

NO: **R186**

COUNCIL DATE: **July 23, 2012**

REGULAR COUNCIL

TO: **Mayor & Council**

DATE: **July 23, 2012**

FROM: **General Manager, Planning and Development
General Manager, Engineering
General Manager, Investment & Intergovernmental
Relations**

FILE: **5450-01**

SUBJECT: **Pilot Program for the Use of Street Light and Utility Poles for the
Installation of Wireless Communications Infrastructure**

RECOMMENDATION

The Planning and Development Department, the Engineering Department and the Investment and Intergovernmental Relations Department recommend that Council:

1. Receive this report as information;
2. Approve a one-year pilot program during which each of the major cellular providers (Telus, Bell, Rogers, Wind and Mobilicity) will be allowed to install and operate wireless transmission equipment on a total of up to 20 existing City street light poles or utility poles (i.e., four installations per provider) all as generally described in this report; and
3. Authorize the appropriate City officials to execute a license agreement, as generally described in this report, with Data and Audio-Visual Enterprises Wireless Inc. doing business as Mobilicity ("Mobilicity") to allow the installation, operation and maintenance of wireless transmission infrastructure on a street light pole at the intersection of 152 Street and 84 Avenue as generally illustrated in Appendix I and with terms and conditions as documented in this report.

INTENT

The purpose of this report is to seek Council approval of a one-year pilot program to allow for the secondary use of up to 20 City street light poles or existing utility poles for the installation, operation and maintenance of wireless transmission equipment and to execute a license agreement with Mobilicity for such an installation on a specific street light pole on 152 Street at 84 Avenue.

BACKGROUND

The last several years has seen significant growth in the demand for wireless services. Smart phones, e-readers, tablet computers, mobile internet, mobile workforce management, field operations management and other new technologies have sparked this growing demand. This

growing demand for wireless services has challenged the wireless industry to provide sufficient infrastructure (i.e., data transmission capacity) to address macro and micro area coverage and capacity issues while being mindful of community concerns over infrastructure aesthetics.

Historically, a smaller number of taller cellular towers provided sufficient coverage and capacity to serve the needs of residents and businesses. The increase in cellular usage combined with the dramatic increase in data transmission/consumption enabled through smart phones has drastically increased the demand for capacity. In response to this increased consumer and business-driven demand, telecommunication companies have requested a more streamlined process for obtaining approvals from the City for new installations. Since October 2010, City staff has been working with the major wireless carriers (Telus, Bell, Rogers, Wind and Mobilicity) on updating the City's current Telecommunication Policy. Key in this work is the development of a comprehensive wireless communications strategy to ensure Surrey residents and businesses have high quality service and coverage from all carriers while minimizing the number of infrastructure installations especially in proximity to residential areas and to improve the aesthetics of telecommunications infrastructure where it is necessary. It is anticipated that the new wireless protocol will be presented for Council's consideration later this year.

Representatives of the wireless industry and City staff have been exploring alternative solutions to the typical monopole tower design. There are approximately 26,500 metal street light poles in the City, ranging in height from 7.5 metres to 13.5 metres (24 feet to 44 feet). Street lights are spaced 30 metres to 60 metres (98 feet to 196 feet) apart along most City streets. The secondary use of City street light poles for wireless transmission equipment has mutual benefit to the wireless carriers and the City. Utility poles utilized by BC Hydro and Telus vary in height with the shortest at approximately 9.3 metres (30 feet). These utility poles offer another viable alternative for the installation of telecommunications equipment in lieu of single-use stand-alone towers.

Mobilicity has approached the City for permission to replace an existing City street light pole located at the southeast corner of 152 Street and 84 Avenue with a new type of street light pole that will allow them to install telecommunications equipment on/within the pole to provide wireless data transmission. To facilitate such an installation, the City would need to sign a license agreement with Mobilicity that would allow for the use of the road allowance and the street light pole for wireless communications purposes. The other cellular companies have also expressed an interest in utilizing City street light poles for wireless services but are not as advanced in this regard as Mobilicity.

DISCUSSION

Regulatory and Policy Context

Under the *Radio Communication Act*, Industry Canada has the authority to approve and license communication towers and facilities. Industry Canada's Radiocommunication and Broadcasting Antenna Systems Client Procedures Circular (CPC-2-0-03) requires that in certain cases, the local land use authority and the public must be consulted for input regarding the proposed placement of a telecommunication antenna structure prior to its approval.

Surrey Zoning By-law, 1993, No. 12000 allows telecommunication towers as a permitted use in all zones but limits the height of freestanding towers to a maximum of 12 metres (40 feet). Structures exceeding this height require a development variance permit to be approved by City

Council. Industry Canada exempts any structure under 15 metres (50 feet) in height from the local consultation process.

The City's existing Telecommunication Policy encourages the use of existing structures such as Hydro transmission towers, utility poles, buildings and similar structures for the siting of new telecommunication facilities. Industry Canada requires that proponents first explore the use of any feasible existing infrastructure before building a new antenna-supporting structure. The secondary use of street light poles for the installation of wireless transmission equipment supports both the existing City and Industry Canada policy and guidelines.

City of Surrey infrastructure is simpler to access for cellular providers than BC Hydro and Telus infrastructure. BC Hydro infrastructure can be time consuming and complicated to access in that many utility poles are jointly owned by Telus and many of Hydro's transmission towers are on rights-of-way that limit Hydro's use to the transmission of electricity. To expand the use of the right-of-way to allow the installation of cellular equipment requires the agreement of the property owner as well as BC Hydro. Cellular providers have advised that they are willing to pay the City reasonable rates for use of City infrastructure for the installation of cellular antenna and related equipment.

The installation of wireless cellular transmission equipment on City street light poles offers the following potential advantages:

- The location, number and design of street light pole installations would be under the control of the City as the landlord;
- Such poles are more aesthetically compatible with residential areas where most of the growth in cellular demand is occurring;
- The need for larger radio communication towers in residential areas will be reduced or eliminated;
- Better wireless coverage can be provided where it is needed in residential areas;
- Better cellular infrastructure availability and capacity would enhance the attractiveness of Surrey to business;
- Could offer an opportunity to advance the installation of electric vehicle (EV) charging stations at appropriate street light poles; and
- Would provide incremental new revenue to the City without the need for any incremental investment from the City (i.e., these revenues would be generated through application processing fees, infrastructure and road allowance licensing fees and business licensing fees. The carriers would consider the use of up to 170 street light poles at various locations throughout the City over the next three years, which would provide a strong and sustainable revenue stream.

Technical Design Considerations

The new wireless equipment installations would be accomplished by swapping out existing street light poles with upgraded and shared street light poles that would have a maximum height of 15 metres (50 feet) to the top of the antenna. Appendix I contains an illustration of such a pole. The height of the actual street light would remain the same as the other street light poles on the same street so there would be no change in the illumination levels along the street. Use of existing utility poles would follow the same guidelines.

Under Industry Canada's CPC -2-0-03, new antenna systems with a height of less than 15 metres are exempted from the requirement for public consultation.

Each shared street light pole would require an equipment cabinet for cellular switching equipment. The cabinet could be located on the ground either within the road allowance or on an adjacent private property. The cabinet can also be mounted on the street light pole. The cabinet would be placed at a location that would avoid conflicts with sidewalks and underground utilities, minimize their visual impact and as a minimum, be installed with a picture wrap suitable to its location.

Each shared street light pole would be occupied by the equipment of only one cellular provider. The antenna would be at the top of the street light pole and would be shrouded if required based on the installation location. In addition, there could be up to two microwave dishes, each with an area of 0.3 square metres (3 square feet).

It is noted that there will be some variation in design as the cellular providers do not have the same antenna and equipment requirements. Mobilicity, Bell, Telus, Rogers and Wind Mobile each use different technologies based on the radio-frequency they have available to them.

Site Selection Guidelines

The telecommunication companies will be requested to identify the specific street light poles on which they would be interested in installing telecommunication equipment. Upon receiving such an application, staff will evaluate the suitability of the specific location based on its potential visual impact, other aesthetic concerns and its significance from a cellular coverage perspective (i.e., usage, capacity and coverage) and the safety and security of the proposed installation.

The evaluation will also take into to account:

- The need to minimize impacts on view corridors;
- The proposed location not be located directly in front of a window or the frontage of residence; and
- A preference for locations on arterial and collector roads.

The cellular providers will be requested to select sites where the probability of public concerns is low and to submit designs that are aesthetically pleasing.

Proposed Pilot Program

To establish more accurately the public's opinion of and assess other possible impacts stemming from the secondary use of City-owned street light and utility poles for the installation of

telecommunication equipment, a one-year pilot program is proposed during which the major cellular providers (Telus, Bell, Rogers, Wind and Mobilicity) will be allowed to install wireless transmission equipment on up to a total of 20 City street light poles at a rate of four locations per provider. Under the pilot, the cellular provider will need to submit an application to the City for each proposed installation and pay an application fee. Subject to staff being satisfied that the installation is reasonable in the context of the above-referenced criteria, the cellular provider will be required to enter into an agreement with the City for the installation and pay an annual rental fee. The referenced cellular providers are satisfied with this approach.

Staff will report back to Council after the one-year pilot on the results of the program and with recommendations regarding its continuation.

The wireless providers have estimated over the next three years that up to 170 street light pole locations could be useful to them in relation to the delivery of cellular services for cellular users in Surrey.

Proposed License Agreement with Mobilicity

As a start to the pilot program, Mobilicity has applied to the City to replace an existing City street light pole at the southeast corner of the intersection of 152 Street and 84 Avenue with a new combined street light/telecommunication pole as generally illustrated in Appendix I attached to this report.

A tentative agreement has been developed as follows:

1. *Main Licence Terms:*

- *Duration: Five (5) years with two – 5-year options to extend the agreement at market rates with the City having the right to terminate the agreement with notice at any time during the agreement;*
- *Application fee: \$1200;*
- *Rental fee: \$8000 per year for the first 5 years and renegotiation if an option to renew is exercised;*
- *Installation Costs: Mobilicity's responsibility*
- *Maintenance Costs: Mobilicity's responsibility (pole and Mobilicity's infrastructure only, i.e. not street light head and associated wiring).*

2. *Operational Requirements:*

Mobilicity has agreed to be responsible for all costs associated with the removal of the existing street light pole and the installation and maintenance of the new shared street light pole and associated equipment cabinet. Power consumption for the telecommunications equipment will be metered separately and be paid by Mobilicity.

