DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 110TH AVENUE NE, P.O. BOX 90012
BELLEVUE, WA 98009-9012

DETERMINATION OF NON-SIGNIFICANCE

PROPONENT:
Ron Meckler, Powder River Development Services

LOCATION OF PROPOSAL:
2664 146th Avenue SE, Bellevue, WA

DESCRIPTION OF PROPOSAL:.
Application for an administrative conditional use permit to replace a 38.3 foot tall PSE pole with a 53 foot tall PSE pole, with a flush-mounted wireless communications antenna array at the top of the pole. Associated mechanical equipment will be mounted on a concrete slab on the opposite side of the street.

FILE NUMBER: 10-106190-LA

The Environmental Coordinator of the City of Bellevue has determined that this proposal does not have a probable significant adverse impact upon the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(C). This decision was made after the Bellevue Environmental Coordinator reviewed the completed environmental checklist and information filed with the Development Services Section. This information is available to the public on request.

☐ There is no comment period for this DNS

☒ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS. There is a 14-day appeal period. Only persons who submitted written comments before the DNS was issued may appeal the decision. A written appeal must be filed in the City Clerk's Office by 5 p.m. on

☐ This DNS is issued under WAC 197-11-340(2) and is subject to a 14-day comment from the date below. Comments must be submitted by 5 p.m. on _____.

This DNS may be withdrawn at any time if the proposal is modified so that it is likely to have significant adverse environmental impacts; if there is significant new information indicating, or on, a proposals probable significant adverse environmental impacts (unless a non-exempt license has been issued if the proposal is a private project): or if the DNS was procured by misrepresentation or lack of material disclosure.

Carol V Helland
Environmental Coordinator

10/7/10
Date

OTHERS TO RECEIVE THIS DOCUMENT:
State Department of Fish and Wildlife
State Department of Ecology, Shoreline Planner N.W. Region
Army Corps of Engineers
Attorney General
Muckleshoot Indian Tribe

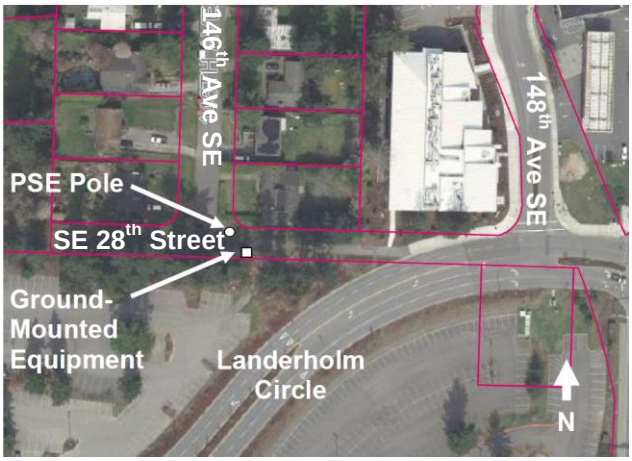
City of Bellevue
Development Services Department
Land Use Staff Report

Proposal Name:	Clearwire WA SEA648
Proposal Address:	2664 146th Avenue SE
Proposal Description:	Application for an administrative conditional use permit to replace a 38.3 foot tall PSE pole with a 53 foot tall PSE pole, with a flush-mounted wireless communications antenna array at the top of the pole. Associated mechanical equipment will be mounted on a concrete slab on the opposite side of the street.
File Number:	10-106190-LA
Planner:	Mike Upston, AICP, Senior Planner
Applicant:	Ron Meckler, Powder River Development Services
Recommendations Included:	Administrative Conditional Use Permit (Process II, Land Use Code 20.30E)
State Environmental Policy Act Threshold Determination:	**Determination of Non-Significance (DNS)** Carol V Helland Carol V. Helland, Environmental Coordinator Development Services Department
Director's Decision:	**Approval with Conditions** Michael A. Brennan, Director Development Services Department By: Carol V Helland Carol V. Helland, Land Use Director Development Services Department

Decision Publication Date:	10/7/10
Appeal Deadline:	10/21/10

For information on how to appeal a proposal, visit Development Services at City Hall or call (425) 452-6800. Comments on State Environmental Policy Act (SEPA) Determinations can be made with or without appealing the proposal within the noted comment period for a SEPA Determination. Appeal of the Decision must be received in the City's Clerk's Office by 5 PM on the date noted for appeal of the decision.

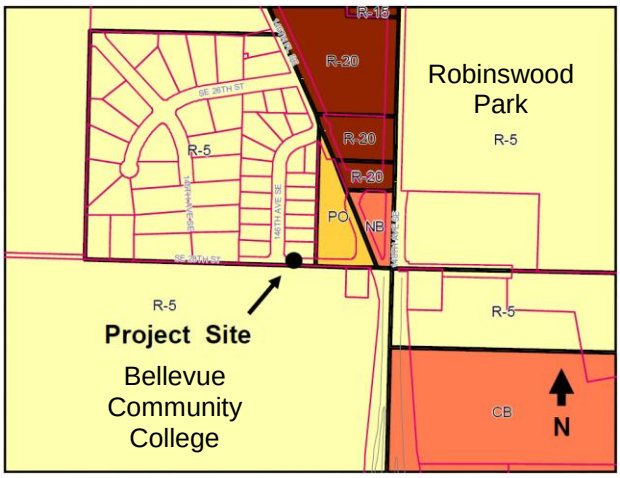
I. Request/Proposal Description



The purpose of this application is to replace a 38.3 foot tall PSE pole with a 53 foot tall PSE pole, with a flush-mounted, three-panel wireless communications antenna array and three microwave dishes at the top of the pole. Associated mechanical equipment will be mounted on a concrete slab on the opposite side of the street. Clearwire communications services would be provided to an approximately two thousand foot distance to the north, west, and south covering all of the Bellevue Community College campus to the south and residential neighborhoods to the west and north.

II. Site Description and Context

As shown on the photo above, the facility location is within City of Bellevue right-of-way, with the proposed new PSE pole and antennas on the north side of the road and ground-mounted mechanical equipment on the south side of the road. This area is in the West Lake Hills neighborhood and has a variety of residential and commercial land use districts throughout (see map to the left).



Bellevue Community College is to the immediate south/southwest, Fire Department and churches to the east, Robinswood Park to the northeast, and single family homes to the north/northwest.

The proposed 15 foot pole height extension will provide the minimum PSE-required separation between the existing power lines and the bottom of the proposed antennas. Clearwire's radio frequency (RF) engineer has determined that the resulting height would be adequate to provide a signal to the coverage area, as described in the RF engineer's report and propagation maps available for viewing in the City's project file, Development Services Department Records Office.

III. Environmental Impacts of the Proposal

The environmental review indicates no probability of significant adverse environmental impacts occurring as a result of the proposal. The Environmental Checklist submitted with the application adequately discloses expected

environmental impacts associated with the project. The City codes and requirements, including the Clear and Grade Code, Utility Code, Land Use Code, Noise Ordinance, Building Code and other construction codes adequately mitigate expected environmental impacts. Therefore, issuance of a Determination of Non-Significance (DNS) is the appropriate threshold determination under the State Environmental Policy Act (SEPA) requirements. The SEPA Checklist is available for viewing in the project file at the City Hall Records Room.

IV. Public Comment

The applicant filed this application on February 26, 2010. The surrounding property owners were mailed notice of the proposal in the weekly Permit Bulletin on March 18, 2010, and a public information sign was installed that same day adjacent to the existing PSE pole. The public comment period established for this application ended on April 1, 2010. At the time of completing this report, no public comments were received regarding this proposal.

V. Applicable Decision Criteria / Findings and Conclusions

Compliance with decision criteria of Land Use Code Section 20.30E.140 is discussed below.

A. The administrative conditional use is consistent with the Comprehensive Plan.

Finding: This proposal is consistent with Bellevue's Comprehensive Plan policies regarding such facilities. The Comprehensive Plan policies listed below from the Utility Element have been considered in support of the City's decision regarding this site:

(1) UT-40. Require the reasonable screening and/or architecturally compatible integration of all new above-ground utility facilities.
(2) UT-40a. Protect Bellevue's aesthetic quality and infrastructure investment from unnecessary degradation caused by the construction of telecommunication infrastructure.
(3) UT-43. Encourage consolidation on existing facilities where reasonably feasible and where such consolidation leads to fewer impacts than would construction of separate facilities.
(4) UT-55. Require the placement of personal wireless communication facilities in a manner that minimizes adverse impacts on adjacent land uses.
(5) UT-59. Recognize that personal wireless communication facilities will be deployed in all areas of the city to provide coverage and capacity consistent with the changing use of wireless technology. Minimize the attendant impacts, particularly the visual impacts, of personal wireless communication facility towers, lattice towers and structures by utilizing criteria for the design and location of such facilities that appropriately balance the need for wireless services and the impacts of the necessary facilities.
(6) UT-61. Minimize visual impacts of personal wireless communication facilities by encouraging system designs in the following preferred and descending order: 1) attached to public facility structures, building mounted, or integrated with utility poles, light standards, and signal

supports; 2) co-located on utility poles, light standards, signal supports; and 3) free standing towers.

(7) UT-64. Encourage the use of utility poles and towers on public rights of way to install wireless equipment compatible with other utility functions.

Clearwire's proposal is consistent with these policies since the proposed location represents the least impact while still achieving Clearwire's coverage and capacity needs, and the proposed design includes elements that will minimize visual intrusion, as summarized under criteria B below.

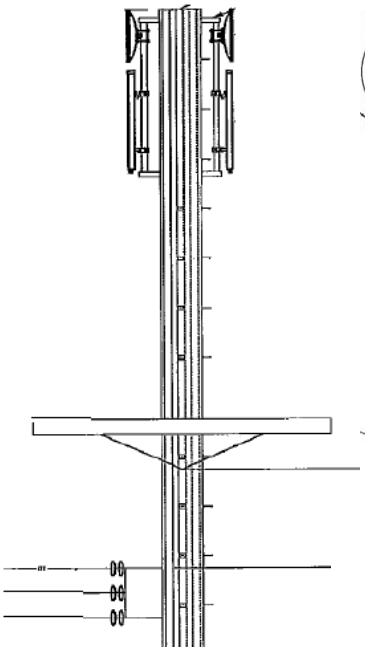
Consistency with UT-43 (encourage consolidation) is particularly worth noting here. The applicant's analysis of location and design alternatives (available for viewing in the City's project file) conclusively identifies this site as a co-located facility as preferable to other locations or designs.

B. The design is compatible with and responds to the existing or intended character, appearance, quality of development and physical characteristics of the subject property and immediate vicinity.

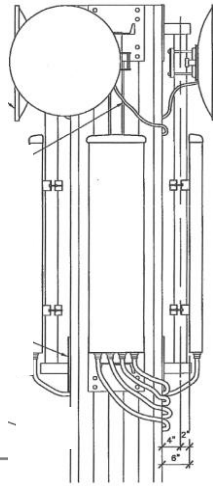
Finding: To ensure that the facility is compatible with property in the immediate vicinity, the proposal incorporates the following measures:

(1) The replacement pole will be wooden so as to be as compatible as possible with other nearby PSE poles.

(2) The antenna array and microwave dishes will be flush-mounted to the pole. A condition of approval is included within section VII of this report requiring that the antennas and microwave dishes extend no more than six inches from the face of the pole and do not extend to the side or above the top of the pole. Another condition requires the antennas, microwave dishes, and all ancillary components be painted to match the pole.



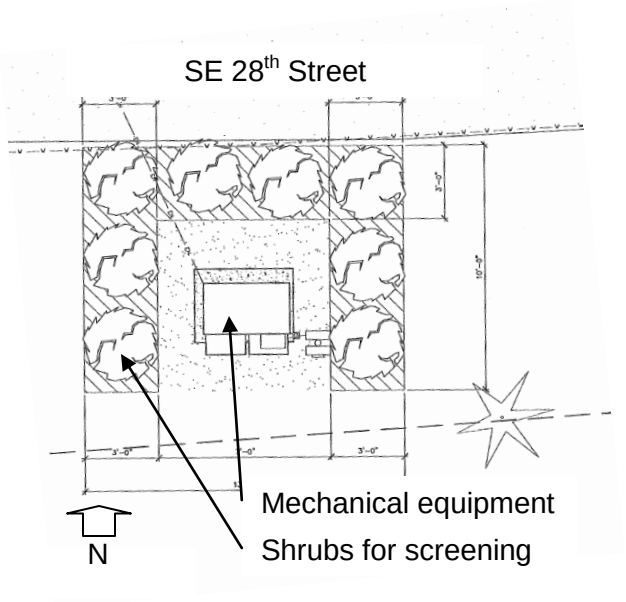
Proposed pole with antennae & microwave dishes



Enlarged drawing of top of pole

(3) A condition of approval is included within section VII of this report requiring that the RRU's currently shown on the plans as pole-mounted (see plan sheet A-2) be relocated to the equipment area so they are out of sight, with conduit to them routed underground.

(4) The ground-mounted mechanical equipment will not exceed the dimensional limits prescribed by the Land Use Code, and will be screened with shrubs. A condition of approval is included in section VII of this report requiring a landscape assurance device for any required landscaping not installed at final inspection, as well as labor and materials for landscape maintenance for a period of one year from date of final inspection.



C. The administrative conditional use will be served by adequate public facilities including streets, fire protection, and utilities.

Finding: The facility is located within a public right-of-way served by adequate public facilities including streets and fire protection.

D. The administrative conditional use will not be materially detrimental to uses or property in the immediate vicinity of the subject property.

Finding: As discussed in subsection A above, the proposed facility modification is the least visually intrusive option, apart from a no-project option. However, a condition of approval is included in section VII of this report requiring that the facility be removed when it ceases to be operational or if it falls into disrepair. Another condition of approval requires that the facility be removed at no expense to the City if co-located on an electrical system facility or utility support structure that is subsequently under grounded.

E. The administrative conditional use complies with the applicable requirements of the Land Use Code.

Finding: The proposal meets all Land Use Code requirements applicable to non-exempt wireless communications facilities per LUC 20.20.195.D 1-9.

VI. Decision

After conducting the various administrative reviews associated with this proposal, including applicable land use consistency, SEPA, and City Code and Standard compliance reviews, the Development Services Director does hereby **APPROVE** the proposal subject to the following conditions:

VII. Conditions of Approval

1. **Flush-Mount**
   The distance between the pole face and the antennas & microwave dishes shall neither exceed six inches nor extend to the side or above the top of the pole.
   REVIEWER: Mike Upston, (425) 452-2970
   AUTHORITY**:** LUC 20.20.195.B.1.a.v

2. **Paint to Match**
   The antennas, microwave dishes, and all ancillary components shall be painted to match the pole.
   REVIEWER: Mike Upston, (425) 452-2970
   AUTHORITY**:** LUC 20.20.195.B.1.a.v

3. **Relocate RRU's**
   The RRU's currently shown on the plans as pole-mounted (sheet A-2) shall be relocated to the equipment area so they are out of sight, with conduit to them routed underground.
   REVIEWER: Mike Upston, (425) 452-2970
   AUTHORITY**:** LUC 20.20.195.B.1.a.v

4. **Landscape Assurance Device**
   The applicant shall provide a landscape assurance device (assignment of savings or letter of credit) for 150% of the fair market value of labor and materials for any required landscaping not installed at final inspection. It shall also cover 20% of the fair market value of labor and materials for landscape maintenance for a period of one year from date of final inspection.
   REVIEWER: Mike Upston, (425) 452-2970
   AUTHORITY**:** LUC 20.20.520.K.1 and 2, and 20.20.520.L.1 and 2

5. **Removal of Abandoned Sites**
   The owner of this facility shall provide the Director with copies of any notice of intent to cease operations that is provided to the Federal Communications Commission (FCC). All wireless communications devices and associated equipment shall be removed by the facility owner within 90 days of the date it ceases to be operational, or if the facility falls into disrepair and is not maintained. Disrepair includes structural features, paint, or general lack of maintenance, which could result in safety or visual impacts.
   REVIEWER: Mike Upston, (425) 452-2970
   AUTHORITY: LUC 20.20.195.D.8

6. **Removal Upon Undergrounding:** The facility shall be removed at no expense to the City if co-located on an electrical system facility or utility support structure that is subsequently undergrounded.
   REVIEWER: Mike Upston, (425) 452-2970
   AUTHORITY: LUC 20.20.195.D.9

Attached: Project Plans

clear wire®

BELLEVUE CC PSE POLE

WA-SEA0648-C

2664 146TH AVE SE
BELLEVUE, WA 98007

PROJECT INFORMATION

PROJECT DESCRIPTION:

CLEARWIRE PROPOSES TO CONSTRUCT AN UNSTAFFED TELECOMMUNICATIONS FACILITY CONSISTING OF (3) PANEL ANTENNAS, (3) MICROWAVE DISHES, AND (3) RRU'S MOUNTED ON A REPLACEMENT PSE 53'-0" AGL WOOD-LAM UTILITY POLE WITH EQUIPMENT CABINET MOUNTED ON A CONCRETE SLAB NEAR BASE OF POLE WITHIN A 7'-0"X7'-0" LEASE AREA SURROUNDED BY PROPOSED LANDSCAPING.

APPLICANT:
CLEARWIRE, LLC
4400 CARILLON POINT
KIRKLAND, WA 98033
CONTACT: EDWARD HILL
PH: (425) 216-4730

CODE INFORMATION:
ZONING CLASSIFICATION: RIGHT-OF-WAY
BUILDING CODE: 2009 IBC
CONSTRUCTION TYPE: IIB
OCCUPANCY: S-2
JURISDICTION: CITY OF BELLEVUE
CURRENT USE: PSE UTILITY POLE
PROPOSED USE: TELECOMMUNICATIONS FACILITY

TELCO COMPANY:
QWEST
PH: (800) 475-7526

POWER COMPANY:
PUGET SOUND ENERGY
PH: (888) 225-5773

SITE LOCATION: (BASED ON NAD 83):
LATITUDE: 47° 35' 7.69" N
LONGITUDE: 122° 8' 40.75" W
TOP OF STRUCTURE AGL: 53'-0"
BASE OF STRUCTURE AMSL: 418'-6"

PARCEL NUMBER(S):
RIGHT-OF-WAY 146TH AVE SE

AREA OF PARCEL:
N/A

PROJECT AREA:
49 S.F. EQUIPMENT LEASE AREA

PROPERTY OWNER:
PUGET SOUND ENERGY
PO BOX 90868
BELLEVUE, WA 98009
CONTACT: TIM GASSER
PHONE: (425) 456-2776

SITE ACQUISITION:
CONTACT: TODD FIEBIG
PH: (206) 354-9271

CONSTRUCTION:
CONTACT: LARRY BELL
PH: (360) 329-6879

PERMITTING:
CONTACT: RON MECKLER
PH: (206) 384-2454

RF ENGINEER:
CONTACT: CESAR TANSENGCO
PH: (214) 649-1734

BH ENGINEER:
CONTACT: ROSS GALANG
PH: (318) 402-6549

GENERAL INFORMATION:
1. PARKING REQUIREMENTS ARE UNCHANGED.
2. TRAFFIC IS UNAFFECTED.
3. SIGNAGE IS PROPOSED.

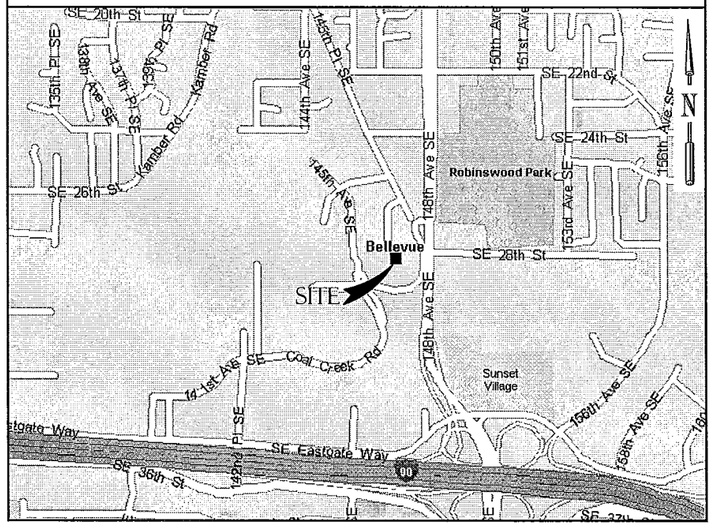
PROJECT TEAM

PROJECT ARCHITECT
RICHARD B. HALL, AIA
PACIFIC TELECOM SERVICES, LLC
568 FIRST AVENUE, S., SUITE 650
SEATTLE, WA 98104
CONTACT: PAUL DANNEBERG
PH: (206) 375-3798
EMAIL: PDANNEBERG@PTSWA.COM

PROJECT CONSULTANT
POWDER RIVER
DEVELOPMENT SERVICES, LLC
17400 SW UPPER BOONES FERRY RD
SUITE 270
PORTLAND, OR 97224

STRUCURAL ENGINEER
PACIFIC TELECOM SERVICES, LLC
568 FIRST AVENUE, S., SUITE 650
SEATTLE, WA 98104
CONTACT: CHRIS NICKERSON
PH: (206) 464-4415

VICINITY MAP



DRIVING DIRECTIONS

FROM SEATTLE-TACOMA INTERNATIONAL AIRPORT:
HEAD SOUTHWEST TOWARD S 182 ST, CONTINUE STRAIGHT ONTO S 182 ST, TURN LEFT AT INTERNATIONAL BLVD/WA-99 N, TAKE THE RAMP ONTO WA-518 E, CONTINUE ONTO I-405 N, TAKE EXIT 11 TO MERGE ONTO I-90 E TOWARD SPOKANE, TAKE EXIT 11B TO MERGE ONTO 148TH AVE SE, TURN LEFT AT SE 24TH ST, TAKE THE 1ST LEFT ONTO 145TH PL SE, 145TH PL SE TURNS RIGHT AND BECOMES 146TH AVE SE; DESTINATION WILL BE ON THE LEFT

FROM CLEARWIRE OFFICE (KIRKLAND, WA):
HEAD NORTH ON CARILLON POINT TOWARD ACCESS DRIVEWAY, TAKE THE 1ST RIGHT ONTO ACCESS DRIVEWAY, CONTINUE ONTO LAKEVIEW DR, CONTINUE ONTO NE 68TH ST, TURN RIGHT TO MERGE ONTO I-405 S, TAKE EXIT 11 TO MERGE ONTO I-90 E TOWARD SPOKANE, TAKE EXIT 11B TO MERGE ONTO 148TH AVE SE, TURN LEFT AT SE 24TH ST, TAKE THE 1ST LEFT ONTO 145TH PL SE, 145TH PL SE TURNS RIGHT AND BECOMES 146TH AVE SE; DESTINATION WILL BE ON THE LEFT

APPROVAL	DATE	SIGNATURE
CLEARWIRE:		
LANDLORD:		
CONST:		
S/A:		
R.F.:		
ZONING:		
A&E:		
B.H.:		

REVIEWERS SHALL CLEARLY PLACE INITIALS ADJACENT TO EACH REDLINE NOTE AS DRAWINGS ARE BEING REVIEWED

DRAWING INDEX

ABBREVIATIONS

A/C	AIR CONDITIONING	HORZ	HORIZONTAL	PLYWD	PLYWOOD
AGL	ABOVE FINISH GRADE	HR	HOUR	PROJ	PROJECT
APPROX	APPROXIMATELY	HT	HEIGHT	PROP	PROPERTY
		HVAC	HEATING VENTILATION AIR CONDITIONING	PT	PRESSURE TREATED
BLDG	BUILDING			REQ	REQUIRED
BLK	BLOCKING			RM	ROOM
CLG	CEILING	ID	INSIDE DIAMETER	RO	ROUGH OPENING
CLR	CLEAR	IN	INCH		
CONC	CONCRETE	INFO	INFORMATION	SHT	SHEET
CONST	CONSTRUCTION	INSUL	INSULATION	SIM	SIMILAR
CONT	CONTINUOUS	INT	INTERIOR	SPEC	SPECIFICATION
		IBC	INTERNATIONAL BUILDING CODE	SF	SQUARE FOOT
DBL	DOUBLE			SS	STAINLESS STEEL
DIA	DIAMETER			STL	STEEL
DIAG	DIAGONAL	LBS	POUNDS	STRUCT	STRUCTURAL
DN	DOWN			STD	STUD
DET	DETAIL	MAX	MAXIMUM	SUSP	SUSPENDED
DWG	DRAWING	MECH	MECHANICAL		
		MTL	METAL	THRU	THROUGH
EA	EACH	MFR	MANUFACTURE	TNNG	TINNED
ELEV	ELEVATION	MGR	MANAGER	TYP	TYPICAL
ELEC	ELECTRICAL	MIN	MINIMUM		
EQ	EQUAL	MISC	MISCELLANEOUS	UNO	UNLESS NOTED OTHERWISE
EQUIP	EQUIPMENT				
EXT	EXTERIOR	NA	NOT APPLICABLE	VERT	VERTICAL
		NIC	NOT IN CONTRACT	VIF	VERIFY IN FIELD
FIN	FINISH	NTS	NOT TO SCALE		
FLUOR	FLOURESCENT			W/	WITH
FLR	FLOOR	OC	ON CENTER	W/O	WITHOUT
FT	FOOT	OD	OUTSIDE DIAMETER	WP	WATER PROOF
GA	GAUGE				
GALV	GALVANIZED				
GC	GENERAL CONTRACTOR				
GRND	GROUND				
GYP BD	GYPSUM WALL BOARD				

LEGAL DESCRIPTION

RIGHT-OF-WAY 146TH AVE SE

NOTES

1. (12) RUNS OF 7/8" COAX CABLE, (6) RUNS OF RET CABLE & (3) RUNS OF 1/2" COAX TO BE ATTACHED TO INTERIOR OF COAX SHROUD OF WOOD-LAM POLE

2. ALL VISIBLE EQUIPMENT, INCLUDING THE ANTENNAS, MOUNTING HARDWARE, CABLES, AND CONNECTORS TO BE PAINTED A NON-REFLECTIVE COLOR TO MATCH PROPOSED WOOD-LAM POLE.

