between the architectural quality of the proposed installation and the surrounding neighborhood.
The tower has been at this location for approximately twenty years and the proposed external installation consists of three additional antennas that are minor in size compared to the size of the tower. The tower is located in the Municipal Complex and has very little impact on surrounding residential areas. All the equipment will be located within the equipment compound. The existing ice bridge will be used and it is not visible above the wall. The wiring will be inside the tower.

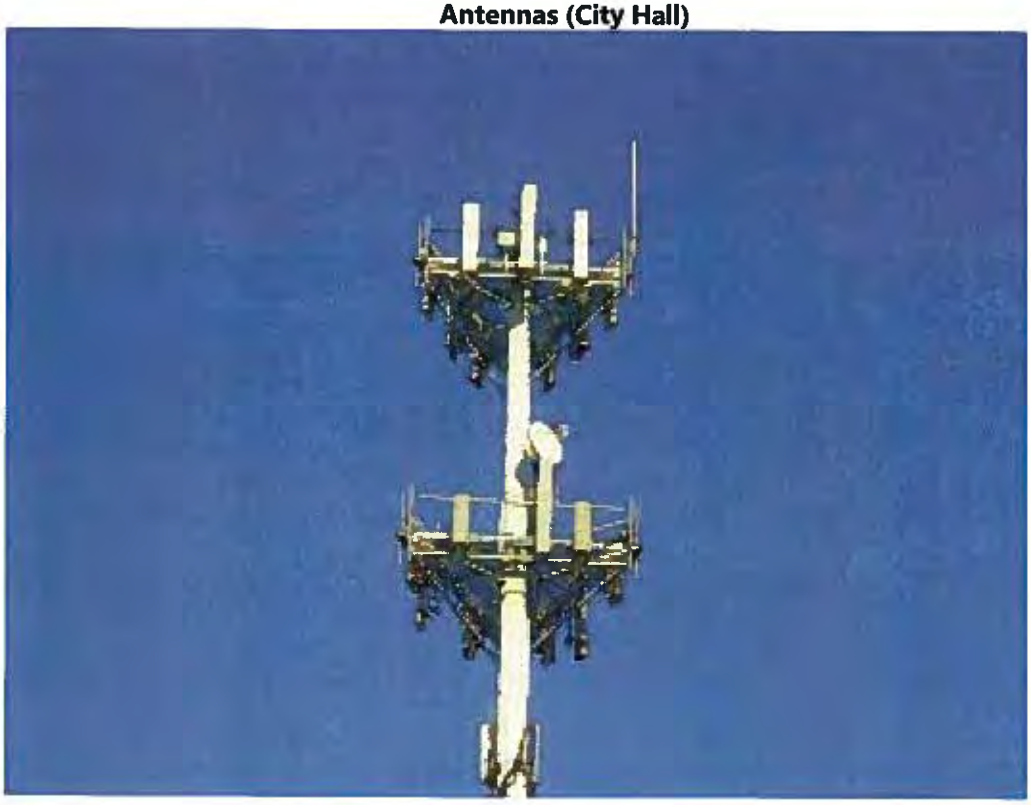
G. The plan represents an overall development pattern that is consistent with the comprehensive plan (Village Vision) and other adopted planning policies.
Wireless communications are not specifically addressed in Village Vision. Generally it falls into maintaining and improving infrastructure.

RECOMMENDATION:

It is the recommendation of the Staff that the Planning Commission approve this Site Plan for Sprint subject to the following conditions:

1) That the antennas be installed as shown on the proposed site plan.
2) That all wiring be contained inside the tower.
3) That all equipment and wiring shall be below the screening wall. The three existing steel poles that extend above the screening wall shall either be removed or reduced to the height of the wall.
4) That the three existing cabinets shall be removed immediately after the operation of the new cabinets has been approved but in no event longer than 12 months from the date of Planning Commission approval of this application.
5) That the three existing antennas shall be removed immediately after the operation of the new antennas has been approved but in no event longer than 12 months from the date of Planning Commission approval of this application.

Antennas (City Hall)



Equipment Compound (City Hall)

Structural Calculations

Prepared for: Sprint Network Vision

New Antennas on Existing 150ft Monopole

Site No. KC60XC727
Prairie Village City
7700 Mission Road
Prairie Village, KS 66208

August 19, 2011

8/19/11

Abraham J. Rokach, PE
Kansas PE License No. 21784
Expires April 30, 2013

I certify that this report was prepared by me, or under my direct supervision and control, and, to the best of my knowledge and belief, complies with the requirements of the applicable building code.

Fullerton
Engineering Consultants

9600 Bryn Mawr Ave, Suite 200, Rosemont, IL 60018
Phone: (847) 292 0200 Fax: (847) 292 0205

Summary

The structural analysis was performed by Fullerton Engineering Consultants, as requested by the client, to determine the compliance of existing structure with the governing building code and the industry standard, TIA/EIA-222-F (Structural Standards for Steel Antenna Towers and Antenna Supporting Structures). The analysis considers the tower properties, existing antennas and proposed antennas and the required loading criteria.

In conclusion, the tower member and foundation stresses are adequate for the loading considered.

Analysis Criteria

The structural analysis was performed with the following criteria:

Codes & Requirements 2006 International Building Code

TIA-222-F (2006)

Basic Wind Speed 76 mph (fastest mile) / 90 mph (3-second gust), with ½"radial ice

Appurtenance Loading Schedule

Elev. (ft.– AGL)	Appurtenance	Transmission Lines
	Proposed	
110'	(3) RFS APXVERR18-C-0 (3) Argus HPX311R (12) RRU's (1) Low Profile Platform	(12) 7/8" Coaxial
	Existing	
147'	(6) EMS 72"x12"x7" Panels (1) 12' Omni Antenna, mounted on (1) 15' Platform with handrail	(6) 7/8" Coaxial
125'	(9) Andrew 731DG65VTAXM with (9) TMA's, mounted on (1) 15' Platform with handrail	(9) 1 5/8" Coaxial
110'	(3) EMS RR6517XXDPL2	(6) 1 1/4" Coaxial
57'	(1) 20' Omni, mounted on (1) 3' Side arm mount	(1) 7/8" Coaxial

Results

The results of the structural analysis are summarized as follows:

Tower Mast

The tower leg members are **adequate** for new loads, with a maximum stress ratio of 94.4% @ Elev. 0'-46' AGL.

The tower base plate is **adequate** for new loads, with a maximum stress ratio of 67.1% @ Elev. 0' AGL.

Deflection/Tilt/Twist

Design wind speed, with ½" radial ice

Max. 123.614" / 6.9200 deg. / 0.0249 deg. @ Elev. 150' AGL
Max. 56.770" / 5.3493 deg. / 0.0080 deg. @ Elev. 100' AGL

Service Wind Speed (60 mph)

Max. 77.267" / 4.3274 deg. / 0.0156 deg. @ Elev. 150' AGL
Max. 35.458" / 3.3411 deg. / 0.0050 deg. @ Elev. 100' AGL

Foundation

The maximum design reactions at the base of the monopole are 1869 ft*kips in overturning and 18 kips in shear. The maximum calculated reactions at the base of the monopole are 1911 ft*kips in overturning and 19.3 kips in shear. Because the 2% increase in overturning moment is very small, the existing foundation can be assumed to be **adequate** by engineering judgment.

Geotechnical

No geotechnical information is available during this analysis.

Analysis Data

The following is based on information provided by the client, field investigation, and other determination by Fullerton Engineering Consultants or third parties.

Site Location

7700 Mission Road
Prairie Village, KS 66208

Configuration

150' Valmont 12-sided, monopole with a base diameter of 42.29" and a top diameter of 16.35". Monopole currently has antenna mounts at 57', 110', 125, and 148'.

Origination Date

Unknown

Modification History

Unknown

References

Existing structural provided by Selective Site Consultants, Inc. dated July 7, 2004.

Assumptions

This analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. The analysis is based solely on the information supplied, and the results, in turn, are only as accurate as data extracted from this information. Fullerton has been instructed by the client to assume the information supplied is accurate, and Fullerton has made no independent determination of its accuracy. The following assumptions were made for this structural analysis:

- The tower member sizes and geometry are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and stated in the materials section.
- The existing tower is assumed to have been properly maintained in accordance with the TIA/EIA Standard and/or its original manufacturer's recommendations. The existing tower is assumed to be in good condition with no structural defects and with no deterioration to its member capacities.
- The antenna configuration is as supplied and/or stated in the analysis section. It is assumed to be complete and accurate. All antennas, mounts, coaxial cables and waveguides are assumed to be properly installed and supported as per the manufacturer's requirements.
- The antennas, mounts and lines stated in the appurtenance loading schedule represent Fullerton's understanding of the overall antenna configuration. If the actual configuration is different than above, then this analysis is invalid. Please refer to the Appendix for the projected wind areas used in the calculations for antennas and mounts. If variations or discrepancies are identified, please inform Fullerton.
- Some assumptions are made regarding antenna and mount sizes and their projected areas based on a best interpretation of the data supplied and a best knowledge of antenna type and industry practice.
- The existing foundation is assumed to be in good condition with no structural defects and with no deterioration to its member capacities.
- The soil parameters are as per data supplied, or as assumed, and stated in the calculations.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
- All prior structural modifications, if any, are assumed to be as per date supplied/ available, to be properly installed and to be fully effective.

Scope and Limitations

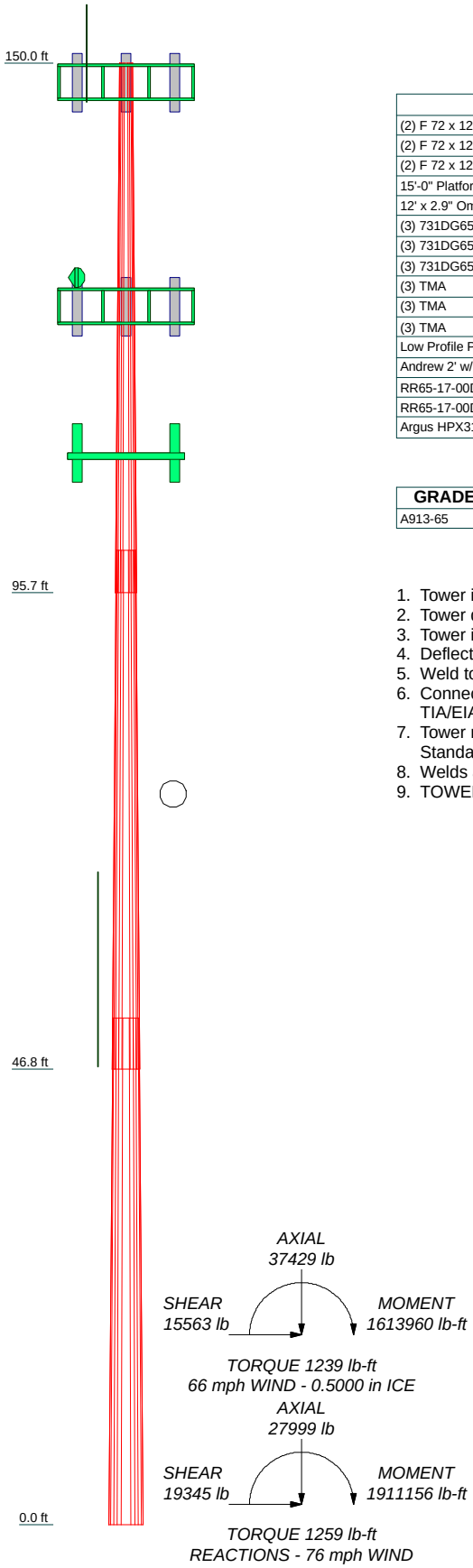
The engineering services rendered by Fullerton Engineering Consultants, Inc. (Fullerton) in connection with this structural analysis are limited to a computer analysis of the tower structure, size and capacity of its members. Fullerton does not analyze the fabrication, including welding and connection capacities, except as included in this Report.

The information and conclusions contained in this report were determined by application of the current “state of the art” engineering and analysis procedures and formulae, and Fullerton assumes no obligation to revise any of the information or conclusions contained in this report in the event such engineering and analysis procedures and formulae are hereafter modified or revised.

Fullerton makes no warranties, expressed or implied in connection with this report and disclaims any liability arising from original design, material, fabrication and erection deficiencies or the “as-built” condition of this tower. Fullerton will not be responsible whatsoever for or on account of consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report.

Installation procedures and loading are not within the scope of this report and should be performed and evaluated by a competent tower erection contractor.

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	54.33	12	0.2190	4.33	16.3500	26.1300		2740.5
2	53.25	12	0.3130	5.25	24.9126	34.5000	A913-65	5367.9
3	52.00	12	0.3440		32.9288	42.2900		7304.0
								15412.3



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) F 72 x 12	148	Argus HPX311R	110
(2) F 72 x 12	148	Argus HPX311R	110
(2) F 72 x 12	148	RFS APXVERR18-C-2-19101	110
15'-0" Platform	148	RFS APXVERR18-C-2-19101	110
12' x 2.9" Omni	148	RFS APXVERR18-C-2-19101	110
(3) 731DG65VTAXM	125	Low Profile Platform	110
(3) 731DG65VTAXM	125	(3) 1900 RRU	110
(3) 731DG65VTAXM	125	(3) 1900 RRU	110
(3) TMA	125	(3) 1900 RRU	110
(3) TMA	125	(2) RRU 1800	110
(3) TMA	125	(2) RRU 1800	110
Low Profile Platform	125	(2) RRU 1800	110
Andrew 2' w/Radome	125	RR65-17-00DPL2	110
RR65-17-00DPL2	110	3" Dia 20' Omni	57
RR65-17-00DPL2	110	Pirod 4' Side Mount Standoff (1)	57
Argus HPX311R	110		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A913-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Johnson County, Kansas.
2. Tower designed for a 76 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 66 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60 mph wind.
5. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.
9. TOWER RATING: 94.4%

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Job: ***KC60XC727***			
Project: ***Prairie Village City***			
Client: Sprint	Drawn by: Kyle Fortin	App'd:	
Code: TIA/EIA-222-F	Date: 08/19/11	Scale: NTS	
Path:		Dwg No. E-1	

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Tower Input Data

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

Tower is located in Johnson County, Kansas.
Basic wind speed of 76 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 66 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	150.00-95.67	54.33	4.33	12	16.3500	26.1300	0.2190	0.8760	A913-65 (65 ksi)
L2	95.67-46.75	53.25	5.25	12	24.9126	34.5000	0.3130	1.2520	A913-65 (65 ksi)
L3	46.75-0.00	52.00		12	32.9288	42.2900	0.3440	1.3760	A913-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
									(65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.9268	11.3753	377.8068	5.7749	8.4693	44.6090	765.5391	5.5986	3.7949	17.328
	27.0518	18.2719	1565.8078	9.2761	13.5353	115.6829	3172.7512	8.9929	6.4159	29.296
L2	26.5985	24.7929	1914.9955	8.8066	12.9047	148.3952	3880.3001	12.2023	5.8377	18.651
	35.7170	34.4557	5140.0712	12.2389	17.8710	287.6208	10415.1778	16.9581	8.4072	26.86
L3	35.0688	36.0935	4891.5195	11.6653	17.0571	286.7733	9911.5447	17.7641	7.9030	22.974
	43.7818	46.4627	10434.5067	15.0167	21.9062	476.3262	21143.1395	22.8675	10.4118	30.267

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 150.00-95.67				1	1	1		
L2 95.67-46.75				1	1	1		
L3 46.75-0.00				1	1	1		

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	√
Anchor bolt grade	A615-75
Anchor bolt size	2.5000 in
Number of bolts	12
Embedment length	48.0000 in
f'_c	3 ksi
Grout space	4.0000 in
Base plate grade	A633-60
Base plate thickness	2.5000 in
Bolt circle diameter	50.2800 in
Outer diameter	56.2800 in
Inner diameter	24.0000 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	148.00 - 0.00	6	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
LDF6-50A (1-1/4	C	No	Inside Pole	148.00 - 0.00	1	No Ice	0.00	0.66

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
FOAM)						1/2" Ice	0.00	0.66
LDF7-50A (1-5/8	C	No	Inside Pole	125.00 - 0.00	9	No Ice	0.00	0.82
FOAM)						1/2" Ice	0.00	0.82
LDF6-50A (1-1/4	C	No	Inside Pole	110.00 - 0.00	6	No Ice	0.00	0.66
FOAM)						1/2" Ice	0.00	0.66
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	57.00 - 0.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	110.00 - 0.00	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	150.00-95.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	468.10
L2	95.67-46.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	881.01
L3	46.75-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	854.12

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	150.00-95.67	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	468.10
L2	95.67-46.75	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	881.01
L3	46.75-0.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	854.12

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) F 72 x 12	A	From Leg	4.00	0.0000	148.00	No Ice	8.40	4.96	51.90
			0.00			1/2" Ice	8.95	5.89	107.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00						
(2) F 72 x 12	B	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice	8.40 8.95	4.96 5.89	51.90 107.13
(2) F 72 x 12	C	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice	8.40 8.95	4.96 5.89	51.90 107.13
15'-0" Platform	C	None		0.0000	148.00	No Ice 1/2" Ice	14.91 18.65	14.91 18.65	3400.00 5300.00
12' x 2.9" Omni	C	From Leg	4.00 0.00 3.00	0.0000	148.00	No Ice 1/2" Ice	3.48 4.71	3.48 4.71	15.00 40.31
(3) 731DG65VTAXM	A	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	6.07 6.47	3.27 3.63	21.00 57.30
(3) 731DG65VTAXM	B	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	6.07 6.47	3.27 3.63	21.00 57.30
(3) 731DG65VTAXM	C	From Leg	4.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	6.07 6.47	3.27 3.63	21.00 57.30
(3) TMA	A	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	2.27 2.51	2.27 2.51	25.00 44.25
(3) TMA	B	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	2.27 2.51	2.27 2.51	25.00 44.25
(3) TMA	C	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	2.27 2.51	2.27 2.51	25.00 44.25
RR65-17-00DPL2	A	None		0.0000	110.00	No Ice 1/2" Ice	3.73 4.10	1.60 1.90	15.00 34.37
Low Profile Platform	C	None		0.0000	125.00	No Ice 1/2" Ice	8.00 9.00	8.00 9.00	2500.00 4000.00
RR65-17-00DPL2	B	None		0.0000	110.00	No Ice 1/2" Ice	3.73 4.10	1.60 1.90	15.00 34.37
RR65-17-00DPL2	C	None		0.0000	110.00	No Ice 1/2" Ice	3.73 4.10	1.60 1.90	15.00 34.37
3" Dia 20' Omni	C	From Leg	2.00 0.00 0.00	0.0000	57.00	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	55.00 100.00
Pirod 4' Side Mount Standoff (1)	C	None		0.0000	57.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	50.00 89.00
Argus HPX311R	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice	4.99 5.42	3.30 3.72	38.50 66.26
Argus HPX311R	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice	4.99 5.42	3.30 3.72	38.50 66.26
Argus HPX311R	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice	4.99 5.42	3.30 3.72	38.50 66.26
RFS APXVERR18-C-2-19101	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice	7.70 8.24	5.28 5.74	62.50 109.94
RFS APXVERR18-C-2-19101	B	From Leg	4.00 0.00	0.0000	110.00	No Ice 1/2" Ice	7.70 8.24	5.28 5.74	62.50 109.94

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00						
RFS	C	From Leg	4.00	0.0000	110.00	No Ice	7.70	5.28	62.50
APXVERR18-C-2-19101			0.00			1/2" Ice	8.24	5.74	109.94
			0.00						
Low Profile Platform	C	None		0.0000	110.00	No Ice	8.00	8.00	2500.00
						1/2" Ice	9.00	9.00	4000.00
(3) 1900 RRU	A	From Leg	3.00	0.0000	110.00	No Ice	2.94	1.21	44.00
			0.00			1/2" Ice	3.17	1.38	63.09
			0.00						
(3) 1900 RRU	B	From Leg	3.00	0.0000	110.00	No Ice	2.94	1.21	44.00
			0.00			1/2" Ice	3.17	1.38	63.09
			0.00						
(3) 1900 RRU	C	From Leg	3.00	0.0000	110.00	No Ice	2.94	1.21	44.00
			0.00			1/2" Ice	3.17	1.38	63.09
			0.00						
(2) RRU 1800	A	From Leg	3.00	0.0000	110.00	No Ice	2.94	1.19	54.00
			0.00			1/2" Ice	3.17	1.35	73.32
			0.00						
(2) RRU 1800	B	From Leg	3.00	0.0000	110.00	No Ice	2.94	1.19	54.00
			0.00			1/2" Ice	3.17	1.35	73.32
			0.00						
(2) RRU 1800	C	From Leg	3.00	0.0000	110.00	No Ice	2.94	1.19	54.00
			0.00			1/2" Ice	3.17	1.35	73.32
			0.00						

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
Andrew 2' w/Radome	C	Paraboloid w/Radome	From Leg	4.00	0.0000		125.00	2.00	No Ice	3.14	70.00
				0.00					1/2" Ice	3.41	282.00
				3.00							

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	121.17	1.45	21	96.164	A	0.000	96.164	96.164	100.00	0.000	0.000
150.00-95.67					B	0.000	96.164		100.00	0.000	0.000
					C	0.000	96.164		100.00	0.000	0.000

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Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L2 95.67-46.75	70.62	1.243	18	122.692	A	0.000	122.692	122.692	100.00	0.000	0.000
					B	0.000	122.692		100.00	0.000	0.000
					C	0.000	122.692		100.00	0.000	0.000
L3 46.75-0.00	22.60	1	15	148.361	A	0.000	148.361	148.361	100.00	0.000	0.000
					B	0.000	148.361		100.00	0.000	0.000
					C	0.000	148.361		100.00	0.000	0.000

Tower Pressure - With Ice

G_H = 1.690

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 150.00-95.67	121.17	1.45	16	0.5000	100.692	A	0.000	100.692	100.692	100.00	0.000	0.000
						B	0.000	100.692		100.00	0.000	0.000
						C	0.000	100.692		100.00	0.000	0.000
L2 95.67-46.75	70.62	1.243	14	0.5000	126.768	A	0.000	126.768	126.768	100.00	0.000	0.000
						B	0.000	126.768		100.00	0.000	0.000
						C	0.000	126.768		100.00	0.000	0.000
L3 46.75-0.00	22.60	1	11	0.5000	152.257	A	0.000	152.257	152.257	100.00	0.000	0.000
						B	0.000	152.257		100.00	0.000	0.000
						C	0.000	152.257		100.00	0.000	0.000

