

**REPORT ON SLOPE RESTORATION ALTERNATIVES
FORMER WOODS WOOLEN MILL
HILLSBOROUGH, NEW HAMPSHIRE**

by

**Haley & Aldrich, Inc.
Manchester, New Hampshire**

for

**Town of Hillsborough
Hillsborough, New Hampshire**

**File No. 28933-000
March 2004**



9 March 2004
File No. 28933-000

Haley & Aldrich, Inc.
340 Granite Street, 3rd Floor
Manchester, NH 03102-4004
Tel: 603.625.5353
Fax: 603.624.8307
www.HaleyAldrich.com

Town of Hillsborough
29 School Street P.O. Box 7
Hillsborough, New Hampshire 03244

Attention: Matthew Taylor

Subject: Former Woods Woolen Mill
25 West Mill Street
Hillsborough, New Hampshire

Ladies and Gentlemen,

The purpose of this letter is to provide the Town of Hillsborough (Town) with a summary of the slope restoration alternatives evaluation for the former Woods Woolen Mill located along the Contoocook River in Hillsborough, New Hampshire. Services provided for this project include a regulatory file review, preparation of a site plan, wetlands delineation, conceptual slope restoration alternative evaluation, and identification of necessary permits. Alternative design concepts were discussed with you in a meeting conducted at the Hillsborough town offices on 17 January 2003. This work was performed in accordance with our agreement with the Town of Hillsborough (Haley & Aldrich, Inc. Proposal No. 28933-970).

PROJECT DESCRIPTION

Although this property is currently owned by others, we understand that the Town is potentially interested in removing the debris from the site and restoring the river bank. Specifically, we understand that the Town's short term goals are to:

- Remove the existing building demolition debris from the site,
- Remove the building foundation from the riverbed, and
- Restore the river bank to a stable condition.

For this project Haley & Aldrich, Inc. (Haley & Aldrich) performed the following tasks:

- Visited the site to review current conditions,
- Retained a licensed land surveyor to prepare a site plan and wetlands delineation,
- Reviewed available records at the New Hampshire Department of Environmental Services (NHDES) Waste Management Division relative to the presence of petroleum and hazardous materials at the site,

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- Prepared conceptual site restoration alternatives, and
- Summarized permits that may be required to perform the work.

This report provides slope restoration alternatives. In addition, this report identifies areas of potential environmental concern (as a result of historic site use based on available records), potential permits that may be required to complete the bank restoration, and provide relative construction cost estimates (engineer's estimate of probable construction costs) for each restoration alternative.

SITE DESCRIPTION

The former Woods Woolen Mill (site) is located at 25 West Mill Street in Hillsborough, New Hampshire, immediately adjacent to the Contoocook River (Figure 1). The site is listed as Lots 28 and 29 on Map 25 at the Hillsborough Assessors Office and encompasses approximately 2 acres. The ground surface at the site generally slopes downward from West Mill Street to the east toward the Contoocook River to the west. Properties adjacent to the site are developed with a mixed use of residential and commercial buildings.

The site contains a railroad right of way (ROW) that varies in width from approximately 26 to 32 feet. Currently there are no railroad tracks on the right of way. Historically, a large mill building was located along the river, however the majority of this building was demolished in 2001. The northern-most portion of this building (the boiler building) remains intact, but is in poor condition.

The rock and concrete foundation for the demolished portion of the building remains at the site and is approximately 250-feet long by 40-feet wide, and appears to have been constructed within the original limits of the Contoocook River. A significant amount of building demolition debris consisting primarily of wood, concrete and steel remains within the building foundation. In addition, staining was observed on portions of the exposed concrete slabs within the building foundation, indicating possible areas of petroleum releases. During our site visit, only limited sections of the floor of the basement could be observed do to the presence of the debris however, where observed, the floor was dirt. A large concrete pad is located along the entire eastern side of the building foundation. A residential structure (building 5 on Figure 2) is located on the southeastern portion of the property line. Figure 2 is a topographic plan of the site.

SITE SURVEY

A site survey was performed on 19 and 20 September 2002 by Meridian Land Services Inc. The survey included identification of physical site features, approximate property and right of

way (ROW) boundaries, ground surface and river bottom elevation contours, and a wetlands delineation. A copy of the completed site plan is contained in Appendix A.

REGULATORY FILE REVIEW

Haley & Aldrich reviewed available records for the site related to the release of petroleum products or other hazardous materials at the NHDES in October 2002. The NHDES site file number is 199909015. The results of our file review are summarized below.

Summary of Petroleum and Hazardous Materials

A 12,000-gallon single-wall No. 6 fuel oil underground storage tank (UST) was removed from the site adjacent to the southern side of the boiler house building on 22 and 26 December 2000 by Franklin Environmental, Inc. A 1/4-inch hole was noted in the bottom of the UST, and an area of stained soil was observed beneath the UST. Elevated concentrations of volatile organic chemicals (VOCs) were not detected during photoionization detector (PID) headspace screening of soil samples collected from the excavation. A composite soil sample was collected from beneath the former UST and analyzed for VOCs (EPA Methods 8260B), polycyclic aromatic hydrocarbons (PAH; EPA method 8270), and total petroleum hydrocarbons (TPH; EPA Method 8015-DRO). No VOCs or PAHs were detected above laboratory quantification limits. TPH was detected in the sample at a concentration of 3,300 mg/kg (fuel oil). This concentration is below the New Hampshire Risk Characterization and Management Policy (RCMP) NH S-1 Soil standard of 10,000 mg/kg. The UST closure report indicated that the site also contained a No. 2 heating oil UST that was closed in September 1998; however no additional information regarding the No. 2 oil UST was available during our review of the records.