3. ALL CABLING TO BE INSTALLED IN A WORKMANLIKE MANNER, WITH MINIMAL SLACK, BUNDLED AND DRESSED.

4. EXACT LOCATION OF NEW REPLACEMENT PSE POLE TO BE DETERMINED BY PSE.

clear wire®
4400 CARILLON POINT
KIRKLAND, WA 98033

PTS
PACIFIC TELECOM SERVICES, LLC
568 First Avenue S., Suite 650
Seattle, WA. 98104
Phone: (206) 342-9000 Fax: (206) 903-8513

8828 REGISTERED ARCHITECT
RICHARD B. HALL
STATE OF WASHINGTON
EXPIRATION DATE OF THE LICENSE: 09/20/11

BELLEVUE CC PSE POLE
WA-SEA0648-C
2664 146TH AVE SE
BELLEVUE, WA 98007

REVISIONS

NO.	DATE	DESCRIPTION	INITIAL
1	01-04-10	PRELIMINARY CONSTRUCTION DRAWINGS	WJR
2	01-12-09	FINAL CONSTRUCTION DRAWINGS	CBK
3	02-22-10	REV FINAL CONSTRUCTION DRAWINGS	PHD
4	03-22-10	REV 2 FINAL CONSTRUCTION DRAWINGS	PHD
5	07-13-10	REV 3 FINAL CONSTRUCTION DRAWINGS	PHD
6	08-04-10	SUBMITTAL SET	PHD
7	09-08-10	REVISIONS	PHD

NOT FOR CONSTRUCTION UNLESS LABELED AS CONSTRUCTION SET

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIALS SHALL COMPLY WITH THE "INTERNATIONAL BUILDING CODE 2009" AND CITY CODE, SHALL MEET OR EXCEED THE STRICTER OF APPLICABLE COUNTY CODES AND REGULATIONS, LATEST EDITIONS.
2. ANTENNAS, CABINETS AND COAXIAL CABLE SHALL BE PROVIDED BY CLIENT. CONTRACTOR SHALL COORDINATE SCHEDULE OF DELIVERY TO AVOID DELAYS.
3. DAMAGE TO ALL UTILITIES, LAND, DRIVEWAY AREAS, AND PROPERTY OF OTHERS, DISTURBED DURING CONSTRUCTION, SHALL BE RETURNED TO THE ORIGINAL CONDITION AT THE COMPLETION OF WORK.
4. CONTRACTOR SHALL COORDINATE WITH THE LOCAL POWER, TELEPHONE UTILITIES, AND THE CONSTRUCTION MANAGER TO CONFIRM THE SOURCE OF SERVICE PRIOR TO INSTALLATION OF CONDUITS.
5. FOR CLEARWIRE PROJECTS WHERE THE SITE SUPPORT CABINET IS ANCHORED TO A CONCRETE SLAB ON GRADE, EXISTING VEGETATION AND ORGANIC MATERIALS SHALL BE REMOVED FROM THE PROPOSED CONCRETE PAD AREA, FILL SITE TO DESIGN ELEVATION WITH CLEAN, 5/8" MINUS CRUSHED ROCK FILL, COMPACTED UNDER CONCRETE PAD TO OBTAIN NOT LESS THAN 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY FOR SOIL IN ACCORDANCE WITH ASTM D557.
6. REGRADE AROUND PAD AS REQUIRED TO ALLOW MAXIMUM 3" OF PAD THICKNESS, EXTENDING ABOVE GRADE.
7. ALL WORK SHALL BE DONE SATISFACTORY IN A PROFESSIONAL WORKMANLIKE MANNER, SUBJECT TO INSPECTION DURING THE CONSTRUCTION AND FINAL APPROVAL BY THE CONSTRUCTION MANAGER.
8. ANY SUBSTITUTIONS OF MATERIALS, EQUIPMENT OR ALTERATIONS FROM THE PLANS AND/OR SPECIFICATIONS SHALL BE APPROVED BY THE CONSTRUCTION MANAGER.
9. COLOR SELECTION SHALL BE COORDINATED WITH CONSTRUCTION MANAGER.
10. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS, DIMENSIONS, AND BRING DISCREPANCIES TO THE ATTENTION OF THE CONSTRUCTION MANAGER.
11. CONTRACTOR SHALL CONTACT SUBSURFACE UTILITY LOCATOR FOR EXACT LOCATION OF EXISTING UTILITIES, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL VERIFY EXISTING UTILITY LOCATIONS BY TEST PIT, AS NECESSARY. LOCATION OF UTILITIES SHOWN ON PLAN ARE APPROXIMATE AND FOR PLANNING PURPOSES ONLY.
12. CONTRACTOR SHALL SECURE THE NECESSARY PERMITS FOR THIS PROJECT FROM ALL APPLICABLE GOVERNMENT AGENCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL THE CONDITIONS AND REQUIREMENTS OF THE PERMITS.
13. TOWER AND TOWER FOUNDATIONS ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.
14. CONTRACTOR SHALL VISIT THE PROJECT SITE TO VIEW ALL CONDITIONS PRIOR TO SUBMITTING BID. ANY CHANGES DURING CONSTRUCTION VISUALLY ASCERTAINABLE PRIOR TO SUBMITTING BID, CANNOT BE THE BASIS FOR A CHANGE ORDER.
15. COAT ALL SURFACES WITH NO-OX WHERE DISSIMILAR METALS CONTACT.
16. CONTRACTOR SHALL REMOVE ALL DEBRIS AND EMPTY COAX REELS FROM THE SITE UPON COMPLETION OF THE PROJECT.

PROJECT NOTES:

REINFORCED CONCRETE:

R-1. CONCRETE: ALL CONCRETE WITH SURFACES EXPOSED TO STANDING WATER SHALL BE AIR-ENTRAINED WITH AN AIR-ENTRAINING AGENT CONFORMING TO ASTM C260, C494, AND C618. TOTAL AIR CONTENT FOR FROST-RESISTANT CONCRETE SHALL BE IN ACCORDANCE WITH TABLE 1904.2.1 OF THE INTERNATIONAL BUILDING CODE. EXPOSED CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3000 PSI AT THE END OF 28 DAYS. NO SPECIAL INSPECTION IS REQUIRED FOR 3000 PSI INSTALLED SOLELY TO SATISFY EXPOSED CONCRETE REQUIREMENTS.

R-2. PREPARATION, TESTING, AND PLACING OF CONCRETE AND REINFORCEMENT SHALL BE PER ACI-318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, LATEST EDITION.

R-3. REINFORCING BARS SHALL HAVE A MINIMUM YIELD STRENGTH OF Fy = 60,000 PSI AND SHALL COMPLY WITH ASTM A615.

R-4. PROVIDE MINIMUM CONCRETE COVERAGE FOR REINFORCING STEEL OF 3".

DESIGN:

D-1. DESIGN IS IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE 2009.

D-2. EQUIPMENT CABINET LOADING PER CLEARWIRE STANDARD EQUIPMENT.

D-3. DESIGN LOADS: WASHINGTON STATE
A. 100 MPH WIND SPEED
3 SECOND GUST
CATEGORY 2 IMPORTANCE FACTOR 1.0
EXPOSURE CATEGORY C
B. ALL OTHER LOADS ARE PER ASCE 7-02

STRUCTURAL:

S-1. DETAIL, FABRICATE, AND ERECT ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC, SPECIFICATION FOR DESIGN, FABRICATION AND ERECTION OF STRUCTURE STEEL FOR BUILDINGS.

S-2. ALL STRUCTURAL STEEL WORK SHALL CONFORM TO THE AISC SPECIFICATION FOR STRUCTURAL STEEL FOR BUILDINGS – ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN, 9th EDITION.

S-3. STRUCTURAL PIPE COLUMNS SHALL COMPLY WITH ASTM A53. TYPE E OR S, GRADE B, Fy = 36KSI. ALL WIDE FLANGE SHAPES SHALL BE ASTM A992. GRADE 50. ALL STRUCTURAL SHAPES AND PLATE SHALL COMPLY WITH ASTM A36.

S-4. WELDING: ALL WELDING IS TO BE DONE BY PRE-QUALIFIED WELDERS HOLDING CURRENT CERTIFICATE FROM A RECOGNIZED TESTING LABORATORY. ALL WELDS SHALL BE 3/16" MINIMUM FILLET WELDS U.O.N. ELECTRODES SHALL BE E70XX.

S-5. THERE SHALL BE NO FIELD WELDING.

S-6. STRUCTURAL GROUT SHALL BE SHRINKAGE RESISTANCE NON-EXPANSIVE, NONMETALLIC GROUT WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5,000 PSI WHEN TESTED IN ACCORDANCE WITH ASTM CODE C109. FORMS SHALL BE PLACED AROUND BASE PLATE AND THE STRUCTURAL GROUT SHALL BE POURED. NO DRY-DAMP PACKING.

S-7. ANCHOR BOLTS AND ALL-THREAD RODS SHALL COMPLY WITH ASTM A36, UNLESS OTHERWISE NOTED. ALL OTHER BOLTS AND NUTS SHALL COMPLY WITH ASTM A325. ALL BOLTS SHALL BE HOT-DIPPED GALVANIZED.

S-8. ALL EXPOSED STEEL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A153 OR A123.

S-9. APPLY TWO COATS OF ZINC-RICH RUST-OLEUM #2185 PAINT TO ALL FIELD DRILLED HOLES AND CUTS. GRID-GUARD EPOXY #5465 COATING SHALL BE APPLIED TO ALL AREAS WHERE GALVANIZED SURFACES NEED TO BE RECONDITIONED, INCLUDING ALL WELD AREAS.

ELECTRICAL NOTES:

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE UL APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS, INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE, OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS, AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING BETWEEN CABINETS SHALL RUN IN EMT OR SCHEDULE 40 PVC (AS PERMITTED BY CODE).
6. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR PVC WHERE LOCAL CODES AND SITE CONDITIONS PERMIT.
7. ELECTRICAL WORK SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
8. RUN ELECTRICAL CONDUIT BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND EXISTING METER SOCKET AS LOCATED ON THIS DRAWING IN PVC, PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUITS BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND EXISTING TELCO CABINET AND CLEARWIRE CABINET AS INDICATED ON THIS DRAWING IN PVC. PROVIDE FULL LENGTH PULL ROPE IN TELCO CONDUIT.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
11. IT IS THE GENERAL CONTRACTOR'S RESPONSIBILITY TO APPLY FOR COMMERCIAL POWER IMMEDIATELY UPON RECEIVING AWARD OF BID. THE GENERAL CONTRACTOR IS REQUIRED TO KEEP ALL RECEIPTS FROM THE POWER COMPANY ACKNOWLEDGING APPLICATION FOR POWER AND THOROUGH DOCUMENTATION OF ANY DISCUSSIONS WITH THE POWER COMPANY THEREAFTER. ALSO, THE GENERAL CONTRACTOR SHALL RECEIVE IN WRITING FROM THE POWER COMPANY AS TO WHEN THE ANTICIPATED POWER CONNECTION WILL BE COMPLETE. IF COMMERCIAL POWER IS NOT AVAILABLE BY THE "POWER COMPLETE" DATE AS CALLED OUT IN THE SPECIFICATIONS, A GENERATOR SHALL BE SUPPLIED AND MAINTAINED BY THE GENERAL CONTRACTOR UNTIL COMMERCIAL IS OBTAINED, ALL COSTS ASSOCIATED WITH THE GENERATOR WILL BE MUTUALLY AGREED UPON BETWEEN THE OWNER AND GENERAL CONTRACTOR, IN THE EVENT THAT THE GENERAL CONTRACTOR FAILS TO TAKE THE NECESSARY MEASURES AS DESCRIBED HEREIN TO SECURE POWER BY THE POWER COMPLETION DATE, THEN ALL COSTS ASSOCIATED WITH THE GENERATOR SHALL BE BORNE BY THE CONTRACTOR.

GROUNDING NOTES:

1. AN ANTIOXIDANT COMPOUND SHALL BE APPLIED TO ALL EXTERIOR, ABOVE GRADE, MECHANIC, GROUND CONNECTIONS.
2. CONTRACTOR SHALL SUPPLY ALL MATERIAL, LABOR, AND EQUIPMENT NECESSARY FOR A COMPLETE SYSTEM AS INTENDED HEREIN UNLESS OTHERWISE NOTED.
3. ALL EXTERNAL GROUND CONDUCTORS SHALL BE #2 AWG, BARE, SOLID, TINNED COPPER UNLESS OTHERWISE NOTED.
4. ALL GROUND CONNECTIONS SHALL BE MADE WITH EXOTHERMIC WELD PROCESS UNLESS OTHERWISE NOTED OR APPROVED. ALL CONNECTIONS SHALL BE MADE AT DESIGNATED LOCATIONS ON THE EQUIPMENT.
5. EXACT LOCATION OF GROUND RODS AND GROUND CONNECTION POINTS SHALL BE DETERMINED IN THE FIELD, ADJUST LOCATIONS AS REQUIRED TO KEEP GROUND CONNECTIONS AS SHORT AS POSSIBLE (9" MIN. BEND RADIUS AND 90 DEGREE MAX BEND ANGLE). ALL BELOW GRADE GROUNDING SHALL BE INSPECTED AND APPROVED BY CONSTRUCTION MANAGER PRIOR TO BACKFILLING.
6. ALL GROUND COMPONENTS SHALL BE INSTALLED WITHIN THE CONFINES OF THE FENCED AREA. ANY METALLIC ITEMS WITHIN 6' OF THE GROUND RING SHALL BE BONDED TO THE GROUND RING. GROUNDING REQUIREMENT NOT SHOWN ON PLANS ARE WAVEGUIDE HATCH COVER / PLATE, CABLE TRAYS, SUPPORTS, SERVICE PANELS, DISCONNECT SWITCHES, HVAC UNITS ETC. THESE ITEMS MUST BE GROUNDED.
7. ALL EXTERIOR EXPOSED GROUND CONDUCTORS LONGER THAN 18" SHALL BE PROTECTED AND SUPPORTED BY A 3/4" PVC SCHEDULE 80 CONDUIT SLEEVE MOUNTED WITH CLIC-STRAP SUPPORTS FROM 6" BELOW FINISHED GRADE TO 6" FROM FINAL CONNECTION.
8. ALL GROUND RODS SHALL BE DRIVEN STRAIGHT DOWN, PERPENDICULAR TO FINISHED GRADE, SUITABLE PROTECTION SHALL BE PROVIDED ON END OF RODS TO PREVENT MUSHROOMING WITH GROUND DURING INSTALLATION.
9. GROUND CONDUCTORS SHALL NOT COME IN CONTACT WITH THE SLAB OR TOWER EXCEPT AS DESIGNATED.
10. THE UTILITY NEUTRAL / GROUND BOND IS TO BE MADE IN THE METER OR MAIN DISCONNECT SWITCH, NOT IN ATS.
11. ALL EQUIPMENT SURFACES TO BE BONDED TO GROUNDING SYSTEM SHALL BE STRIPPED OF ALL PAINT AND DIRT, CONNECTIONS TO VARIOUS METALS SHALL BE A TYPE AS TO NOT CAUSE A GALVANIC OR CORROSIVE REACTION AREA SHALL BE REPAINTED FOLLOWING BONDING.

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8828 REGISTERED ARCHITECT
RICHARD B. HALL
STATE OF WASHINGTON
EXPIRATION DATE OF THE LICENSE: 09/20/11

BELLEVUE CC PSE POLE
WA-SEA0648-C
2664 146TH AVE SE
BELLEVUE, WA 98007

REVISIONS

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7	09-08-10	REVISIONS	PHD

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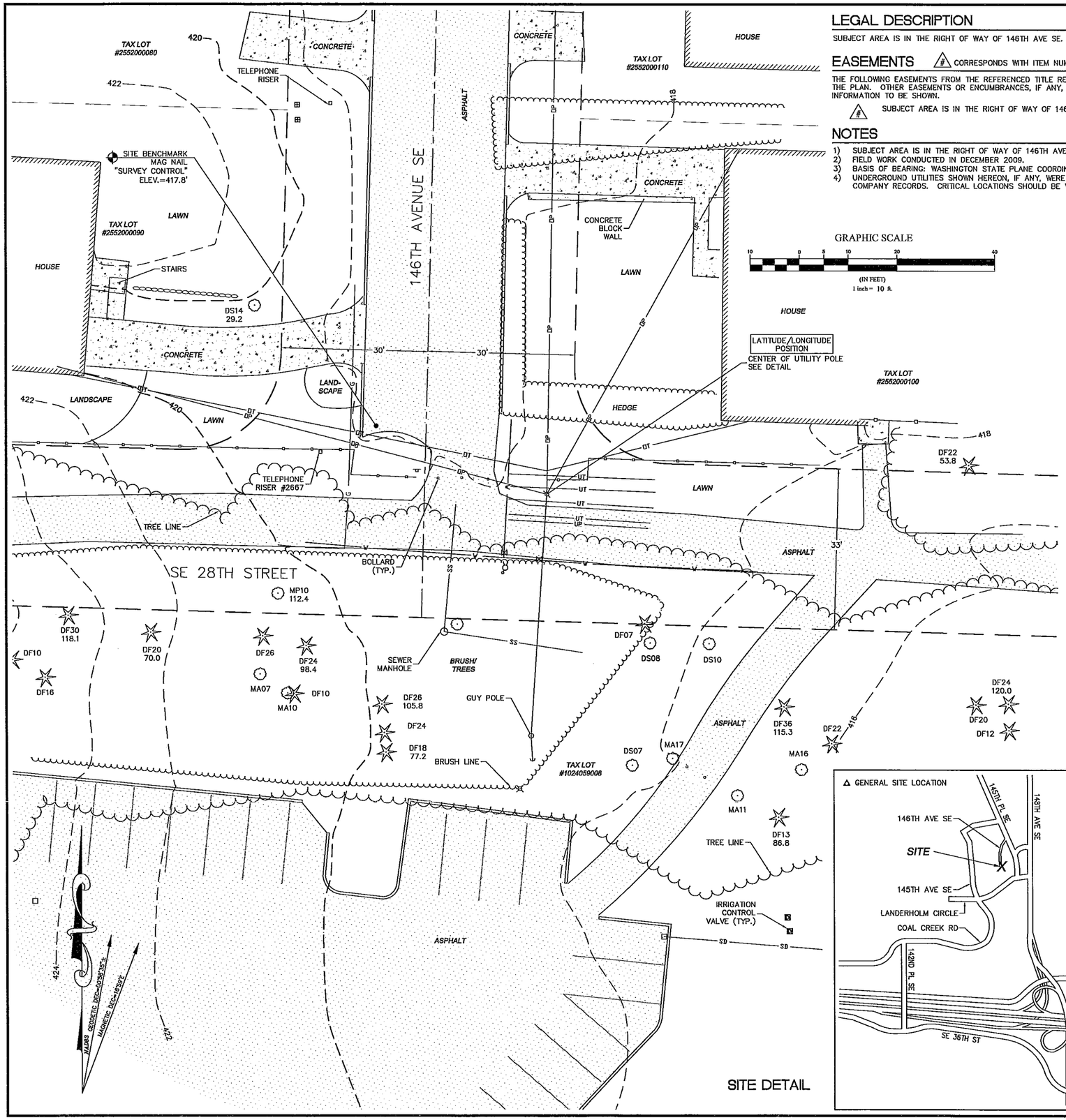
SHEET TITLE
GENERAL NOTES

SHEET NUMBER
G-1



LEGAL DESCRIPTION

SUBJECT AREA IS IN THE RIGHT OF WAY OF 146TH AVE SE.

EASEMENTS

(#) CORRESPONDS WITH ITEM NUMBER IN 'SCHEDULE B' OF TITLE REPORT.

THE FOLLOWING EASEMENTS FROM THE REFERENCED TITLE REPORT CONTAIN SUFFICIENT INFORMATION TO BE DEPICTED ON THE PLAN. OTHER EASEMENTS OR ENCUMBRANCES, IF ANY, MAY AFFECT THE PROPERTY, BUT LACK SUFFICIENT INFORMATION TO BE SHOWN.

(#) SUBJECT AREA IS IN THE RIGHT OF WAY OF 146TH AVE SE.

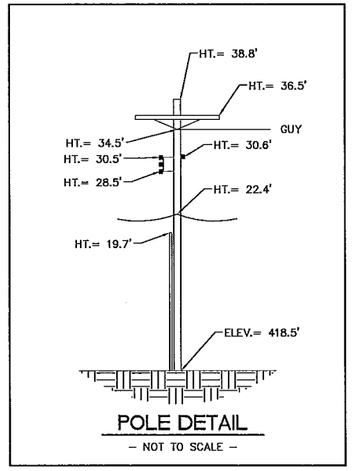
NOTES

1) SUBJECT AREA IS IN THE RIGHT OF WAY OF 146TH AVE SE.
2) FIELD WORK CONDUCTED IN DECEMBER 2009.
3) BASIS OF BEARING: WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE (NAD83).
4) UNDERGROUND UTILITIES SHOWN HEREON, IF ANY, WERE DELINEATED FROM SURFACE EVIDENCE AND/OR UTILITY COMPANY RECORDS. CRITICAL LOCATIONS SHOULD BE VERIFIED PRIOR TO DESIGN AND CONSTRUCTION.

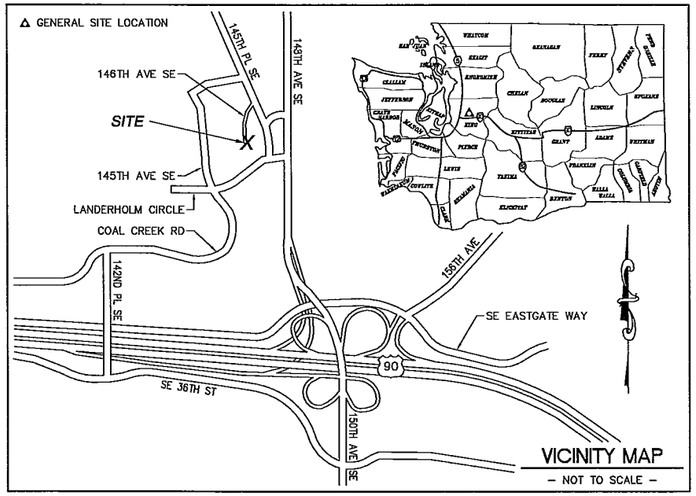
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



POLE DETAIL
– NOT TO SCALE –



VICINITY MAP
– NOT TO SCALE –

LEGEND

- SUBJECT BOUNDARY LINE
- RIGHT–OF–WAY CENTERLINE
- RIGHT–OF–WAY LINE
- ADJACENT BOUNDARY LINE
- SECTIONAL BREAKDOWN LINE
- OVERHEAD POWER LINE
- BURIED POWER LINE
- BURIED GAS LINE
- OVERHEAD TELEPHONE LINE
- BURIED TELEPHONE LINE
- BURIED WATER LINE
- BURIED SANITARY SEWER
- BURIED STORM DRAIN
- DITCH LINE/FLOW LINE
- ROCK RETAINING WALL
- VEGETATION LINE
- CHAIN LINK FENCE
- WOOD FENCE
- BARBED WIRE/WIRE FENCE

TRANSFORMER	FIRE HYDRANT
LIGHT STANDARD	GATE VALVE
POWER VAULT	WATER METER
UTILITY BOX	FIRE STAND PIPE
UTILITY POLE	CATCH BASIN, TYPE I
POLE GUY WIRE	CATCH BASIN, TYPE II
GAS VALVE	SIGN
GAS METER	BOLLARD
TELEPHONE VAULT	MAIL BOX
TELEPHONE RISER	234.21 SPOT ELEVATION

NOTE:
1) ALL ELEVATIONS SHOWN ARE ABOVE MEAN SEA LEVEL (AMSL) AND ARE REFERENCED TO THE NAVD88 DATUM.
2) ALL TOWER, TREE AND APPURTENANCE HEIGHTS ARE ABOVE GROUND LEVEL (AGL) AND ARE ACCURATE TO ± 3 FEET OR ± 1% OF TOTAL HEIGHT, WHICHEVER IS GREATER.