Tower Pressure - Service

G_H = 1.690

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 150.00-95.67	121.17	1.45	13	96.164	A	0.000	96.164	96.164	100.00	0.000	0.000
					B	0.000	96.164		100.00	0.000	0.000
					C	0.000	96.164		100.00	0.000	0.000
L2 95.67-46.75	70.62	1.243	11	122.692	A	0.000	122.692	122.692	100.00	0.000	0.000
					B	0.000	122.692		100.00	0.000	0.000
					C	0.000	122.692		100.00	0.000	0.000
L3 46.75-0.00	22.60	1	9	148.361	A	0.000	148.361	148.361	100.00	0.000	0.000
					B	0.000	148.361		100.00	0.000	0.000
					C	0.000	148.361		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	468.10	2740.49	A	1	1.03	1	1	1	96.164	3581.17	65.92	C
150.00-95.67			B	1	1.03	1	1	1	96.164			
			C	1	1.03	1	1	1	96.164			
L2	881.01	5367.89	A	1	1.03	1	1	1	122.692	3903.08	79.78	C
95.67-46.75			B	1	1.03	1	1	1	122.692			
			C	1	1.03	1	1	1	122.692			
L3 46.75-0.00	854.12	7303.96	A	1	1.03	1	1	1	148.361	3846.76	82.28	C
			B	1	1.03	1	1	1	148.361			
			C	1	1.03	1	1	1	148.361			
Sum Weight:	2203.23	15412.34						OTM	796543.17 lb-ft	11331.01		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	468.10	2740.49	A	1	1.03	1	1	1	96.164	3581.17	65.92	C
150.00-95.67			B	1	1.03	1	1	1	96.164			
			C	1	1.03	1	1	1	96.164			
L2	881.01	5367.89	A	1	1.03	1	1	1	122.692	3903.08	79.78	C
95.67-46.75			B	1	1.03	1	1	1	122.692			
			C	1	1.03	1	1	1	122.692			
L3 46.75-0.00	854.12	7303.96	A	1	1.03	1	1	1	148.361	3846.76	82.28	C
			B	1	1.03	1	1	1	148.361			
			C	1	1.03	1	1	1	148.361			
Sum Weight:	2203.23	15412.34						OTM	796543.17 lb-ft	11331.01		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	468.10	2740.49	A	1	1.03	1	1	1	96.164	3581.17	65.92	C
150.00-95.67			B	1	1.03	1	1	1	96.164			
			C	1	1.03	1	1	1	96.164			
L2	881.01	5367.89	A	1	1.03	1	1	1	122.692	3903.08	79.78	C
95.67-46.75			B	1	1.03	1	1	1	122.692			
			C	1	1.03	1	1	1	122.692			
L3 46.75-0.00	854.12	7303.96	A	1	1.03	1	1	1	148.361	3846.76	82.28	C
			B	1	1.03	1	1	1	148.361			
			C	1	1.03	1	1	1	148.361			
Sum Weight:	2203.23	15412.34						OTM	796543.17 lb-ft	11331.01		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	468.10	3480.01	A	1	1.03	1	1	1	100.692	2812.33	51.76	C
150.00-95.67			B	1	1.03	1	1	1	100.692			
			C	1	1.03	1	1	1	100.692			
L2	881.01	6305.02	A	1	1.03	1	1	1	126.768	3024.57	61.83	C
95.67-46.75			B	1	1.03	1	1	1	126.768			
			C	1	1.03	1	1	1	126.768			
L3 46.75-0.00	854.12	8433.28	A	1	1.03	1	1	1	152.257	2960.82	63.33	C
			B	1	1.03	1	1	1	152.257			
			C	1	1.03	1	1	1	152.257			
Sum Weight:	2203.23	18218.32						OTM	621311.37 lb-ft	8797.73		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	468.10	3480.01	A	1	1.03	1	1	1	100.692	2812.33	51.76	C
150.00-95.67			B	1	1.03	1	1	1	100.692			
			C	1	1.03	1	1	1	100.692			
L2	881.01	6305.02	A	1	1.03	1	1	1	126.768	3024.57	61.83	C
95.67-46.75			B	1	1.03	1	1	1	126.768			
			C	1	1.03	1	1	1	126.768			
L3 46.75-0.00	854.12	8433.28	A	1	1.03	1	1	1	152.257	2960.82	63.33	C
			B	1	1.03	1	1	1	152.257			
			C	1	1.03	1	1	1	152.257			
Sum Weight:	2203.23	18218.32						OTM	621311.37 lb-ft	8797.73		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	468.10	3480.01	A	1	1.03	1	1	1	100.692	2812.33	51.76	C
150.00-95.67			B	1	1.03	1	1	1	100.692			
			C	1	1.03	1	1	1	100.692			
L2	881.01	6305.02	A	1	1.03	1	1	1	126.768	3024.57	61.83	C
95.67-46.75			B	1	1.03	1	1	1	126.768			
			C	1	1.03	1	1	1	126.768			
L3 46.75-0.00	854.12	8433.28	A	1	1.03	1	1	1	152.257	2960.82	63.33	C
			B	1	1.03	1	1	1	152.257			
			C	1	1.03	1	1	1	152.257			
Sum Weight:	2203.23	18218.32						OTM	621311.37 lb-ft	8797.73		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	468.10	2740.49	A	1	1.03	1	1	1	96.164	2232.03	41.08	C
150.00-95.67			B	1	1.03	1	1	1	96.164			
			C	1	1.03	1	1	1	96.164			
L2	881.01	5367.89	A	1	1.03	1	1	1	122.692	2432.67	49.73	C
95.67-46.75			B	1	1.03	1	1	1	122.692			
			C	1	1.03	1	1	1	122.692			
L3 46.75-0.00	854.12	7303.96	A	1	1.03	1	1	1	148.361	2397.56	51.28	C
			B	1	1.03	1	1	1	148.361			
			C	1	1.03	1	1	1	148.361			
Sum Weight:	2203.23	15412.34						OTM	496460.43 lb-ft	7062.26		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	468.10	2740.49	A	1	1.03	1	1	1	96.164	2232.03	41.08	C
150.00-95.67			B	1	1.03	1	1	1	96.164			
			C	1	1.03	1	1	1	96.164			
L2	881.01	5367.89	A	1	1.03	1	1	1	122.692	2432.67	49.73	C
95.67-46.75			B	1	1.03	1	1	1	122.692			
			C	1	1.03	1	1	1	122.692			
L3 46.75-0.00	854.12	7303.96	A	1	1.03	1	1	1	148.361	2397.56	51.28	C
			B	1	1.03	1	1	1	148.361			
			C	1	1.03	1	1	1	148.361			
Sum Weight:	2203.23	15412.34						OTM	496460.43 lb-ft	7062.26		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	468.10	2740.49	A	1	1.03	1	1	1	96.164	2232.03	41.08	C
150.00-95.67			B	1	1.03	1	1	1	96.164			
			C	1	1.03	1	1	1	96.164			
L2	881.01	5367.89	A	1	1.03	1	1	1	122.692	2432.67	49.73	C
95.67-46.75			B	1	1.03	1	1	1	122.692			
			C	1	1.03	1	1	1	122.692			
L3 46.75-0.00	854.12	7303.96	A	1	1.03	1	1	1	148.361	2397.56	51.28	C
			B	1	1.03	1	1	1	148.361			
			C	1	1.03	1	1	1	148.361			
Sum Weight:	2203.23	15412.34						OTM	496460.43	7062.26		

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
									lb-ft			

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	15412.34					
Bracing Weight	0.00					
Total Member Self-Weight	15412.34			297.26	514.87	
Total Weight	27998.97			297.26	514.87	
Wind 0 deg - No Ice		12.94	-19319.23	-1790202.79	-1141.67	-1166.12
Wind 30 deg - No Ice		9675.05	-16751.75	-1552985.40	-896711.54	-716.40
Wind 60 deg - No Ice		16753.09	-9672.40	-896589.63	-1552938.79	0.00
Wind 90 deg - No Ice		19344.97	-2.97	-82.27	-1793280.58	716.40
Wind 120 deg - No Ice		16737.41	9648.41	894112.68	-1550931.93	1166.12
Wind 150 deg - No Ice		9659.28	16699.67	1546912.92	-894692.93	1286.11
Wind 180 deg - No Ice		3.67	19289.30	1786967.28	45.21	1117.45
Wind 210 deg - No Ice		-9658.71	16724.07	1550036.76	895649.64	676.75
Wind 240 deg - No Ice		-16735.89	9662.47	895912.77	1551766.43	0.00
Wind 270 deg - No Ice		-19312.83	2.65	636.96	1790196.04	-676.75
Wind 300 deg - No Ice		-16703.19	-9647.83	-893444.48	1547581.66	-1117.45
Wind 330 deg - No Ice		-9632.70	-16715.02	-1548283.26	892319.42	-1286.11
Member Ice	2805.98					
Total Weight Ice	37429.00			946.01	1638.53	
Wind 0 deg - Ice		10.54	-15542.29	-1457026.16	289.30	-1165.24
Wind 30 deg - Ice		7783.72	-13476.97	-1263864.83	-728957.29	-707.89
Wind 60 deg - Ice		13478.06	-7781.56	-729373.28	-1263311.58	0.00
Wind 90 deg - Ice		15563.26	-2.41	636.89	-1459017.70	707.89
Wind 120 deg - Ice		13465.29	7762.02	728763.62	-1261677.01	1165.24
Wind 150 deg - Ice		7770.88	13434.55	1260326.65	-727313.15	1296.30
Wind 180 deg - Ice		2.99	15517.92	1455798.65	1256.00	1125.60
Wind 210 deg - Ice		-7770.41	13454.42	1262870.99	730530.75	675.59
Wind 240 deg - Ice		-13464.05	7773.47	730229.77	1264795.07	0.00
Wind 270 deg - Ice		-15537.08	2.16	1222.69	1458943.73	-675.59
Wind 300 deg - Ice		-13437.42	-7761.55	-726811.59	1261386.62	-1125.60
Wind 330 deg - Ice		-7749.22	-13447.05	-1260034.99	727818.32	-1296.30
Total Weight	27998.97			297.26	514.87	
Wind 0 deg - Service		8.07	-12041.07	-1115665.38	-517.60	-726.81
Wind 30 deg - Service		6030.16	-10440.84	-967815.20	-558698.27	-446.51
Wind 60 deg - Service		10441.68	-6028.51	-558704.27	-967704.17	0.00
Wind 90 deg - Service		12057.12	-1.85	60.71	-1117501.69	446.51
Wind 120 deg - Service		10431.91	6013.55	557384.43	-966453.36	726.81
Wind 150 deg - Service		6020.33	10408.38	964254.39	-557440.13	801.59
Wind 180 deg - Service		2.29	12022.42	1113872.75	222.14	696.47
Wind 210 deg - Service		-6019.97	10423.59	966201.38	558424.35	421.80
Wind 240 deg - Service		-10430.95	6022.31	558506.37	967361.41	0.00
Wind 270 deg - Service		-12037.08	1.65	508.98	1115967.12	-421.80
Wind 300 deg - Service		-10410.58	-6013.19	-556743.99	964753.17	-696.47
Wind 330 deg - Service		-6003.76	-10417.95	-964884.51	556348.73	-801.59

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	150 - 95.67	Pole	Max Tension	5	0.00	0.00	0.31
			Max. Compression	14	-20392.95	1511.90	-872.90
			Max. Mx	5	-12077.90	-317340.88	-98.21
			Max. My	2	-12082.56	-68.05	316707.60
			Max. Vy	5	12263.64	-317340.88	-98.21
			Max. Vx	2	-12235.81	-68.05	316707.60
			Max. Torque	13			871.52
L2	95.67 - 46.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27326.50	1917.69	-1107.18
			Max. Mx	5	-18380.26	-991356.43	-63.49
			Max. My	2	-18382.94	-539.07	989462.20
			Max. Vy	5	15970.45	-991356.43	-63.49

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	2	-15943.11	-539.07	989462.20
			Max. Torque	13			1262.89
L3	46.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37429.00	1917.41	-1107.02
			Max. Mx	5	-27977.15	-1911150.09	88.85
			Max. My	2	-27977.21	-1225.68	1907868.17
			Max. Vy	5	19376.52	-1911150.09	88.85
			Max. Vx	2	-19350.73	-1225.68	1907868.17
			Max. Torque	13			1261.49

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	18	37429.01	-15563.29	2.41
	Max. H_x	11	27998.97	19312.83	-2.65
	Max. H_z	2	27998.97	-12.94	19319.23
	Max. M_x	2	1907868.17	-12.94	19319.23
	Max. M_z	5	1911150.09	-19344.97	2.96
	Max. Torsion	13	1258.81	9632.70	16715.02
	Min. Vert	1	27998.97	0.00	-0.00
	Min. H_x	5	27998.97	-19344.97	2.96
	Min. H_z	8	27998.97	-3.67	-19289.31
	Min. M_x	8	-1904432.18	-3.67	-19289.31
	Min. M_z	11	-1907892.42	19312.83	-2.65
	Min. Torsion	7	-1258.75	-9659.28	-16699.67

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	27998.97	-0.00	0.00	303.70	526.03	0.00
Dead+Wind 0 deg - No Ice	27998.97	12.94	-19319.23	-1907868.17	-1226.05	-1141.51
Dead+Wind 30 deg - No Ice	27998.97	9675.05	-16751.76	-1655064.70	-955654.98	-701.28
Dead+Wind 60 deg - No Ice	27998.97	16753.09	-9672.40	-955522.12	-1655012.78	-0.03
Dead+Wind 90 deg - No Ice	27998.97	19344.97	-2.96	-89.08	-1911150.09	701.33
Dead+Wind 120 deg - No Ice	27998.97	16737.41	9648.41	952875.03	-1652880.06	1141.51
Dead+Wind 150 deg - No Ice	27998.97	9659.28	16699.67	1648587.94	-953510.52	1258.75
Dead+Wind 180 deg - No Ice	27998.97	3.67	19289.31	1904432.18	50.19	1093.59
Dead+Wind 210 deg - No Ice	27998.97	-9658.71	16724.07	1651945.77	954541.77	662.32
Dead+Wind 240 deg - No Ice	27998.97	-16735.89	9662.47	954821.53	1653799.32	-0.03
Dead+Wind 270 deg - No Ice	27998.97	-19312.83	2.65	684.52	1907892.42	-662.31
Dead+Wind 300 deg - No Ice	27998.97	-16703.19	-9647.83	-952175.42	1649316.44	-1093.53
Dead+Wind 330 deg - No Ice	27998.97	-9632.70	-16715.02	-1650058.26	950963.85	-1258.81
Dead+Ice+Temp	37429.00	-0.01	0.00	1107.02	1917.41	0.00
Dead+Wind 0 deg+Ice+Temp	37429.01	10.54	-15542.32	-1609891.84	442.51	-1115.04
Dead+Wind 30 deg+Ice+Temp	37429.01	7783.74	-13477.00	-1396467.79	-805350.78	-678.23
Dead+Wind 60 deg+Ice+Temp	37429.01	13478.09	-7781.58	-805864.31	-1395797.46	-0.10
Dead+Wind 90 deg+Ice+Temp	37429.01	15563.29	-2.41	779.89	-1612051.58	678.33

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Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead+Wind 120 deg+Ice+Temp	37429.00	13465.29	7762.02	805331.94	-1393990.78	1115.04
Dead+Wind 150 deg+Ice+Temp	37429.01	7770.89	13434.58	1392681.79	-803528.43	1238.94
Dead+Wind 180 deg+Ice+Temp	37429.01	2.99	15517.95	1608685.78	1524.93	1075.81
Dead+Wind 210 deg+Ice+Temp	37429.00	-7770.41	13454.43	1395535.32	807370.88	646.38
Dead+Wind 240 deg+Ice+Temp	37429.01	-13464.07	7773.49	806980.05	1397729.98	-0.10
Dead+Wind 270 deg+Ice+Temp	37429.01	-15537.11	2.16	1436.00	1612248.91	-646.37
Dead+Wind 300 deg+Ice+Temp	37429.01	-13437.45	-7761.56	-803022.66	1393925.43	-1075.71
Dead+Wind 330 deg+Ice+Temp	37429.00	-7749.22	-13447.05	-1392221.27	804336.39	-1239.05
Dead+Wind 0 deg - Service	27998.97	8.07	-12041.07	-1190544.83	-541.94	-717.76
Dead+Wind 30 deg - Service	27998.97	6030.16	-10440.84	-1032782.01	-596192.00	-441.05
Dead+Wind 60 deg - Service	27998.97	10441.68	-6028.51	-596203.97	-1032655.54	-0.01
Dead+Wind 90 deg - Service	27998.97	12057.12	-1.85	73.61	-1192507.36	441.06
Dead+Wind 120 deg - Service	27998.97	10431.91	6013.55	594805.13	-1031316.58	717.75
Dead+Wind 150 deg - Service	27998.97	6020.33	10408.38	1028981.55	-594845.08	791.40
Dead+Wind 180 deg - Service	27998.97	2.29	12022.42	1188645.78	254.47	687.58
Dead+Wind 210 deg - Service	27998.97	-6019.97	10423.59	1031079.01	595936.11	416.48
Dead+Wind 240 deg - Service	27998.97	-10430.95	6022.31	596017.56	1032332.67	-0.01
Dead+Wind 270 deg - Service	27998.97	-12037.08	1.65	556.30	1190904.58	-416.48
Dead+Wind 300 deg - Service	27998.97	-10410.58	-6013.19	-594104.58	1029528.21	-687.56
Dead+Wind 330 deg - Service	27998.97	-6003.76	-10417.95	-1029641.71	593701.64	-791.42

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-27998.97	0.00	0.00	27998.97	-0.00	0.000%
2	12.94	-27998.97	-19319.23	-12.94	27998.97	19319.23	0.000%
3	9675.05	-27998.97	-16751.75	-9675.05	27998.97	16751.76	0.000%
4	16753.09	-27998.97	-9672.40	-16753.09	27998.97	9672.40	0.000%
5	19344.97	-27998.97	-2.97	-19344.97	27998.97	2.96	0.000%
6	16737.41	-27998.97	9648.41	-16737.41	27998.97	-9648.41	0.000%
7	9659.28	-27998.97	16699.67	-9659.28	27998.97	-16699.67	0.000%
8	3.67	-27998.97	19289.30	-3.67	27998.97	-19289.31	0.000%
9	-9658.71	-27998.97	16724.07	9658.71	27998.97	-16724.07	0.000%
10	-16735.89	-27998.97	9662.47	16735.89	27998.97	-9662.47	0.000%
11	-19312.83	-27998.97	2.65	19312.83	27998.97	-2.65	0.000%
12	-16703.19	-27998.97	-9647.83	16703.19	27998.97	9647.83	0.000%
13	-9632.70	-27998.97	-16715.02	9632.70	27998.97	16715.02	0.000%
14	0.00	-37429.00	0.00	0.01	37429.00	-0.00	0.000%
15	10.54	-37429.00	-15542.29	-10.54	37429.01	15542.32	0.000%
16	7783.72	-37429.00	-13476.97	-7783.74	37429.01	13477.00	0.000%
17	13478.06	-37429.00	-7781.56	-13478.09	37429.01	7781.58	0.000%
18	15563.26	-37429.00	-2.41	-15563.29	37429.01	2.41	0.000%
19	13465.29	-37429.00	7762.02	-13465.29	37429.00	-7762.02	0.000%
20	7770.88	-37429.00	13434.55	-7770.89	37429.01	-13434.58	0.000%
21	2.99	-37429.00	15517.92	-2.99	37429.01	-15517.95	0.000%
22	-7770.41	-37429.00	13454.42	7770.41	37429.00	-13454.43	0.000%
23	-13464.05	-37429.00	7773.47	13464.07	37429.01	-7773.49	0.000%
24	-15537.08	-37429.00	2.16	15537.11	37429.01	-2.16	0.000%
25	-13437.42	-37429.00	-7761.55	13437.45	37429.01	7761.56	0.000%
26	-7749.22	-37429.00	-13447.05	7749.22	37429.00	13447.05	0.000%
27	8.07	-27998.97	-12041.07	-8.07	27998.97	12041.07	0.000%
28	6030.16	-27998.97	-10440.84	-6030.16	27998.97	10440.84	0.000%
29	10441.68	-27998.97	-6028.51	-10441.68	27998.97	6028.51	0.000%
30	12057.12	-27998.97	-1.85	-12057.12	27998.97	1.85	0.000%
31	10431.91	-27998.97	6013.55	-10431.91	27998.97	-6013.55	0.000%
32	6020.33	-27998.97	10408.38	-6020.33	27998.97	-10408.38	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
33	2.29	-27998.97	12022.42	-2.29	27998.97	-12022.42	0.000%
34	-6019.97	-27998.97	10423.59	6019.97	27998.97	-10423.59	0.000%
35	-10430.95	-27998.97	6022.31	10430.95	27998.97	-6022.31	0.000%
36	-12037.08	-27998.97	1.65	12037.08	27998.97	-1.65	0.000%
37	-10410.58	-27998.97	-6013.19	10410.58	27998.97	6013.19	0.000%
38	-6003.76	-27998.97	-10417.95	6003.76	27998.97	10417.95	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00015045
3	Yes	6	0.00000001	0.00028421
4	Yes	6	0.00000001	0.00028854
5	Yes	5	0.00000001	0.00009850
6	Yes	6	0.00000001	0.00029491
7	Yes	6	0.00000001	0.00027911
8	Yes	5	0.00000001	0.00014909
9	Yes	6	0.00000001	0.00029215
10	Yes	6	0.00000001	0.00028837
11	Yes	5	0.00000001	0.00009615
12	Yes	6	0.00000001	0.00027988
13	Yes	6	0.00000001	0.00029452
14	Yes	4	0.00000001	0.00002666
15	Yes	6	0.00000001	0.00016281
16	Yes	6	0.00000001	0.00096772
17	Yes	6	0.00000001	0.00098039
18	Yes	6	0.00000001	0.00015845
19	Yes	7	0.00000001	0.00013243
20	Yes	6	0.00000001	0.00095404
21	Yes	6	0.00000001	0.00016272
22	Yes	7	0.00000001	0.00013214
23	Yes	6	0.00000001	0.00098992
24	Yes	6	0.00000001	0.00015857
25	Yes	6	0.00000001	0.00095889
26	Yes	7	0.00000001	0.00013252
27	Yes	5	0.00000001	0.00007578
28	Yes	6	0.00000001	0.00009617
29	Yes	6	0.00000001	0.00009821
30	Yes	5	0.00000001	0.00004943
31	Yes	6	0.00000001	0.00010140
32	Yes	6	0.00000001	0.00009393
33	Yes	5	0.00000001	0.00007394
34	Yes	6	0.00000001	0.00010019
35	Yes	6	0.00000001	0.00009836
36	Yes	5	0.00000001	0.00004762
37	Yes	6	0.00000001	0.00009435
38	Yes	6	0.00000001	0.00010132

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 95.67	77.267	35	4.3274	0.0156
L2	100 - 46.75	35.458	30	3.3411	0.0050
L3	52 - 0	9.565	30	1.7043	0.0020

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.00	(2) F 72 x 12	35	75.480	4.2959	0.0151	17563
128.00	Andrew 2' w/Radome	30	57.851	3.9641	0.0103	3989
125.00	(3) 731DG65VTAXM	30	55.285	3.9090	0.0096	3510
110.00	RR65-17-00DPL2	30	42.994	3.5957	0.0066	2191
57.00	3" Dia 20' Omni	30	11.378	1.8833	0.0021	1367

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 95.67	123.614	5	6.9200	0.0249
L2	100 - 46.75	56.770	5	5.3493	0.0080
L3	52 - 0	15.324	5	2.7304	0.0031

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.00	(2) F 72 x 12	5	120.758	6.8698	0.0241	11177
128.00	Andrew 2' w/Radome	5	92.583	6.3413	0.0164	2537
125.00	(3) 731DG65VTAXM	5	88.480	6.2537	0.0153	2231
110.00	RR65-17-00DPL2	5	68.824	5.7553	0.0105	1391
57.00	3" Dia 20' Omni	5	18.227	3.0170	0.0034	856

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual / Allowable Ratio Bolt Tension lb	Actual / Allowable Ratio Concrete Stress ksi	Actual / Allowable Ratio Plate Stress ksi	Actual / Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension	Actual Allowable Ratio Concrete Stress	Actual Allowable Ratio Plate Stress	Actual Allowable Ratio Stiffener Stress	Controlling Condition	Critical Ratio
in		in	lb	ksi	ksi	ksi		
2.5000	12	2.5000	116145.00 161988.37 0.72	1.616 2.100 0.77	40.233 45.000 0.89		Plate	0.89 ✔

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	lb	lb	
L1	150 - 95.67 (1)	TP26.13x16.35x0.219	54.33	0.00	0.0	39.000	17.7223	-12080.40	691168.00	0.017
L2	95.67 - 46.75 (2)	TP34.5x24.9126x0.313	53.25	0.00	0.0	39.000	33.5030	-18380.20	1306620.00	0.014
L3	46.75 - 0 (3)	TP42.29x32.9288x0.344	52.00	0.00	0.0	38.749	46.4627	-27977.10	1800380.00	0.016

Pole Bending Design Data

Section No.	Elevation	Size	Actual M_x	Actual f_{bx}	Allow. F_{bx}	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y	Actual f_{by}	Allow. F_{by}	Ratio $\frac{f_{by}}{F_{by}}$
	ft		lb-ft	ksi	ksi		lb-ft	ksi	ksi	
L1	150 - 95.67 (1)	TP26.13x16.35x0.219	317538.33	-35.023	39.000	0.898	0.00	0.000	39.000	0.000
L2	95.67 - 46.75 (2)	TP34.5x24.9126x0.313	991358.33	-43.758	39.000	1.122	0.00	0.000	39.000	0.000
L3	46.75 - 0 (3)	TP42.29x32.9288x0.344	1911158.33	-48.147	38.749	1.243	0.00	0.000	38.749	0.000

Pole Interaction Design Data

Section No.	Elevation	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft							
L1	150 - 95.67 (1)	TP26.13x16.35x0.219	0.017	0.898	0.000	0.915 ✔	1.333	H1-3 ✔
L2	95.67 - 46.75 (2)	TP34.5x24.9126x0.313	0.014	1.122	0.000	1.136 ✔	1.333	H1-3 ✔
L3	46.75 - 0 (3)	TP42.29x32.9288x0.344	0.016	1.243	0.000	1.258 ✔	1.333	H1-3 ✔

Fullerton Engineering Consultants
9600 W. Bryn Mawr Ave. Suite 200
Rosemont, IL 60018
Phone: (847) 292-0200
FAX: (847) 292-0206

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
L1	150 - 95.67	Pole	TP26.13x16.35x0.219	1	-12080.40	921326.91	68.7	Pass
L2	95.67 - 46.75	Pole	TP34.5x24.9126x0.313	2	-18380.20	1741724.39	85.2	Pass
L3	46.75 - 0	Pole	TP42.29x32.9288x0.344	3	-27977.10	2399906.44	94.4	Pass
							Summary	
						Pole (L3)	94.4	Pass
						Base Plate	67.1	Pass
						RATING =	**94.4**	**Pass**

PRAIRIE VILLAGE, KANSAS

STAFF REPORT

TO: Prairie Village Planning Commission
FROM: Dennis J. Enslinger, Assistant City Administrator
DATE: December 6, 2011 Planning Commission Meeting

Application: **PC 91-108 Revision**

Request: **Revision to Site Plan PC 91-108 Southminster Presbyterian Church**

Property Address: **6306 Roe Avenue**

Applicant: **Wayne Wilson**

Current Zoning and Land Use: R-1A Single Family Residential District – Church

Surrounding Zoning and Land Use: **North** R-1B Single-Family Residential District – Single Family Dwellings and the City of Mission R-1 to the immediate north – Single Family Dwellings
West: R-1A Single-Family Residential District-Single Family Dwellings
South: R-1A Single-Family Residential District-Single Family Dwellings
East: R-1A Single-Family Residential District – Single-Family Dwellings

Legal Description: 16-12-25 BG 40' W & 30' S NE CR NW1/4 S 132.19' SW 406.66' WLY 132.57' N 310.33' E 504.21' TO POB EX .321 AC IN ST

Property Area: 2.72 (Acres (118,317.82 sq. ft)

Related Case Files: Special Use Permit – Daycare PC 89-7
Site Plan – Addition PC 91-08

Attachments: Site Plan PC 91-108, Fence Design

General Location Map

Aerial Map

COMMENTS:

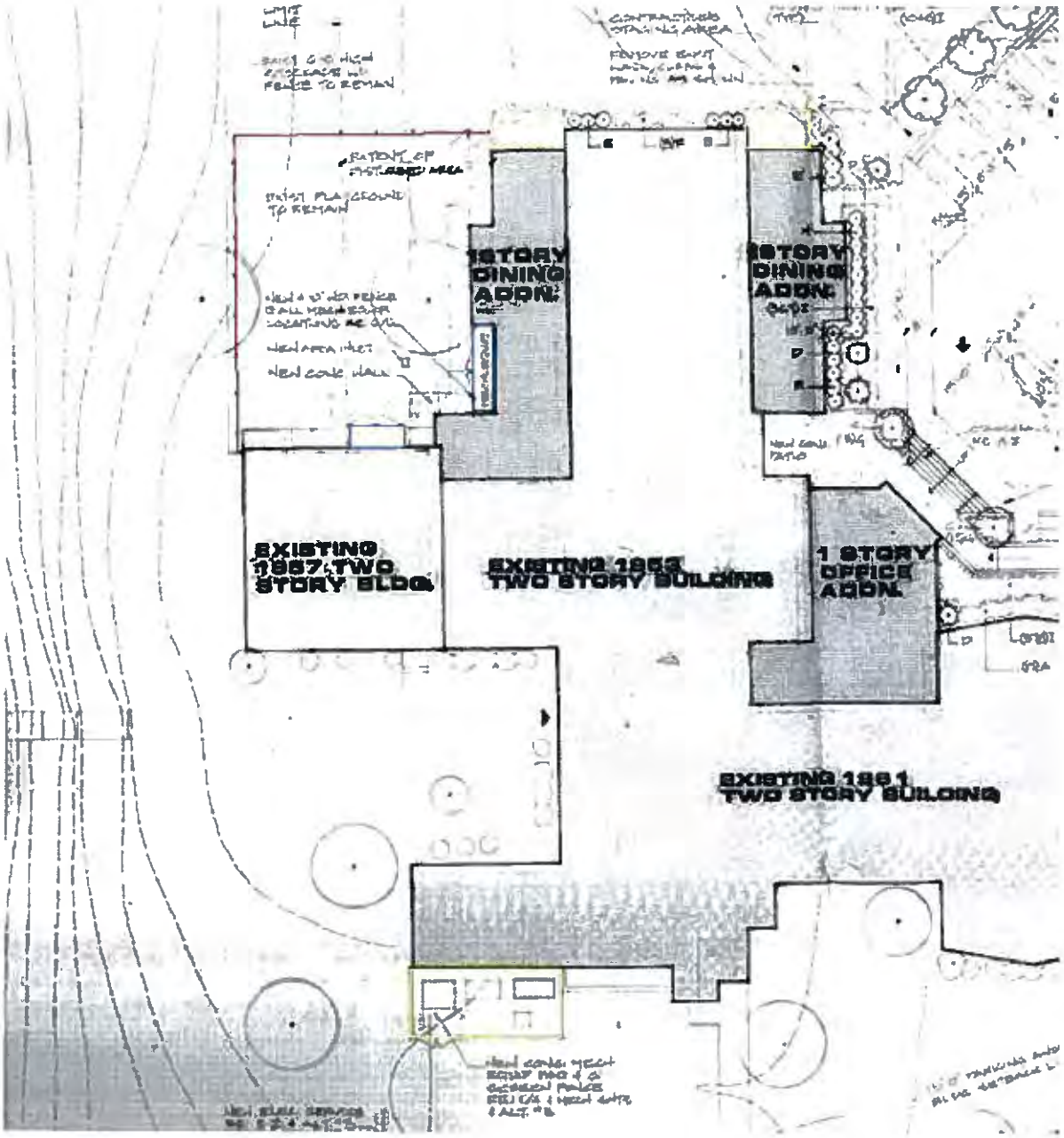
The Planning Commission approved a site plan for an addition at the Southminster Presbyterian Church, 6306 Roe Avenue on February 11, 1992. The originally approved site plan called for the construction of wood fencing around the air conditioner units and around the playground on the north side of the site.

