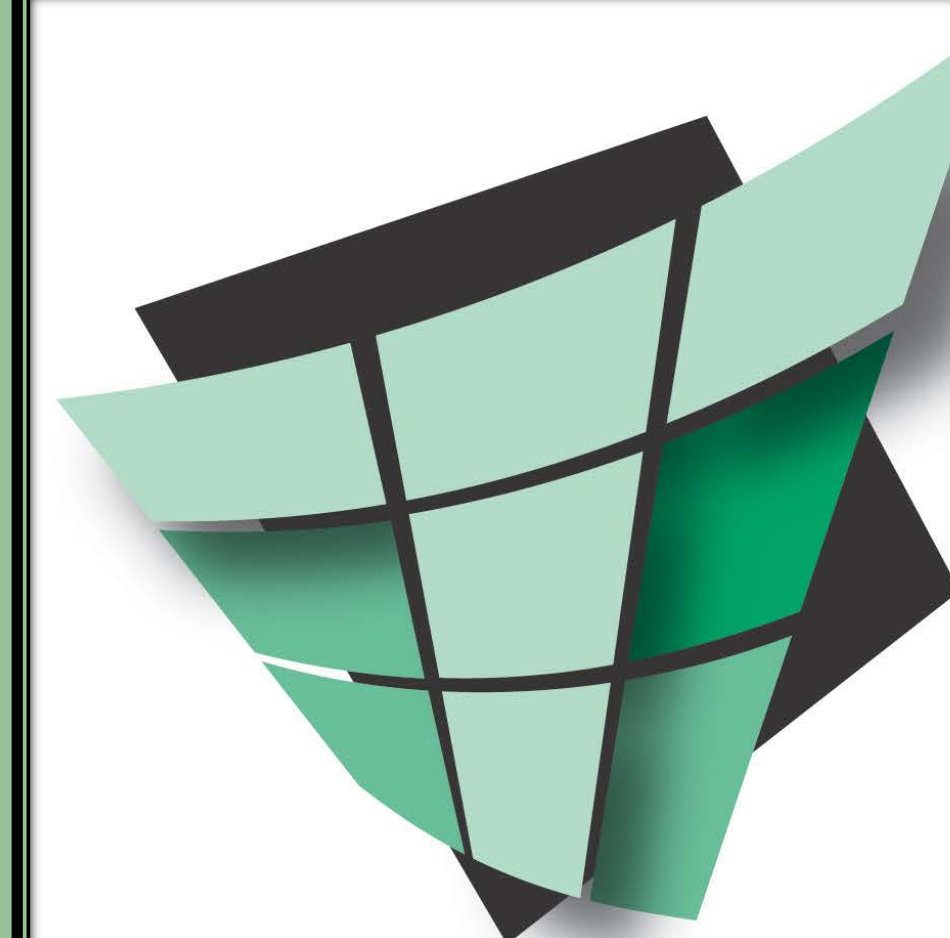


# TOWNSHIP OF RAMARA

## LAGOON CITY PARKS AND WATERWAYS COMMISSION

### PHASE 1 SHOREWALL INSPECTION PROGRAM

November 10, 2016



**C.C. Tatham & Associates Ltd.**  
Consulting Engineers

Collingwood

Bracebridge

Orillia

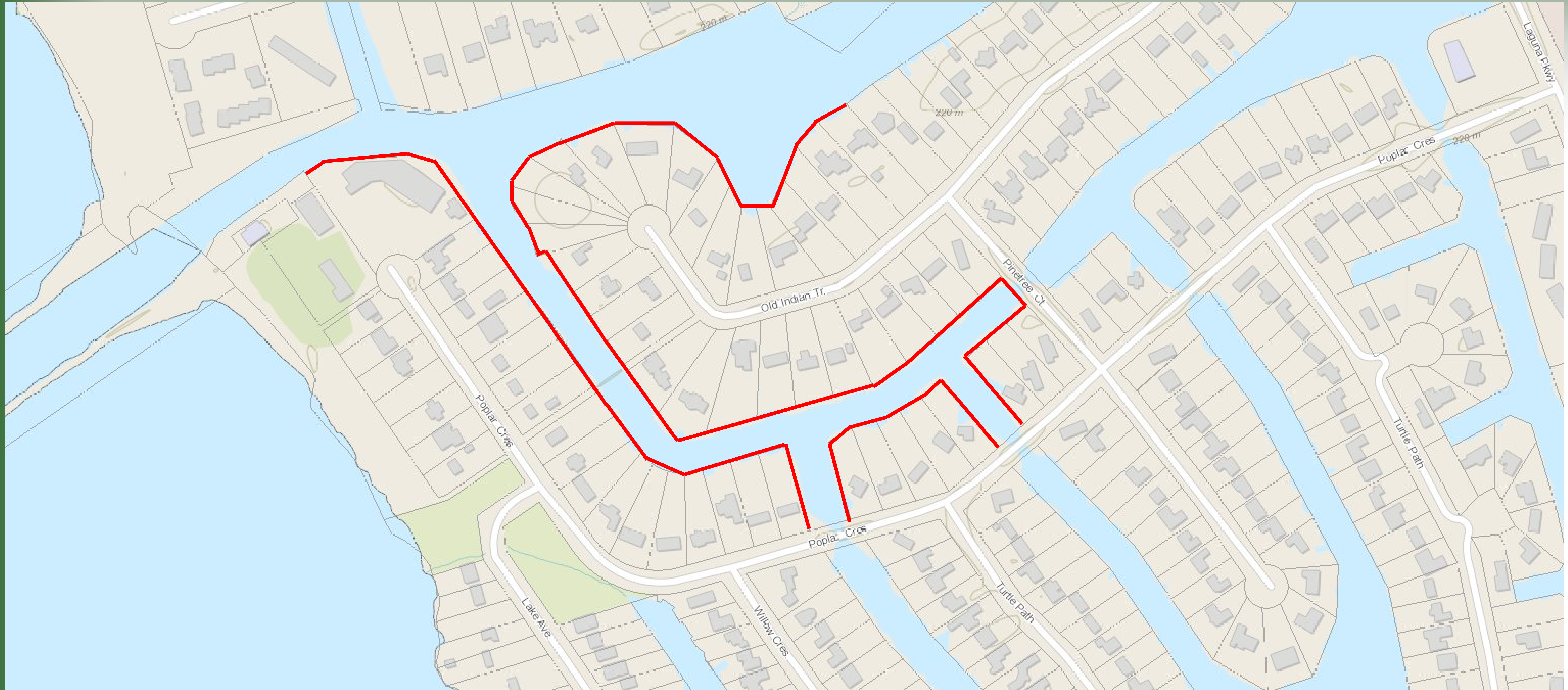
Barrie

Ottawa

## Introduction

- ❖ C.C. Tatham & Associates (CCTA) has been retained by the Lagoon City Parks and Waterways Commission to complete Phase 1 of a multi-year shorewall inspection program.
- ❖ Properties reviewed:
  - ❖ Odd numbers 1 to 23 – Old Indian Trail;
  - ❖ Even Numbers 2 to 30 – Old Indian Trail;
  - ❖ Odd Numbers 1 to 51 – Poplar Crescent; and
  - ❖ Pinetree Court and Northern Foot Bridges.
- ❖ Limited to shorewalls and surrounding grade accessible from land/water.
  - ❖ Written notice issued to Owners regarding the removal of obstructions.
- ❖ Review current By-laws and suggest improvements, if recommended.











