

TO: Mayor Peter Kelly and Members of Halifax Regional Council

SUBMITTED BY:



Michael E. Eddy, Chief Director, Fire Services

DATE: January 10, 2003

SUBJECT: Evacuation District 10 - Train Derailment - February 15, 2002

INFORMATION REPORT

ORIGIN

At the February 26, 2002 Council Meeting, Councillor Cunningham requested a staff report on the implications of the derailment, evacuation, and relocation of the marshalling yards in relation to the incident that occurred February 15, 2002, near Shore Road, Dartmouth.

BACKGROUND

The Canadian National Railroad is maintaining a rail marshalling yard in the central area of Dartmouth near the waterfront and bordering on Alderney Landing, Alderney Dr, Geary St and Shore Rd. The area bordering the marshalling yard is comprised of residential and commercial applications and has grown up around the marshalling yard. Discussions around relocating the marshalling yards have been occurring for some time.

In October of 1995, a study called a **Relocation Feasibility Study** was prepared by the engineering firm of UMA Engineering Ltd. for the former City of Dartmouth. This study discussed the marshalling yard and the options for relocating it elsewhere.

DISCUSSION

Around mid-morning of February 15, 2002, a CN train was travelling through the marshalling yard. As it was passing outside the north end of the yard, several cars of the train derailed. Included in this derailment was a fully loaded propane rail car. The initial response by HRM. was through the Fire and Emergency Service and the Halifax Regional Police. After an initial assessment of the incident, EMO was asked to respond and assess the need to escalate to the Emergency Site Management (ESM) system. The incident met the criteria for ESM and Fire Service was named as lead agency. A Site Manager was appointed from within the Fire Service, as per procedure and an Emergency Site Management team was formed. Agencies external to HRM as part of this team were: CN Rail, Transportation and Safety Board, Transport Canada and the Halifax-Dartmouth Bridge Commission.

A decision was made to off-load as much as possible of the product from the rail car before any attempt would be made to turn it upright. Due to the potential of a major fire and/or explosion, it was decided that an evacuation of the immediate area would be required during the off-loading and up-righting process. Also, due to the proximity of the rail car to the MacDonald Bridge, and the potential threat of danger, it was decided to close the bridge to all traffic during this time.

The Emergency Operations Centre (EOC) was activated in order to plan for and conduct the evacuation. The EOC would also support the any needs required of the site. The EOC was opened by 12:00PM on the 15th and was staffed until the operation was completed and residents were allowed back into their homes the next morning. The Emergency Public Information Officer worked from the EOC and also from the site.

As the rail car was not leaking in its present position, it was decided to do the off-loading at a time when the major road traffic would be reduced. The evacuation was scheduled to start after supper time and to be completed by 9:00 PM. The off-loading and up-righting would start after the evacuation was completed and was expected to take 12-14 hours.

The evacuation started at 7:00 PM with Ground Search and Rescue volunteers, working under the direction of the Police Service going door to door advising people of the need to evacuate and passing along information as to location of a shelter, if needed and expected times that residents might be away from their homes. The door to door portion was completed by 9:00 PM. One reception center /shelter was established and maintained by the Red Cross, Salvation Army, and the Provincial Department of Community Services. The shelter had 209 persons register and only 24 stayed over night.

The off-loading and up-righting operations went smoothly and without incident. The operation was completed ahead of schedule and residents were allowed back into their homes by mid-morning of the 16th. The ESM system was then deactivated and the site was reverted back to a standard Incident Command response and allowed to follow normal procedures.

In response to the question of the relocation of the marshalling yards, this request is beyond the scope of this report. However, reference should be made to the **Relocation Feasibility Study** prepared by UMA Engineering Ltd.

BUDGET IMPLICATIONS

None

FINANCIAL MANAGEMENT POLICIES/BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating and Capital Budgets, policies and procedures.

ALTERNATIVES

None

ATTACHMENTS

Relocation Feasibility Study - Downtown Dartmouth CN Rail Marshalling Yards, dated October, 1995, UNM Engineering Ltd. in association with R. L. Banks & Associates, Inc.

Additional copies of this report, and information on its status, can be obtained by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Barry Manuel, EMO Coordinator, 490-5400

Report Approved by:



Michael E. Eddy, Chief Director, 490-4238

Phase I
Report

Relocation Feasibility Study

Downtown Dartmouth CN Rail Marshalling Yards

Prepared by:

uma Engineering Ltd.

in association with:

R. L. Banks & Associates, Inc.

Prepared for:

The City of Dartmouth

October 1995



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October 20, 1995

Mr. Tom Rath
Economic Development Business Investment
City of Dartmouth
P.O. Box 817
Dartmouth, NS
B2Y 3Z3

Dear Mr. Rath:

**RE: Phase I: Relocation Feasibility Study
Downtown Dartmouth CN Rail Marshalling Yard**

We are pleased to submit 20 copies of the Phase I Report. Based on the analysis conducted in Phase I, we have concluded that the North Burnside area is the only viable location along the Dartmouth Subdivision for the relocation of the Downtown Dartmouth Yard. This area contains the necessary features to meet the operational requirements of CN with minimal land use conflicts with adjacent land users. However, the planned Highway 107 Extension and power-right-of-way by Nova Scotia Power Inc. create some urgency to proceed to more detailed planning, land negotiations and land use policy and control amendments.

It is our conclusion that the refinement of a site for the relocation in Phase II will represent a prudent and forward looking initiative by the City of Dartmouth. The designation of lands in the North Burnside area for the future relocation of the Dartmouth Yard will offer the opportunity to achieve a wide range of positive benefits. A major development opportunity parcel will become available on the Downtown Dartmouth waterfront. The negative impacts of the yard on adjacent land uses will no longer exist. There will also be operational cost savings to CN.

Beyond these benefits, the relocation of the yard from a confined downtown location to a "greenfield" site offers the flexibility to accommodate changes in unforeseen future demand. This flexibility, and the proximity of the relocation area to the Burnside Industrial Park area, create the opportunity for rapid response to unforeseen future needs.

Yours truly,

UMA ENGINEERING LTD.

Maurice Lloyd, P.Eng, MCIP
Vice President, Atlantic Region

Chris C. Lowe, MCIP
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I Introduction

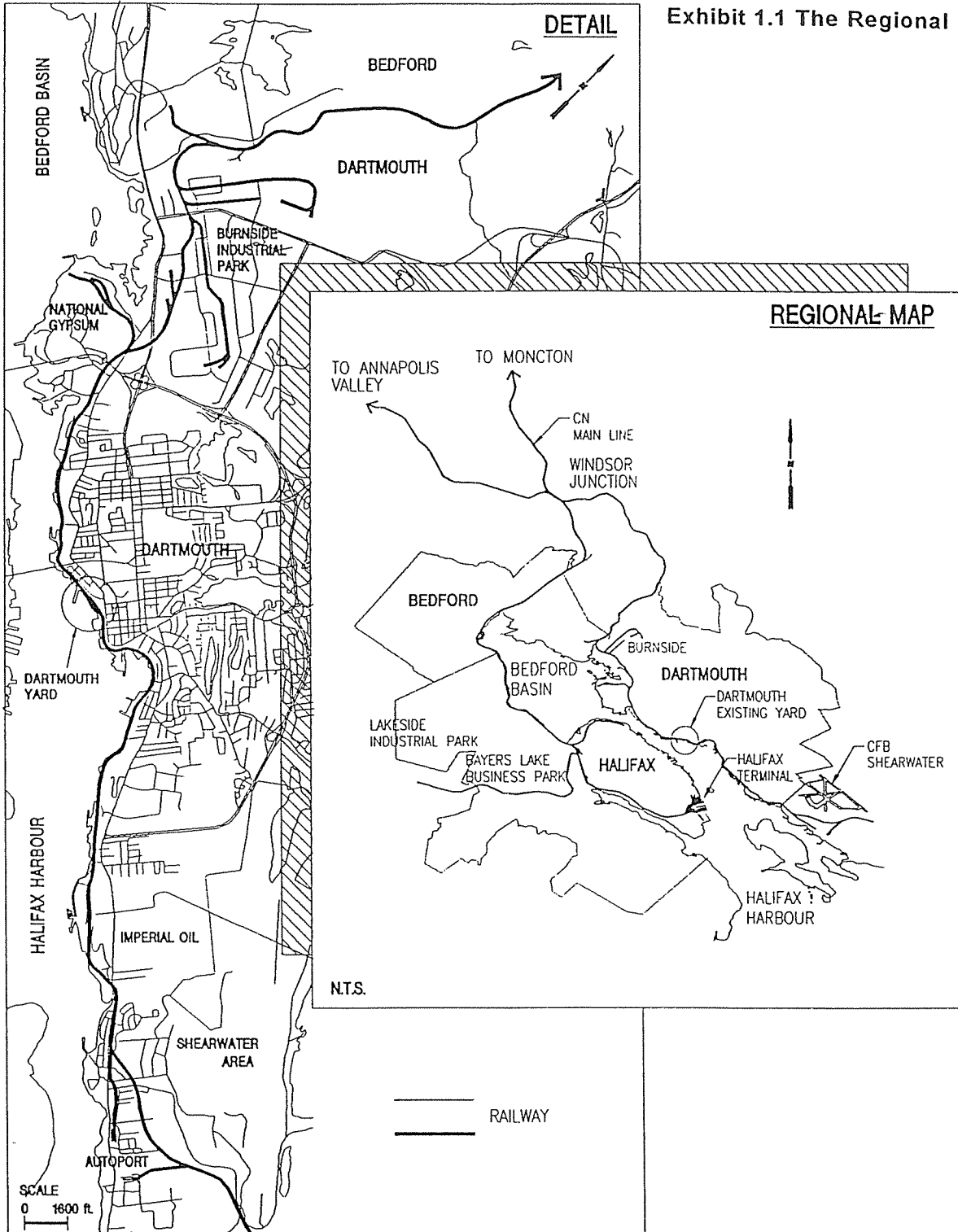
1.1 Background

For over 30 years, the relocation of CN's Downtown Dartmouth Marshalling Yard (the Dartmouth Yard) has been discussed by civic, community and business interests in Dartmouth. This interest is formally documented in downtown revitalization or development plans prepared for the City of Dartmouth by DPA Consulting Ltd. in the 1970s, UMA Group in the 1980s and Sperry/MacLennan Architects and Planners Limited in the 1990s.

All these plans suggest the need to increase residential, commercial and community uses for the Downtown Dartmouth waterfront area. This need has been expressed in a desire to remove the Dartmouth Yard to create new harbourside development opportunity parcels. Both the DPA and UMA work recognized the longer term need for mixed use, people oriented waterfront projects. However, specific anchor projects were not identified at that time. The Sperry/MacLennan plan was more ambitious and recommended development opportunities for the CN holdings. It also recommends the first step in the possible relocation be the Relocation Feasibility Study.

To balance against the desire for urban renewal, there are the realities of CN and its customers. There are several trains serving customers in the Dartmouth area. Major Eastern Passage customers are Autoport and the Imperial Oil Dartmouth Refinery. Other customers include M&M Manufacturing in Woodside and, until recently, the Ultramar Refinery. To the west, between Downtown Dartmouth and the Burnside Industrial Park area, major users are National Gypsum and various customers in the larger Burnside Industrial Park area. The National Gypsum cars are delivered in special trains. All other industrial traffic is handled or "set off" in the Dartmouth Yard. These cars are switched to make up trains for delivery to the local industrial sidings. Cars released and pulled from the industrial sidings are returned to the Dartmouth Yard and made up into trains for despatch into the railway network.

Exhibit 1.1 The Regional Setting



1.2 Study Objectives

As outlined in the Request for Proposals, the **Downtown Dartmouth CN Rail Marshalling Yard Relocation Feasibility Study** is organized into two phases to achieve the following objectives:

- To provide a practical and realistic understanding of alternate sites.
- To design a potential new marshalling yard that addresses CN requirements.
- To assess the benefits of alternative sites.
- To conduct an environmental site investigation of the Dartmouth Yard following acceptable standards and protocols.

In Phase I, we identify and evaluate alternative sites. If the identified alternative sites are acceptable to the City of Dartmouth and CN, then Phase II will commence. In Phase II, development concepts, order-of-magnitude costing and a timetable for development will be prepared for the preferred alternative site. The Phase II costing will include decommissioning and removing of the current marshalling yard. The regulatory approval requirements for relocation will also be documented.

II Existing Conditions and Facilities

2.1 Introduction

The purpose of Section II is to review the existing conditions at the Dartmouth Yard to define the needs of a new marshalling yard at an alternative site. The following sections describe the existing marshalling yard and main track infrastructure, and the nature of present railway operations in and around the Downtown Dartmouth Yard. This provides the background and context for CN's operating and infrastructure needs in the future.

2.2 Track Layout and Materials

The Dartmouth Yard is part of the CN Dartmouth Subdivision. This line extends from Windsor Junction (Mile 0.0) to Mile 18.46 beyond Autoport in the Eastern Passage area of Halifax County Municipality. The Dartmouth Yard is at Mile 12.5. Other notable reference points along the CN Dartmouth Subdivision include:

- The Department of National Defense spur (DND spur) - Mile 7.8
- The Burnside Industrial Park spur - Mile 8.7
- The National Gypsum spur - Mile 10.1
- The Autoport spur - Mile 16.6.

The CN Dartmouth Subdivision main track follows a curvilinear alignment with curvatures of up to six degrees and grades of up to 1.4%. The track north of the Dartmouth Yard is maintained in good condition. It consists of 115 pound per yard (57 kilograms per metre) jointed rail, with Number 10 turnouts¹ at yards and spurs. South of the Dartmouth Yard, the track consists of 100 pound per yard (50 kilograms per metre) rail, and is maintained to a lesser standard than the track to the north. The maximum operating speed on the main line is 25 miles per hour (mph) with slower speed restrictions ranging from five to 15 mph at public road crossings.

The Dartmouth Yard consists of seven storage and marshalling tracks with clear length varying from 1,030 feet to 1,805 feet. There are three locomotive tie-up tracks that can hold a total of 10 locomotives. There is also a bad order track for storage/repair of rolling stock, and a "maintenance of way" track for storage of maintenance equipment and boarding cars. The marshalling yard is parallel to the main track with several other tracks serving:

- Switching level spurs.
- Public use spurs, potentially providing extra capacity for train storage or marshalling activities.

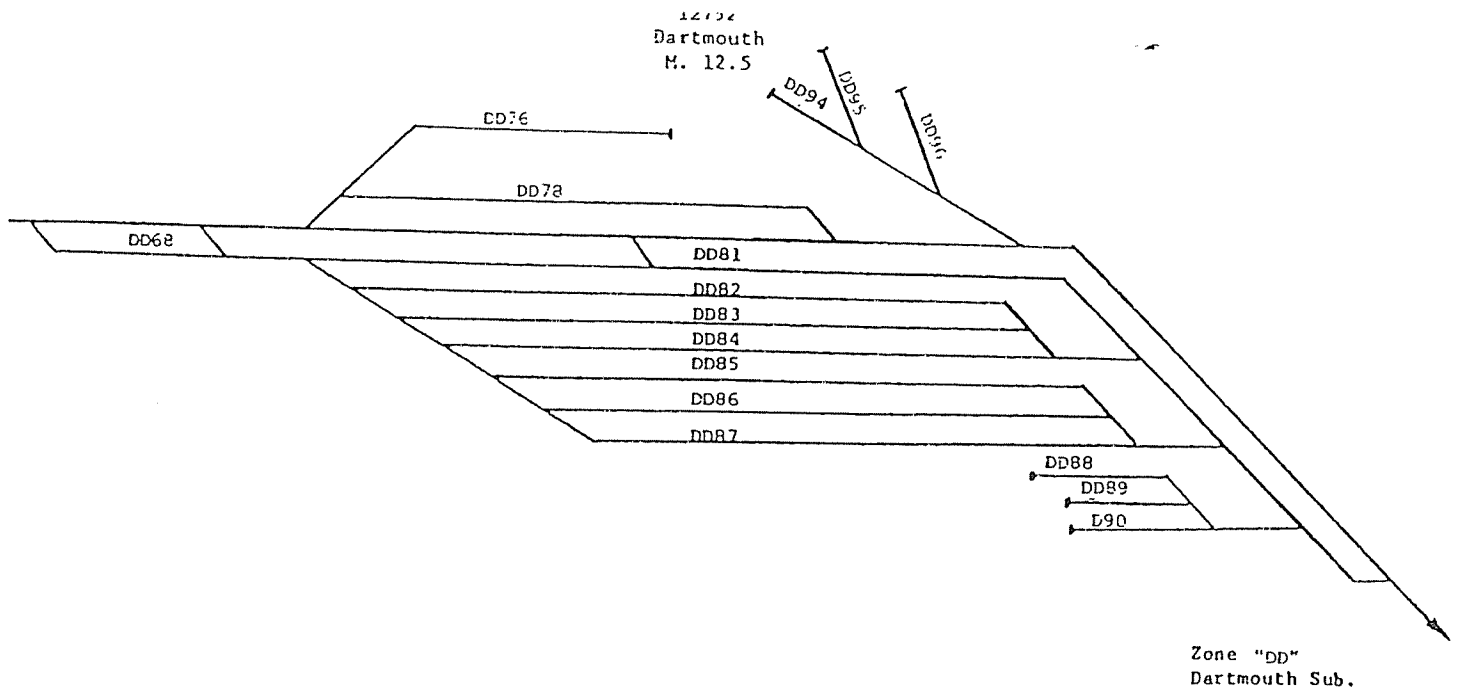
¹ Number 10 refers to the angle of turnout, in this case, diverging by one foot in every 10 feet.

The track consists of mostly 100 pound rail in a variety of ages and wear conditions. Although adequate for current demands, we anticipate that most of the rail would not be suitable for reuse and would be scrapped if the marshalling yard is relocated.

Turnouts on the main line are Number 10's, and turnouts in the marshalling yard are Number 8's. Turnouts are in various states of repair and are adequate for current use. If relocated today, some could conceivably be reused. However, as the timing of the marshalling yard relocation is unknown (mid 1995), turnouts may be too badly worn for reuse in the future.

Track ties are in good condition. If relocated today, we estimate that $\pm 50\%$ would be reusable. However, based on the above rationale, a conservative approach is recommended for costing the relocation. All ties, together with other track material, should be considered as scrap for valuation purposes.

Exhibit 2.1 Existing Downtown Dartmouth Marshalling Yard Layout



2.3 Current Railway Operation

Operating Activity

There are two return trips to National Gypsum every day (seven days a week). The assignments start from the Dartmouth Yard at 06:00 and 17:00 hours. The locomotives leave the marshalling yard to pick up a train of 70 empties at National Gypsum, and deliver them via Windsor Junction to West Milford on the Bedford Subdivision. The locomotives then return with 70 loaded cars. Once the cars have been spotted on the National Gypsum spur at Wrights Cove, the locomotives return to the Dartmouth Yard, completing their assignment.

Train 308 delivers general traffic to Dartmouth. It consists of approximately 50 to 60 cars a day, six days a week. It arrives in Dartmouth between 07:00 and 09:00 hours. The return trip, Train 307, leaves Dartmouth about 00:15 hours.

Train 505 operates nearly every day from Rockingham on the Halifax side of the Bedford Basin. This train leaves Rockingham around 22:00 hours and arrives in Dartmouth around 02:00-03:00 hours. In addition, Train 507 operates "some days". It normally arrives between 10:00 and 11:00 hours in Dartmouth.

There are two daily switching assignments to Autoport. They leave Downtown Dartmouth at 09:00 and 16:00 hours. Each assignment is responsible for making up its own train, and/or making up main line trains. These trains transfer 15 to 45 auto carriers per day, each way. Automobiles are shipped both to and from Autoport. The Autoport layout is extremely restrictive due to cramped space and busy road crossings. The result is that switchers more or less have to pick individual cars in and out of the loading tracks all day long. These assignments also serve the Imperial Oil Dartmouth Refinery area at the rate of about 30 cars per week. These cars are for the transport/storage of propane and butane. Oil and gas are shipped by road.