The US Environmental Protection Agency (EPA) performed a drum inventory in the mill building on 14 September 2000. This inventory identified 53 drums/containers within the mill building. Fifteen drums identified as containing hazardous substances, pollutants or contaminants were removed from the site under the guidance of the EPA by Clean Harbors, Inc. on 11 December 2000. Eleven drums were determined to contain water or were empty, and were allowed to remain in the building. The remaining 27 drums contained oil or oil and water and were disposed of by the NHDES.

An internal NHDES correspondence from Ralph Wickson dated 8 February 2001 indicates that no further action is necessary relative to the former UST. Based on documents reviewed at the NHDES for this site, it appears that no further actions were anticipated by the EPA.

Summary of Asbestos and Lead Based Paint

The NHDES files indicate that the Scott Lawson Group, Ltd. prepared a report titled "Asbestos and Lead Survey at the Former Beck Woolen Mill" dated 14 October 1999. Although a copy of this report was not available at the time of our file review, a 10 May 2000 letter from the NHDES to Joseph Griffiths (site property owner) indicated the following relative to asbestos containing materials (ACM) and lead-based paint (LBP):

- Testing of red painted clapboards detected lead concentrations of 115 milligrams/liter (mg/l) which exceeded the hazardous waste criteria of 5 mg/l, indicating that this material is a hazardous waste. No information was available on the final disposal location of the red painted clapboards.
- The roof shingles from the main mill building and cement from the roof overhang were determined to be an ACM. The NHDES concluded that all roofing material in the debris pile should be considered ACM and should be handled and disposed of accordingly. No information was available on the final disposal location of the shingles.

During October 2000, an EPA subcontractor performed asbestos abatement work in the boiler room. Two roll-off containers of ACM were removed from the site and disposed of at the Town Landfill in Hillsborough, New Hampshire.

ALTERNATIVES SLOPE RESTORATION CONCEPTS

Haley & Aldrich, Inc. evaluated alternatives for slope restoration consistent with the Town's plans for removing the building foundation and restoring the river bank. Three slope restoration concepts are presented within this report. We anticipate that under each concept the bank would be stabilized against erosion with a combination of vegetation, woody plants, and/or geosynthetics and that the use of hard restoration materials (e.g; riprap) would be minimized. Under each alternative, solid waste should be excavated, separated by waste type, characterized as necessary and disposed of off-site. Based on our observations, we anticipate that wood, steel, concrete and potentially impacted soil would require off-site disposal. To the extent practical, these wastes should be recycled. After the debris/solid waste is removed from within the building foundation, the soil should be observed for potential staining and if necessary sampling be performed to determine the nature and extent of impacts. We anticipate that some of the granite foundation blocks will be suitable for use as of rip rap that may be necessary for the slope restoration.

Each concept varies with regard to bank slope, amount of riverbed restored, and anticipated use. Consequently, the construction cost of each concept varies slightly due to the adjusted volume of excavated material and anticipated off-site fill and topsoil required. A plan view of each concept is provided in Figures 3 through 5. A description of each of the three concepts, potential benefits and an engineer's estimate of probable construction cost are provided below.

The cost estimate for each alternative assumes the following:

- Approximately 3 feet of wood debris is present within the building foundation and will be disposed off-site as a solid waste.
- A contingency of \$50,000 has been included for the off-site disposal of contaminated soil, wood/soil mixtures and hazardous materials.
- Approximately 350 cubic yards of concrete will be recycled off-site.

The cost estimate for each concept also includes costs for additional excavation, off-site borrow, and site restoration as necessary to achieve the final grades.

Concept A:

Embankment grading will begin near the railroad Right of Way (ROW) and extend downward toward the river at a slope 2.5 horizontal to 1 vertical. A plan view of concept A is shown on Figure 3. The toe of slope will be located approximately 17 feet closer to the shore than the existing building foundation, resulting in the restoration of a portion of what appears to be the original riverbed. Existing bridge abutments located on the southern portion of the site will remain intact. All building foundation and miscellaneous debris will be excavated and removed from the site. Access to the river would be difficult due to the steepness of the slope. The concept may not support recreational use. The anticipated cost of restoration is approximately \$285,000. Benefits of this alternative include:

- Eliminate physical hazards of building foundation
- Expand river width by approximately 17-feet
- Preserve historical and aesthetic value of existing bridge abutments

Concept B:

The toe of the slope for concept B is located approximately 25 feet closer to the shore than the existing building foundation, resulting in the restoration of a portion of what appears to be the original river bed. A plan view of this concept is shown in Figure 4. The proposed slope would be moderately steep at 2 horizontal to 1 vertical. Bridge abutments at the southern portion of the site would be removed. The building foundation and miscellaneous debris will be excavated and removed from the site. Due to the relatively steep slope, the concept may not

promote recreational access to the river. The anticipated cost of restoration is approximately \$295,000. Benefits of the alternative would include:

- Eliminate physical hazards.
- Expand river width by approximately 25-feet
- Remove hazard associated with existing bridge abutments

Concept C:

Concept C consists of a multi-sloped bank that incorporates a nearly flat landing near the water's edge. A plan view of this concept is shown in Figure 5. The top of slope will be located near the edge of the railroad ROW and slope downward at 2.5 horizontal to 1 vertical for approximately 40 feet (to an elevation approximately 5 feet above the normal river level) where a relatively flat (8 horizontal to 1 vertical) landing would be located. The flat landing would be approximately 19 feet wide and lead to the final slope (at 2.5 horizontal to 1 vertical) to the edge of the water. Bridge abutments located on the southern portion of the site will remain intact. The construction of the flat landing area would lend the site to recreational use such as fishing or picnicking. The anticipated cost of restoration for this concept is approximately \$285,000. Benefits of the alternative would include:

- Eliminate physical hazards.
- Create recreational use area
- Preserve historical and aesthetic value of existing bridge abutments

The concepts outlined above have been prepared for our evaluation of slope restoration alternatives only. The information contained within this report is not sufficient for construction, and detailed design work will be required.

PRELIMINARY PERMITTING REQUIREMENTS

To implement the slope restoration alternatives similar to those outlined above, a wetlands dredge and fill permit will be required by the NHDES. Since the project will impact over 200 lineal feet of river frontage, we anticipate that the project would be considered a major impact. In addition, the work should be performed in accordance with the minimum requirements of the Shoreline Protection Act. The permitting effort required for the three options outlined in this report will be similar.

RECOMMENDATIONS

Based on the information contained within this report, Haley & Aldrich provides the following recommendations:

- After a slope restoration concept has been selected, detailed design work should be performed. This work would include site plans, cross-sections, slope stabilization details, and product specifications.
- A wetlands permit from the NHDES will be required to perform the construction work. Information contained in the site plan and detailed design will to
- During construction work, an environmental professional should be on-site to observe the debris removed and to segregate materials for disposal and waste characterization.
- After the debris within the foundation has been removed, the exposed floor of the building basement should be observed for evidence of a release of hazardous materials or petroleum. If necessary sampling should be performed to determine the nature and extent of potential impacts observed.

LIMITATIONS

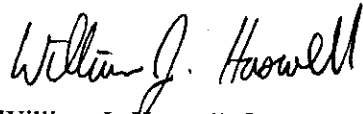
This report has been prepared for the use of the Town of Hillsborough. The conclusions provided by Haley & Aldrich, Inc. are based solely on the sources of information referenced in our report. Any additional information that becomes available concerning this site should be provided to Haley & Aldrich, Inc. so that our conclusions may be reviewed and modified, as necessary.

The work performed by Haley & Aldrich, Inc. is subject to the terms and conditions stated in our proposal dated 17 May 2002. This work has been undertaken in accordance with generally accepted consulting practices. No other warranty, express or implied, is made.


Our report is prepared for your exclusive use, solely for the purpose of rendering an opinion concerning the bank restoration of site mentioned above. The report may not be circulated or conveyed, in whole or part, to any other party, nor used by any other party without the prior written permission of Haley & Aldrich, Inc.

We appreciate the opportunity to provide engineering services on this project. Please do not hesitate to call either of the undersigned if you have any questions or comments.

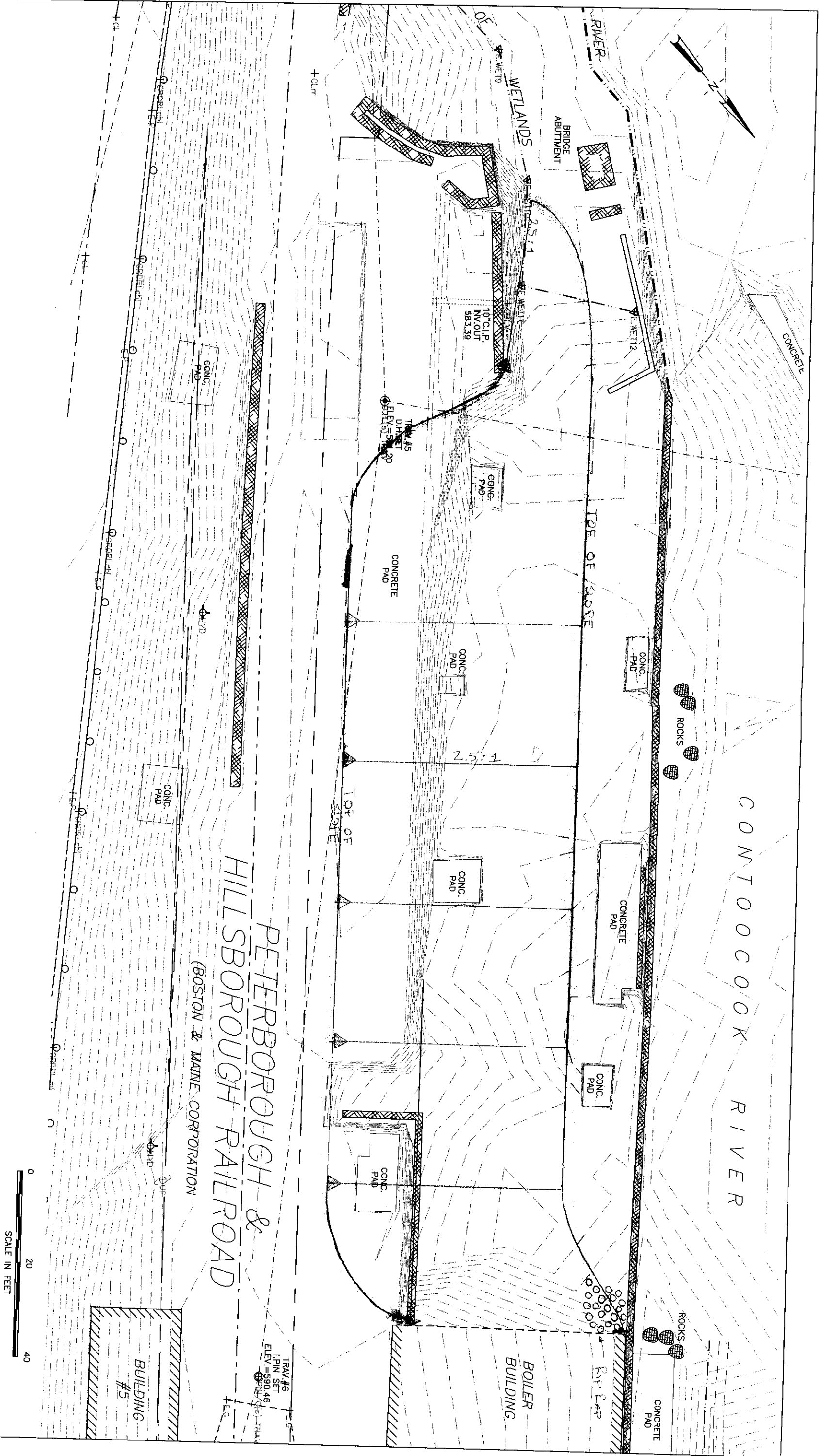
Sincerely yours,
HALEY & ALDRICH, INC.



