NORTHFIELD SUBSTATION

PRODUCTION DEPARTMENT -- VANCOUVER ISLAND

SITE APPEARANCE IMPROVEMENT PROPOSAL

This report reviews the present condition at a low profile station constructed in 1966. Re-grading, filling, ditching, and planting recommendations are made to improve the present appearance of the location, and to provide long term screening of the facility from residential property in the immediate area.

Approximate cost estimates are included as a guide only.

1. Present Situation

1.1 General Description

This low profile substation is located west of Boxwood Road in Lots 1 and 2 of Section 17, Range 7, Mountain District, and is referred to as Northfield Substation. It is within the unincorporated municipality of Northfield. The station is situated on the westerly edge of a semi-urban area of sporadic housing and arable land. Lots 4 and 5 immediately opposite the station are scheduled for development in the near future. Boxwood Road is presently served by three entrances from the main thoroughfare, Bowen Road. These are namely Northfield, Meredith and Fern Roads. As residential premises intensify, traffic frequency along Boxwood Road will increase; the station will therefore be seen by both residents and visitors to the area.

The station has been constructed on an artificial plateau of gravel fill, some 260 feet wide and 330 feet long. Original ground contours show a surface drop of some 16 feet over the length of the station necessitating fill to a depth of some 18 feet at the southern boundary. For specific details reference should be made to Drawings 501F-C05-D1 and 501F-E05-D4 (Revision 2) enclosed with this report.

1.2 Site Description

The station has been set back from the road some 69 feet and lies between an undeveloped property which is for sale on the southerly boundary and a rough orchard and stand of Douglas Fir (Pseudotsuga Taxifolia) to the north. The Authority's property extends west some considerable distance to the right-of-way. This area has a minimum of woody growth at present as it presumably has been sprayed in the past. A makeshift stock fence between the station and this rough grass area would seem to indicate that grazing has been allowed. Considerable growth which is encroaching on the station yard has now sprung up along the fence. Between the steep bank to the south and the property line is an access road to the rear of the grounds; however this has been blocked perhaps purposely with a load of rough fill.

To the east between the road and the bank Blackberry (Rubus ursinus), Maple (Acer macrofolia), Cherry (Prunus emarginate), Broom (Cytisus Scoparius), Alder (Prunus rubra), Arbutus (Arbutus menziesii), Douglas Fir, Wild Rose (Rosa nutkana), and a wide variety of grasses and broad leaved weeds have become established on the disturbed area after construction. However, the greater part of the fill area is devoid of vegetation.

The northern boundary provides only some seven feet between the station fence and the property line. An open ditch provides drainage for surface runoff from the higher adjacent property. Blackberry, Wild Rose and some broadleaved weeds have colonized this ditch but again the extremely low fertility of the fill has resulted in little desirable ground cover. This same situation may be said to exist on the steep banks on the perimeter of the plateau. An open area some 90 feet long and 260 feet wide intended for future station expansion is supporting little growth despite an overdressing of pit run gravel.

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Lodgepole Pine (Pinus contorta) and Douglas Fir have seeded in on one corner. Severe erosion has washed much of the fill down in places; this, along with the tangle of undergrowth at the roadside combines to give the station an unkept and unsightly appearance. Reference may be made here to the four pictures enclosed with this report.

2. Rehabilitation

2.1 Removal of Existing Debris

The ditch to the north should have the present plant growth removed by hand or sprayed with paraquat "Gramoxone" TM Plant Protection Ltd. at the rate of 1 oz. product in 2 gallons of water per 750 square feet. Encroachment of vegetation from adjoining property should be controlled with a similar treatment now and hereafter with a 2-4-D, 2-4-5-T tank mix or Brushkill at the rate of 1 to 2 lb. acid per hundred gallons of water.