There are one or two switchers serving the Burnside Industrial Park area, depending on traffic volumes. The crews of these trains start a shift by making up their train in the Dartmouth Yard. The assignments start at 07:00 hours Monday to Friday and 13:00 hours on Saturday. The second train, when required, starts at 17:00 hours. The daily switcher also makes up Train 307 before finishing the shift. There are some very steep grades on these sidings (in the range of 3%). There are also many road crossings throughout the Burnside Industrial Park area.

Operating Issues

Up to 10 locomotives are stabled in the Dartmouth Yard. They are refuelled from a fuel truck as required. Two of the tracks are equipped with metal drip pans to capture any spills. The pans are gravity drained to an underground oil separator and the residue is pumped out periodically. During the winter, the locomotives idle when not in use to prevent freezing, and this leads to complaints from some nearby residents regarding noise, vibration and fumes. Minor repairs are performed at this site. Otherwise, locomotives return to Moncton, New Brunswick for monthly servicing or for major repairs.

2.4 Dartmouth Servocentre

The Servocentre at the Dartmouth Yard serves several operational functions. Located between Church and North Streets, the existing Servocentre is fully serviced with utilities, including hydro, telephone, water, sewer, roads and parking.

The functions at the Servocentre are as listed:

- Yardmaster's Office
- Car Control Terminal (SRS)
- Train Crew Facilities
- Rules Classes and Safety Meeting Room
- First Aid
- Maintenance of Way Depot
- Signal Maintainers Depot.

To support the current operation, the first three functions must be located in the Dartmouth Yard. The remainder could be independent of a relocation and therefore accommodated off-site. There could be some additional operational costs associated with providing alternate facilities. For planning purposes, all of the above functions are included in one new facility at a new yard.

2.5 Anticipated Future Needs

Officials of CN Rail have suggested to UMA the preferred features and characteristics of an alternative site for the Dartmouth Yard. These requirements are listed below and are used as the basis of identifying and assessing alternative sites in Section IV of the Phase I Report.

New Marshalling Yard Requirements

- Six yard tracks @ 2,000 foot clear length.
- Bad order repair track @ 300 foot clear length.
- Three locomotive tie-up tracks for a total of 10 locomotives. All three tracks to be equipped with drip trays.
- Pullback track clear of the main track for marshalling, simultaneously with other train movements.
- Total 5,000 foot clear lengths on the pullback, plus yard to accept a train clear of the main track.

The six yard tracks will have a total storage capacity of 12,000 feet compared to a total of seven tracks with 9,600 feet currently available in the Dartmouth Yard.

New Servocentre Requirements

A new Servocentre at an alternative site will require sufficient space to hold the following facilities. The total estimated space requirements are 1,845 square feet and parking spaces for 15 to 20 vehicles.

- Yardmaster's office - 225 square feet
- Booking in room - 170 square feet
- Classroom - 450 square feet
- Kitchen - 300 square feet
- Washrooms and lockers - 250 square feet
- Maintainers' quarters - 450 square feet

- Total - 1,845 square feet.

III New Marshalling Yard Design Requirements

3.1 Introduction

In searching out potential sites for an alternative marshalling yard, it is necessary to have an understanding of the general geometry and shape of the yard. This includes:

- The size and configuration of the land required
- Gradients
- Availability of access to roads and utilities.

Section III describes the process of developing a generic marshalling yard layout to be used as a guide in the identification and assessment of possible alternative marshalling yard sites.

The process begins with an outline of the functional requirements and design standards to be applied in designing the alternative marshalling yard layout. These data were used to prepare a generic or idealized marshalling yard layout, ignoring site specific constraints such as topography, property boundaries and other physical features. The generic marshalling yard was then used as a template in the initial determination of possible alternative sites near to the main line.

3.2 Operational Requirements

CN has indicated to UMA that train operations on the Dartmouth Subdivision will, for the foreseeable future, continue with similar characteristics to 1995 conditions. The number of carloads is anticipated to show a moderate increase, and train lengths will increase accordingly.

Marshalling yard operations will continue with characteristics similar to 1995 conditions. The desired number and length of tracks required to support anticipated traffic volumes were outlined in Section 2.5. It is also desirable that tracks at an alternative marshalling yard should be spaced alternately at 14 foot and 21 foot centres. This spacing will provide room for a roadway between each pair of tracks. This roadway will allow for vehicular access to inspect equipment and provide emergency access. For convenience of train crews, the Servocentre is best located near to the locomotive tie-up tracks where most assignments begin or end. Road access to the Servocentre is required for train crews, administrative personnel, plant and equipment maintenance forces, fuel trucks and emergency response. From an operations perspective, a double-ended marshalling yard parallel to the main track, and with connections to the main line at both ends, is preferred over a dead ended or stub yard. This operational requirement means that possible alternative sites not parallel to the main line are excluded from consideration.

3.3 Design Standards

CN's current (1995) design standards for marshalling yards and main line tracks are presented against the backdrop of existing infrastructure. It should be noted that current standards are generally higher than the standards applied to the existing infrastructure. The existing yard was built to past CN standards and is adequate for current needs. It is prudent that any new construction allows expansion flexibility for reasonable, yet unforeseen, future requirements. The design standards used in the identification and assessment of alternative sites are listed below:

1. The pullback track should be on a level grade and free of curvature for sight lines and ease of switching.
2. Lead and ladder tracks should have a descending grade away from the main line of 0.2% - 0.3%.
3. Number 12 turnouts are required on the main line and Number 10 turnouts in the marshalling yard.
4. Maximum curvatures on the main line are six degrees.
5. Maximum grade on the main line is 1.0% and must be curve compensated at the rate of 0.04% per degree of curvature.
6. Maximum rates of change for vertical curves are:
 - Main track: 0.1% per 100 feet in sags and 0.2% per 100 feet on summits.
 - Marshalling Yard: 1.0% per 100 feet in sags and 2.0% per 100 feet on summits.
7. Classification tracks should be designed as bowl shaped with descending grades of 0.1% at the ends, and approaching a level portion in the middle of the marshalling yard.
8. Minimum standard for rail on the main line is 115 pounds part worn and 100 pounds part worn in the marshalling yard.

3.4 Generic Marshalling Yard Layout

A generic marshalling yard layout, shown in Exhibit 3.1, was developed to meet the operating and design criteria described above. This layout requires a rectangular parcel of land with a length of 5,000 feet and a width of 200 feet, excluding any allowance for grading and drainage. The track elevation is constant throughout at zero grade.

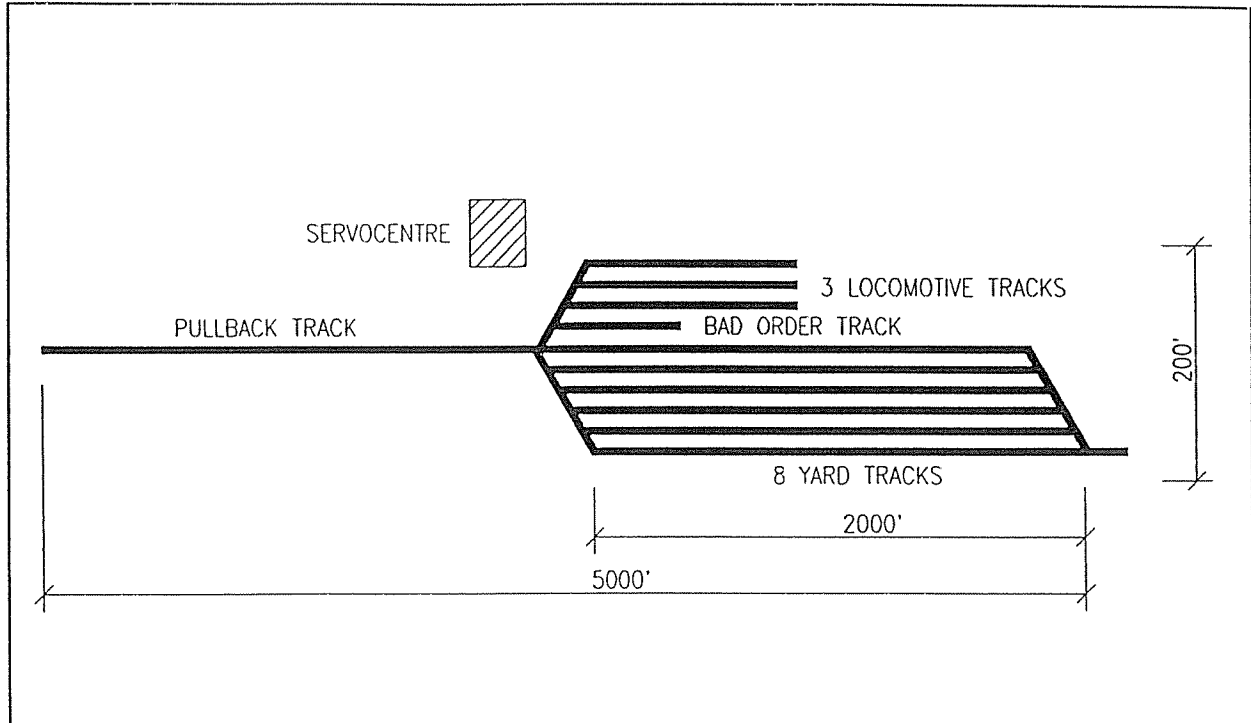


Exhibit 3.1 Generic Marshalling Yard Layout

3.5 Servocentre and Other Infrastructure

A new servocentre is specified with a net floor area of approximately 1,800 to 2,000 square feet to meet CN's anticipated needs described in Section 2.5. All utilities will be required, including power, telephone, water, sanitary sewer or septic system, storm drainage, road access and parking for 20 or more vehicles.

IV Site Identification and Assessment

4.1 Introduction

The purpose of Section IV is to identify and assess potential alternative sites for the relocation of the Dartmouth Yard. In this section, we select potential alternative sites, and then apply a site selection criterion for potential sites next to the Dartmouth Subdivision main line. This process has resulted in the selection of a preferred location for a new marshalling yard in the Burnside Industrial Park area.

When we compare the requirements of CN to land use and development conditions along the main line, we see many unique physical features and site size conditions that must be addressed in the identification and assessment of alternative sites. These include:

- **Current Land Uses Offer Limited Relocation Options:** The densities of development next to the Dartmouth Subdivision main line and changing elevations greatly restrict the number of potential sites for a new marshalling yard.
- **The Linear Pattern of CN Rail Customers:** The Dartmouth Subdivision main line contains several major customers that are concentrated in the Eastern Passage and Burnside Industrial Park areas. The Autoport at Eastern Passage is one of the most significant activities on the subdivision. There is a limited customer base between the Refineries - Autoport area of Eastern Passage and the National Gypsum - Burnside Industrial Park area.

4.2 Site Selection Criteria

Major Factors

There are two major factors that dictate potential alternative sites for a marshalling yard along the Dartmouth Subdivision main line. They are:

- **Minimal or No Grades Along The Main Line:** There is little tolerance for grade differences at the tie-in points from a new marshalling yard to the main line. This need for very minimal or no grade is the starting point for the alternative site identification and selection. Therefore, the basis of our work in this assessment is the main track profile, used to identify sections of the track that offer the prerequisite grading.
- **5,000 Feet Of Available Track Next To The Main Line:** CN has specified that a new marshalling yard will require 5,000 feet of track next to the main line. The existing main line track follows an undulating curvature, and the number of potential alternative sites with 5,000 of length is limited.

Other Factors

Any site that is not relatively flat, next to the main line and cannot hold 5,000 feet of new marshalling yard track will be rejected from further analysis. If these major siting factors are present, then several other factors must be considered to arrive at a preferred new area. These factors are:

1. Development should cause minimum or no significant impact on the natural environment.
2. Development should be compatible with adjacent land uses, Municipal Planning Strategy (MPS) and Land Use ByLaw designations, or amendments to these documents.
3. The parcel or parcels should be available in an undeveloped or redevelopable state.
4. Access and egress conflict with existing and planned roads should be minimal.
5. Conflicts with existing or planned utilities should be minimal.
6. Road access to the site should be achievable at reasonable costs.
7. Utilities should be at, or near to, the site.

4.3 Site Identification

The first part of the site identification and assessment process is to assess track grades along the Dartmouth Subdivision main line to determine potential adjacent areas for a new marshalling yard. We obtained track grade information from CN from Mile 0.00 (Windsor Junction) to Mile 18.46 (end of main line beyond Autoport). Major notable checkpoints of the subdivision are:

- Mile 0.00 - Windsor Junction
- Miles 2.17 to 2.65- The track passes between Lake William and Powder Mill Pond in the Waverley area of Halifax County Municipality.
- Miles 3.27 to 3.78 - The track profile reaches a summit along the undeveloped and otherwise inaccessible shoreline of Lake William. Ground profiles around the site are variable.
- Miles 4.45 to 4.92 - Bottom of sag. May offer potential as a new marshalling yard site.
- Miles 6.34 to 7.00 - Top of track summit and along the western boundary of lands owned by the Jesuit Fathers of Upper Canada Holding Corporation. Offers potential for a new marshalling yard.
- Miles 7.48 to 8.04 - Located on a gently descending section in the middle of a long downgrade of the main line. This area is bounded by Department of National Defense (DND) holdings in the Town of Bedford and Nova Scotia Power Inc. (NSP Inc.) holdings in the City of Dartmouth. There is a DND spur at Mile 7.83. Offers potential for a new marshalling yard.
- Mile 8.70 - This is the location of the switch to the Burnside Industrial Park spur.
- Mile 9.27 - Wright Avenue at-grade crossing.
- Mile 10.1 - National Gypsum spur.
- Miles 10.41 to 11.93 - Long undulating track profile in Shannon Park - Tufts Cove area. Reasonable track profile but density of development next to main line results in no available sites.
- Mile 12.0 - Lyle Street at-grade crossing northwest of Angus L. MacDonald Bridge.
- Mile 12.5 - Dartmouth Yard.

- Mile 12.64 - Ochterloney Street - Dartmouth Ferry Terminal/Waterfront Parking at-grade crossing at the east end of the Dartmouth Yard.
- Miles 13.06 to 13.63 - sags in track around Dartmouth Cove.
- Miles 14.01 to 14.77 - Sag in track in Woodside area with narrow right-of-way.
- Miles 15.15 to 16.47 - Level break in long gradient before the Imperial Oil Dartmouth Refinery. Possible site for new marshalling yard but no acceptable vacant or redevelopable land parcels (i.e., corporate holdings or industrial/port uses).
- Mile 16.14 - Pleasant Street grade separated crossing.
- Mile 16.60 - Autoport switch.
- Miles 17.61 to 18.46 - Undulating section of track at the end of the main line. This area is on a hill beyond Autoport in Halifax County Municipality. Could be considered as an alternative site, but there are no acceptable vacant or redevelopable land parcels. Also, Eastern Passage is now experiencing significant expansion as a residential community.

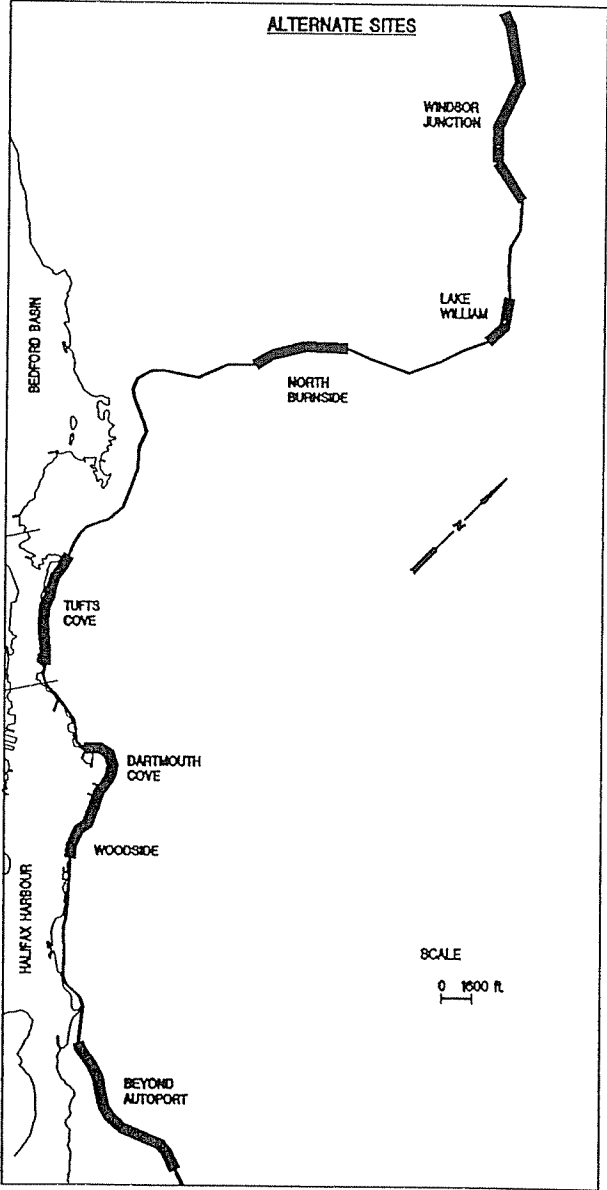
4.4 Assessment of Alternative Marshalling Yard Sites

Based upon the assessment of the Dartmouth Subdivision track profiles, we have identified the following general areas for more detailed investigations:

- Miles 1.9 to 3.0 Windsor Junction
- Miles 4.2 to 5.2 Lake William
- Miles 6.4 to 7.4 North Burnside
- Miles 10.5 to 12.0 Tufts Cove
- Miles 13.0 to 15.0 Dartmouth Cove/Woodside
- Miles 17.4 to 18.5 Beyond Autoport.

These areas next to the main line are shown in the following exhibit and analyzed according to key evaluation criteria as set out below. We also reviewed the potential for other sites away from the main line. This assessment determined that such areas as the Wrights Cove spur lack the track profiles or land availability to support a new marshalling yard.

Exhibit 4.1 Alternative General Site Locations



Evaluation Criteria

The following seven elements were used to evaluate the potential of the general areas for a new marshalling yard location. In the subsequent pages, the sites are discussed in relation to each element. The analysis is also summarized in Exhibit 4.2.

- Minimal/no grades along main line
- 5,000 feet of available land next to the main line
- Impact on natural environment
- Appropriate sized parcel(s) available
- Site access
- Services and utilities available
- Land use compatibility.

Criterion One: Minimal/No Grades Along Main Line

All of the sites meet this basic criterion. It was the principal criterion for selecting the list of possible relocation areas.

Criterion Two: 5000 Feet Of Available Land Adjacent To Main Line

The three locations highlighted in Exhibit 4.2, Tufts Cove, Dartmouth Cove/Woodside, and Beyond Autoport, all have restricted amounts of land immediately adjacent to them. This eliminates them for potential development of marshalling yards, without the acquisition and redevelopment of already built-up land (or the infill on part of the Halifax Harbour at Tufts Cove and Dartmouth Cove). These options have been considered as too costly and are rejected.

Criterion Three: Impact on Natural Environment

All of the general areas appear to offer potential for impact on the environment, both in the construction and operations phases. Construction practises may be specified to ensure that potential damage to the environment during construction is either avoided, minimized or mitigated.

During operations, the nature of rail shipments is such that hazardous materials are sometimes carried. There is a risk, albeit small, that spills may occur from the trains or that the trains derail, causing environmental damage. There is no way to predict where such accidents may occur.

Given this potential, individual sites may be more susceptible to severe negative impacts than others. Sites on water courses or water bodies will suffer the effects of poisonous intrusion more quickly than ones surrounded by extensive land. All but one of the general areas are associated with a water body or water course. They are:

<u>Location</u>	<u>Area</u>	<u>Water Body</u>
• Miles 1.9 to 3.0	Windsor Junction	Lake William
• Miles 4.2 to 5.2	Lake William	Lake William
• Miles 6.4 to 7.4	North Burnside	Wrights Brook
• Miles 10.5 to 12.0	Tufts Cove	Halifax Harbour
• Miles 13.0 to 15.0	Dartmouth Cove/Woodside	Halifax Harbour
• Miles 17.4 to 18.5	Beyond Autoport	None

The general area at Miles 17.4 to 18.5 (Beyond Autoport) is not connected to a water body or course. Therefore, the relocation to most of the above locations along the main line would appear to offer some aquatic environmental risks in terms of accidental events. These risks are judged to be minimal because the risk of spills is limited.

