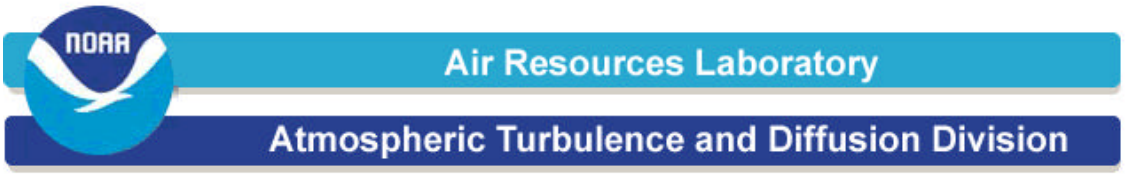
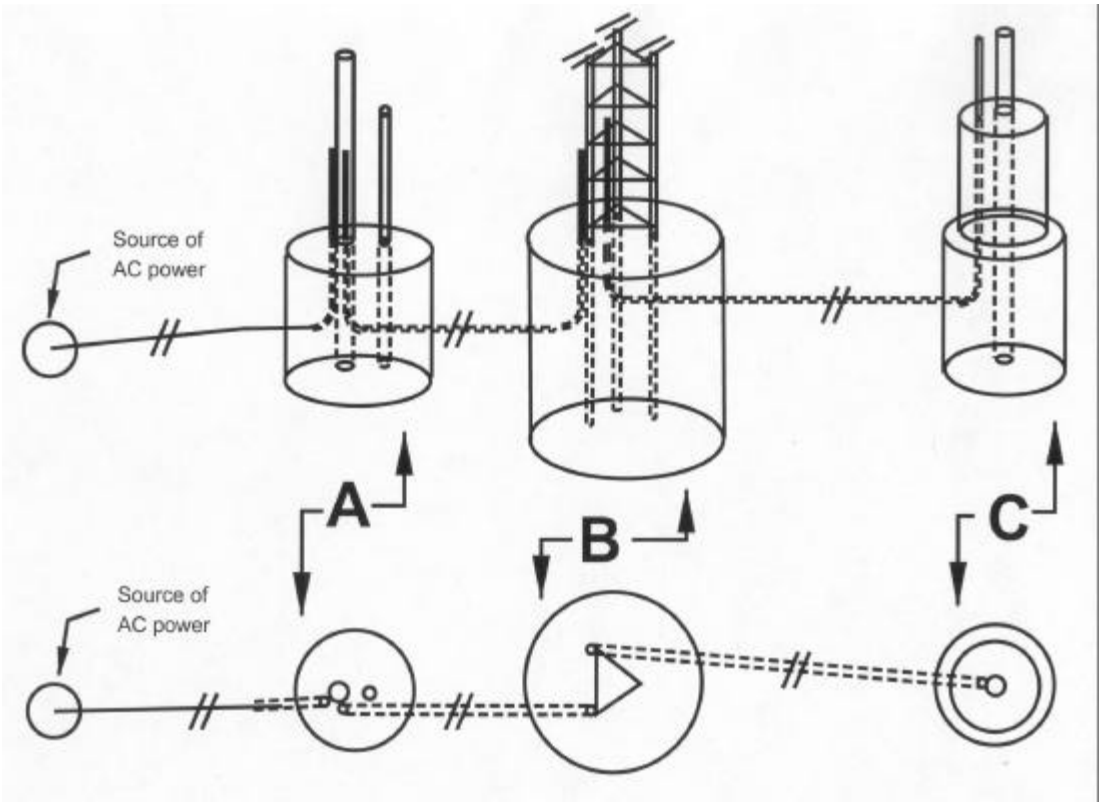


A Guide for the Installation of a United States Climate Reference Network Station

U.S. Climate Reference Network Site Specifications

Figure 1: Shows the shapes of the structures and proper conduit placement.



Structure A is 2 ft in diameter and 3 ft deep.

Structure B is 3 ft in diameter and 5 ft deep.

Structure C is 2 ft in diameter and 3 ft deep.

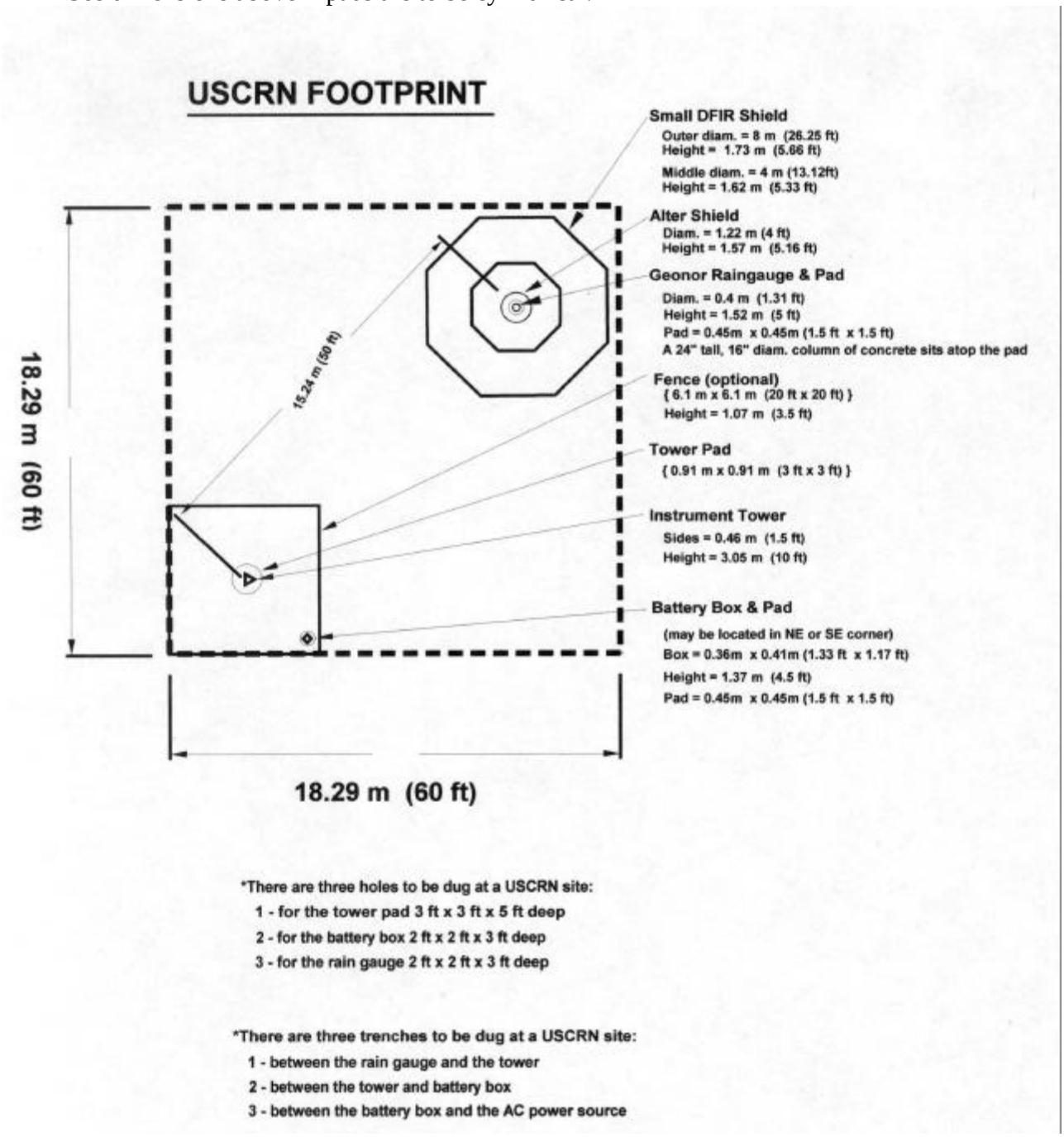
The center of the hole for structure A is 12 ft to the Southeast from the center of the hole for structure B.

The center of the hole for structure C is 50 ft to the Northeast from the center of the hole for structure B.

Total concrete required is 2.25 yards.

Figure 2: Shows the relative positions of the structures.

Note: The dimensions given for the concrete pads apply if the pads are rectangular.
See dimensions above if pads are to be cylindrical.



Note: An optional item dependant upon the desire of the Site Host, is the fence. The Host has the option of a fence around the tower (20ft x 20ft) or around the entire site (60ftx 60ft). The type of fence is conditional upon review by NCDC to determine if blockage will be acceptable. ATDD personnel will attain bids for the fence installation after the site install, and as such it may take a few weeks to be installed. If there is a reason that the fence must be in place prior to, or immediately following site installation, please notify ATDD.

Note: AC line is to be direct-bury cable, buried 18 in. deep. If any other configuration is required, please notify ATDD.

Note: A clear sky-view is required for the proper operation of the satellite transmitter antenna. This may dictate that some trees be topped or removed. However, the antenna is attached about seven feet high on the instrument tower, and typically with an elevation angle of greater than 30 degrees, so that unless the trees are fairly close and quite tall, they will not be a problem.

Note: The instrument tower has the possibility of being changed form 10 ft tall to 30 ft tall.

USCRN

SITE PREPARATION GUIDE

Site Prep Guide

Note: This document is intended only as a guide, and does not override applicable federal, state, or local regulations. Every effort should be made to follow any federal, state, or local regulations as they apply to a USCRN site.

Note: at all bends in conduit use 90^{o} sweeps, not elbows

Note: the concrete pads for structures A, B, and C (see site drawing) do not have to be at the same elevation as long as each individual pad is level

Trenching

1. Trench between structure A and structure B (18 in. depth)
2. Trench between structure B and structure C (18 in. depth)
3. Trench between structure A and source of AC power (36 in. depth)

Structure A (see site drawing) – Battery Box Pad

Description

1.5 ft x 1.5 ft x 3 ft deep cube of concrete containing one 2 in. diameter aluminum pipe, one 1 in. diameter aluminum pipe, and two lengths of 1 in. PVC or aluminum conduit. It is acceptable for the concrete mass to be cylindrical instead of rectangular, but the dimensions should be changed to 2 ft diameter x 2 ft deep. If rectangular, the concrete pad should be oriented so that one corner points to the north. This center of this structure is to be 12 ft to the southeast from the center of Structure B.