Vegetation on the roadside of the station should be scalped with a bulldozer and removed from the site. Debris blocking access to the rear of the property should also be removed and thought given to resetting the present gate and renewing the boundary fence. A boundary fence along the roadside of the property is specifically not suggested as this would detract from the proposed tree planting.

2.2 Filling

Erosion caused by surface runoff has washed a considerable quantity of gravel from the steep banks. Disturbance of the original top soil to construct the cable manhole and lay cable ductwork has left sub soil evident on the road allowance from the station to Northfield Road. Extremely low fertility and very rapid moisture loss have precluded any appreciable plant growth on the sandy gravel fill. This will necessitate drawing top soil on to the site after the existing banks have been reformed (refer to 2.3). Some 400 cubic yards of medium quality top soil will be required to provide a minimum 6" to 8" cover. At present a very narrow rim exists between the station fence and the

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edge of the plateau. This is not an ideal situation to inherit as it provides almost no opportunity for planting a screen under satisfactory conditions. Extension of this rim could be undertaken to provide a level surface for planting; however considerable fill would be required and it is doubtful if this effort is warranted. Subsequent recommendations are therefore based on the assumption that this work will not be undertaken and that planting will be done on the banks with relatively small nursery stock.
Top soil will be required for the area between the station and the road; it is calculated that a further 400 cubic yards will be required for this location. Placement of top soil on the banks will require removal of a section of the south station boundary fence and filling of a shallow ditch.

2.3 Grading

Once the present undesirable vegetation has been scalped from the area to the east, west, and south of the station, grading should be undertaken to even out the ground contours and provide a more gentle transition from bank to ground level prior to top soiling. The top soil should then be evenly spread on the banks to a depth of six to eight inches. Where basic fill is required to remodel the present banks, this may be taken from the area to the south of the station entry way where extra fill has been left in the past.
During all work on the section between the road and the station care must be exercised to ensure that existing cable ductwork some 2 feet to 3 feet below surface grade is not disturbed. Top soil should not cover the cable manhole. Mr. D. Cross, Nanaimo District of B.C. Hydro, has been contacted and alerted to the possibility of this work. Reference to Drawing 501F-U07-D1 shows the location of the underground facility.

2.4 Drainage

The previously noted ditch to the north of the property should be given a thin cover of top soil and seeded once the weed growth has been removed. This ditch feeds into a 12" culvert which passes under the station entry way. The culvert

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is presently sunk too deeply and inappropriately placed for proper functioning. The road allowance to the north of the station should be graded and ditched, the culvert removed and relocated, and a ditch continued for the length of the property parallel to the road. This ditch should be of the depression drainage type similar in cross-section to the existing ditch on the north boundary. It should be located no greater than five feet from the edge of the blacktop and will provide drainage for both the station, adjoining property, and the road. The Provincial Department of Highways have been contacted (John Morris 754-2111) and they have no objection to this work being carried out partially on the road allowance.

Mr. Chapman of Willis Cunliffe and Tait Consulting Engineers has been contacted and at present there are no water pipes in this area which could be damaged by our proposed work. Similarly B.C. Telephone (M.B. Dempsey - 114) have been contacted and have confirmed that they have no equipment in the grading or drainage area.

It is not proposed that provision be made for irrigation facilities on the site on the grounds of excessive cost.

2.5 Plant Material

Screening of the station is complicated by two factors - the nature of the fill and the lack of ground moisture in the filled banks thus severely restricting the choice of plant material which can be utilized. The height of the station above ground level on the southerly boundary moreover necessitates species with an upright habit and poor natural pruning characteristics.

Site potential is normally indicated to some extent by natural regeneration which is at present restricted to Douglas Fir and Lodgepole Pine. The problem of screening is further compounded by the relatively narrow rim between the station fence and the steep banks which themselves terminate close to the property boundary on three sides.