Criterion Four: Appropriate Sized Parcel(s) Available

The appropriate size of a parcel or parcels for a new yard is 5,000 feet adjacent to the main line with 200 feet of depth. Ideally, this land should be flat. As shown in Exhibit 4.2, three possible relocation areas meet this criterion. They are Windsor Junction, Lake William and North Burnside.

Criterion Five: Site Access

The Windsor Junction and Lake William locations are in remote locations that are not readily reached by roads. They would require extensive road construction to make them accessible to commercial vehicles necessary for access to the Servocentre or rail-related commercial activities.

Criterion Six: Services and Utilities Available

Similar to above, the Windsor Junction and Lake William areas are in remote areas that are not readily serviced. They may require the extension of all services. Sewer wastes may be handled on site. While no detailed water evaluation was done for the Phase I Study, a review of water supply issues in the Waverley/Lake William area of Halifax County Municipality reveals a problem of high arsenic in some well water. We presume that piped or trucked water would be preferred to well water. Piped water has a high cost implication. Depending on demand, trucked water may be a less expensive alternative for these locations.

Criterion Seven: Land Use Compatibility

To determine the compatibility of a relocated yard with other land uses, we reviewed the factors that favour moving the yard from Downtown Dartmouth. The *Dartmouth Waterfront Development Plan* (Sperry/MacLennan, 1991) reports that members of the public in the early 1990s possessed two general views on the Dartmouth Yard. One group said that "the tracks must go." Others had trouble only with the noise of rail operations stating, "the tracks are not a real problem, just the whistle". The largest group, according to this 1991 report, is the one that favours a single track that helps to add "colour" to the waterfront, yet does not provide an impediment to the development of the waterfront. The relocation of the Dartmouth Yard would achieve this desire.

In interpreting these findings, we have concluded that a rail function is not unwanted on the Downtown Dartmouth waterfront. However, the land that the Dartmouth Yard now occupies is perceived as more valuable, in a community sense, for non-industrial uses. Therefore, a new site for the Dartmouth Yard should be in a location that:

- 1) Is compatible with neighbouring land uses in that it:
 - a) should not create a nuisance for them,
 - b) may be of benefit to them.
- 2) Has a low potential to encroach or be encroached upon by competing land uses.
- 3) Will not negatively affect nearby land values.
- 4) Is in an area that is not vulnerable to redevelopment pressure or alternative uses, and preferably within, or next to, an industrial area.

The Lake William area meets one of these criteria by its somewhat isolated location that does not create incompatible adjacent land uses. Its principal weakness is that it is in an estate (large lot) residential zone of Halifax County Municipality. This zone abuts an industrial zone that accommodates quarrying. There is known and vocal public opposition in the Waverley area to quarrying. It is not known how a new rail marshalling yard at Lake William would be perceived in this context.

North Burnside is the only possible relocation area that meets most of these criteria. It is compatible with adjacent land uses, mainly because it is currently undeveloped. The site is adjacent to the Burnside Industrial Park and will benefit businesses by heightening the Park's rail service profile. It is separated from the activities in the Park by the Wrights Brook wetland. The brook forms a natural barrier to expansion of the Park in a westerly direction. The site is on undeveloped land that is in an undisturbed vegetative state. It is located well away from any residential or active recreation uses and therefore poses no threat of being a nuisance.

Summary and Conclusion

Exhibit 4.2 summarizes the alternative marshalling yard evaluation. It lists the possible relocation areas across the top and the assessment criteria down the left side. In the exhibit, a toned box indicates a negative condition while a positive condition is left untoned. The layout of the exhibits is such that the area or areas with the fewest toned boxes are the most favourable.

Exhibit 4.2 Summary Assessment of Alternative Possible Relocation Areas						
Assessment Factors	Possible Relocation Area					
	Windsor Junction	Lake William	North Burnside	Tufts Cove	Dartmouth Cove/Woodside	Beyond Autoport
Minimal/No Grades Along Main Line	Yes	Yes	Yes	Yes	Yes	Yes
5000 Ft. Of Available Land Adjacent To Main Line	Yes	Yes	Yes	No	No	No
Impact On Natural Environment	Minimal	Minimal	Minimal	Minimal	Minimal	Minimal
Compatibility With Adjacent Land Uses	Potential Residential Conflicts	Undeveloped Area	Undeveloped Area Adjacent To Burnside	Potential Strip Commercial & Residential Conflicts	Potential Adjacent Residential Conflicts	Potential DND (Housing) and Residential Conflicts
Appropriate Sized Parcel(s) Available	Yes	Yes	Yes	No	No	No
Site Access	No access	No access	Access Available	Access Available	Access Available	Access Available
Services & Utilities Available	No	No	Yes	Yes	Yes	Yes
Suitable Location For New Marshalling Yard	No	No	Yes	No	No	No

Based on the assessment summarized above, we can conclude that the North Burnside site between Miles 6.4 and 7.4 is preferred for a new marshalling yard. This site is next to the Burnside Industrial Park and could extend into the Town of Bedford and Halifax County Municipality on vacant lands. The site is vacant and relatively flat, offers room for expansion, has excellent adjacent services and access to the region's road transportation system and has no incompatible adjacent land uses. The major land use in the area, as presented in Exhibit 4.3, is the Nova Scotia Power Inc. Burnside Gas Turbine Plant and a proposed power line right-of-way. We have reviewed the plans of NSP Inc. as of mid 1995 and the conceptual designs presented in Section V are intended to accommodate the future expansion plans of this power plant.

Relocation of the yard to North Burnside will reduce train and car miles with positive effects upon Dartmouth. First, train and engine movements along the harbour will decrease by nearly two-thirds. Second, back and forth switching movements across downtown street crossings will be eliminated completely. Downtown Dartmouth would experience greatly reduced horn and train noise, vibration and engine emissions. When these benefits are added to the reduction in conflicts, injuries, delays and requirements for police intervention at grade intersections between rail and highway vehicles, as well as a reduction in locomotive emissions, the excess of qualitative benefits over the qualitative costs of this project becomes certain. In contrast, the proposed new location is between Department of National Defence (undeveloped) and industrial land uses with low-density, largely daytime users, so rail impacts are minimized.

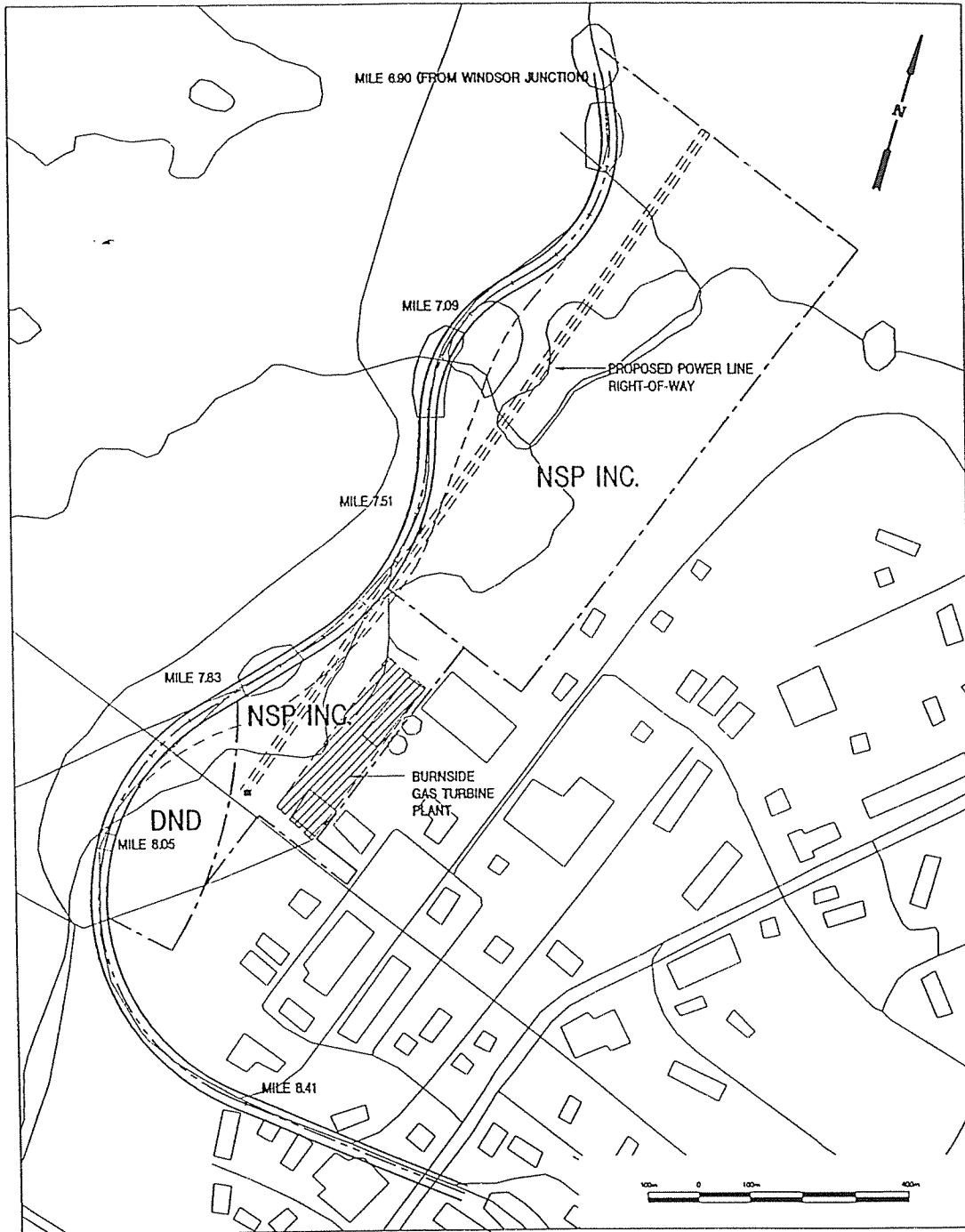
Cautions

The incompatibility factors that currently favour moving the Dartmouth Yard from its present location appear to be mostly absent at the North Burnside location. They appear to have a low potential to develop over time. However, certain preemptive steps may need to be taken.

First, the preferred site has holding zone-type land use controls in both the Town of Bedford and Halifax County Municipality to discourage uncontrolled development because services are not currently available. Discussions with officials of the two adjacent municipalities should be initiated to address the planning policy and zoning issue. This is discussed in more detail in Section 5.6.

In addition, the Wrights Brook wetland remains a viable natural wetland area that, while not unique, is valuable and important to the plants and wildlife that inhabit it. The area will require safeguards to minimize the hazardous spill potential associated with the marshalling yard and with initial construction of the yard. The Wrights Brook area may be seen to have potential for enhancement and as a nature interpretation site. This potential should be carefully weighed in terms of possibly negative exposure that could be created for the new yard.

Exhibit 4.3 NSP Inc. Burnside Turbine Plant and Right-of-Way



4.5 Future Regional Considerations

The plans advanced by CN for a relocated classification yard are based on the assumption that such a facility would be simply a movement of present functions to a new location to serve the anticipated future needs of the Dartmouth Subdivision. At or about the time such a facility would be physically completed, its functions could be altered from those now performed at the Dartmouth Yard. Current North American trends in railroad operating practice indicate the probability that a new facility could possibly exclude numerous support functions formerly carried out at individual yards, which in the future could be consolidated and centralized from a regional headquarters such as Moncton or Halifax. Therefore, it is possible that locomotive servicing and car repair activities, as well as some services staffed by clerks, might not be undertaken at a relocated facility. In addition, the role and function of the Port of Halifax may change and see the relocation or expansion of vehicles, container, bulk or break bulk traffic along the Dartmouth Subdivision. Regardless of these unforeseen future scenarios, the recommended North Burnside site allows for flexibility in meeting a wide range of rail-related unknowns.

V Analysis of New Rail Yard on Recommended Site

5.1 Introduction

The purpose of this section to the describe the recommended North Burnside area, and to present four general schemes for the relocation of the Dartmouth Yard.

5.2 Physical Description

Information for this description was derived from field observation and from the document entitled, *Environmental Assessment Report for the Highway 107 Extension* (EIA Report), by P. Lane and Associates, 1991. The Highway 107 Extension is planned to cross the recommended relocation area. The highway project successfully passed the EIA Review.

Topography

The North Burnside area straddles the boundary of the Town of Bedford and the City of Dartmouth, north and west of Burnside. In fact, the Dartmouth Subdivision main line marks much of the boundary of the two municipalities. In addition, a large portion of the area is contained within Halifax County Municipality.

The site has a hummocky relief that rises very slowly. It changes in elevation from about 100 feet at its southern end (Wrights Brook crossing) to about 140 feet at the northern end (where the track straightens out west of Flat Lake). This is a distance of about a mile and a half, giving an overall gradient of less than one percent.

The most extreme variation in topography adjacent to the main track is from a low of 106 feet at Stillwater Creek to 148 feet at a point about 650 feet to the south. The average gradient here is about 5.8 percent, with some localized slopes of about 10 percent.

Wrights Brook is the principal water course in the relocation area. It travels from north to south, emptying into Wrights Cove in Bedford Basin. Wrights Brook drains a portion of North Burnside and connects with Flat Lake and Enchanted Lake. The headwaters are south of the Akerley Boulevard Extension. The connecting stream from Anderson Lake, Stillwater Brook, flows into Wrights Brook. Other smaller tributaries flow into Wrights Brook as well.

Geology and Soils

The Goldenville Formation of sedimentary rock underlies the site. The rock has been metamorphosed through uplift and folding through its 500 million year history. Goldenville rocks are made up of bedded sequences of greywacke and quartzite and thinly interbedded with green and black slates. Parts of the Goldenville Formation contain acid-bearing pyrites responsible for acid runoff. Rock samples taken near the relocation area showed low

quantities of the acid producing sulphide. The EIA report stated, "*Samples of [suspect] rock types were collected...Sulphide values are below those necessary for significant acid production.*" (p. 6-5). The suspect rocks included argillite and greywacke. Both of these rocks are common to the area. The report concluded that acid runoff problems will be unlikely. However, it cautions that it will be necessary to test for acid-producing bedrock in any areas to be cut or excavated.

Glacial activity has left thin, nutrient-poor soils in all but the low-lying areas. The till soil averages about five feet deep over the site.

Vegetation

The soil supports a variety of flora types. The area appears to have been burned over about 30 years ago and as a result, there is a wide mix of hardwoods and conifers. Pockets of old growth (100 to 150 years) forest are known mostly in low-lying and streamside (riparian) areas. An usual abundance (for Nova Scotia) of red oak occurs in the well-drained uplands near Burnside, including pure stands.

In the rich riparian habitat of Wrights Brook, which typically contains white spruce, other species such as White Ash, Eastern Hemlock, American Beech, Hazelnut and Sugar Maple may be found. The wide flood plain of Wrights Brook is largely treeless. Instead, it is vegetated in a variety of flood-tolerant species including alders, sedges and rushes. The ponds along Wrights Brook may have been caused by beaver activity.

Wildlife

White tail deer were observed in the relocation area during one field visit. A wide variety of other native wildlife has been reported in the area over the years, although with the gradual encroachment of urban development, the extent of wildlife activity is not known. An animal particularly sensitive to environmental change, River Otter, has been reported at Wrights Brook in the past.

Birdlife has been reported to be varied and abundant. As many as 20 rare birds have been noted in the area over the years. The Whip-Poor-Will is a species of nocturnal songbird facing a non-cyclical decline throughout North America. The relocation area offers good habitat for this bird and it has been noted within the last decade. However, it is not known if any of the birds actually nest in the relocation area itself. This species tends to return to the same general area to nest each year as long as the area remains viable. The Black-Throated Blue Warbler is also in decline. It has been observed in the general relocation area. The EIA Report recommended that an environmental management plan be developed for the protection of any species found.

5.3 Alternative Yard Layouts

Four alternative marshalling yard layouts were investigated in the North Burnside area to establish the basis for assessing the impact of relocating the Dartmouth Yard to this site in Phase II. They are shown as Schemes 1, 2, 3, and 4 in Exhibits 5.1 through 5.4. These potential layouts will be further analyzed in Phase II.

The main features of each layout are summarized below.

Scheme 1

The main track is relocated on a generally straight alignment alongside the marshalling yard. The north-south location of the marshalling yard is determined by the existing track elevations and the 1% maximum allowable design grade on the main track and marshalling yard connections. The 1% gradient at the north end of the pullback track, while not desirable, is dictated by existing track elevations at the north and south tie-in points.

Relocation of the main track will shorten the Big Bog passing track, and will require a new connection to the DND spur. Materials released from the existing main track can be reused in the marshalling yard.