Construction Procedure

A 1 in. diameter aluminum conduit pipe shall be placed vertically in the concrete. The center of the pole shall be 9 in. from the northeast edge and 5 in. from the northwest edge. The pipe shall extend vertically down into the concrete to a minimum sub-surface depth of 2 ft with at least 3 ft of vertical length remaining above the surface of the concrete.

A 2 in. diameter aluminum conduit pipe shall be placed vertically 6 in. from the southeast edge and 9 in. from the northeast edge. The pipe shall extend vertically down into the concrete to a minimum sub-surface depth of 2 ft with at least 4 ft of vertical length remaining above the surface of the concrete.

110 volts of AC power shall be supplied via direct bury cable in a 36 in. deep trench from the breaker box (use a 20 amp breaker for USCRN Station) located at the metered source of AC power to a point, 1 ft from Structure A, at which point the AC power cable shall continue, being contained in 1 in. PVC or aluminum conduit into the concrete mass and then extend up vertically beside the 2 in. diameter aluminum pipe to a height of three feet above the surface of the concrete

at which point the 1 in. conduit shall be terminated. The AC power cable shall extend at least 5 ft from the termination point of the conduit before being terminated. If it is acceptable to the host, new service is not required if another source (i.e. an existing breaker box) is available.

Empty 1 in. PVC or aluminum conduit shall begin 3 ft above the surface of the concrete and extend down vertically beside the 2 in. diameter aluminum pipe to a depth of 18 in. below the surface of the concrete and then continue horizontally in an 18 in. deep trench approximately 12 ft to *Structure B*. Use PVC for the horizontal conduit.

Note: A template will be provided by ATDD to assure proper spacing between the 2 in diameter aluminum conduit and the two 1 in. diameter conduit lengths.

Structure B (see site drawing) – Tower Pad

Description
3 ft x 3 ft x 4 ft deep cube of concrete containing one 10 ft tall triangular tower with 18 in. sides, and two pieces of 1 in. PVC conduit. It is acceptable for the concrete mass to be cylindrical instead of rectangular, but the dimensions should be changed to 3 ft diameter x 5 ft deep.

Construction Procedure
The tower is to be placed in the center of the concrete with one leg to **TRUE** north, one leg to the south and the remaining leg to the east. The anchoring legs of the tower, which are bolted to the tower with four bolts per leg, shall extend vertically 47 in. down into the concrete. In addition the tower needs to be bolted to the anchoring legs, in such a way that if the bottom two bolts were removed from the south leg and the bottom bolt was removed from both the north and east leg, that the tower could be laid down to the northeast.

Empty 1 in. PVC conduit from *structure A* shall extend vertically up beside the south leg of the tower and rise to a height of 2 ft above the surface of the concrete before being terminated.

Empty 1 in. PVC conduit shall begin 2 ft above the surface of the concrete and extend vertically down beside the north leg of the tower down into the concrete to a depth of at least 18 in. and then continue horizontally in an 18 in. deep trench approximately 50 ft to *Structure C*.

Note: The tower and legs, and a template to assure proper spacing between the legs of the tower and the 1 in. PVC conduit will be provided by ATDD.

Structure C (see site drawing) – Rain Gauge Pad

Description
2 ft diameter x 2 ft deep sub-surface mass of concrete with an additional 16 in. diameter column of concrete extending 2 ft vertically above the center of the sub-surface concrete mass and containing one piece of 2 in. diameter aluminum conduit pipe, and one piece of 1 in. PVC conduit. The center of this structure is to be 50 ft to the northeast from the center of structure B.

Construction Procedure
A 2 in. diameter aluminum pipe shall be placed vertically in the center of the concrete. The pipe shall extend vertically down into the concrete to a minimum sub-surface depth of 3 ft with at least 3 ft of vertical length remaining above the surface of the concrete.

Empty 1 in. PVC conduit from *structure B* shall extend up vertically beside the outside of the 2 in. diameter aluminum conduit pipe and rise to a height of 3 ft above the surface of the highest concrete before being terminated.

Note: Two templates will be provided by ATDD to assure proper spacing between the 2 in. aluminum conduit and the 1 in. PVC conduit.

Note: Perhaps the easiest way to accomplish the desired concrete design is to dig a hole 2 ft in diameter and 3 ft deep. Then place a 5 ft length of 16 in. diameter concrete form tube in the center of the hole and then partially refill the hole around the outside of the 16 in. diameter tube until the hole is only 2 ft deep and then insert a 2 ft length of 2 ft diameter concrete form tube into the hole. When pouring concrete fill the larger tube first.

Figure 1: Site Drawing

Note: This drawing is only to show the general layout of a USCRN site and not to be used to determine spacing or orientation for the actual USCRN site.

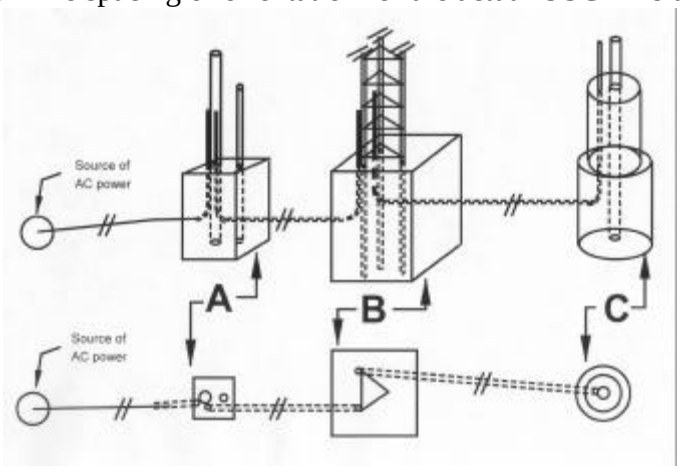
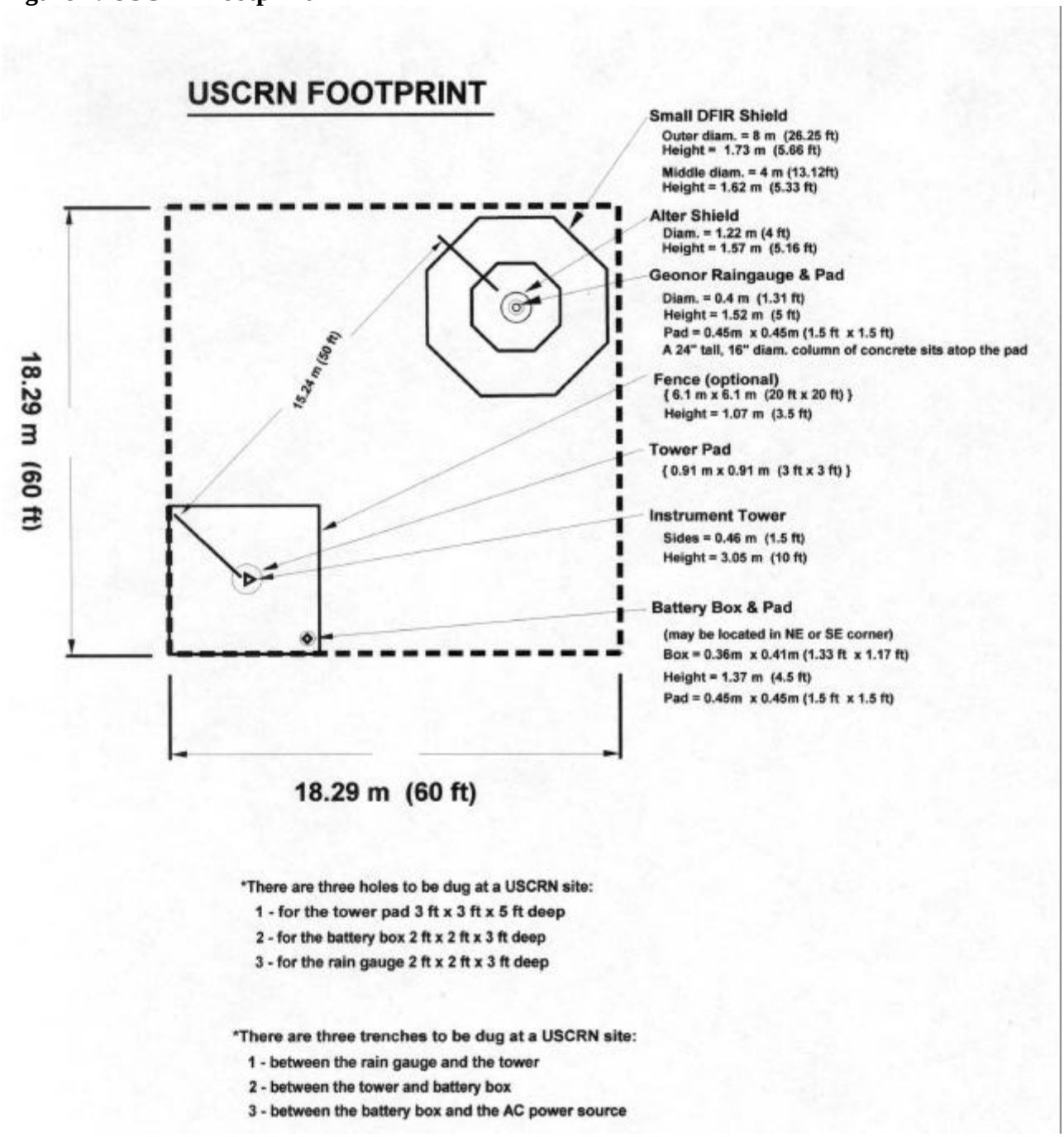


Figure 2: USCRN Footprint



The previous page shows a hypothetical USCRN footprint configuration, but in many cases the installation team leader has some discretion as to the orientation of the 60 ft x 60 ft site area as well as the placement of the tower, the Geonor, and the battery box inside the site area. Using the above drawing as a guide, complete an “as-built” drawing of the site below. Note any discrepancies between the site “as-built” and the theoretical drawing above. Assume the top of this page represents true North.