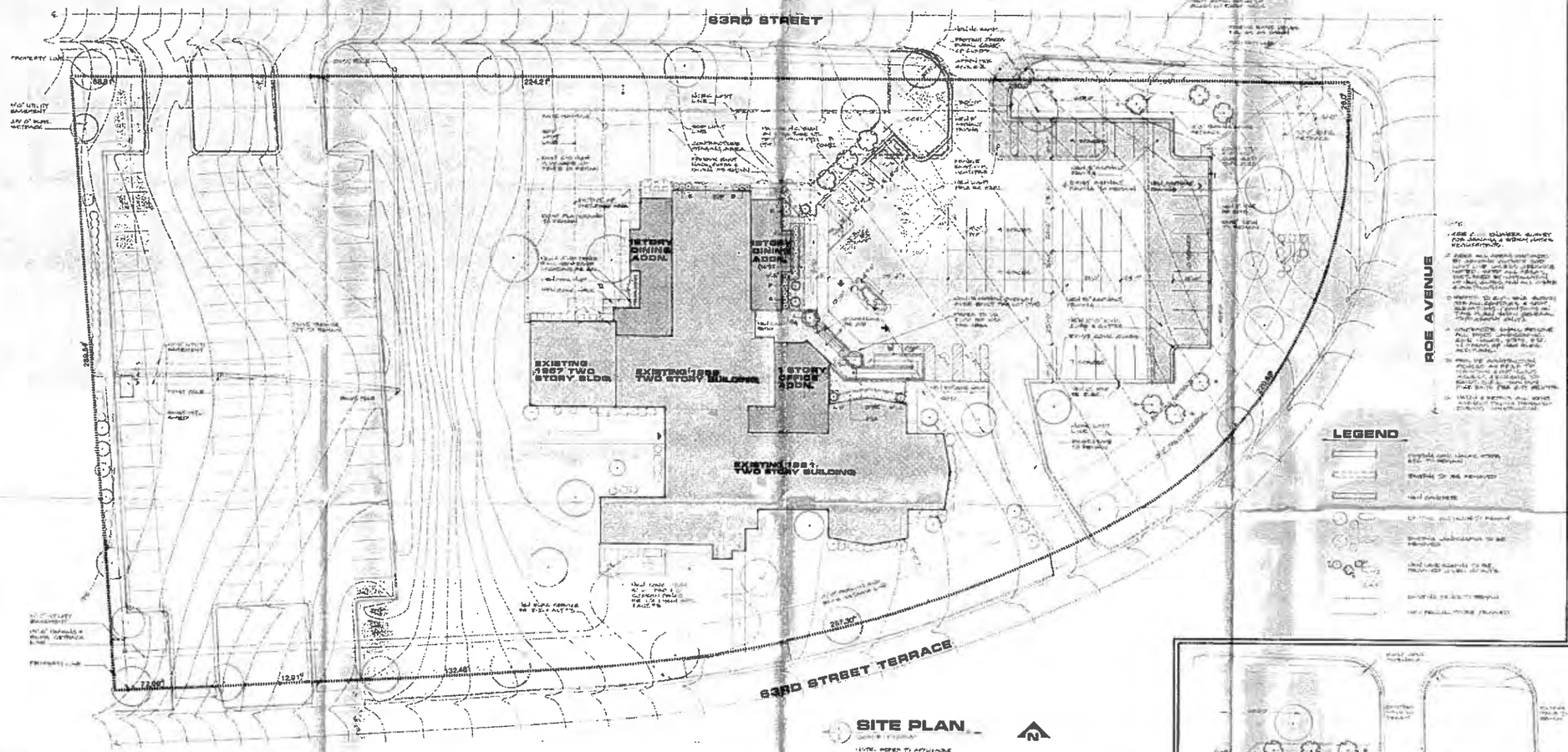
The applicant is proposing to replace the existing fence material with a 6 foot chain link fence with slats in some locations. The image below is a picture of the proposed slats which will be black in color.

Three of the existing wood fence enclosures would utilize the proposed slats. These three areas are highlighted in yellow. The applicant is requesting not to use slats in the two areas shown in light blue. These two areas also house air conditioner units; however, the applicant is requesting this modification because the units are adjacent to windows. The third area of fencing would be around the playground which is denoted in red.

Staff has reviewed the minutes from the February 11, 1992 to determine if there was a condition of approval related to the fence. There was no specific condition that the fence material be wood in material. However, the site plan reviewed by the Planning Commission denoted wood fence material so it would not have been necessary to make this a condition of approval. Since the existing staff and Planning Consultant were not present during this review, staff was not comfortable approving the request without Planning Commission approval

Recommendation:
Planning Commission should review the applicant's request to replace the existing sections of wood fencing, as depicted on the approved PC 91-108 site plan, and determine if the proposed fencing material at the specific locations is acceptable.


1STORY DINING ADDN.
1STORY DINING ADDN.
EXISTING 1887 TWO STORY BLDG.
EXISTING 1953 TWO STORY BUILDING
1 STORY OFFICE ADDN.
EXISTING 1861 TWO STORY BUILDING



LANDSCAPE SCHEDULE ALTERNATE #4

SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	ROOT	SPACING
A					
B					
C					
D					
E					
F					
G					
H	BLUE ASH JUNIPER	JUNIPERUS ASHEI 'BLUE ASH'	5 GAL.		3'-0" O.C.
I	JAPANESE MAPLE	ACER PALMATUM 'BLOODGOOD'	8' CAL.		
J					

LANDSCAPE SUMMARY

1. TOTAL SITE AREA	8.614 ACRES
2. EXISTING TREES TO REMAIN	42 TREES
3. NEW TREES TO BE ADDED	11 TREES
4. TOTAL TREES	53 TREES

3 PLANTING DETAIL

GENERAL SITE NOTES

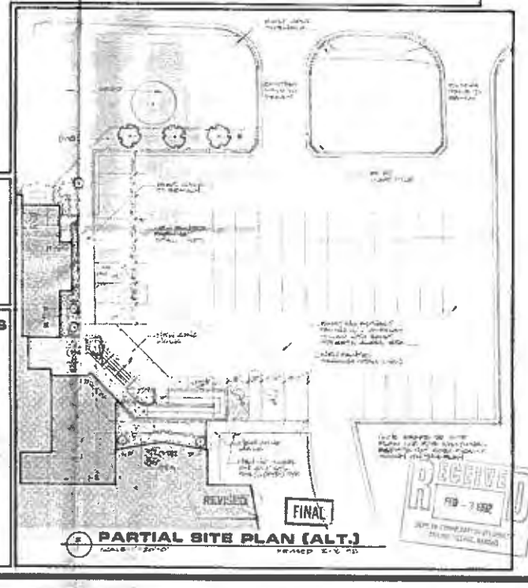
1. The survey information was supplied by the Owner. The architect cannot guarantee the accuracy of the survey.
2. Any and trespass and water spout vents shall be shall be kept to the rear of the building to Baltimore Boulevard. All requirements to notify owners shall be kept 5 feet of property lines or regulated at lesser distance.
3. The General Contractor shall have tests performed for soil and conditions, densities and bearing capacities of the specific areas, and undertake such tests as may be necessary. Compact all areas to maximum densities or minimum soil moisture required, as per Section 24.3.15 of Specifications.
4. Fences shall be required to obtain personal observations shall be of approved composition placed per soils engineer's recommendations (Geotechnical Engineering, Inc.).
5. Check and field verify all existing ground vary, grades and dimensions with those shown on the drawings. Report any discrepancies to the Architect before proceeding with construction for proper layout.
6. Verify location of new utilities, both overhead and underground, with local utility companies. Manholes, clean-outs or other utility type appurtenances will be replaced or set on the fences, level; actual final conditions may vary from drawings.
7. Existing trees will be field marked by the Architect and other tough grading is required for erosion. Final changes in field conditions fences may be required.
8. Existing trees not specifically noted and all grading to be protected during construction. Any damage must be repaired promptly.
9. Existing trees not specifically noted for preservation after rough grading is completed shall be improved limits. Root pruning will be required. Contractor shall be responsible for all of existing trees not specifically noted for preservation after rough grading is completed. Additional trees shall be brought in at no cost to the Owner. Any trees shall be replaced with new trees.
10. All trenches within shall be 6" thick reinforced with 6x6 6x6 WWF.
11. All concrete and parking areas are to be surface grade with concrete curbs. All new curbs shall be provided with construction joints at 10'-0" max. spacing.
12. Verify location of all electrical and fire utility equipment with architect. Contractor shall provide a 10'-0" length as indicated on drawings. Paint all trees and bollards.
13. Provide 6'-0" high reinforced barbed ornamental fencing at entrance and parking areas as shown on the Site Plan. Fence shall be installed in accordance with manufacturer's recommendations.
14. Verify location of all electrical and fire utility equipment with architect. Contractor shall provide a 10'-0" length as indicated on drawings. Paint all trees and bollards.
15. Provide 6'-0" high reinforced barbed ornamental fencing at entrance and parking areas as shown on the Site Plan. Fence shall be installed in accordance with manufacturer's recommendations.
16. Verify location of all electrical and fire utility equipment with architect. Contractor shall provide a 10'-0" length as indicated on drawings. Paint all trees and bollards.
17. Provide 6'-0" high reinforced barbed ornamental fencing at entrance and parking areas as shown on the Site Plan. Fence shall be installed in accordance with manufacturer's recommendations.
18. Verify location of all electrical and fire utility equipment with architect. Contractor shall provide a 10'-0" length as indicated on drawings. Paint all trees and bollards.
19. Provide 6'-0" high reinforced barbed ornamental fencing at entrance and parking areas as shown on the Site Plan. Fence shall be installed in accordance with manufacturer's recommendations.
20. Verify location of all electrical and fire utility equipment with architect. Contractor shall provide a 10'-0" length as indicated on drawings. Paint all trees and bollards.

GENERAL SITE NOTES CONT.

21. Existing asphalt areas designated for construction shall be repaired with 6" base asphalt base to be treated will be as directed by the Architect. Repair areas of asphalt, curbs, concrete work, asphalt, and any other items damaged by the construction of repairs or replacing at lower cost.
22. See Civil Engineers Notes for grading and drainage requirements. Coordinate all items with Architectural Site Plan and Notes. Architect directs all requirements. Report all discrepancies to Architect before proceeding with construction for proper layout.
23. All dimensions are taken from face of curb, concrete steps, sidewalk, etc. See concrete only and all dimensions, curb & gutter shall be installed to provide positive drainage away from the buildings. Report any discrepancies to the Architect prior to construction for proper layout.

GENERAL SITE DEMOLITION NOTES

1. The General Contractor will remove any and all sidewalks, curbs, shrubbery, trees, fences, concrete work, asphalt, and any other items noted as to be removed but required to be removed to install the new construction. Exterior demolition is under 6' unless noted on existing plans. Coordinate with respective utilities.
2. All new concrete sidewalks and/or concrete curbs shall be installed at an existing point with expansion joint material and sealant to provide a smooth transition between old and existing construction.
3. All new asphalt and patch asphalt shall be 3-3/4" new 3-1/4" mild asphalt and match slope with crowned areas and grinding with asphalt areas to provide a smooth transition between new and existing surfaces. Ridge, bumps, or humps will not be accepted.
4. At all poles, lines, meters, pads, etc. to be removed, the utility owning to item shall remove it. General Contractor will be responsible for this work see Division 2.
5. Coordinate with utility. Sometimes with owning utility company.
6. General Contractor shall protect, retain and during and all existing structures adjacent to any and all demolitions. Prior to constructing the General Contractor shall establish the depth of foundations. Prior to excavating the existing footings of adjacent structures, the General Contractor shall be responsible for the design and construction of such methods of protection of existing structures.
7. General Contractor shall contact all utility companies to field verify exact locations of underground and above ground lines and coordinate with utility company owning lines that may need to be relocated or removed.
8. General Contractor shall protect all utility lines (above & below ground) during the entire demolition period. Damaged lines will be repaired and/or replaced at no cost to the Owner. Any outages in utility lines shall be coordinated with the utility company or its agents.
9. Utility lines shown on a few notes supplied survey and architect does not guarantee the accuracy or location. General Contractor shall verify the location of all underground and above ground utility lines with the company owning lines whether shown or not shown.



PARTIAL SITE PLAN (ALT.)
REVISED 2-6-92

Southminster Presbyterian Church
6300 ROE AVENUE • PRAIRIE VILLAGE, KANSAS 66208 • (913) 432-3995

MANTEL & TEETER
AMERICAN INSTITUTE of ARCHITECTS
KANSAS CITY MISSOURI 64108

DATE
PROJECT
DRAWN BY
CHECKED BY
REVISED

SHEET 1 OF 20

SITE NAME:

PRAIRIE VILLAGE CITY MONOPOLE

SITE NUMBER:

KC60XC727

SITE ADDRESS:
7700 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

DRIVING DIRECTIONS

DEPART FROM SPRINT OFFICE:
6391 SPRINT PARKWAY, OVERLAND PARK, KS 66251

DEPART ON SPRINT PKWY (SOUTH). TURN LEFT (EAST) ONTO W 117TH ST. TURN LEFT (NORTH) ONTO NALL AVE. TURN RIGHT (EAST) ONTO W 103RD ST. TURN LEFT (NORTH) ONTO MISSION RD. ARRIVE AT SITE.

SITE INFORMATION

PROJECT TYPE:	SITE TYPE:	MARKET:
NETWORK VISION	MONOPOLE	KANSAS CITY

SITE NAME:	PRAIRIE VILLAGE CITY MONOPOLE	APPLICANT:	SPRINT 6391 SPRINT PARKWAY OVERLAND PARK, KS 66251
SITE NO: TOWER NO:	KC60XC727 –		
SITE ADDRESS:	7700 MISSION ROAD PRAIRIE VILLAGE, KS 66208	LANDLORD:	CITY OF PRAIRIE VILLAGE
COUNTY: JURISDICTION: APN: ZONING:	JOHNSON, KS CITY OF PRAIRIE VILLAGE, KS – R–1A	BUILDING CODE:	INTERNATIONAL BUILDING CODE, 2006 EDITION
SITE COORDINATES LATITUDE: LONGITUDE: GROUND ELEVATION:	(FROM RF SHEET) N. 38.9894° (NAD 83) W. 94.63140° (NAD 83) 1037.2' (AMSL)	ELECTRICAL CODE:	NATIONAL ELECTRICAL CODE, 2005 EDITION

LIST OF DRAWINGS

NO.	TITLE
T1	TITLE SHEET
T2	GENERAL NOTES
T3	GENERAL NOTES
T4	GENERAL NOTES
A1	SITE PLAN
A2	PLATFORM LAYOUT
A3	SITE ELEVATION
A4	ANTENNA LAYOUT
A5	RFDS SHEET
A6	ANTENNA DETAILS
A7	SITE DETAILS
A8	EQUIPMENT DETAILS
E1	UTILITY PLAN AND DETAILS
E2	GROUNDING DIAGRAM AND NOTES

SITE ACCESS PROCEDURES

TOWER ACCESS – 24X7
COMPOUND COMBO = 6985. TELCO CABINET ACCESS – ROGER WYATT, FIELD SUPERINTENDENT (913) 385–4644 DESK, (913) 385–4647 MAIN PUBLIC WORKS NUMBER, HE IS THE CONTACT TO ACCESS THE TELCO ROOM WHERE YOUR NIU IS PLACED. THE ROOM IS BEHIND THE RECEPTIONIST DESK IN CITY HALL. YOU CAN REACH THE PUBLIC WORKS FOR ACCESS BETWEEN 9–5. AFTER HOURS YOU WOULD HAVE TO GO TO THE POLICE DEPARTMENT DISPATCH DESK TO GAIN ACCESS.

PROJECT SUMMARY

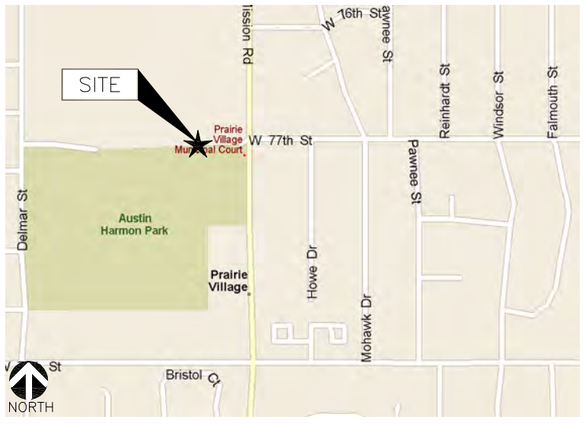
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED
- FACILITY HAS NO PLUMBING
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS

SCOPE OF WORK

WORK CONSIST OF MODIFYING THE EXISTING WIRELESS INSTALLATION:

- DECOMMISSIONING OF EXISTING ANTENNAS AND BASE STATION EQUIPMENT
- INSTALLATION OF NEW ANTENNAS, ANTENNA SUPPORTS AND BASE STATION EQUIPMENT
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. CABINETS, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR

LOCATION MAP



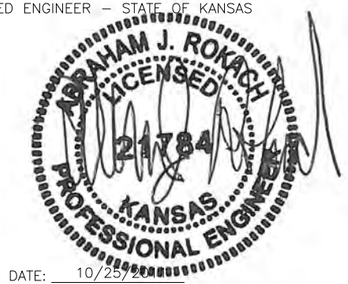
PROJECT CONTACTS

APPLICANT: SPRINT NEXTEL PROPERTY SERVICES	MAILSTOP KSOPHT0101–Z2650 6391 SPRINT PARKWAY OVERLAND PARK, KS 66251–2650
TOWER/LANDORD:	CITY OF PRAIRIE VILLAGE
ENGINEERING CONSULTANTS: FULLERTON ENGINEERING	RAFIK ISHAYA (847) 292–0200 EX (241)
LEASING: MD7	10590 WEST OCEAN AIR DR., SUITE 300 SAN DIEGO, CA 92130 JOE O'CONNER (858) 799–7850
ZONING PM: NETWORK BUILDING & CONSULTING, LLC	7380 COCA COLA DR., SUITE 106 HANOVER, MD 21076 RON EBERZ (215) 527–0199
SAM:	BRIAN BARRETT (630) 440–6791
CM:	RUSSELL McCALMENT (918) 699–9837
RF ENGINEER:	AARON SCARBOROUGH 913–219–4175

ENGINEER'S LICENSE

I CERTIFY THAT THESE DRAWING WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, 2006 EDITION

LICENSED ENGINEER – STATE OF KANSAS



SIGNED DATE: 10/25/2011
EXPIRES: 4/30/2013 LICENSE#: 21784

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DRAWINGS SCALED TO 11"x17"

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OVERLAND PARK, KS 66251

ERICSSON
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DRAWN BY:	CHECKED BY:	APPROVED BY:
TP	RI	MB

NO	DESCRIPTION	BY	DATE
	90% REVIEW	TP	8/15/11
	FINAL	LA	10/25/11

SITE NAME
PRAIRIE VILLAGE
CITY MONOPOLE

SITE NO.
KC60XC727

SITE ADDRESS
7700 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

COMPLY WITH THESE STANDARDS UNLESS OTHERWISE REQUIRED BY APPLICABLE CODES

1.0 CONSTRUCTION TO CONFORM TO SPRINT NEXTEL INTEGRATED CONSTRUCTION STANDARDS

1.1 PURPOSE AND INTENT

A. 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. SHOULD THERE BE ANY DISCREPANCIES BETWEEN REQUIREMENTS SHOWN IN BOTH, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.

B. THE INTENTION OR 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.

C. THE PURPOSE OF THE SPRINT WIRELESS CONSTRUCTION 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. VERIFY ALL MEASUREMENTS AT THE SITE BEFORE ORDERING MATERIAL OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION WILL BE ALLOWED DUE TO DIFFERENCES BETWEEN ACTUAL DIMENSIONS OR DIMENSIONS SHOWN ON PLANS. SUBMIT NOTICE OF ANY DISCREPANCY IN DIMENSIONS OR OTHERWISE TO SPRINT WIRELESS FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK.

B. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST OR OF DIFFICULTIES OF CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING 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 CONSTRUCTION DOCUMENTS GOVERNING THE WORK.

1.3 CLEANING

KEEP THE SITE FREE FROM ACCUMULATION OF WASTE AND RUBBISH CAUSED BY EMPLOYEES AT THE COMPLETION OF THE WORK. REMOVE ALL WASTE AND NON-CONSTRUCTION MATERIAL INCLUDING ALL CONTRACTOR TOOLS, SCAFFOLDING AND SURPLUS MATERIAL AND LEAVE SITE CLEAN AND READY FOR USE.

1.4 CODES

CONTRACTOR SHALL. BE RESPONSIBLE FOR FOLLOWING ALL LAWS, REGULATIONS AND RULES PROMULGATED BY FEDERAL STATE AND LOCAL AUTHORITIES WITH JURISDICTION OVER THE SITE. THIS RESPONSIBILITY IS IN EFFECT REGARDLESS OF WHETHER THE LAW, ORDINANCE, REGULATION OR RULE IS MENTIONED IN THESE SPECIFICATIONS.

1.5 LICENSING

HAVE AND MAINTAIN A VALID CONTRACTORS LICENSE FOR THE LOCATION IN WHICH THE WORK IS TO BE PERFORMED. FOR JURISDICTIONS THAT LICENSE INDIVIDUAL TRADES, THE TRADESMAN OR SUBCONTRACTORS PERFORMING THOSE TRADES SHALL BE LICENSED. RESEARCH AND COMPLY WITH LICENSING LAWS, PAY LICENSE FEES, AND SELECT AND INFORM SUBCONTRACTORS REGARDING THESE LAWS.

1.6 OSHA

FOLLOW ALL APPLICABLE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATIONS, AND STATE LAWS BASED IN THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT. THESE REGULATIONS INCLUDE BUT ARE NOT LIMITED TO REGULATIONS DEALING WITH TOWER CONSTRUCTION AND SAFETY, EXCAVATIONS AND TRENCHING, AND WORK IN CONFINED SPACES. ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT AII TIMES DURING CONSTRUCTION.

1.7 PHOTOS

PROVIDE PHOTOGRAPHIC EVIDENCE OF ALL FOUNDATION INSTALLATION, GROUNDING AND TRENCHING AFTER PLACEMENT OF UTILITIES PRIOR TO BACKFILL.

1.8 BUILDING PERMITS

SPRINT WIRELESS WILL SUBMIT CONSTRUCTION DOCUMENTS TO THE JURISDICTIONAL AUTHORITY FOR PLAN CHECK AND REVIEW. CONTRACTOR WILL SUBMIT LICENSING AND WORKMAN'S COMPENSATION INFORMATION TO THE JURISDICTION AS REQUIRED TO OBTAIN THE BUILDING PERMIT. CONTRACTOR SHALL COORDINATE AND SCHEDULE REQUIRED INSPECTIONS AND POST REQUIRED PERMITS AT THE JOB SITE. COMPLY WITH SPECIFIC PROJECT-RELATED REQUESTS AND SUGGESTIONS MADE BY BUILDING INSPECTOR AND INFORM CONSTRUCTION MANAGER OF ANY SUCH WORK THAT MAY BE BEYOND THE SCOPE OF THE CONTRACT OR DEVIATE FROM THE CONSTRUCTION DOCUMENTS. SPRINT WIRELESS WILL REIMBURSE THE CONTRACTOR FOR FEES FOR PLAN REVIEW, BUILDING PERMIT, CONNECTIONS AND INSPECTION.

