

Promontory Point in Burnham Park

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54th to 57th Streets in Chicago, Illinois

July 13, 2003

The Hyde Park Community's Proposal for the Preservation,
Restoration and Enhancement of the Historic Stepped
Limestone Revetment System at Promontory Point

Presented by the Hyde Park Historical Society
and the Community Task Force for Promontory Point



Chicago Shoreline Looking South Toward Promontory Point

Preservation Plan for Promontory Point in Burnham Park

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Introduction

The seawall which lines much of Chicago's Lake Michigan coastline has deep historic, aesthetic and recreational value to the citizens and communities who use it, residents and visitors to Chicago alike. It also serves an important engineering purpose, preventing erosion of the parkland at the lake's shore. As the original shoreline revetment, built in the 1930s of quarried limestone, enters its seventh decade of use, the City of Chicago has turned its attention to its repair and replacement. Construction work on the revetment began in 1998, and will span almost ten years before it is done.

The background of this project starts much earlier, as far back as 1974, when the City and the federal government began to work together to assess the extent of the work needed, and to bring federal dollars to the City to help fund construction. The process involved studies and meetings, Congressional oversight and public input. By 1994, when the Army Corps of Engineers published their feasibility report ("Illinois Shoreline Erosion, Interim III Wilmette to Illinois State Line"), a long and careful process of seeking participation, comment, and input from the public and from governmental agencies on every level had been documented and included in the report to Congress. The single strongest item of concern, "articulated throughout the project evaluation period," was the expression of a preference for a limestone step-stone design matching the existing design, designated "Plan IV," rather than the Corps' rubblemound plan. Indeed, various departments in the City of Chicago (the "local sponsors") worked hard for the step-stone. The Corps responded: "The step-stone revetment plan was considered the preferred plan by the local sponsors and a number of public and private entities."

Typical among comments [*italics added*]:

- from the Illinois Department of Transportation: "To recommend rubblemound revetments in areas that formerly provided *significant passive and active recreational and aesthetic opportunities*, and which has made Chicago one of the premier urban waterfronts in the country, as the federal supportable plan would not seem to be in the Corps' best interest. ... [T]he lead state agency for the state of Illinois, supports Plan IV."

- from the US Department of the Interior: "[W]e believe that Plan IV would be *aesthetically preferable* to the other structural alternatives."

- from the Lake Michigan Federation: "[We] support the step-stone revetment plan on the grounds that: ... the Chicago lakefront is a renown model for *public access and aesthetics along an urban shoreline* ... this plan is *sensitive to the Chicago historic heritage*, including the Lake Michigan shoreline and the historic lakefront parks ... this plan represents citizen interests and involves *meaningful citizen participation*..."

- from the Jackson Park Advisory Council: "[We] approve the plan to rebuild the step-stone revetments ... *The accessibility of the lake to the public and the aesthetic quality* of the lakefront are tremendous financial assets to Chicago."

- from Friends of the Parks: "[We] support Plan IV, the rebuilding of the step-stone revetments..."

- from 4th Ward Alderman Toni Preckwinkle: The "step-stone plan will also maintain safe access to the shoreline while *preserving its historical and aesthetic value*."

- and from individual concerned citizens: "The *aesthetics* of the lakefront are extremely important...;" "I *strongly* prefer the stepping stones...;" "Please choose step-stone revetments...;" "Please use the step-stone revetment approach..."

The City's own planning objectives for the project matched the public desire: The City of Chicago's stated policy was to "preserve the cultural, historical, and recreational heritage

of the lakeshore parks." The Chicago Park District stated that "[o]ne key objective of the CPD is to insure that [the new revetment] would not reduce or limit the historical emphasis of the Park District on shore accessibility, safety, and aesthetics for park users." Indeed, the City and various agencies within it fought hard, alongside an impassioned public, for the step-stone design.

The message was clear, and the Corps responded: "The step-stone was analyzed from an engineering, economic and environmental perspective and was shown to be feasible. ... Accordingly, in view of the local support for the step-stone revetment plan, the Corps of Engineers elected to recommend that plan for implementation."

The US Congress then authorized the building of the Corps-approved step-stone revetment design, and committed federal money to its construction.

Where the shoreline revetment borders historic properties, like Promontory Point, the legislation goes further: Government agencies drafted and signed an agreement for the historical preservation of properties on or eligible for listing on the National Register of Historic Places. The Memorandum of Agreement specifies "that the design and construction of the revetment will match the existing" revetment on those properties. That Agreement is signed by the President's Advisory Council on Historic Preservation, by the City of Chicago, by the Chicago Park District, by the Army Corps of Engineers, and by the Illinois Historic Preservation Officer. **The Agreement is part of the legislation, is still in force, and governs the work to be done at Promontory Point.**

No where in the 358-page document [House Document 103-302] governing federal interest in Chicago's lakefront construction does the concrete and steel design appear.