“As-Built”:

CRN

SITE INSTALLATION GUIDE

Site Installation Guide

A. Underground

1. Run cables inside of the 1 in. PVC – extend wire 7 ft from each PVC orifice

a. Cable 1 is to be run between structures A and B
   i. 12 AWG 2 conductor
   ii. 16 AWG 2 conductor
b. Cable 2 is to be run between structures B and C
   i. 12 AWG 2 conductor
   ii. 16 AWG 2 conductor

Note: Cables are custom made and will be provided by ATDD. Cable 2 has one side of a four (4) pin connector on the end that is to be at structure C

2. Set up rain gauge

a. Attach 2 in. floor flange supplied by Holleander to 2 in. diameter pipe of structure C
b. Gauge orifice is to be 5 ft above the surface of the ground
c. Connect rain gauge (be sure the bucket support is only object contacting the bucket)

Note: The base of the gauge has a hole approximately ¾ in. diameter drilled in it where the signal cable comes through. The vibrating wire that is directly above this hole is designated #1 (VW1), the vibrating wire that is closest to #1 in the clockwise direction is designated #2 (VW2), and the final vibrating wire is designated #3 (VW3)

   i. Red wire from vibrating wire to a green interface box, terminal #5
   ii. Black vibrating wire to same green interface box, terminal #3
   iii. White wire from datalogger to the same green interface box, terminal #6
   iv. Black with white stripe wire from datalogger to same green interface box, terminal #4
   v. Repeat four previous steps for the other two vibrating wires, using yellow, and black with yellow stripe for vibrating wire #2, and using purple, and black with purple stripe for vibrating wire #3

d. Duct seal PVC where any air gaps exist
e. Calibrate rain gauge – see procedure
f. Add antifreeze to rain gauge
g. Add approximately 8 ounces of water to rain gauge
h. Connect two sides of the four pin connector and attach gauge lid

3. Tower Assembly

a. Place caps in each end of Aluminum conduit pieces listed below
   i. 10 ft x 1 in. ∅
   ii. 5 ft x 1 in. ∅
   iii. 3.25 ft x 1 in. ∅
   iv. 1.5 ft x 1 in. ∅

b. Place caps in one end of 1 ft x 1 in. ∅ aluminum conduit pieces

c. Place caps in the top end of each of the three legs of tower (Wrap with tape to get a snug fit)

d. Attach antenna – Use computer program to determine angle and elevation

e. Attach Arms
   i. 10 ft x 1 in. ∅ to north leg and south leg of tower at a height of 49.5 in. above the ground
      - use 1 in. x 1 in. offset cross assemblies supplied by Holleander
      - level arm
   ii. 5 ft x 1 in. ∅ to south leg and east leg of tower at a height of 80.5 in. above the ground
      - use 1 in. x 1 in. offset cross assemblies supplied by Holleander
   iii. 3.25 ft x 1 in. ∅ to north leg of tower and 5 ft x 1 in. ∅ aluminum conduit
      -place below the 5 ft arm and make end of pipe flush with outer edge of offset cross assembly attached to N leg of tower
      - use 1 in. x 1 in. offset cross assemblies supplied by Holleander

f. Attach Holleander Fittings
   i. Attach 1 in. x 1 in. to tips of 5 ft arm and tip of 3.25 ft arm
   ii. Attach 1 in. x 1 in. to 10 ft arm 3 in. from southern tip of arm
   iii. Attach 1 in. x ¾ in. to tips of 10 ft arm
   iv. Attach 1 ft x 1 in. ∅ pieces of aluminum conduit to flange on top of aspirated shields

g. Assemble Aspirated Solar Radiation Shields
   i. Insert 1 ft x 1 in. ∅ pieces of conduit listed from above into offset crosses on 5 ft and 3 ft arms
   ii. Level shields
   iii. Position middle shield 1.5 m above ground and use laser level to get other two shields to same height
   iv. Attach power cables for fans in aspirated shields

h. Attach Datalogger Box
      - bottom of box shall be 15 in. above the ground
      - attach to North and South leg of the tower
   i. Place sensors into fittings
   ii. Place temperature sensors in aspirated shields
   iii. Place IR temperature sensor in ¾ in. x 1 in. Holleander fitting located on the southern tip of the 10 ft x 1 in. ∅ arm
   iv. Place solar radiation sensor in 1” x 1” Hollander fitting adjacent to IR temperature sensor on the Southern tip of the 10’ arm
   v. Place anemometer in ¾” x 1” Hollander fitting located on the Northern tip of the 10’ arm
   vi. Place fitting with GPS receiver on Northern side of the 10’ arm as far from datalogger box as permitted by the cord
   vii. Cable tie sensor cables to tower using black UV resistant cable ties
   viii. Insert cables into datalogger box

4. Set up Aluminum Box for backup power supply (face tower)

a. Place Hollander flange on 1 in. diameter pipe
b. Attach battery box mounting plates to template
c. Attach mounting template to 2 in. diameter pipe
d. Remove template
e. Attach battery box

f. Connect AC power to outlet inside outlet box
g. Connect face plate to junction box
h. Plug surge suppressor into outlet
i. Connect DC load from datalogger box to Low Voltage Disconnect (LVD)
    i. attach red wire for DC supply from 23x box to LVD terminal marked Load +
    ii. attach black wire for DC supply from 23x box to LVD terminal marked Load -
j. Connect battery jumpers to batteries
    i. Connect battery harness red wire to + battery terminals and to the LVD terminal marked Battery +
    ii. Connect battery harness black wire to - battery terminals and to the LVD terminal marked Battery -
    iii. Connect battery charger to left battery
    iv. Connect lead with red heat shrink to + battery terminal
    v. Connect lead with no heat shrink to – battery terminal

k. Connect 16 AWG to transformer for 23x battery charger
l. Set charger to “warm”
m. Set charger to “gel”
n. Spray posts with corrosion inhibitor

5. Wire Datalogger box

a. Connect red 12 AWG from the LVD in battery box to fuse block in 23x box
b. Connect black 12 AWG from LVD in battery box to ground terminal strip in 23x box
c. Connect 16 AWG from transformer in battery box to 23x battery charger
d. Connect yellow wire from the temperature sensor in the east shield to 23x SE 1
e. Connect white wire from the temperature sensor in the east shield to 23x SE 2
f. Connect green wire from the temperature sensor in the east shield to 23x gnd
g. Connect yellow wire from the temperature sensor in the south shield to 23x SE 3
h. Connect white wire from the temperature sensor in the south shield to 23x SE 4
i. Connect green wire from the temperature sensor in the south shield to 23x gnd
j. Connect yellow wire from the temperature sensor in the west shield to 23x SE 5
k. Connect white wire from the temperature sensor in the west shield to 23x SE 6
l. Connect green wire from the temperature sensor in the west shield to 23x gnd
m. Connect orange wires from all three of the temperature sensors to 23x EX 1
n. Connect orange wire from the voltage divider to 23x SE 16
o. Connect black wire from the voltage divider to 23x gnd
p. Connect the white wire from the pyranometer to 23x SE 17
q. Connect the green wire from the pyranometer to 23x SE 18
r. Connect the bare wire from the pyranometer to 23x gnd
s. Connect the red wire from the anemometer to 23x P1
t. Connect the black wire from the anemometer 23x gnd
u. Connect the yellow wire from the surface temp lead w/ the black band to 23x SE 9
v. Connect the orange wire from the surface temp lead w/ the black band to 23x SE 10
w. Connect the bare wire from the surface temp lead w/ the black band to 23x gnd
x. Connect the yellow wire from the surface temp lead w/o the black band to 23x SE 11
y. Connect the orange wire from the lead w/o the black band to 23x SE 12
z. Connect the bare wire from the lead without the black band to 23x gnd
aa. Connect white wire from the green interface box connected to VW1 at the rain gauge to terminal A of a green interface box in the datalogger box and then connect a length of white wire from the terminal E of that box to the 23x SE 13

bb. Connect black with white stripe wire from the green interface box connected to VW1 at the rain gauge to terminal B of the same green interface box as above in the datalogger box and then connect a length of wire that is black with a white stripe from the terminal F of that box to 23x ground
cc. Connect yellow wire from the green interface box connected to VW2 at the rain gauge to terminal A of a green interface box in the datalogger box and then connect a length of yellow wire from the terminal E of that box to the 23x SE 14
dd. Connect black with yellow stripe wire from the green interface box connected to VW2 at the rain gauge to terminal B of the same green interface box as above in the datalogger box and then connect a length of wire that is black with yellow stripe from the terminal F of that box to 23x ground
ee. Connect purple wire from the green interface box connected to VW3 at the rain gauge to terminal A of a green interface box in the datalogger box and then connect a length of purple wire from the terminal E of that box to the 23x SE 15
ff. Connect black with purple stripe wire from the green interface box connected to VW3 at the rain gauge to terminal B of the same green interface box as above in the datalogger box and then connect a length of wire that is black with a purple stripe from the terminal F of that box with 23x ground
gg. Connect a length of red wire from the green interface boxes in the datalogger box to 23x 12V
hh. Connect a length of black wire from the green interface boxes in the datalogger box to 23x ground
ii. Connect 16 AWG red wire from rain gauge heater to NO on control circuit
jj. Connect 16 AWG black wire from rain gauge heater to ground terminal strip
kk. Connect 22 AWG red wire from rain gauge heater to 23x EX 2
ll. Connect 22 AWG brown wire from rain gauge heater to 23x SE 24
mm. Connect 23x SE 24 to 23x gnd via 1 kΩ resistor
oo. Connect a wire between CNTRL on control circuit to 23x C2
pp. Connect a wire between 12V fuse block and 12V on control circuit
qq. Connect a wire from ground terminal strip to GND on control circuit
rr. Connect red wire from the East shield power cable to 12V fuse block
ss. Connect red wire from the South shield power cable to 12V fuse block
tt. Connect red wire from the West shield power cable to 12V fuse block
uu. Connect black, green, and bare wires from the three shield power cables to ground terminal strip
vv. Connect clear wire from the East shield power cable to 23x C5
ww. Connect clear wire from the South shield power cable to 23x C6
xx. Connect clear wire from the West shield power cable to 23x C7
yy. Connect one wire from the door switch to 23x C1
zz. Connect the other wire from the door switch to 23x 5V