1.9 ZONING REGULATIONS AND CONDITIONAL USE PERMITS

SPRINT WIRELESS WILL SUBMIT FOR AND OBTAIN ALL ZONING AND CONDITIONAL USE PERMITS. SOME USE PERMITS MAY HAVE SPECIFIC REQUIREMENTS RELATED TO THE CONSTRUCTION SUCH AS NOISE REGULATIONS, HOURS OF WORK, ACCESS LIMITATIONS, ETC. THE CONSTRUCTION MANAGER WILL INFORM THE CONTRACTOR OF THESE REQUIREMENTS AT THE PRE-BID MEETING OR AS SHOWN IN CONSTRUCTION DOCUMENTS.

1.10 FM PERMIT AND TOWER LIGHTING

REFER TO CONSTRUCTION DOCUMENTS AND CONSTRUCTION MANAGER FOR FAA AND STATE LIGHTING REQUIREMENTS. CONTRACTOR SHALL PROVIDE TEMPORARY FM APPROVED LIGHTING UNTIL PERMANENT LIGHTING IS OPERATIONAL

1.11 TOWER SECURITY

TOWER MUST BE FENCED, TEMPORARILY OR PERMANENTLY WITHIN 24 HOURS OF ERECTION. DO NOT ALLOW THE GATE ACCESSING THE TOWER AREA TO REMAIN OPEN OR UNATTENDED AT ANY TIME FOR ANY REASON. KEEP THE GATE CLOSED AND LOCKED WHEN NOT IN USE.

1.12 SITE CONTROL

A. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR CONTAINMENT OF SEDIMENT AND CONTROL OF EROSION AT THE SITE. ANY DAMAGE TO ADJACENT OR DOWNSTREAM PROPERTIES WILL BE CORRECTED BY THE CONTRACTOR AT NO EXPENSE TO SPRINT WIRELESS.

B. THE CONTRACTOR IS TO MAINTAIN ADEQUATE DRAINAGE AT ALL TIMES. DO NOT ALLOW WATER TO STAND OR POND. ANY DAMAGE TO STRUCTURES OR WORK ON THE SITE CAUSED BY INADEQUATE MAINTENANCE OF DRAINAGE PROVISIONS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND ANY COST ASSOCIATED WITH REPAIRS FOR SUCH DAMAGE WILL BE AT THE CONTRACTOR'S EXPENSE.

C. ALL WASTE MATERIAL SHALL BE PROPERLY DISPOSED OF OFF-SITE OR AS DIRECTED BY THE CONSTRUCTION MANAGER AND IN ACCORDANCE WITH JURISDICTIONAL AUTHORITIES.

2.0 SITE PREPARATION

2.1 SCOPE OF WORK INCLUDES:

A. PROTECTION OF EXISTING TREES, VEGETATION AND LANDSCAPING MATERIALS WHICH MIGHT BE DAMAGED BY CONSTRUCTION ACTIVITIES.

B. TRIMMING OF EXISTING TREES AND VEGETATION AS REQUIRED FOR PROTECTION DURING CONSTRUCTION ACTIVITIES.

C. CLEARING AND GRUBBING OF STUMPS, VEGETATION, DEBRIS, RUBBISH, DESIGNATED TREES, AND SITE IMPROVEMENTS.

D. TOPSOIL STRIPPING AND STOCKPILING.

E. TEMPORARY EROSION CONTROL, SILTATION CONTROL AND DUST CONTROL CONFORMING TO LOCAL REQUIREMENTS AS APPLICABLE.

F. TEMPORARY PROTECTION OF ADJACENT PROPERTY, STRUCTURES, BENCHMARKS AND MONUMENTS.

G. PROTECTION AND TEMPORARY RELOCATION, STORAGE AND RE-INSTALLATION OF DUSTING FENCING AND OTHER SITE IMPROVEMENTS SCHEDULED FOR REUSE.

H. REMOVAL AND LEGAL DISPOSAL OF CLEARED MATERIALS.

2.2 PRODUCTS AND MATERIALS (AS APPROVED BY CONSTRUCTION MANAGER OR AS NOTED III CONSTRUCTION DOCUMENTS.)

A. MATERIALS USED FOR TREE PROTECTION, EROSION CONTROL, SILTATION CONTROL AND DUST CONTROL AS SUITABLE FOR SPECIFIC SITE CONDITIONS.

3.0 EARTH WORK

3.1 SCOPE OF WORK INCLUDES:

A. EXCAVATION, TRENCHING, FILLING, COMPACTION, AND GRADING FOR STRUCTURES, SITE IMPROVEMENTS AND UTILITIES.

B. MATERIALS FOR SUB-BASE DRAINAGE FILL, FILL, BACKFILL AND GRAVEL FOR SLABS, PAVEMENTS AND IMPROVEMENTS.

C. ROCK EXCAVATION WITHOUT BLASTING.

D. SUPPLY OF ADDITIONAL MATERIALS FROM OFFSITE AS REQUIRED.

E. REMOVAL AND LEGAL DISPOSAL OF EXCAVATED MATERIALS AS REQUIRED

3.2 QUALITY ASSURANCE

A. COMPACTION:

1. UNDER STRUCTURES, BUILDING SLABS, PAVEMENTS AND WALKWAYS WILL OBTAIN A 95 PERCENT COMPACTION AT A MAXIMUM DRY DENSITY AS DETERMINED BY ASTM 0-1557 OR WITHIN PLUS OR MINUS 3 PERCENT OF OPTIMUM MOISTURE.

B. GRADING TOLERANCES OUTSIDE BUILDING CODES:

1. LAWNS, UNPAVED AREAS AND WALKS PLUS OR MINUS 1 INCH.
2. UNDER PAVEMENTS PLUS OR MINUS 1/2 INCH.

C. GRADING TOLERANCE FOR FILL UNDER ALL CONCRETE APPLICATIONS: PLUS OR MINUS 1/2 INCH MEASURED WITH 10 FOOT STRAIGHTEDGE.

3.3 PRODUCTS AND MATERIALS (AS APPROVED BY CONSTRUCTION MANAGER OR AS NOTED IN CONSTRUCTION DOCUMENTS.)

A. SUBBASE MATERIAL GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE OR SLAG. AND NATURAL SAND.

B. WASHED MATERIAL EVENLY GRADED MIXTURE OF CRUSHED STONE OR GRAVEL WITH 95 PERCENT PASSING A 1 1/2 INCH SIEVE.

C. GRADING MATERIAL WILL CONSIST OF: SATISFACTORY NATIVE OR IMPORTED SOILMATERIALS FREE Of CLAY, ROCK OR GRAVEL NOT LARGER THAN 2 INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS AND OTHER UNSUITABLE MATERIALS WILL NOT BE ALLOWED FOR USE. IMPORTED MATERIALS SHALL HAVE A CLAY CONTENT NO MORE THAN 5 PERCENT.

D. BACKFILL MATERIALS WILL CONSIST OF: SATISFACTORY NON-COHESIVE NATIVE OR IMPORTED SOIL MATERIALS FREE OF CLAY, ROCK OR GRAVEL NOT LARGER THAN 4 INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, AND OTHER UNSUITABLE MATERIALS. IMPORTED MATERIAL SHALL HAVE A CLAY CONTENT OF NO MORE THAN 5 PERCENT.

E. GRAVEL MATERIAL EVENLY GRADED MIXTURE OF CRUSHED STONE OR GRAVEL WITH 95 PERCENT PASSING A 1 1/2 INCH SIEVE.

F. GEOTEXTILE FABRIC: AS PER CONSTRUCTION DOCUMENTS.

3.4 CLEARING AND GRUBBING REMOVE ALL VEGETATION AND MATERIALS AS REQUIRED. REMOVE STUMPS COMPLETELY UNDER FOUNDATIONS AND ROADWAY. DISPOSE OF CLEARING AND GRUBBING OFF-SITE, OR IN AN ON-SITE LOCATION APPROVED BY CONSTRUCTION MANAGER.

3.5 STRIPPING

STRIP NOT LESS THAN 3 INCHES OF SOD AND TOPSOIL FROM AREAS THAT WILL UNDERLAY GRAVEL PAVEMENT, NEW STRUCTURES OR NEW EMBANKMENTS. STOCKPILE STRIPPING ON-SITE FOR RE-USE IN FINAL LANDSCAPING.

3.6 COMMON EXCAVATION

1. EXCAVATE TO DEPTH, LINES AND GRADES SHOWN ON THE PLANS OR AS OTHERWISE SPECIFIED.
2. TEMPORARILY STOCKPILE ON-SITE EXCAVATION AT AN APPROVED LOCATION WITHIN THE WORK AREA UNTIL SITE GRADING IS COMPLETE STOCKPILE SHALL NOT EXCEED 15 FEET IN HEIGHT.
3. LEGALLY DISPOSE OF EXCESS COMMON EXCAVATION OFF-SITE.

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TP	RI	MB

NO	DESCRIPTION	BY	DATE
	90% REVIEW	TP	8/15/11
	FINAL	LA	10/25/11

ABRAHAM J. ROKACH
LICENSED
21784
KANSAS
PROFESSIONAL ENGINEER

DATE SIGNED: 10/25/11

SITE NAME
PRAIRIE VILLAGE
CITY MONOPOLE

SITE NO.
KC60XC727

SITE ADDRESS
7700 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

SHEET NAME
GENERAL NOTES

SHEET NUMBER
T2

3.7 EMBANKMENT

A. CONSTRUCT EMBANKMENT TO THE LINES AND GRADE SHOWN ON THE DRAWINGS.
B. CONSTRUCT EMBANKMENT FROM ON-SITE EXCAVATION MATERIALS WHEN SUITABLE USE IMPORTED BACKFILL ONLY AFTER AVAILABLE ON-SITE EXCAVATION MATERIALS HAVE BEEN USED.
C. CONSTRUCT IN LIFTS OF NOT MORE THAN 12 INCHES IN LOOSE DEPTH. THE FULL WIDTH OF THE CROSS SECTION SHALL BE BROUGHT UP UNIFORMLY.
D. MATERIAL SHALL NOT BE PLACED IN LAYERS AND SHALL BE NEAR OPTIMUM MOISTURE CONTENT BEFORE ROLLING TO OBTAIN THE PRESCRIBED COMPACTION. WETTING DR DRYING OF THE MATERIAL AND MANIPULATION TO SECURE A UNIFORM MOISTURE CONTENT THROUGHOUT THE LAYER MAY BE REQUIRED. SUCH OPERATIONS SHALL BE INCLUDED IN THE APPROPRIATE BID ITEM. SHOULD THE MATERIAL BE TOO WET TO PERMIT PROPER COMPACTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE MATERIAL WITH AN ACCEPTABLE MOISTURE CONTENT.
E. DO NOT PLACE FROZEN MATERIAL IN THE EMBANKMENT AND DO NOT PLACE EMBANKMENT MATERIAL UPON FROZEN MATERIAL.
F. CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF EMBANKMENTS AND THE REPLACEMENT OF ANY PORTION WHICH HAS BECOME DISPLACED DUE TO THE CONTRACTORS OPERATIONS.
G. START LAYERS IN THE DEEPEST PORTION OF THE FILL, AND AS PLACEMENT PROGRESSES, CONSTRUCT LAYERS APPROXIMATELY PARALLEL TO THE FINISHED GRADE LINE.
H. ROUTE EQUIPMENT, BOTH LOADED AND EMPTY, OVER THE FULL WIDTH OF EMBANKMENT TO ENSURE UNIFORMITY OF MATERIAL PLACEMENT.
I. COMPACT EMBANKMENT UNDERLYING NEW GRAVEL PAVING FLOOR SLABS AND STRUCTURES TO A 95 PERCENT COMPACTION AT A MAXIMUM DRY DENSITY AS DETERMINED BY ASTM 0-1557 OR WITHIN PLUS OR MINUS 3 PERCENT OF OPTIMUM MOISTURE CONTENT. COMPACT NON-STRUCTURAL AREA EMBANKMENTS TO A MINIMUM OF 90 % OF ASTM 0-1557.

3.8 SITE GRADING

A. USING ON-SITE EXCAVATION MATERIALS SHAPE, TRIM, FINISH AND COMPACT SURFACE AREAS TO CONFORM TO THE LINES, GRADES AND CROSS SECTIONS SHOWN ON THE DRAWINGS OR AS DESIGNATED BY THE CONSTRUCTION MANAGER.
B. GRADE SURFACES TO DRAIN AND ELIMINATE ANY PONDING OR EROSION.
C. ELIMINATE WHEEL RUTS BY REGRADING.
D. COMPACT AREAS UNDERLYING NEW GRAVEL PAVING, FLOOR SLABS AND STRUCTURES TO A 95 PERCENT COMPACTION AT A MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1551 OR WITHIN PLUS OR MINUS 3 PERCENT OF OPTIMUM MOISTURE CONTENT.
E. CONSTRUCT FINISHED SURFACE OF SITE GRADING AREAS WITHIN ONE INCH FROM SPECIFIED GRADE

3.9 SUBGRADE PREPARATION

A. SHAPE TOP OF SUBGRADE TO THE LINES AND GRADES SHOWN ON THE DRAWINGS.
B. MAINTAIN TOP OF SUBGRADE TO A FREE-DRAINING CONDITION.
C. DO NOT STOCKPILE MATERIALS ON TOP OF SUBGRADE UNLESS AUTHORIZED BY CONSTRUCTION MANAGER.
D. COMPACT THE TOP 12 INCHES OF SUBGRADE TO A 95% COMPACTION AT A MAXIMUM DRY DENSITY AS DETERMINED BY ASTM 0-1557 OR WITHIN PLUS OR MINUS 3 PERCENT OF OPTIMUM MOISTURE CONTENT.
E. CONSTRUCT TOP OF SUBGRADE WITHIN ONE INCH Of ESTABLISHED GRADE AND CROSS-SECTION.

3.10 GEOTEXTILE FABRIC

A. LAY GEOTEXTILE FABRIC OVER COMPACTED SUBGRADE AS PER CONSTRUCTION DOCUMENTS IN THE COMPOUND AREA AND UNDER LENGTH OF ROAD (WHEN REQUIRED). LAP ALL JOINTS TO A MINIMUM Of 36 INCHES.

3.11 GRAVEL SURFACING

A. CONSTRUCT GRAVEL SURFACING AREAS USING CRUSHED AGGREGATE BASE AND FINISH COURSES AS SPECIFIED BY CONSTRUCTION MANAGER OR CONSTRUCTION DOCUMENTS.
B. SPREAD GRAVEL AND RAKE TO OBTAIN A UNIFORM SURFACE AREA.

4.0 TRENCHING

CALL LOCAL UNDERGROUND UTILITY LOCATING SERVICE BEFORE ANY EXCAVATION OR TRENCHING.

4.1 MATERIALS

FILL MATERIAL SHALL BE OBTAINED, WHEN POSSIBLE FROM MATERIALS EXCAVATED FROM TRENCHES. ON-SITE STRUCTURAL FILL SAND OR SLURRY SHALL BE APPROVED BY THE CONSTRUCTION MANAGER AND SHALL CONFORM TO LOCAL GOVERNING JURISDICTIONS AND UTILITY COMPANY REQUIREMENTS. THE FILL MATERIAL SHALL CONTAIN NO ORGANIC MATERIAL OR ROCKS, NOR SHALL CONTAIN OBJECTIONABLE MATERIALS AND/OR MATERIALS DESIGNATED AS HAZARDOUS OR INDUSTRIAL BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THE FILL MATERIAL SHALL CONTAIN FINES SUFFICIENT TO FILL ALL VOIDS IN THE MATERIAL COMPACTION OF BACKFILL OR BORROW SOIL SHALL BE PLACED IN 12 INCH LOOSE LIFTS WHEN UTILIZING HEAVY COMPACTION EQUIPMENT OR 6 INCH LOOSE LIFTS WHEN UTILIZING HAND OPERATED TAMPERS.

4.2 PIPE DETECTION AND IDENTIFICATION

A. UTILIZING WARNING TAPE: ALL ELECTRIC SERVICE TRENCHES SHALL BE MARKED WITH WARNING TAPE.

4.3 TRENCH EXCAVATION

A. DIG TRENCH TO LINES AND GRADES SHOWN ON THE PLANS OR AS DIRECTED BY CONSTRUCTION MANAGER.
B. TRENCH LENGTH SHALL BE SUFFICIENT TO ALLOW FOR SATISFACTORY CONSTRUCTION AND INSPECTION OF THE PROJECT WITHOUT ENDANGERING OTHER CONSTRUCTION WORK OR ADJACENT FACILITIES.
C. DISPOSE OF EXCESS AND UNSUITABLE EXCAVATION MATERIAL PROPERLY, AS DIRECTED BY CONSTRUCTION MANAGER.
D. USE HAND METHODS FOR EXCAVATION THAT CANNOT BE ACCOMPLISHED WITHOUT ENDANGERING EXISTING OR NEW STRUCTURES OR OTHER FACILITIES.

4.4 TRENCH PROTECTION

A. PROVIDE MATERIALS, LABOR AND EQUIPMENT NECESSARY TO PROTECT TRENCHES AT ALL TIMES.
B. SHEETING AND BRACING: MEET OR EXCEED OSHA REQUIREMENTS.

4.5 BACKFILLING

A. NOTIFY THE CONSTRUCTION MANAGER AT LEAST 24 HOURS IN ADVANCE OF BACKFILLING.
B. BACKFILL TRENCH WITH LIFTS UP TO 12 INCHES, LOOSE MEASURE.
C. PROTECT CONDUIT FROM LATERAL MOVEMENT, DAMAGE FROM IMPACT OR UNBALANCED LOADING TO AVOID DISPLACEMENT OF CONDUIT AND/OR STRUCTURES. DO NOT FREE FALL BACKFILL INTO TRENCH UNTIL AT LEAST 12 INCHES OF COVER IS OVER THE CONDUIT.

4.6 COMPACTION

A. COMPACT BACKFILL TO A 95 PERCENT COMPACTION AT A MAXIMUM DRY DENSITY AS DETERMINED BY ASTM 0-1557 OR WITHIN PLUS OR MINUS 3 PERCENT OF OPTIMUM MOISTURE CONTENT.
B. IF REQUIRED COMPACTION DENSITY HAS NOT BEEN OBTAINED, REMOVE THE BACKFILL FROM THE TRENCH OR STRUCTURE, REPLACE WITH APPROVED BACKFILL AND RECOMPACT AS SPECIFIED.
C. ANY SUBSEQUENT SETTLEMENT OF TRENCH OR STRUCTURE BACKFILL DURING MAINTENANCE PERIOD SHALL BE CONSIDERED THE RESULT OF IMPROPER COMPACTION AND SHALL BE PROMPTLY CORRECTED.

5.0 CHAIN LINK FENCES AND GATES

5.1 GENERAL

A. PROVIDE CHAIN LINK FENCES AND GATES AS COMPLETE UNITS BY A SINGLE SUPPLY SOURCE INCLUDING NECESSARY ERECTION ACCESSORIES, FITTINGS AND FASTENERS.

5.2 PRODUCTS AND MATERIALS (AS APPROVED BY CONSTRUCTION MANAGER OR AS WITHIN CONSTRUCTION DOCUMENTS)

A. COMPOUND FABRIC 84 INCHES HIGH AND OVER WITH 2-INCH MESH SHALL BE KNUCKLED AT ONE SELVAGE AND TWISTED AT THE OTHER.
B. STEEL FABRIC:
COMPLY WITH CHAIN LINK FENCE MANUFACTURERS INSTITUTE (CLFMI) PRODUCT MANUAL. FURNISH ONE PIECE OF FABRIC WIDTHS. WIRE SIZE INCLUDES ZINC OR ALUMINUM COATING.
1. SIZE: 2-INCH MESH 9 GAUGE (D.148-INCH DIAMETER) WIRE.
2. GALVANIZED STEEL FINISH: ASTM A 392. CLASS 2. WITH A MINIMUM 2.0 OZ. ZINC PER SQ. FT. OF UNCOATED WIRE SURFACE.
C. FRAMEWORK AND ACCESSORIES:
1. GENERAL REQUIREMENTS: EXCEPT AS INDICATED OTHERWISE CONFORM TO THE CHAIN LINK FENCE MANUFACTURERS INSTITUTE (CLFMI) PRODUCT MANUAL INDUSTRIAL STEEL GUIDE FOR FENCE RAILS, POSTS, GATES AND ACCESSORIES INCLUDING TABLE II.
2. STRENGTH REQUIREMENTS FOR POSTS AND RAILS CONFORMING TO ASTM F 669.
3. TYPE 1 PIPE HOT-DIPPED GALVANIZED STEEL PIPE CONFORMING TO ASTM F 1083. PLANE ENDS, STANDARD WEIGHT (SCHEDULE 40) WITH NOT LESS THAN 18 OZ. ZINC PER SQ. FT. OF SURFACE AREA COATED.
4. FILLINGS: COMPLY WITH ASTM F 526 MILL FINISHED ALUMINUM OR GALVANIZED IRON STEEL TO COMPLY WITH MANUFACTURER'S REQUIREMENTS.
5. TOP RAIL MANUFACTURERS LONGEST LENGTHS, WITH EXPANSION TYPE COUPLINGS, APPROXIMATELY 6 INCHES LONG, FOR EACH JOINT. PROVIDE MEANS FOR ATTACHING TOP RAIL SECURELY TO EACH GATE CORNER, PULL AND END POST.
D. GALVANIZED STEEL 11/4 INCH NPS (1.66 INCH OD) TYPE I OR II STEEL PIPE OR 1.625 INCH x 1.25 INCH ROLL-FORMED C SECTIONS WEIGHING 1.35 LBS. PER FT.
E. SWING GATES:
COMPLY WITH ASTM F 9000. PROVIDE HARDWARE AND ACCESSORIES FOR EACH GATE. GALVANIZED PER ASTM A 153, AND IN ACCORDANCE WITH THE FOLLOWING:
1. HINGES: NON LIFT- OFF TYPE. OFFSET TO PERMIT ISO DEG. GATE OPENING.
2. LATCH: MTS MULTI-LOCKING DEVICE MT-C6477 OR APPROVED EQUAL.
3. KEEPER: PROVIDE KEEPER FOR VEHICLE GATES, WHICH AUTOMATICALLY ENGAGES GATE LEAF AND HOLDS IT IN OPEN POSITION UNTIL MANUALLY RELEASED.

F. CONCRETE:
PROVIDE CONCRETE CONSISTING OF PORTLAND CEMENT, ASTM C 150, AGGREGATES ASTM C 33, AND CLEAN WATER. MIX MATERIALS TO OBTAIN CONCRETE WITH A MINIMUM OF 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI.

6.0 LANDSCAPING

A. FURNISH, INSTALL AND MAINTAIN LANDSCAPE WORK AS SHOWN AND OR REQUIRED WITHIN THE CONSTRUCTION DOCUMENTS OR AS SPECIFIED IN THE SPRINT WIRELESS CONSTRUCTION SPECIFICATIONS.

7.0 CONCRETE FORMWORK

A. FORMS: SMOOTH AND FREE OF SURFACE IRREGULARITIES. UTILIZE FORM RELEASE AGENTS.
B. CHAMFER: EXPOSED EDGES OF ALL TOWER FOUNDATIONS SHALL RECEIVE A 3/4" BY 3/4" 45 DEGREE CHAMFER. OTHER EXPOSED EDGES SHALL RECEIVE A TOOLED RADIUS FINISH.
C. UPON COMPLETION, REMOVE ALL FORMS, INCLUDING THOSE CONCEALED OR BURIED.
D. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL REQUIREMENTS.

8.0 CONCRETE REINFORCEMENT

REFER TO STRUCTURAL DRAWINGS FOR ALL REQUIREMENTS.