TREE LEGEND

DECIDUOUS TREE
AL12 — TRUNK DIAMETER (IN)
TYPE

AL=ALDER
MP=MAPLE
DS=DECIDUOUS
MA=MADRONA
OK=OAK
CH=CHERRY

EVERGREEN TREE
DF18
195.2
HEIGHT AGL IF MEASURED

CE=CEDAR
DF=DOUGLAS FIR
HE=HEMLOCK
PI=PINE
EVG=EVERGREEN

NOTE:
TREE DRIP LINES ARE NOT TO SCALE. TREE SYMBOLS REFERENCE TRUNK LOCATION ONLY. TRUNK DIAMETERS WERE APPROXIMATED AT 3.5' TO 4' ABOVE GROUND LEVEL. TREES SHOWN ARE FOR REFERENCE ONLY AND OTHER TREES AND VEGETATION MAY EXIST.

SITE INFORMATION

TAX LOT NUMBER	ROW 146TH AVE SE
SITE ADDRESS	146TH AVE SE & SE 28TH ST BELLEVUE, WA 98007
SITE CONTACT	.
PHONE NUMBER	.
ZONING	ROW
TOTAL LOT AREA	ROW
PROJECT AREA	TO BE DETERMINED

LATITUDE/LONGITUDE POSITION

COORDINATE DATA AT SUBJECT UTILITY POLE:
NAD 83 — NAVD 88
LAT – 47°35'07.75" N — ELEV.= 418.5 FEET
LONG – 122°08'40.90" W

NAVD 88

BENCHMARK IS "SEAI"
NGS GPS CORS STATION.
ELEV = 66.17'

ELEVATION DERIVED USING GPS. ACCURACY MEETS OR EXCEEDS 1A STANDARDS AS DEFINED ON THE FAA ASAC INFORMATION SHEET 91-003.

SURVEY REFERENCE

PLAT OF FIR TERRACE RECORDED UNDER VOLUME 68 OF PLATS, PAGE 86, RECORDS OF KING COUNTY, WASHINGTON.

BOUNDARY DISCLAIMER

THIS PLAN DOES NOT REPRESENT A BOUNDARY SURVEY. SUBJECT AND ADJACENT PROPERTY LINES ARE DEPICTED USING FIELD–FOUND EVIDENCE AND RECORD INFORMATION.

CAUTION!

UNDERGROUND UTILITIES EXIST IN THE AREA AND UTILITY INFORMATION SHOWN MAY BE INCOMPLETE. STATE LAW REQUIRES THAT CONTRACTOR CONTACT THE ONE–CALL UTILITY LOCATE SERVICE AT LEAST 48 HOURS BEFORE STARTING ANY CONSTRUCTION.

1-800-424-5555

DUNCANSON
Company, Inc.
145 SW 155th Street, Suite 102
Seattle, Washington 98166
Phone 206.244.4141
Fax 206.244.4455

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wireless broadband

REVISIONS

NO.	DATE	DESCRIPTION	BY

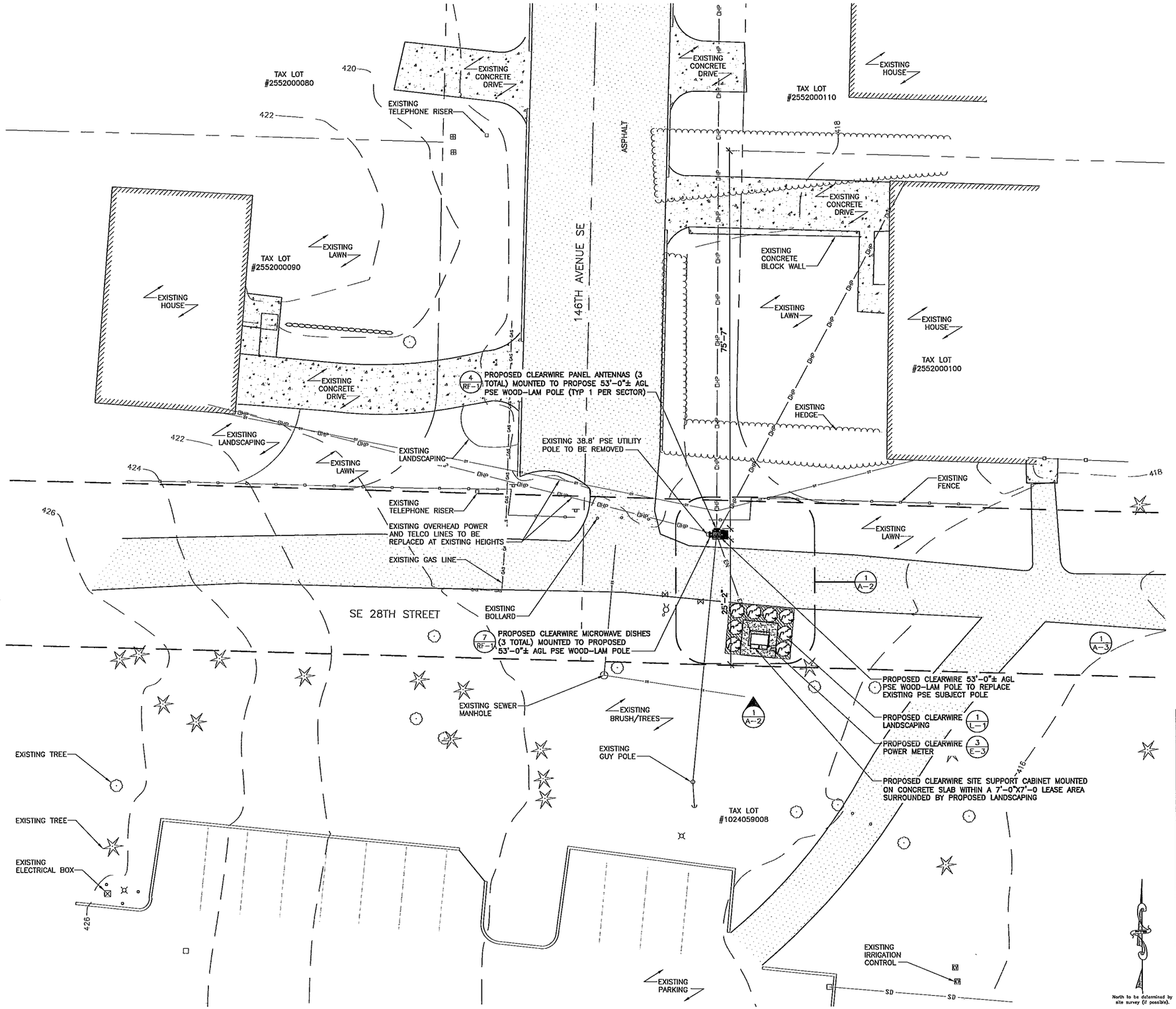
WA-SEA0648

WA-SEA0648
EXISTING SITE SURVEY
SEC 10, TWP 24 N, RNG 5 E, WM

FLD. CREW: JAR/JW
FLD. BOOK: 227/44
DRAWN BY: CJD
JOB #: 05514.187
DATE: 12/23/09

C-1

1 OF 1



LEGEND

- SUBJECT BOUNDARY LINE
- RIGHT-OF-WAY CENTERLINE
- RIGHT-OF-WAY LINE
- ADJACENT BOUNDARY LINE
- SECTIONAL BREAKDOWN LINE
- OHP — OVERHEAD POWER LINE
- UGP — BURIED POWER LINE
- BURIED GAS LINE
- OHT — OVERHEAD TELEPHONE LINE
- UGT — BURIED TELEPHONE LINE
- W — BURIED WATER LINE
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- SD — BURIED STORM DRAIN
- DITCH LINE/FLOW LINE
- ROCK RETAINING WALL
- VEGETATION LINE
- CHAIN LINK FENCE
- WOOD FENCE
- X — BARBED WIRE/WIRE FENCE

△	TRANSFORMER	⊖	FIRE HYDRANT
☼	LIGHT STANDARD	⋈	GATE VALVE
P	POWER VAULT	⊞	WATER METER
⊠	UTILITY BOX	♀	FIRE STAND PIPE
⌀	UTILITY POLE	□	CATCH BASIN, TYPE I
⟵	POLE GUY WIRE	◎	CATCH BASIN, TYPE II
GV	GAS VALVE	⊓	SIGN
⊠	GAS METER	○	BOLLARD
T	TELEPHONE VAULT	▭	MAIL BOX
▫	TELEPHONE RISER	234.21	SPOT ELEVATION

NOTE:
A WEED BARRIER IS TO BE INSTALLED BELOW GRAVEL OR ASPHALT WITHIN LEASE AREA BEFORE CONSTRUCTION

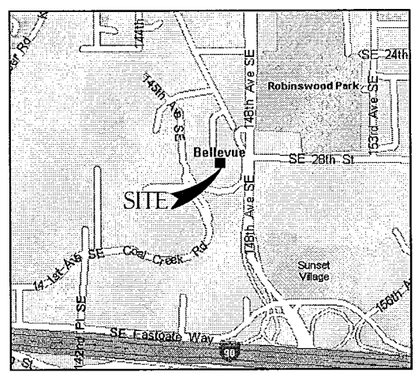
1. (12) RUNS OF 7/8" COAX CABLE, (6) RUNS OF RET CABLE & (3) RUNS OF 1/2" COAX TO BE ATTACHED TO INTERIOR OF COAX SHROUD OF WOOD-LAM POLE

2. ALL VISIBLE EQUIPMENT, INCLUDING THE ANTENNAS, MOUNTING HARDWARE, CABLES, AND CONNECTORS TO BE PAINTED A NON-REFLECTIVE COLOR TO MATCH PROPOSED WOOD-LAM POLE.

3. ALL CABLING TO BE INSTALLED IN A WORKMANLIKE MANNER, WITH MINIMAL SLACK, BUNDLED AND DRESSED.

4. EXACT LOCATION OF NEW REPLACEMENT PSE POLE TO BE DETERMINED BY PSE.

VICINITY MAP



24"x36" SCALE: 1" = 10'-0"
11"x17" SCALE: 1' = 20'-0"
10' 8' 6' 4' 2' 0" 10'

SITE PLAN | 1

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8828 REGISTERED ARCHITECT
RICHARD B. HALL
STATE OF WASHINGTON
EXPIRATION DATE OF THE LICENSE: 09/20/11

BELLEVUE CC PSE POLE

WA-SEA0648-C

2664 146TH AVE SE
BELLEVUE, WA 98007

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SHEET TITLE
SITE PLAN

SHEET NUMBER
A-1

NOTE:
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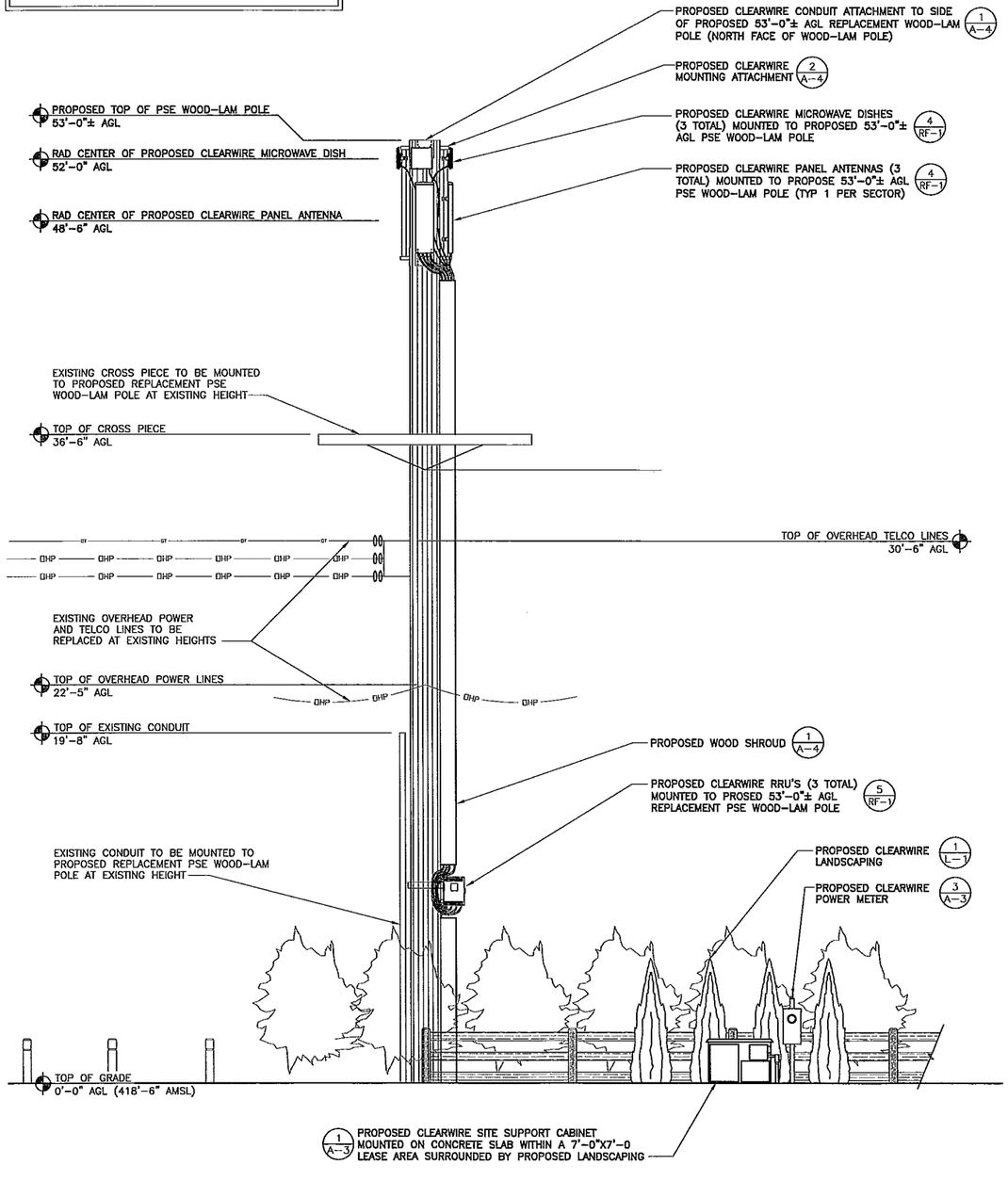
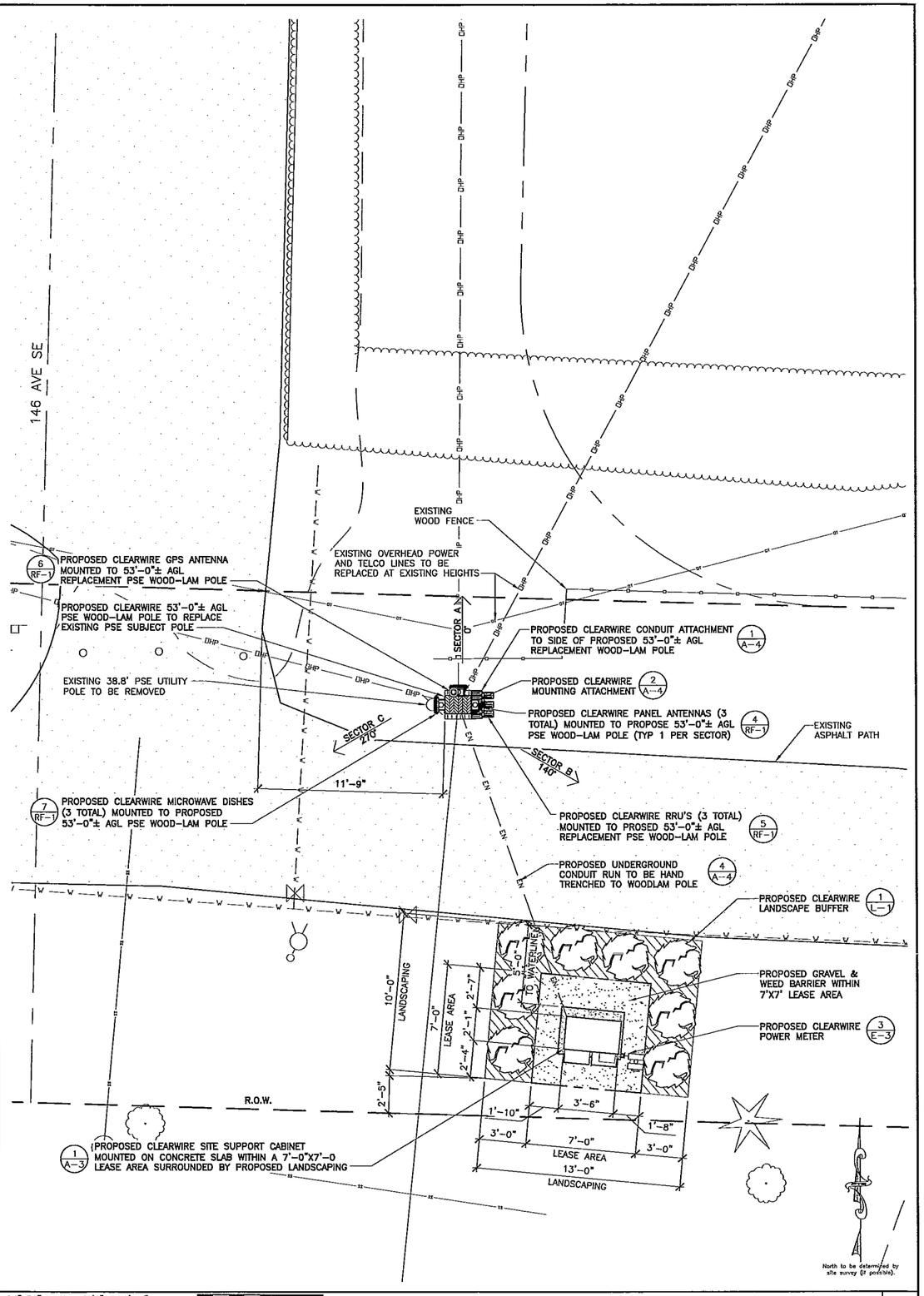


24"x36" SCALE: 1/4"=1'-0"
11"x17" SCALE: 1/8" = 1'-0"
4' 3' 2' 1' 0" 4'

SOUTH ELEVATION 2



24"x36" SCALE: 1/4" = 1'-0"
11"x17" SCALE: 1/8" = 1'-0"
4' 3' 2' 1' 0" 4'

ENLARGED SITE PLAN 1

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8828 REGISTERED ARCHITECT
RICHARD B. HALL
STATE OF WASHINGTON
EXPIRATION DATE OF THE LICENSE: 06/20/11

BELLEVUE CC PSE POLE

WA-SEA0648-C

2664 146TH AVE SE
BELLEVUE, WA 98007

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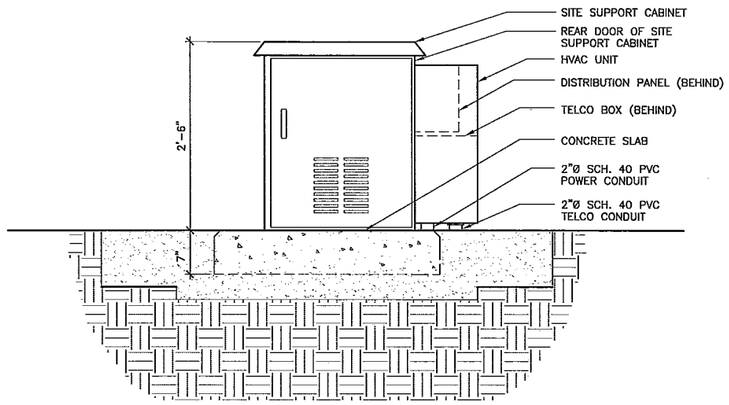
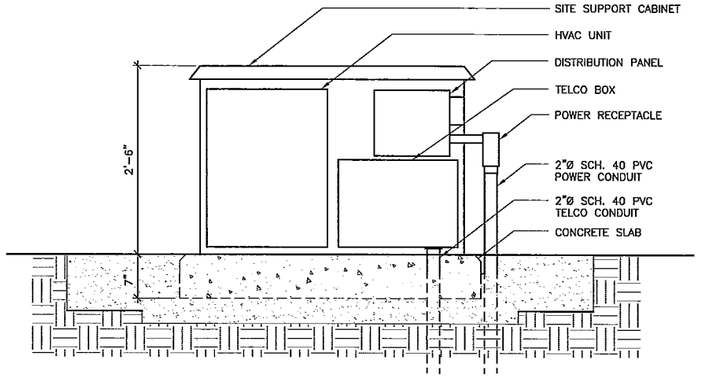
SHEET TITLE
ENLARGED SITE PLAN AND ELEVATION

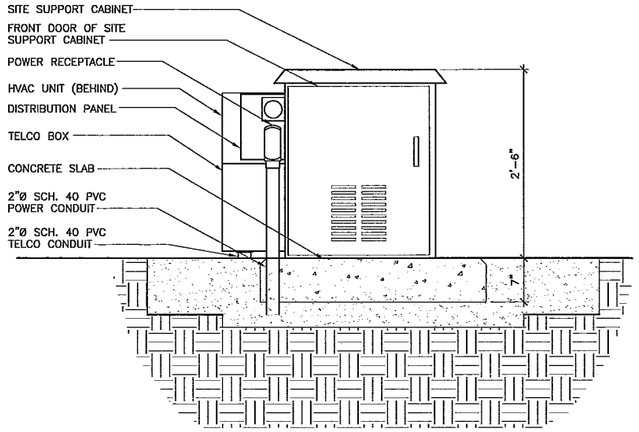
SHEET NUMBER
A-2



CABINET ELEVATION 6
24"x36" SCALE: 1" = 1'-0"
11"x17" SCALE: 1/2" = 1'-0"

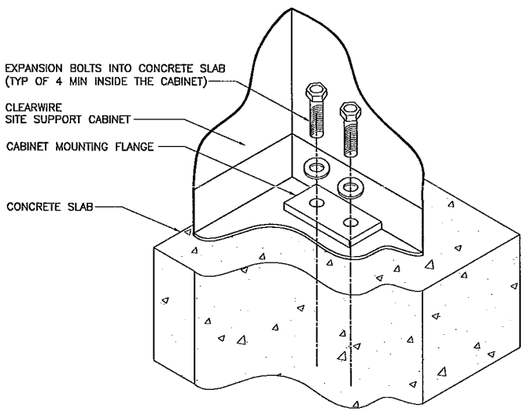


CABINET ELEVATION 5
24"x36" SCALE: 1" = 1'-0"
11"x17" SCALE: 1/2" = 1'-0"

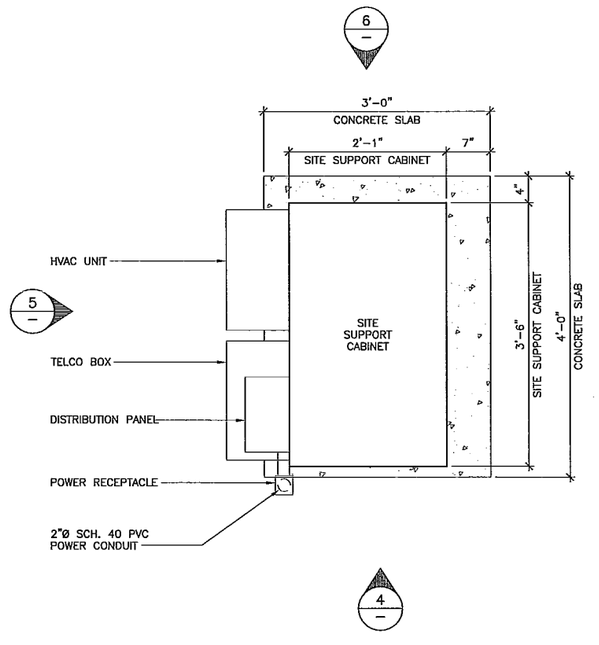


CABINET ELEVATION 4
24"x36" SCALE: 1" = 1'-0"
11"x17" SCALE: 1/2" = 1'-0"

NOT USED 3
24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE



MOUNTING DETAIL 2
24"x36" SCALE: 3" = 1'-0"
11"x17" SCALE: 1-1/2" = 1'-0"



EQUIPMENT PLAN 1
24"x36" SCALE: 3/4" = 1'-0"
11"x17" SCALE: 3/8" = 1'-0"

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SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-3

ANTENNA CABLING:

1) ACTUAL LENGTHS SHALL BE DETERMINED PER SITE CONDITION BY THE CONTRACTOR.