William J. Maswell, P.E.
Project Manager



Robert A. Mullin, P.E.
Vice President



PETERBOROUGH &
HILLSBOROUGH RAILROAD
(BOSTON & MAINE CORPORATION)

(BOSTON & MAINE CORPORATION

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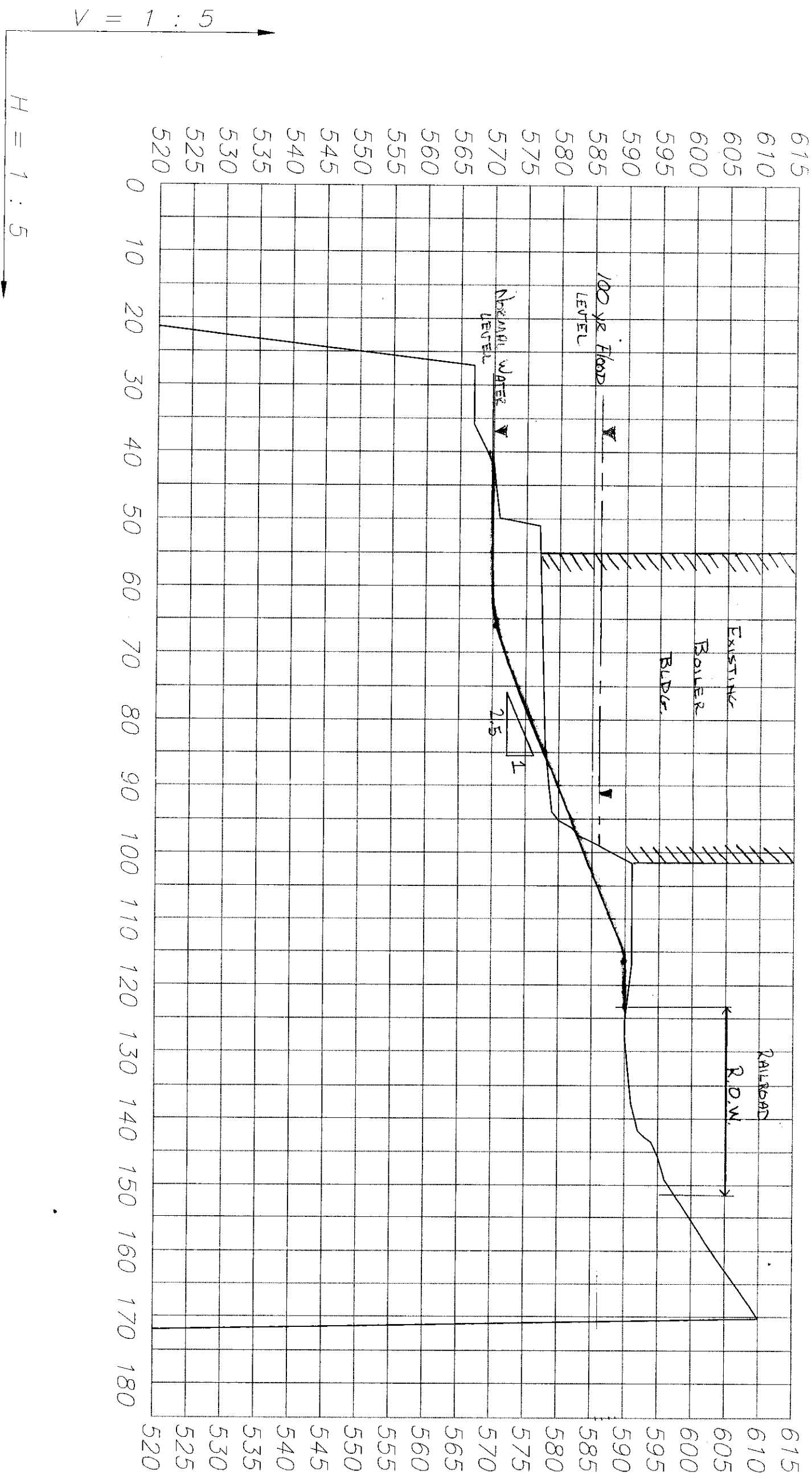
FORMER WOODS WOOLEN MILL,
MILL STREET
HILLSBOROUGH, NEW HAMPSHIRE