9.0 CAST IN PLACE CONCRETE

FOR STRUCTURAL CONCRETE (FOOTINGS, FOUNDATIONS. ETC.), REFER TO STRUCTURAL DRAWINGS FOR REQUIREMENTS. FOR ANY MISCELLANEOUS CONCRETE, REFER TO SPECIFICATION BOOK OR OBTAIN REQUIREMENTS FROM CONSTRUCTION MANAGER.
A. ALL CONCRETE SHALL COMPLY WITH ASTM C94 UNLESS NOTED OTHERWISE.
B. MINIMUM COMPRESSIVE STRENGTH (F'C) AT 28 OATS: 4000 PSI FOR TOWER FOUNDATION AND 3500 PSI FOR ALL OTHER CONCRETE UNLESS SPECIFIED IN CONSTRUCTION DOCUMENTS.
C. AIR ENTRAINMENT: PROVIDE 4 TO 8% AIR ENTRAINMENT FOR ALL CONCRETE SUBJECT TO FREEZE-THAW CYCLE.
D. CONCRETE TESTING: ALL FOUNDATION CONCRETE SHALL BE TESTED BY AN INDEPENDENT TESTING AGENCY APPROVED BY THE CONSTRUCTION MANAGER. ALL STRUCTURAL TOWER FOUNDATION CONCRETE MUST BE TESTED. EQUIPMENT OR BUILDING PADS ARE NOT REQUIRED TO BE TESTED, UNLESS OTHERWISE NOTED BY CONSTRUCTION MANAGER. PROVIDE A MINIMUM OF 5 CYLINDERS (2-7-DAY, 2-28-DAY, 1-SPARE) FOR EACH OATS POUR, OR FOR EVERY 50 YARDS PLACED, WHICHEVER 15 GREATER. ADDITIONAL TESTS OR CYLINDERS MAY BE REQUIRED BY CONSTRUCTION MANAGER. A SLUMP, AIR, AND TEMPERATURE TEST SHALL BE PERFORMED FOR EACH SET OF CYLINDERS CAST. PREFERABLY, TESTS SHALL BE PERFORMED AT THE LOCATION OF ANCHOR BOLTS (PIERS - FOR MAT & PIERS, CAISSONS - TOP 1/3 OF CAISSON). TESTS SHALL ALSO BE REQUIRED FOR CONCRETE CONSIDERED BEING LESS THAN DESIRABLE BY CONCRETE SPECIFICATION STANDARDS. THE TESTING AGENCY HAS THE AUTHORITY TO NOT ACCEPT CONCRETE MEETING THESE SPECIFICATIONS FOR SPRINT WIRELESS. THE CONTRACTOR IS RESPONSIBLE FOR ANY CONCRETE NOT MEETING THESE STANDARDS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF THE TESTING AGENCY A MINIMUM OF 24 HOURS IN ADVANCE OF EACH FOUNDATION POUR. TEST REPORTS SHALL BE FORWARDED TO SPRINT CONSTRUCTION MANAGER WITHIN 24 HOURS OF LAB TEST.
E. VIBRATE ALL CONCRETE USING SUFFICIENT HIGH FREQUENCY LOW AMPLITUDE MECHANICAL IMMERSION TYPE VIBRATORS. INSERT VIBRATORS IN CONCRETE AT REGULAR INTERVALS AND OVER ENTIRE SURFACE TO SOLIDLY FILL CONCRETE MECHANICAL IMMERSION TYPE VIBRATORS. INSERTVIBRATORS IN CONCRETE AT REGULAR INTERVALS AND OVER ENTIRE SURFACE TO SOLIDLY FILL CONCRETE AROUND AND BETWEEN REINFORCEMENT BARS AND INTO CORNERS AND IRREGULARITIES. VIBRATE THOROUGHLY THROUGH EACH LIFT TO THE PREVIOUS LIFE REVERBERATION AS LATE AS THE RUNNING VIBRATOR WILL SINK THROUGH UPPER LAYERS OF ITS WEIGHT IS RECOMMENDED. DISCONTINUE VIBRATION WHEN RISING ENTRAPPED AIR BUBBLES STOP BREAKING THE LEVELING SURFACE. DO NOT OVER VIBRATE AS THIS MAY CAUSE SEGREGATION.
F. FINISHING EXPOSED CONCRETE SURFACES:
1. THESE PROVISIONS APPLY TO ALL EXPOSED AND ALL FORMED CONCRETE, EXTERIOR OR INTERIOR. UNLESS SPECIFICALLY DETAILED OTHERWISE, PERFORM PROCEDURES PRIOR TO APPLICATION OF ANY CURING COMPOUNDS.
2. ALL SURFACES: THOROUGHLY CLEAN OFF ALL STAINS, SPATTER AND LOOSE MATERIAL.
3. FINS, RIDGES AND HIGH SPOTS: HONE SMOOTH WITH ABRASIVE POWER GRINDERS WHILE CONCRETE IS GREEN, IMMEDIATELY AFTER FORM REMOVAL.
4. FORM TIE HOLES AND DEEP DEPRESSIONS: FLUSH THOROUGHLY WITH CLEAN WATER AND TAMP TO OVERFULL WITH DRYPACK. CURE 10 DAYS AND HONE FLUSH AND SMOOTH.
5. ROCK POCKETS, HONEYCOMB, SAND STREAKS, DEBRIS AND VOIDS: CUT OUT AT LEAST 1 INCH DEEP WITH SIDES PERPENDICULAR TO SURFACE. FLUSH THOROUGHLY WITH CLEAN WATER, COAT SURFACE WITH NEAT CEMENT PASTE AND TAMP TO OVERFULL WITH DRYPACK IN AT LEAST TWO LAYERS. CURE FOR 10 DAYS AND HONE FLUSHED AND SMOOTH.
G. CONTRACTOR SHALL VERIFY ALL SIZES AND LOCATIONS OF ALL ELECTRICAL OPENINGS AND EQUIPMENT/BUILDING PADS WITH THE ELECTRICAL DRAWINGS AND SHOP DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL OPENINGS AND SLEEVES FOR PROPER DISTRIBUTION FOR ALL UTILITIES.
CONTRACTOR SHALL REFER TO DRAWINGS OF OTHER TRADES AND VENDOR DRAWINGS FOR EMBEDDED ITEMS AND RECESSES NOT SHOWN ON STRUCTURAL DRAWINGS.
PRIOR TO POURING CONCRETE THE INDEPENDENT TESTING AGENCY SHALL INSPECT ALL FOUNDATION STEEL AND FOUNDATION SUBGRADE

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CITY MONOPOLE

SITE NO.
KC60XC727

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GENERAL NOTES

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10.0 STRUCTURAL STEEL

MEET OR EXCEED MANUFACTURER'S RECOMMENDATIONS.

A. UNLESS OTHERWISE NOTED, ALL DETAILING, FABRICATION AND PLACING OF REINFORCING STEEL SHALL CONFORM TO THE MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (ACI 315).

B. ALL REINFORCING STEEL SHALL BE NEW BILLET STEEL, CONFORMING TO ASTM A-615, GRADE 60, DEFORMED.

C. HEATING AND WELDING OF BARS IS PROHIBITED WITH THE EXCEPTION OF WRITTEN APPROVAL BY THE STRUCTURAL ENGINEER.

D. ALL REINFORCEMENT BARS TO BE FREE FROM LOOSE RUST AND SCALE.

E. UNLESS OTHERWISE NOTED, ALL REINFORCEMENT SHALL HAVE A MINIMUM CONCRETE COVERAGE OF 3 INCHES. THIS MAY REQUIRE SPACERS AND CHAIRS AS REQUIRED BY TESTING AGENCY OR CONSTRUCTION MANAGER.

F. SPLICES IN REINFORCEMENT STEEL ARE PROHIBITED, UNLESS APPROVED BY CONSTRUCTION MANAGER. ALL SPLICES MUST THEN MEET ALL APPLICABLE ASTM STANDARDS FOR SPLICING.

11.0 GROUNDING

MEET ALL APPLICABLE CODES, REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS AND SPRINT WIRELESS CONSTRUCTION SPECIFICATIONS.

GENERATOR SPECIFICATIONS

1. SWITCHES AND STANDARD FEATURES
   - A. CYCLIC CRANKING
   - B. ALARM HORN WITH SILENCING SWITCH
   - C. VOLTAGE ADJUSTING RHEOSTAT
   - D. OVERVOLTAGE PROTECTION
   - E. REMOTE TWO-WIRE AUTO START SYSTEM
   - F. LAMP TEST SWITCH
   - G. RUN-OFF-RESET/AUTO SWITCH (ENGINE START)
   - H. ENGINE COOL DOWN TIMER (5 MINUTES)
2. ERROR-PROOF WIRING HARNESS FOR ELECTRICAL CONNECTIONS
3. PANEL LAMPS
4. DC CIRCUIT PROTECTION

UNIT ACCESSORIES

1. WEATHER HOUSING-STANDARD WITH ROOF MOUNTED SILENCER
2. MOUNTED CRITICAL GRADE EXHAUST SILENCER
3. TAIL PIPE AND RAIN CAP

COOLING SYSTEM ACCESSORIES

1. UNIT MOUNTED RADIATOR
2. ENGINE BLOCK HEATER

FUEL SYSTEM ACCESSORIES

1. FLEXIBLE FUEL LINES
2. ENGINE BLOCK HEATER
3. SUBBASE FUEL TANK-172 GALLONS
4. DOUBLE WALL CONSTRUCTION WITH LEAK DETECTION MONITOR
5. U.L. 142 LISTED
6. FUEL LEVEL GAUGE
7. LOW FUEL LEVEL ALARM
8. FILL PIPE EXTENDED 10% INTO TANK
9. HIGH-FUEL LEVEL ALARM-SET AT 95%
10. 7.5 GALLON LOCKABLE FILL WITH SPILL CONTAINMENT

GENERATOR ACCESSORIES

1. MAIN LINE CIRCUIT BREAKER-100 AMPS, INSTALLED ON GENERATOR
2. VOLTAGE REGULATOR ±2%
3. SAFEGUARD BREAKER

ENGINE ELECTRICAL ACCESSORIES

1. ELECTRONIC/ISOCHRONOUS GOVERNOR
2. BATTERY RACK, CABLES AND STARTING BATTERY SYSTEM-LEAD ACID TYPE
3. BATTERY CHARGER-AUTOMATIC 6 AMP OUTPUT

UTILITY POLES

1. ALL UTILITY POLES SHALL BE 35 FT., CLASS 4 OR AS DIRECTED BY THE UTILITY PROVIDER. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY PRIOR TO EXCAVATING OR INSTALLING ANY UTILITY POLES.

GENERAL NOTES:

1. THE GENERAL CONTRACTOR MUST VERIFY ALL DIMENSIONS, CONDITIONS AND ELEVATIONS BEFORE STARTING WORK. ALL DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER AND SHALL BE RESOLVED BEFORE PROCEEDING WITH THE WORK. ALL WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER IN ACCORDANCE WITH ACCEPTED CONSTRUCTION PRACTICES.

2. IT IS THE INTENTION OF THESE DRAWINGS TO SHOW THE COMPLETED INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY BRACING, SHORING, 115, FORM WORK, ETC. IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL ORDINANCES TO SAFELY EXECUTE ALL WORK AND SHALL BE RESPONSIBLE FOR SAME. ALL WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES.

3. THE CONTRACTOR SHALL USE ADEQUATE NUMBER OF SKILLED WORKMEN WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND METHODS NEEDED FOR PROPER PERFORMANCE OF THE WORK.

4. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT. INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY. THAT REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO INDEMNIFY AND HOLD DESIGN ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH PERFORMANCE OF WORK ON THIS PROJECT.

5. SITE GROUNDING SHALL COMPLY WITH SPRINT/NEXTEL GROUNDING STANDARDS, LATEST EDITION AND COMPLY WITH SPRINT/NEXTEL GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT, THEY SHALL GOVERN. GROUNDING SHALL BE COMPLETED BEFORE ERECTION OF A NEW TOWER.

6. ALL WORK SHALL COMPLY WITH OSHA AND STATE SAFETY REQUIREMENTS. PROCEDURES FOR THE PROTECTION OF EXCAVATIONS, EXISTING CONSTRUCTION AND UTILITIES SHALL BE ESTABLISHED PRIOR TO FOUNDATION INSTALLATION. IF TEMPORARY LIGHTING AND MARKING ARE REQUIRED BY THE FEDERAL AVIATION ADMINISTRATION (FAA), IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE NECESSARY LIGHTS AND NOTIFY THE PROPER AUTHORITIES IN THE EVENT OF A PROBLEM.

7. ALL WORK SHALL BE ACCOMPLISHED IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL CODES OR ORDINANCES. THE MOST STRINGENT CODE WILL APPLY IN THE CASE OF DISCREPANCIES OR DIFFERENCES IN THE CODE REQUIREMENTS.

8. ANY DAMAGE TO ADJACENT PROPERTIES WILL BE CORRECTED AT THE CONTRACTOR'S EXPENSE

9. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AMPLE NOTICE TO THE BUILDING INSPECTION DEPARTMENT TO SCHEDULE THE REQUIRED INSPECTIONS. A MINIMUM OF 24 HOURS OF NOTICE SHOULD BE GIVEN AND THE BUILDING INSPECTION DEPARTMENTS HAVE REQUESTED THAT GROUPS OF TWO OR THREE SITES BE SCHEDULED AT ONE TIME IF POSSIBLE.

10. FOR NEW TOWERS, SPRINT WILL CONFIRM FAA APPROVAL OF TOWER LOCATION BY ISSUING TOWER RELEASE FORM. NO TOWER SHALL BE CONSTRUCTED UNTIL TOWER RELEASE FORM IS ISSUED TO THE CONTRACTOR.

11. THE COMPLETE BID PACKAGE INCLUDES THESE CONSTRUCTION DRAWINGS ALONG WITH THE SPECIFICATIONS AND TOWER DRAWINGS/ANALYSIS. CONTRACTOR IS RESPONSIBLE FOR REVIEW OF THE TOTAL BID PACKAGE PRIOR TO BID SUBMITTAL.

12. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING UTILITIES WITHIN THE CONSTRUCTION LIMITS PRIOR TO CONSTRUCTION.

13. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE ON THE SITE AT ALL TIMES. SILT AND EROSION CONTROL SHALL BE MAINTAINED ON THE DOWNSTREAM SIDE OF THE SITE AT ALL TIMES. ANY DAMAGE TO ADJACENT PROPERTIES WILL BE CORRECTED AT THE CONTRACTORS EXPENSE.

14. CLEARING OF TREES AND VEGETATION ON THE SITE SHOULD BE KEPT TO A MINIMUM. ONLY THE TREES NECESSARY FOR CONSTRUCTION OF THE FACILITIES SHALL BE REMOVED. ANY DAMAGE TO PROPERTY OUTSIDE THE LEASED PROPERTY SHALL BE REPAIRED BY THE CONTRACTOR.

15. ALL SUITABLE BORROW MATERIAL FOR BACKFILL OF THE SITE SHALL BE INCLUDED IN THE BID. EXCESS TOPSOIL AND UNSUITABLE MATERIAL SHALL BE DISPOSED OF OFF SITE AT LOCATIONS APPROVED BY GOVERNING AGENCIES PRIOR TO DISPOSAL.

16. SEEDING AND MULCHING OF THE SITE WILL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER COMPLETION OF THE SITE DEVELOPMENT. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND MAINTAINING AN ADEQUATE COVER OF VEGETATION OVER THE SITE FOR A ONE YEAR PERIOD.

17. PERMITS: THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS, LICENSES, FEES, INSPECTIONS, ETC. AND PROVIDE E911 ADDRESS TO SPRINT WIRELESS.

18. RECORD DRAWINGS: MAINTAIN A RECORD OF ALL CHANGES, SUBSTITUTIONS, ETC., BETWEEN THE WORK AS SPECIFIED AND INSTALLED. RECORD CHANGES ON A CLEAN SET OF CONTRACT DRAWINGS WHICH SHALL BE TURNED OVER TO THE CONSTRUCTION MANAGER UPON COMPLETION OF THE PROJECT.

EXCAVATION AND GRADING NOTES:

I. ALL CUT AND FILL SLOPES SHALL BE 3:I MAXIMUM.

2. ALL EXCAVATIONS ON WHICH CONCRETE IS TO BE PLACED SHALL BE SUBSTANTIALLY HORIZONTAL ON UNDISTURBED AND UNFROZEN SOIL AND BE FREE FROM LOOSE MATERIAL AND EXCESS GROUND WATER. DEWATERING FOR EXCESS GROUND WATER SHALL BE PROVIDED IF REQUIRED.

3. CONCRETE FOUNDATIONS SHALL NOT BE PLACED ON ORGANIC MATERIAL IF SOUND SOIL IS NOT REACHED AT THE DESIGNATED EXCAVATION DEPTH. THE UNSATISFACTORY SOIL SHALL BE EXCAVATED TO ITS FULL DEPTH AND EITHER BE REPLACED WITH MECHANICALLY COMPACTED GRANULAR MATERIAL OR THE EXCAVATION SHALL BE FILLED WITH CONCRETE OF THE SAME QUALITY SPECIFIED FOR THE FOUNDATION.

4. ANY EXCAVATION OVER THE REQUIRED DEPTH SHALL BE FILLED WITH EITHER MECHANICALLY COMPACTED GRANULAR MATERIAL OR CONCRETE OF THE SAME QUALITY SPECIFIED FOR THE FOUNDATION. CRUSHED STONE MAY BE USED TO STABILIZE THE BOTTOM OF THE EXCAVATION. STONE, IF USED, SHALL NOT BE USED AS COMPILING CONCRETE THICKNESS.

5. AFTER COMPLETION OF THE FOUNDATION AND OTHER CONSTRUCTION BELOW GRADE AND BEFORE BACKFILLING, ALL EXCAVATIONS SHALL BE CLEAN OF UNSUITABLE MATERIAL SUCH AS VEGETATION, TRASH, DEBRIS AND SO FORTH.

6. ALL BACKFILLING SHALL (1) USE APPROVED MATERIALS CONSISTING OF EARTH, LOAM, SANDY CLAYS, SAND AND GRAVEL OR SOFT SHALE, (2) BE FREE FROM CLODS OR STONES OVER 2 1/2" MAXIMUM DIMENSIONS. MD (3) BE PLACED IN LAYERS AND COMPACTED.

7. SITE FILL MATERIAL AND FOUNDATION BACKFILL SHALL BE PLACED IN LAYERS MAXIMUM 6' DEEP BEFORE COMPACTION. EACH LAYER SHALL BE SPRINKLED IF REQUIRED AND COMPACTED BY HAND OR MACHINE TAMPERS TO 95% OF MAXIMUM DENSITY. AT THE OPTIMUM MOISTURE CONTENT OF ±2% AS DETERMINED BY ASTM DESIGNATION D-69B, UNLESS OTHERWISE APPROVED. SUCH BACKFILL SHALL NOT BE PLACED BEFORE 3 DAYS AFTER PLACEMENT OF CONCRETE.

8. THE FOUNDATION AREA SHALL BE GRADED TO PROVIDE WATER RUNOFF AND PREVENT WATER FROM STANDING. THE FINAL GRADE SHALL SLOPE AWAY IN ALL DIRECTIONS FROM THE FOUNDATION AREA (UP TO ONE FOOT OUTSIDE THE FENCE OR GROUND SYSTEM PERIMETER) AND SHALL BE COVERED WITH A GEOTEXTILE FABRIC MIRAFI 500X OR APPROVED EQUAL TO PREVENT REOCCURRENCE OF VEGETATIVE GROWTH, AN THEN SHALL BE COVERED WITH 4" DEEP COMPACTED STONE OR GRAVEL.

9. THE CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED BY LOCAL, CITY, COUNTY AND STATE CODES AND ORDINANCES TO PROTECT EMBANKMENT FROM SOIL LOSS AND TO PREVENT ACCUMULATION OF SOIL AND SILT IN STREAMS AND DRAINAGE PATHS FROM LEAVING THE CONSTRUCTION AREA. THIS MAY INCLUDE SUCH MEASURES AS SILT FENCES, STRAW BALE SEDIMENT BARRIERS AND CHECK DAMS.

10. FILL PREPARATION: REMOVE ALL VEGETATION, TOPSOIL DEBRIS, WET AND UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS AND DELETERIOUS MATERIAL FROM GROUND SURFACE PRIOR TO PLACING FILLS, PLOW STRIP OR BREAK UP SLOPED SURFACES STEEPER THAN 1 VERTICAL TO 4 HORIZONTAL SO FILL MATERIAL WILL BOND WITH EXISTING SURFACE WHEN SUBGRADE OR EXISTING GROUND SURFACE TO RECEIVE FILL HAS A DENSITY LESS THAN THAT REQUIRED FOR FILL, BREAK UP GROUND SURFACE TO REQUIRED DEPTH, PULVERIZE, MOISTURE CONDITION OR AERATE SOIL AND RECOMPACT TO REQUIRED DENSITY.

11. REPLACE EXISTING GRAVEL SURFACING ON AREAS FROM WHICH GRAVEL SURFACING IS REMOVED DURING CONSTRUCTION OPERATIONS. GRAVEL SURFACING SHALL BE REPLACED TO MATCH EXISTING ADJACENT GRAVEL SURFACING AND SHALL BE OF THE SAME THICKNESS. SURFACES AND GRAVEL SURFACING SHALL BE FREE FROM CORRUGATIONS AND WAVES. EXISTING GRAVEL SURFACING MAY BE EXCAVATED SEPARATELY AND REUSED IF INJURIOUS AMOUNTS OF EARTH, ORGANIC MATTER, OR OTHER DELETERIOUS MATERIALS ARE REMOVED PRIOR TO REUSE. FURNISH ALL ADDITIONAL GRAVEL RESURFACING MATERIAL AS REQUIRED. BEFORE GRAVEL SURFACING IS REPLACED, SUBGRADE SHALL BE GRADE TO CONFORM TO REQUIRED SUBGRADE ELEVATIONS, AND LOOSE OR DISTURBED MATERIALS SHALL BE THOROUGHLY COMPACTED. DEPRESSIONS IN THE SUBGRADE SHALL BE FILLED AND COMPACTED WITH APPROVED SELECTED MATERIAL. GRAVEL SURFACING MATERIAL SHALL NOT BE USED FOR FILLING DEPRESSIONS IN THE SUBGRADE.

12. PROTECT EXISTING GRAVEL SURFACING AND SUBGRADE IN AREAS WHERE EQUIPMENT LOADS WILL OPERATE, USE PLANKING OR OTHER SUITABLE MATERIALS DESIGNED TO SPREAD EQUIPMENT LOADS. REPAIR ANY DAMAGE TO EXISTING GRAVEL SURFACING OR SUBGRADE WHERE SUCH DAMAGE IS DUE TO THE CONTRACTOR'S OPERATIONS.

13. DAMAGE TO EXISTING STRUCTURES AND UTILITIES RESULTING FROM CONTRACTORS NEGLIGENCE SHALL BE REPAIRED/REPLACED TO OWNER'S SATISFACTION AT CONTRACTOR'S EXPENSE.

14. CONTRACTOR SHALL COORDINATE THE CONSTRUCTION SCHEDULE WITH THE PROPERTY OWNER SO AS TO AVOID INTERRUPTIONS TO PROPERTY OWNER'S OPERATIONS.

15. ENSURE POSITIVE DRAINAGE DURING AND AFTER COMPLETION OF CONSTRUCTION.

16. RIPRAP SHALL BE CLEAN, HARD, SOUND, DURABLE AND UNIFORM IN QUALITY AND FREE OF ANY DETRIMENTAL QUANTITY OF SOFT, FRIABLE, THIN, ELONGATED OR LAMINATED PIECES, DISINTEGRATED MATERIAL, ORGANIC MATTER, OIL, ALKALI OR OTHER DELETERIOUS SUBSTANCE.

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CITY MONOPOLE

SITE NO.

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SITE ADDRESS

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SHEET NAME

GENERAL NOTES

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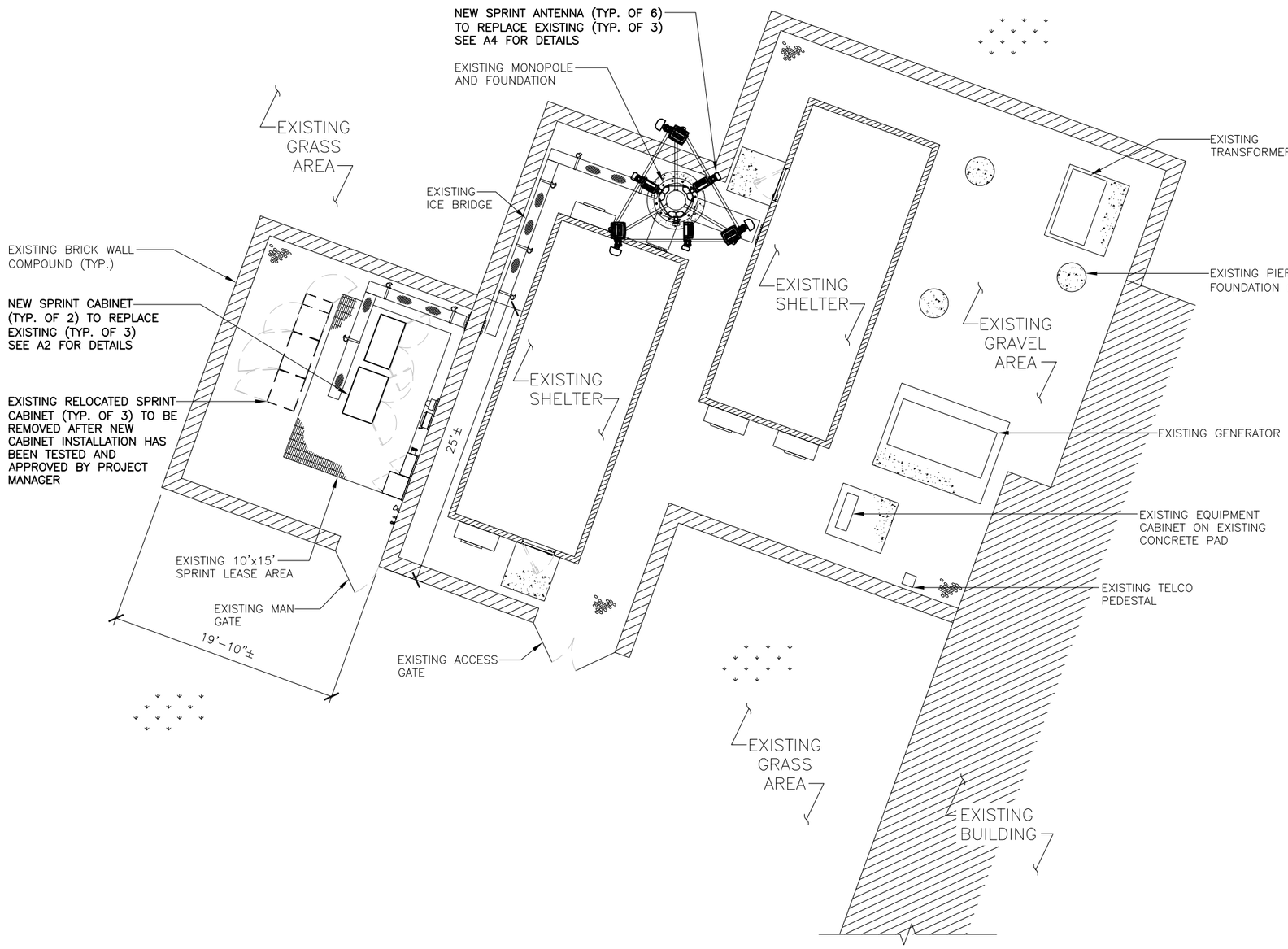
ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
RBS	RADIO BASED STATION
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S)	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER
#	POUND(S)

SYMBOLS

- REVISION
- WORK POINT
- UTILITY POLE
- BRICK
- COMPRESSED STONE
- CONCRETE
- EARTH
- GRAVEL
- MASONRY
- STEEL
- CENTERLINE
- PROPERTY LINE
- LEASE LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- WOOD FENCE
- UE — BELOW GRADE ELECTRIC
- UT — BELOW GRADE TELEPHONE
- OE/OT — OVERHEAD ELECTRIC/ TELEPHONE
- SECTION REFERENCE (A / S-1)



NORTH

1 SITE PLAN
SCALE: 3/32" = 1'-0"
0 2' 4' 8' 16'

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	90% REVIEW	TP	8/15/11
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ABRAHAM J. ROKACH
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21784
KANSAS
PROFESSIONAL ENGINEER