Legal Services Review:

Legal Services has reviewed this report and has no concerns.

SUSTAINABILITY CONSIDERATIONS

The proposed works support the achievement of the objectives of the City's Sustainability Charter; more particularly the following action items:

- EC2: Economic Development Strategy and an Employment Land Strategy – by providing expanded communications capacity and coverage in the City to serve businesses and residents, which will make the City more attractive to investment; and
- EN8: Sustainable Engineering Standards and Practices.

CONCLUSION

Based upon the above discussion, it is recommended that Council:

- Approve a one-year pilot program during which each of the major cellular providers (Telus, Bell, Rogers, Wind and Mobilicity) will be allowed to install and operate wireless transmission equipment on a total of up to 20 existing City street light poles or utility poles (i.e., four installations per provider) all as generally described in this report; and
- Authorize the appropriate City officials to execute a license agreement, as generally described in this report, with Data and Audio-Visual Enterprises Wireless Inc. doing business as Mobilicity ("Mobilicity") to allow the installation, operation and maintenance of wireless transmission infrastructure on a street light pole at the intersection of 152 Street and 84 Avenue as generally illustrated in Appendix I and with terms and conditions as documented in this report.

Original signed by
Jean Lamontagne
General Manager,
Planning and Development

Original signed by
Vincent Lalonde, P.Eng.
General Manager,
Engineering

Original signed by
Shaun Greffard
General Manager, Investment &
Intergovernmental Relations

GF:saw

Attachment:

Appendix I Proposed Mobilicity Street Light Pole Installation at 152 Street at 84 Avenue

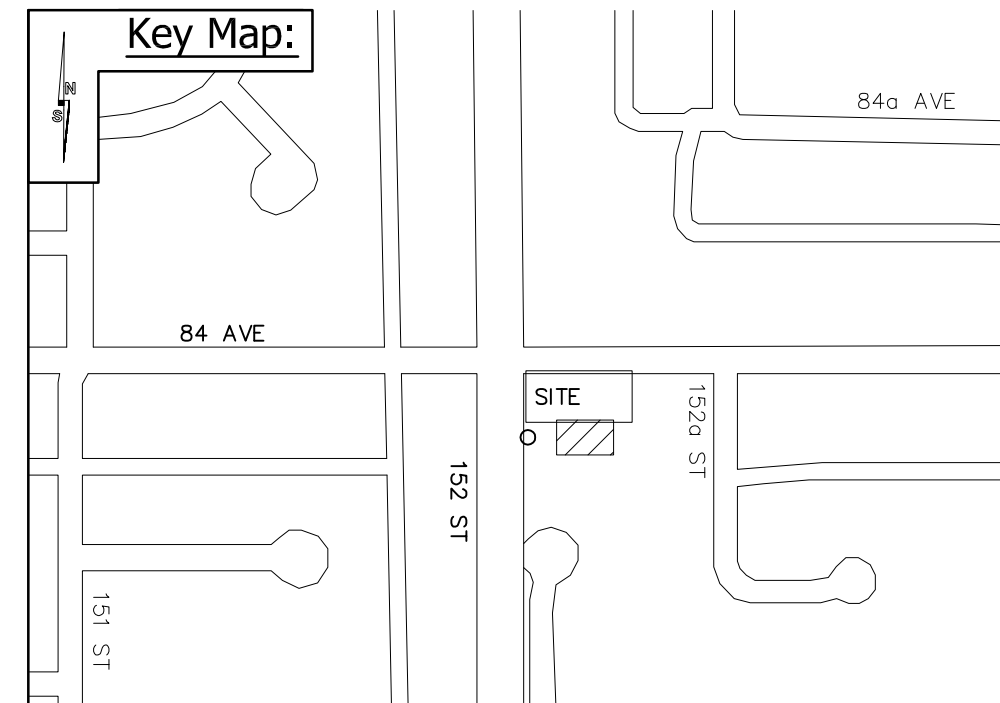
DAVE WIRELESS



SITE PHOTO

CALL BEFORE YOU DIG!
BC ONE CALL: 1-800-474-6886

DO NOT EXCAVATE OR DISTURB EXISTING GROUND SURFACES
PRIOR TO OBTAINING LOCATES AND CLEARANCES FOR ALL
EXISTING SERVICES, INCLUDING SERVICES ON PRIVATE PROPERTY.



Project Information:

Site Type: LIGHT POLE
 Site Code: VAN105B
 Address: 15230 84 AVENUE
 Coordinates: 49.155189, -122.801270
 Intersection: 152 STREET & 84 AVENUE
 City: SURREY
 Project Number: 121-14053-00-80

Approvals:

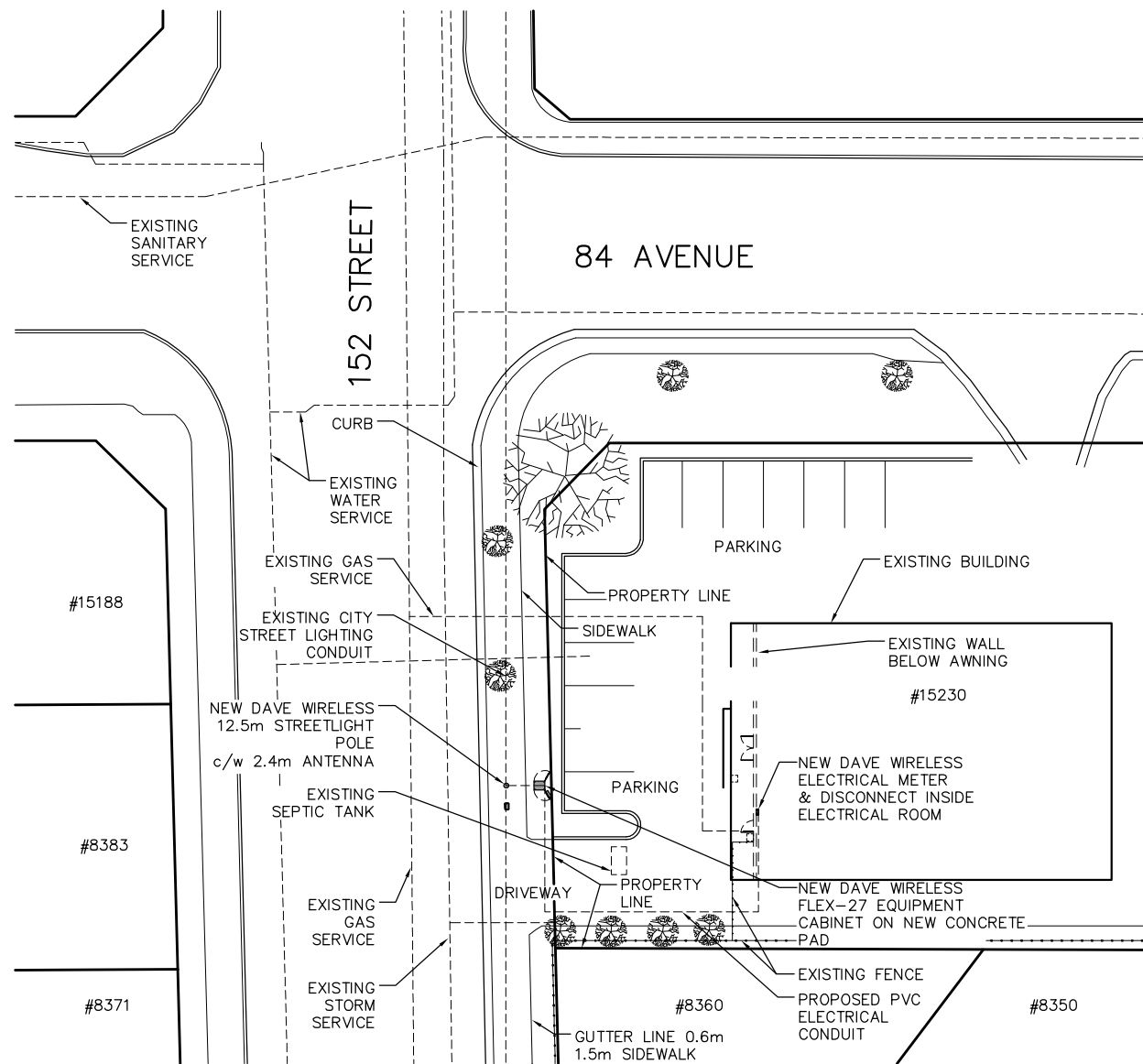
<u>Approved by:</u>	<u>Date:</u>	<u>Company:</u>
.....
.....
.....

Drawing List:

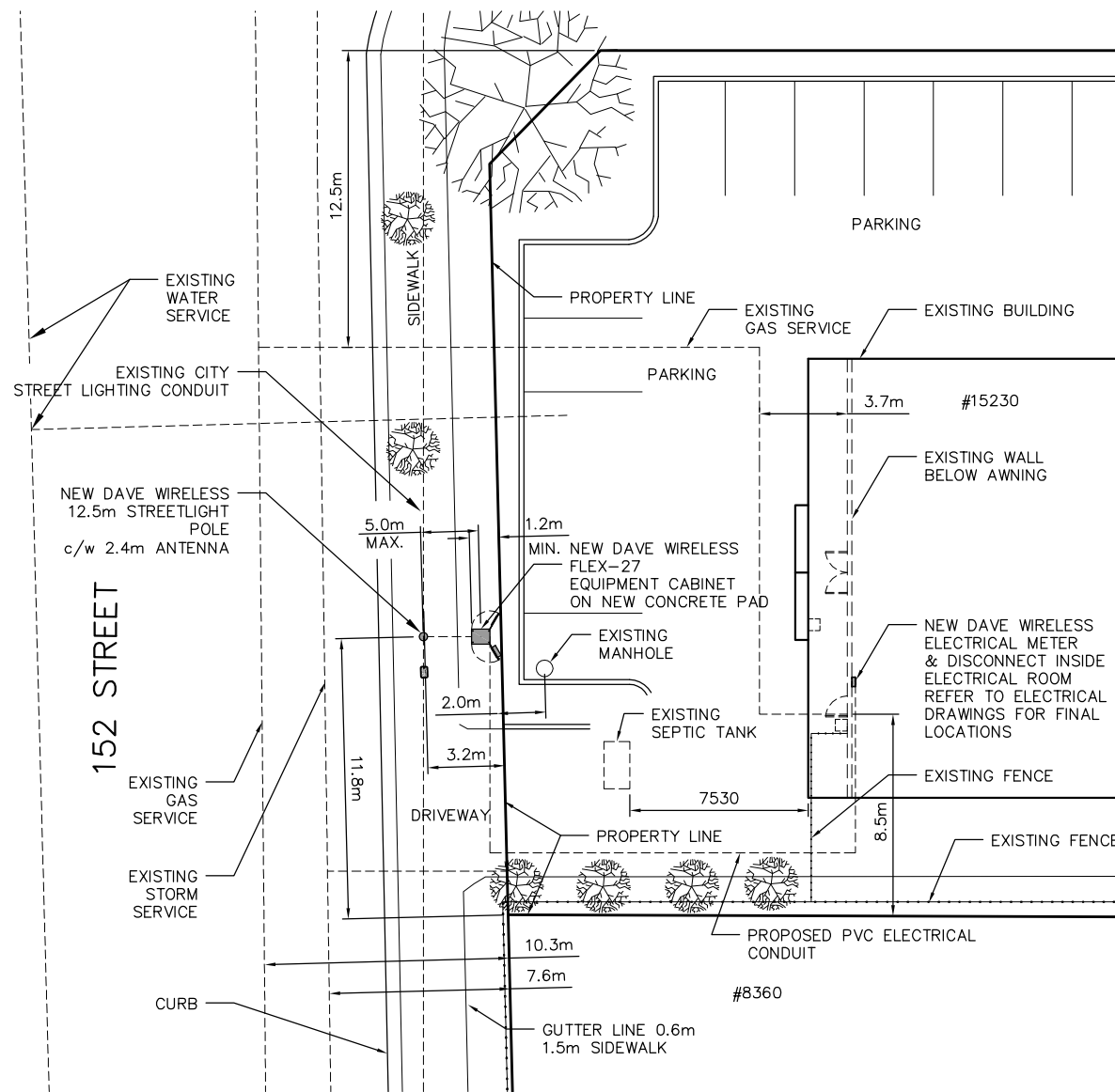
				ISSUE	DATE	DESCRIPTION
SITE PLAN	S1	PAGE:1	1	06/25/12	REVISED ANTENNA HEIGHT	
STREETLIGHT POLE ELEVATION	S2	PAGE:2	1	06/25/12	REVISED ANTENNA HEIGHT	
STREETLIGHT POLE PROXIMITIES	S3	PAGE:3	1	06/25/12	REVISED ANTENNA HEIGHT	
PHOTO ELEVATION VIEW	S4	PAGE:4	1	06/25/12	REVISED ANTENNA HEIGHT	
FOUNDATION DETAILS	S5	PAGE:5	0	04/23/12	ISSUED FOR CONSTRUCTION	
CABINET SUPPORT DETAILS	S6	PAGE:6	1	07/09/12	REVISED FOR CITY PERMIT	
GENERAL NOTES	N1	PAGE:7	0	04/23/12	ISSUED FOR CONSTRUCTION	
ELECTRICAL	E1	PAGE:8	0	04/23/12	ISSUED FOR CONSTRUCTION	

Contacts:

	<u>LANDLORD</u> T.B.D.
<u>STRUCTURAL / ELECTRICAL ENGINEERS</u> GENIVAR INC. #308, 4211 KINGSWAY BURNABY, BC V5H 1Z6 OFFICE: (604) 294-5800 FAX: (604) 294-0400	<u>DAVE WIRELESS CONTACT</u> PETER COLLINS 1060 WEST 8TH AVENUE, SUITE 210 VANCOUVER, BC V6H 1C4 OFFICE: (604) 676-1090 FAX: (604) 676-1091



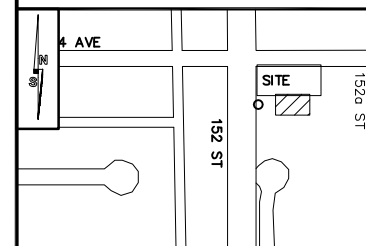
1 SITE PLAN
S1 SCALE: N.T.S.



2 ENLARGED SITE PLAN
S1 SCALE: N.T.S.

EXISTING SITE PLAN INFORMATION WAS OBTAINED FROM CITY OF SURREY PUBLIC COSMOS AND FROM SITE OBSERVATIONS BY GENIVAR INC. CONDUCTED IN FEBRUARY 2012.

KEY MAP (N.T.S.)



REFERENCE DRAWINGS

NOTES

THESE DRAWINGS ARE COPYRIGHT AND THE PROPERTY OF GENIVAR INC. AND MAY NOT BE USED UNTIL MARKED AS ISSUED FOR CONSTRUCTION. REPRODUCTION OF THESE DRAWINGS WITHOUT THE CONSENT OF THE ENGINEER, IS STRICTLY PROHIBITED. DO NOT SCALE THESE DRAWINGS. ANY ERRORS OR DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE ENGINEER.

DAVE WIRELESS

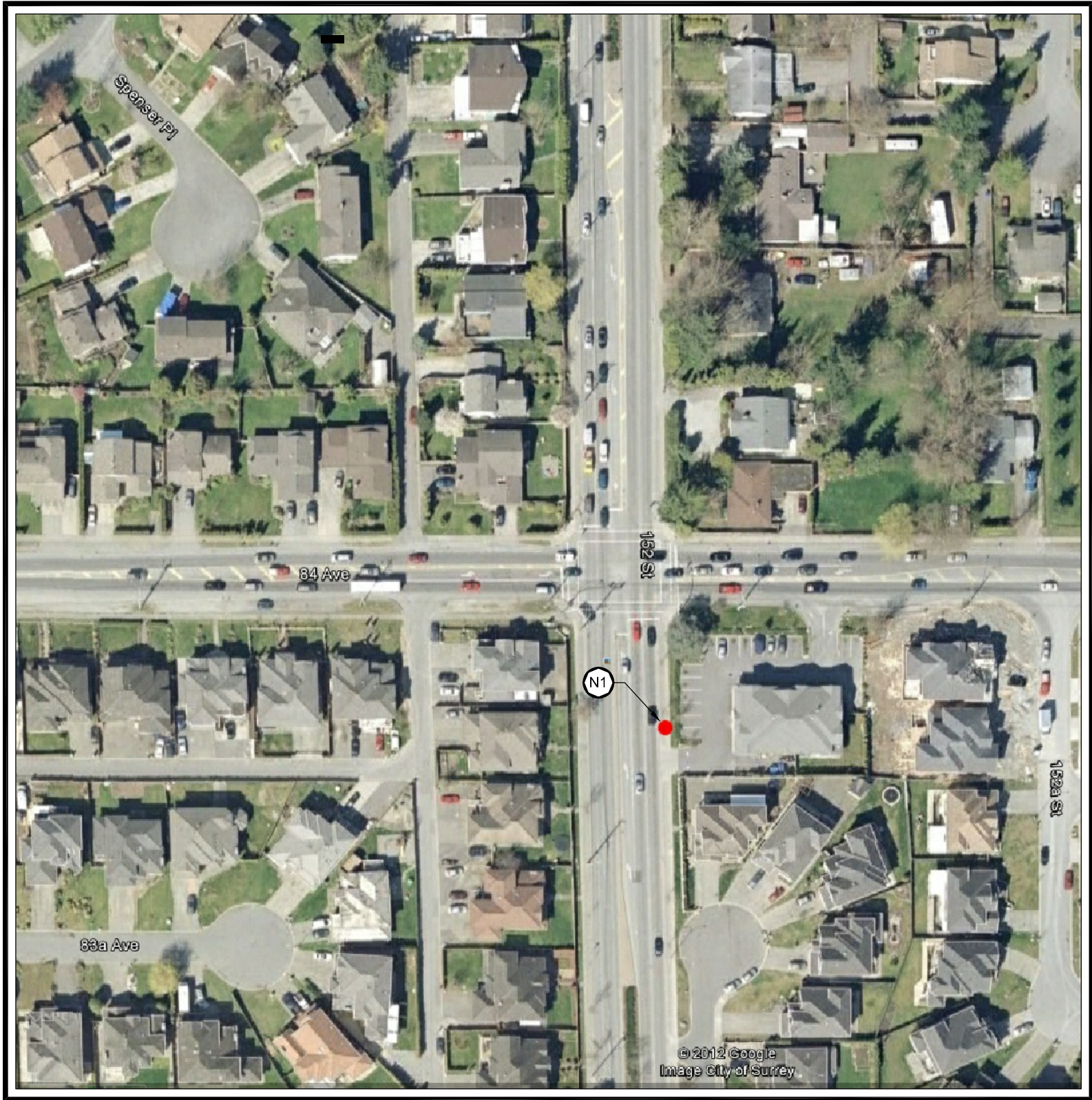
1	06/25/12	REVISED ANTENNA HEIGHT	G.D.
0	04/23/12	ISSUED FOR CONSTRUCTION	B.Y.
No.	DATE	REVISIONS	BY

GENIVAR
#308, 4211 Kingsway, Burnaby, BC V5H 1Z6
Telephone: (604) 294-5800

TITLE: SITE PLAN	
DESCRIPTION: LIGHT POLE	
ADDRESS: 15230 84TH AVE	
PLOT DATE: JUNE 25, 2012	SCALE: AS NOTED
SITE CODE: VAN105B	DRAWING No: S1
GENIVAR PROJECT #: 121-14053-00-80	PAGE NO: 1
DESIGNED BY: D.A.	DRAWN BY: B.Y.

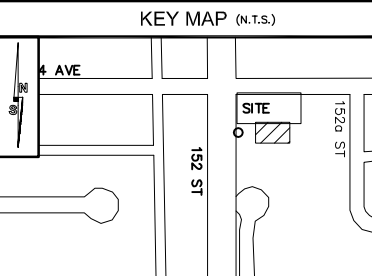
VAN105B

LATITUDE: 49.155189
 LONGITUDE: -122.801270



NOTES:

N1 - NEW DAVE WIRELESS 12.5m STREETLIGHT POLE
 c/w 2.4m ANTENNA (MAX. HEIGHT = 14.9m)



REFERENCE DRAWINGS

NOTES

THESE DRAWINGS ARE COPYRIGHT AND THE PROPERTY OF GENIVAR INC. AND MAY NOT BE USED UNTIL MARKED AS ISSUED FOR CONSTRUCTION. REPRODUCTION OF THESE DRAWINGS WITHOUT THE CONSENT OF THE ENGINEER, IS STRICTLY PROHIBITED. DO NOT SCALE THESE DRAWINGS. ANY ERRORS OR DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE ENGINEER.



