

Site Summit Tower Foundation Report

For:
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By:
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Mr. Sears:

Andrew P. Adams, PE Consulting Engineer is pleased to provide the structural analysis for the existing tower foundation located at Site Summit, Alaska. Analysis for this project is based on information from the original tower design drawings provided by the Alaska Railroad.

The original drawings are provided in an appendix to this report. The goal of this analysis is to determine the suitability of the existing foundation to support a like-kind tower replacement. The tower loading will be based on the following requirements.

Original Tower Equipment Summary			
Type	Size	Area	Elevation
Dish	10q	78.5 sf	50q
Dish	8q	50.24 sf	50q
Dish	10q	78.5 sf	40q
Dish	6q	28.25 sf	40q
Dish	6q	28.25 sf	30q

Summary of Results:

Provisions in the International Existing Building Code 2009, which is currently is the governing state code for existing structures, allows for structural modifications without detailed soil and foundation analysis if certain limits are met. Per IEBC section 3403.3, there is a gravity load increase allowance of 5% and per IEBC section 3403.4, there is a lateral load increase allowance of 10% before modifications are required. However, the original tower design was based on the EIA-222-E, and the current code standards is TIA-222-G. Because of this code change, and additional load parameters requested by the AKRR, the following configuration permits the maximum allowable loading for the existing foundation.

Minimum Wind Speed: 125 MPH no ice
60 MPH ½ ice

Proposed Equipment Configuration			
Type	Size	Area	Elevation
Dish	8q	50.24 sf	40q
Dish	6q	50.24 sf	40q
Dish	6q	28.25 sf	30q
Dish	6q	28.25 sf	30q

Foundation Reaction Comparison			
	Max Axial**	Max Shear	Max Moment
Original Design	13.4 kips	35.6 kips	1373 kip-ft
Proposed Design	10.8 kips	37 kips	1181 kip-ft
Percent Change	-22.4%	+4%	-14%

**The change in foundation reactions assumes the new tower will not have walking platforms.

The tower vendor may provide additional limitations to the loading based on the tower's component capacity.

Recommendations:

The results of the analysis show no modifications are required to the existing foundation. However, due to some damage to the foundation anchorage, the tower foundation shall be repaired as shown on the provided drawings.

Respectfully,

Andrew P. Adams, P.E.



Appendix A: Reaction Summary

Appendix B: Foundation Modification Drawing

SUMMARY OF MODIFICATION

THE TOWER REPLACEMENT IS ASSUMED TO BE LIKE-KIND. THE ONLY FOUNDATION MODIFICATIONS REQUIRED IS TO THE BENT AND DAMAGED ANCHOR BOLTS PER PLAN. IN ORDER TO REDUCE THE NUMBER OF REPAIRED AND REPLACED BOLTS, THE BASE PLATE ANCHOR BOLT HOLES SHALL BE 1 1/8" ANCHOR NUT CONFIGURATION PER TOWER DRAWINGS.

1.0 GENERAL LOADING

BUILDING CODES:
INTERNATIONAL BUILDING CODE 2009
TA-222-G
AMERICAN INSTITUTE OF STEEL CONSTRUCTION 13TH ED.
REFERENCE DRAWINGS:
MICROFLECT DRAWINGS: PROJECT 28106 MAY 1985
DESIGN WIND SPEED (3-SECOND GUST):
125-MPH WITH 0" ICE
60-MPH WITH 1/2" ICE

2.0 GENERAL CONDITIONS

THE CONTRACTOR SHALL CHECK ALL DIMENSIONS AND SECTIONS AND REPORT ANY DISCREPANCY TO THE ENGINEER PRIOR TO THE FABRICATION OR INSTALLATION OF STRUCTURAL MEMBERS. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL TEMPORARY BRACING AND/OR SUPPORTS THAT MAY BE REQUIRED AS THE RESULT OF THE CONTRACTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES. THE PROJECT SPECIFICATIONS SHALL BE CONSIDERED AN INTEGRAL PART OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL REVIEW THE SPECIFICATIONS PRIOR TO CONSTRUCTION AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY REQUIREMENTS AND PUBLIC AGENCIES SAFETY ORDINANCES.

3.0 STEEL

ALL NEW ANCHOR BOLTS TO BE 1 1/4" ASTM A307 OR BETTER (GALVANIZED). SEE TOWER DRAWINGS FOR ADDITIONAL SPECIFICATIONS. NUTS AND WASHERS TO MEET TOWER SPECIFICATIONS.