BANK RESTORATION
CONCEPT A

**UNDERGROUND
ENGINEERING &
ENVIRONMENTAL
SOLUTIONS**

SCALE: AS SHOWN

DECEMBER 2002



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PROJECT CITY, STATE

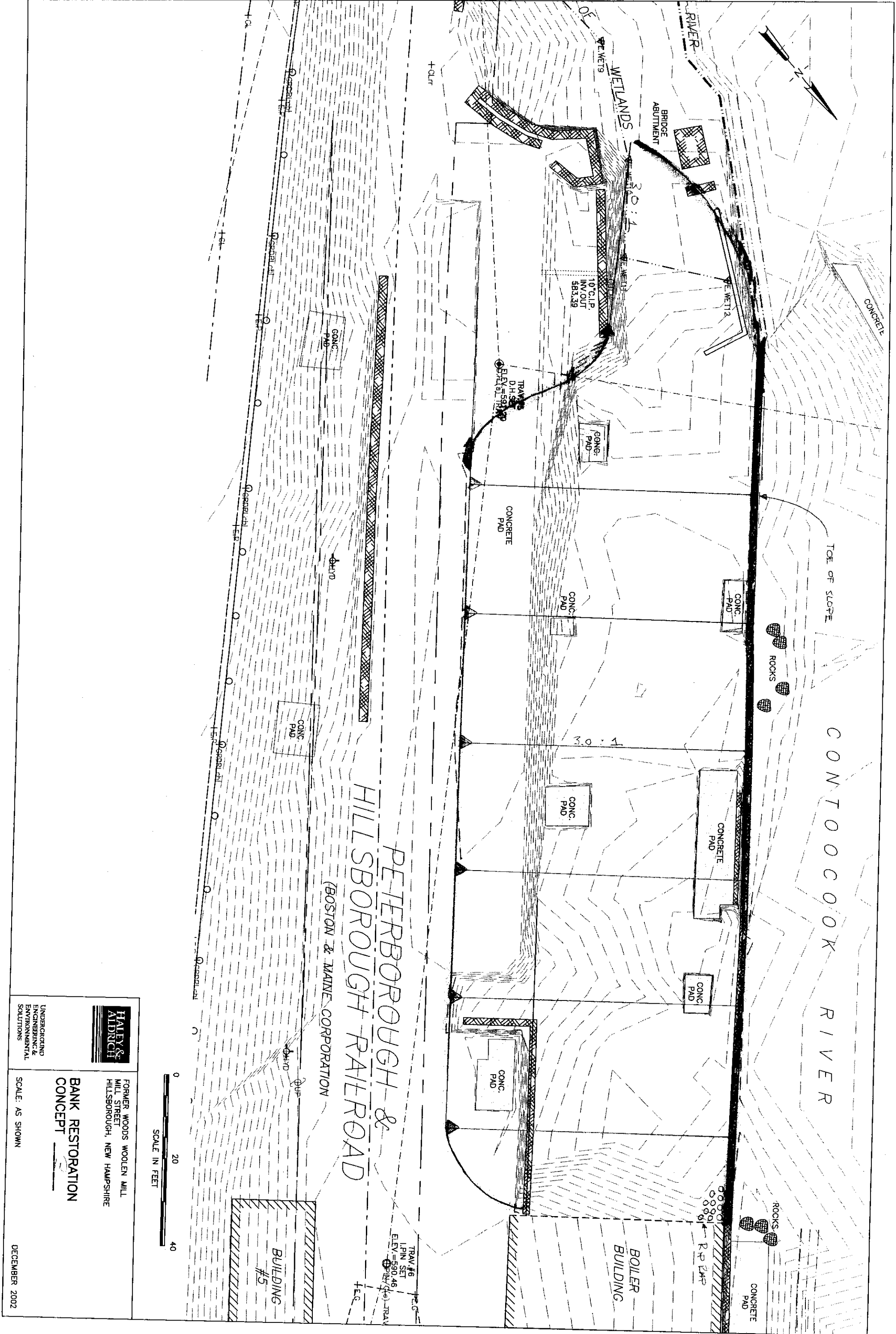
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UNDERGROUND
ENGINEERING &
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SOLUTIONS