The Hyde Park Historical Society, the Community Task Force for Promontory Point, and the broad consensus of community park users continue to advocate for and support the preservation of the limestone step-stone revetment at Promontory Point. The Community Task Force is a broad-based citizen's group charged by the community with representing its interests at the Point, and with coordinating an extraordinary effort of community investment in research and expert studies to support a limestone

preservation plan. The community has raised over \$50,000 to fund studies by two coastal engineers, a national expert on access for persons with disabilities, and two preservation architects. These studies are intended to help the Park District to develop a preservation plan consistent with the federal legislation, with the Memorandum of Agreement, and with the desires of the community.

This report details one such preservation plan. It incorporates sound contemporary engineering, meaningful accessibility, and historic preservation. It is beautifully designed, elegantly balancing the sometimes competing needs of engineering and aesthetics. It is consistent with the Memorandum of Agreement and is therefore federally supportable. The significance of this report is that it proves the feasibility of a historic preservation of the limestone revetment at Promontory Point which meets economic, engineering, recreational and aesthetic requirements.

The Hyde Park Historical Society, the Community Task Force for Promontory Point, and community park users offer this document to the Chicago Park District and its partners in a spirit of cooperation and collaboration as they work to design the revetment at Promontory Point. This plan answers the concerns of the Park District as it struggles to integrate proper engineering, compliance with federal legislation, including its preservation agreement, and the wishes of the citizens and communities of Chicago. This report provides meaningful solutions to real problems. We intend to work side by side with the Park District to insure that we treat Promontory Point with the dignity and respect of a historical landmark of the City of Chicago. This extraordinary park deserves an extraordinary collaboration between city agencies and our community.

Summary of Process

Existing conditions at the Point were carefully studied. The following photographs illustrate the eight different zones of the Point, lettered from north to south.



Segment NX (North Existing)

This photo recently completed concrete revetment to the north.



Segment A

This is just south of the recently completed concrete revetment, and illustrates the rubble stone repairs placed in the 1960s.



Segment B

The outer edge of the promenade has somewhat displaced due to deterioration of the tops of the wood piles. Water is very shallow due to littoral drift with sand accumulating along this segment. It is a favorite area for waders.



Segment C

Existing concrete platform constructed in 1963. Some scouring of supporting fill has occurred permitting revetment to sink.



Segment D

This segment begins with the tip of the Point and curves around toward the south, creating a favorite area for sunning and deep water swimming.



Segment E

Existing promenade and revetment are in good condition and can be preserved.



Segment F

This is a transition segment between new concrete and restored stone revetment. This segment is also in very good condition.



Segment SX

This photo shows the steel sheet piling currently under construction to the south and its transition to the existing limestone promenade.