DAVE WIRELESS

No.	DATE	REVISIONS	BY
1	06/25/12	REVISED ANTENNA HEIGHT	G.D.
0	04/23/12	ISSUED FOR CONSTRUCTION	B.Y.

GENIVAR
 #308, 4211 Kingsway, Burnaby, BC V5H 1Z6
 Telephone: (604) 294-5800

TITLE: STREETLIGHT POLE PROXIMITIES	
DESCRIPTION: LIGHT POLE	
ADDRESS: 15230 84TH AVE	
PLOT DATE: JUNE 25, 2012	SCALE: AS NOTED
SITE CODE: VAN105B	DRAWING No: S3
GENIVAR PROJECT #: 121-14053-00-80	PAGE NO: 3
DESIGNED BY: D.A.	DRAWN BY: B.Y.

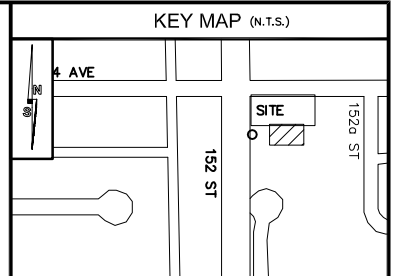
1 84 AVE NE & 152 ST STREETLIGHT POLE
S3 NOTE: IMAGE WAS TAKEN FROM GOOGLE EARTH AND MAY NOT REPRESENT ACTUAL SITE CONDITIONS. SCALE: N.T.S.



1 84 AVE NE & 152 ST STREETLIGHT POLE
 S4 SOUTH ELEVATION SCALE: N.T.S.

NOTES:

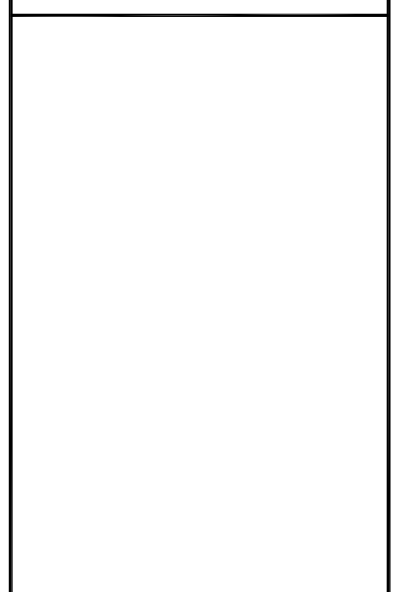
- N1 - NEW DAVE WIRELESS 12.5m STREETLIGHT POLE
 c/w 2.4m ANTENNA (MAX. HEIGHT = 14.9m)
- N2 - NEW DAVE WIRELESS FLEX-27 EQUIPMENT CABINET ON
 CONCRETE PAD ENVIRONMENTAL NOISE 65dB. REFER TO
 DRAWING S6 FOR CONCRETE PAD DETAILS



REFERENCE DRAWINGS

NOTES

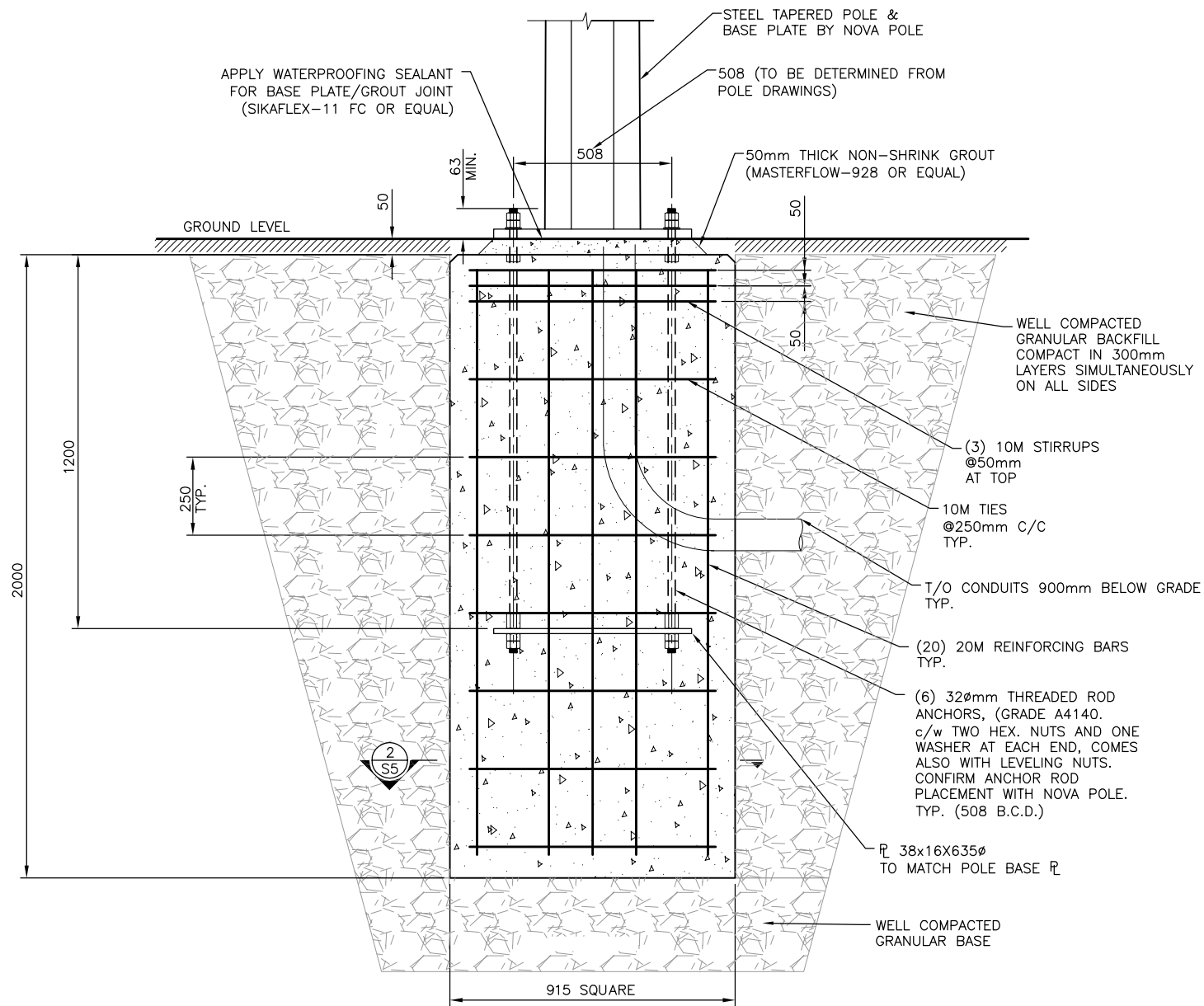
THESE DRAWINGS ARE COPYRIGHT AND THE PROPERTY OF GENIVAR INC. AND MAY NOT BE USED UNTIL MARKED AS ISSUED FOR CONSTRUCTION. REPRODUCTION OF THESE DRAWINGS WITHOUT THE CONSENT OF THE ENGINEER, IS STRICTLY PROHIBITED. DO NOT SCALE THESE DRAWINGS. ANY ERRORS OR DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE ENGINEER.



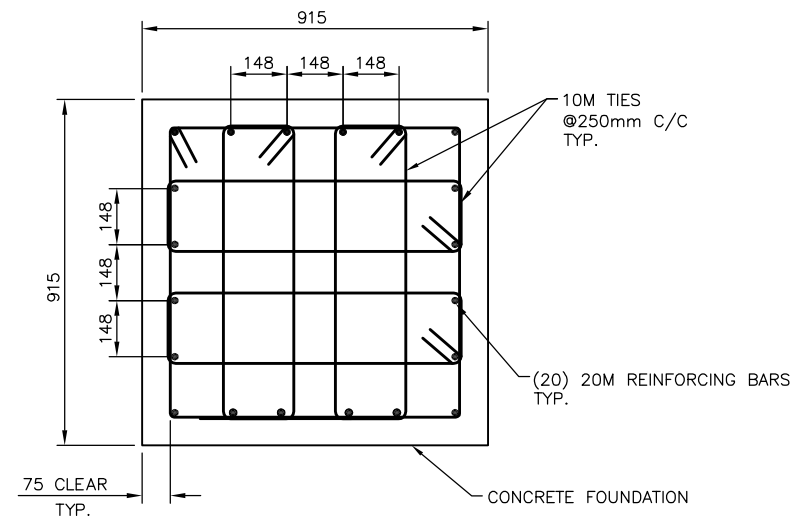
No.	DATE	REVISIONS	BY
1	06/25/12	REVISED ANTENNA HEIGHT	G.D.
0	04/23/12	ISSUED FOR CONSTRUCTION	B.Y.

GENIVAR
 #308, 4211 Kingsway, Burnaby, BC V5H 1Z6
 Telephone: (604) 294-5800

TITLE: PHOTO ELEVATION VIEW	
DESCRIPTION: LIGHT POLE	
ADDRESS: 15230 84TH AVE	
PLOT DATE: JUNE 25, 2012	SCALE: AS NOTED
SITE CODE: VAN105B	DRAWING No: S4
GENIVAR PROJECT #: 121-14053-00-80	PAGE NO: 4
DESIGNED BY: D.A.	DRAWN BY: B.Y.