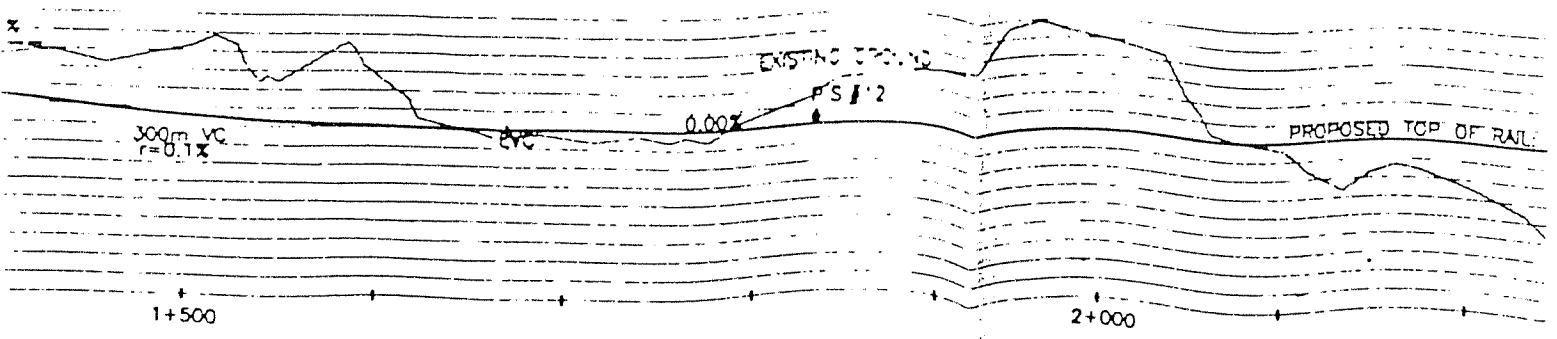
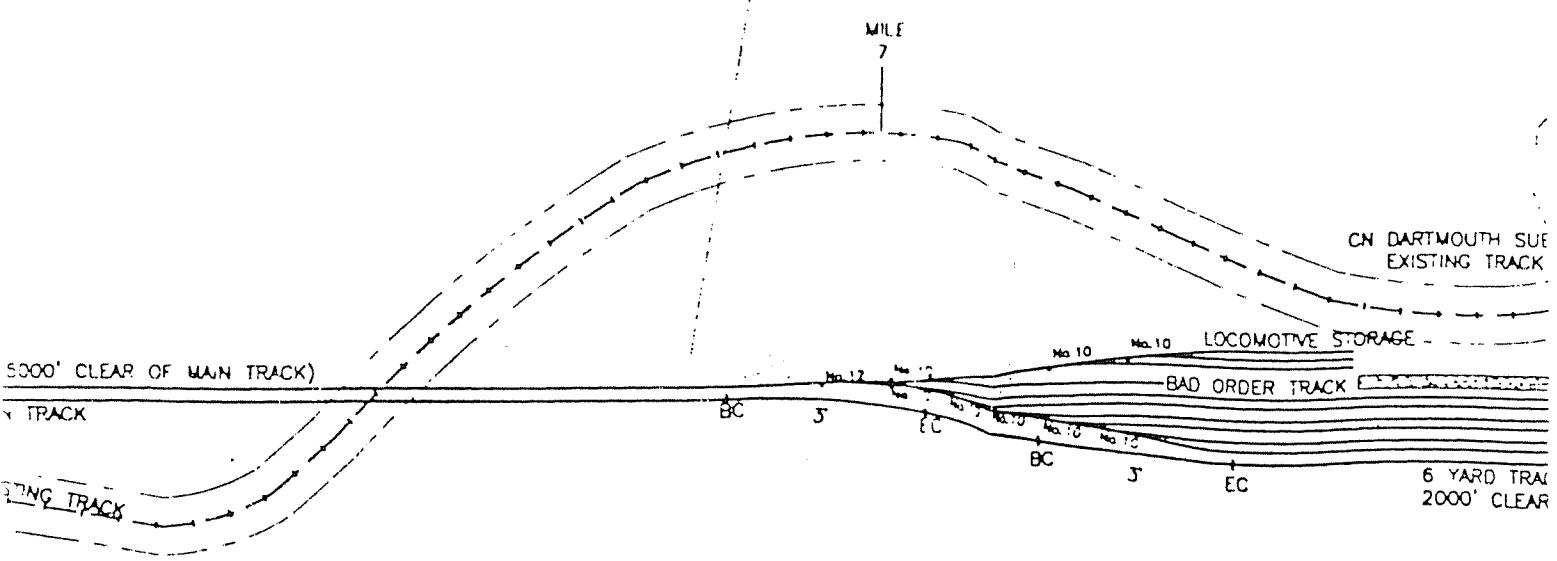
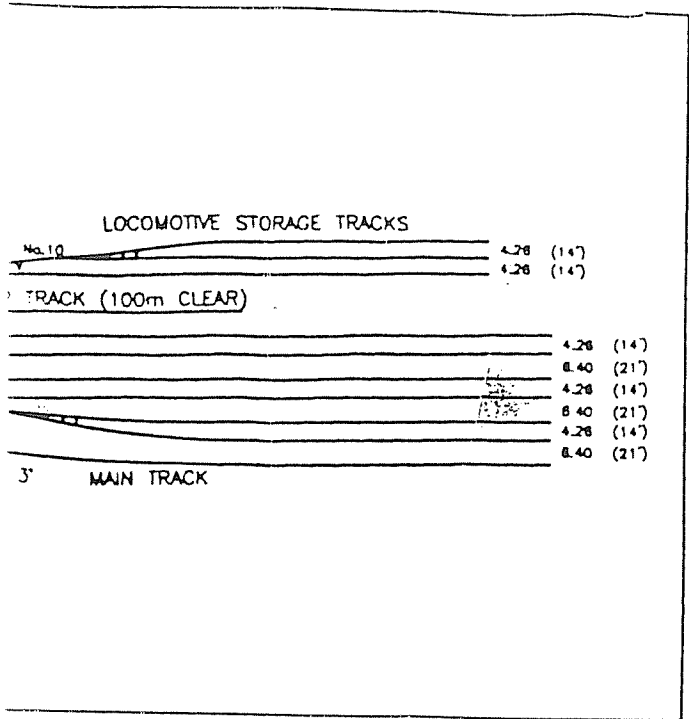
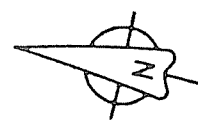
The proposed vertical profile, while only approximate, indicates considerable (rock) excavation, and will also require raising the track elevation by approximately three feet over the existing culvert at Mile 8.

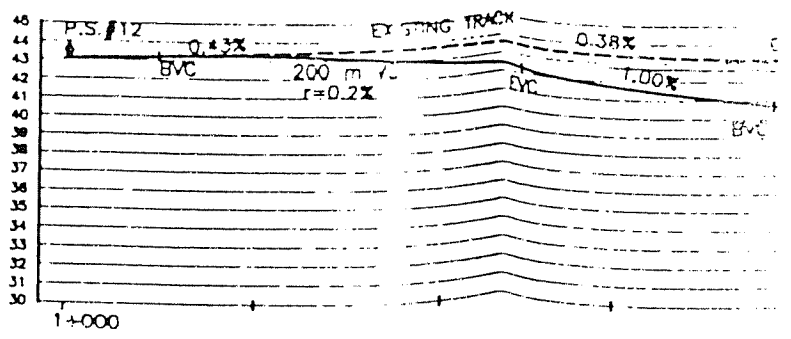
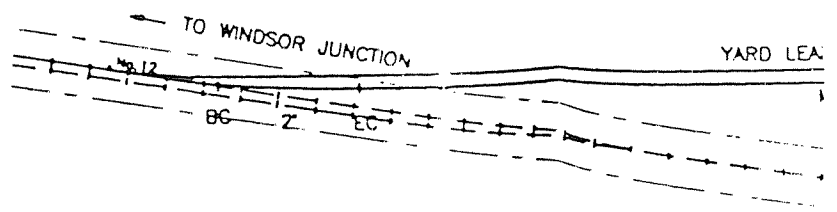
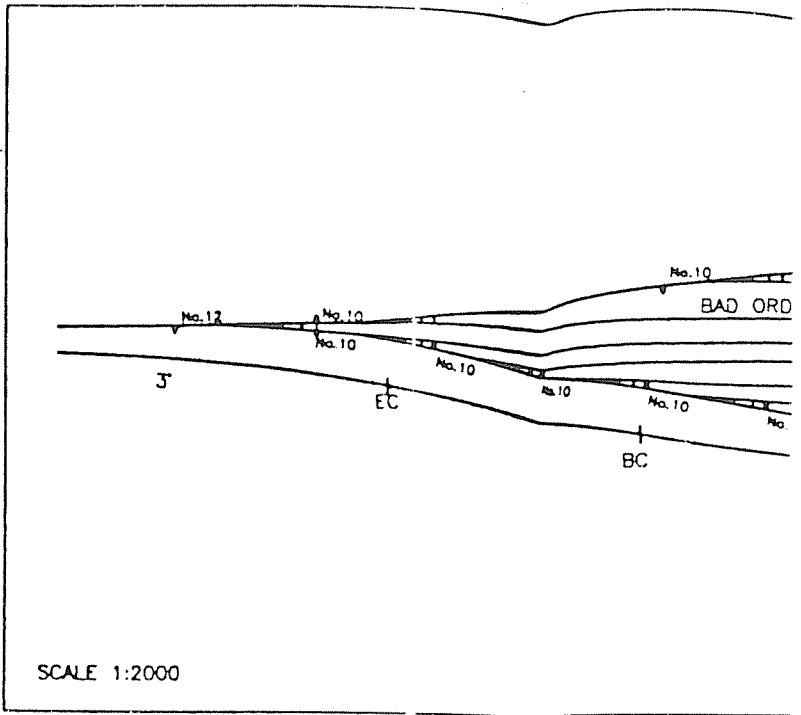
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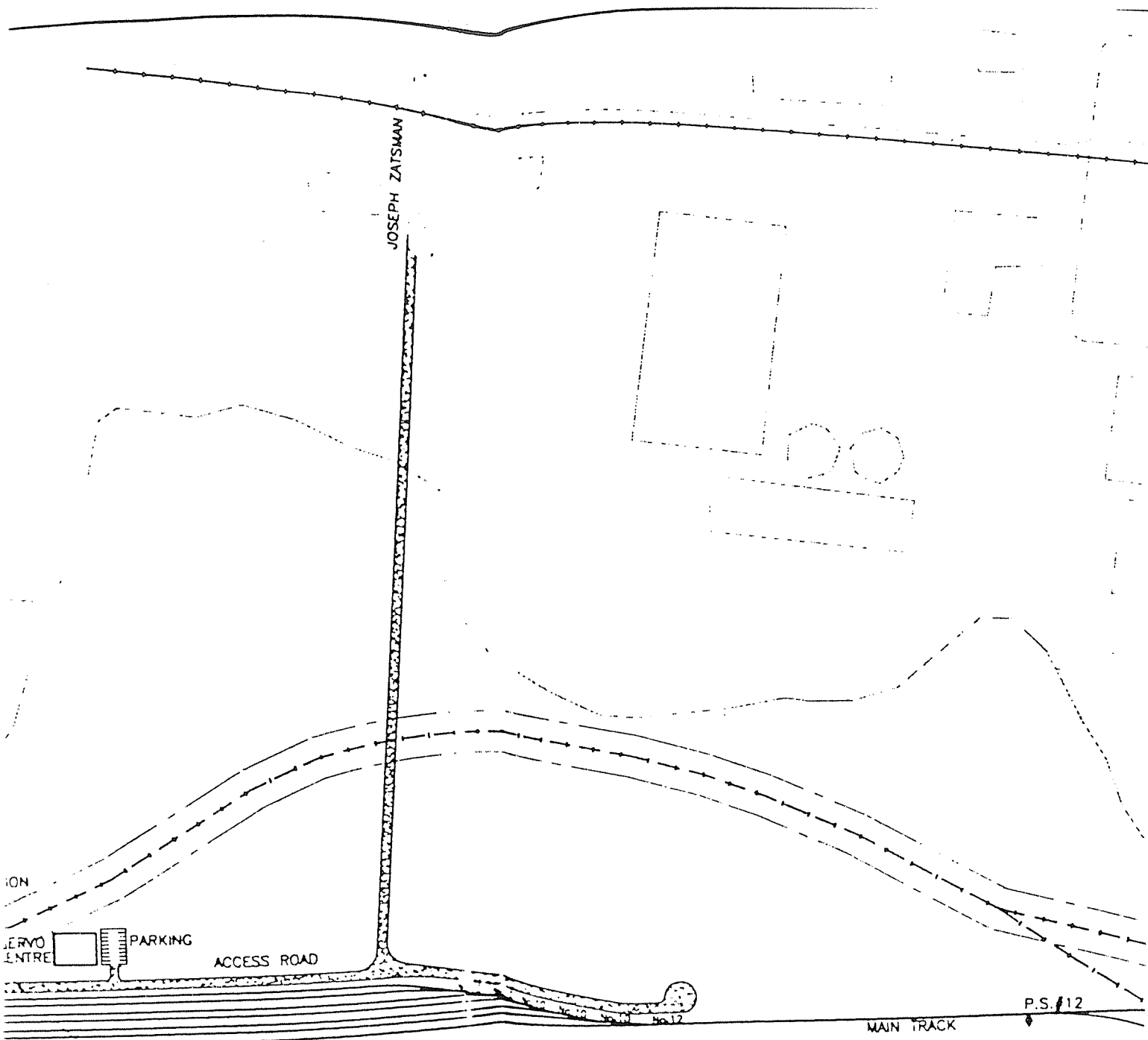
Scheme 2

This scheme is similar to Scheme 1, modified to retain the existing main track. The marshalling yard lead/pullback track connects to the siding at Big Bog.

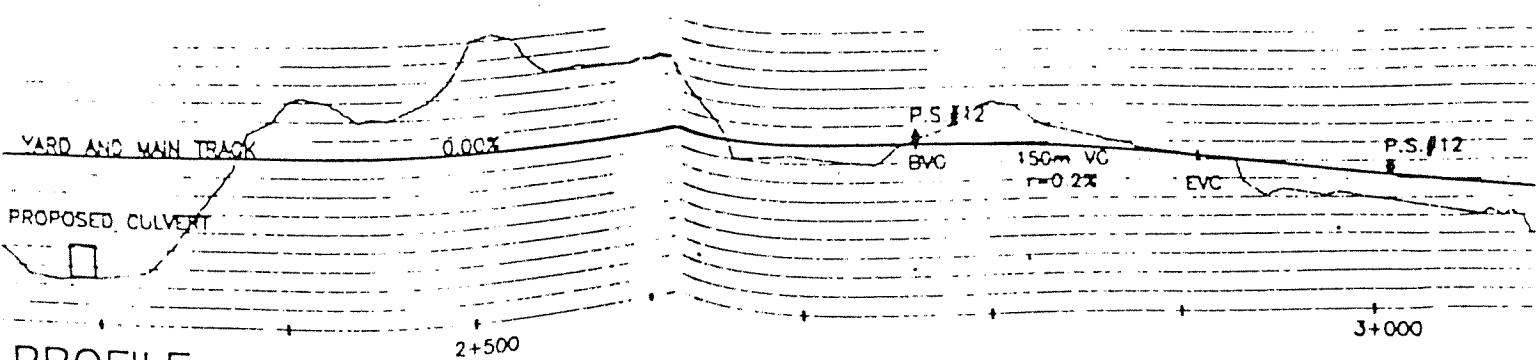
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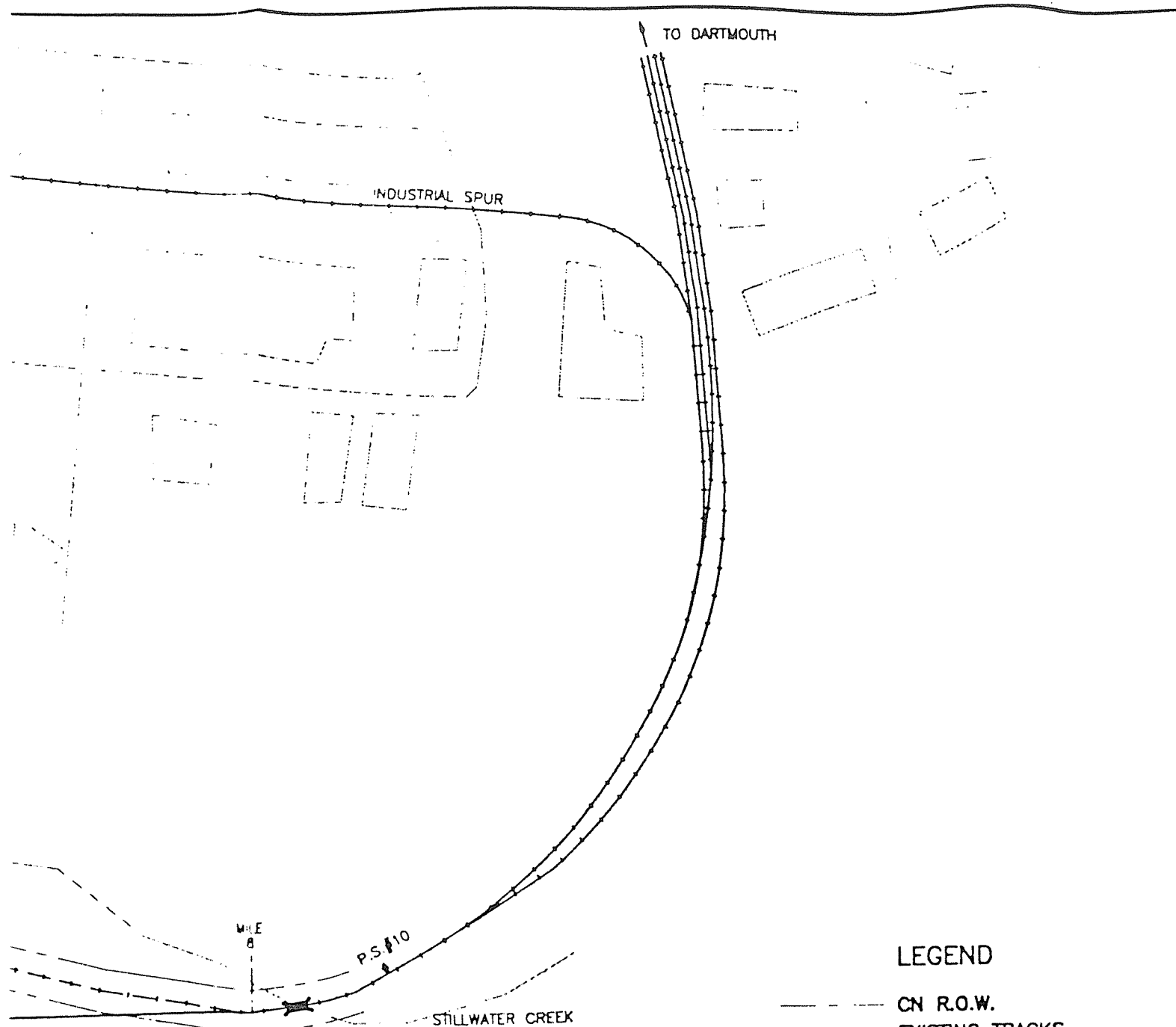






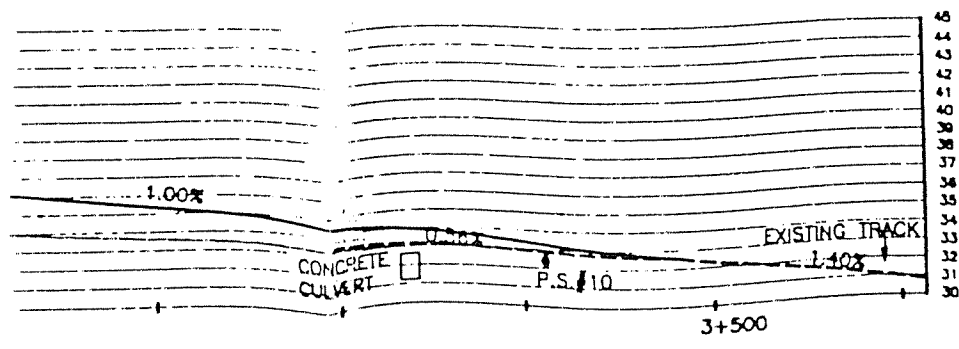
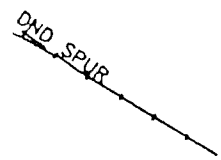
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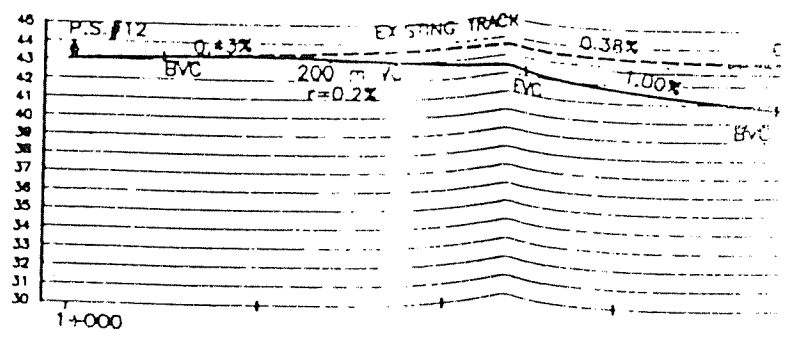
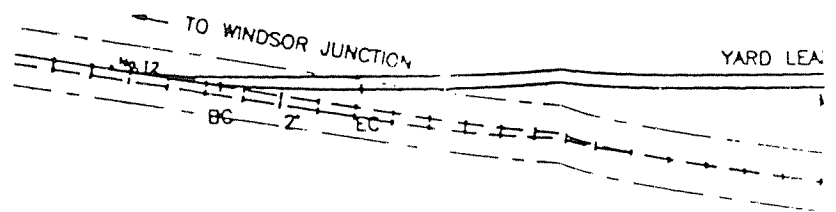
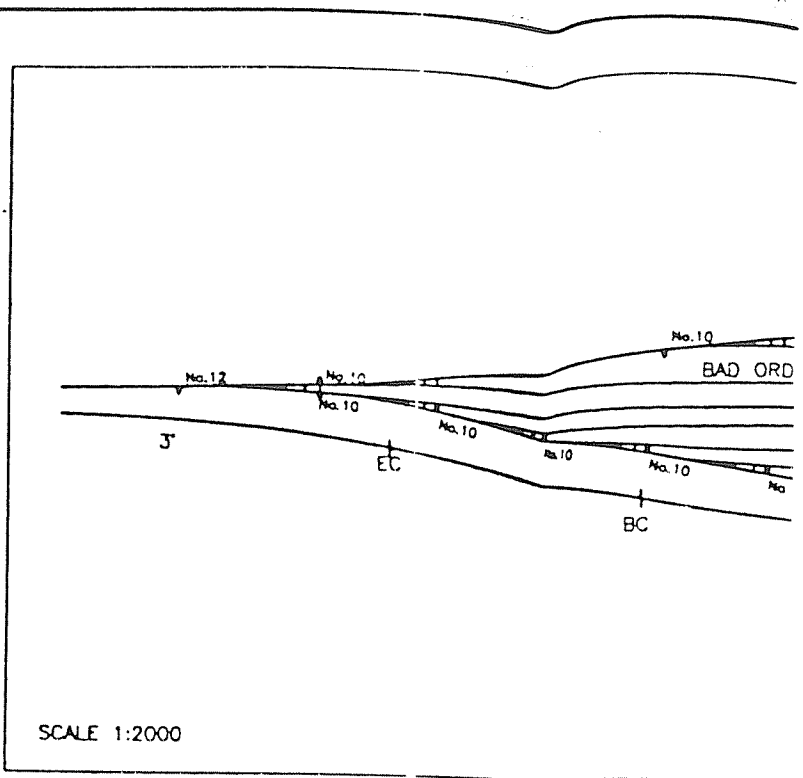