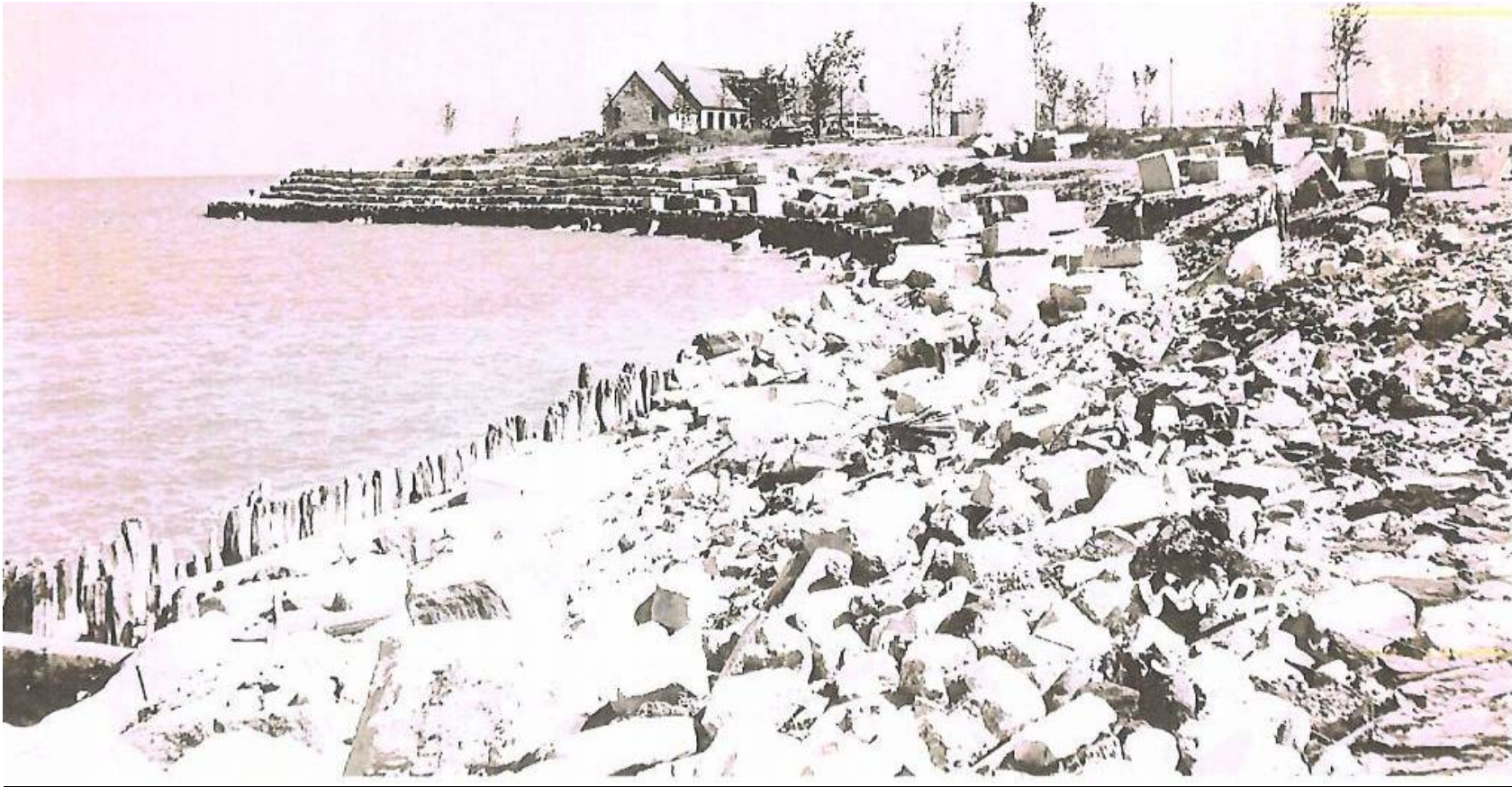
The History of Promontory Point

- Daniel Burnham proposed Point structure in landfill along lake in his *Plan of Chicago*, in 1909 (see plan on page 13)
- Cribbing was installed, landfill was begun, and Lake Shore Drive was marked out in 1928 (see photo on page 14)
- Revetment limestone blocks were placed under WPA project in 1937-38 (see photos on page 15 and 16)
- Landscape and pathways complete and Point being used 1939 (see photo on page 17)
- Eastern tip of Point (Segment C) promenade level was repaired in 1964 (see drawings prepared by Luke Cosme, P.E. of Chicago Park District in 1964, pages 18 and 19)
- Alfred Caldwell's landscape plan, 1937 (page 20 and detail on page 21)