2) THE DESIGN IS BASED ON THE EMSS REPORT, SIGNED AND APPROVED BY ENGINEERING.

3) THE CONTRACTOR SHALL VERIFY THE ACTUAL LENGTHS OF CABLES BEFORE INSTALLATION.

4) ALL TIE WRAPS SHALL BE CUT FLUSH WITH THE APPROVED CUTTING TOOL FOR SAFETY AND PROTECTION.

5) THE ANTENNAS WILL BE FED BY RF CABLES WHICH MAY BE RUN OUTSIDE OR INSIDE THE TOWER DEPENDENT UPON SITE CONDITIONS AND ENGINEERING DRAWINGS.

6) ALL SITE CABLING SHALL MAINTAIN MAXIMUM CABLE SEPARATION REQUIREMENTS AS TO THE TYPE OF CABLE AND FUNCTION. THIS IS DONE TO PROTECT DAMAGE; AS WELL AS; TO PREVENT THE INDUCTION OF CURRENT INTO THE CONDUCTORS FROM MAGNETIC LINES OF FLUX CREATED FROM POWER AND CURRENTS THROUGH THE CABLES.

7) CABLES SHALL BE PROTECTED FROM DAMAGE AND SHALL HAVE THE MINIMUM BEND RADIUS FOR THE SIZE AND MANUFACTURER OF THAT CABLE. IN THIS CASE THE MINIMUM BEND RADIUS IS 100MM.

8) SLACK SHALL BE LEFT IN THE CABLES LEAVING THE EQUIPMENT TO THEIR TERMINATION POINTS. THIS IS DONE IN ORDER TO PROVIDE STRESS RELIEF ON THE CABLES AND CONNECTIONS IN THE EVENT OF SEISMIC ACTIVITY.

9) ALL CABLES SHALL BE ROUTED AND INSTALLED IN A MANNER AS TO PROTECT THE CABLES FROM DAMAGE OF SHARP EDGES OF HARDWARE AND WHERE CABLES ARE ROUTED DOWN THE TOWER.

10) CABLES SHALL BE SUPPORTED A MINIMUM OF EVERY THREE FEET EXCEPT FOR INSIDE MONOPOLES AND LATTICE TOWERS WHERE CABLE AND CONNECTOR MANUFACTURERS RECOMMENDED FIBER SUPPORT ACCESSORIES SHALL BE USED IF REQUIRED.

11) CABLE BRIDGE SYSTEM SHALL BE USED AS AN ICE SHIELD TO SUPPORT AND PROTECT ANTENNA AND MICROWAVE CABLES.

12) DRIP LOOPS SHALL BE REQUIRED ON ALL OUTSIDE CABLES. CABLES SHALL BE SLOPED AWAY FROM THE BUILDING OR OUTDOOR CABINETS TO PREVENT WATER FROM ENTERING THROUGH THE CABLE PORT.

ANTENNA CABLING NOTES 6

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

NOTES:
THE FIBER OPTIC CABLE COMES PRE-MANUFACTURED WITH HUBER-SUHNER CONNECTORS INSTALLED ON EACH END. THE AVAILABLE LENGTHS ARE 20M, 40M, 60M, 80M, 100M.

THE POWER CABLE COMES PRE-MANUFACTURED WITH AN AMPHENOL CONNECTOR FOR USE AT THE DAP HEAD END ONLY. THE OTHER END OF THE CABLE IS BARE. THE AVAILABLE LENGTHS ARE 20M, 40M, 60M, 80M, 100M.

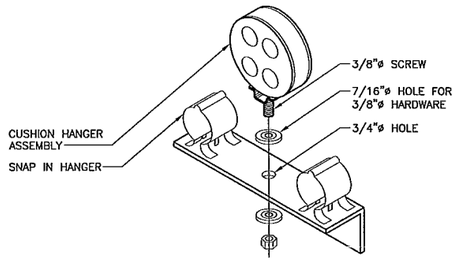
A UNIQUE COMBINED POWER & FIBER OPTIC CABLE (INTEGRATED CABLE 071903-1) HAS BEEN DEVELOPED TO MAKE RUNNING CABLES EASIER AND MAY BE MADE AVAILABLE IN THE FUTURE. THE POWER CABLE IS LONGER THAN THE FIBER CABLE TO PREVENT THE FIBER CABLE FROM BEING DAMAGED.

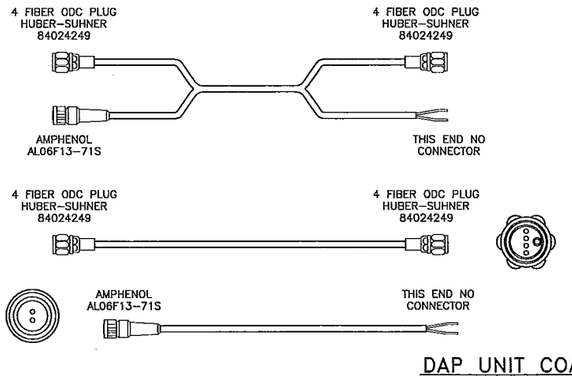
INSTALL THE POWER AND FIBER OPTIC CABLE FROM EACH DAP HEAD TO THE EQUIPMENT CABINET ATTACH THE CABLE END TO THE CONNECTORIZED POWER AND FIBER DAP HEAD CONNECTORS. EACH CABLE SHALL HAVE A SERVICE/DRIP LOOP AT EACH END OF AT LEASE ONE FULL LOOP NOT SMALLER THAN 6" IN DIAMETER. EXTRA CABLE SHALL BE LOOPED AT THE EQUIPMENT CABINET.

CABLE SHALL BE ROUTED FROM EACH DAP HEAD UNIT, ALONG THE ANTENNA MOUNT IN ULTRA-TIGHT NON-METALLIC / LIQUID TIGHT / FLEXIBLE CONDUCT / SUB-DUCT STRUCTURE TO PROTECT THE CABLES FROM EACH INDIVIDUAL SECTOR.

INSTALL TWO 2"ø FLEXIBLE CONDUITS. THE FIRST 2" CONDUIT IS USED TO RUN ALL FIBER AND POWER OPTIC CABLES. THE SECOND 2" CONDUIT IS INSTALLED DURING THE INITIAL INSTALLATION BUT IS RESERVED FOR FUTURE GROWTH / USE. THEN USE OF A KELLEM GRIP PROVIDES ACCEPTABLE CABLE SUPPORT

THE RF CABLES SHALL BE RUN SEPARATELY OUTSIDE OF THE FLEXIBLE CONDUIT OTHER CABLE RUNNING OPTIONS MAY BE USED BASED ON SITE SPECIFIC REQUIREMENTS. THE INSTALLER SHOULD CONSULT WITH THE CLEARWIRE PROJECT MANAGER WHO WILL WORK WITH THE TOWER OWNER TO DEVELOP AN APPROPRIATE METHOD PER SITE. FOR CASES WHERE PROTECTIVE CONDUIT IS NOT INSTALLED, THE USE OF VALMONT MICROFLECT CUSHION HANGER OR APPROVED EQUAL IS RECOMMENDED AS A WAY TO PREVENT DAMAGE TO THE FIBER OPTIC CABLES.





DAP UNIT COAX 3

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

NOTES:

1) ACTUAL LENGTHS SHALL BE DETERMINED PER SITE CONDITION BY THE CONTRACTOR.

2) THE DESIGN IS BASED ON THE EMSS REPORT, SIGNED AND APPROVED BY ENGINEERING.

3) THE CONTRACTOR SHALL VERIFY THE ACTUAL LENGTHS OF CABLES BEFORE INSTALLATION.

4) ALL TIE WRAPS SHALL BE CUT FLUSH WITH THE APPROVED CUTTING TOOL FOR SAFETY AND PROTECTION.

5) ALL SITE CABLING SHALL MAINTAIN MAXIMUM CABLE SEPARATION REQUIREMENTS AS TO THE TYPE OF CABLE AND FUNCTION. THIS IS DONE TO PROTECT DAMAGE. AS WELL AS, TO PREVENT THE INDUCTION OF CURRENT INTO THE CONDUCTORS FROM MAGNETIC LINES OF FLUX CREATED FROM POWER AND CURRENTS THROUGH THE CABLES.

6) ALL CABLES SHALL BE PROTECTED FROM DAMAGE AND SHALL HAVE THE MINIMUM BEND RADIUS FOR SIZE AND MANUFACTURER OF THAT CABLE.

7) SLACK SHALL BE LEFT IN THE CABLES LEAVING THE EQUIPMENT TO THEIR TERMINATION POINTS. THIS IS DONE IN ORDER TO PROVIDE STRESS RELIEF ON THE CABLES AND CONNECTIONS IN THE EVENT OF SEISMIC ACTIVITY.

8) ALL CABLES SHALL BE ROUTED AND INSTALLED IN A MANNER AS TO PROTECT THE CABLES FROM DAMAGE FROM SHARP EDGES ON HARDWARE AND WHERE CABLES ARE ROUTED DOWN THE TOWER.

9) ALL CABLES SHALL BE SUPPORTED A MINIMUM OF EVERY (3) FEET EXCEPT FOR INSIDE MONOPOLES AND LATTICE TOWERS WHERE CABLE AND CONNECTOR MANUFACTURERS SUPPORT RECOMMENDATIONS SHALL BE FOLLOWED. MANUFACTURERS RECOMMENDED CABLE SUPPORT ACCESSORIES SHALL BE USED.

10) A CABLE BRIDGE SYSTEM SHALL BE USED AS AN ICE SHIELD TO SUPPORT AND PROTECT ANTENNA AND MICROWAVE CABLES.

11) DRIP LOOPS ARE REQUIRED ON ALL OUTSIDE CABLES. CABLES SHALL BE SLOPED AWAY FROM THE BUILDING OR OUTDOOR CABINETS TO PREVENT WATER FROM ENTERING THROUGH THE CABLE PORT.

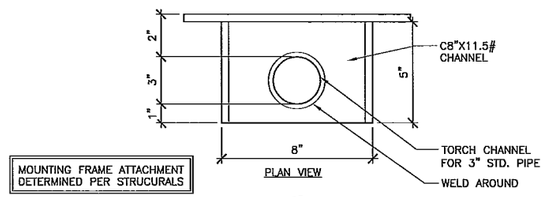
APPROVED COAX

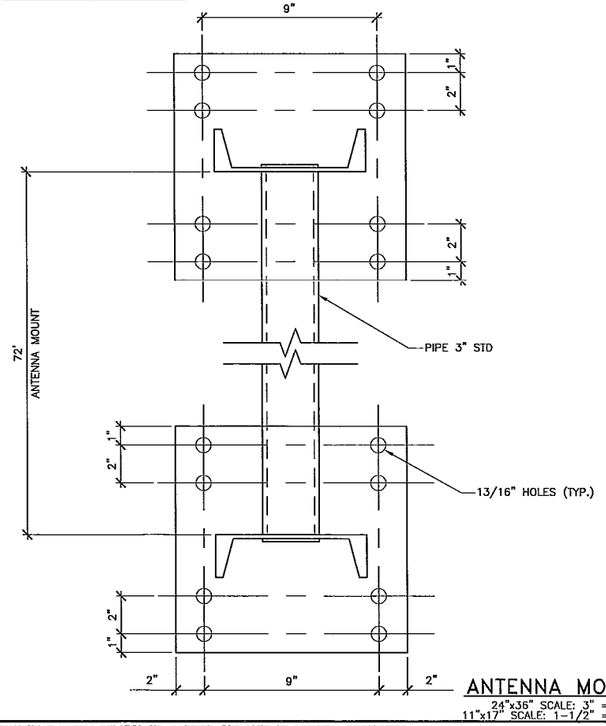
MANUFACTURER DATA								MICROWAVE APPLICATIONS		
TYPE	MFG	PART #	DESCRIPTION	LOSS/100FT @2600 MHz	LOSS/100FT @700 MHz	LOSS/100FT @1900 MHz	WEIGHT (LB/FT)	MICROWAVE RADIO	DISTANCE (min) FEET	DISTANCE (MAX) FEET
CORRUGATED	EUPEN	EC4-50	1/2" FOAM DIELECTRIC	3.77	1.8	3.16	.16	DRAGONWAVE DUO	1	250
CORRUGATED	EUPEN	EC5-50-A	7/8" FOAM DIELECTRIC	1.98	.96	1.66	.33	DRAGONWAVE DUO	1	450
CORRUGATED	EUPEN	EC6-50-A	1-1/4" FOAM DIELECTRIC	1.463	.698	1.22	.58	DRAGONWAVE DUO	450	650
CORRUGATED	EUPEN	EC7-50A	1-5/8" FOAM DIELECTRIC	1.2	.57	.997	.76	DRAGONWAVE DUO	450	800
CORRUGATED	EUPEN	EC4-150-DMNM	1/2" FOAM DIELECTRIC JUMPER-5FT WITH N(m)/DIN(m)	3.77	N/A	N/A	.16	N/A	N/A	N/A
CORRUGATED	EUPEN	EC4-150-DMNM	1/2" FOAM DIELECTRIC JUMPER-5FT WITH DIN(m)/DIN(m)	3.77	N/A	N/A	.16	N/A	N/A	N/A
CORRUGATED	EUPEN	EC4-300-DMNM	1/2" FOAM DIELECTRIC JUMPER-10FT WITH N(m)/DIN(m)	3.77	N/A	N/A	.16	N/A	N/A	N/A
CORRUGATED	EUPEN	EC4-300-DMNM	1/2" FOAM DIELECTRIC JUMPER-10FT WITH DIN(m)/DIN(m)	3.77	N/A	N/A	.16	N/A	N/A	N/A

RAN APPLICATIONS			GPS APPLICATIONS			APPROVED CONNECTORS	
RAN SYSTEMS	DISTANCE (min) FEET	DISTANCE (MAX) FEET	RAN SYSTEM	DISTANCE (MAX) FEET	DISTANCE (MAX) FEET	MFG	PART #
DBS GROUND	1	20 70	DBS3900 WAP450 SPI2213	N/A	N/A	PPC	CC-DM-L4 CC-NM-L4
DBS GROUND	1	45 145	N/A	N/A	N/A	PPC	CC-DM-EC5 CC-DF-EC5 CC-NM-C5
GROUND	1	105****	N/A	N/A	N/A	PPC	CC-DF-EC6
GROUND	1	110****	N/A	N/A	N/A	PPC	CC-DF-EC7
RFH TO ANTENNA/FILTER	N/A	5	N/A	N/A	N/A	INCLUDED	INCLUDED
FILTER TO ANTENNA	N/A	5	N/A	N/A	N/A	INCLUDED	INCLUDED
RFH TO ANTENNA/FILTER	N/A	10	N/A	N/A	N/A	INCLUDED	INCLUDED
FILTER TO ANTENNA	N/A	10	N/A	N/A	N/A	INCLUDED	INCLUDED

MICROWAVE COAX 5

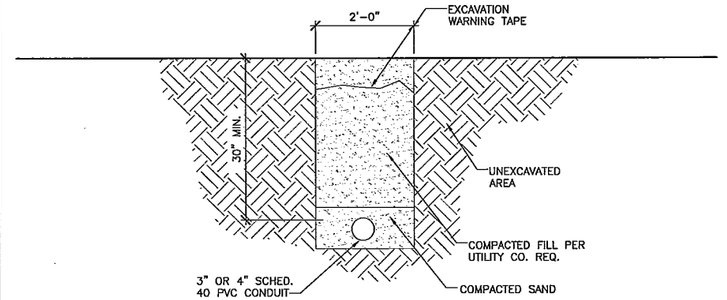
24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE





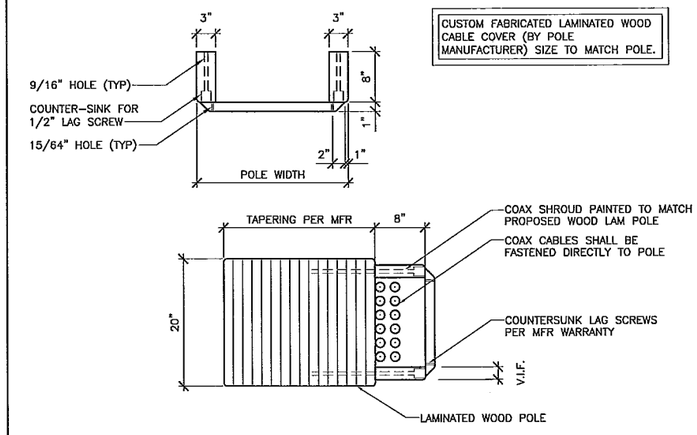
ANTENNA MOUNT 2

24"x36" SCALE: 3" = 1'-0"
11"x17" SCALE: 1-1/2" = 1'-0"



CONDUIT TRENCHING 4

24"x36" SCALE: 1/4" = 1'-0"
11"x17" SCALE: 1/8" = 1'-0"



CONDUIT ATTACHMENT 1

24"x36" SCALE: 1" = 1'-0"
11"x17" SCALE: 1/2" = 1'-0"

clear wire®
4400 CARILLON POINT
KIRKLAND, WA 98033

PTS
PACIFIC TELECOM SERVICES, LLC
568 First Avenue S., Suite 650
Seattle, WA. 98104
Phone: (206) 342-9000 Fax: (206) 903-8513

8828 REGISTERED ARCHITECT
RICHARD B. HALL
STATE OF WASHINGTON
EXPIRATION DATE OF THE LICENSE: 09/20/11

BELLEVUE CC PSE POLE

WA-SEA0648-C
2664 146TH AVE SE
BELLEVUE, WA 98007

REVISIONS

NO.	DATE	DESCRIPTION	INITIAL
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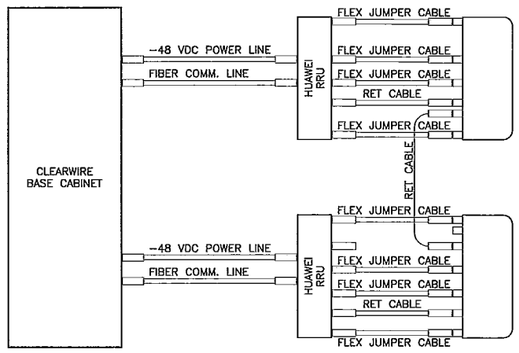
3	02-22-10	REV FINAL CONSTRUCTION DRAWINGS	PHD
4	03-22-10	REV 2 FINAL CONSTRUCTION DRAWINGS	PHD
5	07-13-10	REV 3 FINAL CONSTRUCTION DRAWINGS	PHD
6	08-04-10	SUBMITTAL SET	PHD
7	09-08-10	REVISIONS	PHD

NOT FOR CONSTRUCTION UNLESS LABELED AS CONSTRUCTION SET

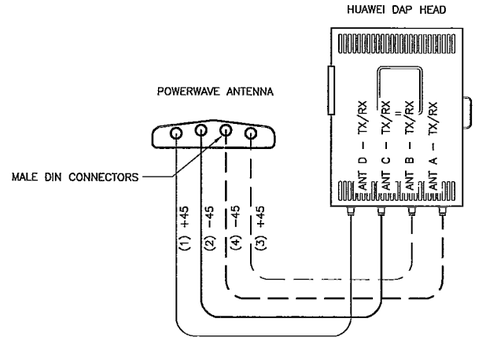
SHEET TITLE
COAX DETAILS

SHEET NUMBER
A-4



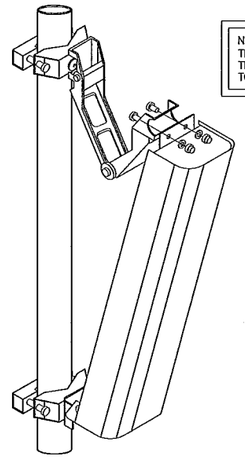
RET SCEHMATIC DETAIL 11

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE



CABLE CONNECTION 10

24"x36" SCALE: 1-1/2" = 1'-0"
11"x17" SCALE: 3/4" = 1'-0"



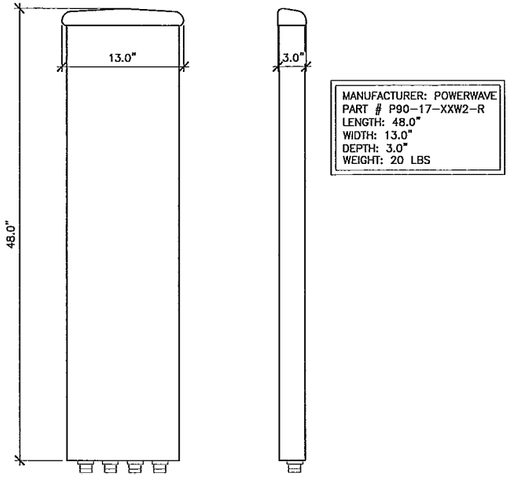
NOTE:
THE TILT KIT (737 978) IS USED WITH THE MOUNTING KIT WHICH ALLOWS 0 TO 15 DEGREES OF DOWNTILT ANGLE.

ANTENNA MOUNTING 9

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

NOT USED 8

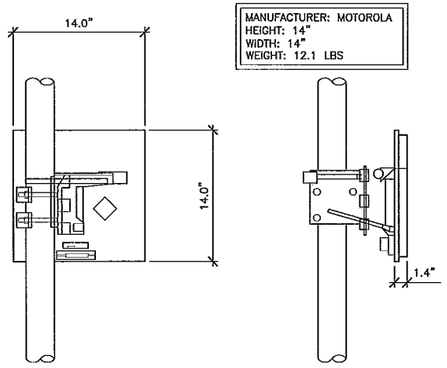
24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE



MANUFACTURER: POWERWAVE
PART # P90-17-XXW2-R
LENGTH: 48.0"
WIDTH: 13.0"
DEPTH: 3.0"
WEIGHT: 20 LBS

ANTENNA SPECIFICATION 4

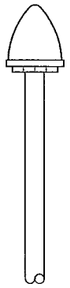
24"x36" SCALE: 1-1/2" = 1'-0"
11"x17" SCALE: 3/4" = 1'-0"



MANUFACTURER: MOTOROLA
HEIGHT: 14"
WIDTH: 14"
WEIGHT: 12.1 LBS

MICROWAVE SPECIFICATION 7

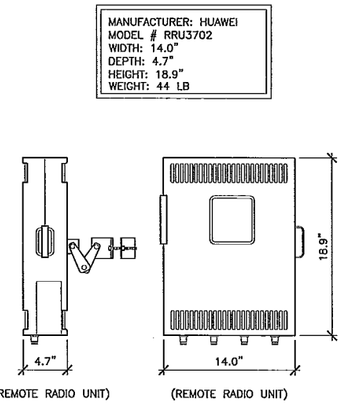
24"x36" SCALE: 1-1/2" = 1'-0"
11"x17" SCALE: 3/4" = 1'-0"



MANUFACTURER: MOTOROLA
PART #: MNT62312B1
(2) 12" LONG PIECES OF UNISTRUT
1"Ø MOUNTING PIPE

GPS SPECIFICATION 6

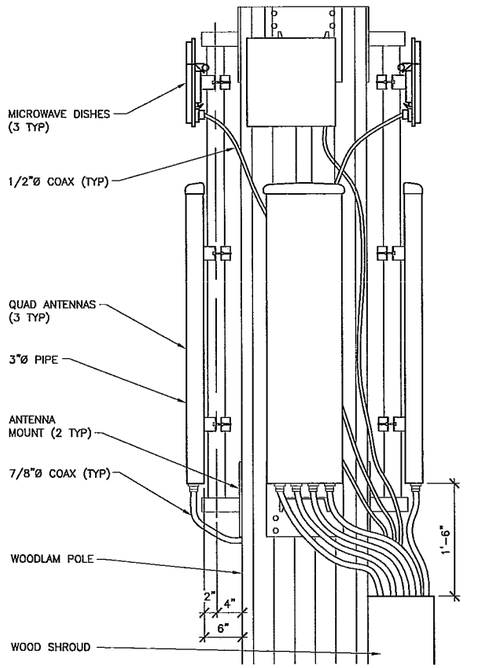
24"x36" SCALE: 3" = 1'-0"
11"x17" SCALE: 1-1/2" = 1'-0"



MANUFACTURER: HUAWEI
MODEL # RRU3702
WIDTH: 14.0"
DEPTH: 4.7"
HEIGHT: 18.9"
WEIGHT: 44 LB

RRU SPECIFICATION 5

24"x36" SCALE: 1-1/2" = 1'-0"
11"x17" SCALE: 3/4" = 1'-0"



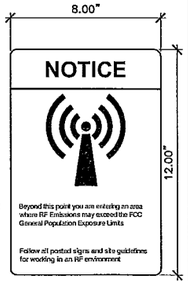
ANTENNA ELEVATION 1

24"x36" SCALE: 1" = 1'-0"
11"x17" SCALE: 1/2" = 1'-0"

SIGNS AND PLACEMENT:
1. LOW LEVEL BLUE NOTICE SIGNS – PLACE AT SITE ENTRY / ACCESS POINTS ONLY.
– ROOFTOPS: PLACE SIGNS ON THE INSIDE OF ROOF HATCH; PLACE ON ACCESS DOOR UNLESS DOOR IS USED BY GENERAL PUBLIC OR BUILDING TENANTS ON A REGULAR BASIS FOR ACCESS – IN THESE CASES CONSULT CONSTRUCTION MANAGER.
– WATER TANKS: PLACE SIGNS ON COMPOUND GATE.
– NETWORK CARRIER OWNED SITES: PLACE ONE SIGN ON COMPOUND GATE; ALL SIGNS SHALL BE SECURED WITH EITHER STAINLESS STEEL ZIP TIES OR STAINLESS TECH SCREWS.