SCALE: AS SHOWN

JULY 2000

FIGURE 2



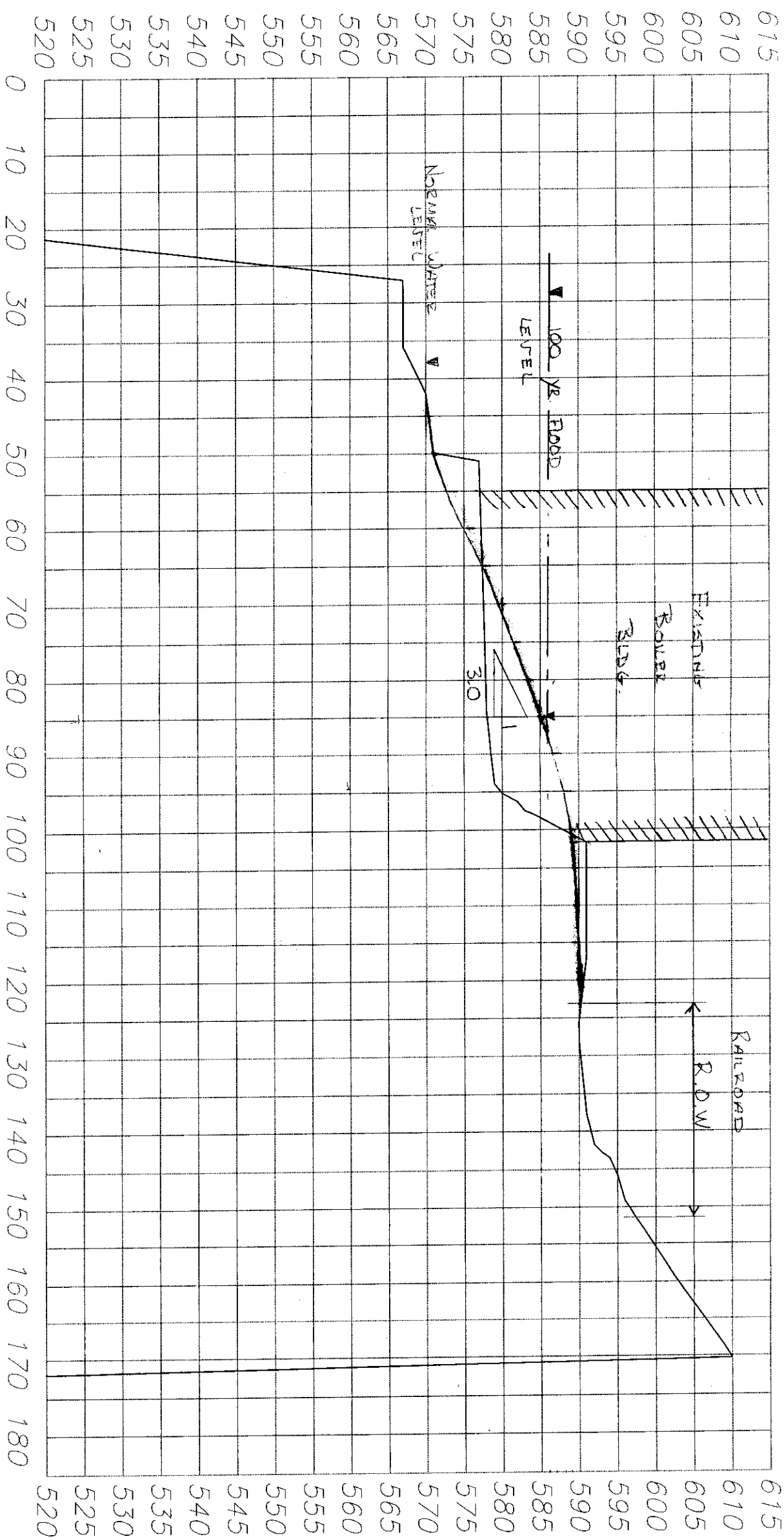
UNDERGROUND
ENGINEERING &
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SOLUTIONS