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When weighing the choice of species for screening, cost, site, screening capability, aspect, and resistance to entemological and pathological disturbance have been considered. Silvicultural and aesthetic criteria dictate that one species alone not be recommended. It is therefore suggested that Lodgepole Pine 40% and Scots Pine (Pinus sylvestrus) or Austrian Pine (Pinus Nigra) 40% be randomly mixed with Beech (Fagus sylvatica) 10% and Norway Maple (Acer platanoides) 10% and planted at 7 foot spacing on the steep banks. This combination will provide a three row screen of visual variety. The rows should be offset at 2 foot distances progressively up the slope.

No planting is envisaged on the top of the rim, except on the north edge where a single row of pine should again be planted at 7 foot spacing six feet from the fence. In time the lower branches will require to be pruned to give access to the drainage ditch for weed control.

Coniferous stock should be 2 + 2 + 1 bare root stock lifted one month prior to fall planting and surface lined and fertilized. Green Thumb Nurseries can supply this stock but should be given two months lead time if September or October planting is to be successful.

The Beech and or Maple stock should be container grown in the 16" to 18" size range. It is intended that all of the preceding stock will be hand planted in the top soil. It is suggested that the earthwork be carried out during the summer months and the final surface be hydro-seeded with a suitable seed mix, for example 50% Kentucky Blue, 25% Red Top, 25% Red Fescue. The grass seed may require watering for up to thirty days after sowing.

To provide more immediate effect and to break up the eventual screening band appearance, it is suggested that fastigiate hardwoods and conifers of a semi-mature size be planted in the open ground between the base of the easterly bank and the edge of the road allowance.

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Fastigate species, although slightly more expensive in initial cost, are to be preferred since this will reduce the eventual problem of pruning to maintain clearance from the woodpole line. Further, large growing species may encroach on the ductwork with their more aggressive root systems.

Four screening drifts ovate in shape should be comprised of the following species mixed randomly - Mountain Ash (Sorbus aucuparia), Plum (Prunus cerasifera), Hawthorn (Crataegus oxyacantha v. Paul's Scarlet), Garry Oak (Quercus garyana), Crabapple (Malus fusca), and Pacific Dogwood, along with Arizona Cypress (Cupressus arizonica), Yellow Cedar (Chamaecyparis nootkatensis), and Juniper (Juniperus virginiana Burke). Conifers should be placed to the station side of the drifts and hardwoods to the road side. The preceding will provide an attractive foreground for the more consistent screen behind. This larger stock should be in the 5 feet to 8 feet range and be supplied balled and burlapped.

3.1 Costs

The following are rule-of-thumb costs but should provide an adequate picture of the expenditures that will be involved in the improvement of the station appearance to the standard suggested herein.

800 cubic yards top soil at $3 per cubic foot	$2,400.
Front End Load D6 size for 4 days	600.
Plant Material - Small Coniferous	525.
- Small Deciduous	175.
- Large Coniferous	98.
- Large Deciduous	140.
Fencing Repairs	200.
Labour calculated at $6 per man hour	768.
Supervision - 4 days at $75 per day	300.
	$5,206.

4. Methods and Aftercare

4.1 Methods, etc.

Planting and seeding methods, as well as aftercare requirements, are not outlined here as it is envisaged that this work will be executed "in house" after the decision to undertake the work has been given. Allowance has been made in the costing for on the job supervision of all work to be carried out. Aftercare will