4.0 INSPECTIONS

ALL MATERIAL SPECIFICATIONS, SHOP DRAWINGS, COATING PROCEDURES AND MATERIAL CERTIFICATIONS MUST BE SUBMITTED TO THE ENGINEER OF RECORD OR OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.

SUBMIT THIRD-PARTY INSPECTOR PLAN TO OWNER FOR APPROVAL.

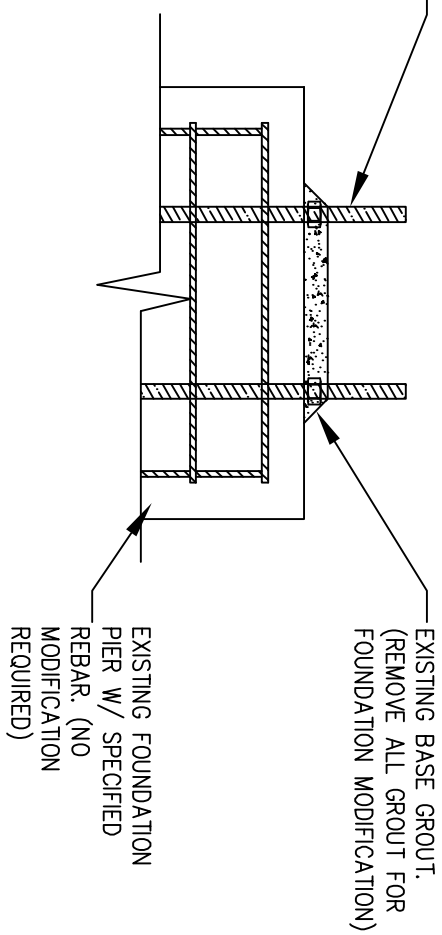
ALL REPLACED ANCHORS TO BE CHECKED PRIOR TO MOUNTING THE TOWER. A BASE PLATE TEMPLATE SHALL BE AVAILABLE DURING THE INSPECTION.

ALL OTHER INSPECTIONS PER NEW TOWER DRAWINGS.

5.0 CONNECTIONS

ALL-THREAD COUPLERS SHALL BE SIMPSON STRONG-TIE CNW1 1/4. TOUCH UP EXISTING RODS WITH SPRAY GALVANIZATION.

EXISTING ANCHOR BOLT W/
LEVELING NUT. REMOVE
LEVELING NUT AND ENSURE
BOLT THREADS ARE CLEAR
AND STRAIGHT.



1 EXISTING ANCHOR BOLT ASSEMBLY

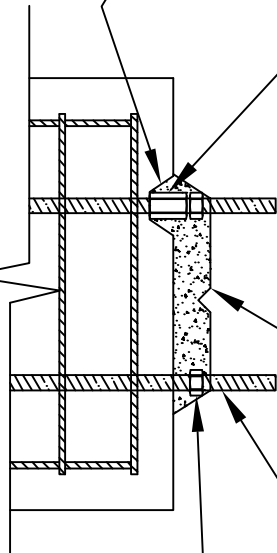
SCALE: 3/4" = 1'-0"

IF EXISTING BOLT IS LESS THAN 3/16" OUT OF PLUMB, NO MODIFICATIONS ARE REQUIRED.

LEVELING NUT TO BE ADJUSTED TO MEET LEVEL TOLERANCE. (ELEVATION MAY INCREASE SLIGHTLY)

REMOVE 2" OF CONCRETE BELOW TOP OF FOUNDATION PIER. IF REBAR IS ENCOUNTERED, CEASE REMOVAL AND BUILD UP BASE PLATE ELEVATION WITH GROUT.

SPLICE NEW 1 1/4" THREADED ROD TO EXISTING ANCHOR WITH SIMPSON CNW1 1/4 COUPLER.



2 REPAIR ANCHOR BOLT ASSEMBLY

SCALE: 3/4" = 1'-0"

3/16"

IF BOLT PLUMB IS OUT OF ALIGNMENT GREATER THAN 3/16", ADD NEW ANCHOR SPLICE. USE 1 1/4" MATCHING DIE TO REPAIR DAMAGED THREADS AS REQUIRED.

CUT DAMAGED BOLTS DIRECTLY ABOVE EXISTING LEVELING NUTS AS REQUIRED.



3 ANCHOR REPLACEMENT GUIDANCE

SCALE: NTS



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SITE SUMMIT TOWER
FOUNDATION REPAIR

ALASKA RAILROAD
1224 Whitney Road
Anchorage, Alaska 99501

DATE: 7/20/15
DR'N: AA
CHK'D: DL
TYPE: IFC
Scale: NOTED

SHEET NO: S

JOB NO.: AKR-150701
DWG: AKR-150701-01 REV A