DATE SIGNED: 10/25/11

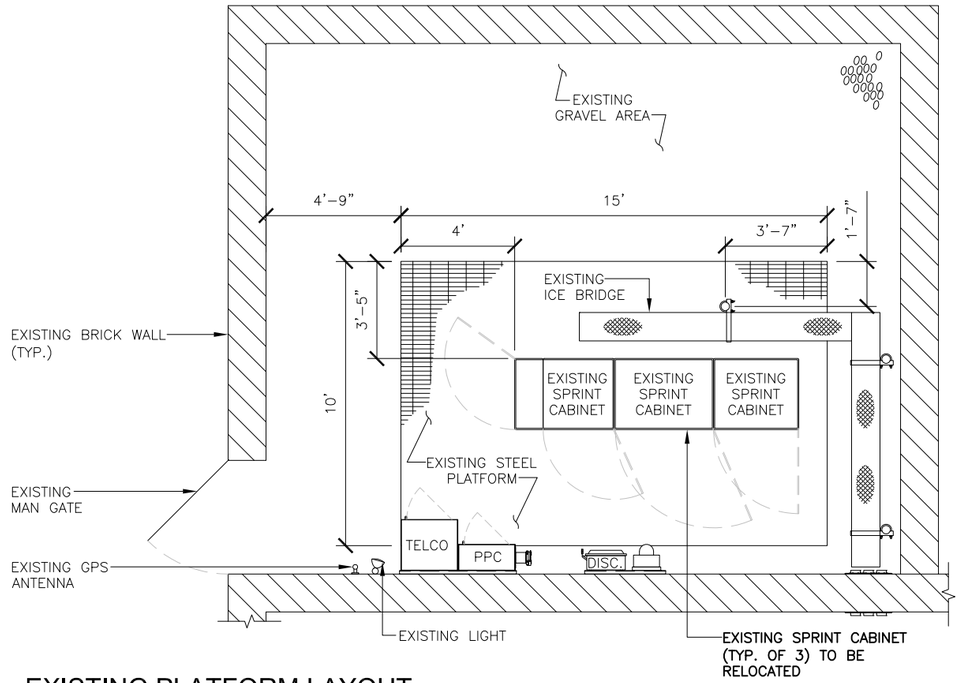
SITE NAME
PRAIRIE VILLAGE
CITY MONOPOLE

SITE NO.
KC60XC727

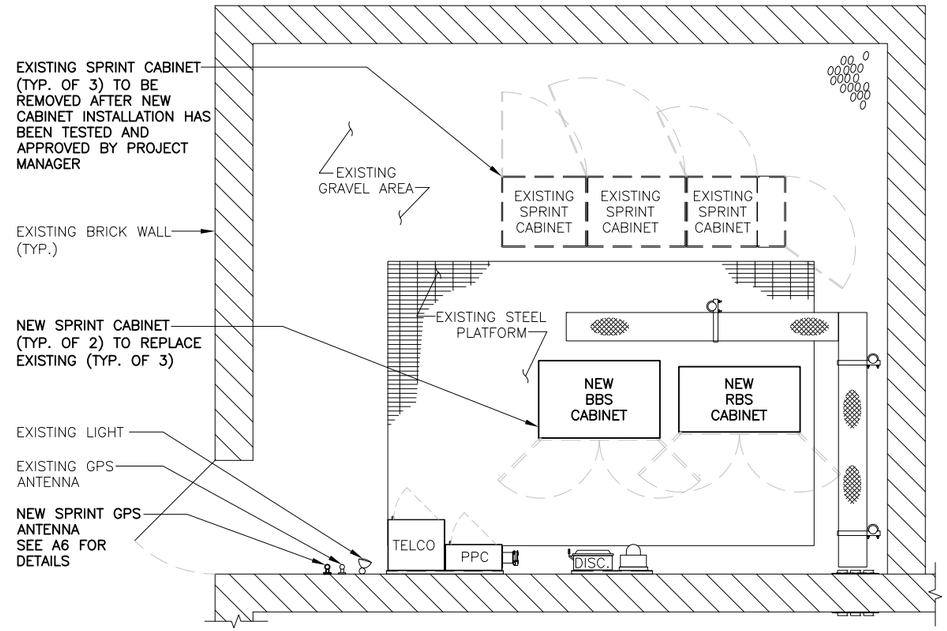
SITE ADDRESS
7700 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

SHEET NAME
SITE PLAN

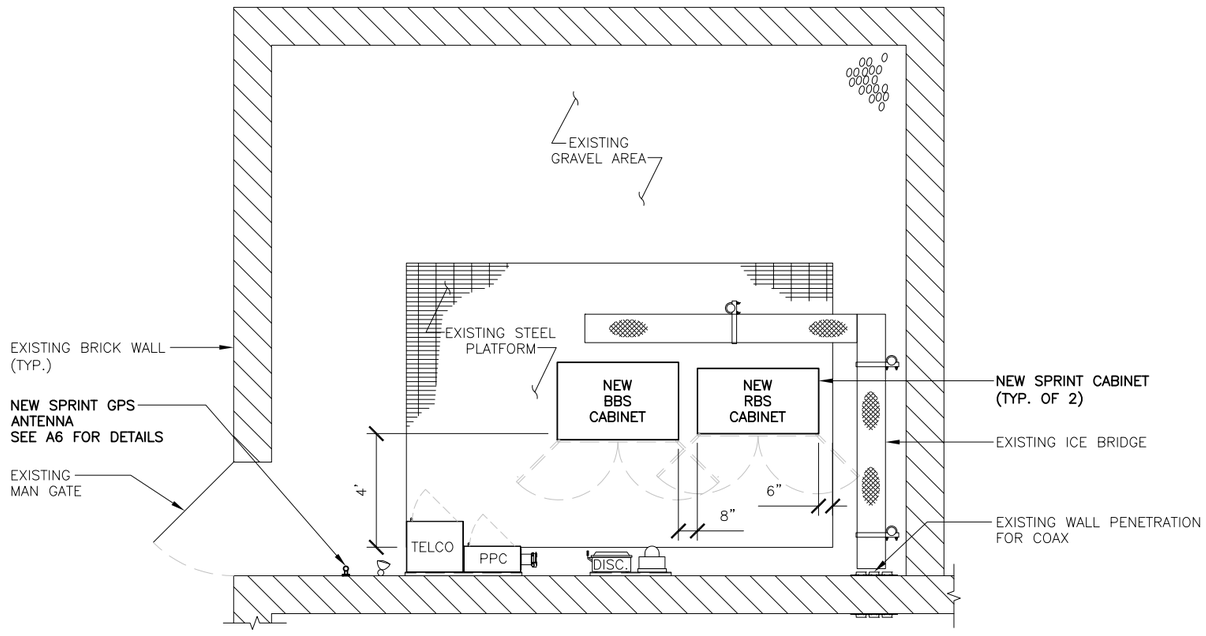
SHEET NUMBER
A1



1 EXISTING PLATFORM LAYOUT
SCALE: 3/16" = 1' - 0"
NORTH
0 1' 2' 4' 8'



2 TEMPORARY PLATFORM LAYOUT
SCALE: 3/16" = 1' - 0"
NORTH
0 1' 2' 4' 8'



3 FINAL PLATFORM LAYOUT
SCALE: 3/16" = 1' - 0"
NORTH
0 1' 2' 4' 8'

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SHEET NAME
PLATFORM LAYOUT

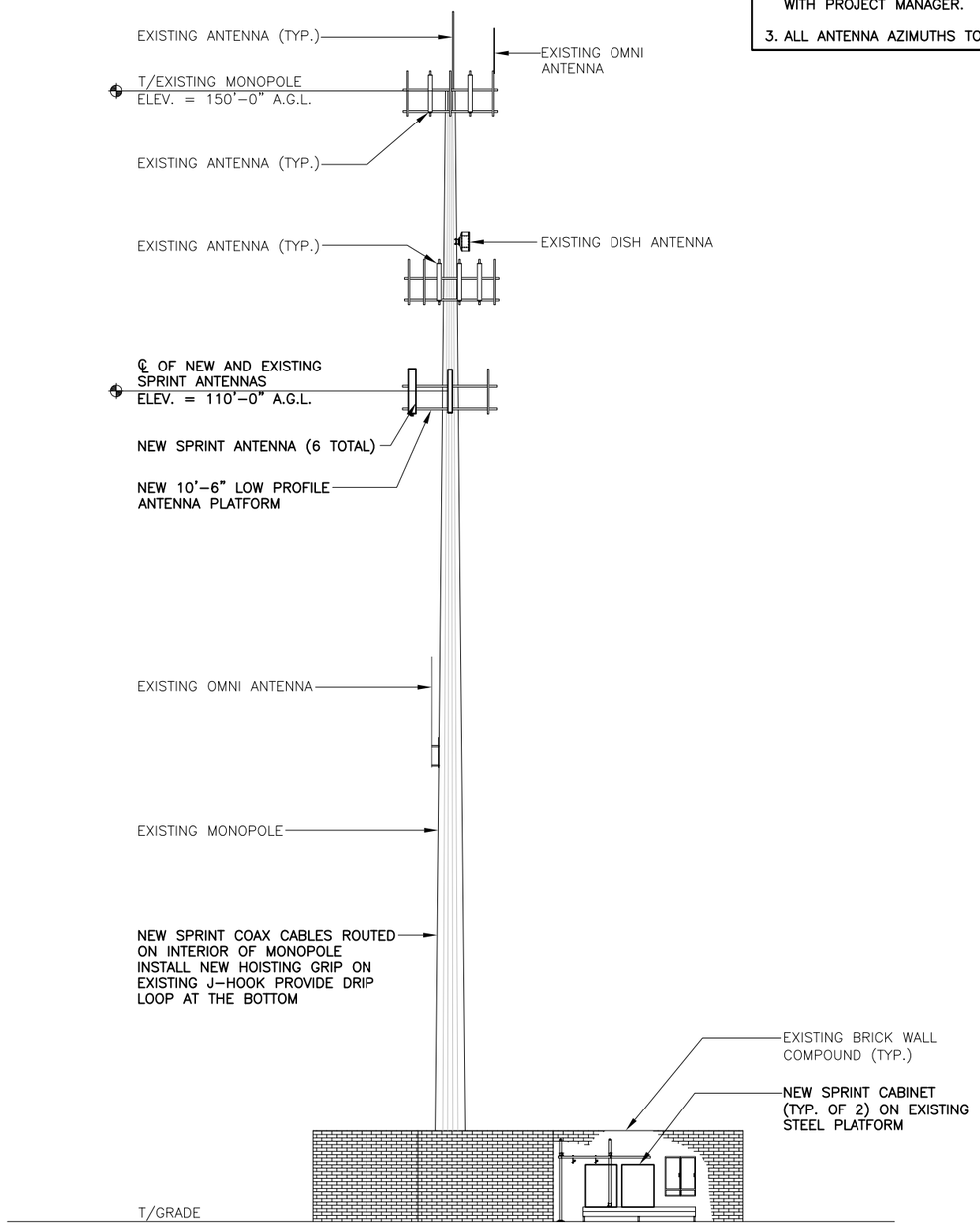
SHEET NUMBER
A2

ANTENNA NOTES:

1. THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNA SHALL BE ADJUSTED TO MEET SYSTEM REQUIREMENTS.
2. CONTRACTOR SHALL VERIFY HEIGHT OF ANTENNA WITH PROJECT MANAGER.
3. ALL ANTENNA AZIMUTHS TO BE FROM TRUE NORTH.

STRUCTURAL NOTES:

1. STRUCTURAL CALCULATION PREPARED BY FULLERTON ENGINEERING CONSULTANTS. CONTRACTOR TO COORDINATE WITH PROJECT MANAGER TO OBTAIN A COPY.
2. CONTRACTOR TO REFER TO STRUCTURAL CALCULATIONS FOR ADDITIONAL LOADS. NO ERECTION OR MODIFICATION OF THE STRUCTURE SHALL BE MADE WITHOUT APPROVAL OF STRUCTURAL ENGINEER.



1 ELEVATION
SCALE: 1" = 20'-0"
0 10 20 30

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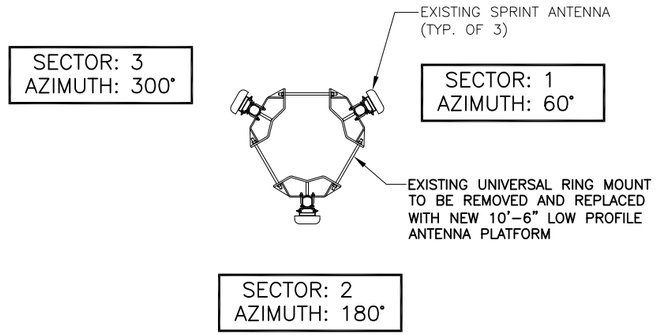
SHEET NAME
SITE ELEVATION

SHEET NUMBER
A3

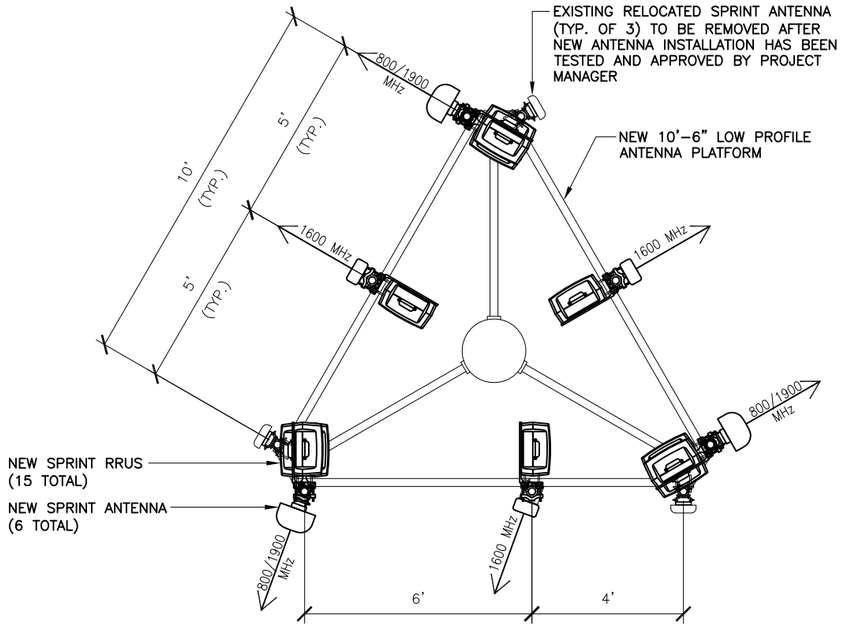


1 EXISTING ANTENNA LAYOUT

SCALE: 1/4" = 1'-0"

NORTH

0 1' 2' 4' 6'

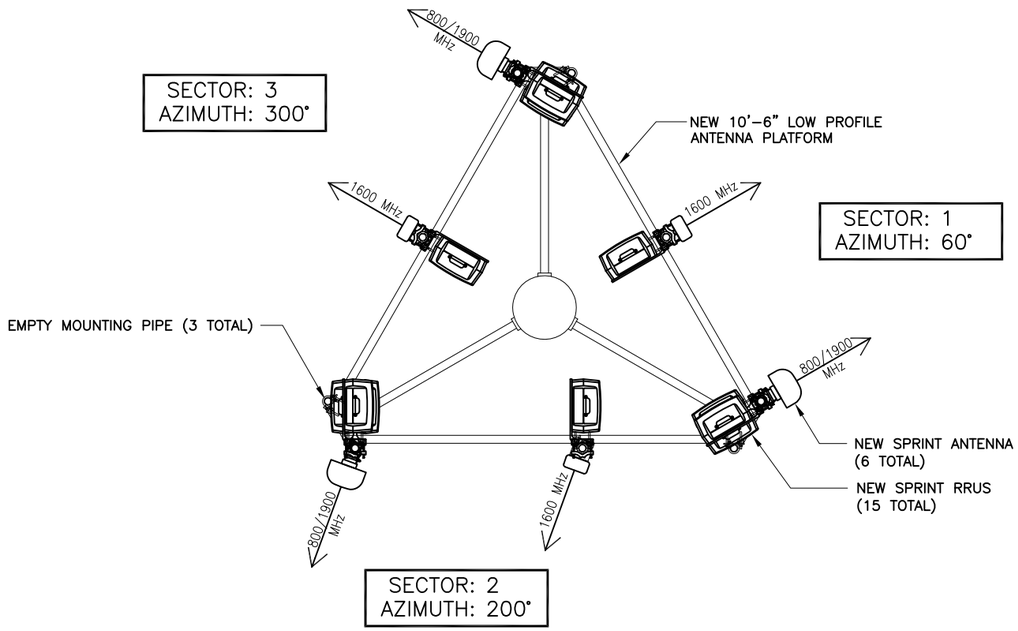


2 TEMPORARY ANTENNA LAYOUT

SCALE: 1/4" = 1'-0"

NORTH

0 1' 2' 4' 6'



3 FINAL ANTENNA LAYOUT

SCALE: 1/4" = 1'-0"

NORTH

0 1' 2' 4' 6'

ANTENNA LEGEND

EXISTING SPRINT ANTENNAS

NEW SPRINT ANTENNAS

RFS:	ARGUS:
APXVERR18-C	HPX311R

NOTES:

1. FINAL AZIMUTHS ARE SUBJECT TO REVISIONS AND ARE TO BE VERIFIED WITH LATEST RF DATA SHEET.
2. CONTRACTOR TO VERIFY EXISTING ANTENNA FRAMES ARE ADEQUATE TO MEET MINIMUM SEPARATION REQUIREMENTS. SEPARATION IS TYPICAL PER SECTOR UNLESS NOTED OTHERWISE. NOTIFY PROJECT MANAGER IF SEPARATION CAN NOT BE MET

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SITE NAME

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CITY MONOPOLE

SITE NO.

KC60XC727

SITE ADDRESS

7700 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

SHEET NAME

ANTENNA LAYOUT

SHEET NUMBER

A4

Revision:	v6
Date:	8/23/2011

Cascade	KC60XC727
Market	Kansas
MTX/BSC	KC-LENEXA-BSC_1.1
Lat	38.9894
Lon	-94.63140
Structure Type	MONOPOLE

	RBS1	RBS2
Existing BTS #		
New BTS #		
Existing Cell ID	727	
New Cell ID		

	Count	Model
RBS	1	6102
BBS	1	6102
MW 20p	0	6101
MW 20p BBS	0	6101

GPS INFO		
	GPS	Cable
Vendor	Ericsson	
Model	KRE 101 2082/1	
Type		
Diameter		

Number of Sectors:	3
Radio Location	TowerMountedRRU

ANTENNA #1 (800MHz & 1900 MHz Dual Band)

	Sector1	Sector2	Sector3	Sector4	Sector5	Sector6
Vendor	RFS	RFS	RFS	#N/A	#N/A	#N/A
Model	APXVERR18-C-4-1910I	APXVERR18-C-2-1910I	APXVERR18-C-0-1910I			
Antenna Band Type	Dual	Dual	Dual			
Antenna Count	1	1	1			
Gain (dBi)	17.8	17.8	17.8			
Beamwidth	69.4	69	68.9			
Azimuth	60	200	300			
Height (ft)	110	110	110			
Mech. Downtilt	0	0	0			
Elect. Downtilt 1900	4	2	1			
Elect. Downtilt 800	4	2	1			
EIRP (W)	250	250	250			
RET Count	3	3	3			
RET Manufacturer	RFS	RFS	RFS			
RET Model	ACU-A20-N	ACU-A20-N	ACU-A20-N			

ANTENNA #2 (1600 MHz)

	Sector1	Sector2	Sector3	Sector4	Sector5	Sector6
Vendor	Argus	Argus	Argus	#N/A	#N/A	#N/A
Model	HPX311R	HPX311R	HPX311R			
Antenna Band Type	Single	Single	Single			
Antenna Count	1	1	1			
Gain (dBi)	18.4	18.4	18.4			
Beamwidth	65	65	65			
Azimuth	60	200	300			
Height	110	110	110			
Mech. Downtilt	0	0	0			
Elect. Downtilt	0	0	0			
EIRP (W)						
RET Count	1	1	1			
RET Manufacturer	Argus	Argus	Argus			
RET Model	Argus-Internal	Argus-Internal	Argus-Internal			

ANTENNA #3 (800 MHz)

	Sector1	Sector2	Sector3	Sector4	Sector5	Sector6
Vendor				#N/A	#N/A	#N/A
Model						
Antenna Band Type						
Antenna Count						
Gain (dBi)						
Beamwidth						
Azimuth						
Height						
Mech. Downtilt						
Elect. Downtilt						
EIRP (W)						
RET Count						
RET Manufacturer						
RET Model						
Antenna Count Per Sector	**2**	**2**	**2**	**0**	**0**	**0**

Combiners

	Sector1	Sector2	Sector3	Sector4	Sector5	Sector6
Count	2	2	2			
Manufacturer	RFS	RFS	RFS			
Model	IBC1900HG-1	IBC1900HG-1	IBC1900HG-1			
Gain (dB)	3-9 dB	3-9 dB	3-9 dB			

Microwave Site Name	
Microwave Deployed	No

MICROWAVE DISH

Azimuth	Height	Antenna		Diameter (ft)	Comment	Total	Tx/Rx	EIRP (dBm)	GAIN (dBi)	Link Capacity	Link to Site:
					# Dish:	0					

MICROWAVE RADIO

Azimuth	Height	Radio		Comment	Total	Tower Mount?	Model	Cable Type	Freq (MHz)	Vendor			Cable Length
				# Radio:	0								

Carrier Information

	Carriers	Frequencies
1x ADV-800	1	
EVDO-800	0	
1x ADV-1900	2	50;75;
EVDO-1900	3	100;150;25;
LTE 1900	1	
LTE 1600	1	
Total 800	1	
Total 1900	5	

Start/Stop Freqs

Tx (MHz)	Rx (MHz)
862-869	817-824
1950-1965	1870-1885
1990-1995	1910-1915
1526-1536, 1545-1555	1627-1637, 1646-1656

Channel Element Counts

Total	32 Blocks	Per Carrier
128	4	128
0	0	0
320	10	160
320	10	107

T1 COUNTS

CDMA 800	1
CDMA 1900	3
EVDO 800	0
EVDO 1900	6
LTE	0

RBS Configuration

RBS Modules				RBS Cards		
Count:	RBS1	RBS2		Count:	RBS1	RBS2
DBU	3	0		XCEMA (1900)	1	0
DBA	0	0		DOMA (1900)	3	0
CEEM	1	0		XCEMA (800)	1	0
DUL	6	2		DOMA (800)	0	0
XMU	3	0				

RRU Count

	Sector1	Sector2	Sector3	Sector4	Sector5	Sector6
RRUS 11 Single	5	5	5			
RRUS 12 Single	0	0	0			
RRUS 12 Dual	0	0	0			
RRUS A2 Module	1	1	1			

RRU Count - Detailed Breakdown

RRUS 11	Sector1	Sector2	Sector3	Sector4	Sector5	Sector6
CDMA - 800	1	1	1			
CDMA - 1900	2	2	2			
LTE - 800	0	0	0			
LTE - 1600	1	1	1			
LTE - 1900	1	1	1			
LTE - 2500	0	0	0			
RRUS12	Sector1	Sector2	Sector3	Sector4	Sector5	Sector6
CDMA/LTE - 800	0	0	0			
CDMA/LTE - 190	0	0	0			
LTE - 1600	0	0	0			
LTE - 2500	0	0	0			
RRUS 11 Count	5	5	5	0	0	0
RRUS 12 Count	0	0	0	0	0	0

800 MHz FILTER

	Sector1	Sector2	Sector3	Sector4	Sector5	Sector6
Count	2	2	2			
Manufacturer	Ericsson	Ericsson	Ericsson			
Model	800 ESMR	800 ESMR	800 ESMR			

1600 MHz FILTER

	Sector1	Sector2	Sector3	Sector4	Sector5	Sector6
Count	2	2	2			
Manufacturer	Ericsson	Ericsson	Ericsson			
Model	SARSAT	SARSAT	SARSAT			
Count	2	2	2			
Manufacturer	Ericsson	Ericsson	Ericsson			
Model	MAT	MAT	MAT			

CABLING

	Sector1	Sector2	Sector3	Sector4	Sector5	Sector6
Est. Cable Length (feet)	125	125	125	#VALUE!	#VALUE!	#VALUE!
Number of Cables	1	1	1			
Cable1 Diameter	39 mm	39 mm	39 mm			
Cable1 Type	Hybrid Cable	Hybrid Cable	Hybrid Cable			
Cable1 Manufacturer	RFS	RFS	RFS			
Cable1 Model	HB114-1-08U5-S6J	HB114-1-08U5-S6J	HB114-1-08U5-S6J			
Number of Cables	0	0	0			
Cable2 Diameter	39 mm	39 mm	39 mm			
Cable2 Type	Hybrid Cable	Hybrid Cable	Hybrid Cable			
Cable2 Manufacturer	RFS	RFS	RFS			
Cable2 Model	HB114-1-08U3-S3J	HB114-1-08U3-S3J	HB114-1-08U3-S3J			
Top Jumper Length	3 m	3 m	3 m			
Top Jumper Type	TSR 951 70/3	TSR 951 70/3	TSR 951 70/3			
Cable Type	Power	Power	Power			
Cable Manufacturer	0	0	0			
Cable Model	0	0	0			
Total Power Cables	0	0	0			
Cable Type	Fiber OPTO	Fiber OPTO	Fiber OPTO			
Cable Manufacturer	0	0	0			
Cable Model	0	0	0			
Total Opto Cables	0	0	0			
Bottom Jumper Length	none	none	none			
Bottom Jumper Type	none	none	none			

1 RFDS SHEET
SCALE: N.T.S.

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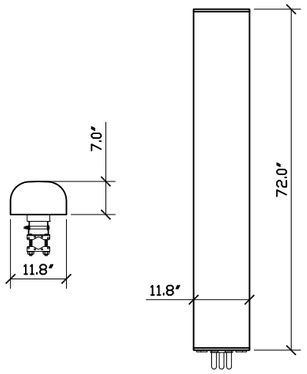
RFDS SHEET

SHEET NUMBER
A5



PLAN VIEW FRONT VIEW

RFS APXVERR18 ANTENNA

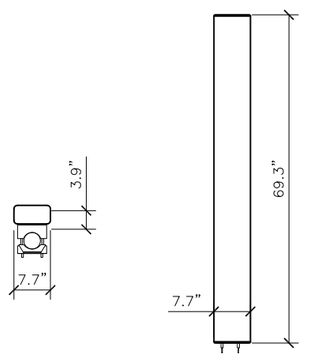
TRIPLE BAND DUAL POLARIZED

FREQUENCY RANGE	806–869 & 1850–1995 MHz
ANTENNA W/O MOUNTING HARDWARE	55 lb
MOUNTING HARDWARE	7.5 lb
TOTAL WEIGHT	62.5 lb

800/1900 ANTENNA SPEC.