6. Miscellaneous

a. Place duct seal in air gaps in the datalogger box
b. Place appropriate coefficients into 23x program
c. Load program into datalogger
d. Program SAT HDR transmitter
d. Leave extra fuses inside 23x box
    i. 3A ATC @ 32v fast-blow
    ii. 7.5A ATC @ 32v fast-blow
    iii. 30A ATM @ 32v fast-blow
e. Place lock on datalogger box
f. Place lock insert into access for battery box latch
g. Place lock on battery box
i. Place decal on battery box and datalogger box
m. Apply government ID tag to inside of 23x box

7. Grounding

a. Attach lightning rod and solderless lug near the top of a tower leg
b. Attach solderless lug to battery box
c. Attach solderless lug to datalogger box
d. Drive an 8 ft x 0.5 in. ∅ copper-clad ground rod beneath datalogger box
e. Drive an 8 ft x 0.5 in. ∅ copper-clad ground rod beneath battery box
f. Attach grounding wire to solderless lug at lightning rod
    note: all ground wire is non-insulated solid #4 AWG
g. Attach grounding wire from solderless lug at lightning rod to ground rod via ground clamp
h. Attach grounding wire to solderless lug on datalogger box
i. Attach grounding wire from solderless lug on datalogger box to wire from lightning rod via split bolt connector
j. Attach grounding wire to solderless lug on battery box
k. Attach grounding wire from solderless lug on battery box to ground rod via ground clamp
l. Connect the two ground rods with ground wire in a shallow trench

8. Landscaping
a. Close all trenches and level
b. Return ground IR temperature sensor to original state

9. Documentation
a. Take required pictures (see list)
b. Video of overall site should be taken, include object distances
c. Record distances of objects within 100 m of tower

10. Verification
a. Verify transmission and data stream for GOES
b. Correct any problems in measurements

11. Train Site Operator*
*steps to be determined, potential steps listed below

l. Train site operator
    i. change components
    ii. enter coefficients
    iii. basic maintenance
2.Leave basic tool kit
    i. 23x screwdriver
    ii. 5/32 in. & 3/26 in. Allen wrenches

USCRN Site Acceptance Checklist

1. USCRN Site Name/Site ID:

Short Name: _____ State: _____

Long Name: _____

Alias: _____

GOES/DCS - ID_____ WBAN Number:_____

Latitude_____ Longitude_____Elevation_____

2. USCRN Site Host (Organization, contact name, mailing address city, state, ZIP, telephone)

Organization: _____

Contact Name:_____

Mailing Address:_____

Mailing Address:_____

City:_____ State_____ ZIP_____

Telephone: _____

Email: _____

3. Certify site preparation complete Initials_____Date_____
*Attach: completed **USCRN Site Install Issues** form*

Comments/Issues: _____

4. Certify "as built" documentation is complete Initials_____Date_____
*Attach: completed **USCRN Site "As-Built" Drawing***

Comments/Issues: _____

5. Certify site metadata is complete Initials_____Date_____
*Attach: completed **USCRN Station Database - Station History** form*

Comments/Issues: _____

USCRN Site Acceptance Test Checklist (Page 2)
6. Certify site metadata is placed under CM Initials_____Date_____ *Enter into **CRNSITES*** Comments/Issues: _____
7. Certify NEPA documentation is complete Initials_____Date_____ *Attach: completed **NEPA Statement for USCRN Site*** Comments/Issues: _____
8. Certify site equipment is installed in compliance with USCRN Site Installation Guide Initials_____Date_____ *Attach: **USCRN Site Install Checklist*** ***USCRN Site Install Component Checklist*** Comments/Issues: _____
9. Certify temperature and precipitation sensors are calibrated in compliance with USCRN Calibration Procedures Initials_____Date_____ *Attach: PRT (3) calibration sheets* *GEONOR field calibration sheet* *Wind speed sensor calibration sheet* *Solar Radiation sensor calibration sheet* *Surface IR sensor calibration sheet* *(Calibration sheets for any other sensors installed)* Comments/Issues: _____
10. Certify GOES DCS comms interface is properly activated Initials_____Date_____ *Attach: **NOAA Platform Description Table*** Comments/Issues: _____
11. Certify metadata provided to host Initials_____Date_____ Comments/Issues: _____
12. Certify Site Technical Support Guide provided to host Initials_____Date_____ Comments/Issues: _____
13. Certify host trained to provide support Initials_____Date_____ Comments/Issues: _____

USCRN Site Acceptance Test Checklist (Page 3)

14. Certify "as-built" documentation is placed under CM Initials_____Date_____

Following documentation sent to NCDC to be included on Station History CD:

_____*USCRN Site Install Checklist form*
_____*USCRN Site Install Issues form*
_____*USCRN Site Install Component Checklist form*
_____*NOAA Environmental Checklist Statement form*
_____*USCRN Site "As-Built" Drawing form*
_____*USCRN Site Visit Data Verification form*
_____*USCRN Station Database- Station History form*
_____*NOAA Platform Description Table form*
_____*Calibration sheets for all installed sensors*

Comments/Issues:_____

15. Test Manager Name:_____

Test Manager Signature_____Date_____

Additional
Comments:_____
_____
_____
_____
_____
_____
_____
_____

Form Date: May 17, 2004

USCRN Site Install Checklist

ST - Site ID - Location:

Prepared By: **Date:**

--- Use initials to indicate step has been completed

- [ ] Obtain site survey
- [ ] Obtain climate report

	in.	Design extreme snow depth
	°F	Design extreme minimum temp.
	in.	Tower location relative to wind fence

- [ ] Make contacts & address issues (see USCRN Site Install Issues)
- [ ] ---site contact
- [ ] ---fax contact current footprint for approval
- [ ] ---firm-up dates
- [ ] Compile components (see USCRN Site Install Component Checklist)
- [ ] Compile tools (see USCRN Site Install Component Checklist)
- [ ] Initiate MetaData process
- [ ] View site
- [ ] The site seems appropriate (make notes if disagreeable)
- [ ] Complete NEPA form
- [ ] Take before pictures (see Photographical Documentation Checklist for USCRN Site)
- [ ] Layout (see USCRN Site Preparation Guide)
- [ ] Dig & trench (see USCRN Site Preparation Guide)
- [ ] Frame (see USCRN Site Preparation Guide)
- [ ] Set-up tower (see USCRN Site Preparation Guide)
- [ ] Stub in conduit (see USCRN Site Preparation Guide)
- [ ] Backfill (see USCRN Site Preparation Guide)
- [ ] Pour concrete (see USCRN Site Preparation Guide)
- [ ] Assemble SDFIR (see Instructions for Small DFIR)
- [ ] Assemble tower (see USCRN Site Installation Guide)
- [ ] Attach instruments/equipment (see USCRN Site Installation Guide)
- [ ] Wire in AC or solar power (see USCRN Site Installation Guide)
- [ ] Wire datalogger (see USCRN Site Installation Guide)
- [ ] Wire rain gauge (see USCRN Site Installation Guide)
- [ ] Program SAT HDR GOES
- [ ] Program CSI Datalogger
- [ ] Level SR
- [ ] Caulk tower legs
- [ ] Place spare USCRN key in asp. Shield #1 (NE)

	Use screws (4-40) to attach serial cable between datalogger CS I/O port & transmitter CS I/O port
	Attach barcode
	Calibrate Geonor
	Verify Geonor (use 1000 mL of H_2O)
	Calibrate TB3
	Complete Site Visit Data Verification
	Complete Site Inventory Record
	Take after pictures (see Photographical Documentation Checklist for USCRN Site)
	Video with distances of objects within 100m
	Train site operator
	Check for transmission
	Complete detailed driving directions for site
	Fill out Site Visit Accountability Sheet
	Begin Site Visit History
	Enter MetaData (see CRN Station Database - Station History)
	Enter Platform Table Description (see Platform Description Table)
	Archive files
	---pictures
	---NEPA
	---platform table
	---program
	---metadata
	---calibrations

Site Updates & Eccentricities

Note: Select or enter appropriate answer.

Datalogger program information **(name / version / OS)**			
Transmitter information **(name / version / OS)**			
Trailer Connector for Geonor heater?	Yes	No	
Aluminum channel for Geonor heater wiring?	Yes	No	
Drain installed in Geonor base?	Yes	No	
Are VW Fail-Safes installed?	Yes	No	
TB3 Installed?	Yes	Yes w/ H	No
Indicate aspirated shield(s) with gold connectors.	NE	SE	SW
Indicate aspirated shield(s) with Easy-Out fans.	NE	SE	SW
Door switch type?	Mag.	Mech.	
Height of Rain Gauge(s)		in.	
Height of aspirated shields inlets		in.	
Insulated & heated datalogger box?	Yes	No	

Extended memory 23x?	Yes	No
Datalogger ex. voltage bridge check installed?	Yes	No
Serial cable screwed into GOES and 23x?	Yes	No
Heater control relay mounting plate installed?	Yes	No
Caulk added to tower legs?	Yes	No
Cable protection type?	None	2 in. PVC / Split Loom / Other
Type of antifreeze mixture?		
Type of oil?		
Amount of antifreeze added?		L
Amount of antifreeze left with host?		L

Notes:

Form Date: April 9, 2004

USCRN Site Install Issues

Site Location

State of Site	New York
STN ID	Millbrook
Official Site Title	
Local Slang Title	
Latitude	41.7856
Longitude	-73.7423
Elevation	440 ft

Host Contact

name	
organization	
address	
phone	
phone	
fax	
email	
Back-Up Contact (name & phone #)	

Has contact seen site drawings?	yes	no

Contact for site determination (i.e. who will NOAA interact with during install?**)**

name _____

phone(s) _____

email _____

Shipping Information (Where should any items for the CRN site be shipped?**)**

name _____

address _____

_____

_____

_____

phone _____

phone _____

email _____

Site Access

Will NOAA have unrestricted access to the site and be able to work late and on weekends?

yes	no

If not, please list any restrictions that will be placed on NOAA personal in regards to site access.