1 CONCRETE FOUNDATION ELEVATION
S5 SCALE: 1:20



2 SECTION
S5 SCALE: 1:20

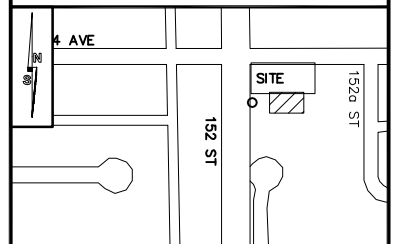
FOUNDATION NOTES:

- DESIGN LOADS (FACTORED)
MOMENT = 60 KN.m
SHEAR = 8KN
AXIAL = 10kN (BARE)
AXIAL = 17KN (WITH ICE)
- CONCRETE STRENGTH = 30 MPa AT 28 DAYS
- CONCRETE GROUT SHALL BE NON-SHRINK, NON-METALLIC HAVING MINIMUM COMPRESSIVE STRENGTH OF 35MPa AT 28 DAYS.

GEOTECHNICAL NOTES:

- ASSUMED SOIL PROPERTIES
AVERAGE SOIL LATERAL PRESSURE = 95 KPa. (FOR CAISSON DESIGN)
SOIL ALLOWABLE BEARING PRESSURE = 100 KPa.
Kp = 3.0
SOIL DRY DENSITY = 100 psf
WATER TABLE IS BELOW THE FOOTING DEPTH.
FROST LEVEL = 600mm.
- GEOTECHNICAL DATA NEEDS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER BEFORE INSTALLATION. ANY DISCREPANCIES SHOULD BE REPORTED TO GENIVAR FOR REASSESSMENT OF FOUNDATION DESIGN.
- REFER TO SHEET N1 FOR ADDITIONAL NOTES.
- TOPSOIL AND SOD NEEDS TO BE PLACED ON TOP OF PAD, KEEP ROCK UNDERNEATH PAD.
- BACKFILL THE FOOTING SIDES WITH WELL GRADED SOIL AND COMPACT TO 98% SPD TO 2m DEPTH FROM GROUND LEVEL IN 300mm LAYERS.

KEY MAP (N.T.S.)



REFERENCE DRAWINGS

NOTES

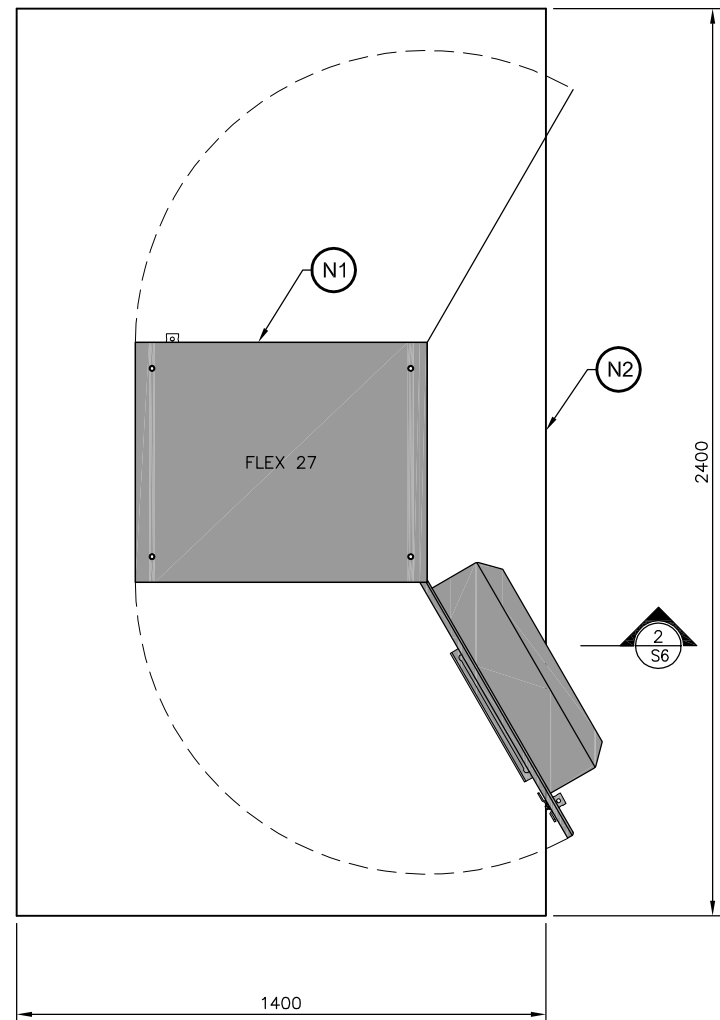
THESE DRAWINGS ARE COPYRIGHT AND THE PROPERTY OF GENIVAR INC. AND MAY NOT BE USED UNTIL MARKED AS ISSUED FOR CONSTRUCTION. REPRODUCTION OF THESE DRAWINGS WITHOUT THE CONSENT OF THE ENGINEER, IS STRICTLY PROHIBITED. DO NOT SCALE THESE DRAWINGS. ANY ERRORS OR DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE ENGINEER.

DAVE WIRELESS

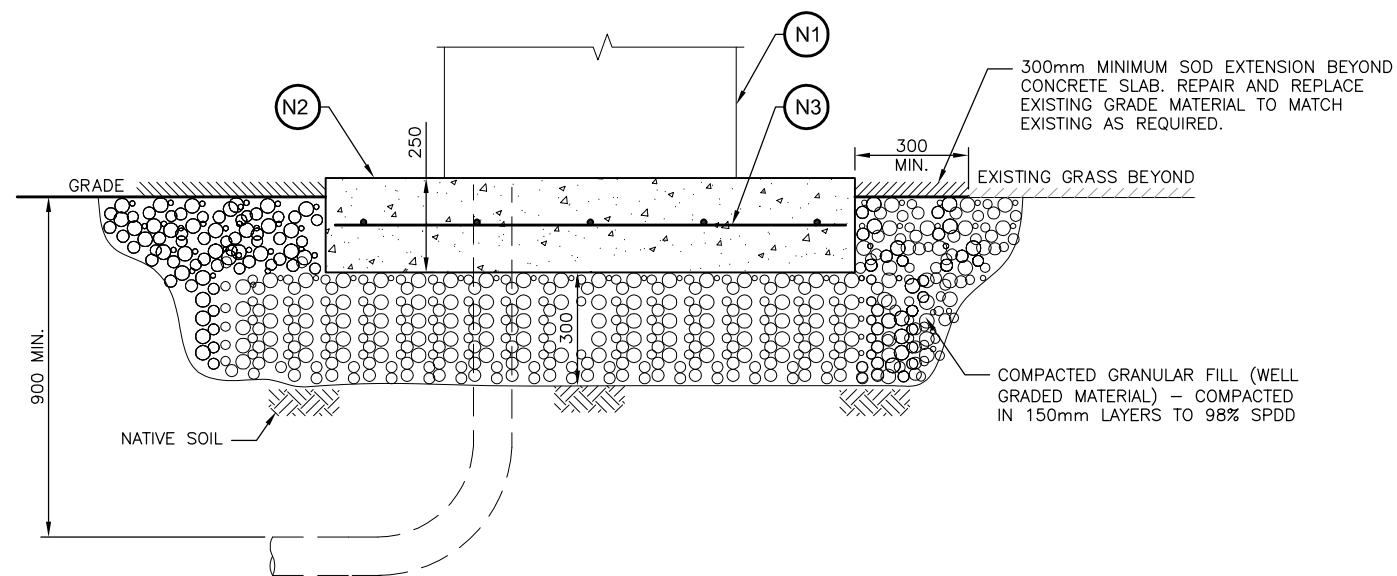
0	04/23/12	ISSUED FOR CONSTRUCTION	B.Y.
No.	DATE	REVISIONS	BY

GENIVAR
#308, 4211 Kingsway, Burnaby, BC V5H 1Z6
Telephone: (604) 294-5800

TITLE: FOUNDATION DETAILS	
DESCRIPTION: LIGHT POLE	
ADDRESS: 15230 84TH AVE	
PLOT DATE: JUNE 25, 2012	SCALE: N/A
SITE CODE: VAN105B	DRAWING No: S5
GENIVAR PROJECT #: 121-14053-00-80	PAGE NO: 5
DESIGNED BY: D.A.	DRAWN BY: B.Y.



1
S6
CABINET SUPPORT PLAN
SCALE: 1:20



2
S6
CABINET SUPPORT ELEVATION
SCALE: 1:20

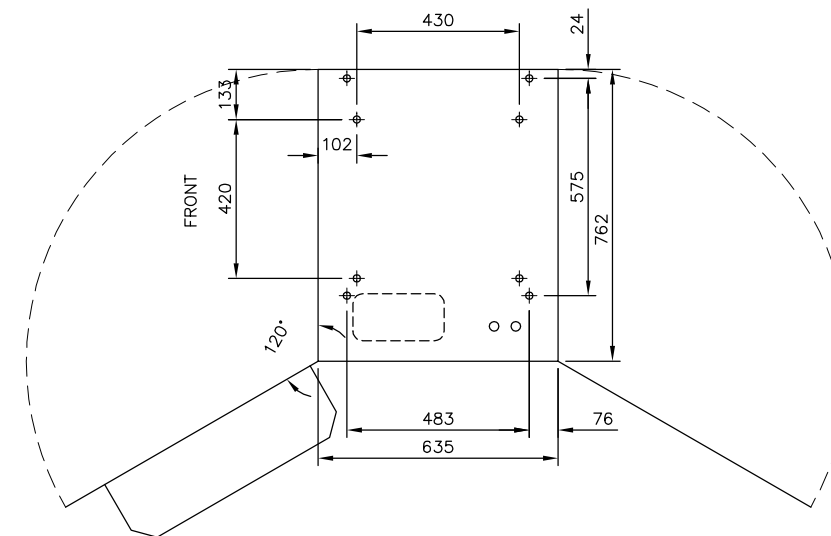
NOTES

- 1 - CONTRACTOR SHALL VERIFY EXISTING DIMENSIONS, DETAILS AND CONDITIONS PRIOR TO FABRICATION, REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
- 2 - ALL MATERIALS TO BE HOT DIP GALVANIZED AFTER FABRICATION INCLUDING NUTS, BOLTS, AND WASHERS, UNLESS NOTED OTHERWISE.
- 3 - ALL DRILLING BY ROTATION ONLY. HAMMER DRILLING NOT PERMITTED.
- 4 - DESIGN LOADS:
MAX. WEIGHT OF FLEX-27 INCLUDED BATTERIES = 505 Kg (1112 lbs)

1 IN 50 YEAR RETURN PERIOD PER BCBC 2006
SNOW GROUND LOAD $S_s = 2.4kPa$
ASSOCIATED RAIN LOAD $S_r = 0.3kPa$
REFERENCE WIND VELOCITY LOAD $q = 0.47kPa$
SEISMIC $S_a (0.2) = 1.0$, SITE CLASS C
- 5 - BOLTS SHALL BE IN FULL BEARING WITH THREADS EXCLUDED FROM THE SHEAR PLANE.
- 6 - SHOP DRAWINGS MUST BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION. REVIEW OF SHOP DRAWINGS IS A PRECAUTION AGAINST OVERSIGHT OR ERROR. IT IS NOT A DETAILED CHECK AND SHALL NOT BE CONSTRUED AS RELIEVING CONFORMITY WITH THE CONTRACT DOCUMENTS. MAINTAIN A SET OF REVIEWED DRAWINGS ON SITE. DRAWINGS ARE TO BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER IN THE PROVINCE OF BRITISH COLUMBIA.
- 7 - REFER TO DRAWING N1 FOR ADDITIONAL NOTES.