2. CONSTRUCTION COORDINATOR PARTICIPATION IN SIGN LOCATION:
NETWORK CARRIER CONSTRUCTION MANAGER SHALL MEET WITH ALL CONSTRUCTION COORDINATOR'S TO OUTLINE CRITERIA FOR SIGN PLACEMENT. EMPHASIS SHALL BE PLACED ON "CHALLENGING" SITES, WHERE THE NETWORK CARRIER CONSTRUCTION MANAGERS SHALL GIVE CONSTRUCTION COORDINATOR'S AS MUCH GUIDANCE ON EACH SPECIFIC SITUATION AS POSSIBLE, HOWEVER, CONSTRUCTION COORDINATOR'S SHALL BE ENCOURAGED TO PARTNER WITH NETWORK CARRIER CONSTRUCTION MANAGER IN DECIDING PLACEMENT PERTAINING TO CHALLENGING SITES. A SITE VISIT MAY BE REQUIRED TO FULFILL REQUIREMENTS. CONSTRUCTION COORDINATOR SHALL IDENTIFY ALL SIGN LOCATIONS AT THE A&E WALK. PLEASE SEE SIGN DETAIL AND SIZE.

3. SIGN DISBURSEMENT FROM WAREHOUSE:
SIGN INVENTORY SHALL BE ACCESSIBLE AT NETWORK CARRIER WAREHOUSE TO BE DISBURSED AS PART OF THE GENERAL CONTRACTOR BOM AS CALLED OUT IN A&E DRAWINGS FOR EACH SITE.



NOTICE SIGNAGE 3

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

CLEARWIRE ANTENNA INFORMATION

SECTOR	ANTENNA	BAND #	AZIMUTH	MODEL	QTY.	DOWNTILT	RAD CENTER FT. AGL	COAX LENGTH (±)
A	RED	1	0°	POWERWAVE	2	0	48'-6"	82'-0"
B	BLUE	2	140°	POWERWAVE	2	0	48'-6"	82'-0"
C	YELLOW	3	270°	POWERWAVE	2	0	48'-6"	82'-0"
	14" MW	TBD	TBD	MOTOROLA	1	0	52'-0"	86'-0"
	14" MW	TBD	TBD	MOTOROLA	1	0	52'-0"	86'-0"
	14" MW	TBD	TBD	MOTOROLA	1	0	52'-0"	86'-0"
GPS ANTENNA LOCATION OPTIONS: (1) EQUIPMENT CABINET; (2) ANTENNA MAST; (3) H-FRAME; FIELD VERIFY								

LABEL MARKING SHALL BE PLACED AT:
1. WITHIN 12" OF CABLE AT BOTH ENDS
2. AT/NEAR TOWER MGB
3. PRIOR TO ENTRY INTO THE CABINET FOR A CABLE SUPPORT BRIDGE
*COORDINATE BACKHAUL INSTALLATION WITH FINAL ENGS

ANTENNA SCHEDULE 2

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

clear wire®
4400 CARILLON POINT
KIRKLAND, WA 98033

PTS
PACIFIC TELECOM SERVICES, LLC
568 First Avenue S., Suite 650
Seattle, WA. 98104
Phone: (206) 342-9000 Fax: (206) 903-8513

8828 REGISTERED ARCHITECT
RICHARD B. HALL
STATE OF WASHINGTON
EXPIRATION DATE OF THE LICENSE: 09/29/11

BELLEVUE CC PSE POLE

WA-SEA0648-C

2664 146TH AVE SE
BELLEVUE, WA 98007

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NOT FOR CONSTRUCTION UNLESS LABELED AS CONSTRUCTION SET

SHEET TITLE
RF INFORMATION AND DETAILS

SHEET NUMBER
RF-1

EQUIPMENT SPECIFICATIONS:

1) BINOCULARS OR SPOTTING SCOPE, COMPASS, TELESCOPIC ANTENNA POINTING DEVICE, SURVEYOR'S MAP, INCLINOMETER AND DECLINATION INFORMATION FROM MAGNETIC NORTH.
2) TRANSMISSION LINE TEST EQUIPMENT; MAY BE EITHER OF THE FOLLOWING TEST EQUIPMENT SUITES BUT MUST MATE WITH BOTH N-TYPE AND DIN-TYPE CONNECTORS
3) PRECISION N-TYPE TERMINATIONS FOR TEST EQUIPMENT CALIBRATION
   A) MATCHED LOAD (50 OHM TERMINATION AT PCS/ESMR FREQUENCIES)
   B) SHORT LOAD
   C) OPEN LOAD
4) PLOTTER/PRINTER OR LAPTOP PC WITH CABLING
5) PRECISION DIN-TYPE TERMINATIONS FOR SWEEP TESTS
   A) 7/16 DIN PRECISION SHORT TERMINATION
   B) 7/16 DIN PRECISION OPEN TERMINATION
   C) 7/16 DIN PRECISION MATCHED LOAD TERMINATION
6) N TYPE PRECISION SHORT TERMINATION (AT GPS FREQUENCIES)
7) TORQUE WRENCH WITH INCREMENTS DOWN TO 5 IN-LBS (NOTE: WHEN USING THE ANRITSU SITE MASTER YOU MUST BEWARE OF WHAT YOU HAVE THE SITE MASTER MODE SET-UP TO MEASURE. IF THE SITE MASTER MODE IS SET-UP TO MEASURE RETURN LOSS YOU MUST DIVIDE THE PEAK AND VALLEY MEASUREMENTS BY (4) TO GET THE CORRECT INSERTION LOSS. IF THE SITE MASTER MODE IS SET-UP TO MEASURE CABLE LOSS YOU MUST DIVIDE THE PEAK AND VALLEY MEASUREMENTS BY (2) TO GET THE CORRECT INSERTION LOSS.

THE MATHEMATICAL MODEL FOR RL OF EACH CABLE ASSEMBLY (JUMPER, OR MAIN LINE) IS PROVIDED BELOW:

1) CONVERT ALL COMPONENTS VSWR'S TO REFLECTION COEFFICIENT:\
   REFF COEFF = (VSWR-1)/(VSWR+1)
2) CALCULATE FEEDER ATTENUATION FACTOR:
   ATT FACTOR = EXP(-(ATTENUATION (DB/100FT)*LENGTH (FT)/434.3)
3) COLLECT CONTRIBUTING REFLECTIONS AT BOTTOM OF SYSTEM
4) MULTIPLY REFLECTION COEFFICIENTS OF TOP COMPONENTS BY ATTENUATION FACTOR FROM STEP 2
5) REFLECTION COEFFICIENTS OF BOTTOM COMPONENTS ARE UNCHANGED
6) DETERMINE RSS (ROOT SUM OF THE SQUARES) OF REFLECTIONS FROM STEP 3
   RFF = (REF1^2+REF2^2+REF3^2+.....)^.5
7) CALCULATE EXPECTED SYSTEM VSWR AND RETURN LOSS:
VSWR = (1+RFF)/(1-RFF) RET LOSS = -20*LOG 10(RSS)

TEST EQUIPMENT SUITES	
OPTION A	OPTION B
WILTRON SITEMASTER S331 CABLE AND ANTENNA ANALYZER OR EQUIVALENT EQUIPMENT	SPECTRUM ANALYZER WITH PLOT STORAGE CAPABILITY (800MHz-2.1 GHz RANGE) OR APPROVED EQUAL
SPECTRUM ANALYZER (FOR PORT-TO-PORT TESTING)	SIGNAL GENERATOR (800MHz-2.1 GHz RANGE)
SIGNAL GENERATOR (FOR PORT-TO-PORT TESTING)	DIRECTIONAL COUPLER (40 dB DIRECTIVITY OR BETTER)
	EITHER FFT CAPABILITY FOR THE SPECTRUM ANALYZER OR TDR EQUIPMENT

SWEEP TEST PROCEDURE:

PRELIMINARY VISUAL INSPECTION
PRIOR TO TRANSMISSION LINE TESTING, A VISUAL INSPECTION IS TO BE PERFORMED TO VERIFY THAT THE CELL SITE IS PROPERLY CONFIGURED AND READY FOR SWEEP TESTING. THIS INSPECTION VERIFIES THAT PROPER TRANSMISSION LINE CABLES ARE INSTALLED, THAT ALL JUMPERS HAVE BEEN CONNECTED, AND THAT THE CABLES HAVE NO NOTICEABLE STRUCTURAL PROBLEMS.

TEST PREPARATION
VERIFY THAT ALL TEST PERSONNEL AND EQUIPMENT ARE PRESENT, INCLUDING TOWER CREW FOR ANTENNA MAST ACCESS.

TESTING SEQUENCE
1) VERIFY THAT THE CORRECT BOTTOM JUMPER IS PRESENT (IF APPLICABLE) AND OF THE PROPER LENGTH AND NOTE IN THE CHECK OFF SHEET
2) VERIFY THAT THE CORRECT TOP JUMPER IS PRESENT (IF APPLICABLE) AND OF THE PROPER LENGTH AND NOTE IN THE CHECK-OFF SHEET.
3) VISUALLY CHECK FOR ANY EXCESSIVE JUMPER STRESS CAUSED BY THE BEND RADIUS AT EITHER TOP OR BOTTOM JUMPER, AND NOTE ANY PROBLEMS IN THE CHECK-OFF SHEET.
4) VERIFY THAT THE CORRECT ANTENNA(S) ARE INSTALLED FOR EACH SECTOR.
5) VISUALLY VERIFY THAT CONNECTIONS BETWEEN JUMPERS AND MAIN FEED LINE ARE MATED.
6) VISUALLY CHECK FOR DENTS, KINKS, OR OTHER OBVIOUS STRUCTURAL PROBLEMS WITH THE FEED-LINE OR JUMPERS.

EXIT CRITERIA
VERIFY THAT THE CABLE AND ANTENNA ARE PROPERTY INSTALLED AND FREE FROM ANY OBVIOUS DEFECTS.

FEED LINE INSERTION LOSS TEST:

TEST
THE INSERTION LOSS VALUES ARE TO BE OBTAINED OVER THE ENTIRE BLOCK ASSIGNED FREQUENCY RANGE (TO AVOID RE-CALIBRATION FOR DISTANCE-TO-FAULT TEST).

TEST PREPARATION
1) INSTALL A 7/16 DIN SHORTED LOAD INTO THE CONNECTOR AT THE ANTENNA END OF THE TRANSMISSION FEED LINE TOP JUMPER.
2) VERIFY THE TORQUE SETTING OF THE FEED LINE CONNECTOR WITH THE SHORTED LOAD MATCHES THE MANUFACTURER'S RECOMMENDATIONS.
3) SET THE TEST EQUIPMENT TO SWEEP THE FREQUENCY RANGE IN USE IN YOUR MARKET.
4) IF THE FIELD ENGINEER PREFERS, THE TOWER GROUNDING AND THE FEED-LINE GROUNDING CAN BE DONE AT THIS POINT. THIS STEP IS THE FIELD ENGINEER'S PRERROGATIVE.
5) SET TRANSMIT POWER TO TEST EQUIPMENT DEFAULT
6) CALIBRATE THE TEST EQUIPMENT ACCORDING TO TEST EQUIPMENT MANUFACTURER'S EQUIPMENT.
7) VERIFY THAT THE DISPLAY WILL SHOW INSERTION LOSS (CALLED CABLE LOSS ON THE SITE MASTER); OR MEASURE RETURN LOSS THEN DIVIDE BY 2.
8) CONNECT THE TEST EQUIPMENT TO THE BOTTOM JUMPER'S CONNECTOR AND ADJUST TO THE PROPER TORQUE SETTING. (SEE MANUFACTURER'S RECOMMENDATION)
9) PERFORM SETUP AND MEASUREMENTS FOR ALL REMAINING TRANSMISSION LINES.

EXIT CRITERIA
ALL TRANSMISSION LINES IN ALL SECTORS HAVE INSERTION LOSS LESS THAN OR EQUAL TO THE MAXIMUM ALLOWABLE THRESHOLD.

	CABLE ATTEN. (dB/FT)		CABLE LENGTH (FT)		INSERTION LOSS (dB)
BOTTOM JUMPER:		X		=	
MAIN FEEDLINE:		X		=	
TOP JUMPER:		X		=	

# CONNECTOR PAIRS		ATTEN. PER PAIR (dB)		INSERTION LOSS (dB)
	X	0.14	=	

BOTTOM JUMPER LOSS (dB)		MAIN FEEDLINE LOSS (dB)		TOP JUMPER LOSS (dB)		CONNECTOR LOSS (dB)		MAX. INSERTION LOSS (dB)
	+		+		+		=	

IF TOP AND BOTTOM JUMPERS ARE NOT APPLICABLE TO YOUR CABLE CONFIGURATION, ENTER (0) LOSS FOR THESE

FEED LINE DISTANCE-TO-FAULT TEST:

ANY DISCONTINUITY (CONNECTOR CONTACT, KINKED CABLE, DAMAGED CABLE, OR OTHER ANOMALY) IN A TRANSMISSION CABLE RESULTS IN THE REFLECTION OF SOME OF THE TRANSMITTED POWER. THIS REFLECTION IS A LOSS OF THE INTENDED TRANSMIT POWER AND IS CALLED "THE RETURN LOSS" BY MEASURING THE TIME REQUIRED FOR THE SIGNAL TO TRAVEL TO THE POINT OF ANOMALY AND BACK, ONE CAN DETERMINE THE ANOMALY'S DISTANCE FROM THE POINT OF ORIGINATION OF THE SIGNAL.

THE RETURN LOSS VALUES OF THE FEED LINE COMPONENTS ARE TO BE OBTAINED OVER THE ENTIRE BLOCK ASSIGNED FREQUENCY BAND. THIS TEST USES DISTANCE TO FAULT MEASUREMENTS TO DETERMINE THE RETURN LOSS ASSOCIATED WITH EACH CONNECTOR PAIR AND CABLE COMPONENT OF THE TRANSMISSION FEED LINE. THESE VALUES SHOULD BE REFERENCED TO THE THRESHOLD VALUES LISTED BLOW. IF THE VALUE OF THE RETURN LOSS DOES NOT MEET THIS VALUE, THEN THE APPLICABLE ANTENNA TRANSMISSION LINE SYSTEM FAILS. BY USING THIS TEST THE SUSPECT COMPONENT CAN BE LOCATED AND CORRECTED. THE DTF MEASUREMENT CAN THEN BE REPEATED TO VERIFY ADHERENCE TO SPECIFICATIONS.

ENTRANCE CRITERIA
- PASSED PRELIMINARY VISUAL INSPECTION
- PASSED FEED LINE INSERTION LOSS TEST

TEST PREPARATION
1) INSTALL A 7/16 DIN 50_MATCHED LOAD INTO THE CONNECTOR AT THE ANTENNA END OF TRANSMISSION FEED LINE TOP JUMPER
2) VERIFY THE TORQUE SETTING OF THE FEED LINE CONNECTOR WITH THE MATCHED LOAD MATCHES THE MANUFACTURER'S RECOMMENDATIONS
3) SET THE TEST EQUIPMENT FREQUENCY SWEEP RANGE FOR THE ASSIGNED FREQUENCY BAND USED IN THE MARKET. ENSURE THAT THE TRANSMITTED SWEEP FALLS WITHIN THE AUTHORIZED BAND FOR THE MARKET. FREQUENCIES USED ARE_____MHZ OTHER FUTURE FREQUENCIES THAT REQUIRE SWEEPING ARE_____MHZ
4) CALIBRATE THE TEST EQUIPMENT ACCORDING TO TEST EQUIPMENT MANUFACTURER'S EQUIPMENT
5) VERIFY THAT THE TEST EQUIPMENT IS CONFIGURED TO MEASURE DISTANCE TO FAULT
6) CONNECT THE TEST EQUIPMENT TO THE BOTTOM JUMPER'S CONNECTOR AND ADJUST TO THE PROPER TORQUE SETTING

TESTING SEQUENCE
NOTE MEASUREMENTS OF THE RETURN LOSS AND THE DISTANCE CORRESPONDING TO EACH CONNECTOR PAIR. ALSO NOTE THE LOWEST RETURN LOSS VALUE AND CORRESPONDING DISTANCE FOR EACH CABLE (WHERE PRACTICAL; USUALLY CABLES >=6'-0" IN LENGTH). IF THE MEASURED RETURN LOSS FOR ANY COMPONENT IS LESS THAN THE APPROPRIATE VALUE FROM THE TABLE BELOW, THE TEST HAS FAILED. REPLACE ANY FAILED COMPONENTS AND RE-TEST THE TRANSMISSION LINE FROM THE BEGINNING OF THE ATP. PERFORM THE SETUP AND MEASUREMENTS FOR ALL REMAINING LINES

EXIT CRITERIA
ALL TRANSMISSION LINE COMPONENTS IN ALL SECTORS HAVE RETURN LOSS GREATER THAN OR EQUAL TO THE MINIMUM ALLOWABLE THRESHOLD.

MINIMUM COMPONENT RETURN LOSS VALUES	
COMPONENT	RETURN LOSS (dB)
CONNECTORS	≥ 30
CABLE	≥ 45

ANTENNA SUBSYSTEM RETURN LOSS TEST:

THE RETURN LOSS VALUES OF THE ANTENNA SUBSYSTEM COMPONENT (NOT TO INCLUDE TRANSMISSION FEED LINE CONTRIBUTIONS) ARE TO BE OBTAINED FOR THE COMPANY'S ASSIGNED FREQUENCIES IN YOUR MARKET. THESE VALUES SHOULD BE REFERENCED TO THE THRESHOLD VALUES CALCULATED FOR YOUR SPECIFIC ANTENNA. IF THE VALUE OF THE RETURN LOSS IS LESS THAN THE THRESHOLD VALUE, THEN THE ANTENNA FAILS AND NEEDS TO BE ANALYZED AND CORRECTED BEFORE REPEATING THIS TEST. THIS TEST MUST BE REPEATED FOR EACH CARRIER FREQUENCY IN USE AT THE SITE.

ENTRANCE CRITERIA
VERIFY THAT THE FREQUENCY CHANNELS ARE CLEAR BY REFERENCING THE ANTENNA SWEEP ANALYSIS FOR YOUR MARKET BY CONTACTING RF ENGINEERING.
- PASSED PRELIMINARY VISUAL INSPECTION
- PASSED FEED LINE INSERTION LOSS TEST
- PASSED FEED LINE DISTANCE-TO-FAULT TEST

TEST PREPARATION - BTS RECEIVE FREQUENCY TEST
CONNECT THE TEST EQUIPMENT TO THE BOTTOM JUMPER'S CONNECTOR AND ADJUST TO THE PROPER TORQUE SETTING. (SEE MANUFACTURER'S RECOMMENDATION)
SET THE TEST EQUIPMENT FREQUENCY SWEEP RANGE TO THE BASE STATION RECEIVE FREQUENCIES USED IN YOUR MARKET.
1) CALIBRATE THE TEST EQUIPMENT WITH RESPECT TO THE END OF THE TOP JUMPER ACCORDING TO MANUFACTURER'S INSTRUCTION. (CALIBRATE WITH AN OPEN, SHORT AND 50 OHM LOAD)
2) VERIFY THAT THE DISPLAY WILL SHOW RETURN LOSS VALUES.
3) REMOVE THE CALIBRATION LOAD FROM THE TOP JUMPER CONNECTOR AND CONNECT THE ANTENNA TO THE FEED LINE TOP JUMPER.
4) VERIFY THE TORQUE SETTING OF THE FEED LINE CONNECTOR WITH THE ANTENNA MATCHES THE MANUFACTURER'S RECOMMENDATIONS.

TEST EQUIPMENT CONNECTION
TESTING SEQUENCE - BTS RECEIVE FREQUENCY TESTS
TAKE MEASUREMENT OF THE LOWEST RETURN LOSS VALUE OVER THE FREQUENCY BAND AND RECORD THE VALUE. IF THE MEASURED RETURN LOSS FOR THE ANTENNA IS LESS THAN THE THRESHOLD VALUE CALCULATED, THEN THE TEST HAS FAILED.

TEST PREPARATION - BTS TRANSMIT FREQUENCY TESTS
1) SET THE TEST EQUIPMENT FREQUENCY SWEEP RANGE TO THE BASE STATION TRANSMIT FREQUENCIES USED IN YOUR MARKET.
2) SET TRANSMIT POWER TO TEST EQUIPMENT DEFAULT.
3) CALIBRATE THE TEST EQUIPMENT WITH RESPECT TO THE END OF THE TOP JUMPER ACCORDING TO MANUFACTURER'S INSTRUCTIONS. (CALIBRATE WITH AN OPEN, SHORT, AND 50 OHM LOAD).
4) VERIFY THAT THE DISPLAY WILL SHOW RETURN LOSS.

TESTING SEQUENCE - BTS TRANSMIT FREQUENCY TESTS
TAKE MEASUREMENT OF THE LOWEST RETURN LOSS VALUE OVER THE FREQUENCY BAND AND RECORD THE VALUE IN THE PROVIDED WORKSHEET IF THE MEASURED RETURN LOSS FOR THE ANTENNA IS LESS THAN THE THRESHOLD VALUE CALCULATED, THEN THE TEST IS FAILED.

PERFORM THE ABOVE SETUP AND MEASUREMENTS FOR ALL REMAINING TRANSMISSION LINES.

EXIT CRITERIA
ALL ANTENNAS IN ALL SECTORS HAVE RETURN LOSS GREATER THAN OR EQUAL TO THE MINIMUM ALLOWABLE THRESHOLD.

TRANSMISSION SYSTEM RETURN LOSS TEST:

THE RETURN LOSS VALUE FOR THE AGGREGATE TRANSMISSION LINE AND ANTENNA SYSTEM (INCLUDING WEATHER PROOFING) IS TO BE OBTAINED FOR BOTH THE BASE STATION TRANSMIT AND RECEIVE FREQUENCIES ASSIGNED AND CLEARED IN YOUR MARKET. THESE VALUES SHOULD BE REFERENCED TO THE THRESHOLD VALUE. IF THE VALUE OF THE RETURN LOSS IS LESS THAN THE DESIGNED VALUE, THEN THE SYSTEM FAILS AND NEEDS TO BE ANALYZED AND CORRECTED BEFORE REPEATING THE ATP.

ENTRANCE CRITERIA
- VERIFY THAT THE FREQUENCY CHANNELS ARE CLEAR BY CONTACTING RF ENGINEERING
- PASSED PRELIMINARY VISUAL INSPECTION
- PASSED FEED LINE INSERTION LOSS TEST
- PASSED FEED LINE DISTANCE-TO-FAULT TEST

TEST PREPARATION - BTS RECEIVE FREQUENCY TESTS
1) VERIFY THAT ANTENNAS ARE CONNECTED TO THE APPROPRIATE FEED LINE AS DESIGNATED IN THE COLOR CODING SCHEME (SEE CONSTRUCTION SPECIFICATIONS)
2) DETERMINE THE RETURN LOSS VALUE OF THE ANTENNA
3) VERIFY THE TORQUE/CRIMPER SETTING OF THE FEED LINE CONNECTOR, MATCHES THE MANUFACTURER'S RECOMMENDATIONS.
4) APPLY WEATHER PROOFING TO EACH ANTENNA/CONNECTOR INTERFACE. AVOID BLOCKING ANY WEEP HOLES ON THE ANTENNA.
5) CONNECT THE TEST EQUIPMENT TO THE BOTTOM JUMPER'S CONNECTOR AND ADJUST TO THE PROPER TORQUE SETTING. (SEE MANUFACTURER'S RECOMMENDATION).
6) SET THE TEST EQUIPMENT FREQUENCY SWEEP RANGE TO THE BASE STATION RECEIVE RF FREQUENCIES USED IN YOUR MARKET.
7) CALIBRATE THE TEST EQUIPMENT ACCORDING TO TEST EQUIPMENT MANUFACTURER'S EQUIPMENT.
8) VERIFY THAT THE DISPLAY WILL SHOW RETURN LOSS.