_____

_____

_____

Site Installation

Does host have a backhoe and/or trencher available?	Yes Backhoe	Yes Trencher	Neither
If yes, may NOAA operate?		yes	no
If no, may NOAA obtain and operate, or must a contractor be hired?		NOAA	Contractor
Will digging be difficult?		yes	no

If yes, please explain. (solid rock, large rocks?) _____

_____

For any installation work is it necessary to hire a contractor?	yes	no

If yes, please explain. _____

_____

If a contractor is required, is there a specific contractor desired?	yes	no

If yes, please list name, number, and task to be done by that contractor.

_____

_____

_____

Can vehicles (NOAA van (2WD), concrete truck) drive to the exact spot of the site?	yes	no

If no, please explain. _____

_____

Is there a concrete supplier that is used by the host, or at least delivers to the area?	yes	no

If yes, please list name and phone number. _____

_____

Permits & Inspections

Are any permits or inspections needed prior or post installation?	yes	no
If yes, will host or NOAA obtain?	Host	NOAA

Please list any permits or inspections that need to be arranged by NOAA. _____

Electrical

Distance to AC Power? _____

Is it required or recommended that the underground AC cable to be in conduit?	yes	no

If yes, please elaborate. _____

AC power Status (check applicable):

Main Line only, will need transformer, etc.	
Transformer in place, need meter, etc.	
Meter in place, needs breaker box, etc.	
Breaker box in place, only need breaker.	← **Ideal**

Will AC power need to be energized by power company?	yes	no
Is an electrician required?	yes	no

If yes, please explain. _____

What needs to be done for the power to be turned on and the meter running? _____

_____

Power Company _____

phone(s) _____

Contact name _____

Is host to absorb cost of AC? (maximum load is only 1.35 AC Amps per hour)	yes	no
If not, will host pay bills and then be reimbursed, or will NOAA pay bills?	Host	NOAA

Billing Name _____

Address _____

_____

Phone _____

Miscellaneous

Host Expectations (in addition to those stated in the SLA) _____

_____

_____

Fence (check appropriate box**):**

no fence	
fence around tower	
fence around entire 60ft x 60ft area	

If fence is required, please describe desired fence. _____

_____

If fence is required, is there a known area contractor?	yes	no

If yes, please list name and phone number. _____

If fence is required, is it required immediately after install?	yes	no

Emergency Information

Emergency Phone (911?) _____

Nearest Hospital _____

Phone _____

Address _____

Address _____

Driving Directions (from the site to a major roadway) _____

_____

_____

_____

_____

_____

_____

Additional Comments _____

_____

_____

_____

_____

_____

_____

Host Representative: _____

NOAA Representative: Brent French 865/576-5647 865/386-7501 french@atdd.noaa.gov

Form Date: April 6, 2004

USCRN Site Install Issues

Site Location

State of Site _____

STN ID _____

Official Site Title _____

Local Slang Title _____

Latitude _____

Longitude _____

Elevation _____

Host Contact

name _____

organization _____

_____

address _____

_____

_____

_____

phone _____

phone _____

fax _____

email _____

Back-Up Contact (name & phone #) _____

Has contact seen site drawings? | yes | no |

Contact for site determination (i.e. who will NOAA interact with during install?**)**

name _____

phone(s) _____

email _____

Shipping Information (Where should any items for the CRN site be shipped?**)**

name _____

address _____

_____

_____

_____

phone _____

phone _____

email _____

Site Access

Will NOAA have unrestricted access to the site and be able to work late and on weekends?

yes	no

If not, please list any restrictions that will be placed on NOAA personal in regards to site access.

_____

_____

_____

Site Installation

Does host have a backhoe and/or trencher available?	Yes Backhoe	Yes Trencher	no
If yes, may NOAA operate?		yes	no
If no, may NOAA obtain and operate, or must a contractor be hired?		NOAA	Contractor
Will digging be difficult?		yes	no

If yes, please explain. (solid rock, large rocks?) _____

_____

For any installation work is it necessary to hire a contractor?	yes	no

If yes, please explain. _____

_____

If a contractor is required, is there a specific contractor desired?	yes	no

If yes, please list name, number, and task to be done by that contractor.

_____

_____

_____

Can vehicles (NOAA van (2WD), concrete truck) drive to the exact spot of the site?	yes	no

If no, please explain. _____

_____

Is there a concrete supplier that is used by the host, or at least delivers to the area?	yes	no

If yes, please list name and phone number. _____

_____

Permits & Inspections

Are any permits or inspections needed prior or post installation?	yes	no
If yes, will host or NOAA obtain?	Host	NOAA

Please list any permits or inspections that need to be arranged by NOAA. _____

Electrical

Site is to be solar powered.

Miscellaneous

Host Expectations (in addition to those stated in the SLA) _____

Fence (check appropriate box**):**

no fence	
fence around tower	
fence around entire 60ft x 60ft area	

If fence is required, please describe desired fence. _____

If fence is required, is there a known area contractor?	yes	no

If yes, please list name and phone number. _____

If fence is required, is it required immediately after install?	yes	no

Emergency Information

Emergency Phone (911?) _____

Nearest Hospital _____

Phone _____

Address _____

Address _____

Driving Directions (from the site to a major roadway) _____

_____

_____

_____

_____

_____

_____

Additional Comments _____

_____

_____

_____

_____

_____

_____

Host Representative: _____

NOAA Representative: _____

Form Date: August 28, 2003

USCRN Site Install Component Checklist

ST - STN ID - Site: | | | |

Prepared By: | | **Date:** | |

Indicate Y or N if item is needed

Included? - **Use initials to indicate that the item(s) has (have) been packed**

Included?		A	*Tower & Site Prep. Conduit*		
		1	tower		deburred
		2	base (roof top or concrete)		deburred
		3	(3) base to tower adaptor sleeves		
		4	1" diam x 10' conduit	AL	
		5	1" diam x 5' conduit	AL	
		6	1" diam x 3.25' conduit	AL	
		7	1" diam x 1.5' conduit	AL	
		8	(3) 1" diam x 1' conduit	AL	
		9	1" diam x 6' conduit	AL	
		10	(2) 2" diam x 8' conduit	AL	length = site dependant
		11	(2) 1" diam x 3' conduit	AL	length = site dependant
		12	(2) 1" diam x 3.5' conduit	AL	length = site dependant
		13	(10) 1" diam x 10' conduit	PVC	length = site dependant
		14	(4) 3/4" diam x 7' (legs for Alter)	SS	
		15	(2) 1/2" diam. x 8' grounding rods	CU	
		16	concrete form tube 16" diam. x 6'		
		17	concrete form tube 24" diam. x 2'		
		18	concrete form tube 16" diam. x 3'		
		19	concrete form tube 36" diam. x 5'		

		B	*Conduit & Fittings for Cable Protection Assembly*	
		#REF!	1 in. Ø tee - plumbing PVC	
		#REF!	1in. Ø to 3/4 in. Ø reducer - electrical PVC	
		#REF!	2 in. junction box type LB - electrical PVC (install vent)	
		#REF!	26 in. of 2 in. Ø conduit - electrical PVC	
		#REF!	16 in. of 2 in. Ø conduit - electrical PVC	
		#REF!	3 in. of 2 in. Ø conduit - electrical PVC	
		#REF!	2 in. Ø offset - hub to male threads - electrical PVC	
		#REF!	2 in. Ø 180^{o} - hub to hub - plumbing PVC	
		#REF!	2 in. Ø 90^{o} - hub to nun-hub - plumbing PVC	**1 20 ft of 3/4 in. liquid tight flex conduit**
		#REF!	2 in. Ø steel lock ring	**2 (2) 3/4 in. conduit hold-downs**
		#REF!	2 in. Ø ring - electrical PVC	**3 (2) 3/4 in. Ø 90o elbows - plumbing PVC**
		#REF!	(2) 2 in. Ø to 3/4 in. Ø reducer - plumbing PVC	
		#REF!	2 in. Ø to 1 in. Ø reducer - plumbing PVC	
		#REF!	2 in. Ø double tee - all hub - plumbing PVC	
		#REF!	2 in. Ø hub to male threads - electrical PVC	
		#REF!	2 in. plug - plumbing PVC - notched	
		#REF!	2 in. cap - plumbing PVC - notched	

Form Date: August 28, 2003

		C	***Hollaender Fittings***	
		1	(6) Hollaender 1"x1" offset cross assembly	
		2	(4) Hollaender 1"x1" offset cross	
		3	(2) Hollaender 1"x ¾" offset cross	
		4	(1) Hollaender 1" floor range	
		5	(1) Hollaender 2" floor flange (custom drilled)	
		6	(11) Hollaender 1" plug	
		7	(3) Hollaender ¾" plug	
		8	(2) Hollaender 2" plug	

		D	***Lumber***		
		1	(500) pickets 1"x2" x 4'	pressure treated	
		2	(9) 2"x4" x 8'	pressure treated	
		3	(9) 2"x4" x 6.5'	pressure treated	
		4	(24) 2"x4" x 10'	pressure treated	
		5	(17) 4"x4" x 10'	pressure treated	length = site dependant
		6	(TBD*) 4'x8' x 5/16" OSB	*depends on availability	
		7	(TBD*) 2"x4" x 8'	of concrete form tubes	

		E	***Alter Shield***
		1	(2) leaf assemblies
		2	(8) fittings (should be attached to leaves)