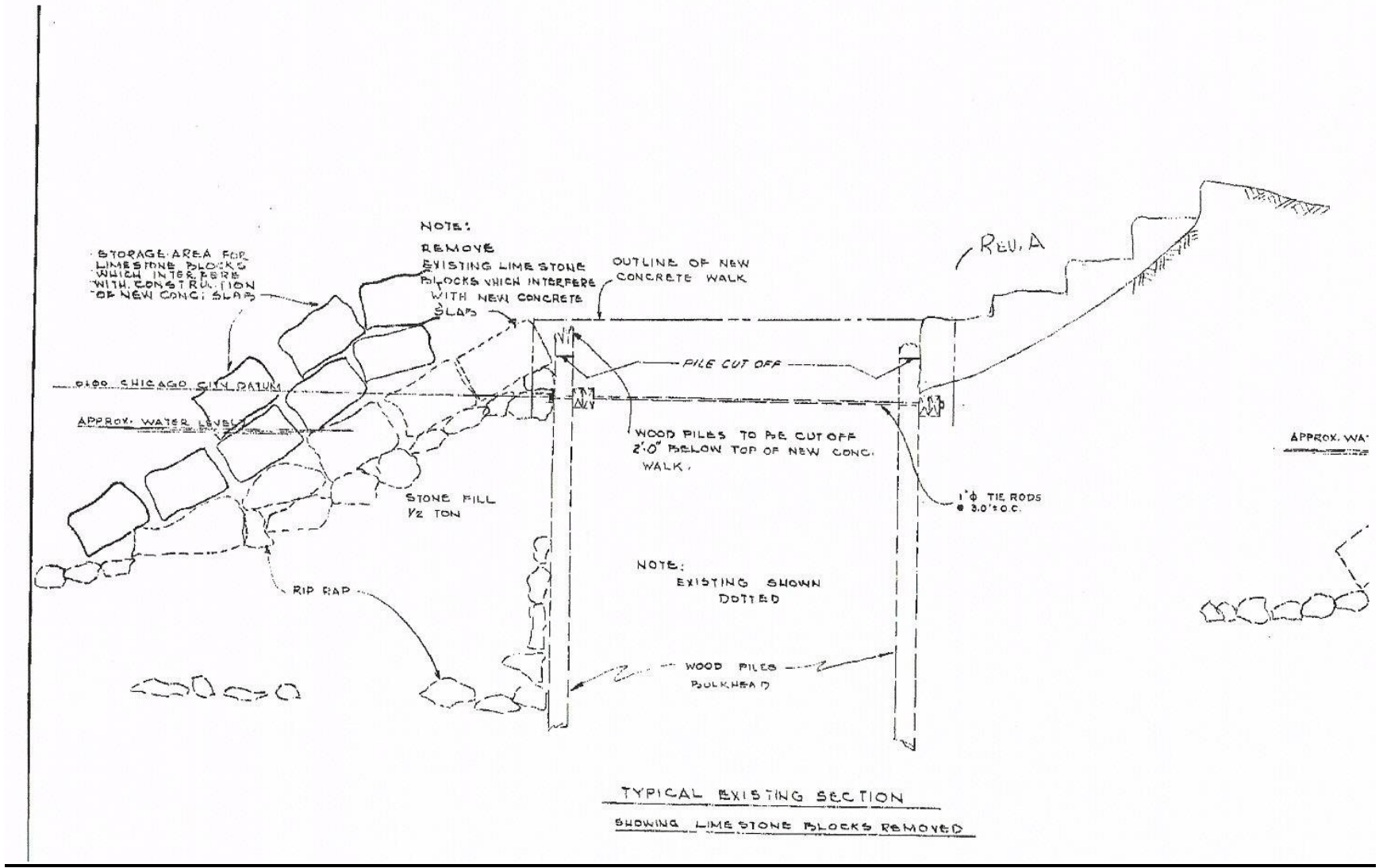


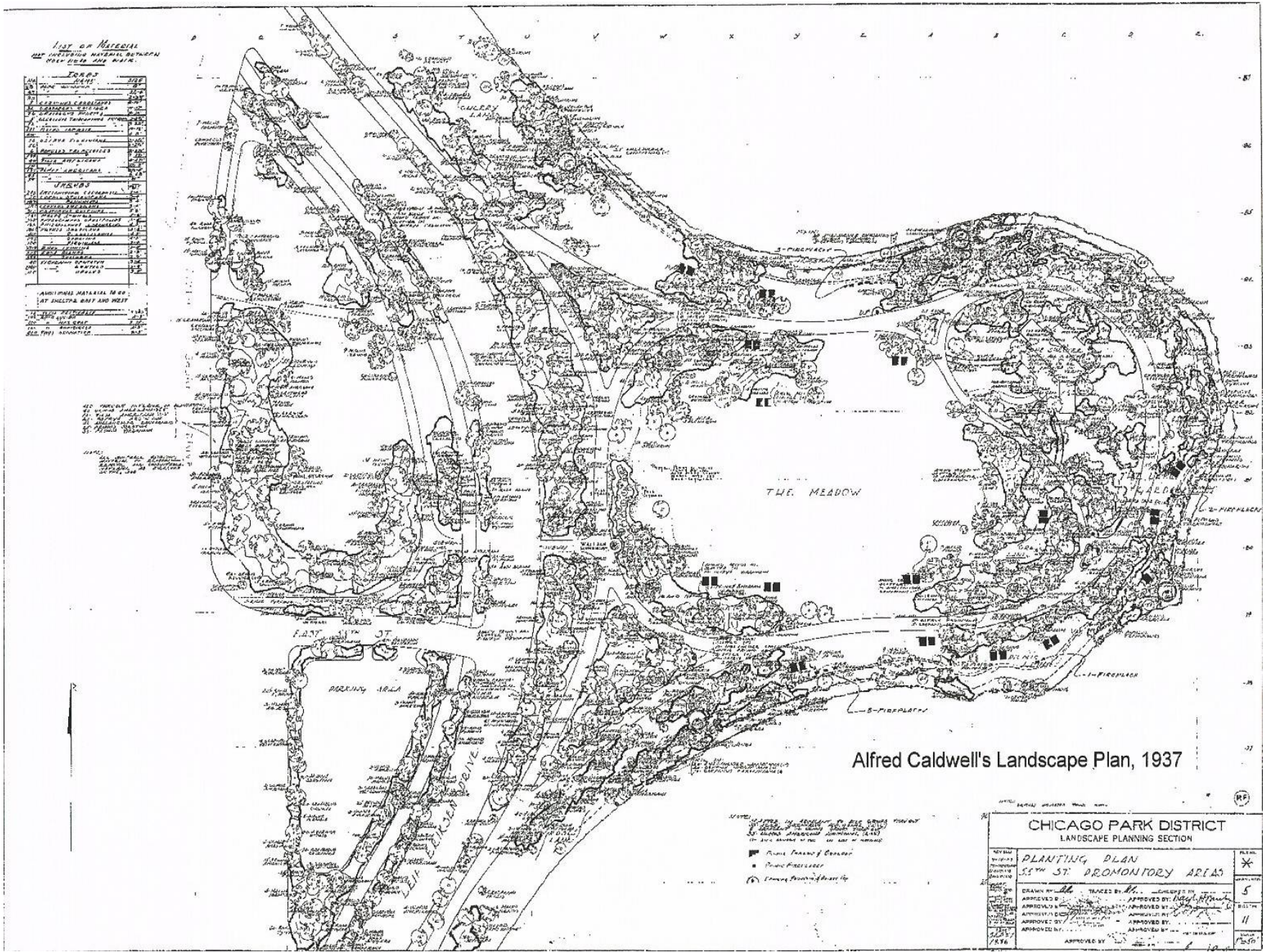
August 15, 1928 - New Fill











Conclusions Based on Analysis

- There has been some structural failure, but no functional failure in the existing step-stone protection system at the Point.
- Tops of wood piling have rotted which has allowed some promenade stones to be displaced
- The north side of the Point was badly repaired in the 1960s with rubble mounds creating unattractive appearance
- The concrete platform on the east end of the Point is sound but has been undermined by wave action, allowing some revetment stones to be shifted
- The south side promenade and revetment can be preserved and retained with little or no repair
- Shoreline is not accessible to persons with disabilities

Chronology of Past Proposed Actions

- May, 1988: Chicago Shoreline Protection Commission Recommendations for Shoreline Protection and Recreational Enhancement, Final Report. This report stipulates to “rebuild 1800 ft. of edge south of Promontory Point ... Step-Stone and Sheetpile Wall....”
- 1989: Chicago Park District Shoreline Protection and Recreational Enhancement requires repair of step-stone revetments by using steel sheet piling and restoration of Promontory Point to its original revetment structure to be compatible with the landward improvements then being made under direction of Alfred Caldwell (p. 49)
- 1993: U.S. Corp of Engineers Shoreline Reconstruction Plans for Chicago states “Newly constructed step-stone revetments would use

steel sheet piles to anchor the stone steps.” (p. 8); and “The recommended step-stone plan will also maintain safe access to the shoreline while preserving its historical and aesthetic value.”