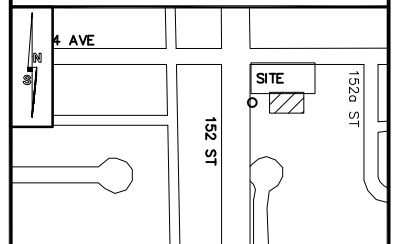
NOTES:

- N1 - PROPOSED DAVE WIRELESS FLEX 27 CABINET (762x635x1778mm).
- N2 - PROPOSED 2400x1400x250mm SLAB ON GRADE.
- N3 - 15M BARS AT 300c/c EACH WAY AT MIDDLE OF SLAB.



3
S6
FLEX-27 CABINET BOLTING PATTERN
SCALE: 1:20

KEY MAP (N.T.S.)



REFERENCE DRAWINGS

NOTES

THESE DRAWINGS ARE COPYRIGHT AND THE PROPERTY OF GENIVAR INC. AND MAY NOT BE USED UNTIL MARKED AS ISSUED FOR CONSTRUCTION. REPRODUCTION OF THESE DRAWINGS WITHOUT THE CONSENT OF THE ENGINEER, IS STRICTLY PROHIBITED. DO NOT SCALE THESE DRAWINGS. ANY ERRORS OR DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE ENGINEER.

DAVE WIRELESS

1	07/09/12	REVISED FOR CITY PERMIT	G.D.
0	04/23/12	ISSUED FOR CONSTRUCTION	B.Y.
No.	DATE	REVISIONS	BY

GENIVAR
#308, 4211 Kingsway, Burnaby, BC V5H 1Z6
Telephone: (604) 294-5800

TITLE: **CABINET SUPPORT DETAILS**

DESCRIPTION: **LIGHT POLE**
ADDRESS: **15230 84TH AVE**

PLOT DATE: JUNE 25, 2012 SCALE: N/A

SITE CODE: VAN105B DRAWING No: **S6**

GENIVAR PROJECT #: 121-14053-00-80 PAGE NO:

DESIGNED BY: D.A. DRAWN BY: B.Y. 6

GENERAL NOTES:

1. UNLESS NOTED OTHERWISE, ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE BRITISH COLUMBIA BUILDING CODE (2006), THE OCCUPATIONAL HEALTH AND SAFETY ACT, REGULATIONS AND CODE, AND WITH GOOD CONSTRUCTION PRACTICE.
2. THE CONTRACTOR IS RESPONSIBLE TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO THE PREPARATION OF SHOP DRAWINGS AND MANUFACTURE OF COMPONENTS. ADVISE THE ENGINEER AND DAVE WIRELESS OF ANY CONFLICT AND/OR OMISSIONS. TAKE THE NECESSARY PRECAUTIONS TO PROTECT THE EXISTING INSTALLATION FROM DAMAGE. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL THE CLAIMS DUE TO DAMAGE.
3. THE CONTRACTOR SHALL ADVISE THE ENGINEER, IN WRITING, OF ANY DISCREPANCY OBSERVED BETWEEN THE DRAWING AND EXISTING CONDITIONS, PRIOR TO COMMENCING WORK. ANY DISCREPANCIES IDENTIFIED AFTER THE COMMENCEMENT OF WORK SHALL BE RECTIFIED AT THE EXPENSE OF THE CONTRACTOR AND TO THE ENGINEER'S SATISFACTION.
4. ANY DETERIORATION FOUND WITHIN EXISTING ELEMENTS OR ANY EXISTING SITE DAMAGE, AT THE LOCATION OF THE NEW INSTALLATION, MUST BE REPORTED IN WRITING TO THE ENGINEER AND DAVE WIRELESS, PRIOR TO COMMENCING ANY WORK. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH SPECIFICATIONS AND DRAWINGS.
5. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS IN METERS UNLESS NOTED OTHERWISE. ALL REVISIONS MUST BE MADE PRIOR TO CONSTRUCTION.
6. THE CONTRACTOR SHALL CHECK AND VERIFY ALL SITE CONDITIONS, CLEARANCES AND DIMENSIONS AT THE SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH WORK.
7. VISIT THE SITE TO CHECK ON AVAILABLE ACCESS, STORAGE AND WORKING AREAS. DETERMINE ANY INTERFERENCE WITH EXISTING SERVICES.
9. ALL DUCT BENDS ARE SWEEP 90 DEGREES, MINIMUM RADIUS IS 300mm.
10. DO NOT EXCAVATE OR DISTURB EXISTING GROUND SURFACES PRIOR TO OBTAINING LOCATES AND CLEARANCES FOR ALL EXISTING SERVICES, INCLUDING SERVICES ON PRIVATE PROPERTY.
11. LOCATIONS AND DETAILS SHOWN ON THIS DRAWING ARE BASED ON THE BEST INFORMATION AVAILABLE AT TIME OF SURVEY. CONFIRM ALL LOCATIONS, CLEARANCES, AND INTERFERENCES ON SITE PRIOR TO BEGINNING WORK.
12. MAKE GOOD ALL EXISTING FINISHES WHEN WORK IS COMPLETE.
13. THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVE GROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
14. ALL THE MATERIAL AND EQUIPMENT TO BE CSA APPROVED.

STRUCTURAL STEEL:

1. STEEL DESIGN, FABRICATION AND ERECTION SHALL BE CARRIED OUT IN ACCORDANCE WITH CSA-S37 AND CAN/CSA S16
2. ALL WELDING SHALL BE CARRIED OUT IN ACCORDANCE WITH CSA-W59, BY A CONTRACTOR CERTIFIED BY THE CANADIAN WELDING BUREAU IN CONFORMANCE WITH CSA W47.1, DIVISION 1 OR 2.1. ALL WELDS ARE TO BE SEAL WELDS AND SHALL BE THOROUGHLY CLEANED PRIOR TO GALVANIZING.
3. PROVIDE NEW STEEL MATERIALS CONFORMING TO CSA STANDARDS G40.21, UNLESS NOTED OTHERWISE, AND WITH DIMENSIONAL TOLERANCES IN ACCORDANCE WITH G40.20. (GRADE 350W FOR ROLLED W SHAPES AND HOLLOW STRUCTURAL SECTIONS (CLASS C), GRADE 300W FOR OTHER SHAPES).
4. ALL STEEL INCLUDING BOLTS, NUTS AND WASHERS, SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION TO CAN-G164. ALL DAMAGED SURFACES SHALL BE CLEANED, WIRE BRUSHED AND PAINTED WITH COLD GALVANIZING COMPOUND.
5. ALL BOLTS SHALL BE HIGH STRENGTH CONFORMING TO ASTM STANDARDS A325, EXCEPT WHERE NOTED OTHERWISE. **BOLTS SHALL BE IN FULL BEARING WITH THREADS EXCLUDED FROM THE SHEAR PLANE.** ALL BOLTS SHALL BE INSTALLED UTILIZING "TURN OF NUT" METHOD.
6. GROUTING FOR BASE PLATES AND BEARING PLATES SHALL BE A CEMENTITIOUS NON-SHRINK TYPE.
7. THE CONTRACTOR SHALL SUBMIT THREE (3) SETS OF SHOP AND ERECTION DRAWINGS FOR REVIEW BY THE ENGINEER, PRIOR TO FABRICATION.
8. BOLT HOLES TO BE 2mm LARGER THAN THE BOLT DIAMETER.
9. ALL CONNECTION BOLTS TO BE SNUG-TIGHTENED.
10. U-BOLTS SHALL BE IN FIRM AND UNIFORM CONTACT WITH CONNECTING PARTS.
11. TIGHTEN U-BOLTS TO MANUFACTURER RECOMMENDED TORQUE VALUES.

REINFORCEMENT STEEL:

1. REINFORCEMENT STEEL SHALL BE DEFORMED BARS CONFORMS TO CSA G30.18-M92. HAVING YIELD STRENGTH OF 400 MPa.
2. ALL SPLICING OF REINFORCEMENT SHALL BE LAPPED SPLICED AND SHALL BE PLACED IN CONTACT WITH EACH OTHER AND WIRED SECURELY. THE MINIMUM LAP LENGTH SHALL BE 36 TIMES BAR DIAMETER.
3. SPLICE LOCATIONS SHALL BE STAGGERED ALONG THE SLAB.
4. REINFORCEMENT SHALL BE FREE FROM MUD, LOOSE MILL AND RUST SCALE, GREASE, OIL OR ANY OTHER COATINGS THAT WOULD DESTROY OR REDUCE THE BOND WITH CONCRETE.
5. BARS SHALL BE PROPERLY LOCATED IN FORMS AND HELD IN PLACE BEFORE AND DURING CONCRETING BY USING SUPPORTS OF ADEQUATE STRENGTH TIED TO A WIRE OF #16 GAUGE OR HEAVIER. TYPICALLY THESE SUPPORTS SHALL NOT EXCEED 48 INCHES.