1 ALL SECTORS

SCALE: N.T.S.



PLAN VIEW FRONT VIEW

ARGUS HPX311R ANTENNA

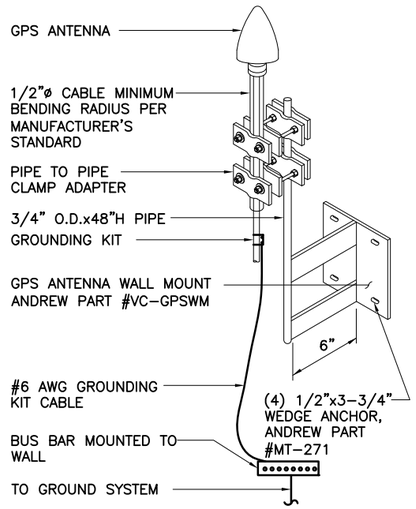
DUAL POLARIZED

FREQUENCY RANGE	1525–1720 MHz
ANTENNA W/O MOUNTING HARDWARE	29 lb
MOUNTING HARDWARE	7.5 lb
TOTAL WEIGHT	38.5 lb

1600 ANTENNA SPEC.

2 ALL SECTORS

SCALE: N.T.S.



3 GPS ANTENNA DETAIL

SCALE: N.T.S.

4 NOT USED

SCALE: N.T.S.

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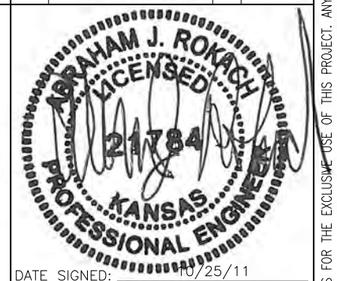

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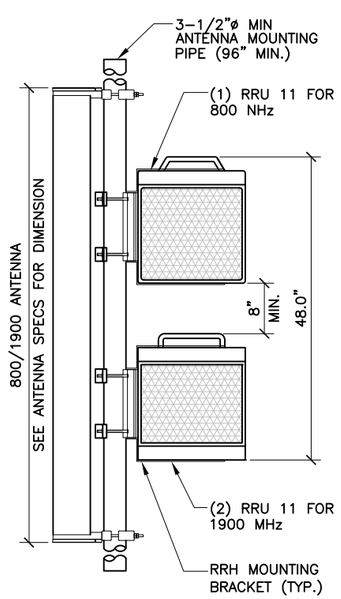
SHEET NAME

ANTENNA DETAILS

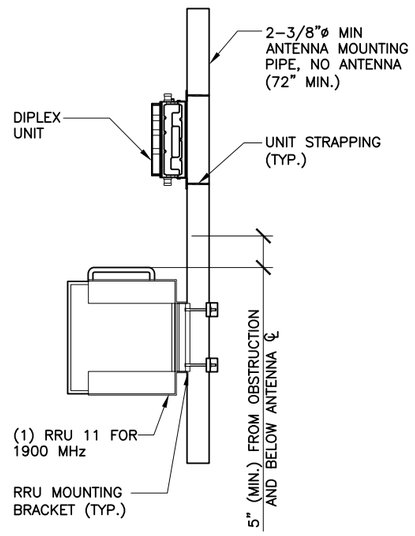
SHEET NUMBER

A6



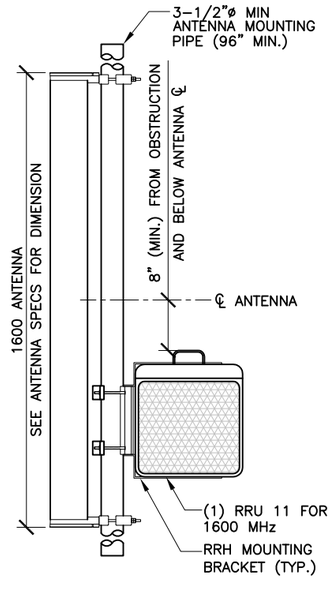
7 800/1900 MOUNTING SPEC.

SCALE: N.T.S.



6 1900/COMBINER MOUNTING SPEC

SCALE: N.T.S.



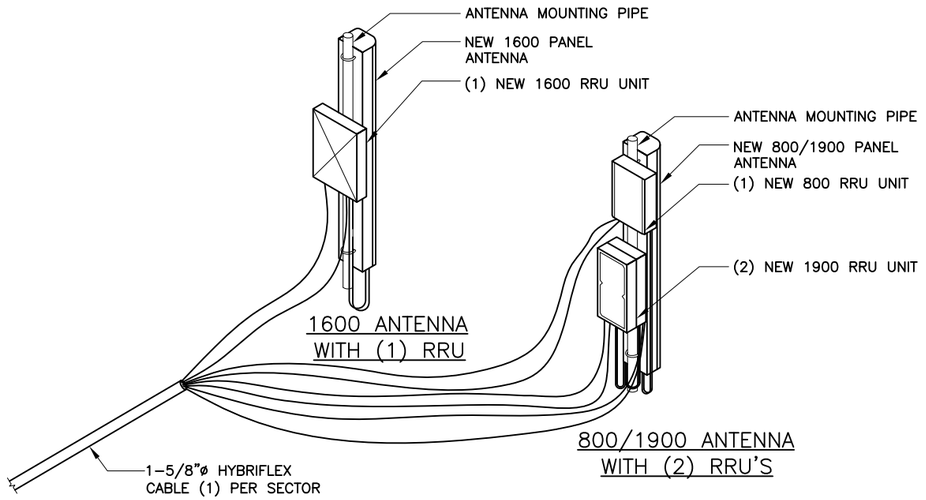
6 1600 MOUNTING SPEC.

SCALE: N.T.S.

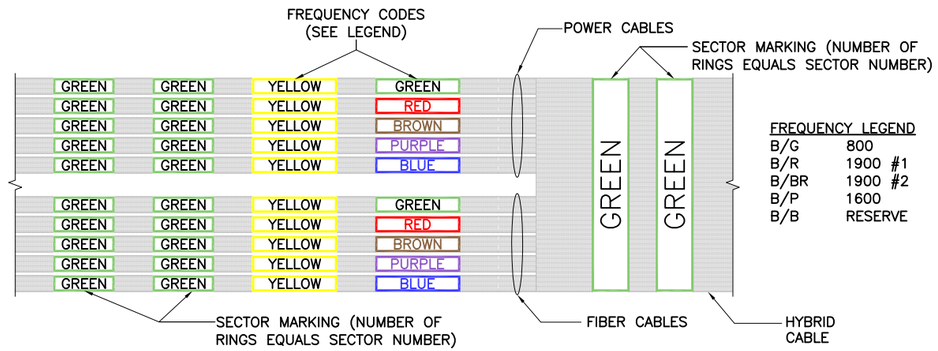
8 NOT USED

SCALE: N.T.S.

NOTE
MOUNTINGS ARE NOT SHOWN

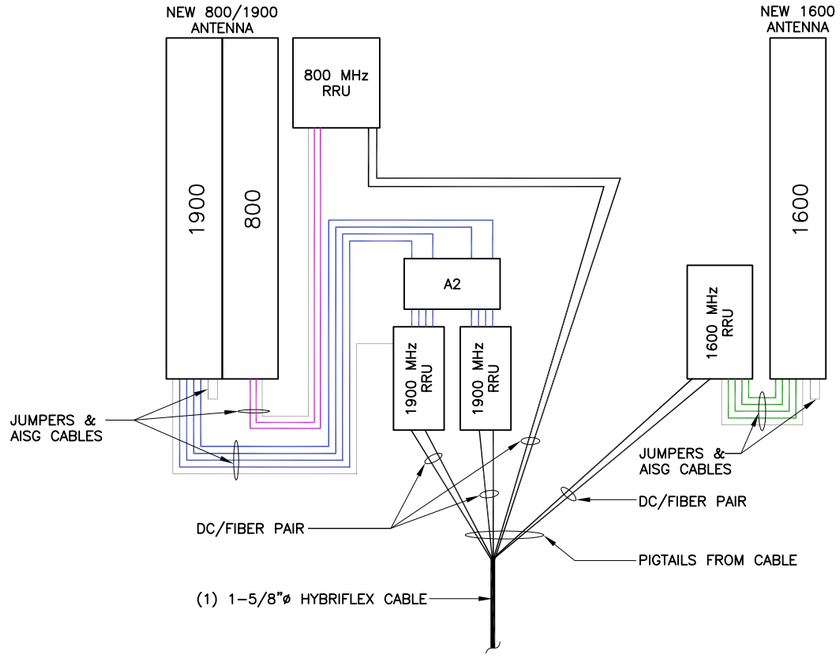


1 TYPICAL ISOMETRIC VIEW
SCALE: N.T.S.

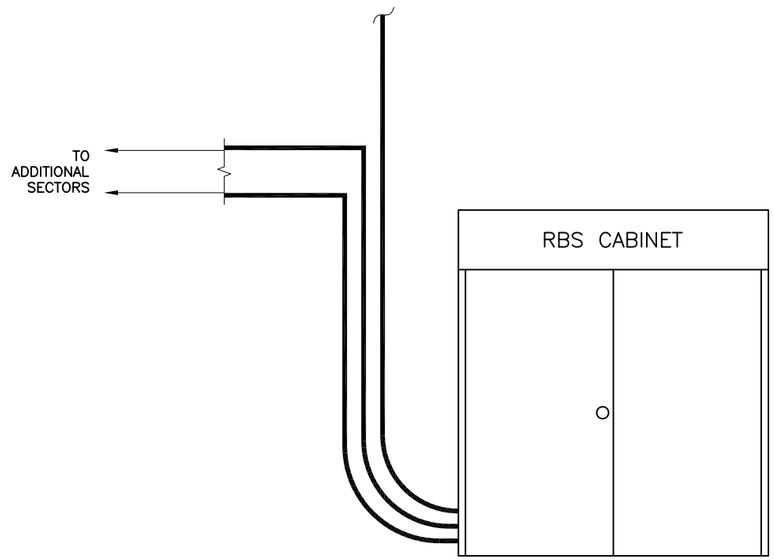


HYBRID CABLE WILL BE MARKED IN A SIMILAR MANNER AS COAX CABLES. THE MAIN "TRUNK" OF THE HYBRID CABLE IS TO BE MARKED WITH THE SECTOR MARKINGS ONLY. THE INDIVIDUAL POWER PAIRS AND FIBER CABLES WILL BE LABELED WITH BOTH THE SECTOR CABLE MARKINGS AND FREQUENCY (EXAMPLE ABOVE IS FOR SECTOR 2)

2 COLOR CODING
SCALE: N.T.S.



TYPICAL SECTOR CONFIGURATION



TYPICAL EQUIPMENT CONFIGURATION

3 SCHEMATIC DIAGRAM
SCALE: N.T.S.

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KANSAS
PROFESSIONAL ENGINEER

DATE SIGNED: 10/25/11

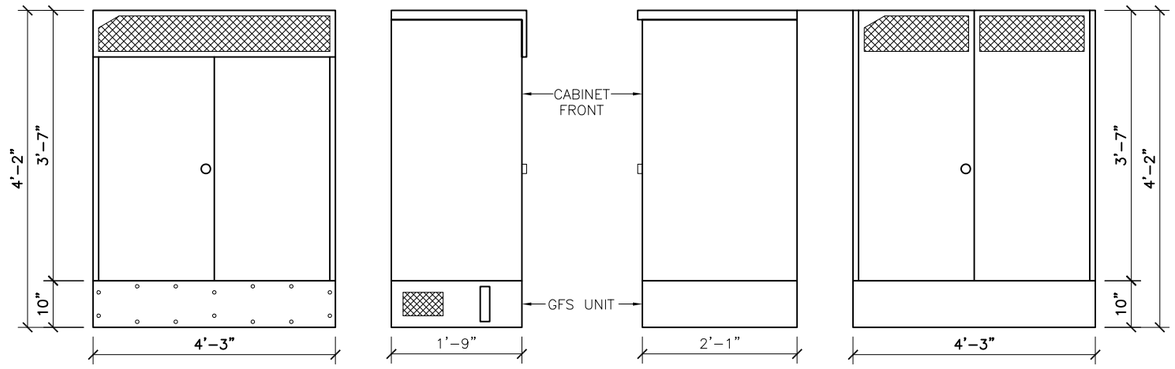
SITE NAME
PRAIRIE VILLAGE CITY MONOPOLE

SITE NO.
KC60XC727

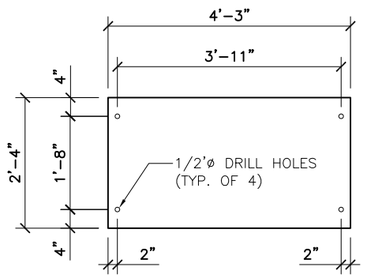
SITE ADDRESS
7700 MISSION ROAD
PRAIRIE VILLAGE, KS 66208

SHEET NAME
SITE DETAILS

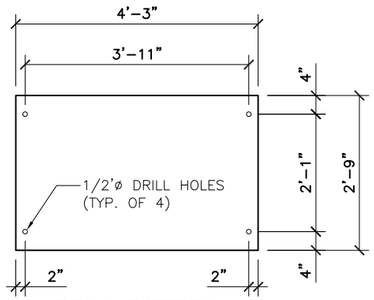
SHEET NUMBER
A7



FRONT OF CABINET | SIDE OF CABINET | SIDE OF CABINET | FRONT OF CABINET



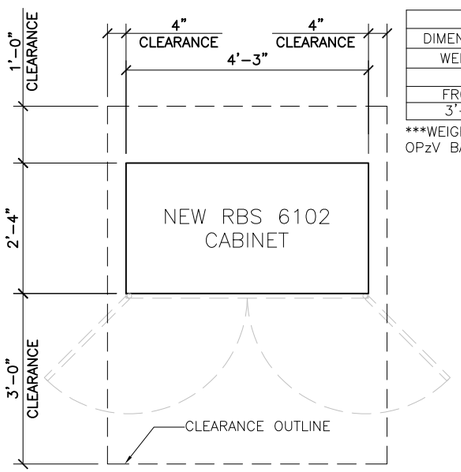
DRILL PATTERN



DRILL PATTERN

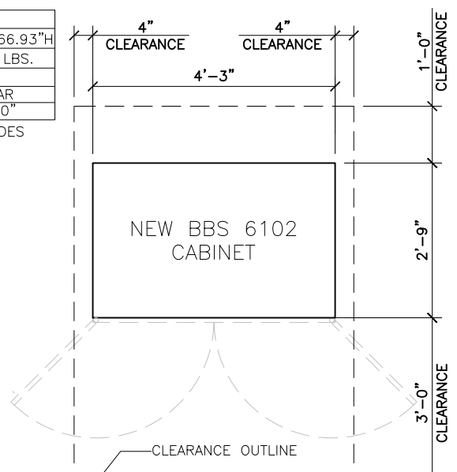
ERICSSON RBS 6102		
DIMENSIONS	51.18"W x 27.56"D x *66.93"H	
WEIGHT	**771.62 LBS.	
MINIMUM CLEARANCES		
FRONT	SIDES	REAR
3'-0"	4"	1'-0"

*HEIGHT SHOWN ON THE TABLE INCLUDES GLOBAL BASE UNIT PROVIDE BY ERICSSON.
**WEIGHT SHOWN ON THE TABLE INCLUDES GLOBAL BASE UNIT PROVIDE BY ERICSSON.



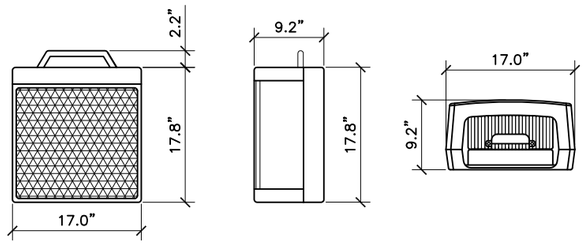
ERICSSON BBS 6102		
DIMENSIONS	51.18"W x 27.56"D x *66.93"H	
WEIGHT	***491.63 – 654.77 LBS.	
MINIMUM CLEARANCES		
FRONT	SIDES	REAR
3'-0"	4"	1'-0"

***WEIGHT SHOWN ON THE TABLE INCLUDES OPzV BATTERIES



1 ERICSSON 6102 CABINET DETAILS
SCALE: 3/8" = 1'-0"

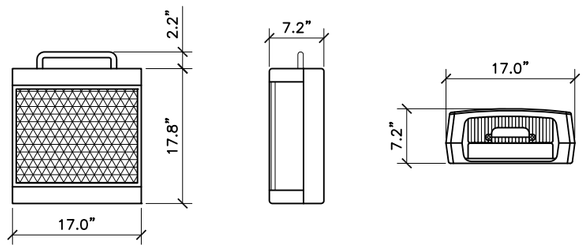
0 6" 1' 2' 4'



FRONT VIEW | SIDE VIEW | PLAN VIEW

800 MHz	DIMENSIONS (HxWxD)	17" x 17.8" x 9.2"
	WEIGHT	54 LBS

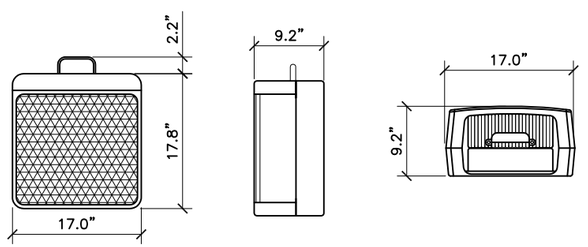
2 800 MHz RADIO
SCALE: N.T.S.



FRONT VIEW | SIDE VIEW | PLAN VIEW

1900 MHz	DIMENSIONS (HxWxD)	17" x 17.8" x 7.2"
	WEIGHT	44 LBS

3 1900 MHz RADIO
SCALE: N.T.S.



FRONT VIEW | SIDE VIEW | PLAN VIEW

1600 MHz	DIMENSIONS (HxWxD)	17" x 17.8" x 9.2"
	WEIGHT	54 LBS

4 1600 MHz RADIO
SCALE: N.T.S.

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TP	RI	MB

NO	DESCRIPTION	BY	DATE
	90% REVIEW	TP	8/15/11
	FINAL	LA	10/25/11

ABRAHAM J. ROKACH
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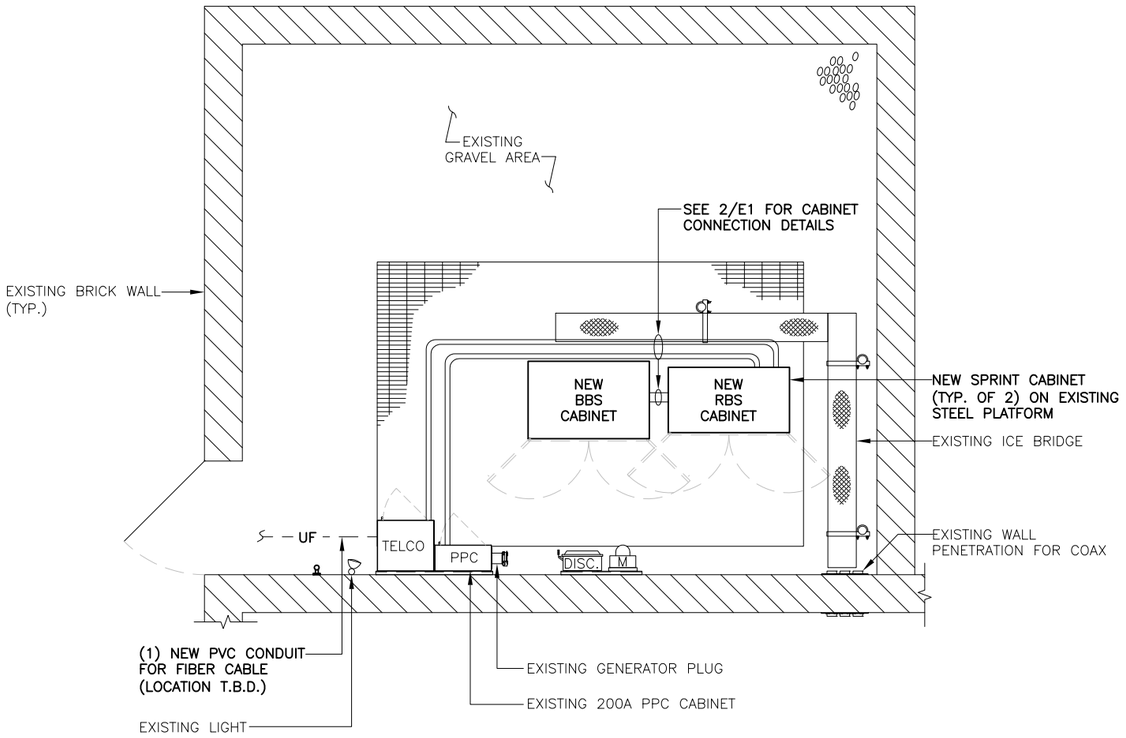
SHEET NAME
EQUIPMENT DETAILS

SHEET NUMBER
A8

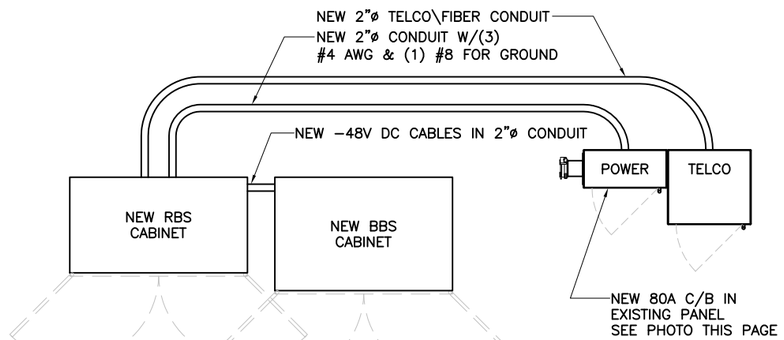
UTILITY COMPANIES
POWER COMPANY:
KCPL
TELCO COMPANY:
AT&T



NORTH

1 UTILITY PLAN
SCALE: 3/16" = 1'-0"

0 1' 2' 4' 8'



2 ONE LINE RISER DIAGRAM
SCALE: N.T.S.

3 PPC CABINET
SCALE: N.T.S.

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE (N.E.C.), AND APPLICABLE LOCAL CODES
2. GROUNDING SHALL COMPLY WITH ARTICLE 250 OF NATIONAL ELECTRICAL CODE.
3. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED.
4. ALL WIRES SHALL BE AWG MIN #12 THHN COPPER UNLESS NOTED.
5. CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT UNLESS NOTED OTHERWISE.
6. LABEL SPRINT SERVICE DISCONNECT SWITCH AND PPC CABINET WITH ENGRAVED LAMACOID LABELS, LETTERS 1" IN HEIGHT.
7. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8" RADIUS.
8. ENGAGE AN INDEPENDENT TESTING FIRM TO TEST AND VERIFY THAT RESISTANCE DOES NOT EXCEED 5 OHMS TO GROUND. TEST GROUND RING RESISTANCE PRIOR TO MAKING FINAL GROUND CONNECTIONS TO INFRASTRUCTURE AND EQUIPMENT. GROUNDING AND OTHER OPERATIONAL TESTING SHALL BE WITNESSED BY SPRINTS REPRESENTATIVE.
9. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE REQUIRED SO THAT CONDUIT BENDS DO NOT EXCEED 360°.
10. OBTAIN PERMITS AND PAY FEES RELATED TO ELECTRICAL WORK PERFORMED ON THIS PROJECT. DELIVER COPIES OF ALL PERMITS TO SPRINT REPRESENTATIVE.
11. SCHEDULE AND ATTEND INSPECTIONS RELATED TO ELECTRICAL WORK REQUIRED BY JURISDICTION HAVING AUTHORITY. CORRECT AND PAY FOR ANY WORK REQUIRED TO PASS ANY FAILED INSPECTION.
12. REDLINED AS-BUILTS ARE TO BE DELIVERED TO SPRINT REPRESENTATIVE.
13. PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS IN THREE-RING BINDER.
14. FURNISH AND INSTALL THE COMPLETE ELECTRICAL SERVICE, TELCO CONDUIT, AND THE COMPLETE GROUNDING SYSTEM.
15. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE BUILDING CODES AND LOCAL ORDINANCES, INSTALLED IN A NEAT MANNER, AND SHALL BE SUBJECT TO APPROVAL BY SPRINT REPRESENTATIVE.
16. CONDUCT A PRE-CONSTRUCTION SITE VISIT AND VERIFY EXISTING SITE CONDITIONS AFFECTING THIS WORK. REPORT ANY OMISSIONS OR DISCREPANCIES FOR CLARIFICATION PRIOR TO THE START OF CONSTRUCTION.
17. PROJECT ADJACENT STRUCTURES AND FINISHES FROM DAMAGE. REPAIR TO ORIGINAL CONDITION ANY DAMAGED AREA.
18. REMOVE DEBRIS ON A DAILY BASIS. DEBRIS NOT REMOVED IN A TIMELY FASHION WILL BE REMOVED BY OTHERS AND THE RESPONSIBLE SUBCONTRACTOR SHALL BE CHARGED ACCORDINGLY. REMOVAL OF DEBRIS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. DEBRIS SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF LEGALLY.
19. UPON COMPLETION OF WORK, THE SITE SHALL BE CLEAN AND FREE OF DUST AND FINGERPRINTS.
20. PRIOR TO ANY TRENCHING, CONTACT LOCAL UTILITY TO VERIFY LOCATION OF ANY EXISTING BURIED SERVICE CONDUITS.
21. DOCUMENT GROUND RING INSTALLATION AND CONNECTIONS TO IT WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PRESENT PHOTO ARCHIVE AT SITE "PUNCH LIST" WALK TO SPRINT'S REPRESENTATIVE.