- 1993: Memorandum of Agreement for the Illinois Shoreline Erosion Interim 3 Project among the Advisory Council on Historic Preservation, the City of Chicago, the Chicago Park District, the Army Corps of Engineers, and the Illinois Historic Preservation Officer. calls for “...construction and rehabilitation of step-stone revetment along five (5) reaches of the Lake Michigan shoreline within the City of Chicago over a 15 year period.”
- April 14, 1994: House Document 103-302, A Letter from the Chief of Engineers, Department of the Army Dated, submitting a Report with Accompanying Papers and Illustrations “The selected plan (step-stone revetment) will not have an adverse impact on archaeological or historic properties....Construction of the selected plan would involve movement of substantial quantities of quarry stone. Stone could be transported to the site via barge or truck....Restoration of the shoreline would insure continued use of the lakefront for sport fishing, golfing, sunbathing, swimming, and other recreational activities. It would also maintain the aesthetic quality of the Lake Michigan shore.” (p. 104)
- 2001: Corps of Engineers Environmental Assessment on Proposed Shoreline Protection Measures,: “Locally Preferred Plan provides for reconstruction of the shoreline using stair-step (or “step-stone”) design similar to the original design...steel sheet pile wall backed by batter piles ... between 54th and 57th street...driving new H piles to support a new concrete promenade...constructing new reinforced concrete slabs, steps, and wave deflectors.”