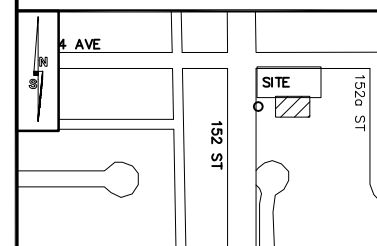
RADIO EQUIPMENT, ANTENNAS & Tx LINES:

1. ALL RADIO EQUIPMENT, ANTENNAS AND DOWNTILT BRACKETS SHALL BE SUPPLIED BY DAVE WIRELESS. THE CONTRACTOR IS RESPONSIBLE FOR PICKUP, TRANSPORTATION, HANDLING AND INSTALLATION.
2. ALL TRANSMISSION LINES, JUMPERS, CONNECTORS AND GROUNDING KITS ARE TO BE SUPPLIED BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR SUPPLY AND INSTALLATION.
3. THE CONTRACTOR SHALL SUPPLY AND INSTALL ALL SUPPORT HANGERS AND OTHER HARDWARE AS RECOMMENDED BY THE TRANSMISSION LINES MANUFACTURER.
4. ANTENNAS MUST BE ALIGNED TO WITHIN ±0.5 DEGREES OF INDICATED AZIMUTH VALUES. PIPE MOUNTS SHALL BE INSTALLED PLUMB LEVEL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A SURVEYOR TO VERIFY ANTENNA POSITIONING. THE SURVEYOR'S REPORT IS TO BE PROVIDED TO THE DAVE WIRELESS CONSTRUCTION MANAGER.
5. THE CONTRACTOR SHALL PERFORM SWEEP TESTS OF TRANSMISSION LINES, ANTENNAS AND JUMPERS. SWEEP TESTS MUST BE DONE WITH AN HP SCALER ANALYZER, HP SPECTRUM ANALYZER, HP NETWORK ANALYZER OR WILTRON ANRITSU S331 TIME DOMAIN REFLECTOMETER AS PER DAVE WIRELESS SPECIFICATIONS.

CONCRETE:

1. ALL CONCRETE WORK INCLUDING DESIGN OF COMPONENTS SHALL BE CARRIED OUT IN ACCORDANCE WITH CAN/CSA A23.1/A23.2/CSA A23.3 AND CSA-S37.
2. MINIMUM CONCRETE COVER TO REINFORCING STEEL SHALL BE:
CONCRETE PLACED ADJACENT TO EARTH = 75mm.
FORMED CONCRETE, EXPOSED TO EARTH AND WEATHER = 50mm.
3. MINIMUM CONCRETE STRENGTH SHALL BE 25 MPa AT 28 DAYS. CONCRETE EXPOSED TO FREEZE/THAW CYCLES SHALL HAVE ENTRAINED AIR IN ACCORDANCE WITH CAN/CSA A23.1.
4. PROVIDE DEFORMED REINFORCING STEEL CONFORMING TO CAN/CSA G30.18. USE GRADE 400R BARS FOR ALL REINFORCING DETAILS. BEND, PLACE AND SUPPORT REINFORCING, STEEL IN CONFORMANCE WITH RSIC MANUAL.
5. BACK FILL TO BE COMPACTED IN LAYERS TO AT LEAST 95% STANDARD PROCTOR DRY DENSITY. BACK FILL TYPE AS SPECIFIED ON THE DRAWINGS.
6. CONCRETE SHALL BE CLASS N EXPOSURE.

KEY MAP (N.T.S.)



REFERENCE DRAWINGS

NOTES

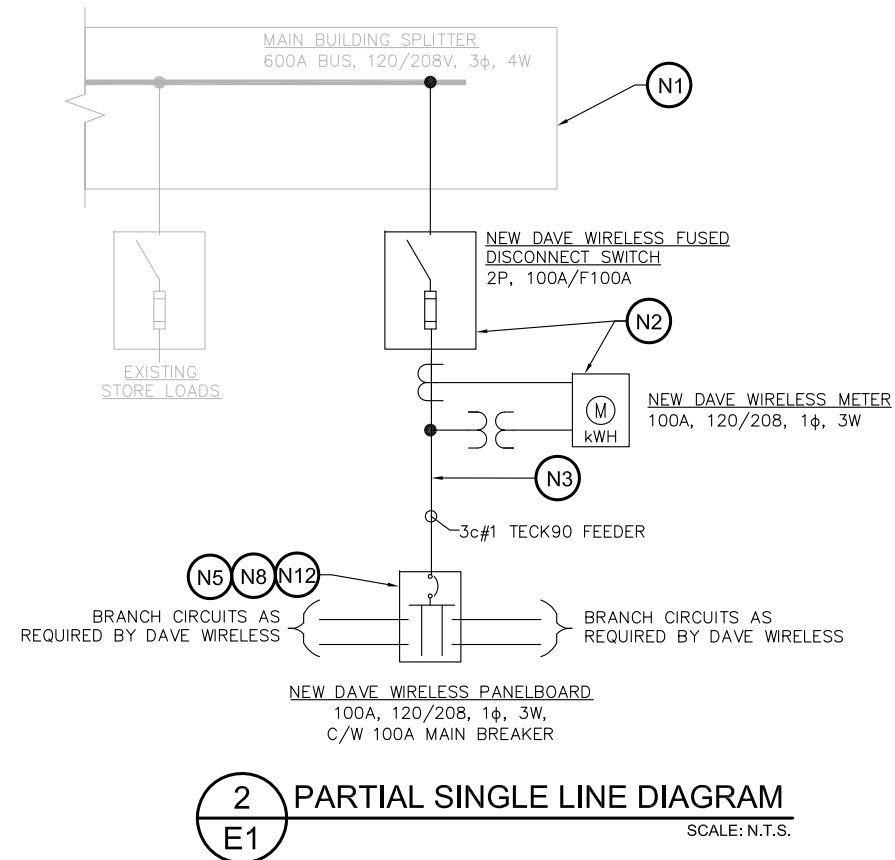
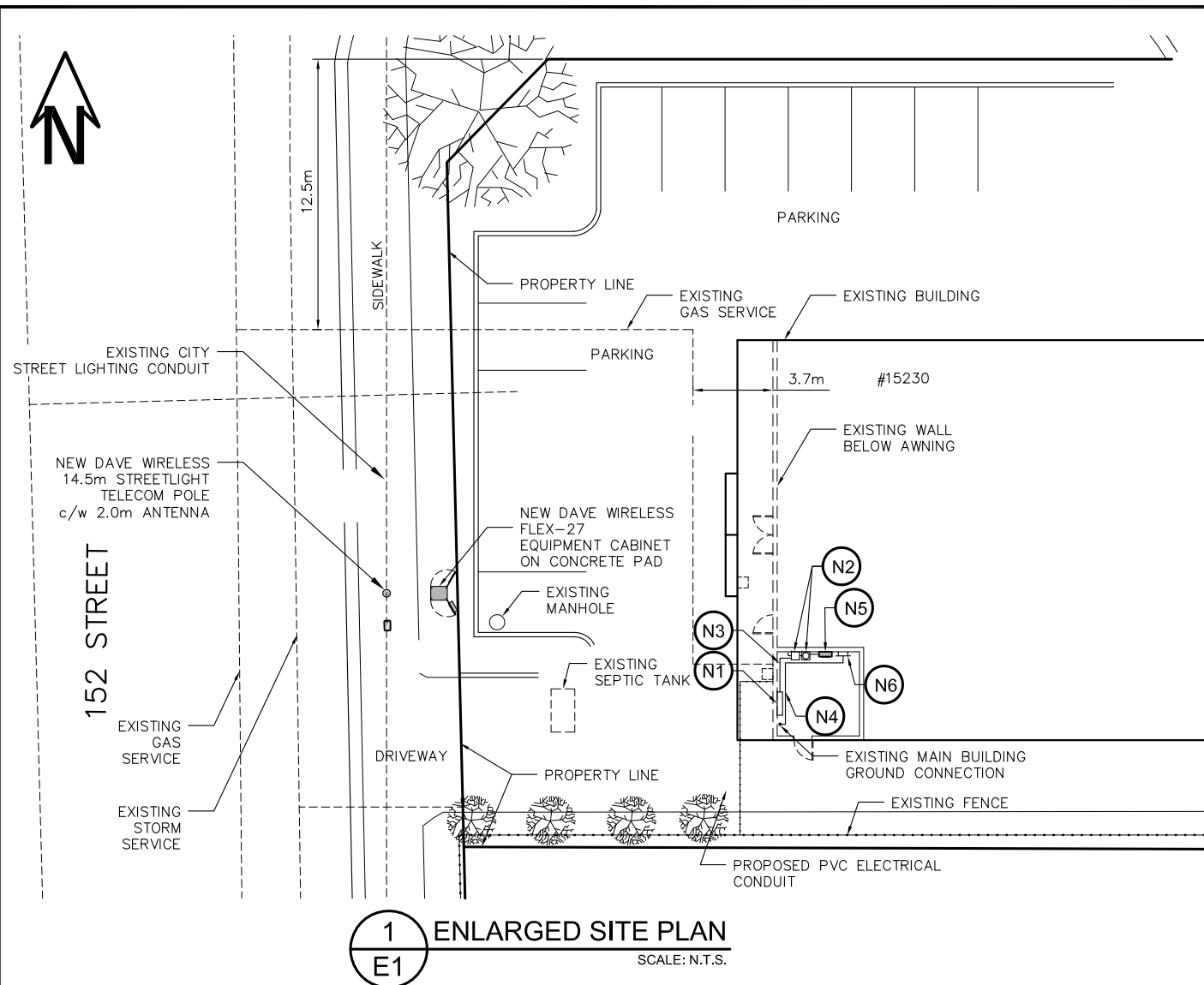
THESE DRAWINGS ARE COPYRIGHT AND THE PROPERTY OF GENIVAR INC. AND MAY NOT BE USED UNTIL MARKED AS ISSUED FOR CONSTRUCTION. REPRODUCTION OF THESE DRAWINGS WITHOUT THE CONSENT OF THE ENGINEER, IS STRICTLY PROHIBITED. DO NOT SCALE THESE DRAWINGS. ANY ERRORS OR DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE ENGINEER.



No.	DATE	REVISIONS	BY
0	04/23/12	ISSUED FOR CONSTRUCTION	B.Y.