FORMER WOODS WOOLEN MILL
MILL STREET
HILLSBOROUGH, NEW HAMPSHIRE

BANK RESTORATION
CONCEPT

SCALE: AS SHOWN

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V = 1 : 5

H = 1 : 5

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SCALE: AS SHOWN

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FIGURE 2

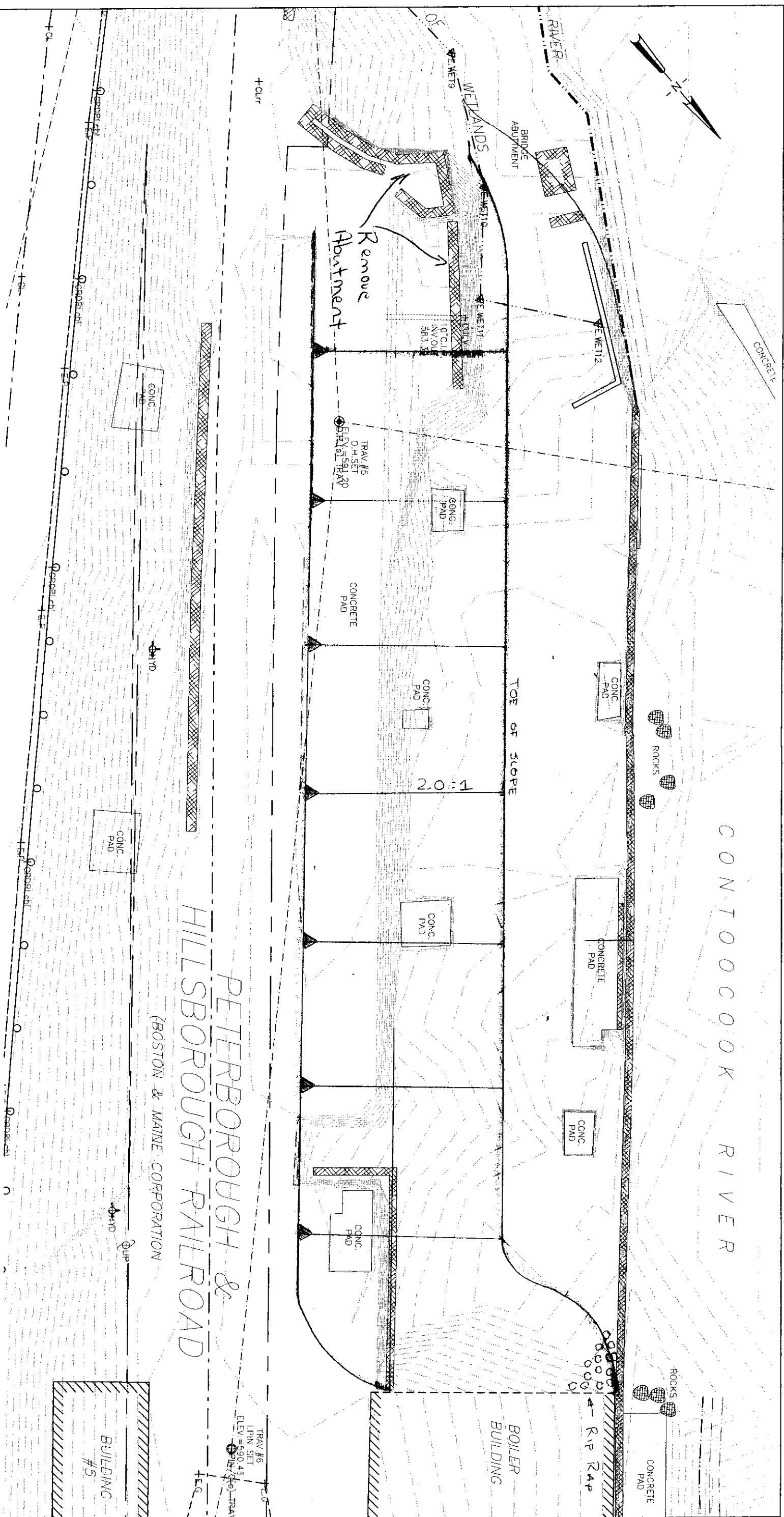
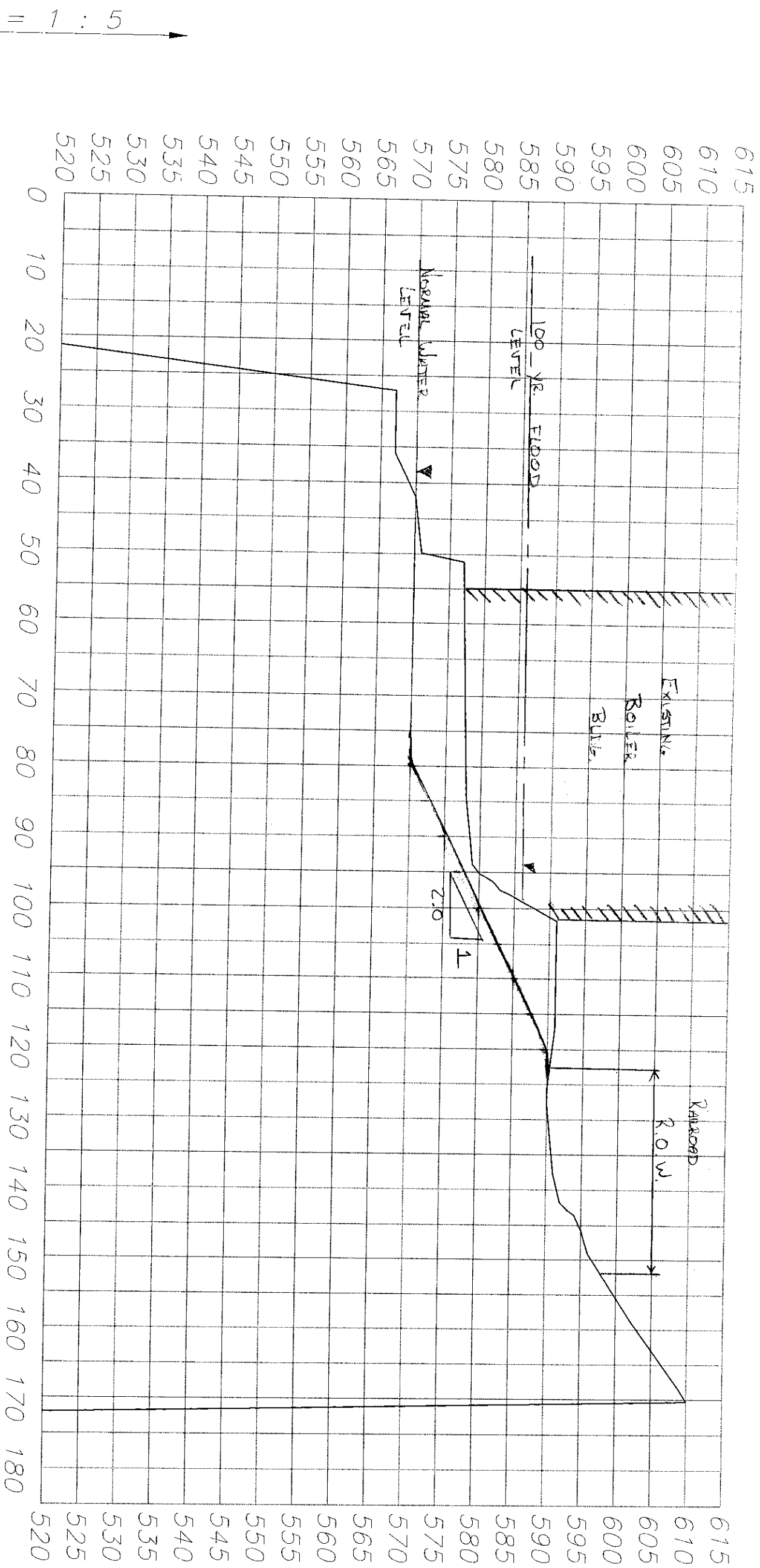