THE SWEEP TESTS PROVIDE A MEANS OF DETERMINING THE CONDITION OF THE TRANSMISSION SYSTEM. IT IS IMPORTANT TO MAINTAIN A VALUE OF RETURN LOSS THAT IS AS LOW AS POSSIBLE TO MAINTAIN THE SYSTEM INTEGRITY. IT IS ALSO VITALLY IMPORTANT TO REALIZE THE PROPER TEST CONDITIONS WHEN ANALYZING THE SYSTEM. THE BEST RETURN LOSS FIGURES WILL ALWAYS OCCUR WHEN THERE IS A 50 OHM LOAD PRESENT AT THE END OF THE TRANSMISSION LINE RATHER THAN AN ANTENNA. IT IS ALSO IMPORTANT TO COMPARE SWEEP RESULTS USING THE SAME EXACT SETUP. THAT IS IF THE MEASUREMENT WAS MADE WITH AN ANTENNA THE COMPARED RESULTS MUST BE MADE WITH THE SAME ANTENNA OR ONE WITH VERY SIMILAR RETURN LOSS CHARACTERISTICS. IF THE RESULTS WERE OBTAINED WITH A 50 OHM LOAD THEY MUST BE COMPARED WITH A 50 OHM TERMINATION.

TESTING SEQUENCE - BTS RECEIVE FREQUENCY TESTS
TAKE MEASUREMENT OF THE LOWEST RETURN LOSS VALUE OVER THE FREQUENCY BAND AND RECORD THE VALUE. IF THE MEASURED RETURN LOSS FOR THE TRANSMISSION SYSTEM IS LESS THAN THE THRESHOLD VALUE, THEN THE TEST HAS FAILED. IF A FAILURE OCCURS, PERFORM A DISTANCE TO FAULT MEASUREMENT AND REPLACE THE SUSPECT COMPONENT. (NOTE: AT THIS POINT, IF ALL OF THE PREVIOUS TESTS HAVE BEEN PERFORMED, THE ANTENNA CONNECTION IS MOST LIKELY FAULTY). IF REPAIRS INVOLVE COMPONENTS OTHER THAN THE ANTENNA/ANTENNA CONNECTION RE-TEST THE TRANSMISSION LINE FROM THE BEGINNING OF THE ATP.

TEST PREPARATION - BTS TRANSMIT FREQUENCY TESTS
- SET THE TEST EQUIPMENT FREQUENCY SWEEP RANGE TO THE BASE STATION TRANSMIT RF FREQUENCIES USED IN YOUR MARKET.
- SET TRANSMIT POWER TO TEST EQUIPMENT DEFAULT
- CALIBRATE THE TEST EQUIPMENT ACCORDING TO TEST EQUIPMENT MANUFACTURER'S EQUIPMENT
- VERIFY THAT THE DISPLAY WILL SHOW RETURN LOSS
- VERIFY RETURN LOSS VALUES

TESTING SEQUENCE - BTS TRANSMIT FREQUENCY TESTS
- TAKE MEASUREMENT OF THE LOWEST RETURN LOSS VALUE OVER THE FREQUENCY BAND AND RECORD THE VALUE. IF THE MEASURED RETURN LOSS FOR THE ANTENNA IS LESS THAN THE THRESHOLD VALUE, THEN THE TEST HAS FAILED. IF A FAILURE OCCURS, PERFORM A DISTANCE TO FAULT MEASUREMENT AND REPLACE THE SUSPECT COMPONENT. (NOTE: AT THIS POINT, IF ALL OF THE PREVIOUS TESTS HAVE BEEN PERFORMED, THE ANTENNA CONNECTION IS MOST LIKELY FAULTY). IF REPAIRS INVOLVE COMPONENTS OTHER THAN THE ANTENNA/ANTENNA CONNECTION, RE-TEST THE TRANSMISSION LINE FROM THE BEGINNING OF THE ATP
- PERFORM THE ABOVE SETUP AND MEASUREMENTS FOR ALL REMAINING TRANSMISSION LINES

EXIT CRITERIA
ALL ANTENNAS AND COMPONENTS IN ALL SECTORS HAVE RETURN LOSS GREATER THAN OR EQUAL TO THE MINIMUM ALLOWABLE THRESHOLD VALUE.
- PASSED PRELIMINARY VISUAL INSPECTION
- PASSED FEED LINE INSERTION LOSS TEST
- PASSED FEED LINE DISTANCE-TO-FAULT TEST
- PASSED ANTENNA SUBSYSTEM RETURN LOSS TEST

FINAL VISUAL INSPECTION:

ENTRANCE CRITERIA
PASSED ALL ELECTRICAL TESTS.

TESTING SEQUENCE
1) VERIFY THAT THE RADOMES ON ALL ANTENNAS ARE SEALED AND DO NOT HAVE ANY CRACKS, INCLUDING GPS
2) CHECK THE ANTENNA MOUNTING
3) MEASURE ANTENNA ORIENTATION TO WITHIN 2 DEGREE RELATIVE TO MAGNETIC NORTH. MEASURE MECHANICAL DOWN-TILT TO WITHIN 0.25 DEGREE FROM HORIZONTAL FOR EACH ANTENNA IN EACH SECTOR. RECORD DOWN-TILT AND ORIENTATION ON THE VISUAL INSPECTION CHECK-OFF SHEET.
4) VERIFY THAT ANTENNA IS VERTICAL IN THE NON-TILT PLANE, I.E., NO SIDE TILT, (AZIMUTH PLANE IS HORIZONTAL) TO WITHIN 0.25 DEGREES AND RECORD AS PASS OR FAIL ON THE VISUAL INSPECTION CHECK-OFF SHEET.
5) VERIFY THE COAXIAL COLOR CODING MATCHES THE CORRECT ANTENNA AND SECTOR AND INDICATE AS PASS OR FAIL ON THE VISUAL INSPECTION CHECK-OFF SHEET. (SEE CONSTRUCTION SPECIFICATION FOR ANTENNA CABLE COLOR CODING SCHEME).
6) VERIFY THAT APPROPRIATE TAGS ARE ATTACHED TO THE TOP AND BOTTOM OF THE FEED LINE SYSTEM AND INDICATE PASS OR FAIL ON THE VISUAL INSPECTION CHECK-OFF SHEET.
7) VERIFY THAT CONNECTOR WEATHER PROOFING IS COMPLETE AND INDICATE ON THE VISUAL INSPECTION CHECK-OFF SHEET.
8) CAREFULLY CHECK ALL ANTENNA FEED LINES FOR DENTS AND KINKS AND OTHER ANOMALIES AND INDICATE OBSERVATIONS ON THE VISUAL INSPECTION CHECK-OFF SHEET.
9) RECORD ALL INFORMATION IN THE SITE LOG BOOK AND THE SITE SPREADSHEET

EXIT CRITERIA
SUCCESSFUL COMPLETION OF THE ANTENNA SWEEPING ATP

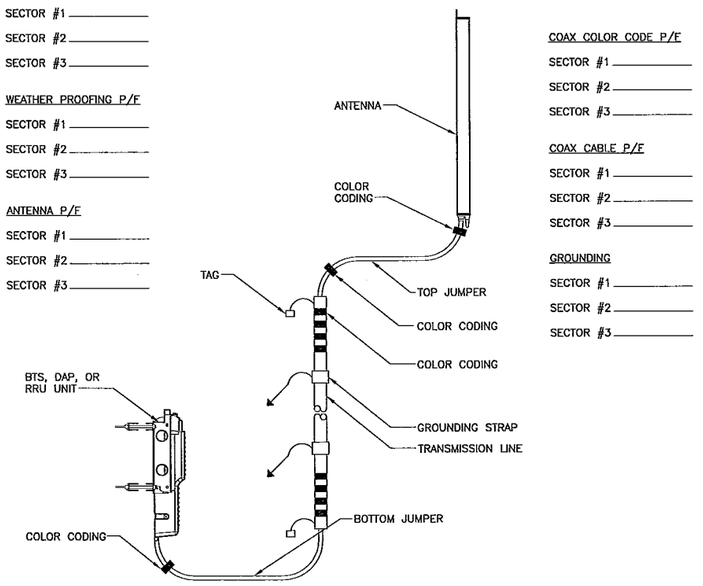
CONNECTORS P/F
SECTOR #1 _____
SECTOR #2 _____
SECTOR #3 _____

WEATHER PROOFING P/F
SECTOR #1 _____
SECTOR #2 _____
SECTOR #3 _____

WEATHER PROOFING P/F
SECTOR #1 _____
SECTOR #2 _____
SECTOR #3 _____

ANTENNA P/F
SECTOR #1 _____
SECTOR #2 _____
SECTOR #3 _____

ANTENNA DOWN TILT AND ORIENTATION				
SECTOR	ANTENNA	DOWN-TILT	ORIENTATION	SIDE TILT
SECTOR 1	TXO/RXO			
	RX1			
SECTOR 2	TXO/RXO			
	RX1			
SECTOR 3	TXO/RXO			
	RX1			



COAX COLOR CODE P/F
SECTOR #1 _____
SECTOR #2 _____
SECTOR #3 _____

COAX CABLE P/F
SECTOR #1 _____
SECTOR #2 _____
SECTOR #3 _____

GROUNDING
SECTOR #1 _____
SECTOR #2 _____
SECTOR #3 _____

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8828 REGISTERED ARCHITECT
RICHARD B. HALL
STATE OF WASHINGTON
EXPIRATION DATE OF THE LICENSE: 09/29/11

BELLEVUE CC PSE POLE
WA-SEA0648-C
2664 146TH AVE SE
BELLEVUE, WA 98007

REVISIONS			
NO.	DATE	DESCRIPTION	INITIAL
1	01-04-10	PRELIMINARY CONSTRUCTION DRAWINGS	WJR
2	01-12-09	FINAL CONSTRUCTION DRAWINGS	CBK
3	02-22-10	REV FINAL CONSTRUCTION DRAWINGS	PHD
4	03-22-10	REV 2 FINAL CONSTRUCTION DRAWINGS	PHD
5	07-13-10	REV 3 FINAL CONSTRUCTION DRAWINGS	PHD
6	08-04-10	SUBMITTAL SET	PHD
7	09-08-10	REVISIONS	PHD

NOT FOR CONSTRUCTION UNLESS LABELED AS CONSTRUCTION SET

SHEET TITLE
SWEEP TEST

SHEET NUMBER
RF-2

P90-17-XXW2-R | Dual High Broadband Cross Polarized

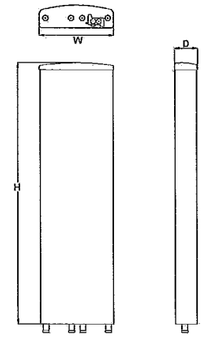
POLARIZATION: XXPol
FREQUENCY (MHz): 2496-2690
HORIZONTAL BEAM WIDTH (°): 90
GAIN (dBi/dBd): 16.5 (14.4)
TILT: Remote Electrical Tilt (RET)
LENGTH: 1.2M (48")

ELECTRICAL SPECIFICATIONS*

Frequency range (MHz)	2496-2690
Frequency band (MHz)	2496-2690
Gain (dBi/dBd)	16.5 (14.4)
Polarization	2 x Dual linear ±45°
Nominal Impedance (Ω)	50
VSWR	<1.4:1
Horizontal beam width, -3 dB (°)	90 +/- 6°
Vertical beam width, -3 dB (°)	5.5
Electrical down tilt (°)	0-10
Side lobe suppression, vertical 1st upper (dB)	12 @ 0°, 17 @ 5°, 15 @ 10°
Isolation between inputs (dB)	>30
Inter band Isolation (dB)	N/A
Tracking, horizontal plane ±60° (dB)	<3.0
First null fill (dB)	>-24,typical>-18
Vertical beam squint (°)	<1.0 +/- .5°
Front to back ratio (dB)	>30 @ 180°
Front to back ratio, total power (dB)	>25 @ +/-30° cone
Cross polar discrimination (XPD) 0° (dB)	>15
Cross polar discrimination (XPD) ±60° (dB)	>10
Far field coupling	N/A
IM3, 2xTx@43dBm (dBc)	<-153
Power handling, average per input (W)	250
Power handling, average total (W)	1000

MECHANICAL SPECIFICATIONS*

Connector	4 x 7/16 DIN Female
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	1219 x 343 x 100 (48" x 13.5" x 3.9")
Mounting	Pre-mounted heavy duty brackets
Weight, with brackets, kg (lbs)	19.5 (44)
Weight, without brackets, kg (lbs)	14.2 (32)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	520
Maximum operational wind speed, m/s (mph)	42 (93)
Survival wind speed, m/s (mph)	55 (123)
Lightning protection	DC Grounded
Operating Temperature	-30 to +70C
Radome material	ASA
Radome colour	Light Grey
Package size, HxWxD, mm (ft)	1430 x 400 x 200 (4'8" x 1'3" x 8")
Shipping weight, kg (lbs)	20 (45)
Brackets	7456.00A, 7454.00, 7455.00, 7458.00, 2201.11



*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data. **VSWR at 2300MHz is 1.55:1.

ANTENNA PATTERNS*

For detailed patterns visit http://www.powerwave.com/rpa/.

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7	09-08-10	REVISIONS	PHD

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SHEET TITLE
ANTENNA SPECIFICATIONS

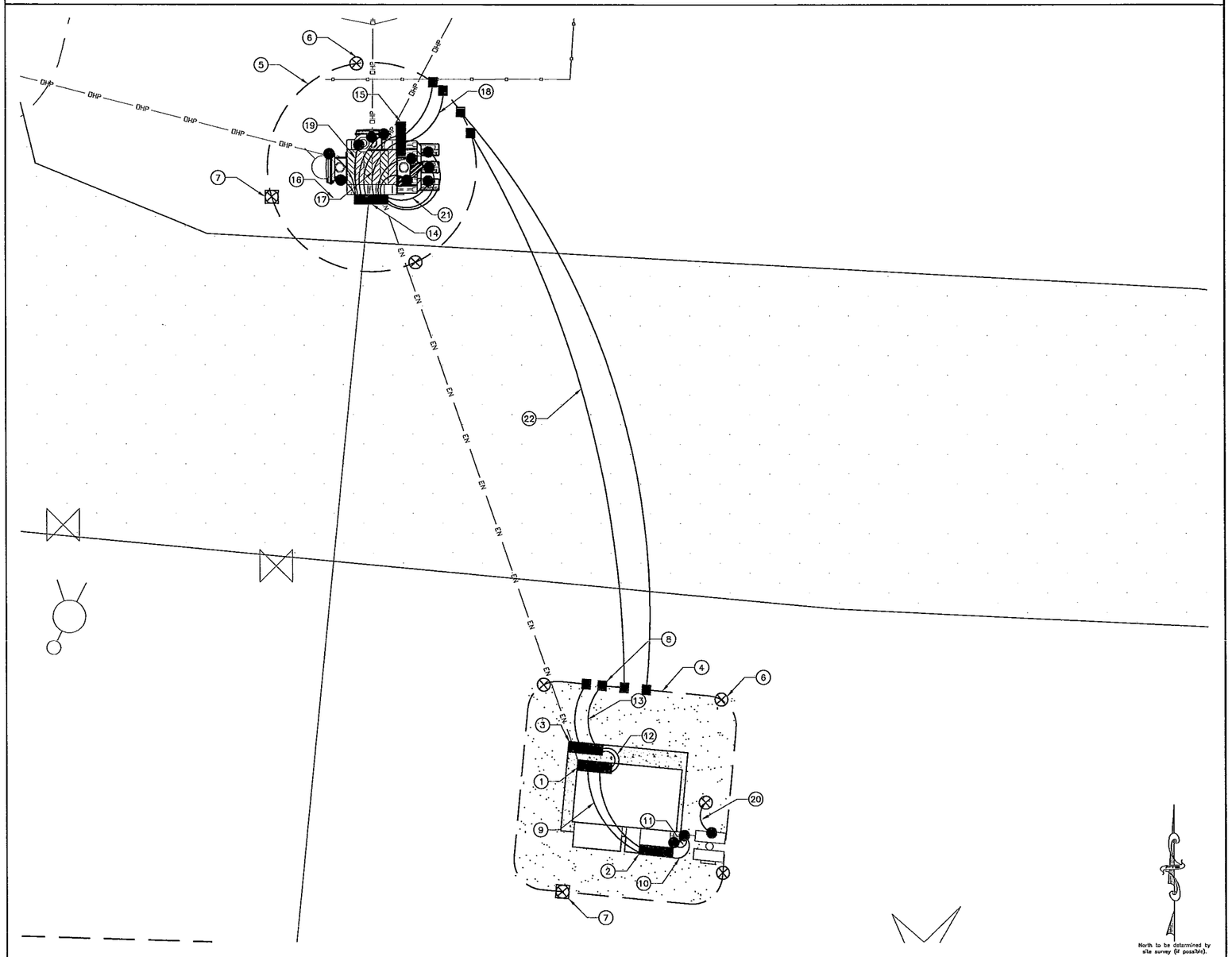
SHEET NUMBER
RF-3

GROUNDING KEYED NOTES:

1. INTERNAL SITE SUPPORT CABINET GROUND BUSS BAR. SEE DETAIL 5/E-2 FOR GROUND BAR CONSTRUCTION AND 9/E-2 FOR GROUND WIRE CONNECTIONS
2. INTERNAL SITE SUPPORT TELCO BOX GROUND BUSS BAR. SEE DETAIL 5/E-2 FOR GROUND BAR CONSTRUCTION AND 9/E-2 FOR GROUND WIRE CONNECTIONS
3. MAIN GROUND BAR MOUNTED ON CONCRETE SLAB. SEE DETAIL 5/E-2 FOR GROUND BAR CONSTRUCTION AND 9/E-2 FOR GROUND WIRE CONNECTIONS
4. #2 EXTERNAL GROUND RING. SEE DETAIL 12/E-2.
5. #2 EXTERNAL TOWER GROUND RING. SEE DETAIL 12/E-2/
6. GROUND ROD SPACED 6'-0" APART. SEE DETAIL 10/E-2.
7. TEST WELL. SEE DETAIL 11/E-2.
8. CAD WELD. SEE DETAIL 3/E-2.
9. #2 AWG GROUND FROM TELCO BOX GROUND BUSS BAR TO SITE SUPPORT CABINET GROUND BUSS BAR SEE DETAIL 9/E-2
10. #6 AWG GROUND FROM BREAKER BOX TO THE TELCO BOX GROUND BUSS BAR SEE DETAIL 9/E-2
11. #6 AWG GROUND FROM BREAKER BOX TO THE TELCO BOX
12. #2 AWG GROUND FROM SITE SUPPORT CABINET GROUND BUSS BAR TO MAIN GROUND BAR (TYP OF (2) PLACES) SEE DETAIL 9/E-2
13. #2 AWG GROUND FROM MAIN GROUND BAR TO EXTERNAL GROUND RING (TYP OF (2) PLACES) SEE DETAIL 12/E-2
14. ANTENNA GROUND BUSS BAR AT ANTENNA LEVEL OF TOWER WITH COAX GROUND KIT. SEE DETAIL 5/E-2 FOR GROUND BAR CONSTRUCTION, 9/E-2 FOR GROUND WIRE CONNECTIONS, AND 2/E-2 FOR COAX GROUNDING.
15. TOWER GROUND BUSS BAR AT BOTTOM OF TOWER WITH COAX GROUND KIT. SEE DETAIL 5/E-2 FOR GROUND BAR CONSTRUCTION, 9/E-2 FOR GROUND WIRE CONNECTIONS, AND 2/E-2 FOR COAX GROUNDING.
16. #6 AWG ANTENNA MOUNT GROUND TO ANTENNA GROUND BUSS BAR (TYP). SEE DETAIL 4/E-2.
17. #2 AWG GROUND FROM ANTENNA GROUND BUSS BAR TO TOWER GROUND BUSS BAR (TYP OF (2) PLACES). SEE DETAIL 9/E-2.
18. #2 AWG GROUND FROM TOWER GROUND BUSS BAR TO TOWER GROUND RING (TYP OF (2) PLACES). SEE DETAIL 12/E-2
19. #6 AWG GROUND FROM GPS ANTENNA MOUNT TO ANTENNA LEVEL BUSS BAR SEE DETAIL 12/E-2
20. #6 AWG GROUND FROM POWER METER TO ISOLATED GROUND ROD SEE DETAIL 10/E-2.
21. #6 AWG RRU TO TOWER GROUND BUSS BAR (TYP OF (3) PLACES). SEE DETAIL 4/E-2.
22. #2 AWG GROUND FROM EXTERNAL GROUND RING TO TOWER GROUND RING (TYP OF (2) PLACES). SEE DETAIL 12/E-2.

GROUNDING NOTES:

1. CONTRACTOR SHALL CAREFULLY REVIEW GROUNDING NOTES AND CONSULT WITH TOWER OWNER FOR SITE SPECIFIC CONDITIONS IF THERE SHOULD BE ANY FURTHER CLARIFICATIONS NEEDED
2. CLEARWIRE GROUNDING LEADS COMING FROM BOTH ANTENNAS AND COAX GROUND KITS SHALL BE DIRECTED TO A DEDICATED CLEARWIRE BUSS BARS AND SHALL BE LOCATED UP ON A GIVEN POLE OR TOWER NEAR THE BOTTOM OF ANTENNAS BEING DIRECTLY FASTENED TO THE STEEL STRUCTURE WITH STAINLESS STEEL HARDWARE AND / OR ANGLE ADAPTERS (E.G. PIROD / VALMONT GROUNDING BUSS BAR PART NUMBER B2981 [CLEARWIRE CONSTRUCTION MANAGER SHALL CONFIRM BUSS BAR PART PRIOR TO CONTRACTOR PURCHASE OF PART] BEING ANCHORED TO A MOUNTING BRACKET KIT FOR B2372 OR EQUIVALENT OR BEING MOUNTED WITH UNIVERSAL CLAMP NUMBER B1852 OR EQUIVALENT [W/O CHERRY INSULATORS]).
3. ANCHORING OF CLEARWIRE UPPER BUSS BAR SHALL NOT EMPLOY THE USE OF DRILLING, WELDING OR CUTTING INTO THE EXISTING POLE OR TOWER (ALL NEW ATTACHMENT BRACKETS SHALL BE CLAMPED OR MECHANICALLY FASTENED TO POLE OR TOWER).
4. CLEARWIRE ANTENNA AND COAX GROUND LEADS SHALL TERMINATE AT UPPER BUSS BAR W/O INSULATORS AT THE NEAR ANTENNA LOCATION WITH LEADS NOT CONTINUING DOWN THE POLE SHAFT OF TOWER LEG (TOWER STRUCTURE SHALL SERVE AS GROUNDING MEDIUM IN ORDER TO ENSURE THAT ALL EQUIPMENT ON THE TOWER IS ON THE SAME GROUND POTENTIAL MAINTAINING ONE COMMON GROUND PLANE).
5. A SECOND CLEARWIRE BUSS BARS WITH STAND OFF INSULATORS (E.G. PIROD / VALMONT GROUNDING BUSS BAR PART NUMBER B2981 [CLEARWIRE CONSTRUCTION MANAGER SHALL CONFIRM BUSS BAR PART PRIOR TO CONTRACTOR PURCHASE OF PART] BEING ANCHORED TO A MOUNTING BRACKET KIT FOR B2372 OR EQUIVALENT OR BEING MOUNTED WITH UNIVERSAL CLAMP NUMBER B1852 OR EQUIVALENT [WITH STANDOFF CHERRY INSULATORS]) SHALL BE ADDED AT THE BASE OF THE TOWER TO CAPTURE ANY ADDITIONAL TOWER SURFACE LIGHTNING RESIDUAL SHEETING WITH A DEDICATED CLEARWIRE GROUND LEAD BEING DIRECTED TO GROUND AND ATTACHED TO THE EXISTING TOWER GROUND RING (FINAL LOCATION OF BOTTOM OF TOWER GROUND BUSS BAR SHALL BE APPROVED BY TOWER REPRESENTATIVE PRIOR TO INSTALLATION).
6. CLEARWIRE GROUND LEAD FROM LOWER CLEARWIRE BUSS BAR SHALL BE NO. 2 OR 2/0 AWG WIRE AND SHALL ATTACHED TO EXISTING POLE / TOWER GROUND RING WITH PARALLEL THRU WIRE MOLD (E.G. PIROD / VALMONT PART NUMBER 171791 OR EQUIVALENT).
7. CLEARWIRE GROUND LEADS MAY NOT BE ATTACHED TO EXISTING GROUND RINGS WITH ANY CONFIGURATION OTHER THAN THE "PARALLEL THRU WIRE MOLD" WITH THE LEAD SWEEPING INTO THE GROUND RING IN THE CONFIGURATION SHOWN ON THE GROUNDING PLAN.
8. CLEARWIRE GROUND LEADS FROM BOTH ANTENNAS AND COAX GROUND KITS WHERE THERE IS AN ESTABLISHED GROUND BUSS BAR POSITIONED AT THE TOP OF A NONCONDUCTIVE POLE OR STRUCTURE (E.G. WOOD UTILITY POLES, PRE-CAST CONCRETE POLES, BUILDINGS, FIBERGLASS STRUCTURES, ETC.) SHALL EMPLOY THE USE OF SEPARATE GROUND LEAD CONDUCTORS RUNNING DOWN THE POLE OR STRUCTURE TO A BUSS BAR AT THE BASE OF THE POLE OR STRUCTURE AND FURTHER RUNNING INTO AN EXISTING GROUND RING.