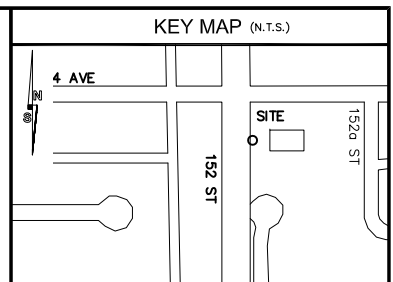
GENERAL NOTES			
DESCRIPTION:			
LIGHT POLE			
ADDRESS:			
15230 84TH AVE			
PLOT DATE:	SCALE:		
JUNE 25, 2012	N/A		
SITE CODE:	DRAWING No:		
VAN105B	N1		
GENIVAR PROJECT #	PAGE NO:		
121-14053-00-80	7		
DESIGNED BY:	DRAWN BY:		
D.A.	B.Y.		



NOTES

- N1 - APPROXIMATE LOCATION OF EXISTING 600A, 120/208V, 3φ, 4W SPLITTER IN THE ELECTRICAL ROOM. TAP OFF THE SPLITTER AND PROVIDE A NEW 100/F100A FUSED DISCONNECT SWITCH ON THE NORTH WALL AND LABEL, "DAVE WIRELESS - DO NOT OPERATE". MEASURE THE LOAD ON ALL THREE PHASES AND TAKE THE SERVICE FROM THE TWO PHASES WITH THE LEAST LOAD. RUN A NEW 3c#1 TECK90 CABLE FROM THE DISCONNECT SWITCH TO AN ADJACENT NEW WALL MOUNTED REVENUE METER. ALL SHUTDOWNS REQUIRED SHALL BE COORDINATED WITH THE BUILDING OWNER.
- N2 - NEW 100A, 120/208V, 1φ, 3W, UTILITY-TYPE REVENUE METER MOUNTED (MIN. 1.5m A.F.F. TO CENTRE) ON THE NORTH WALL OF THE ELECTRICAL ROOM. ALL NEW EQUIPMENT LOCATIONS TO BE VERIFIED ON SITE BY THE CONTRACTOR AND COORDINATED WITH THE BUILDING OWNER.
- N3 - RUN NEW 3C#1 TECK90, FT4 RATED, POWER FEEDER FROM THE REVENUE METER TO THE ADJACENT POWER PANEL. CABLE SUPPORTS SHALL BE SPACED IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE STANDARDS. COORDINATE ALL CABLE ROUTING ON SITE WITH BUILDING OWNER.
- N4 - GROUNDING CONDUCTOR IS TO BE A SINGLE #2/0 GREEN INSULATED, FT4 RATED, STRANDED COPPER WIRE CONNECTED BETWEEN THE BUILDING GROUND IN THE MAIN ELECTRICAL ROOM AND THE MASTER GROUND BUS BAR IN THE SAME ROOM. ROUTE WIRE IN PARALLEL TO THE POWER CABLE TO THE MASTER GROUND BUS BAR LOCATED ON NORTH WALL OF THE ELECTRICAL ROOM. THE GROUND CONDUCTOR SHALL NOT BE PLACED IN METALLIC CONDUIT ANYWHERE IN THE DIRECT RUN TO THE BUILDING GROUND. CONDUIT IS NECESSARY ONLY IF REQUIRED BY THE BUILDING OWNER OR IF REQUIRED FOR MECHANICAL PROTECTION. IN SUCH CASES CONDUIT SHALL BE PVC TYPE SIZED AND SUPPORTED ACCORDING TO THE CEC, PART 1, SECTION 12. ADEQUATE BUILDING GROUND MUST BE IN PLACE. IN BUILDINGS WHERE THE MAIN BUILDING GROUND IS INSUFFICIENT BY LOCAL BUILDING AND CANADIAN ELECTRICAL CODE STANDARDS, ADDITIONAL GROUND RODS/PLATES MUST BE INSTALLED AS PER CEC, PART 1, SECTION 10 AND CONNECTED TO THE MAIN BUILDING GROUND WITH A MINIMUM #2/0 CONDUCTOR.
- N5 - THE ELECTRICAL PANEL SHALL BE A 100A, 120/208V, 1φ, 3W, 24-CCT PANEL, WITH PAD LOCKABLE DOOR. THE PANEL IS TO BE PROVIDED WITH A 100A MAIN BREAKER AND BRANCH BREAKERS AS REQUIRED BY DAVE WIRELESS. PROVIDE A SCREW-HELD LAMACOID NAMEPLATE FOR THE PANEL AND A TYPEWRITTEN PANEL DIRECTORY. ENSURE MIN. 1.0m CLEARANCE IN FRONT OF ALL ELECTRICAL EQUIPMENT.
- N6 - PROVIDE A COPPER MASTER GROUND BUS BAR KIT WITH STANDOFF INSULATORS IN THE ELECTRICAL ROOM FOR TERMINATION OF THE #2/0 GROUND CONDUCTOR. MASTER GROUND BUS BAR SHALL BE TO DAVE WIRELESS REQUIREMENTS. CONFIRM EXACT LOCATION ON SITE WITH DAVE WIRELESS SITE REPRESENTATIVE PRIOR TO INSTALLATION. ALL NON-CURRENT CARRYING METAL PARTS OF COMMUNICATION EQUIPMENT AND STRUCTURES SHALL BE BONDED TO THE MASTER GROUND BUS BAR. THIS INCLUDES ALL STEEL WORK SUCH AS ALL PIPE MOUNTS, BALLAST MOUNTS, CANTILEVERS, AND OTHER METAL FRAMEWORK USED IN THE CONSTRUCTION OF THE SITE.
- N7 - CORE DRILL THROUGH WALLS, SLABS AND OTHER PARTITIONS WITH APPROVAL OF A STRUCTURAL ENGINEER FOR ALL CABLING RUNS. PROVIDE APPROPRIATELY RATED FIRESTOP (AS PER LATEST BC BUILDING CODE) AT ANY LOCATIONS WHERE CABLES PASS THROUGH FIRE RATED STRUCTURES. X-RAY AS REQUIRED TO ENSURE AREAS TO BE CORED ARE ACCEPTABLE LOCATIONS AND FREE OF ALL HIDDEN OBSTRUCTIONS. ALL CABLE PENETRATIONS TO THE EXTERIOR OF THE BUILDING SHALL BE SEALED TO PREVENT ANY WATER FROM ENTERING THE BUILDING INTERIOR. CONTRACTOR TO PROVIDE THE MANUFACTURER'S INFORMATION ON THE FIRE STOPPING MATERIAL BEING USED AND THE APPROPRIATED cUL/UL INSTALLATION DRAWING USED FOR THE INSTALLATION. PROVIDE FIRESTOPPING INFORMATION LABEL NEAR FIRE STOPPED OPENINGS.
- N8 - CONDUIT AND WIRING FROM THE PANEL AND MASTER GROUND BUS BAR TO EQUIPMENT SHALL BE TO DAVE WIRELESS STANDARDS.
- N9 - PROVIDE LABELLING FOR ALL WIRES AND CABLES AT 4500mm INTERVALS OR WHERE CABLES PASS THROUGH WALLS OR FLOORS OR TERMINATE AT EQUIPMENT. LABELLING TO INDICATE "DAVE WIRELESS" AND "AC POWER" OR "GROUND" AS APPLICABLE.
- N10 - ALL WORK SHALL BE PERFORMED TO DAVE WIRELESS STANDARDS AND IN ACCORDANCE WITH THE LOCAL BUILDING CODES, CSA, AND THE CANADIAN ELECTRICAL CODE.
- N11 - THE CONTRACTOR SHALL RETAIN, FROM THE APPROVED B.C. REGISTERED PROFESSIONAL ENGINEERS ASSOCIATION, A SEISMIC ENGINEER TO PROVIDE PROFESSIONALLY SEALED DRAWINGS OF THE EQUIPMENT ANCHORAGE AND SEISMIC RESTRAINT FOR ALL NEW AND/OR RELOCATED ELECTRICAL EQUIPMENT, AND PROVIDE A SCHEDULE S LETTER OF ASSURANCE DIRECTLY TO THE CONSULTANT FOR THE SEISMIC RESTRAINT OF THE ELECTRICAL EQUIPMENT.
- N12 - FOR ARRANGEMENT DETAILS OF DAVE WIRELESS EQUIPMENT IN THE WORKSHOP, SEE STRUCTURAL DRAWINGS.

EXISTING SITE PLAN INFORMATION WAS OBTAINED FROM CITY OF SURREY PUBLIC COSMOS AND FROM SITE OBSERVATIONS BY GENIVAR INC. CONDUCTED IN FEBRUARY 2012.



REFERENCE DRAWINGS

NOTES
THE INFORMATION CONTAINED IN THIS SCHEMATIC PLAN IS SOLELY INTENDED AS A GENERIC REPRESENTATION OF EQUIPMENT LOCATION. THESE DRAWINGS ARE COPYRIGHT AND THE PROPERTY OF GENIVAR CONSULTANTS LIMITED PARTNERSHIP AND MAY NOT BE USED UNTIL MARKED AS ISSUED FOR CONSTRUCTION. REPRODUCTION OF THESE DRAWINGS WITHOUT THE CONSENT OF THE ENGINEER, IS STRICTLY PROHIBITED. DO NOT SCALE THESE DRAWINGS. ANY ERRORS OR DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE ENGINEER.

DAVE WIRELESS			
GENIVAR			
#308, 4211 Kingsway, Burnaby, BC V5H 1Z6 Telephone: (604) 294-5800			
TITLE:	ELECTRICAL INSTALLATION		
DESCRIPTION:	LIGHT POLE		
ADDRESS:	15230 152ND STREET		
PLOT DATE:	APRIL 05, 2012	SCALE:	AS NOTED
SITE CODE:	VAN105	DRAWING No:	E1
GENIVAR PROJECT #	121-14053-00-80	PAGE NO:	1
DESIGNED BY:	GY	DRAWN BY:	GY

No.	DATE	REVISIONS	BY
0	06/13/12	ISSUED FOR CONSTRUCTION	TW
A	04/16/12	ISSUED FOR REVIEW	GY

GENIVAR			
#308, 4211 Kingsway, Burnaby, BC V5H 1Z6 Telephone: (604) 294-5800			
TITLE:	ELECTRICAL INSTALLATION		
DESCRIPTION:	LIGHT POLE		
ADDRESS:	15230 152ND STREET		
PLOT DATE:	APRIL 05, 2012	SCALE:	AS NOTED
SITE CODE:	VAN105	DRAWING No:	E1
GENIVAR PROJECT #	121-14053-00-80	PAGE NO:	1
DESIGNED BY:	GY	DRAWN BY:	GY