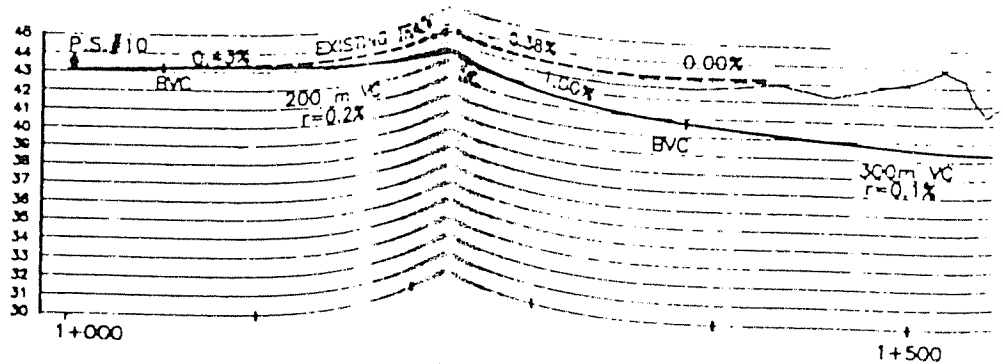
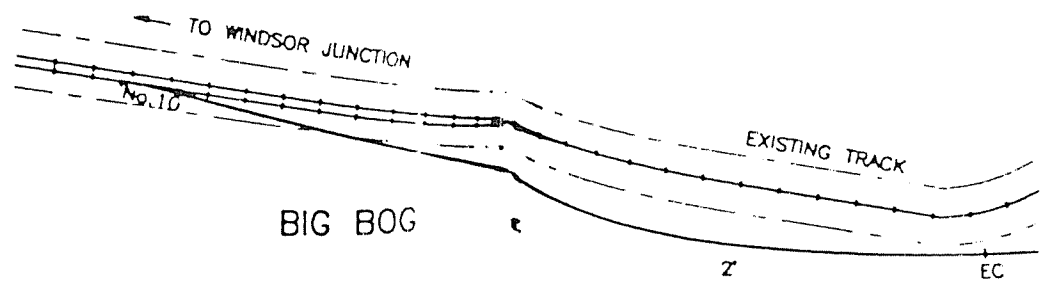
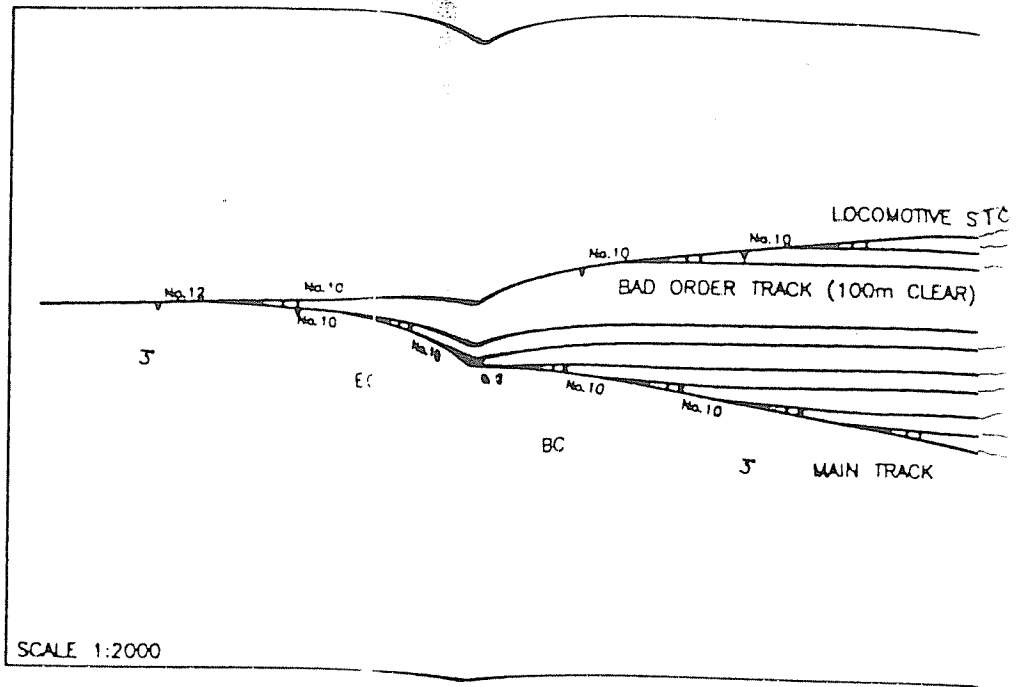
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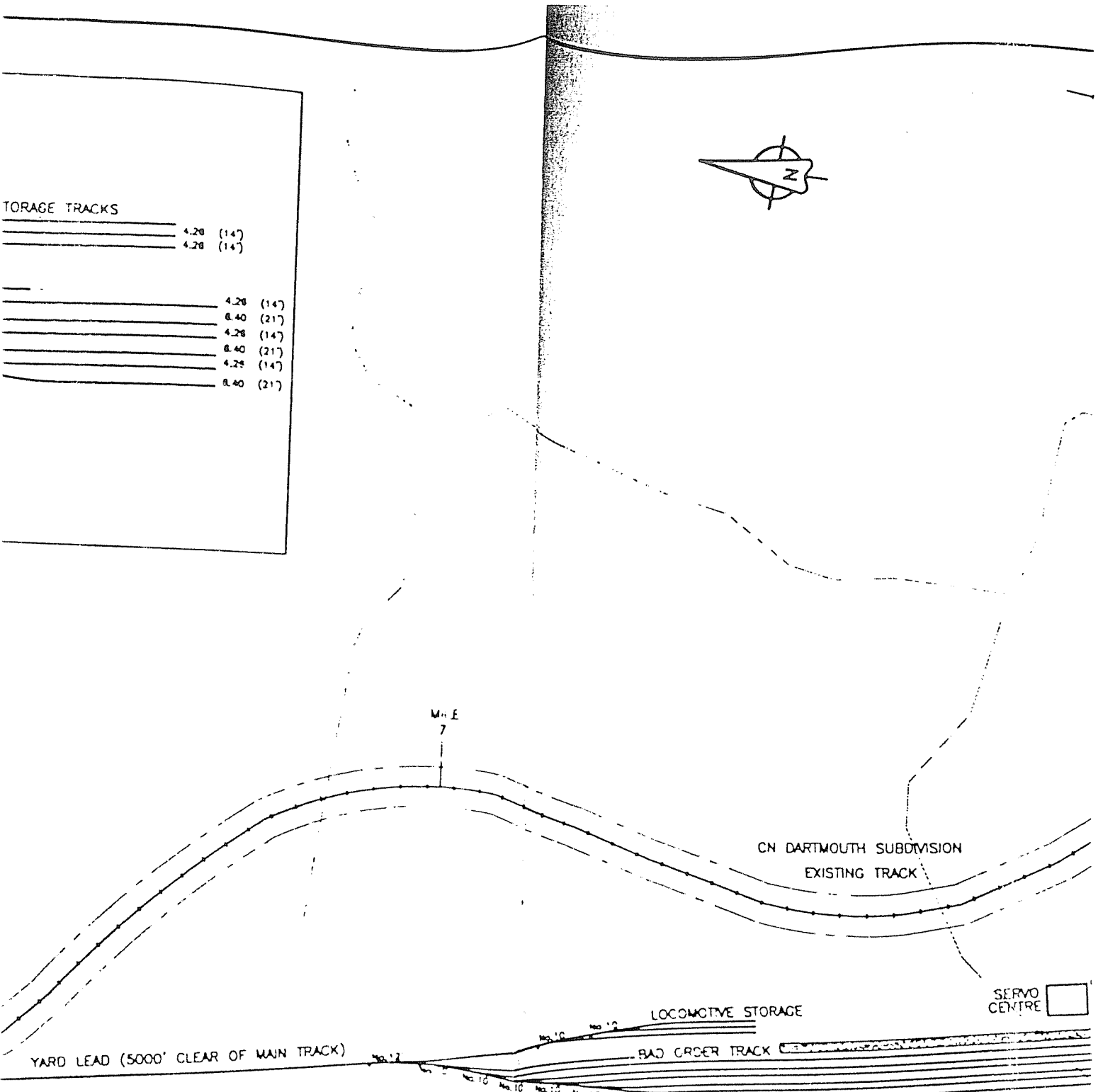
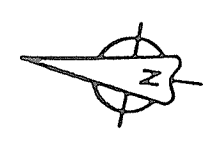
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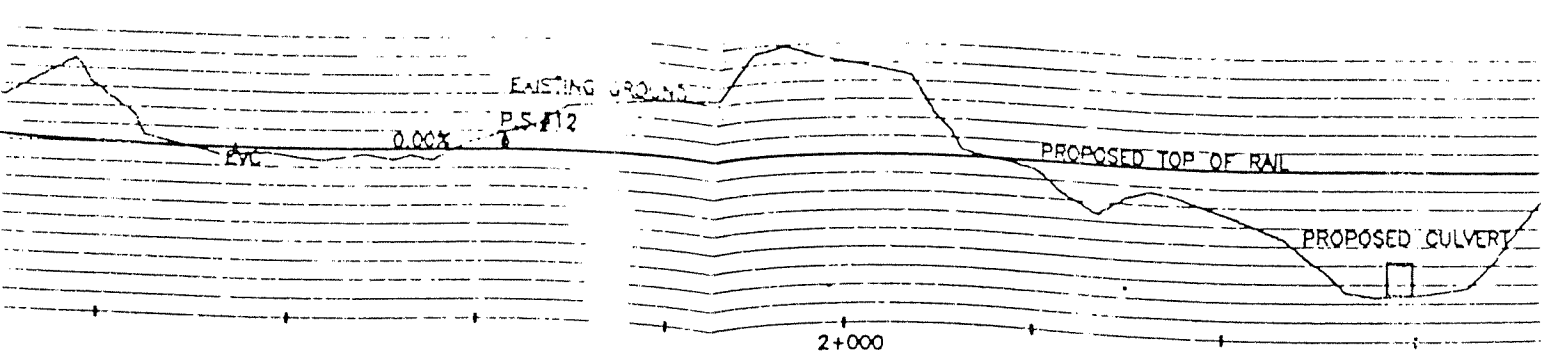


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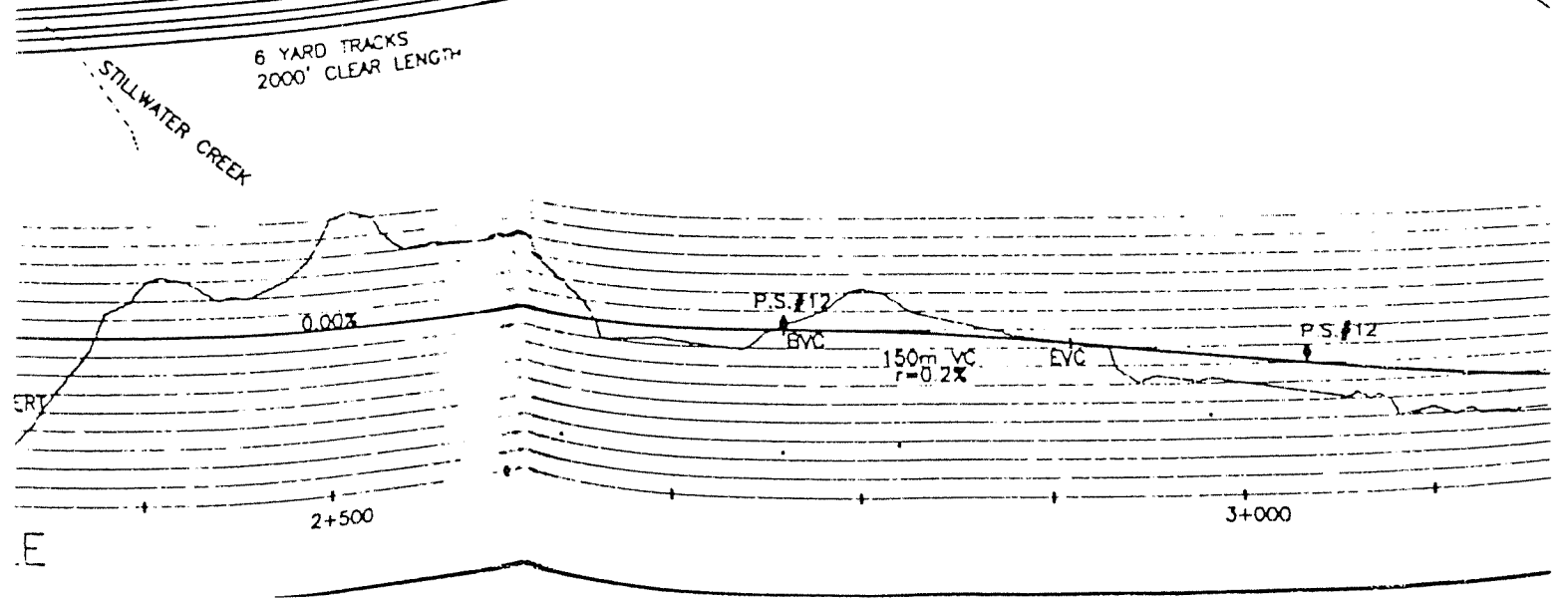
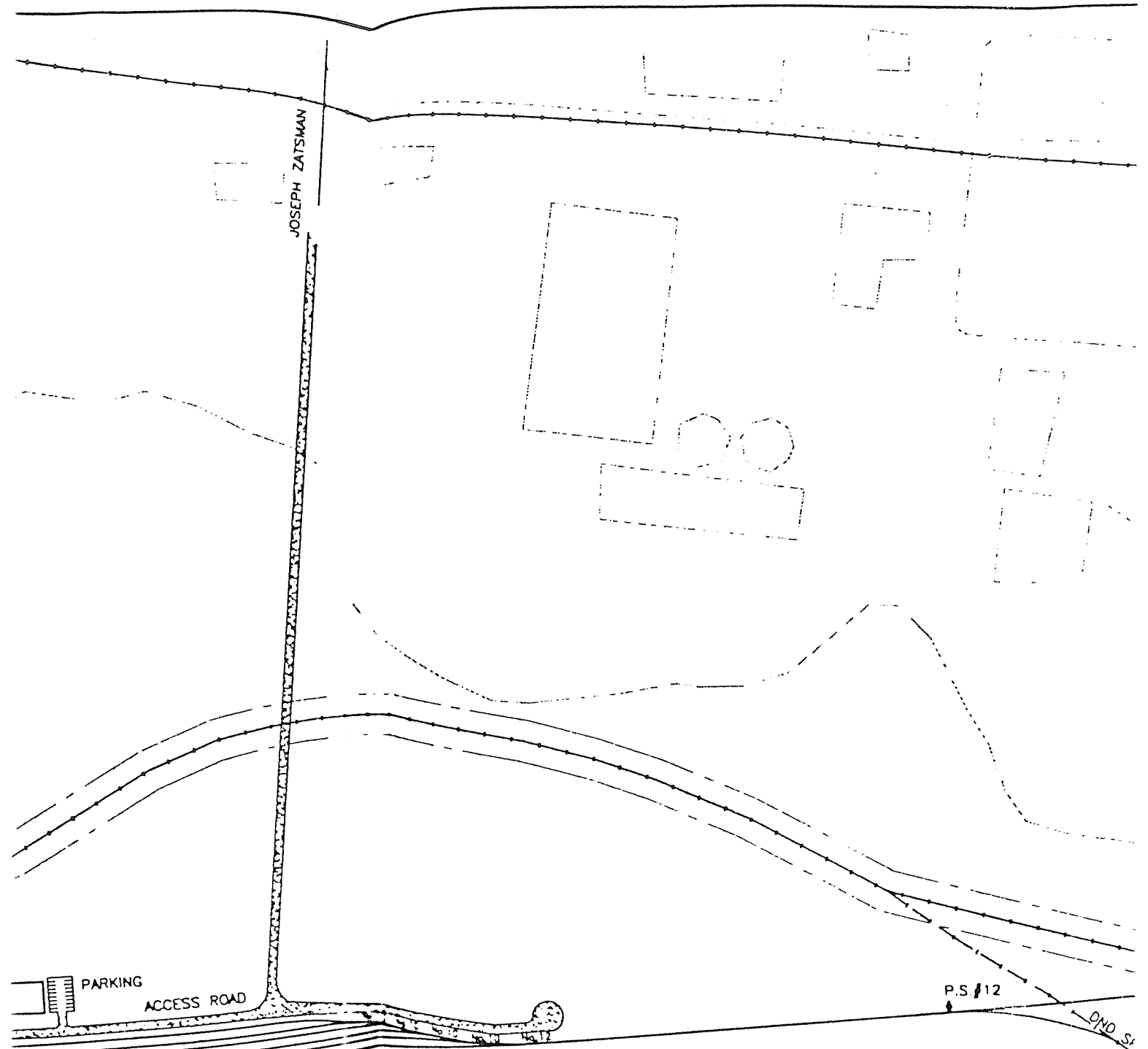
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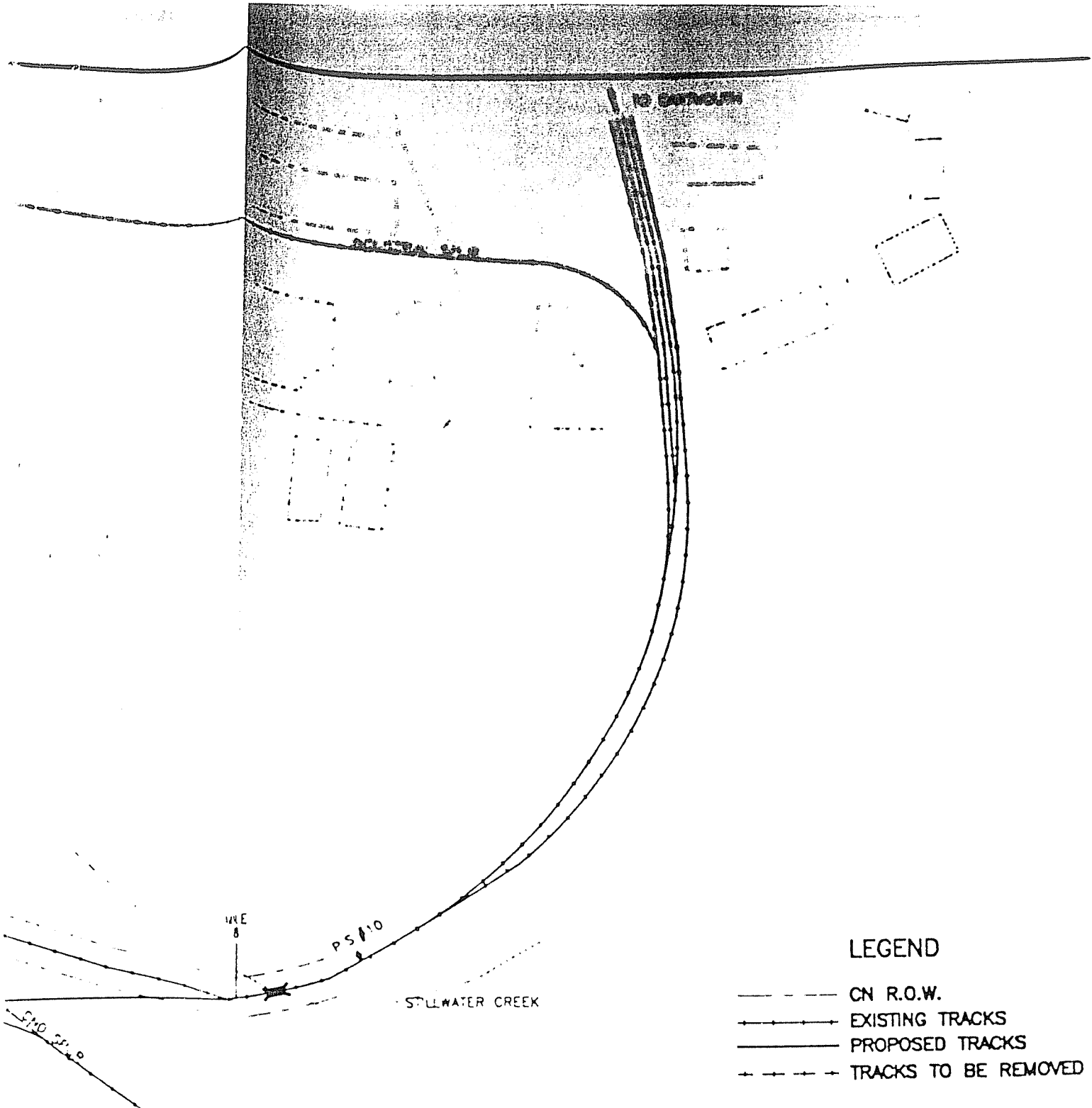
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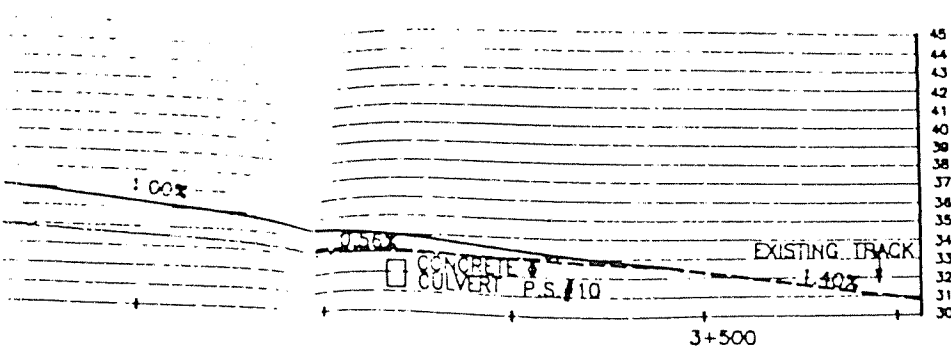