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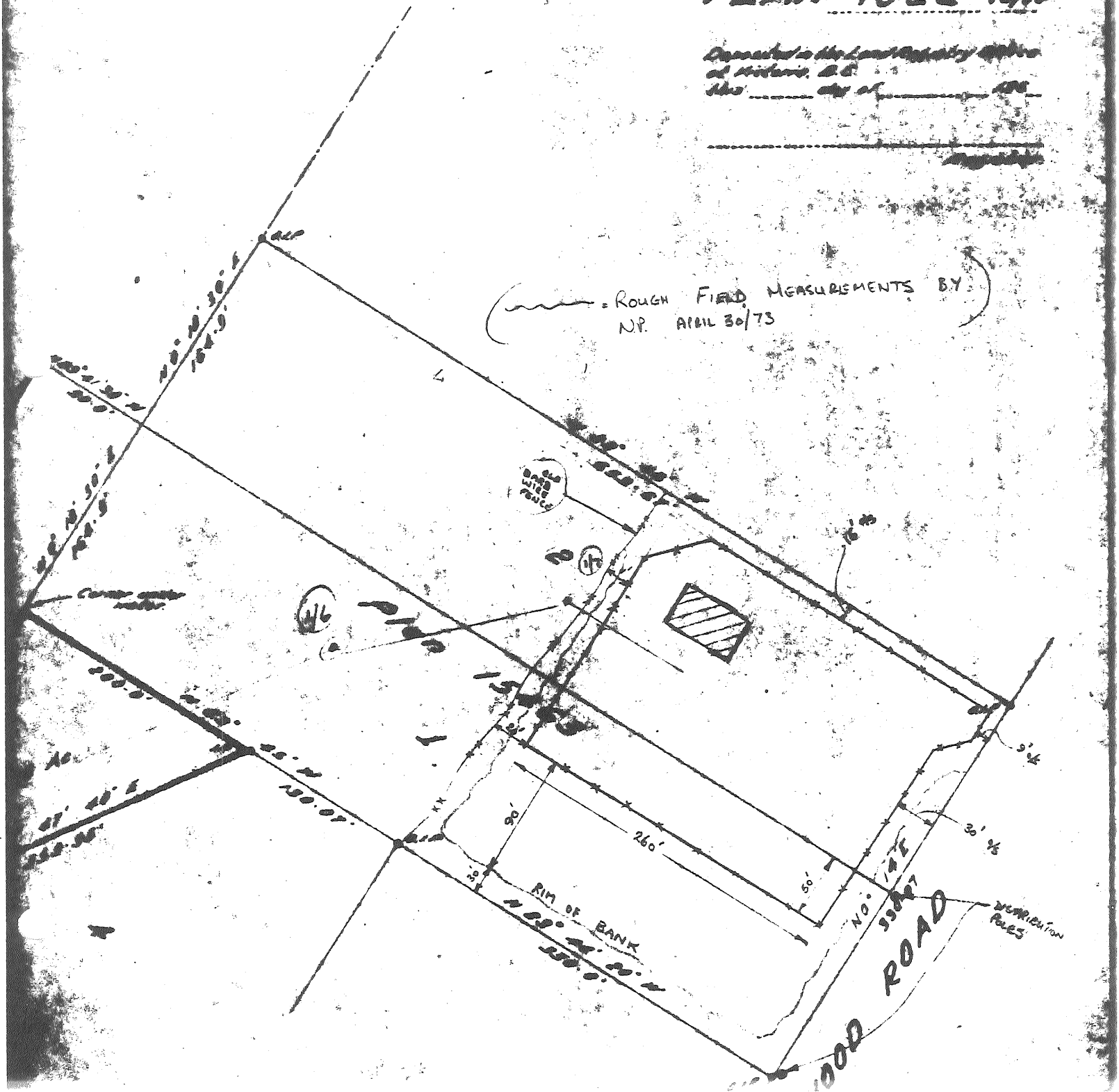
consist primarily of grass control around plant material, weeding and grass cutting. Periodic inspection of plant material for health and vigor, as well as stability, should be scheduled. During long, dry spells it may be necessary to tank water the woody stock.

RMG/ds

PLAN 1622 R/W


Rough Field Measurements B.Y.
N.P. April 30/73
RIM OF BANK
260'
90'
50'
ROAD

General View of Site Looking South
Boxwood Road is Now Blacktopped

Steep Gravel Bank Showing Errosion
and Slow Plant Colonization.

Steep Open Banks on the Southerly and Easterly Perimeter of the Station

Shallow Catchment Drain on the North Boundary