ABBREVIATIONS

AWG	AMERICAN WIRE GAUGE
BCW	BARE COPPER WIRE
DWG	DRAWING
EMT	ELECTRICAL METALLIC TUBING
GEN	GENERATOR
IGR	INTERIOR GROUND RING (HALO)
IMC	INTERMEDIATE METALLIC CONDUIT
MGB	MASTER GROUND BAR
PCS	PERSONAL COMMUNICATION SYSTEM
PTS	POWER TRANSFER SWITCH
PVC	RIGID (SCH. 40) POLYVINYL CHLORIDE CONDUIT
RGS	RIGID GALVANIZED STEEL
RWY	RACEWAY
TYP	TYPICAL

ELECTRICAL SYMBOLS

- GROUND BAR
- GROUND ROD WITH ACCESS
- CHEMICAL GROUND ROD
- GROUND ROD
- DISCONNECT SWITCH
- METER
- CIRCUIT BREAKER
- CADWELD TYPE CONNECTION
- COMPRESSION TYPE CONNECTION
- GROUNDING WIRE
- 1 / A-1 — REPRESENTS DETAIL NUMBER / REFERENCE SHEET NUMBER

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"
2' 18" 1' 6" 0" 2'

GROUNDING PLAN | 1

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8828 REGISTERED ARCHITECT
RICHARD B. HALL
STATE OF WASHINGTON
EXPIRATION DATE OF THE LICENSE: 09/20/11

BELLEVUE CC PSE

WA-SEA0648-C

2664 146TH AVE SE
BELLEVUE, WA 98007

REVISIONS

NO.	DATE	DESCRIPTION	INITIAL
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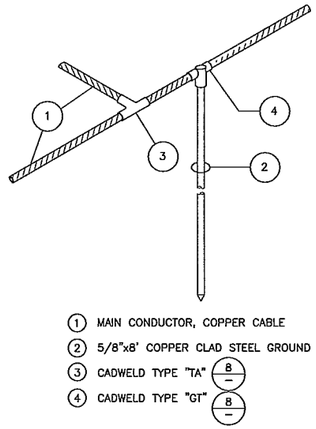
6	08-04-10	SUBMITTAL SET	PHD
7	09-08-10	REVISIONS	PHD

NOT FOR CONSTRUCTION UNLESS LABELED AS CONSTRUCTION SET

SHEET TITLE
GROUNDING PLAN

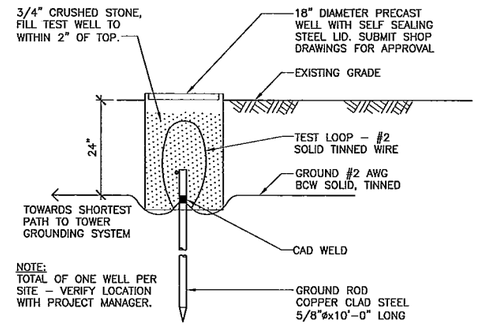
SHEET NUMBER
E-1



1. MAIN CONDUCTOR, COPPER CABLE
2. 5/8"x8' COPPER CLAD STEEL GROUND ROD
3. CADWELD TYPE "TA" (8 –)
4. CADWELD TYPE "GT" (8 –)

GROUND RING BONDING 12

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE



NOTE:
TOTAL OF ONE WELL PER SITE – VERIFY LOCATION WITH PROJECT MANAGER.

TEST WELL 11

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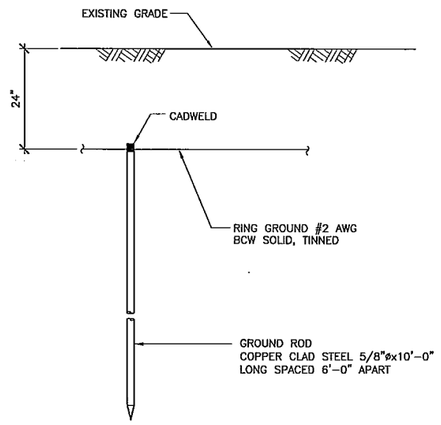
11"x17" SCALE: NOT TO SCALE



GROUND ROD 10

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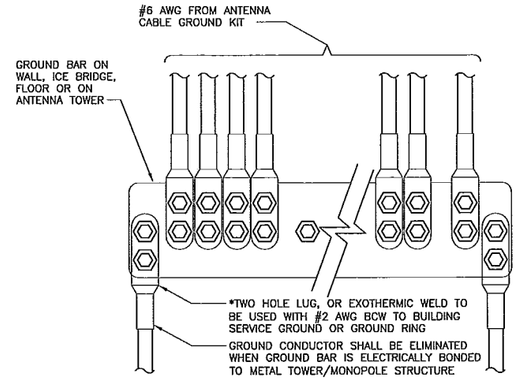
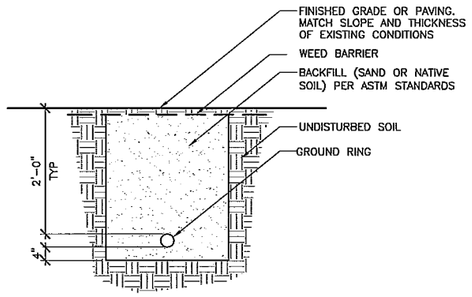
11"x17" SCALE: NOT TO SCALE



NOTE:
GROUND BARS AT BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.

GROUND WIRE INSTALLATION 9

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE



GROUND RING TRENCH 8

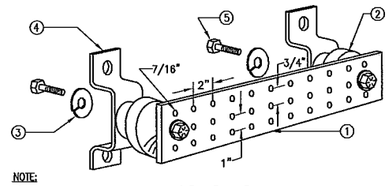
24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

NOT USED 7

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

NOT USED 6

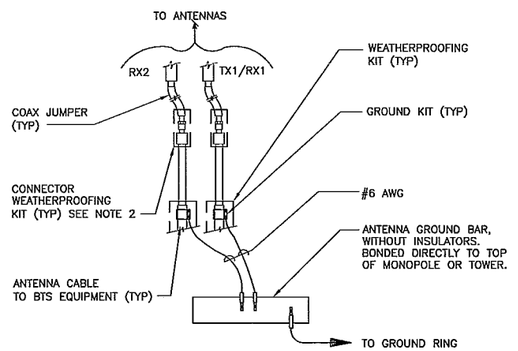
24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE



NOTE:
1) COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. CAT. NO. B–6142 OR APPROVED EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION. (ACTUAL GROUND BAR SIZE WILL VARY BASED ON NUMBER OF GROUND CONNECTIONS)
2) INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061–4 OR APPROVED EQUAL
3) 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015–8 OR APPROVED EQUAL
4) WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A–6056 OR APPROVED EQUAL
5) 5/8–11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012–1 OR APPROVED EQUAL
6) INSULATORS SHALL BE ELIMINATED WHEN BONDING DIRECTLY TO TOWER/MONOPOLE STRUCTURE. CONNECTION TO TOWER/MONOPOLE STRUCTURE SHALL BE PER MANUFACTURERS RECOMMENDATIONS.

TYPICAL GROUND BAR 5

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

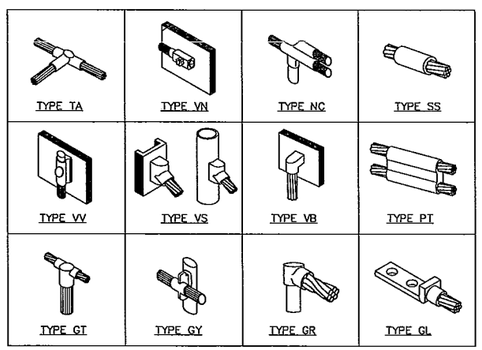


NOTES:
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.

WEATHER PROOFING SHALL BE TWO–PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

GROUND CABLE CONNECTIONS 4

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE



CADWELD GROUNDING CONNECTIONS 3

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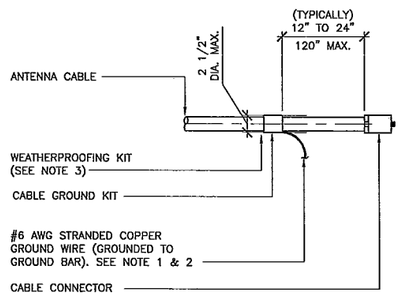
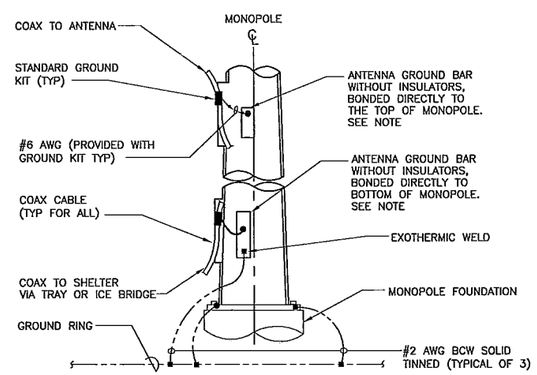
11"x17" SCALE: NOT TO SCALE



NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO–PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

CABLE GROUND KIT CONNECTION 2

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE



NOTE:
NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF MONOPOLE, ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

ANTENNA CABLE GROUND – MONOPOLE 1

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

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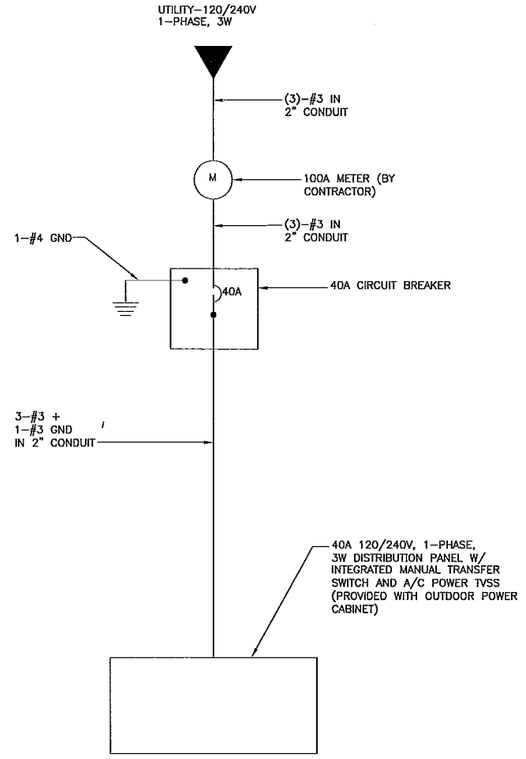
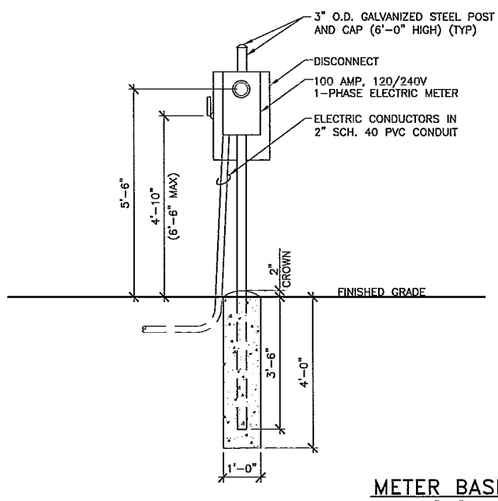
SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
E-2



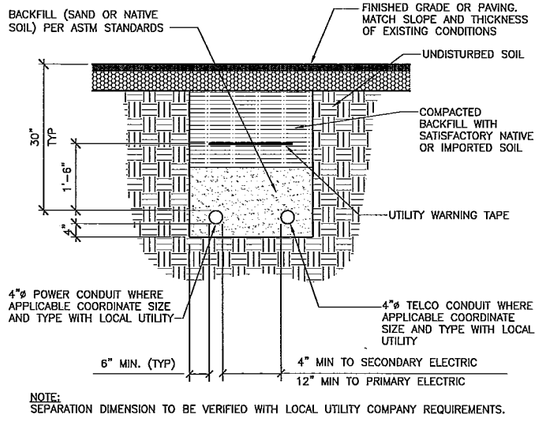
ONE LINE DIAGRAM 4

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE



METER BASE DETAIL 3

24"x36" SCALE: 1/2" = 1'–0"
11"x17" SCALE: 1/4" = 1'–0"



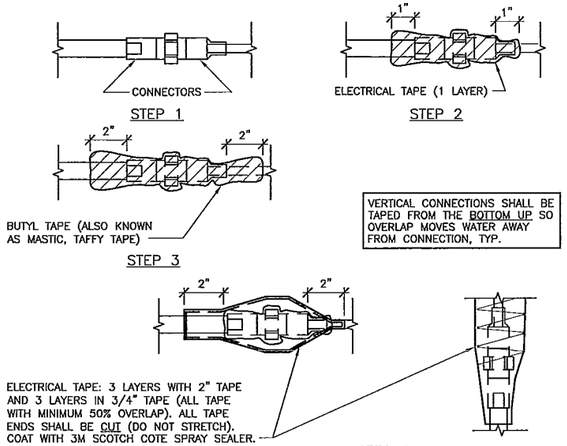
NOTE:
SEPARATION DIMENSION TO BE VERIFIED WITH LOCAL UTILITY COMPANY REQUIREMENTS.

POWER / TELCO TRENCH 6

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

NOT USED 2

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE



WEATHERPROOFING DETAIL 5

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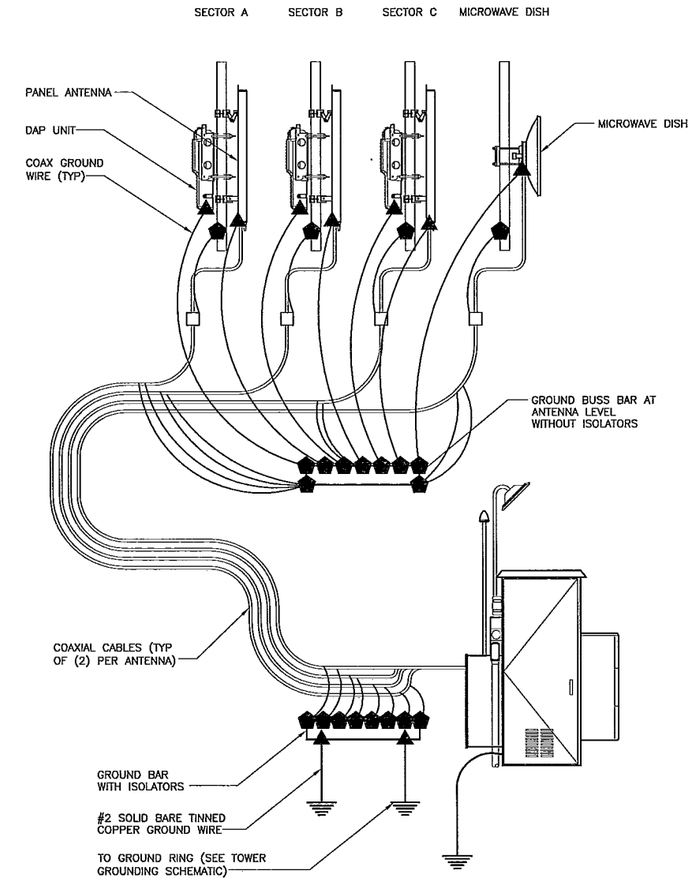
11"x17" SCALE: NOT TO SCALE



ANTENNA GROUNDING DIAGRAM 1

24"x36" SCALE: 1/2" = 1'–0"
11"x17" SCALE: 1/4" = 1'–0"

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8828 REGISTERED ARCHITECT
RICHARD B. HALL
STATE OF WASHINGTON
EXPIRATION DATE OF THE LICENSE: 08/20/11

BELLEVUE CC PSE POLE

WA-SEA0648-C

2664 146TH AVE SE
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SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-3

PLANTING SCHEDULE:

SYM	BOTANICAL/ COMMON NAME	QTY	SIZE	REMARKS
	GAULTHERIA SHALLON / SALAL		1 gal	36" O.C.
	THUJA OCCIDENTALIS 'SMARAGD'/'EMERALD GREEN' ARBORVITAE	8	6' MIN	4'-0" O.C.

NOTES:

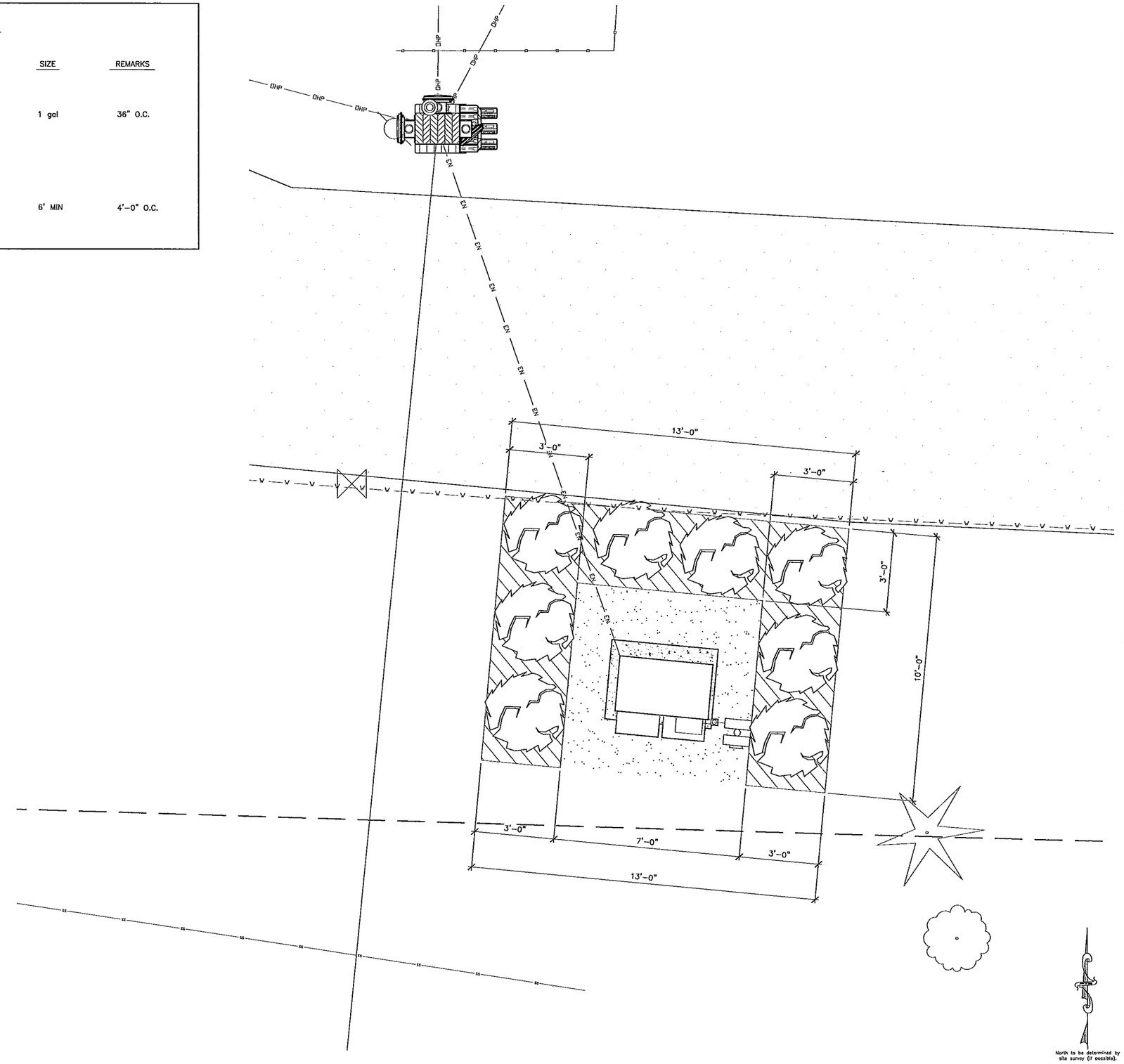
1. SEE L-2 FOR LANDSCAPING DETAILS
2. PLANTS QUANTITIES TO BE DETERMINED BY REQUIRED SPACING
3. ALL PLANTING BEDS ARE TO RECEIVE GROUNDCOVER THROUGHOUT EXCEPT AS NOTED

IRRIGATION NOTES:

1. A PERMANENT UNDERGROUND OR DRIP IRRIGATION SYSTEM WITH AN APPROVED BACK FLOW PREVENTION DEVICE SHALL BE REQUIRED FOR ALL LANDSCAPED AREAS; EXCEPT, WHERE EXISTING HEALTHY VEGETATION HAS BEEN ESTABLISHED FOR AT LEAST TWO YEARS.

2. WHEREVER FEASIBLE, SPRINKLER HEADS IRRIGATING LAWNS OR OTHER HIGH-WATER-DEMAND LANDSCAPE AREAS SHALL BE CIRCUITED SO THAT THEY ARE ON A SEPARATE ZONE OR ZONES FOR THOSE IRRIGATING TREES, SHRUBBERY, OR OTHER REDUCED-WATER-REQUIREMENT AREAS. (ORD. NO. 89-92)

3. TIE PROPOSED IRRIGATION INTO EXISTING WATER LINE, GENERAL CONTRACTOR FIELD VERIFY.



24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"
2' 18" 1' 6" 0" 2'

LANDSCAPING PLAN | 1

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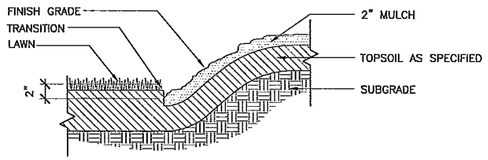
SHEET TITLE
LANDSCAPING PLAN

SHEET NUMBER
L-1

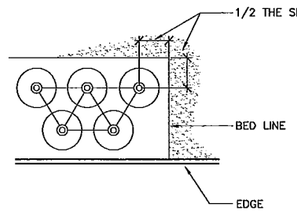
NOT USED
24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE
7

NOT USED
24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE
6

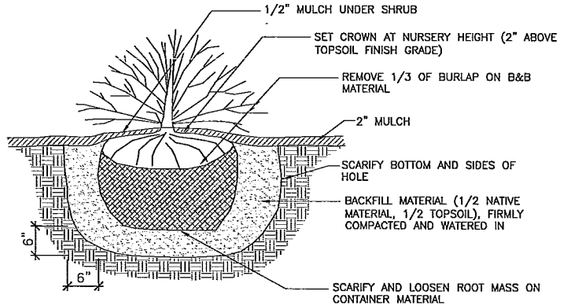
NOT USED
24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE
5



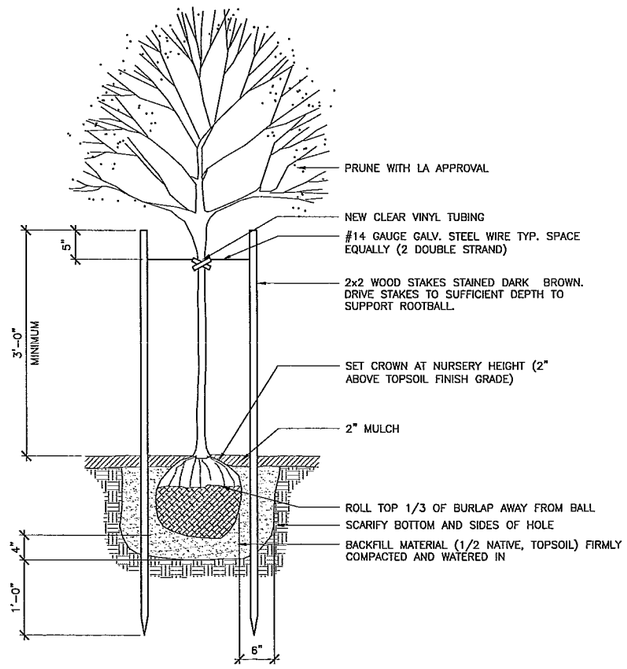
BED EDGE DETAIL
24"x36" SCALE: 1" = 1'-0"
11"x17" SCALE: 1/2" = 1'-0"
4



SPACING DETAIL DETAIL
24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE
3



SHRUB DETAIL
24"x36" SCALE: 1" = 1'-0"
11"x17" SCALE: 1/2" = 1'-0"
2



TREE DETAIL
24"x36" SCALE: 1" = 1'-0"
11"x17" SCALE: 1/2" = 1'-0"
1

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SHEET TITLE
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SHEET NUMBER
L-2

NEW IMPERVIOUS SURFACE AREA CALCULATIONS	
SITE ACCESS	0 S.F.
CLEARWIRE SITE	49 S.F.
TOTAL NEW IMPERVIOUS	49 S.F.