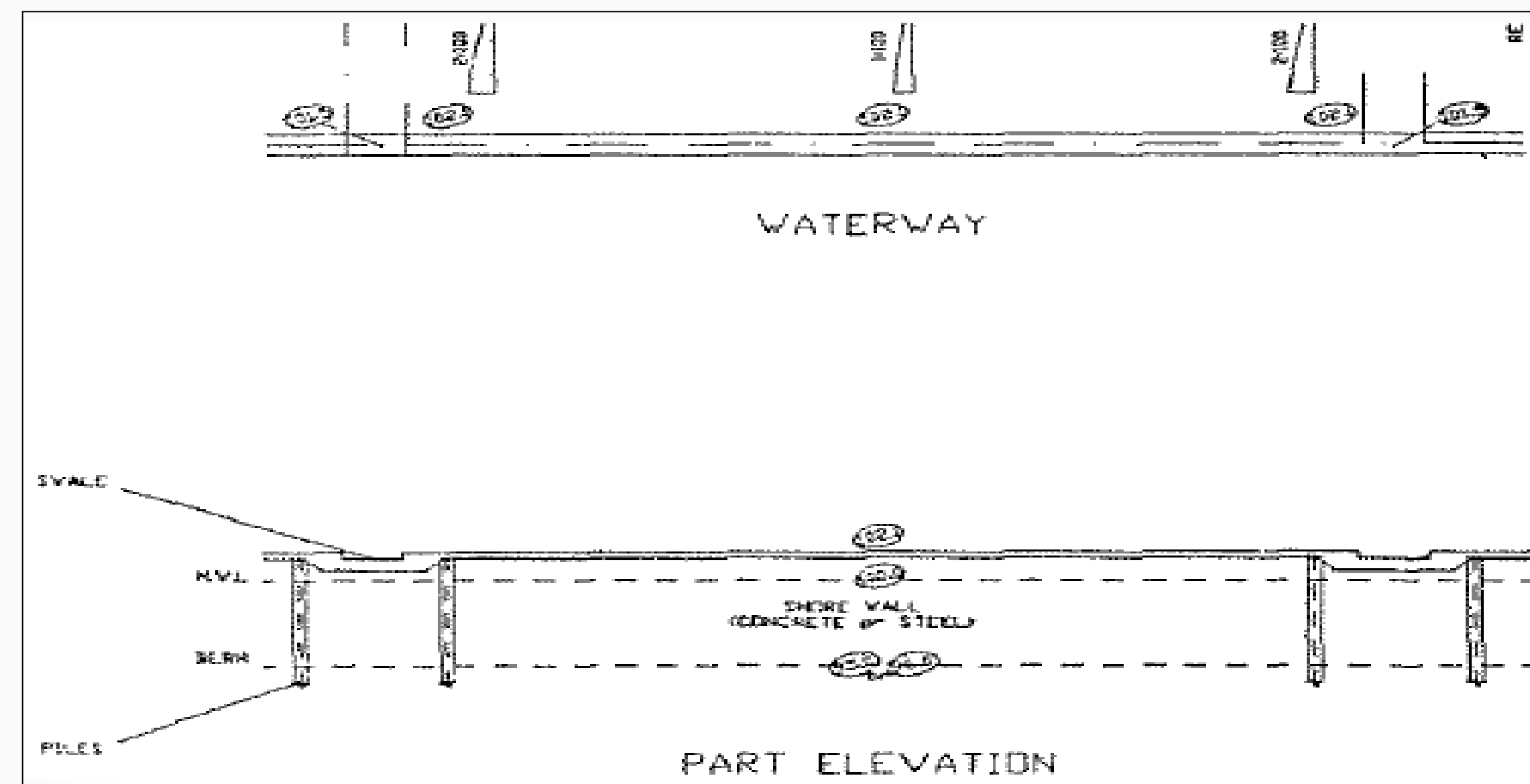
## By-Law Overview

- ❖ Governs the construction and maintenance of shorewalls within Lagoon City.
- ❖ Three allowable configurations:
  - ❖ Straight;
  - ❖ Angled recess; and
  - ❖ Lay by.
- ❖ Two permissible construction types/specifications:
  - ❖ Precast reinforced concrete panels; and
  - ❖ Steel sheet piling.
  - ❖ Both supported via driven piles, tops restrained via tiebacks.