		F	***Aspirated Shields***		
		1	(3) aspirated shield fan assemblies (check connector, caulk)	SNs	
		2	(3) aspirated shield tubes		
		3	(3) aspirated shield cables	(4 pin)	

		G	***Transmitter Antenna***
		1	transmitter antenna

		H	***Rain Gauge(s)***	drilled base & cover,	
		1	rain gauge base, shell, & bucket	heater, & cable clip	
		2	(3) Geonor vibrating wire interfaces	SNs	
		3	Tipping bucket	SN	
		4	Tipping bucket heater		

		I	***Data Logger Enclosure***		
		1	fiberglass box		
		2	box mounts		
		3	(4) u-bolts	5/16" - 18 x 3"	locknuts
		4	CSI 23x	SN	
		5	battery & base		
		6	charger/controller	SN	
		7	Seimac HDR GOES	SN	
		8	transmitter to antenna cable		
		9	23x to transmitter cable		
		10	HDR GOES power cable		
		11	voltage divider		
		12	fuse block		
		13	(4) 3A ATC fuses		
		14	7.5A ATC fuse		
		15	10A ATC fuse		
		16	terminal strip & block		
		17	door switch & wires		
		18	heater control board		
		19	(2) heater control board jumper		

Form Date: August 28, 2003

		20	1000 Ohm Resistor		
		21	transmitter bracket		
		22	GOES antenna mount w/ u-bolts		
		23	GPS antenna with mount		
		24	SR sensor leveling plate		
		25	SR sensor Hollaender fitting		
		26	control board mounting plate		

		J	***BATTERY BOX***		
		1	aluminum box		
		2	charger		
		3	low voltage disconnect		
		4	surge suppressor		
		5	junction box		
		6	20A outlet		
		7	outlet cover plate		
		8	transformer for 23x battery charger		
		9	wiring harnesses w/ in-line fuse holder (30A)		
		10	ATM Fuse (30A)		
		11	mounting brackets		
		12	(2) u-bolts	3/8" - 16 x 3.5 in.	locknuts
		13	(2) spacers for u-bolts	no. 10	
		5	anemometer cable		

		K	***SENSORS***			
		1	(3) PRTs	package carefully	SNs	
		2	Kipp & Zonen SR	place in 23x box	SN	
		3	Apogee Instruments IR	place in 23x box	SN	
		4	MetOne anemometer	place in battery box	SN	

		L	***Additional Components***		
		1	static dissipater		
		2	rain gauge cable x 75' (10 conductor)		CUSTOM
		3	12 & 20 AWG cable x 25' (2 conductor each size)		
		4	(3) aspirated shield power cables		
		5	(3) Geonor datalogger interfaces		
		6	(3) Geonor vibrating wire		
		7	(8) block spade		
		8	(5) female disconnects		
		9	cable ties (large & small)		temp. stabilized
		10	short lock, long lock, & insert		
		11	(6) 1" diam x 90^{o} sweep		PVC
		12	(4) 1" diam male-threaded/female-slide on		PVC
		13	(4) 1" diam female-threaded/female-slide on		PVC
		14	(2) batteries	12V & 100 Ah	GEL
		15	grounding wire 4 AWG x 40'		CU
		16	Geonor wiring harness		

		M	***Hardware***		
		1	(3) Rain gauge mounting bolts	5/16" - 18 x 3 1/2"	locknuts
		2	(2) Battery box mounting bolts	3/8" - 16 x 0 3/4"	locknuts
		3	Lightning rod mounting bolt	1/4" - 20 x 1 3/4"	nut
		4	(2) Post connector mounting bolts	1/4" - 20 x 1/2"	nuts
		5	(2) ground rod clamps	1/2"	
		6	split bolt connect	4 -14 AWG	
		7	(3) post connector (pc)	4 -14 AWG	
		8	(3) SS screws for pc	5/16" - 24 x 3/4"	
		9	(32) lag bolts for hinges	5/16" - lag x 1 1/4"	

		10	(2) turn buckles		
		11	(4) hinges		
		12	(4) wire rope clips	small	
		13	tension wire brackets for gates	ATDD	
		14	(6) tower sleeve to tower bolts	3/8" - 16 x 2"	locknuts
		15	(6) tower sleeve to base bolts	3/8" - 16 x 2 1/2"	locknuts
		16	(2500) finish nails	6d x 1 1/2"	
		17	(250) deck screws	3 1/2"	
		18	(6) spacers for GOES bracket	no. 8	
		19	(3) bolts for SR	m6 x 30mm	
		20	(2) bolts for SR	m5 x 15mm	
		21	(2) bolts for SR	10 x 1"	
		22	(4) alter shield clamps		

List any items below that are to be purchased later.

qty		**description**

NOTES:

Form Date: April 1, 2004

USCRN Site Install Non Site-Specific Components Checklist

STN IDs:					

Prepared By:		Date:	

Indicate Y or N if item is needed

Included? - Use initials to indicate that the item(s) has (have) been packed

		A	***Tower & Site Prep. Conduit***	
		1	base (roof top)	
		2	(__)1" diam x 10' conduit	AL
		3	(__) 2" diam x 8' conduit	AL
		4	(__) 1" diam x 10' conduit	PVC

		B	***Conduit & Fittings***	
		1	20 ft of 3/4 in. liquid tight flex conduit	
		2	1 in. junction box type LB - electrical PVC	(2) 3/4 in. conduit hold-downs
		3	2 in. junction box type LB - electrical PVC (install vent)	

		C	***Hollaender Fittings***
		1	(6) Hollaender 1"x1" offset cross assembly
		2	(4) Hollaender 1"x1" offset cross
		3	(2) Hollaender 1"x ¾" offset cross
		4	(1) Hollaender 1" floor range
		5	(1) Hollaender 2" floor flange (custom drilled)
		6	(11) Hollaender 1" plug
		7	(3) Hollaender ¾" plug
		8	(2) Hollaender 2" plug

		D	***Lumber***	
		1	(__) pickets 1"x 2" x 4'	pressure treated
		2	(__) 2"x4" x 10'	pressure treated
		3	(__) 4"x4" x 10'	pressure treated

		E	***Alter Shield***
		1	(__) fittings

		F	***Aspirated Shields***
		1	(__) aspirated shield fans
		2	(__) aspirated shield cables

		H	***Rain Gauge***
		1	(__) Geonor vibrating wire interface(s)

		2	(__) Geonor vibrating wire(s)			
		3	(__) Geonor vibrating wire signal conditioner(s)			
		4	(__) Geonor vibrating wire fail safe(s)			

		I	***Data Logger Enclosure***			
		1	(__) u-bolt(s)	5/16" - 18 x 3"		
		2	CSI 23x		SN	
		3	charger/controller		SN	
		4	Seimac HDR GOES		SN	
		5	transmitter to antenna cable			
		6	23x to transmitter cable			
		7	voltage divider			
		8	fuse block			
		9	(4) 3A ATC fuses			
		10	7.5A ATC fuse			
		11	10A ATC fuse			
		12	terminal strip & block			
		13	magnetic door switch			
		14	heater control board			
		15	(2) heater control board jumper			
		16	1000 Ohm Resistor			
		17	GPS antenna			
		18	SR sensor Hollaender fitting			

		J	***BATTERY BOX***			
		1	charger			
		2	low voltage disconnect			
		3	surge suppressor			
		4	20A outlet			
		5	outlet cover plate			
		6	transformer for 23x battery charger			
		7	wiring harnesses w/ in-line fuse holder (30A)			
		8	ATM Fuse (30A)			
		9	(2) u-bolts	3/8" - 16 x 3.5 in.	locknuts	
		10	(2) spacers for u-bolts	no. 10		
		11	anemometer cable			

		K	***SENSORS***			
		1	(3) PRTs	package carefully	SNs	
		2	Kipp & Zonen SR	place in 23x box	SN	
		3	Apogee Instruments IR	place in 23x box	SN	

		L	***Additional Components***			
		1	(3) Geonor datalogger interfaces			
		2	block spades			
		3	female disconnects			
		4	cable ties (large & small)	temp. stabilized		
		5	short lock, long lock, & insert			
		6	duct seal			
		7	antifreeze			
		8	hydraulic oil			

		9	(6) 1" diam x 90^{o} sweep	PVC
		10	(4) 1" diam male-threaded/female-slide on	PVC
		11	(4) 1" diam female-threaded/female-slide on	PVC
		12	grounding wire	CU
		13	AC line AWG & Length = Site Dependent	
		14	1" flex pvc & fittings for AC line	
		15	Geonor wiring harness	

		M	***Hardware***		
		1	(3) Rain gauge mounting bolts	5/16" - 18 x 3 1/2"	locknuts
		2	(2) Battery box mounting bolts	3/8" - 16 x 0 3/4"	locknuts
		3	Lightning rod mounting bolt	1/4" - 20 x 1 3/4"	nut
		4	(2) Post connector mounting bolts	1/4" - 20 x 1/2"	nuts
		5	(2) ground rod clamps	1/2"	
		6	split bolt connect	4 -14 AWG	
		7	(3) post connector (pc)	4 -14 AWG	
		8	(3) SS screws for pc	5/16" - 24 x 3/4"	
		9	(32) lag bolts for hinges	5/16" - lag x 1 1/4"	
		10	(2) turn buckles		
		11	(4) hinges		
		12	(4) wire rope clips	small	
		13	tension wire brackets for gates	ATDD	
		14	(6) tower sleeve to tower bolts	3/8" - 16 x 2"	locknuts
		15	(6) tower sleeve to base bolts	3/8" - 16 x 2 1/2"	locknuts
		16	(2500) finish nails	6d x 1 1/2"	
		17	(250) deck screws	3 1/2"	
		18	(6) spacers for GOES bracket	no. 8	
		19	(3) bolts for SR	m6 x 30mm	
		20	(2) bolts for SR	m5 x 15mm	
		21	(2) bolts for SR	10 x 1"	

		N	***Useful Items***
		1	calibration weights
		2	calibration kit for TB3
		3	battery box template
		4	(2) rain gauge conduit template
		5	alter shield template
		6	stakes
		7	wire pulling aide
		8	(4) ratchet straps
		9	(__) straight rebar 3'
		10	(__) straight rebar 3'
		11	lithium grease
		12	bug-spray
		13	PVC Glue
		14	Zinc Spray
		15	site op. kit - fuses, screwdriver, Allen wrenches, pump
		16	meter socket
		17	breaker box & asst. breakers

M		***Useful Items***
1		calibration weights
2		battery box template
3		(2) rain gauge conduit template

Form Date: April 1, 2004

4		alter shield template
5		stakes
6		wire pulling aide
7		(10) ratchet straps
8		(8) straight rebar 3'
9		lubricant
10		bug-spray
11		spray paint
12		PVC Glue
13		Zinc Spray
14		site op. kit - fuses, screwdriver, Allen wrenches, pump
15		meter socket
16		breaker box & breaker

List any items below that are to be purchased later.

	qty	**description**

NOTES: _____

NEPA Statement for USCRN

The National Oceanic and Atmospheric Administration (NOAA) has a blanket NOAA Environmental Checklist for Proposed Actions (NEPA) for installation of United States Climate Reference Network (USCRN) stations. The signer of this document asserts that there are no deviations or exceptions to the standard form for the USCRN site located on the property listed below.