LEGEND

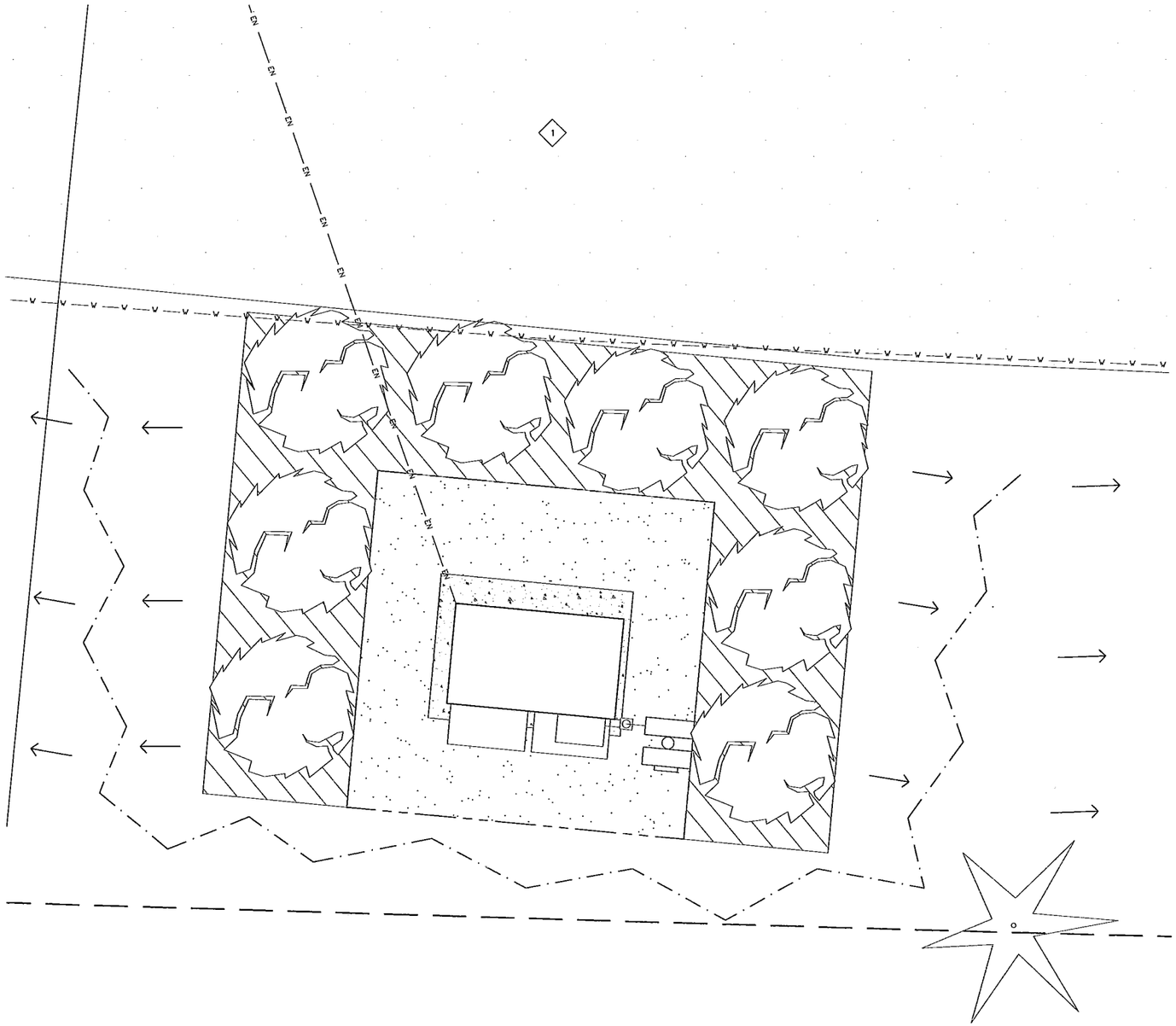
SILT FENCE

1 — PROPOSED CONSTRUCTION ACCESS, PROJECT STORAGE AND STAGING AREA COORDINATED WITH THE CITY OF BELLEVUE R.O.W. DEPT.

2 — 24" WIDE TRENCHES FOR ELECTRICAL & TELCO SERVICES

DIRECTION OF WATER SHED

EXTENT OF CLEARING



TEMPORARY EROSION CONTROL PLAN 1

24"x36" SCALE: 3/4" = 1'-0"
11"x17" SCALE: 3/8" = 1'-0"

clear wire®
4400 CARILLON POINT
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8828 REGISTERED ARCHITECT
RICHARD B. HALL
STATE OF WASHINGTON
EXPIRATION DATE OF THE LICENSE: 09/30/11

BELLEVUE CC PSE POLE

WA-SEA0648-C

2664 146TH AVE SE
BELLEVUE, WA 98007

REVISIONS

NO.	DATE	DESCRIPTION	INITIAL
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NOT FOR CONSTRUCTION UNLESS LABELED AS CONSTRUCTION SET

SHEET TITLE
EROSION CONTROL PLAN

SHEET NUMBER
ESC-1

GENERAL NOTES:

1. ON-SITE EROSION CONTROL MEASURES SHALL BE THE RESPONSIBILITY OF THE DEVELOPER. ANY PROBLEMS OCCURRING BEFORE FINAL ACCEPTANCE OF THE STORM SYSTEM BY THE MUNICIPALITY SHALL BE CORRECTED BY THE APPLICANT AND/OR THE CONTRACTOR.

2. IN CASE EROSION OR SEDIMENTATION OCCURS TO ADJACENT PROPERTY, ALL CONSTRUCTION WORK WITHIN THE DEVELOPMENT THAT WILL AGGRAVATE THE SITUATION MUST CEASE AND THE APPLICANT/CONTRACTOR SHALL IMMEDIATELY COMMENCE RESTORATION OR MITIGATION MEASURES. RESTORATION ACTIVITY SHALL CONTINUE UNTIL SUCH TIME AS THE PROBLEM IS RECTIFIED.

3. ALL EROSION AND SEDIMENTATION CONTROL DEVICES SHOWN ON THIS DRAWING SHALL BE INSTALLED PRIOR TO OR AS THE FIRST STAGE OF SITE PREPARATION.

4. SHOULD THE TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN ON THIS DRAWING NOT PROVE ADEQUATE TO CONTROL EROSION AND SEDIMENTATION, THE APPLICANT/CONTRACTOR SHALL INSTALL ADDITIONAL FACILITIES AS NECESSARY TO PROTECT ADJACENT PROPERTIES, SENSITIVE AREAS, NATURAL WATER COURSES, AND/OR STORM DRAINAGE SYSTEMS.

5. IN ANY AREA WHICH HAS BEEN STRIPPED OF VEGETATION OR EXPERIENCED LAND DISTURBING ACTIVITIES AND WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD EXCEEDING THE LISTED CRITERIA, ALL DISTURBED AREAS MUST BE IMMEDIATELY STABILIZED WITH MULCHING, GRASS PLANTING, OR OTHER APPROVED EROSION CONTROL TREATMENT APPLICABLE TO THE TIME OF YEAR IN QUESTION. GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH SEPTEMBER, INCLUSIVE. SEEDING MAY PROCEED, HOWEVER, WHENEVER IT IS IN THE INTEREST OF THE APPLICANT/CONTRACTOR, BUT MUST BE AUGMENTED WITH MULCHING, NETTING, OR OTHER TREATMENT.

6. THE PROJECT ENGINEER OR PROJECT SURVEYOR WILL BE RESPONSIBLE FOR FIELD LOCATING THE CLEARING LIMITS, AND ESTABLISHING THOSE BOUNDARIES WITH BRIGHT COLORED FLAGGING. THE CONTRACTOR SHALL CLEAR TO THE LIMITS AS ESTABLISHED ON THIS PLAN AND AS FLAGGED IN THE FIELD.

7. THE COUNTY SHALL BE RESPONSIBLE FOR THE INSPECTION AND ACCEPTANCE OF ALL CLEARING AND GRADING WORK AND EROSION AND SEDIMENTATION CONTROL FACILITIES. THE APPLICANT AND/OR CONTRACTOR SHALL NOTIFY THE COUNTY FORTY-EIGHT HOURS IN ADVANCE OF EACH REQUIRED EROSION AND SEDIMENT CONTROL INSPECTION.

INSPECTION NO.1: INSTALLATION OF EROSION CONTROL FACILITIES/PRIOR TO CLEARING.
INSPECTION NO. 2: COMPLETION OF CLEARING
INSPECTION NO. 3: UPON COMPLETION OF EXCAVATION, FILLING, AND EARTHWORK.
INSPECTION NO. 4: COMPLETION OF PROJECT.
INSPECTION NO. 5: AS NEEDED TO DETERMINE COMPLIANCE WITH APPROVED PLANS AND/OR SPECIFICATIONS. (DOES NOT REQUIRE ADVANCE NOTICE.)

8. ALL NECESSARY FACILITIES SHALL BE MAINTAINED ON SITE TO PREVENT DEBRIS, DUST AND MUD FROM ACCUMULATING ON THE PUBLIC RIGHT-OF-WAY.

STANDARD STORM WATER NOTES:

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH COUNTY STANDARD AND THE MOST CURRENT COPY OF THE STATE OF WASHINGTON STANDARDS SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION (WSDOT/APWA) AND AS AMENDED BY THE COUNTY OR THE STATE.

2. TEMPORARY EROSION/WATER POLLUTION PREVENTION MEASURES SHALL BE REQUIRED, AS MODIFIED BY THE APWA SUPPLEMENT, OF THE CURRENT STATE OF WASHINGTON STANDARD SPECIFICATIONS.

SHOULD THE TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN ON THIS DRAWING NOT PROVE ADEQUATE TO CONTROL EROSION AND SEDIMENTATION, THE APPLICANT/CONTRACTOR SHALL INSTALL ADDITIONAL FACILITIES AS NECESSARY TO PROTECT ADJACENT PROPERTIES, SENSITIVE AREAS, NATURAL WATER COURSES, AND/OR STORM DRAINAGE SYSTEMS.

3. CALL THE UNDERGROUND LOCATE LINE 1-800-424-5555 A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATIONS.

4. THE STORM DRAINAGE SYSTEM SHALL BE CONSTRUCTED ACCORDING TO APPROVED PLANS ON FILE WITH THE COUNTY. ANY SIGNIFICANT DEVIATION FROM THE APPROVED PLANS WILL REQUIRE WRITTEN APPROVAL FROM THE COUNTY.

5. A COPY OF THE APPROVED STORMWATER PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.

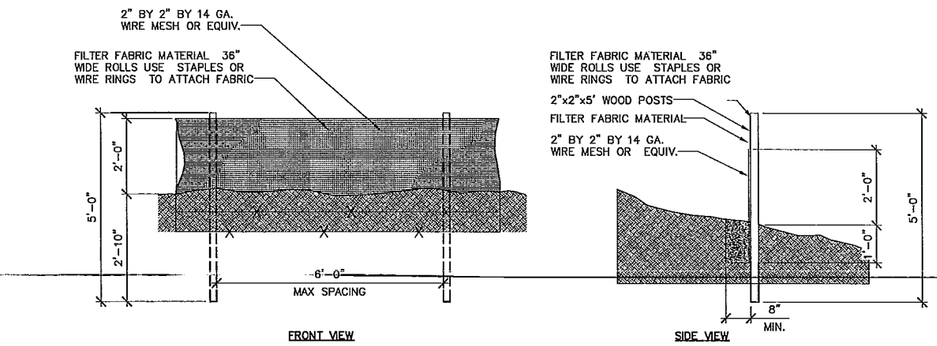
6. ALL EROSION CONTROL AND STORMWATER FACILITIES SHALL BE REGULARLY INSPECTED AND MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION.

7. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN STREET USE AND OTHER RELATED OR REQUIRED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY IN THE MUNICIPALITY'S RIGHT-OF-WAY. IT SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ALL REQUIRED PERMITS PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL ABIDE BY ALL REQUIREMENTS FOR TRAFFIC CONTROL & SAFETY WHEN WORKING IN THE ROAD RIGHT-OF-WAY.

8. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN THE EVENT OF DISCOVERY OF POOR SOILS, STANDING GROUNDWATER, OR SEVERE DISCREPANCIES FROM SOIL LOG DESCRIPTIONS AS NOTED ON THE PLANS.

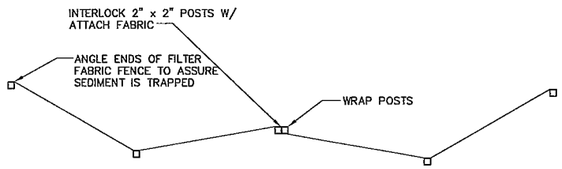
9. FOR PUBLIC SYSTEMS, THE CONTRACTOR SHALL CALL FOR INSPECTION 48 HOURS PRIOR TO COVERING ANY DRAINAGE STRUCTURE.

10. ALL DRAINAGE STRUCTURES, SUCH AS CATCH BASINS AND MANHOLES, NOT LOCATE WITHIN A TRAVELED ROADWAY OR SIDEWALK, SHALL HAVE SOLID LOCKING LIDS. ALL DRAINAGE STRUCTURES ASSOCIATED WITH A PERMANENT RETENTION/DETENTION FACILITY SHALL HAVE SOLID LOCKING LIDS.



NOTES:

1. BURY BOTTOM OF FILTER FABRIC IN 8" BY 12" TRENCH BELOW FINISHED GRADE.
2. 2" BY 2" WOOD POSTS, STANDARD OR BETTER OR EQUAL ALTERNATE; STEEL FENCE POSTS.
3. STITCHED LOOPS TO BE INSTALLED ON UPHILL SIDE OF SLOPE.
4. 4. COMPACT ALL AREAS OF FILTER FABRIC FENCE.



SILT FENCE DETAIL 1

24"x36" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

EROSION AND SEDIMENTATION CONTROL NOTES

SILT FENCE:

1. FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY FASTENED AT BOTH ENDS TO POSTS.

2. POSTS SHALL BE SPACED A MINIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 30 INCHES).

3. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 8 INCHES WIDE AND 12 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER. THIS TRENCH SHALL BE BACKFILLED WITH WASHED GRAVEL.

4. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 4 INCHES AND SHALL NOT EXTEND MORE THAN 24 INCHES ABOVE THE ORIGINAL GROUND SURFACE.

5. THE, STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 20 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 24, INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.

6. WHEN EXTRA-STRENGTH FILLER FABRIC AND CLOSER POST SPACING IS USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISIONS OF ABOVE NOTES APPLYING.

7. FILTER FABRIC FENCES SHALL NOT BE REMOVED BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

8. FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

9. SILT FENCES WILL BE INSTALLED PARALLEL TO ANY SLOPE CONTOURS.

10. CONTRIBUTING LENGTH TO FENCE WILL NOT BE GREATER THAN 100 FEET.

11. DO NOT INSTALL BELOW AN OUTLET PIPE OR WEIR.

12. INSTALL DOWNSLOPE OF EXPOSED AREAS.

13. DO NOT DRIVE OVER OR FILL OVER SILT FENCES.

MULCHING:

1. MULCH MATERIALS" USED SHALL BE STANDARD FINE HARDWOOD BARK MULCH AND SHALL BE APPLIED AT A MINIMUM DEPTH OF 2".

2. MULCHES SHALL BE APPLIED IN ALL AREAS WITH EXPOSED SLOPES GREATER THAN 2:1.

3. MULCHING SHALL BE USED IMMEDIATELY AFTER SEEDING OR IN AREAS WHICH CANNOT BE SEEDED BECAUSE OF THE SEASON.

4. ALL AREAS NEEDING MULCH SHALL BE COVERED BY NOVEMBER 1.

DRY SEASON GRADING NOTES (MAY 1 THROUGH SEPTEMBER 30)

THE CLEARING OF LAND, INCLUDING THE REMOVAL OF EXISTING VEGETATION OR OTHER GROUND COVER, MUST BE LIMITED TO ONLY AS MUCH LAND AREA AS CAN RECEIVE APPROPRIATE COVER OR BE OTHERWISE STABILIZED, AFTER HAVING BEEN CLEARED OR OTHERWISE DISTURBED, BY NO LATER THAN SEPTEMBER 30 OF A GIVEN YEAR. UNLESS IMMEDIATE STABILIZATION IS SPECIFIED IN THE EROSION AND SEDIMENTATION CONTROL PLAN, ALL AREAS CLEARED OR OTHERWISE DISTURBED MUST BE APPROPRIATELY STABILIZED THROUGH THE USE OF MULCHING, NETTING, PLASTIC SHEETING, EROSION BLANKETS, FREE DRAINING MATERIAL, ETC., BY SEPTEMBER 30TH OR SOONER PER THE APPROVED PLAN OF ACTION.

UNLESS OTHERWISE APPROVED BY THE COUNTY, SEEDING, FERTILIZING, AND MULCHING OF CLEARED OR OTHERWISE DISTURBED AREAS SHALL BE PERFORMED DURING THE FOLLOWING PERIODS: MARCH 1 TO MAY 15 AND AUGUST 15 TO OCTOBER 1. SEEDING AFTER OCTOBER 1 WILL BE DONE WHEN PHYSICAL COMPLETION OF THE PROJECT IS IMMINENT AND THE ENVIRONMENTAL CONDITIONS ARE CONDUCIVE TO SATISFACTORY GROWTH. IN THE EVENT THAT PERMANENT STABILIZATION IS NOT POSSIBLE, AN ALTERNATIVE METHOD OF GROUND COVER (SUCH AS MULCHING, NETTING, PLASTIC SHEETING, EROSION BLANKETS, ETC.) MUST BE INSTALLED BY NOT LATER THAN SEPTEMBER 30.

IN THE EVENT THAT CONSTRUCTION ACTIVITIES OR OTHER SITE DEVELOPMENT ACTIVITIES ARE DISCONTINUED FOR 4 CONSECUTIVE DAYS OR MORE, THE PROPONENT SHALL BE RESPONSIBLE FOR THE INSPECTION OF ALL EROSION AND SEDIMENTATION CONTROL FACILITIES IMMEDIATELY AFTER STORM EVENTS, AND AT LEAST ONCE EVERY WEEK. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND REPAIR OF ALL EROSION AND SEDIMENTATION CONTROL FACILITIES.

THE PROPONENT OR CONTRACTOR HAS THE OPTION OF EITHER:

- PROVIDING MATERIALS ON-SITE READILY AVAILABLE TO IMMEDIATELY STABILIZE DENUDED AREAS DURING PERIODS OF INCLEMENT WEATHER WHICH RESULT IN EROSION AND SEDIMENT TRANSPORT OFF-SITE,

OR

- PROVIDING THE COUNTY WITH A PLAN OF ACTION TO BE IMPLEMENTED DURING INCLEMENT WEATHER TO PREVENT OFF-SITE MIGRATION OF SEDIMENTS AND DESIGNING THE ON-SITE ESC FACILITIES FOR A 10-YEAR, 24-HOUR, ESC. TYPE 1A RAINFALL EVENT.

THE PROPONENT OR DESIGNEE SHALL ENSURE THE PROPER CONTINUED FUNCTIONING OF THE ESC FACILITIES BY PROMPT CLEANING AND MAINTENANCE AFTER EACH EROSION AND SEDIMENT PRODUCING RAINFALL EVENT.

OCTOBER 1 TO APRIL 30 (WET SEASON)

ON SITES WHERE UNINTERRUPTED CONSTRUCTION ACTIVITY IS IN PROGRESS, THE CLEARING OF LAND, INCLUDING THE REMOVAL OF EXISTING VEGETATION OR OTHER GROUND COVER, SHALL BE LIMITED TO ONLY AS MUCH LAND AREA AS CAN BE COVERED OR STABILIZED WITHIN 24 HOURS IN THE EVENT A MAJOR STORM IS PREDICTED AND/OR EROSION/SEDIMENT TRANSPORT OFF-SITE IS OBSERVED.

ADDITIONALLY, ALL CLEARED OR DISTURBED AREAS WILL RECEIVED APPROPRIATE PROTECTIVE COVER OR BE OTHERWISE STABILIZED (SUCH AS MULCHING, NETTING, PLASTIC SHEETING, EROSION BLANKETS, FREE DRAINING MATERIAL, ETC.) WITHIN 5 DAYS AFTER HAVING BEEN CLEARED OR OTHERWISE DISTURBED IF NOT BEING ACTIVELY WORKED. FILTER FABRIC FENCING, SEDIMENT TRAPS, SEDIMENT PONDS, ETC., WILL NOT BE VIEWED AS ADEQUATE COVER IN AND OF THEMSELVES. IN THE EVENT THAT ANY LAND AREA NOT BEING ACTIVELY WORKED REMAINS UNPROTECTED OR HAS NOT BEEN APPROPRIATELY STABILIZED 5 DAYS AFTER HAVING BEEN CLEARED, ALL CONSTRUCTION ACTIVITY ON THE SITE, EXCEPT FOR APPROVED EROSION ~~AND SEDIMENTATION CONTROL ACTIVITY, SHALL IMMEDIATELY CEASE UNTIL SUCH A TIME AS SAID LAND AREA HAS BEE APPROPRIATELY PROTECTED OR STABILIZED.~~

THE CONTRACTOR SHALL AT ALL TIMES HAVE AVAILABLE FOR THE PROJECT SUFFICIENT QUANTITIES OF PROTECTIVE COVERING MATERIALS TO IMMEDIATELY STABILIZE ALL DISTURBED AREAS IN CASE THE PROJECT ENGINEER OR COUNTY DIRECTS HIM/HER TO COVER DUE TO OBSERVED MIGRATION OF SOILS OR INCLEMENT WEATHER.

PLAN OF ACTION

THE CONTRACTOR MAY SUBMIT TO THE COUNTY A PLAN OF ACTION IN PLACE OF PROVIDING MATERIALS ON-SITE READY TO STABILIZE DENUDED AREAS. THE PLAN OF ACTION WILL INCLUDE THE FOLLOWING INFORMATION:
CONTRACTOR'S NAME, ADDRESS, PHONE NUMBER, EMERGENCY NUMBER.

ALTERNATE CONTACT WITH ABOVE INFORMATION.

CLEARLY DEFINED PLAN OF ACTION DESIGNED TO PREVENT OFF-SITE MIGRATION OF SEDIMENTS WHICH WILL BE IMPLEMENTED IN THE EVENT A MAJOR STORM IS PREDICTED OR OFF-SITE EROSION IS OBSERVED BY THE CONTRACTOR, HIS/HER EMPLOYEES OR THE COUNTY.

DESCRIPTION OF MATERIALS TO BE USED FOR COVER AND MEANS BY WHICH IT WILL BE PLACED. LIST EQUIPMENT TO BE USED OR NUMBER OF PERSONNEL ANTICIPATED TO BE USED TO SPREAD MATERIAL.

VENDOR OF SUPPLIER OF MATERIALS TO BE USED; LIST TWO ALTERNATES AND INCLUDE PHONE NUMBERS.

MEANS AND TIME FRAME FOR CLEAN UP OF ANY MATERIALS WHICH ESCAPE OFF-SITE AND FOR REPAIRS TO THE NATURAL SYSTEM IF DAMAGES HAVE OCCURRED.

DRAINAGE NOTE:

1. RUNOFF GENERATED FROM THE PROPOSED 49 S.F. ACCESSORY EQUIPMENT AREA; INCLUDING 12 S.F. OF NEW CONC SLAB & 37 S.F. OF CRUSHED ROCK IMPERVIOUS SURFACE, SHALL BE DIRECTED TOWARDS THE EXISTING LANDSCAPE AREA IMMEDIATELY WEST AND EAST OF THE EQUIPMENT AREA AND CONTINUING INTO THESE AREAS WITH DRAINAGE SHEDING AWAY FROM THE EQUIPMENT AREA TOWARDS the WEST AND EAST WITHOUT ANY IMPACT TO ADJACENT PROPERTIES.

2. DISCAHRGE SHALL ADDITIONALLY PERCOLATE INTO THESE SURROUNDING GRASS AREA WITHIN THE EXISTING SHOULDER ADJACENT THE ROW.

3. IN SUMMARY, DRAINAGE WILL MEET RUNOFF REQUIREMENTS BY CONVEYING RUNOFF WEST AND EAST INTO THE PLANTED GRASS AREAS ALONG THE ROW.

4. THERE WILL BE NO ADDITIONAL RUNOFF IMPACT TO ADJACENT PROPERTIES.

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