FIGURE 1



$V = 1 : 5$
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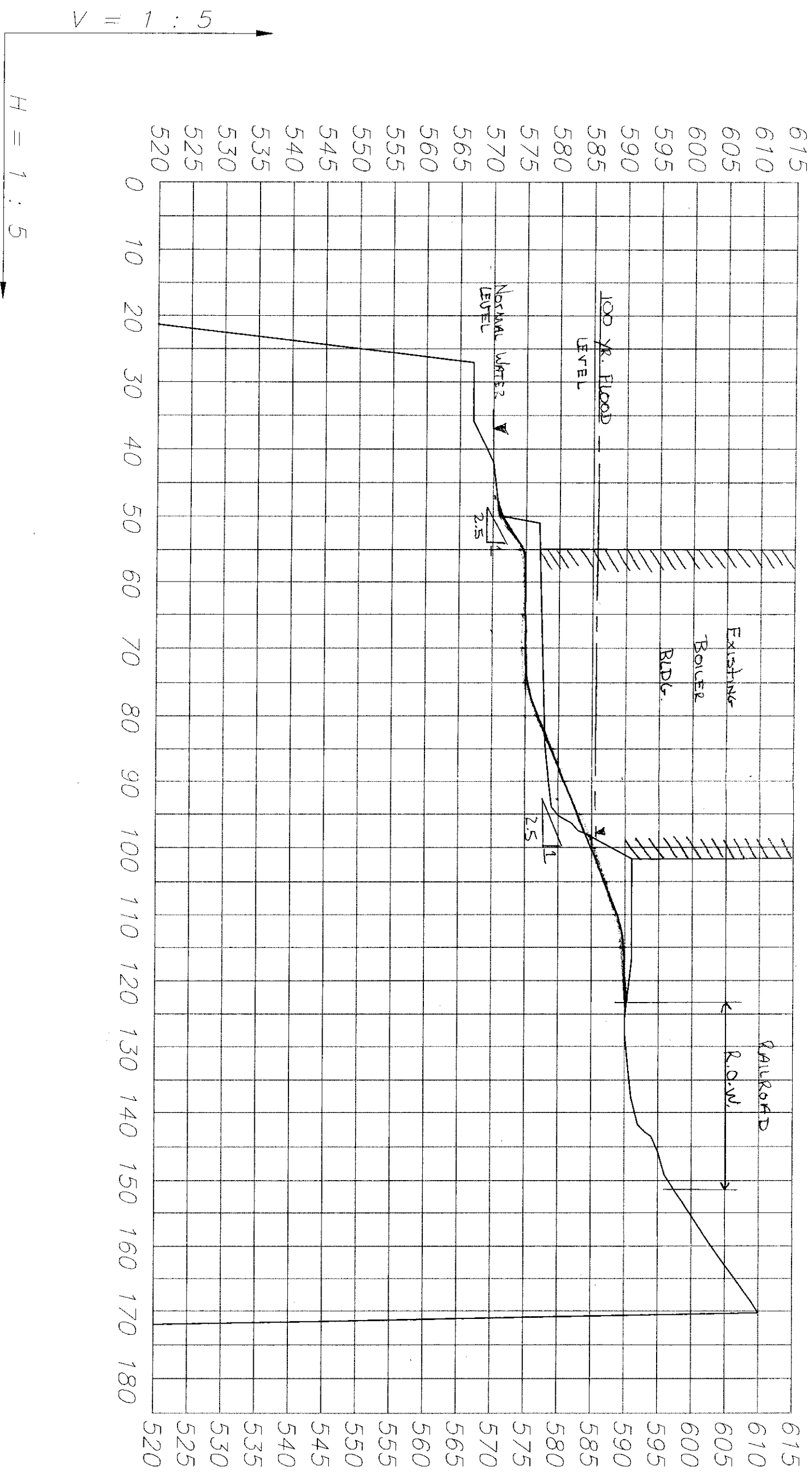
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FIGURE 2



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FIGURE 2