Name: **United States Climate Reference (USCRN) Project**

Project Number:

The real estate is owned and managed by:

Contact & Phone Number:

USCRN Site Test Manager:

Site Test Manager Signature:

Date:

USCRN Site "As-Built" Drawing

There is a hypothetical USCRN footprint standard configuration, but in many cases the installation team leader has some discretion as to the orientation of the 60 ft x 60 ft site area as well as the placement of the tower, the Geonor, and the battery box inside the site area. The drawing below shows the site "as-built".

Site Name:

Site Test Manager:

"As-Built":

List variations from standard USCRN site configuration.

Photographical Documentation Checklist for USCRN Site

☐ Photos taken By: _____

Photos should be made when there is good visibility at 100 meters. On clear days, the pictures should be taken as close to noon as possible. File names should include the compass direction where appropriate. Archive file format is jpg. Photos MUST be taken in order listed below so they will properly be labeled and created.

Prior to installation: Date: _____

1) One Ipix from the center of the tower site denoting objects within 100 meters and their heights. The finished Ipix should have an aligned compass in the center label area with 4 compass points labeled. The 186-degree image shots will be part of the official archive.

Start with NORTH
End with SOUTH

2) Sixteen overlapping annotated still photos from the center of the tower site taken every 22.5 degrees (the sixteen major compass points) denoting objects within 100 meters and their heights.

Start with N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW End with NNW

After installation: Date: _____

1) Four Ipix taken at ten meters from the tower fence at the four points of the compass. Each Ipix should have an aligned compass in the center label area. The 186-degree image shots will be part of the official archive. If the annual site visit uncovers significant change, these shots are to be retaken.

Photo 1: North: start with S, end with N
Photo 2: East: start with W, end with E
Photo 3: South: start with N, end with S
Photo 4: West: start with E, end with W

2) From a position four meters east of the tower and starting at due north, nine still photos taken every 22.5 degrees clockwise to due south denoting objects within 100 meters and their heights. Stitch photos into a single 180-degree image. To be retaken at each annual site visit and photos placed in the archive.

Start with N, NNE, NE, ENE, E, ESE, SE, SSE,
End with S

3) From a position four meters west of the tower and starting at due south, nine still photos taken every 22.5 degrees clockwise to due north denoting objects within 100 meters and their heights. Stitch photos into a single 180-degree image. To be retaken at each annual site visit and photos placed in the archive.

Start with S, SSW, SW, WSW, W, WNW, NW, NNW
End with N

4) From a position fifty meters south of the tower sixteen still photos taken every 22.5 degrees at the major compass points.

Start with N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW End with NNW

5) From a position fifty meters north of the tower sixteen still photos taken every 22.5 degrees at the major compass points.

Start with N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW End with NNW

6) From a position four meters north of the tower take a photo of the ground below the instruments with the instruments at top of the frame. Repeat this from positions four meters east, west and south of the tower.

7) At least four general site views that represents the most informative overall perspective. At least one photo should have the sun at the photographer's back, a margin of sky showing above the tower, and, if possible, the precip gauge in the background. It will be placed in the official archive as a "cover" shot for the station.

Location of original photos:
After photos are edited, properly saved, and sent to NCDC, they will be stored in file cabinet in Gabrielle's office. NCDC will receive cd with all photos. Photographer will receive cd with all photos.

Listing of Objects and Distance:

Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:

Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:
Object:	Distance:

USCRN Site Visit Data Verification

Form Date: May 13, 2004

ST/Stn ID - Loc:					
Pre or Post Visit?		**Date:**		**Prepared By:**	

	CSI 23x ?	**Progam Name**			
*6	97	**Version #**			
*7, 1, A, A		**Array ID FS Area 1**			
*7, 2, A, A		**Array ID FS Area 2**			
		GPS Lat/Lon			
*6	129,130	**23x Lat/Lon**			
			h:m:s	**d:y**	
		GPS Time			
*5		**23x Time**			
*6	39	**Testvolt**			
	82	**T1CAL5min**			
	83	**T2CAL5min**			
	84	**T3CAL5min**			
	9	**Windspeed**			
	10	**SolarRad**			
	11	**PanelTemp**			
	12	**AppT_1**			
	13	**AppT_2**			
	76	**RGTher**			
Does the Geonor heater control circuit work?					
Does the Geonor heater work?					
	79	**Tip15min**		(103.9 tips = 20.6) **&** (20.2 to 21.0 = **OK**)	
	91	**Fan Hz1**		**Tip15min Note:** start at the beginning	
	92	**Fan Hz2**		of a 15 min period so as not to	
	93	**Fan Hz3**		overlap 15 min periods.	
	88	**True Hz1**			
	89	**True Hz2**			
	90	**True Hz3**			
	94	**DoorOpen**			
Does the door switch work?					
	95	**BattVolt**			
	96	**CR23xBatt**			

Geonor Test (for AMV, do verification before and after calibration)

*6	25	**Depth_mm1**		**Addition**	
	31	**Depth_mm2**		_____ mL	
	37	**Depth_mm3**		(1000 mL= 50 mm)	
*5, A, A, A		**CSI 23X OS**		**OS Revision**	
use Dcpcomm		**Power For/Ref**		**Bytes Trnsmtd**	

CRN Station Database - Station History

Station Name:

GOES ID:

Event:

Event Date:

Site Information

Location:

Vector:

Elevation:

UTC Offset:
Time Zone:

Commission Code:

Operational Status:

COOP #:

State:

County

Lat/Lon:

Gov. Property ID :

Climate Division:

WBAN #:

Temperature Sensors

Manufacturer :	**Thermometrics Corporation**
Model Number :	**PRT**
Formula :	**T=C0+C1*V+C2*V^2**

# 1 SN :	
CC 0:	
CC 1:	
CC 2:	

# 2 SN :	
CC 0:	
CC 1:	
CC 2:	

# 3 SN :	
CC 0:	
CC 1:	
CC 2:	

Wind Speed Sensors

Manufacturer :	**Met One**
Model Number :	**014A**
Formula :	**WS(m/s)=C0+C1*Hz**
SN :	
CC 0:	
CC 1:	

Rain Gauge (PRIMARY)

Manufacturer :	**Geonor**
Model Number :	**T-200B**
Formula :	**mm=A*(Hz-fo)+B*(Hz-fo)^2**
Wind Shield:	
Transducer 1 SN :	
fo:	
A:	
B:	
Transducer 2 SN :	
fo:	
A:	
B:	
Transducer 3 SN :	
fo:	
A:	
B:	

Rain Gauge (SECONDARY)

Manufacturer :	**EcoHarmony**
Model Number :	**TB3**
Formula :	**mm = Co x Tips**
SN :	
CC 0 :	**0.2**
Heater SN :	

Solar Radiation

Manufacturer :	**KIPP & ZONEN**
Model Number :	**SP LITE**
Formula :	**W/m^2=C0+C1*mvolts**
SN :	
CC 0 :	
CC 1 :	

Surface Temperature

Manufacturer :	**Apogee Instruments Inc.**
Model Number :	**IRTS-P**
Formula :	**Surface T in C= C0+C1*mv**
SN :	

RelativeHumidity/Temperature

Manufacturer :	
Model Number :	
SN :	
RH Formula :	
CC 0 :	
CC 1 :	
Temp Formula :	
CC 0 :	
CC 1 :	

Datalogger

Manufacturer :	**Campbell Scientific**
Model Number :	**CR23X**
SN :	
CRN Version No.:	

GOES Transmitter

Manufacturer :	SEIMAC
Model Number :	SAT HDR
SN :	
Platform ID :	
Transmission Time:	
Transmission Channel:	
Transmitter EPROM Software Version :	
Antannae Angle:	
Antannae Orientation:	
GOES Satellite Assignment:	

23x Charger / Controller

Manufacturer :	Campbell Scientific
Model Number :	CH 12 R
SN :	

Temperature Aspirated Shield

Manufacturer :	MetOne
Model Number :	076B
# 1 SN :	
# 2 SN :	
# 3 SN :	

Site Contact Info

Contact :	
Address 1 :	
Address 2 :	
City :	
State :	
zip :	
Phone :	
Fax # :	
Email :	

Site driving Directions

Form Date: March 8, 2004

Platform's Description Table

* - indicates required field, dashed border indicates variables

Site ID - Location:

Platform ID: Time: Satellite:

Prepared By: Date:

MAX RETRIES Max. number of interrogation retries:	"1"
DATA FORMAT Data format (A:ASCII, B:Binary):	"A"
PRIME_PREAMBLE Prime preamble (L:Long, S:Short): *	"S"
SCND PREAMBLE Secondary preamble (L:Long, S:Short): *	"S"
LOC_CODE Location Code: * Enter 2 Letter State Abreviation or 3 Letter Province Code	
LOC_REGION Location: * (A)= UNITED STATES (B)= CANADA (C)=SOUTH AMERICA (O)= Other	"A"
LOC_NAME Location: *	
LATITUDE Latitude (DDMMSS ; use - for South): *	
LONGITUDE Longitude (DDMMSS ; use - for West): *	
MIN_ELEVATION Min. elevation angle of platform (DD):	"5"
CATEGORY Platform category: * **(L)and (F)ixed-Buoy (D)rift-Buoy (A)irborne (S)hip (O)ther	"L"
MANUFACTR_ID DCPRS manufacturer name: *	"SEIMAC"
MODEL_NO DCPRS model number: *	"SATHDRGOES"
SEASON_ID Seasonal indicator: *	"N"
DATE DEPLOY Date deployed (YYYYMMDD): *	
DATE REDEPLOY Date redeployed (YYYYMMDD):	
PMAINT_NAME Maintenance official name: *	"MARK HALL"
PMAINT_PHONE Maintenance official phone: *	"865-576-0366"
PMAINT_FTS Maintenance official FTS phone:	NA
PMAINT_FAX Maintenance FAX phone:	"865-576-1327"
PMAINT_TELEX Maintenance official telex:	NA

SHEF_CODE1: *	"TA"	**SHEF_CODE2:**	"P"	**SHEF_CODE3:**	"WS"	**SHEF_CODE4:**	NA	**SHEF_CODE5:**	NA
SHEF_CODE6:	NA	**SHEF_CODE7:**	NA	**SHEF_CODE8:**	NA	**SHEF_CODE9:**	NA	**SHEF_CODE10:**	NA

GEONOR CALIBRATION

ST / Station ID:	
Date:	
Prepared By:	

	SERIAL #	**SERIAL #**	**SERIAL #**
WEIGHT (mg)	**FREQ. (F) (Hz)**	**FREQ. (F) (Hz)**	**FREQ. (F) (Hz)**
0			
1000			
2000			
3000			
4000			
5000			
6000			
7000			
8000			
9000			
10000			
11000			
12000			

$F_o(e^0)$			
$A\ (e^{-2})$			
$B\ (e^{-6})$			

Form Date: April 9, 2003

Location: _____ Date: _____ Surveyor: _____

Temperature & Humidity Classification / Classification Number	**1**		**2**		**3**		**4**		**5**	
Distance from artificial heating sources and reflective surfaces (m)	=300	14 pts	=240 <300	12 pts	=100 <240	8 pts	=50 <100	5 pts	<50 *	0 pts
Distance to large bodies of water (m) (When location near water is not representative of the area)	=300	12 pts	=240 <300	0 pts	=100 <240	7 pts	=50 <100	5 pts	<50 *	0 pts
Angular height of surrounding vegetation within 100 m radius (80% or more coverage is below the angle specified)	< 5°	8 pts	>5° =6°	6 pts	>6° <11°	2 pts	>11° *	0 pts	*	0 pts
Slope of cleared, flat ground surface within 30 m radius	=8º	6 pts	>8 º =15 º	2 pts	>15º = 23º	2 pts	>23° *	0 pts	*	0 pts

Precipitation Classification / Classification Number	**1**		**2**		**3**		**4**		**5**	
Angular height of nearest obstacle with angular width > 10 deg	14°	20 pts	27°	20 pts	45°	10 pts	*	0 pts	*	0 pts

Wind Classification / Classification Number	**1**		**2**		**3**		**4**		**5**	
Angular height of nearest "significant" obstacle (angular width >10 deg.)	= 6°	7 pts	> 6 ° = 8°	4 pts	>8 = 11°	2 pts	>11° *	0	*	0
Angular width of nearest "thin" obstacle (angular width <10 deg.)	4°	4 pts	5°	3 pts	6°	1 pt	>6°	0	*	0
Surrounding terrain relief change (m) (Expressed as height difference within a radius around the site)	<5m/ 300 m	4 pts	<5m/ 100 m	2 pts	<1m/ 10 m	2 pts	>1m/ 10 m	1 pt	*	0

Solar Radiation Classification / Classification Number	**1**		**2**		**3**		**4**		**5**	
Angular height of Solar Horizon (degrees) (Average angular height throughout the sector from 60° to 300°)	=7°	0 pts	>7° to =10°	6 pts	>10° to =15°	2 pts	>15° *	0	*	0
Height of "significant" obstacles (angular width >10°, <20°) (Expressed as angular height to top of obstacle)	= 12°	6 pts	> 12° = 16°	4 pts	>16° = 22°	2 pts	<10/ >22° *	0	*	0

Scores: Temperature& RH _____ Class: _____
Precipitation: _____ Class: _____
Wind: _____ Class: _____
Solar Radiation: _____ Class: _____

Total Score: _____

Acceptable (circle one): Yes No

	Temp/RH	Precip	Wind	SolarRad
Class 1	35-40 points	25-30	13-15	13-15
Class 2	30-34 points	20-24	10-12	8-12
Class 3	20-29 points	10-19	5-9	5-7
Class 4	10-19 points	unacceptable	1-4	unacceptable
Class 5	unacceptable	unacceptable	unacceptable	unacceptable

(Draft 3 12/10/02 OSD/ELM)

Site Survey Scoring Sheet Notes

The Scoring Sheet is intended to supplement the Site Survey Checksheet. There is no question that the survey process requires judgment, skill, and experience and hence a good measure of subjectivity. The intention here is to attempt to objectivize, insofar as possible, the survey process. A successful scoring schema has several important advantages:

- **Serves as a cross check to the Site Survey Checksheet**
- **Greatly assists metadata analysis in subsequent years**
- **Could serve as a "tie-breaker" for competing Class 1 sites**

General Considerations

1. **The Temperature and Precipitation elements are given the most weight, in that these are the primary parameters that drive the rest.**
2. **Precipitation is given slightly less weight than temperature since satisfaction of all Class 1 or 2 temperature criteria is very positive for precipitation as well.**
3. **Some point values for various elements are mutually exclusive, e.g., class 5 for solar with class 1 for temperature, or class 1 for solar and class 4 for precipitation, etc.**
4. **Angular measurements are used wherever possible. M. Leroy's distance-height ratios have merely been converted to angles as a check on distance estimates in the field.**

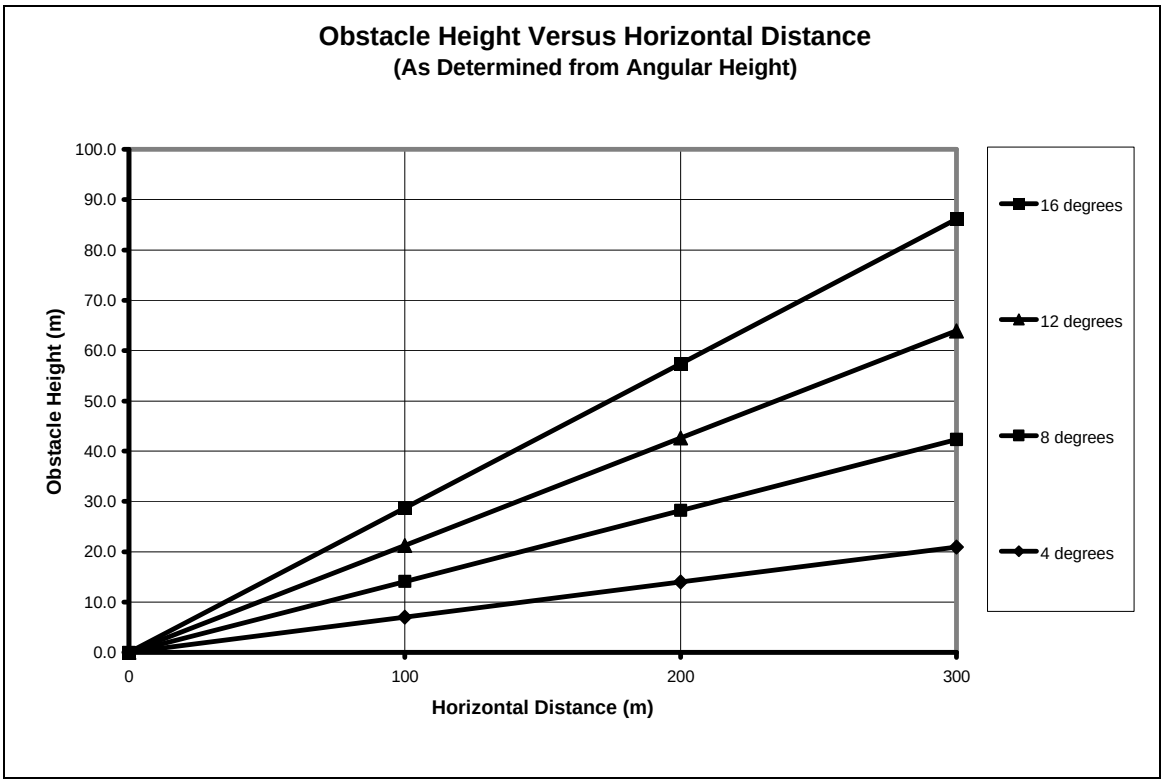
Suggested Use of the Checksheet

The Checksheet is intended to be convenient to use. The Surveyor merely circles the points relevant to the rated criteria, adds the points for each element, converts the score to a Class using the table at the bottom left of the Scoresheet. Finally, all element scores are added for a total score, which leads to an acceptable or non-acceptable rating.

Suggested Use of the Angular Height Diagram

The Diagram is intended as an aid in assessing the acceptability of significant obstacles and surrounding vegetation. Heights in terms of elevation angles (0 deg. to 16 deg.) vs. distance are obtainable directly and by interpolation. Note that the Origin is actually around eye level.

(Draft2 1/10/03 OSD/HB)


Obstacle Height Versus Horizontal Distance
(As Determined from Angular Height)
Obstacle Height (m)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0
100
200
300
Horizontal Distance (m)
16 degrees
12 degrees
8 degrees
4 degrees