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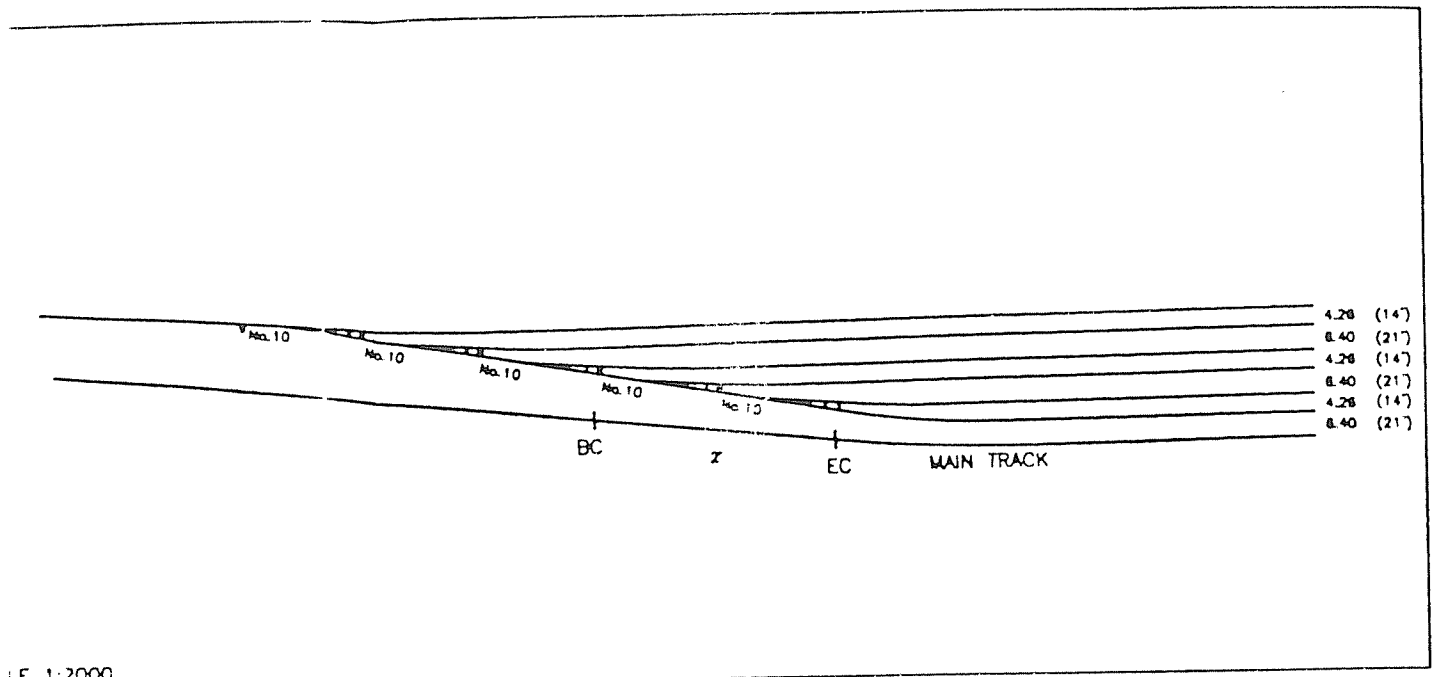


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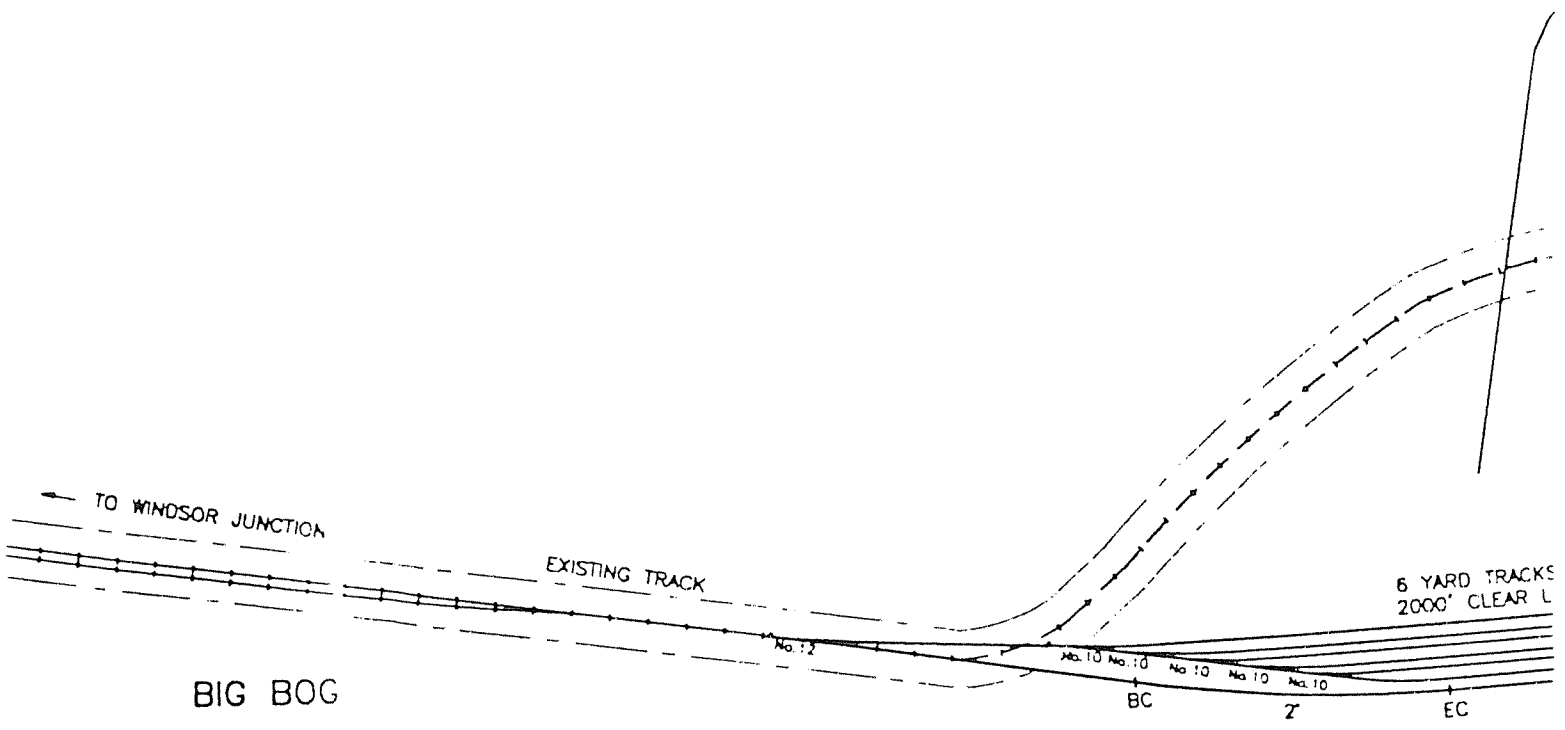
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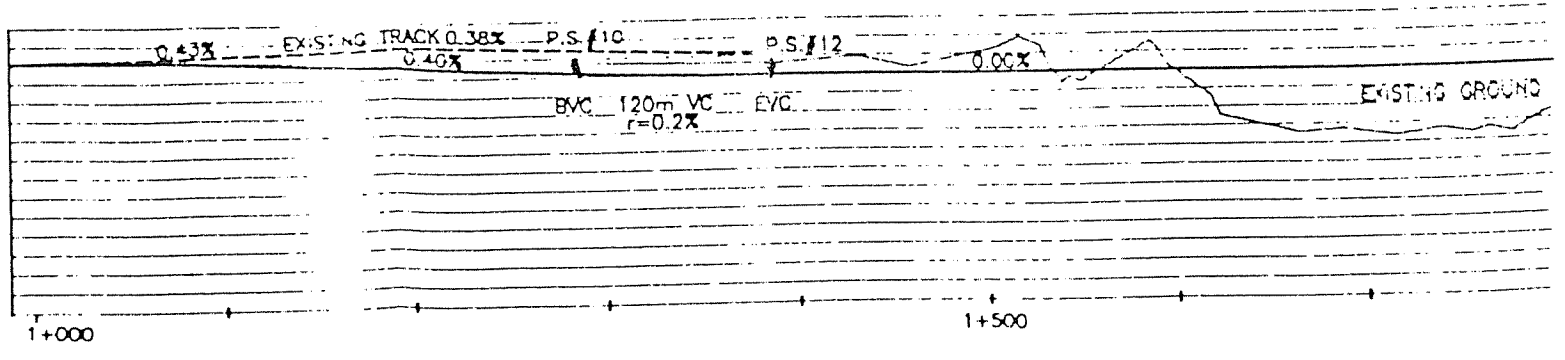
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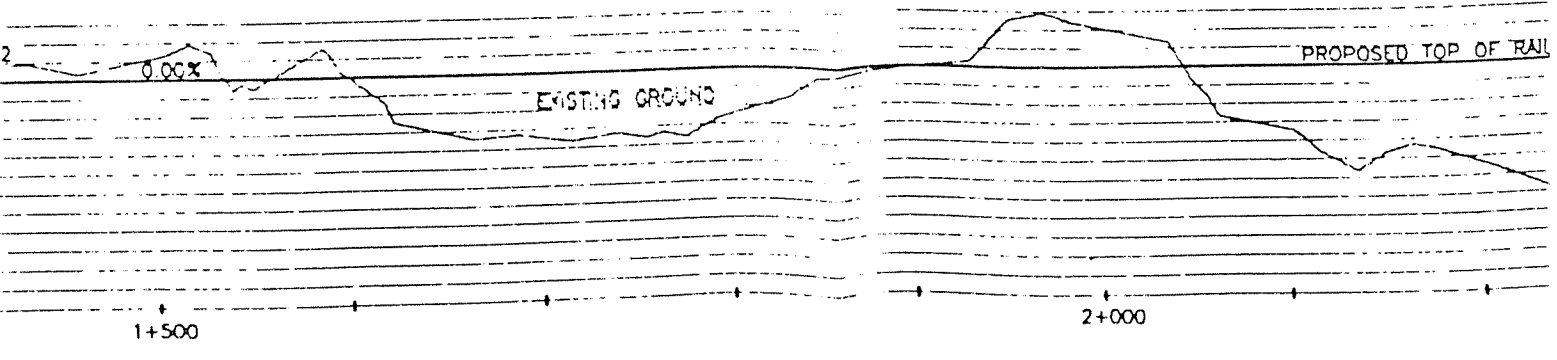
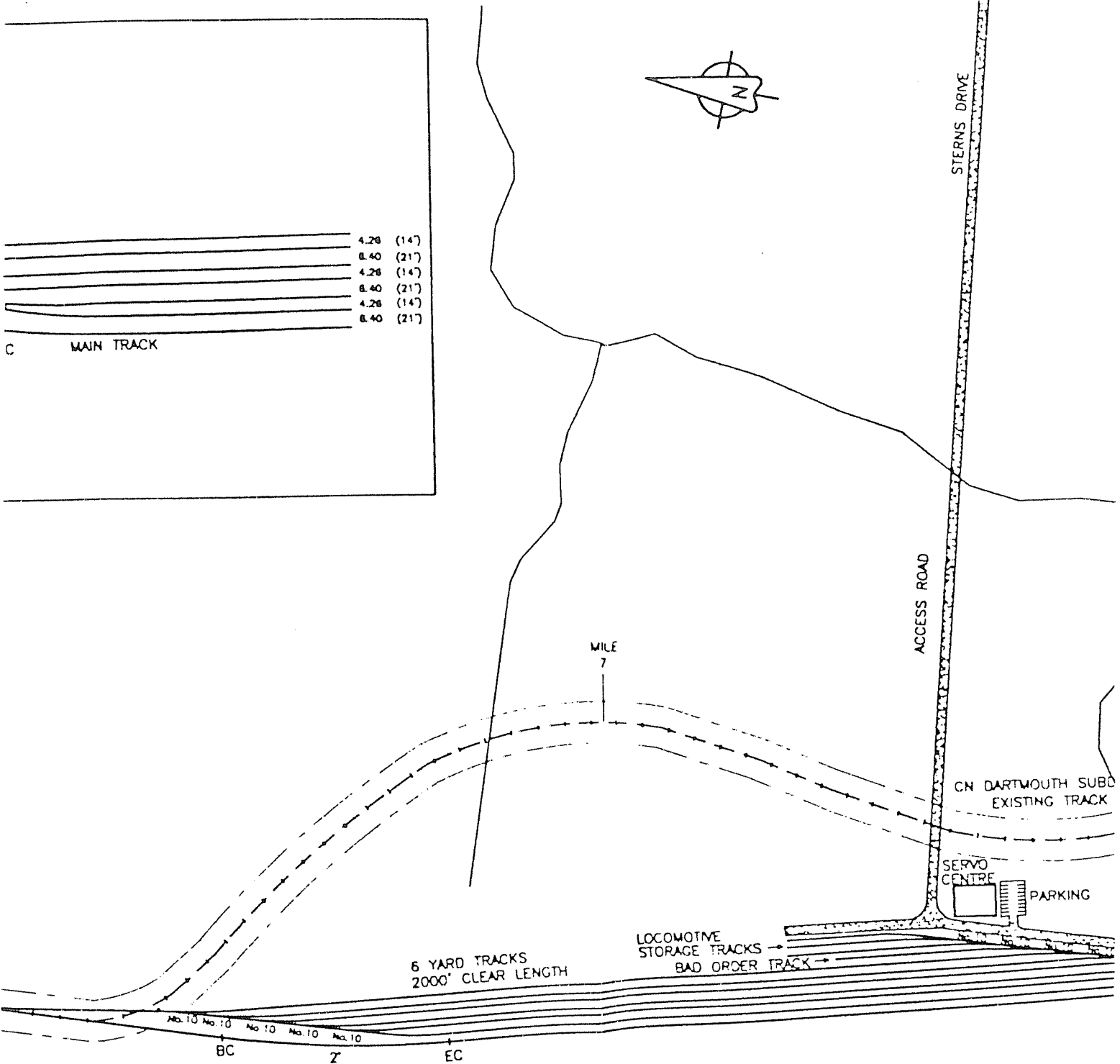
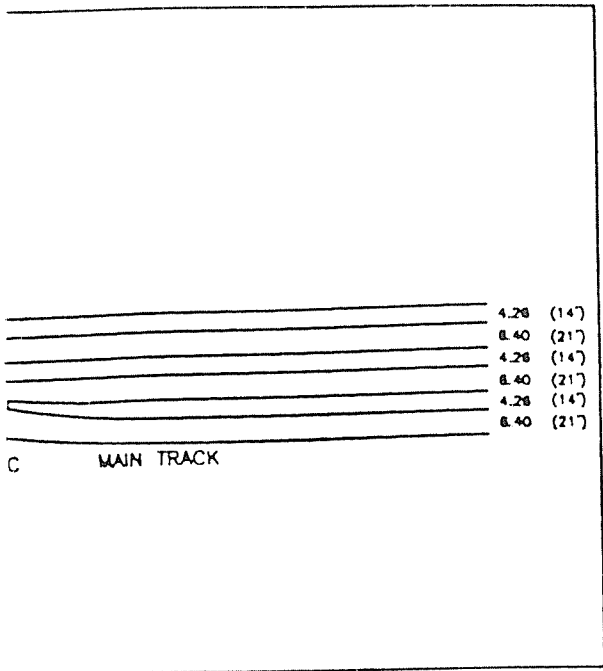
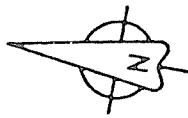