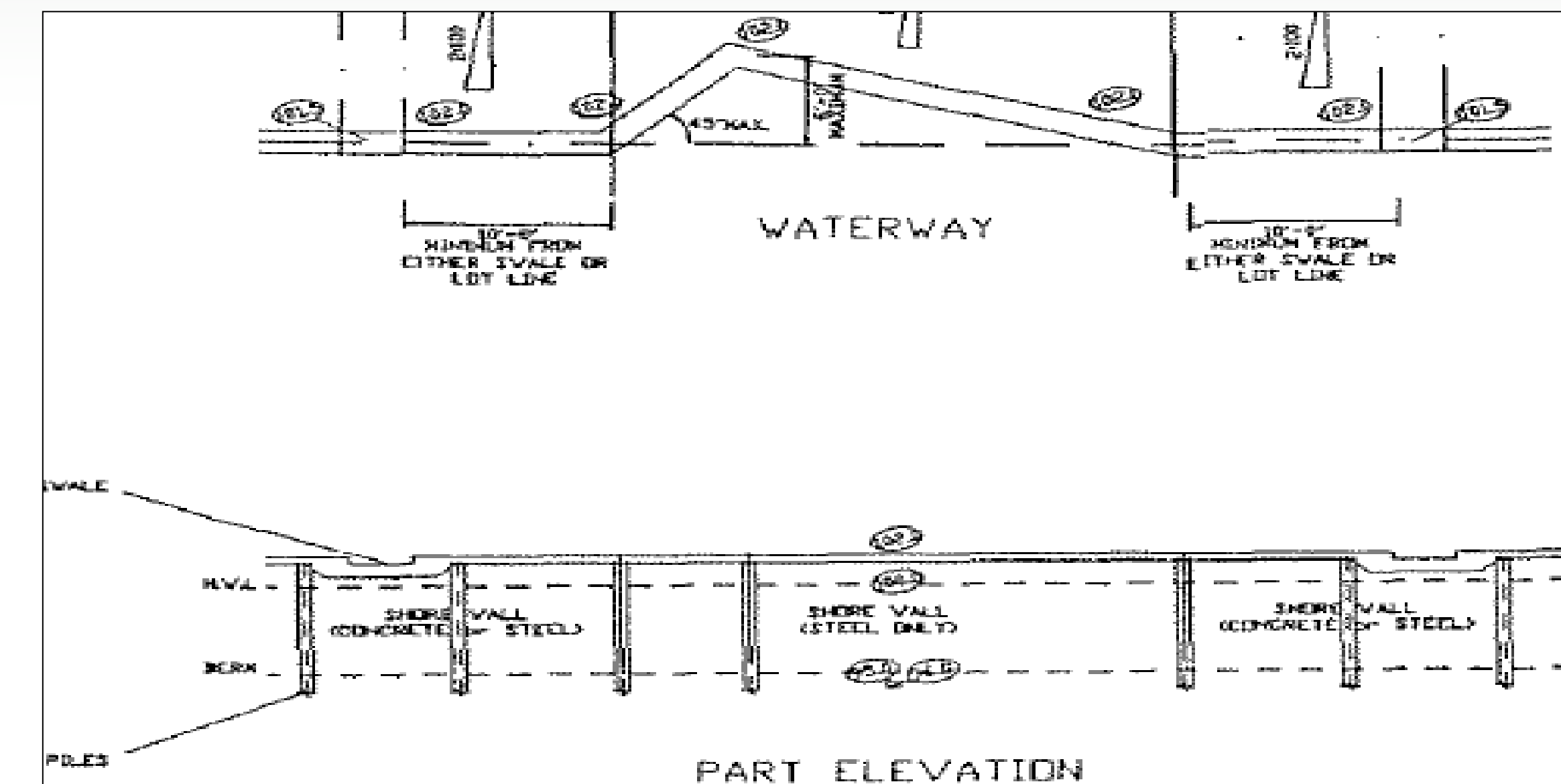


# By-Law Overview

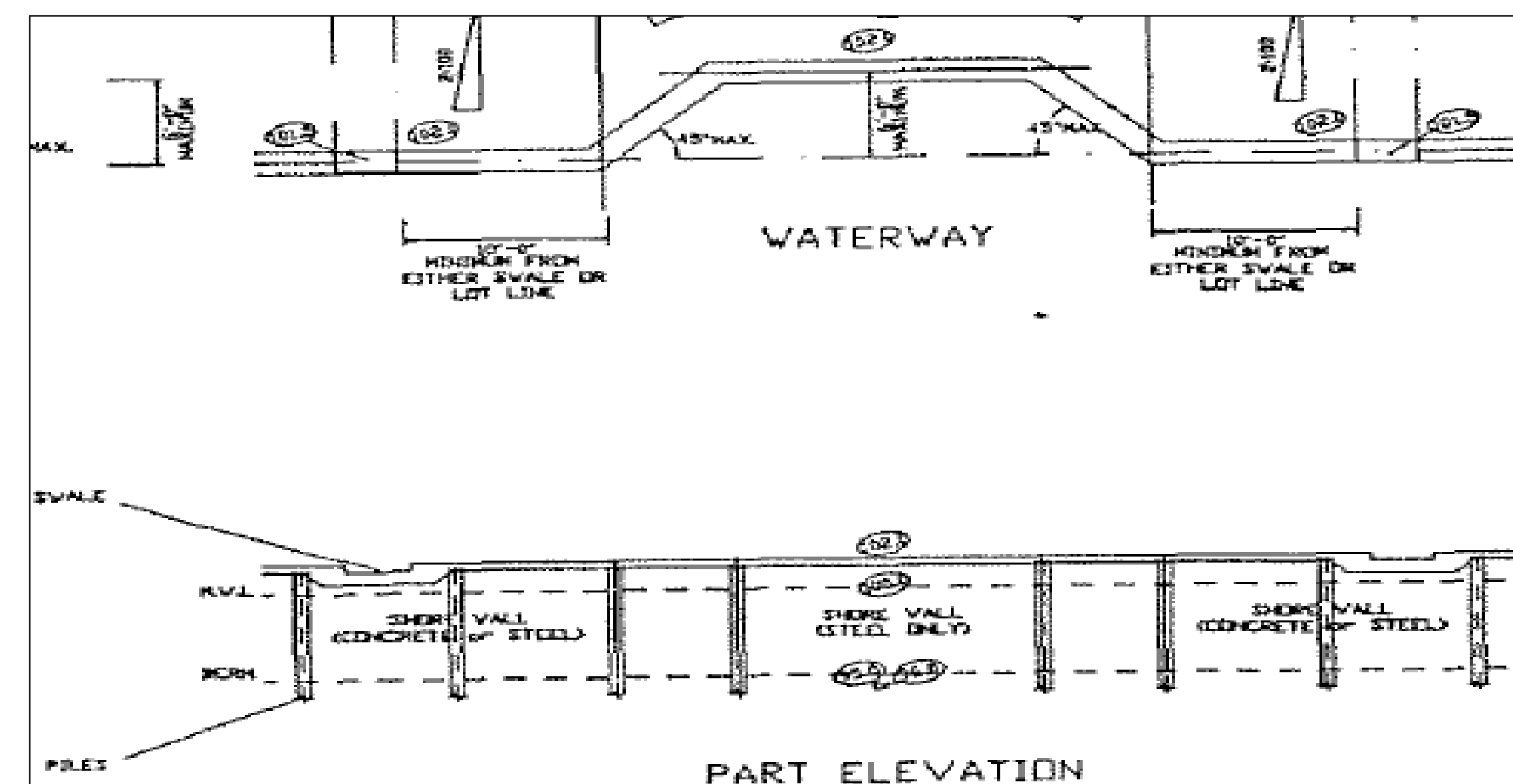
## ❖ Three allowable configurations



a) Straight Wall



b) Angled Recess



c) Lay By



## By-Law Overview

- ❖ Section 2.2: Owners shall construct, at their own expense, a shorewall adhering to these specifications and both existing and newly constructed shorewalls must be keep in a state of repair satisfactory to the Lagoon City Parks and Waterways Commission.
- ❖ Section 3.4: No structure, permanent or temporary shall be placed with 25'-0" of the shorewall, otherwise known as the "restricted area".