4 ELECTRIC NOTES
SCALE: N.T.S.

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SHEET NAME
UTILITY PLAN AND ONE LINE DIAGRAM

SHEET NUMBER
E1

SERVICE EQUIPMENT NOTES:

1. SERVICE EQUIPMENT SHALL HAVE A SHORT CIRCUIT WITHSTAND RATING EQUAL TO OR EXCEEDING THE MAXIMUM AVAILABLE FAULT CURRENT AT THE SUPPLY TERMINAL. THE INSTALLATION SHALL BE FREE FROM ANY SHORT CIRCUITS AND GROUNDS.
2. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
3. PATCH, REPAIR AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.

CONDUCTOR NOTES:

1. ALL CONDUCTORS SHALL BE COPPER
2. ALL WIRING SHALL BE COPPER WITH THHN/THWN DUAL RATED 600 VOLTS INSULATION
3. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER UNLESS OTHERWISE NOTED.

CONDUIT NOTES:

1. RIGID GALVANIZED STEEL (RGS) SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH EARTH, OR EXPOSED ABOVE GRADE
2. EMT SHALL BE USED ONLY FOR INTERIOR RUNS AND SHALL HAVE COMPRESSION TYPE FITTINGS
3. SEAL TIGHT, FLEXIBLE CONDUIT MAY BE USED WHERE CODE PERMITS. ALL CONDUIT SHALL HAVE FULL SIZE EQUIPMENT GROUND WIRE
4. SERVICE CONDUITS SHALL HAVE NO MORE THAN (3) – 90° BENDS IN ANY SINGLE RUN. THE CONTRACTOR SHALL PROVIDE PULL BOXES AS NEEDED WHERE CONDUIT REQUIREMENTS EXCEED THESE CONDITIONS
5. ALL COAX, POWER AND TELEPHONE SYSTEM CONDUITS SHALL HAVE A MINIMUM 24" RADIUS SWEEPS TO EQUIPMENT, PULL BOXES, ETC., UNLESS OTHERWISE NOTED, OR AS REQUIRED BY UTILITY COMPANIES

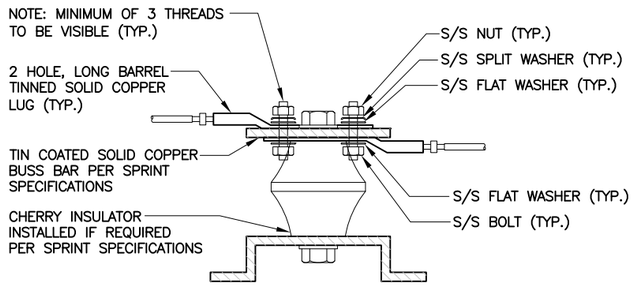
NEW COAX CABLE GROUNDING NOTES:

1. CONTRACTOR SHALL CONNECT GROUND KITS TO THE EXISTING GROUND BARS AT THE TOP AND BASE OF TOWER
2. CONTRACTOR SHALL CONNECT GROUND KITS TO THE NEW GROUND BAR BEFORE ENTRY TO CABINET
3. NO BACK TO BACK LUGGING OF SPRINT GROUNDS

GENERAL GROUNDING NOTES:

1. VERTICAL DROPS SHALL BE 20'–0" OF #2 AWG SOLID TINNED COPPER WIRE. CADWELD TO GROUND BAR.
2. ALL BENDS MINIMUM 8" RADIUS.
3. APPLY ANTI–OXIDATION COMPOUND TO ALL CONNECTIONS.
4. BARE COPPER CONDUCTORS SHALL NOT BE IN CONTACT WITH ANY DISSIMILIAR MATERIAL. PLACE ON STANDOFFS, IF NECESSARY TO ALLOW FOR PROPER INSTALLATION.
5. SHARP BENDS IN GROUNDING CONDUCTORS SHALL BE AVOIDED. 90° BENDS SHALL NOT BE USED.
6. ALL GROUNDING CONDUCTORS SHALL BE KEPT AS SHORT AS POSSIBLE. THE SHORTEST PRACTICAL ROUTE SHALL BE CHOSEN WITH THE LEAST AMOUNT OF BENDS AND SPLICES. USE THIS RULE AT ALL TIMES.
7. ALL CONNECTIONS TO GROUND BARS SHALL BE WITH A 2–HOLE LUG UNLESS OTHERWISE SPECIFIED.
8. ALL SOLID WIRE SHALL USE A 2–HOLE LONG BARREL LUG.
9. WHEN GROUNDING MORE THAN ONE PIECE OF EQUIPMENT, DO NOT USE THE EQUIPMENT AS A GROUNDING CONDUCTOR. DOUBLE–STACKING OF LUGS SHALL BE USED TO GET FROM EQUIPMENT TO EQUIPMENT.
10. REMOVE ALL PAINT BENEATH THE SURFACE OF GROUND LUGS.

1 NOTES
SCALE: N.T.S.

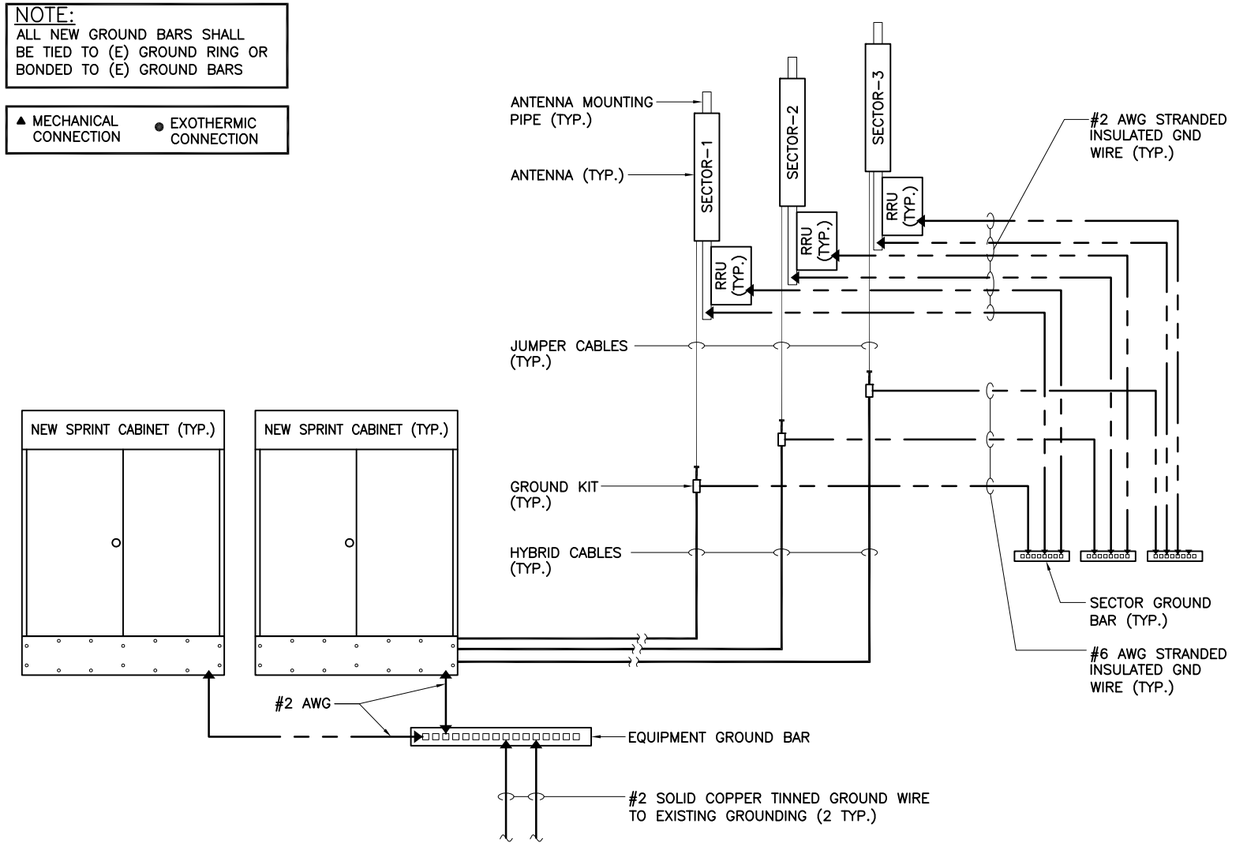


NOTES:
1. ALL HARDWARE 18–8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2. COAT WIRE END WITH ANTI–OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3. APPLY ANTI–OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

2 GROUND LUG DETAIL
SCALE: N.T.S.

NOTE:
ALL NEW GROUND BARS SHALL BE TIED TO (E) GROUND RING OR BONDED TO (E) GROUND BARS

▲ MECHANICAL CONNECTION ● EXOTHERMIC CONNECTION



3 TYPICAL GROUNDING RISER DIAGRAM
SCALE: N.T.S.

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SHEET NAME
GROUNDING DIAGRAM AND NOTES

SHEET NUMBER
E2

LOCHNER

MEMORANDUM

TO:	Prairie Village Planning Commission
FROM:	Ron Williamson, Lochner, Planning Consultant
SUBJECT:	Alternative Energy Ordinance
DATE:	December 6, 2011 Project # 011002401

COMMENTS:

At its regular meeting on November 1, 2011, the Planning Commission discussed solar, wind and geothermal energy in detail and requested Staff to prepare proposed amendments for further discussion at the December meeting addressing the following:

1. Change the "Solar Energy Stems" Chapter to "Alternative Energy Systems" and include solar, wind and geothermal in one Chapter.

2 Amend the Solar Energy Chapter as recommended by the Planning Commission.

3. Create a separate listing for Wind Turbines as either a Conditional Use Permit or Special Use Permit and include standards.

4. Clarify geothermal as Staff approval.

Text that is to be deleted is lined out and new text is shown in italics.

CHAPTER 19.50 - ~~SOLAR~~ *ALTERNATIVE* ENERGY SYSTEMS

Sections:

19.50.005 Purpose.
19.50.010 ~~Application~~. *Solar Energy*
19.50.015 ~~Related Ordinances~~. *Wind Energy*
19.50.020 ~~Definitions~~. *Geothermal Energy*
19.50.025 ~~Solar Easements~~. *Hybrid Energy*
~~19.50.030 Compatibility.~~
~~19.50.035 Appeals.~~
~~19.50.040 Permits.~~

19.50.005 Purpose.
The purpose of this chapter is to establish for the residents of the City of Prairie Village a provision for using an alternate source*s* of energy apart from the prevailing energy sources of natural gas and electricity–in this case, solar*, wind and geothermal* energy. The city, by this chapter, establishes that the use of *alternative* ~~solar~~ energy *systems* is

in the general welfare of its residents in that its use will help alleviate the use of depreciating energy resources and thereby will lessen the city's reliance on increasingly uncertain power resources. The use of ***alternative*** ~~solar~~ energy ***systems*** is, therefore, valid public purpose. ~~and any violation of the chapter shall be considered a public nuisance.~~

19.50.010 Solar Energy - The following regulations shall apply to solar energy installations:

~~19.50.010 Application.~~
~~The requirements established by this chapter shall not be retroactive except by agreement of the property owners under a solar easement agreement. In such case, a property owner who wishes to construct a solar energy system may enter into a solar easement agreement with another property owner whose property contains an obstruction to solar access. Under this agreement the latter property owner may agree to remove existing vegetation or structures which block solar access to the solar energy system.~~

19.50.015 Related Ordinances
~~19.50.015~~ ***A.*** Related Ordinances.
All other ordinances of the municipal code are applicable to this section, including, but not limited to building setbacks, yard requirements, and height restrictions.

~~19.50.020~~ ***B.*** Definitions.
~~A.~~ *1.* "Solar access" means access to the envelope of air space exposed to the face of any solar energy system through which the sun passes and which allows the solar energy system to function. Such access is necessary to any solar energy system.
~~B.~~ 2. "Solar air space envelope" means that volume of air space whose lower limits are defined by a plane sloping upward to the south at an angle of twenty-two (22) degrees from the horizontal plane, measured form the bottom of the solar collector system and whose lateral limits are defined by planes which correspond to the direct rays of the sun on each end (east and west) of the solar collector system at 0900 and 1600 solar time from September 21 through April 21.
~~C.~~ 3. "Solar collector" means both passive and active systems. An active collector shall include panels designed to collect and transfer solar energy into heated water, air or electricity. Passive collectors shall include windows and window walls, which admit solar rays to obtain direct heat or to obtain heat for storage. Such windows and window walls of passive systems may extend to ground level. Greenhouses, atriums, and solariums are included in this definition.
~~D.~~ 4. "Solar easement" means an easement arising by agreement between property owners and establishing the solar air space envelope within which building and vegetation obstructions are prohibited.

~~19.50.025~~ ***C.*** Solar Easements.

In order to preserve and protect the solar access across contiguous or nearby property, "solar annotated easements" may be formulated. Such easements shall establish the solar air space envelope within which building and vegetation obstructions are prohibited. Solar easements are allowed by Kansas Statutes Annotated 58-3801 - "Creation of Solar Easements; Recordation" and 58-3802 - "Same; Content." ~~Such an easement shall be an agreement between property owners and probably, although not necessarily, will be initiated by the owner of a proposed solar energy system.~~ ***A property owner who wishes to construct a solar energy system may enter into a solar easement agreement with another property owner whose property contains an obstruction to solar access. Under this agreement the latter property owner may agree to remove existing vegetation or structures which block solar access to the solar energy system.*** The City of Prairie Village shall also be included as a property owner wherein property owned by the City may be located in a solar air space envelope and the city, therefore, may be a party to such an easement. All easements shall be recorded by the Johnson County Register of Deeds and shall transfer from one owner to another if the property is sold. All such easements shall also be filed with the Building Official for coordinating issuance of future building permits, which might be affected by the easement.

~~19.50.030~~ ***D.*** Compatibility.

The design of any solar system, active or passive, shall generally be compatible with the architectural design of the surrounding neighborhood as follows, whether or not the solar energy system is the subject of a solar easement.

~~A.~~ ***1.*** Any solar energy system incorporated into residential facility shall be integrated into the basic form and main structure of the residence. All active systems shall be roof mounted with the collector panels integrated into the roof either directly mounted against the roof or integrated into the roof so that they form a part of the roof itself. Mounting arrangements, which allow the collectors to project above the roof line, such as "standoff" or "rack" mounting arrangements are not allowed.

~~B.~~ ***2.*** Any system incorporated into a commercial building ***or a nonresidential building in a residentially zoned district*** shall be integrated into the basic form and main body of the building. If roof mounted, all collector panels shall fit into the form of the roof; if the building's roof is sloped or if "rack" mounting is used on a flat roof, the mounting must be concealed from view at street level. Exposed rack supports and freestanding collectors apart from the main building are not permitted.

~~C.~~***3.***Roof mounted solar energy systems mounted on "accessory or detached buildings" are allowed on detached garages or swimming pool equipment buildings. Detached "greenhouses" are also acceptable. All such energy systems mounted on accessory or detached buildings shall conform to the requirements outlined in Paragraphs A and B above. No freestanding panels or panel racks shall be allowed ***except as setout in Section 19.50.030.E.***

~~D.~~ ***4.*** In an active or photovoltaic system, all components servicing the collector panels shall be concealed including mechanical piping, electrical conduits, etc.

~~E.~~ *5.* All exposed metal, including the frame work of active collector panels or exposed mullions and framework of passive systems shall be of finished warm earth tones, or black, in color. Clear unpainted aluminum shall not be allowed.

E. Ground-mounted installation:

1. Ground-mounted solar collectors for utilities and public entities shall not exceed eight (8) feet in total height and shall be located within an easement or public right-of-way.

2. All lines serving a ground-mounted solar collector shall be located underground.

3. Parking lot light pole installation: The mounting height for parking lot light fixtures shall not exceed 25 feet as measured from the bottom of the fixture to grade. Twenty (20) percent of the height of the light pole may be added above the light fixture for the purpose of installing a solar collector panel. The overall height of the parking lot light pole and solar collector shall not exceed 30 feet. Any necessary solar collector appurtenances shall be painted to match the light pole and fixture.

4. Utility Pole Installation: Solar collector panels may be mounted on utility poles by utilities and public agencies.

5. Solar panels shall not exceed two square feet in area.

6. Staff shall review and approve the size, design and location of all ground-mounted installations prior to their installation.

~~19.50.035 Appeals.~~

~~All appeals involving solar easements or any appeal to the rules and regulations of this chapter shall be filed with the Board of Zoning Appeals. Both parties affected by a proposed solar energy system, the owner of the solar energy system and the owner of the property on which the burden of the easement falls, shall have the right to appeal. All appeals shall include engineering drawings and schedule showing the solar energy system and the solar air space envelope, and such appeals must demonstrate that the layout of the solar energy system on the site has been maximized.~~

F. Site Plan Approval.

1. As a part of the site plan approval process as set out in Chapter 19.32 Site Plan Approval, the Planning Commission may make adjustments to the height and location of solar panels provided that it results in a project that will not be detrimental to the public welfare or be injurious to or will substantially adversely affect adjacent property or other property in the vicinity.

2. An application may be made to the Planning Commission for site plan approval of a solar panel installation that is unique and does not have the locational or design characteristics set out in these regulations.

~~19.50.040~~ *G.* Permits.
A building permit is required for the construction and/or installation of any solar system. If the solar system construction is a part of other construction, it may be incorporated with that permit.

19.50.015 - WIND ENERGY - The following regulations shall apply to wind energy installations:

A. Definitions.
1. *"Wind Turbine" means any machine designed for the purpose of converting wind energy into electrical energy. Wind turbine shall include all parts of the system, including the tower and turbine composed of the blades and rotor.*
2. *"Horizontal-axis wind turbine" means the main rotor shaft of the turbine is oriented horizontally. This type of turbine must be pointed into the wind.*
3. *"Meteorological tower" means a tower separate from a wind turbine designed to support the gathering of wind energy resource data. A meteorological tower shall include the tower, anemometers, wind direction vanes, and any telemetry devices that are used to monitor or transmit wind speed and wind flow characteristics at a given location.*
4. *"Roof-mounted wind turbine" means a turbine system mounted to the roof of a building.*
5. *"Vertical-axis wind turbine" means the main rotor shaft of the turbine is arranged vertically and does not have to be pointed into the wind.*

B. Site Plan Approval - The following wind energy installations shall be subject to site plan approval as setout in Chapter 19.32:
1. *Wind turbines may be installed on any non-single-family structure (such as a building, water tower, etc.) three stories in height or greater but no less than 35 feet provided that the wind turbines shall add no more than 20 feet to the height of said existing structure. Wind turbines which are architecturally compatible to the building architecture may locate on non-residential buildings less than three stories or 35 feet in height. The maximum height which may be approved for a roof-mounted wind turbine on a non-residential building less than three stories or 35 feet in height shall be equal to one-half the height of the building, measured from the surface of roof on which the turbine is mounted to the highest point of the wind turbine structure, including blades, if applicable. Associated equipment may be permitted on the roof so long as it is screened from view.*
2. *Wind turbines may be installed on parking lot light poles. The mounting height for parking lot light fixtures shall not exceed 25 feet as measured from the bottom of the fixture to grade. Twenty (20) percent of the height of the light pole may be added above the light fixture for the purpose of installing a wind turbine. The overall height of the parking lot light pole and wind turbine shall not exceed 30 feet, measured to the highest point of the wind turbine structure, including blades, if applicable. The wind turbine and any required appurtenances shall be painted to match the light pole and fixture.*

C. Special Use Permit - The following wind energy installation shall be subject to Special Use Permit as setout in Chapter 19.28:

1. *In office and business districts, a ground-mounted wind turbine not to exceed a maximum height of 150 feet, measured from average grade at the tower base to the highest point of the wind turbine structure, including blades, if applicable. A lightning rod, not to exceed 10 feet, shall not be included within the height limitations.*

D. Application Requirements.

Each application for site plan approval or a special use permit for a wind turbine or wind turbines shall be accompanied by the following information:

1. *Preliminary site plan (see Chapter 19.32).*
2. *Turbine information, including type, model, size, height, rotor material, rated power output, performance, safety, and noise characteristics of each wind turbine being proposed, tower and electrical transmission equipment.*
3. *Meteorological tower information, if applicable, including location, height, and appearance.*
4. *Digital pictorial representations of "before and after" (photo simulation) views from key viewpoints as may be appropriate.*
5. *The Staff, Planning Commission, or Governing Body may require additional technical studies deemed necessary to fully evaluate the application, such as a shadow/flicker model, noise study, geotechnical report, or wildlife impact study.*

E. Conditions of Approval.

The Planning Commission and City Council may require any or all of the following conditions and may add additional conditions if deemed necessary for a specific location:

1. *A request for a special use permit for a wind turbine(s) may be approved for an indefinite period of time.*
2. *Height - The maximum height which may be approved for a wind turbine is 150 feet. Height shall be measured from average grade at the tower base to the highest point of the wind turbine structure, including blades, if applicable. A lightning rod, not to exceed 10 feet, shall not be included within the height limitations. The maximum height which may be approved for a roof-mounted wind turbine shall be equal to one-half the height of the building, not to exceed 20 feet. Height shall be measured from the surface of roof on which the turbine is mounted to the highest point of the wind turbine structure, including blades, if applicable.*
3. *Minimum lot size - Ground-mounted wind turbines shall be located on property a minimum of one acre in size.*
4. *Setbacks - All wind turbines, other than roof-mounted wind turbines, shall be setback a distance equal to the height of the wind turbine, including blades, if applicable, from all property lines.*
5. *Separation requirements - When two or more ground-mounted wind turbines are located on one lot, they shall be separated by a distance equal to the overall height of one wind turbine system, including blades, if applicable.*

6. *The Planning Commission or Governing Body shall have the ability to grant a deviation from these standards. In support of a deviation request from these requirements, the applicant shall submit detailed information illustrating the need for the deviation.*
7. *Color/Finish - Wind turbines, including the towers, shall be painted a non-reflective, non-obtrusive color or a color that conforms to the environment and architecture of the community.*
8. *Tower design - All tower structures shall be of self-supporting, monopole construction unless attached to a structurally reinforced roof where such support is not warranted. No lattice structures shall be permitted.*
9. *Blade size - The diameter of the blades for a ground-mounted horizontal-axis, propeller-style wind turbine system shall be limited to one-third the height of the tower.*
10. *Lighting - Wind turbines shall not be artificially lit unless such lighting is required by the Federal Aviation Administration (FAA) or other applicable authority.*
11. *Signage - Signs shall be limited to the appropriate warning signs (e.g. electrical hazard or high voltage) placed on the wind turbine tower(s), electrical equipment, and the wind turbine. Commercial advertising is strictly prohibited.*
12. *Federal and State regulations - All wind turbines shall meet or exceed current State and federal standards and regulations.*
13. *Building code compliance - All wind turbines shall meet or exceed the current standards expressed in the adopted building codes. A building permit is required prior to the installation of any wind turbine.*
14. *Utility connections - Reasonable efforts shall be made to locate utility connections from the wind turbine(s) underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider. For electrical transformers with a footprint greater than two (2) square feet in area, landscaping shall be provided where necessary to substantially screen the structure from public view and/or view of adjacent homeowners. Maintenance of all landscaping shall be the responsibility of the property owner.*
15. *Electrical wires - All electrical wires associated with a wind turbine shall be located underground or inside the monopole except for those wires necessary to connect the wind generator to the tower wiring, the tower wiring to the disconnect junction box, and the grounding wires.*
16. *Safety shutdown - Each wind turbine shall be equipped with both manual and automatic overspeed controls to limit the rotational speed of the blade within the design limits of the rotor. Manual electrical and/or overspeed shutdown disconnect switches shall be provided and clearly labeled on the wind turbine structure. No wind turbine shall be permitted that lacks an automatic braking, furling or feathering system to prevent uncontrolled rotation, overspeeding and excessive pressure on the tower structure, rotor blades, and turbine components.*

17. *Minimum blade clearance - The blade tip clearance for a ground-mounted, horizontal-axis, propeller-style wind turbine shall, at its lowest point, have a ground clearance of not less than 30 feet.*
18. *Noise - The noise emitted from any wind turbine shall not exceed 55dbA as measured at the nearest property line, except during short-term events such as utility outages and severe windstorms.*
19. *Utility notification - No building permit for a wind turbine shall be issued until a copy of the utility company's approval for interconnection of a customer-owned generator has been provided. Off-grid systems shall be exempt.*
20. *Removal of abandoned wind turbines - Any wind turbine that is not operated for energy production for a continuous period of twelve (12) months shall be considered abandoned, and the owner of such wind turbine shall remove the same within ninety (90) days of a receipt of notice from the governing authority notifying the owner of such abandonment. If such wind turbine is not removed within said ninety (90) days, the governing authority may remove such wind turbine at the owner's expense.*

19.50.020 Geothermal Energy.

A. Definitions

1. *Geothermal Energy - Energy that is stored in the Earth.*

B. Application Requirements

Each application for a geothermal energy installation shall be accompanied by the following:

1. *A site plan or scaled drawing showing all buildings, property lines and the location for the pipe system.*
2. *A description of the system being installed including the type, model, brand and contractor installing the system.*
3. *Staff may require additional information if it is necessary to fully evaluate the application.*

C. Approval

1. *Staff shall review and approve all geothermal installations.*
2. *A building permit will be required for the installation, but if it is part of other construction, it may be incorporated with that permit.*

19.50.025 Hybrid Energy Installations.

It has become a common practice to use a combination of energy sources rather than just one. An applicant may submit an application to include more than one energy source and it will be reviewed and approved as one application.

RECOMMENDATION:

It is the recommendation of Staff that the Planning Commission review each item, determine if change is needed, set a public hearing date and authorize Staff to advertise the item.