- May 1, 2001: City of Chicago memorandum in response to comments from the public, 2001: Improvement to Corps of Engineers Plan, 2001: These so-called “improvements” included “vertical concrete surfaces to be given a rougher texture, drainage gap concrete areas will be smaller, joints in concrete will be staggered, open water swim access will be designated by a line of buoys, revetment height will be reduced and tapered so that a view of the lake won’t be impeded.”
- 1998-2001: STS design scheme, as documented in their drawings dated July 31, 2001. Current state of documents is 75% complete. They are awaiting community concurrence for completion. These plans reflect an all-concrete scheme, demolishing historic resources.
- July 13, 2003 Hyde Park Community’s Proposal (summarized)
 - Step-stone areas: remove limestone blocks temporarily, install new steel sheet piling, install accessibility path on new concrete slab; reset revetment stones
 - Concrete platform area: remove limestone blocks, install new steel sheet piling, grout cavities under concrete platform, install bedding stone on landward side of concrete platform with filter cloth, reset revetment stones, replace broken or missing stones

Criteria for Design

Functional criteria were compiled from diverse sources:

- City of Chicago stated goals
- Hyde Park Community Task Force for Promontory Point and the Hyde Park Historical Society
- Neighborhood accessibility committee headed by Martha Younger-White, Illinois Department of Human Services, Bureau of Accessibility and Safety Standards
- Consultation with John McGovern, Executive Director of the Northern Suburban Special Recreation Association and past chair United States Architectural and Transportation Barriers Compliance Board (Access Board) committee on the development of design requirements for accessibility to outdoor developed areas and recreation facilities
- Consultation with Robin Jones from the Great Lakes Accessibility and IT Center at the University of Illinois at Chicago
- U. S. Secretary of the Interior's "Standards and Guidelines for Archaeology and Historic Preservation."
- Mike Jackson and Anne Haaker at the Illinois Historic Preservation Agency
- Julia Bachrach at the Chicago Park District
- David Bahlman, Executive Director of Landmarks Preservation Council of Illinois

The following criteria were assembled from community input to serve as a basis for design:

- Maintain use of limestone blocks throughout for shoreline protection
- Provide shoreline protection that is structurally sound

- Provide shoreline protection that is cost effective
- Provide gravity and surface storm drainage system from lower Lake Shore Drive into Lake Michigan
- Comply with the U. S. Secretary of the Interior's "Standards and Guidelines for Archaeology and Historic Preservation."
- Retain as much of existing step-stone revetment as possible
- Provide identical physical appearance to existing step-stone design, including out-of-plumb and out-of-level stone blocks
- Build no higher in elevation than current elevation
- Allow continuous promenading all around at lowest level
- Provide easy access to and from water for swimming or wading
- Provide varied aesthetic experiences along length of shoreline
- Provide equivalent experiences and activities for persons with disabilities
- Provide fully accessible paths with gentle slopes for persons with disabilities
- Allow safe approach to water's edge in all seasons
- Provide some more spacious congregation areas near the water for informal gatherings
- Provide at least one example of large scale public art
- Provide uncomplicated and low-tech future maintenance systems
- Restore Alfred Caldwell landscape plan

Structural response:

- Steel sheet piling with either stone blocks or wood piling driven in front; leading stone at edge conceals top of sheet piling
- Concrete platform is repaired and preserved
- Existing step-stone revetment on south preserved

Accessibility response:

- Ramps at gentle slope (1" in 20") allowing access to promenade level from both north and south ends of the Point.
- Textured and colored concrete path at promenade level for wheelchairs set 4" lower than the stone edging to provide detectable warnings
- Seating locations distributed along the path
- Concrete ramp into water on north side of Point for swimming access
- Long and shallow concrete steps into water
- Handrails along retaining wall sides

Recreational Enhancements

- Continuation of existing recreational opportunities
- Open water swimming access on both north and south
- Swimming and wading possible for persons with disabilities
- Resting and viewing points
- Accessible path at high point of Segment C
- Cues for blind and vision impaired persons
- Visual improvements
- Restoration of Alfred Caldwell's objective of a natural setting

Environmental Enhancements

- Reuse existing structural systems to large extent
- Minimal disruption to existing environment
- Minimal disruption to animal habitat
- Little waste of existing materials
- Little new energy used for construction or embodied in materials
- Maintains all existing trees – none required to be transplanted
- Can be constructed in small segments

Constructability considerations:

- Pile driving operations can be carried out from the water side on movable barges; small cranes can be positioned on the land side of the revetment to lift 8 ton maximum stones
- No need for large stockpiles of materials, since most is being reused locally

Costs considerations:

- Can be phased easily by segment
- Reuses much of existing material and concrete platform segment C
- Does not require highly refined surveying work for placement of materials

Maintenance considerations:

- Steel sheet piling will be longer lasting than wood
- Stone revetment is "forgiving" in that it allows some movement to occur in system to adjust to impact stresses
- Future repairs do not require costly materials
- Repairs would be localized
- System has redundant structure so that repair delay will not affect stability

Longevity considerations:

- Step-stone system will last at least as long as current step-stone protection
- Steel sheet piling will have longer life than wood piling
- Limestone is a longer lived material than concrete

The Special Duties of the Illinois Historic Preservation Agency

A "Memorandum of Agreement" was executed in August of 1993 between the United States Advisory Council on Historic Preservation, the City of Chicago, the Chicago Park District, the U.S. Army Corps of Engineers, and the Illinois State Historic Preservation Officer. The agreement stipulates that for areas of the shoreline which the State Historic Preservation Officer (the "SHPO") determines to be eligible for listing on the National Register of Historic Places, the repair or reconstruction of the step-stone revetment will match the existing construction in accordance with the recommendations of the Secretary of the Interior's "Standards and Guidelines for Archaeology and Historic Preservation." Included in these standards for restoration is Item 6: *"Deteriorated features from the restoration period will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials."*

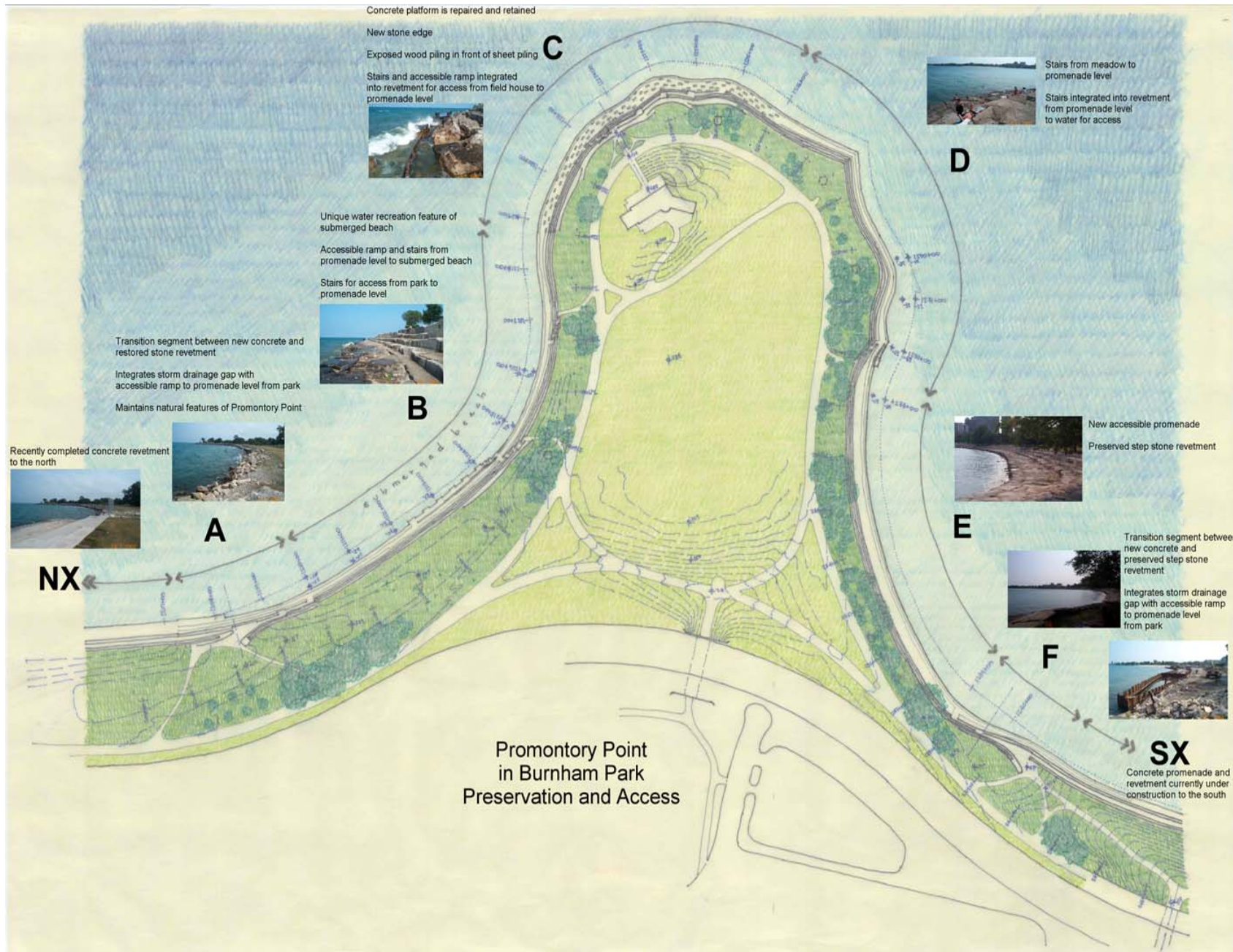
The State Historic Preservation Officer has already made a preliminary determination that Promontory Point is eligible for listing on the National Register, and has indicated his strong interest in preserving the Point, or restoring it using limestone matching the existing limestone design. The deputy SHPO, Anne Haaker, has examined the community preservation plan for Promontory Point and stated that it would comply with the standards. Furthermore, she has also informally looked at the STS 75% submittal and stated that it does not meet the standards and will not be permitted by the authority of their office under the Memorandum of Agreement.