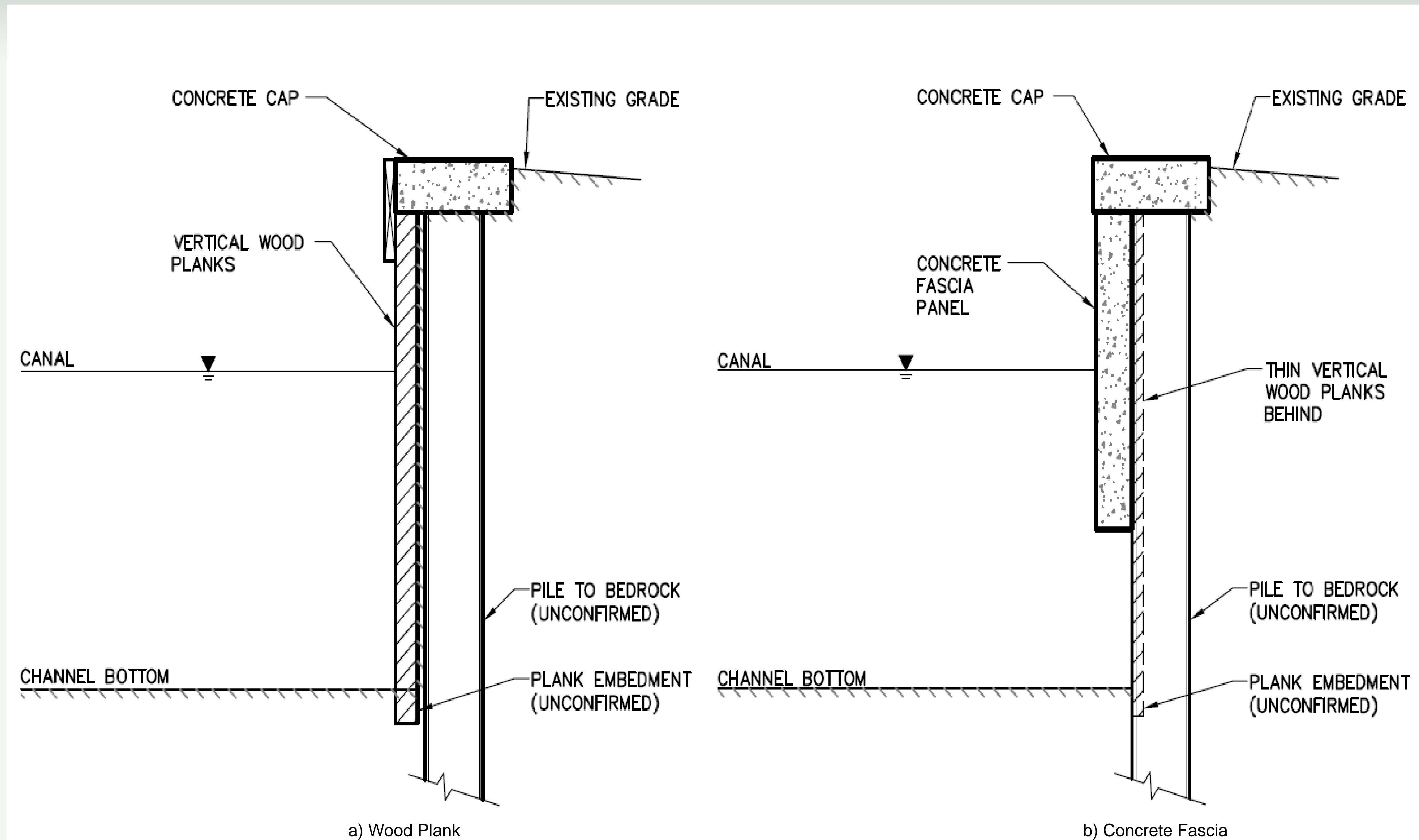


## Existing Wall Construction

- ❖ Generally, two construction types observed:
  - ❖ Vertical wood planks (3" thick); and
  - ❖ Concrete fascia panel with thin vertical planks behind.
  - ❖ Steel piles and tiebacks – Concrete cap.
  - ❖ Construction contravenes specifications of By-Law #97.54 & #99.68 .
- ❖ Believed that construction pre-dates By-law implementation.



# Existing Wall Construction





- ❖ **Many of the same deficiencies were observed throughout:**
  - ❖ Bowing, splitting and deterioration of vertical wood planks;
  - ❖ Exposed and corroded steel piles and tiebacks;
  - ❖ Cracking, spalling, and settlement of concrete cap;
  - ❖ Lateral movement and leaning;
  - ❖ Soil Erosion; and
  - ❖ Structures within setback (restricted area).



# Wood Plank Damage





# Deterioration Behind Concrete Fascia





## Exposed/Corroded Piles and Tiebacks





# Concrete Cap Damage





# Lateral Movement/Leaning





# Soil Erosion





## Structures Within Setback (Restricted Area)





## Condition Summary

- ❖ Properties categorized based on condition: Poor, Fair, or Good.
- ❖ Several elements could not be reviewed due to obstructions – labelled N/A.