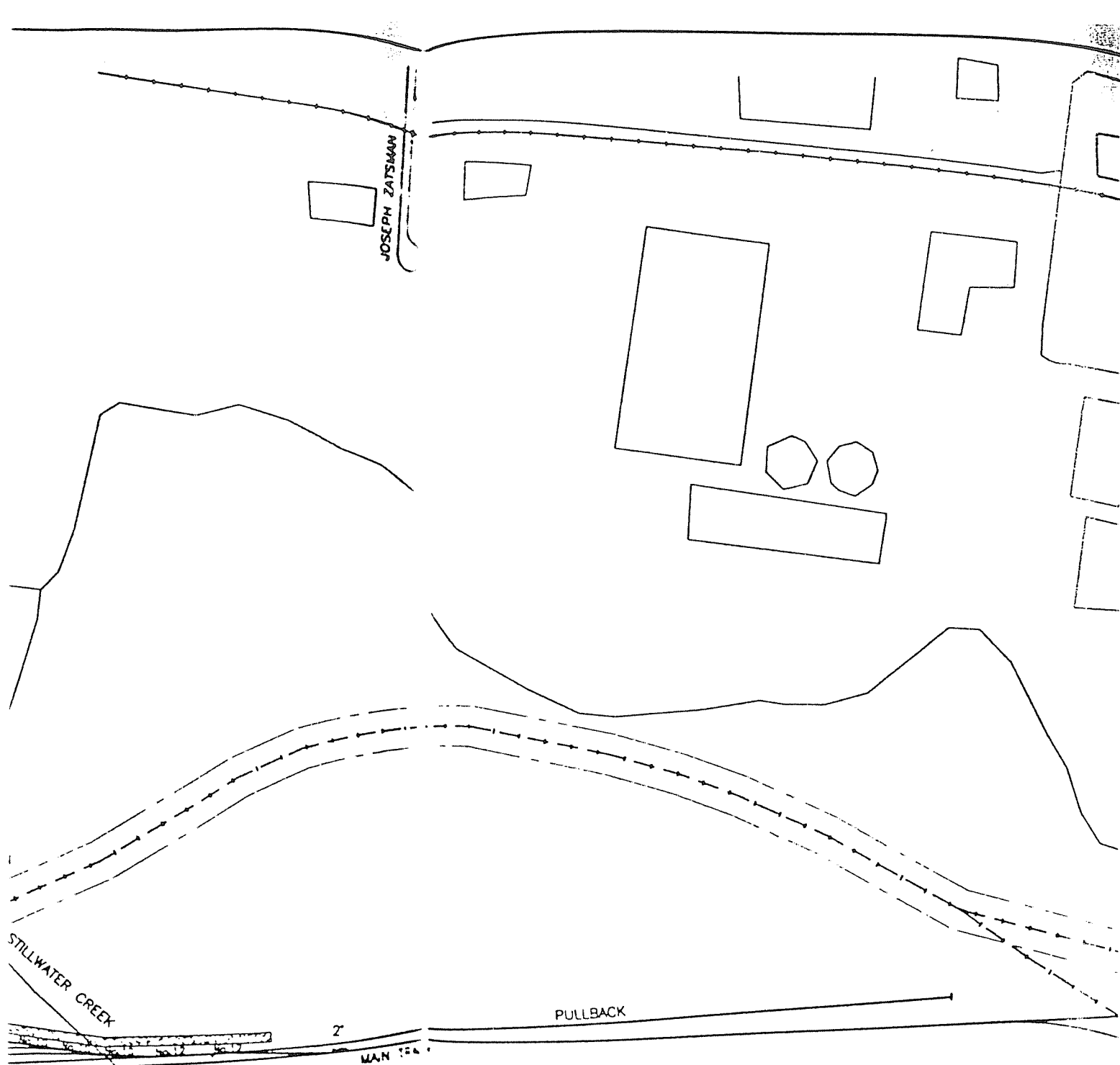
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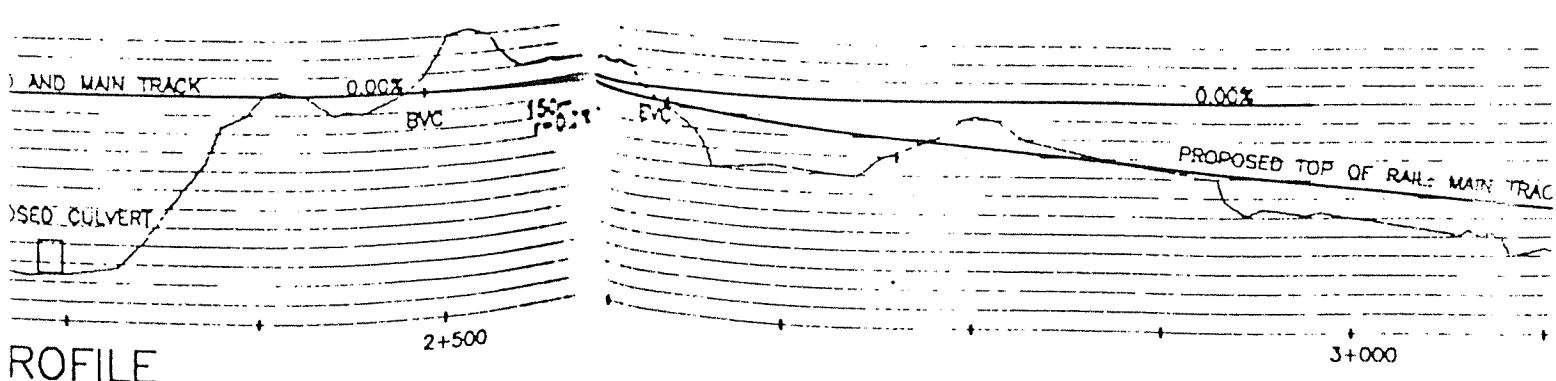
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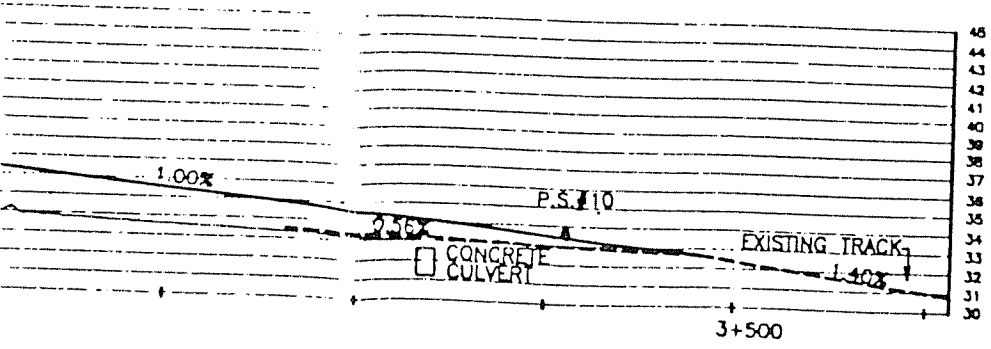



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Scheme 3

Scheme 3 was initiated to raise the elevation of the marshalling yard and reduce the amount of (rock) excavation. The main track is relocated to a generally straight alignment. The pullback track is located south of the marshalling yard as a dead end track. The marshalling yard plus pullback length is sufficient to accommodate a 5,000 foot train.

The marshalling yard and pullback tracks are on a level grade.

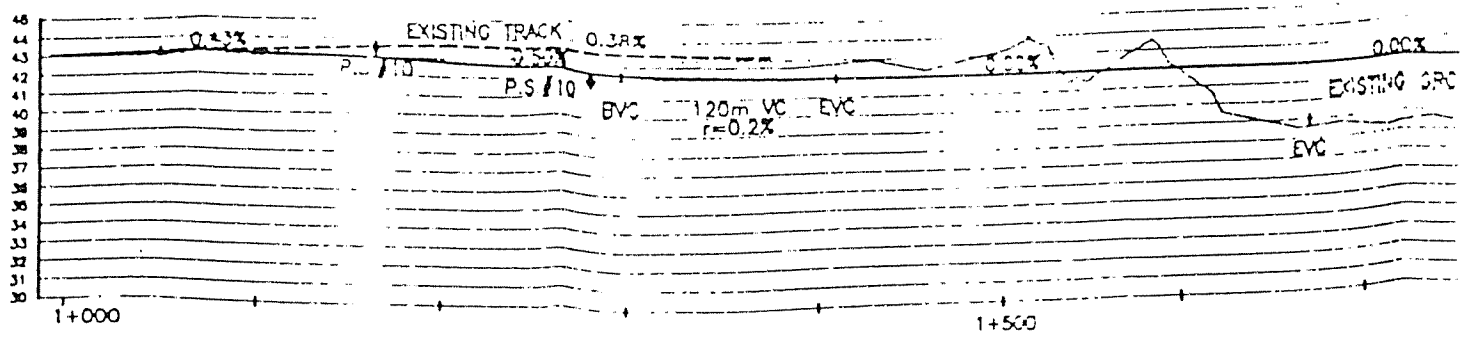
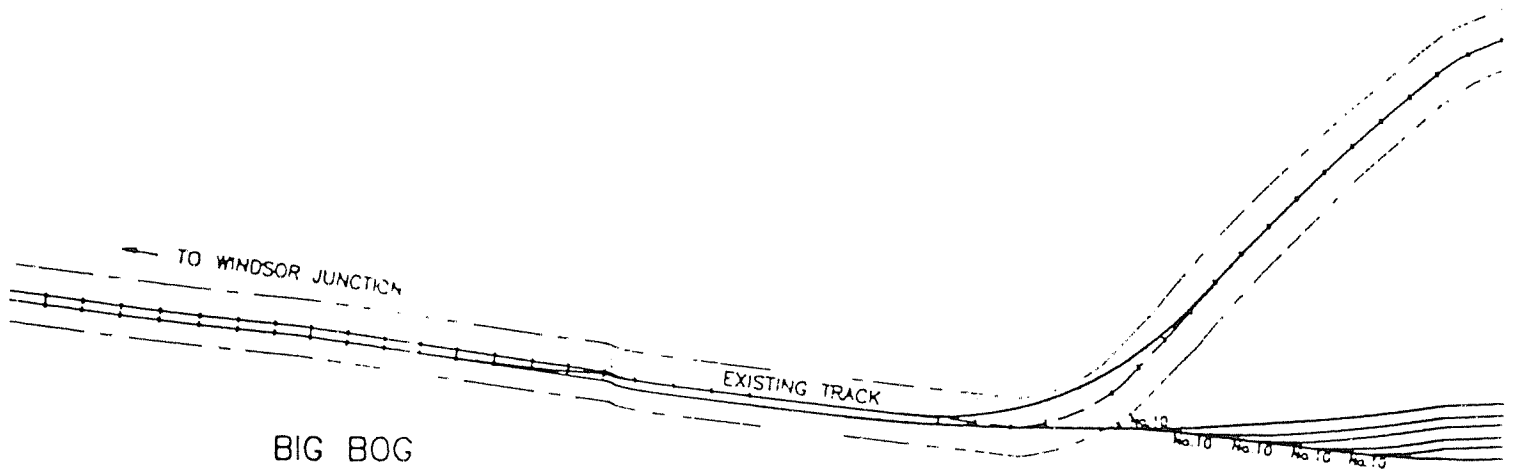
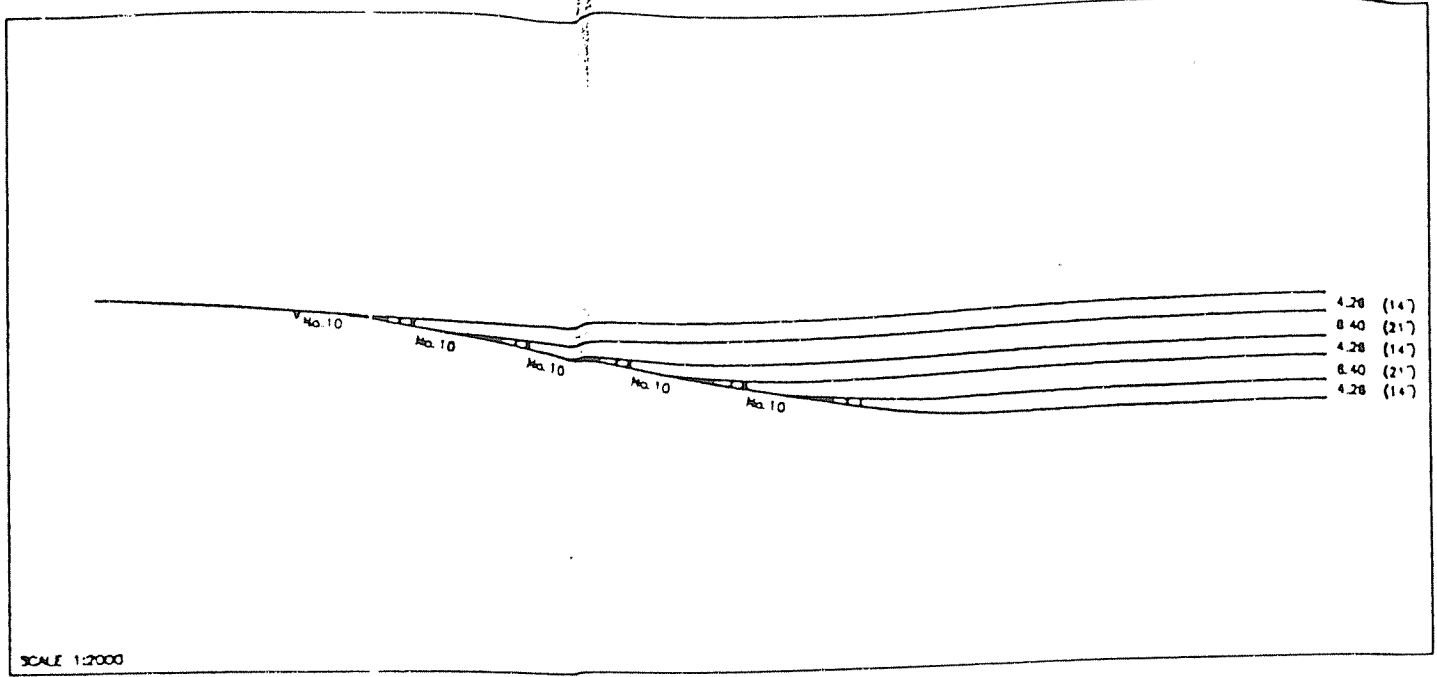
The pullback is curved at the throat to provide horizontal separation from the main track to allow for the difference in grade between the two tracks.

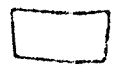
Road access is shown by way of extending Sterns Drive.

Scheme 4

This scheme is similar to Scheme 3, modified to retain the existing main track. The pullback track is dead ended, with the main track no longer available for locomotives to run around the train. The north end of the marshalling yard is connected to the Big Bog siding, but could alternatively be connected to the main track.

Potentially the least costly of all four schemes.





20' x 10' x 10' SIGN

STERNS DRIVE

ACCESS ROAD

CN DARTMOUTH SUBDIVISION
EXISTING TRACK



SERVO
CENTRE

PARKING

STILLWATER CREEK

MILE
7

LOCOMOTIVE
STORAGE TRACKS
BAD ORDER TRACK

YARD TRACKS
2000' CLEAR LENGTH

PLAN

PROPOSED TOP OF RAIL

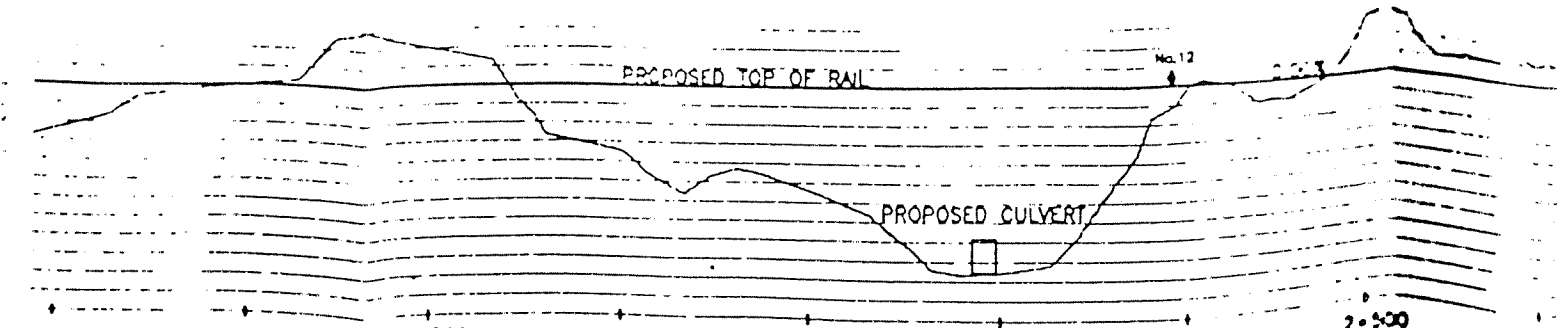
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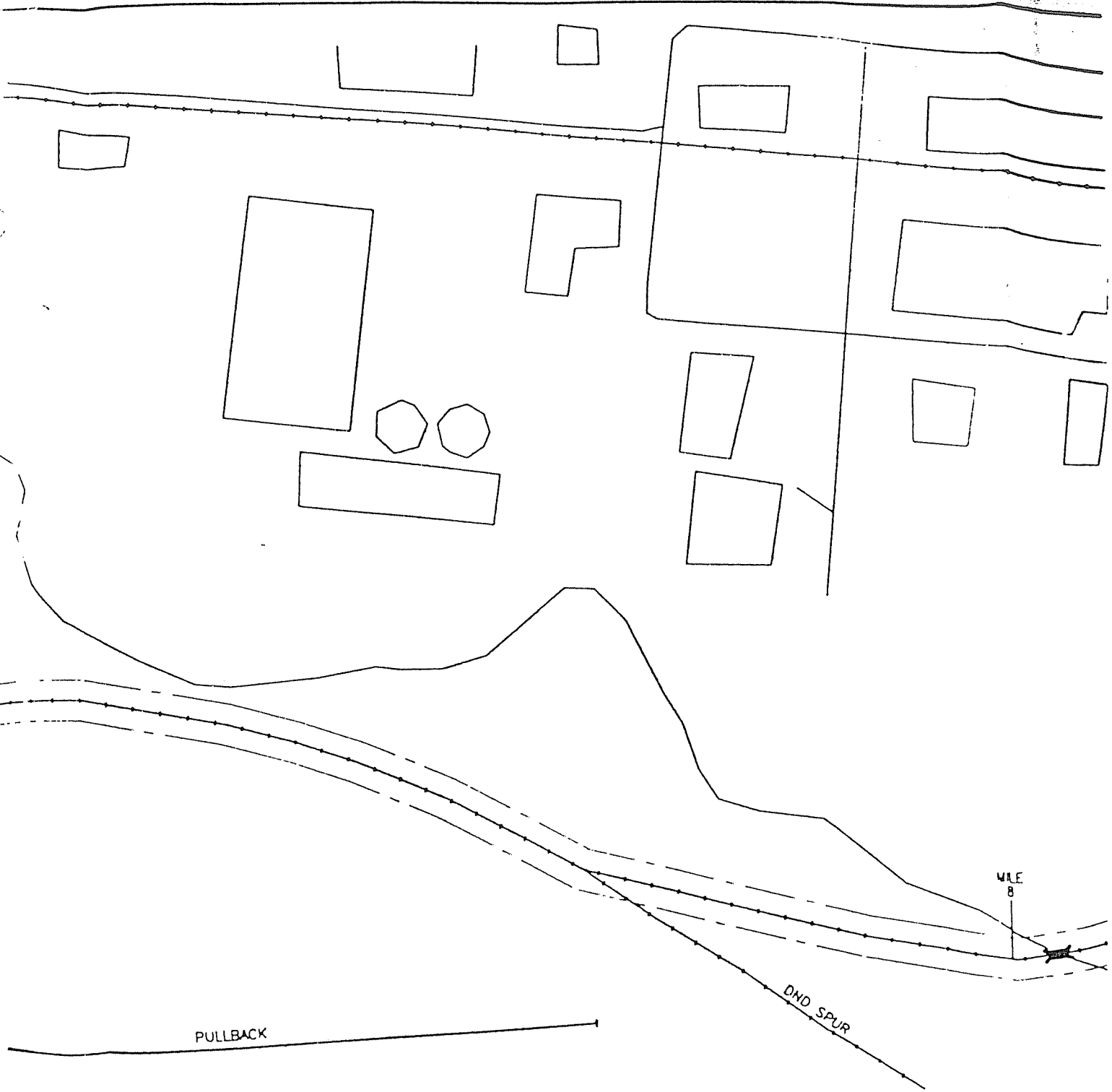
PROPOSED CULVERT

2+000

2+500

PROFILE





MILE
 8

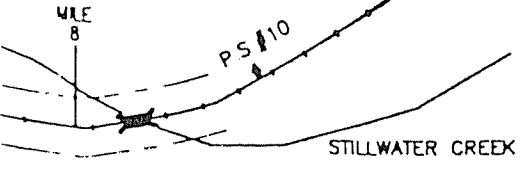
PULLBACK

DND SPUR

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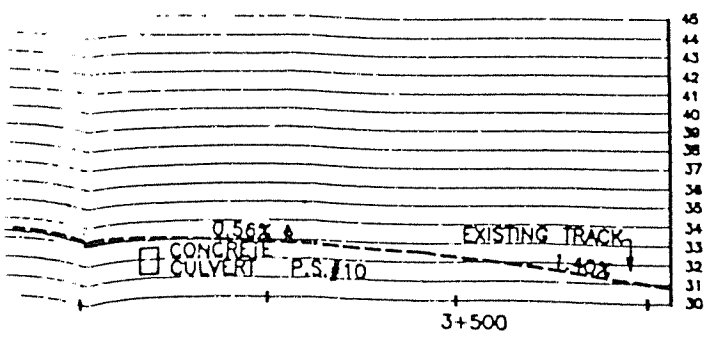
3+000


68



LEGEND

- CN R.O.W.
- +--- EXISTING TRACKS
- PROPOSED TRACKS
- +--- TRACKS TO BE REMOVED



		UMA Engineering Ltd. Engineers & Planners	
		DARTMOUTH YARD RELOCATION STUDY	
NORTH BURNSIDE SITE SCHEME 4			
SCALE 1:4000	REVISED BY	PROJECT NO.	
DRAWN BY S.Z.	DESIGNED BY D.A.	PLAN NO.	
DATE AUGUST 1995.	CHECKED BY		

5.4 Operational Plan and Costs

This yard relocation does not involve any substantial change in yard functions, but rather a relocation of those functions. Basically, railcars generally arrive from Truro and Halifax in the early morning hours, are classified using the six track Dartmouth Yard into local switching movements which operate to Autoport and Burnside to deliver newly arrived cars and from those locations to pull previously placed cars. After returning in the early evening with outbound cars, outbound trains are built for middle of the night departure. The National Gypsum trains operate independently of the yard except for locomotive and railcar maintenance and servicing. Other functions supporting maintenance of roadway and signals will also continue at the new site.

Costs will depend upon the exact location and configuration chosen for the facility. Preliminary estimates of construction costs, using a generic layout, suggest a range of from about \$10 to \$15 million with land costs of approximately \$500,000. A detailed cost breakdown will be conducted in Phase II. This estimate does not include any costs and benefits resulting from the creation of a major new development opportunity area in Downtown Dartmouth.

5.5 Cost/Benefit Analysis

Rail yard relocation from Downtown Dartmouth to the proposed North Burnside area has benefits to CN of reduced engine and car miles operated and improved yard efficiency. Corresponding public benefits include reduced air emissions as well as benefits flowing from reduced train-road conflicts at Downtown Dartmouth, the Autoport area and Shannon Park.

Engine and Car Miles

Engine and car miles decrease far more significantly than do total train miles. Changes in train movements are presented in Exhibit 5.5. Though the movement of Burnside switchers decreases slightly, a direct haul replaces the existing rail car backhaul movement. In addition, arriving road trains with multiple engines are yarded sooner, saving about 9,000 engine miles and 180,000 car miles annually. Using generic values of \$1 per engine mile and \$0.10 per car mile, approximate annual savings would be about \$27,000. We estimate that the significant crew time savings realized from trains which have crews paid by the hour are about equal in cost to the extra miles that must be operated by crews on the dual-pay basis (time and miles). In sum, no net crew cost savings are anticipated.

Yard Efficiency

Most yard operating savings in a new location accrue from having ready access by mechanical forces to every track, saving several switching moves each day as some cars are repaired in place without the time or delay incurred in moving to a "bad order" track. Other advantages accrue from not having to flag over or quickly clear any highway crossing, as at present in Downtown Dartmouth. A preliminary estimate would be savings equal to one train crew start a month, or about \$5,000 annually.

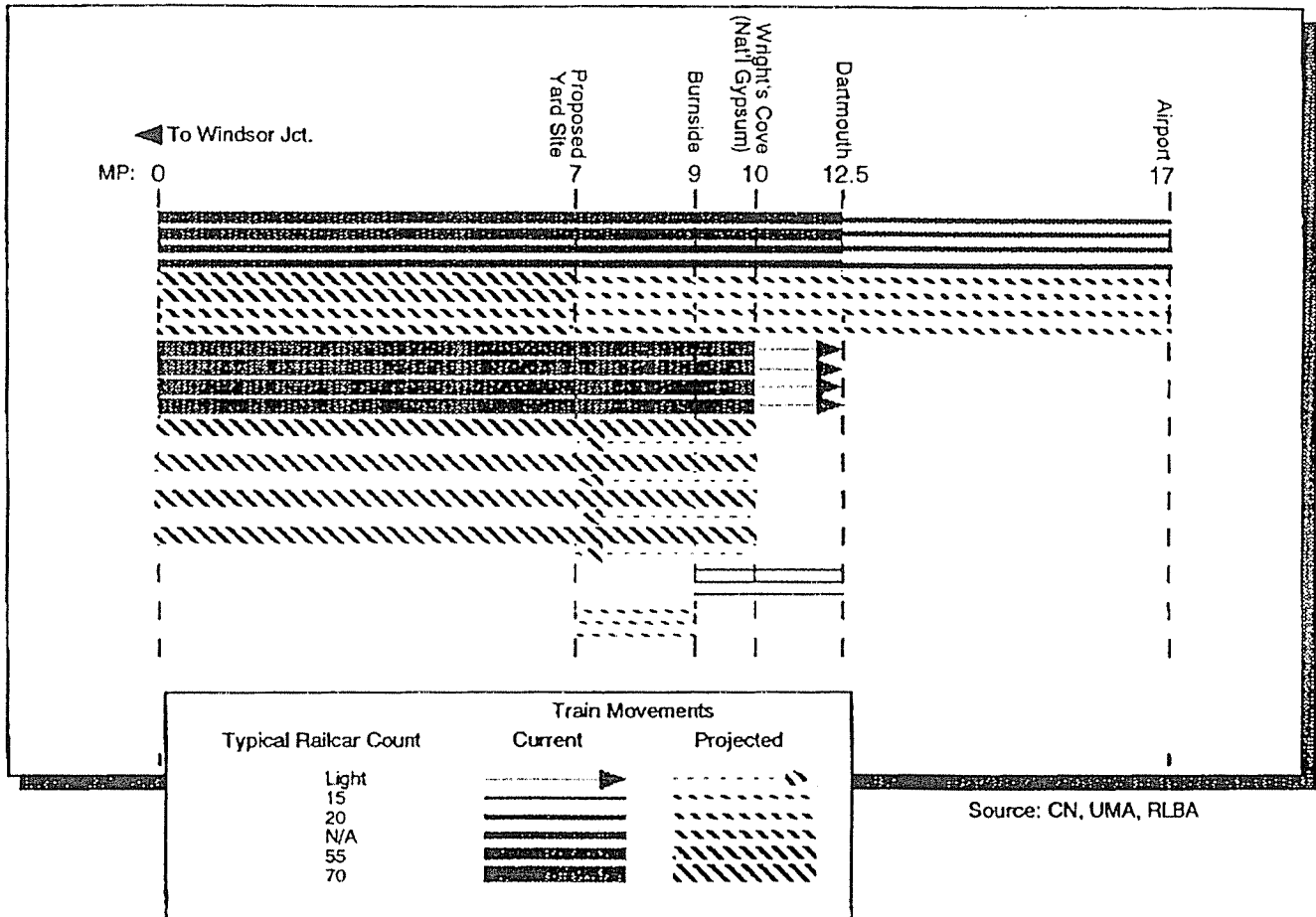
Train-Highway Conflict Reduction

Train movements across Iroquois Drive and Nootka Avenue would be reduced by about seven trains each day. In Downtown Dartmouth, switching moves across Ochterloney Street and Alderney Landing would be eliminated, with total train traffic reduced to four non-stopping trains each day.

Reduced Train Emissions

Reduced train and engine miles would decrease fuel consumption by about 5,000 gallons annually, a savings to the railroad of about \$7,000, with a corresponding reduction in air borne emissions.

Exhibit 5.5 Current and Projected Train Movements - Dartmouth Subdivision



5.6 Land Use Compatibility, Controls and Regulations

A necessary requirement of choosing a site for relocation is defining its compatibility with adjacent land uses and how it fits within local planning controls and regulations. Land use planning and zoning are the principal tools that municipalities in Nova Scotia use to direct the orderly development of the land within their jurisdictions. They attempt to ensure that the "highest and best" use of the land will occur and that land values are not compromised by new developments. Generalized future land use plans and land use bylaws are reviewed on a regular basis in accordance with *The Planning Act*, and therefore offer the opportunity to be changed to meet the needs of land owners and the community at large.

Part of the site lies within the City of Dartmouth. Part lies within the Town of Bedford. The bulk of the site lies within Planning District 17 of Halifax County Municipality. Each of these municipalities has its own plans and bylaws that govern the types of uses that may occur on the site. As the new Halifax Regional Municipality becomes operational in April 1996, we anticipate that the current Municipal Planning Strategies (MPS) and Land Use By Laws will remain in force until a regional plan or strategy is prepared and adopted. This process may take several years or longer.

This section reviews the applicable planning and land use bylaws, and analyzes them in terms of the possible relocation.

City of Dartmouth

In Dartmouth, the 1978 Municipal Development Plan (an older term for a Municipal Planning Strategy), and its subsequent amendments, states planning policy for the City. In the plan, the North Dartmouth Industrial Complex (Burnside and the City of Lakes Business Park) extends north to the City boundary formed by the main line and west across the Burnside Expressway (Burnside Drive). The plan shows future expansion across the main line into the Town of Bedford.

The current yard is in an I-1 Light Industrial zone. This zoning allows "industrial uses" which would include rail yards. Reference to "all storage, freightage, or trucking yards" states that they "shall be enclosed or completely screened by buildings, trees, landscaped features, or fences, or a combination thereof."

The Burnside Industrial Park and much of the adjacent undeveloped land are zoned I-2 General Industrial. Other undeveloped land in North Dartmouth is zoned H for Holding. This area, outside of the preferred relocation area's direct influence, was the subject of a detailed planning study carried out for the City in 1993.

The Burnside I-2 zone permits "industrial enterprises". It does not refer to freighting storage or any other "yards" per se. Since rail services are already provided in Burnside, and since

CN already maintains a small yard at Mile 8.41 in Burnside, UMA suggests that the establishment of a marshalling yard at the preferred site is consistent with the City's Municipal Development Plan.

Town of Bedford

Bedford's *Municipal Planning Strategy and Zoning By-Law* date from 1991. The generalized future land use map contained in the MPS labels the relocation area Residential Reserve (RR). This land is zoned with the same RR designation. Single family dwellings are the main land use permitted. They must occupy lots no smaller than five acres. This zoning creates in effect a holding zone.

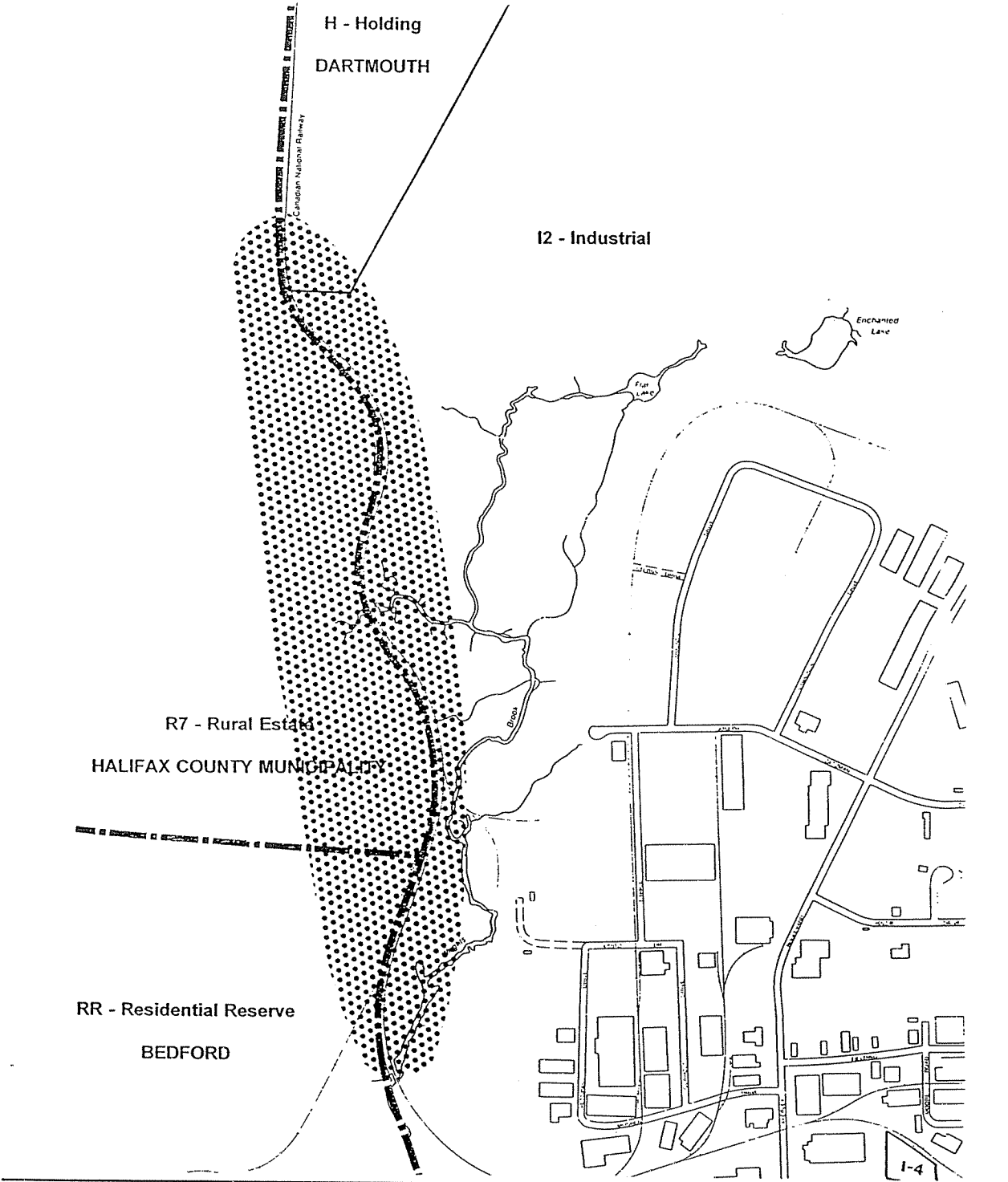
The relocation area touches one corner of this zone. UMA recommends that the proponents apply for a plan amendment and rezoning to allow the use of this land for light industrial purposes associated with the marshalling yard. The zone should be of sufficient size to allow a buffer between the yard and long term potential residential use. Our discussions with Town of Bedford officials suggests that a rail yard may be an acceptable use and the process of MPS and Land Use ByLaw amendments may take more than six months.

Halifax County Municipality

Halifax County Municipality is very large and different districts of the County are developing at widely varying rates. Partly for this reason, the County has chosen to undertake planning exercises at the planning district level, rather than attempt to apply planning policy on a County-wide level. The majority of the relocation area lies within Planning District 17. This district extends from the Bedford/Dartmouth boundaries to include the Waverley-Fall River area. The *Municipal Planning Strategy and Zoning By-Law* for District 17 were adopted in 1989. The subject area lies in an R-7 Rural Estate zone. Similar to Bedford's Residential Reserve, this zoning is in effect a holding zone, since no current development pressures exist in the area and it is essentially land locked. The extension of Highway 107 to Sackville will pass through this area northeast of Anderson Lake.

UMA recommends that the proponents apply to Halifax County Municipality for a plan amendment and rezoning to allow the use of this land for light industrial purposes associated with the marshalling yard. Similar to the Bedford case, the zone should be made sufficiently large to allow a buffer between the yard and long term potential residential use.

Exhibit 5.7 Municipal Zoning in Vicinity of North Burnside Site



5.6 Other Issues and Opportunities

Affected Land Parcels and Assessment

The relocation area would affect a total of five properties as listed below. In addition, it appears that the new track alignment may affect the placement of an overpass on the Highway 107 extension, currently being constructed between Burnside and Sackville by the Nova Scotia Department of Transportation and Communications. This issue will be addressed in Phase II.

Parcel ID Number	Owner	Municipality	Municipal Assessment
40114084	Department of National Defense (DND)	Town of Bedford	\$18,471,000 (411 acres)
258541	Jesuit Fathers of Upper Canada Holding Corp.	Halifax County Municipality	\$102,000
258541*	Nova Scotia Power Inc.	City of Dartmouth	\$18,000
258558	City of Dartmouth	City of Dartmouth	\$3,620,000 (1328 acres)
267864	Municipal Spraying and Contracting	City of Dartmouth	\$38,400 (90 acres)

* PID Number has not been revised by LIMS following June 1995 sale of parcel to NSP Inc.

Discussion

The **Department of National Defence property** is part of CFAD Bedford (Bedford Magazine). This is an undeveloped portion of the Magazine which helps establish a spatial buffer from the ammunition stores. Federal lands are assessed by municipalities and the government pays a grant in lieu of taxes to the municipality based on this assessment. Like any land owner, the government will sometimes ask for a reassessment or negotiate a grant fee based on its own assessment.

Acquisition of Federal lands is only possible if the lands are deemed to be in excess of government needs. In the case of the land in question, the proponent must initiate a request to the Department of National Defense (DND) to purchase the land. The holdings will be evaluated by the DND Property Management Division and if it is deemed in excess (i.e., not required by the Department), a "Notice of Excess" will be sent to the Department of Public Works and Government Services. That department will follow through with legal aspects of the sale. It is usual practice to sell excess government holdings at fair market value through an open bidding process. However, the government may undertake direct negotiations in the case of a specific request such as this.

The **Jesuit Fathers of Upper Canada Holding Corp. lands** are extensive. They take in almost all of the area around Anderson Lake. The Jesuit Fathers recently sold a part of this parcel to Nova Scotia Power Inc. This sale allows the power utility to extend a new transmission line westward from the gas turbine power generation station at Burnside. It is not known whether the owners are in a position to sell additional lands at this time.

A small portion of the new **NSP Inc. holdings** may be required for the track extension. In addition, a right-of-way will be needed for road access to the Servocentre. As a for-profit company, NSP Inc. can be expected to require fair market compensation for any land or easements.

A small part of the relocation area is located on **City of Dartmouth property**.

The firm of **Municipal Spraying and Contracting** owns the parcel at the extreme eastern end of the relocation area. As a private owner, this firm can be expected to require fair market compensation.

Highway 107 Extension

The approved alignment of the new divided highway brings it within the relocation area necessary to fit the yard lead and realignment of the main line. The impact of this will not be known until more detailed work is conducted in Phase II. We anticipate that this refinement will show the need to site a new grade separated crossing slightly south of the current general location. The extension of Highway 107 through the North Burnside area is planned as a five stage project. Stage Two is currently under way and scheduled for completion in 1996 or 1997. Stages Three and Four should be complete in 1999 and 2003 according to the proposed schedule of the Nova Scotia Department of Transportation and Communications.

The design process for highways typically occurs somewhat earlier. Therefore, it is imperative that the planning for the highway extension and rail relocation projects come together to avoid major conflicts at such time as the relocation may proceed.

VI Conclusions

Based on the analysis conducted in Phase I, we conclude that the North Burnside area is the only viable location for the relocation of the Dartmouth Yard. This area contains the necessary features to meet the operational requirements of CN with minimal land use conflicts with adjacent land users. However, the planned Highway 107 Extension and imminent power line development by Nova Scotia Power Inc. create some urgency to proceed to more detailed planning, land negotiations and land use policy and control amendments.

It is our conclusion that the concrete refinement of the relocation site in Phase II will represent a prudent and forward looking initiative by the City of Dartmouth. The designation of lands in the North Burnside area for the future relocation of the Dartmouth Yard will offer the opportunity to achieve a range of positive benefits including:

- A major development opportunity parcel will become available on the Downtown Dartmouth waterfront.
- The negative impacts of the yard on adjacent land uses will no longer exist.
- There will also be operational cost savings to CN.

Beyond these benefits, the relocation of the yard from a confined downtown location to a "greenfield" site offers the flexibility to accommodate changes in unforeseen future demand. This flexibility, and the proximity of the relocation area to the Burnside Industrial Park area, creates the opportunity for rapid response in the future.