	Condition				Total
	<i>Poor</i>	<i>Fair</i>	<i>Good</i>	<i>N/A</i>	
<b>Shorewall</b>	19	25	7	7	<b>58</b>
<b>Grade</b>	25	15	12	6	<b>58</b>



## Phase 1 Shorewall Inspection

- ❖ 19 walls were found to be in poor condition;
- ❖ 25 walls were found to be in fair condition;
- ❖ 25 walls require further investigation. Of these, 14 are due to the presence of obstructions during the initial inspection and 11 are required to investigate suspected failure of the tiebacks below grade due to the wall leaning;
- ❖ 7 walls were found to be in good condition; and
- ❖ 40 properties were found to have poor or fair drainage conditions and all of these require some level of repair.



## By-Law #97.54 & #99.68 Review

We recommend the by-law be revised to address the following:

- ❖ Wording of Section 4.4 revised to say piles shall be driven to refusal at bedrock;
- ❖ Wording of Section 4.2 to 4.4 revised to describe property owners responsibilities in the event they discover the standardized designs cannot be implemented at their property;
- ❖ Add provisions to protect steel structure from corrosion (thereby increasing the longevity of the wall structure); and
- ❖ Clearly define regular inspection requirements.



## Next Steps

1. CCTA to issue full report;
2. Commission to review and notify residents;
3. Schedule re-inspections where required;
4. Consider revisions to bylaw;
5. As required, residents to commence repairs.

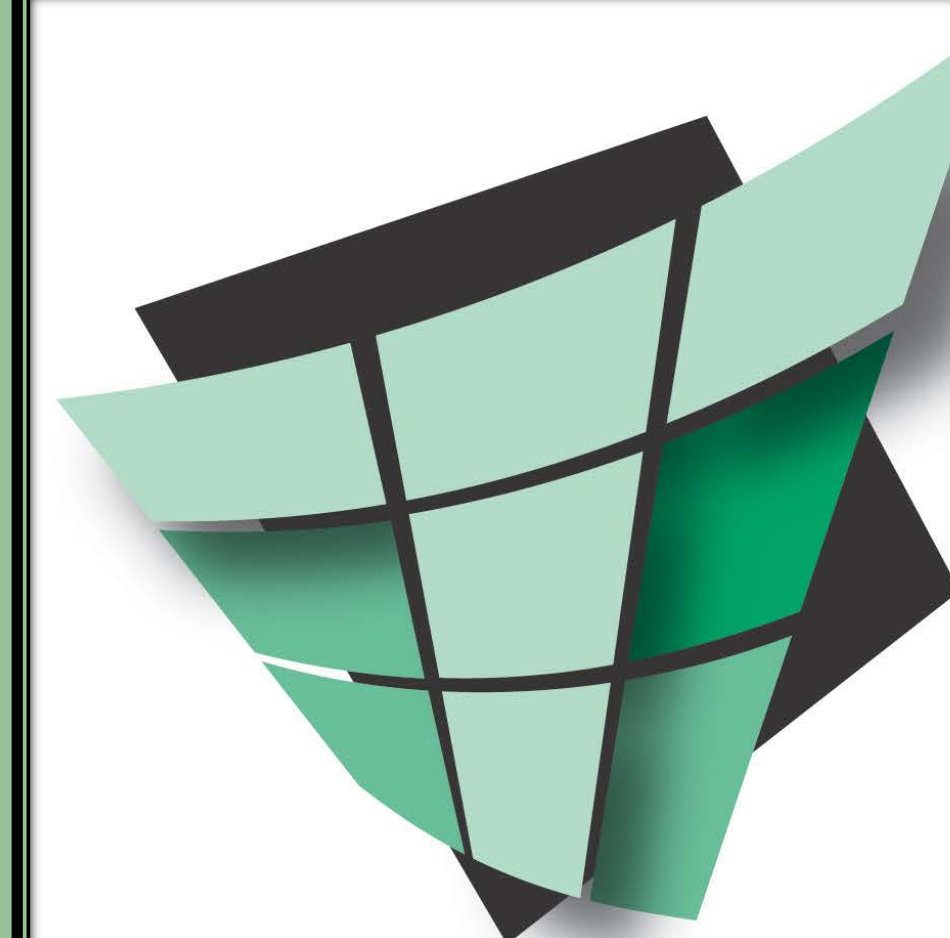


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