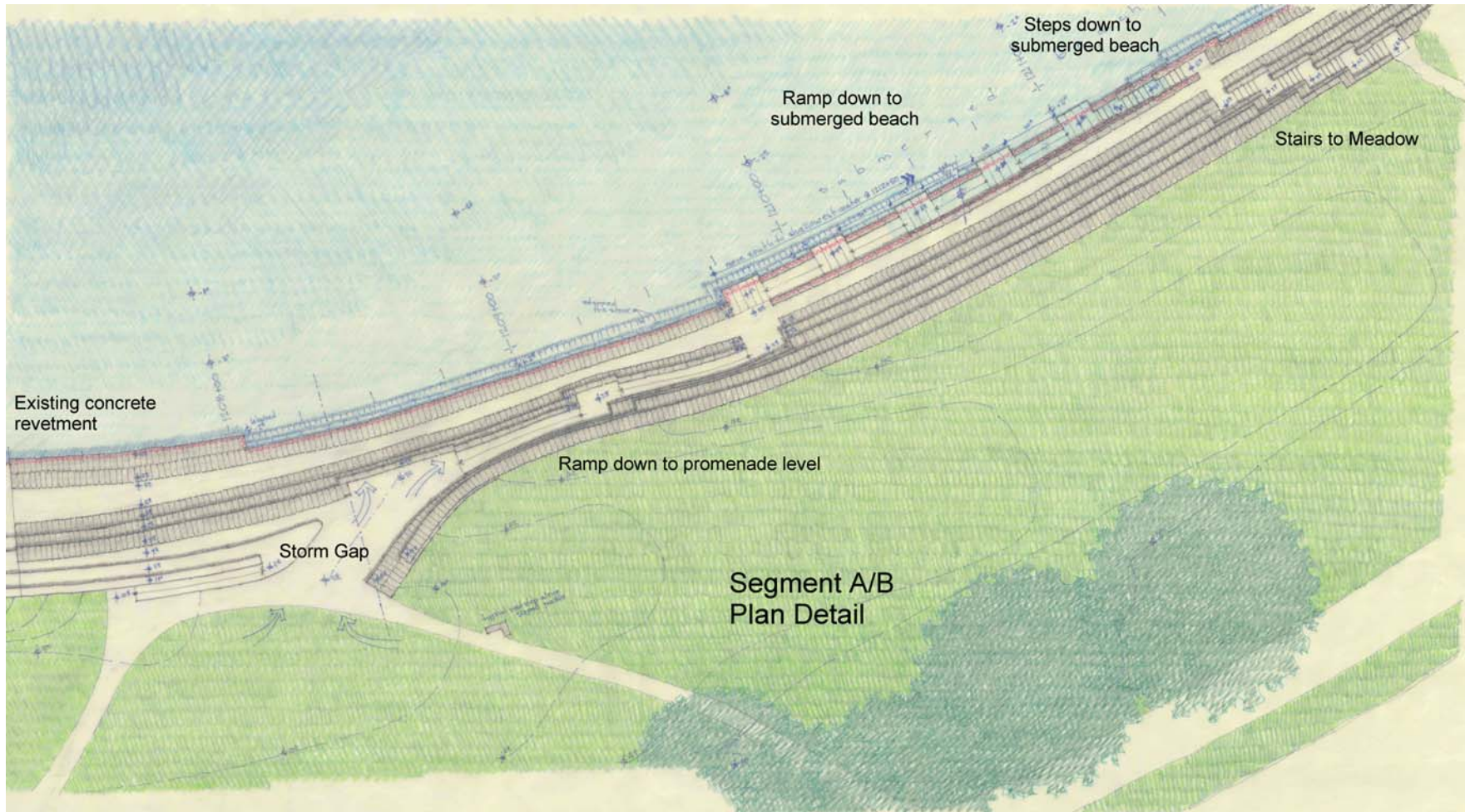
If the City proceeds to construct the STS proposal, it would be in violation of the Memorandum and would likely lose the federal funding, according to the deputy SHPO. The city has not yet submitted drawings to Anne Haaker for her official review, but she has met with the city, and she and the SHPO, Bill Wheeler, have told the City that they cannot proceed with the STS concrete plan.

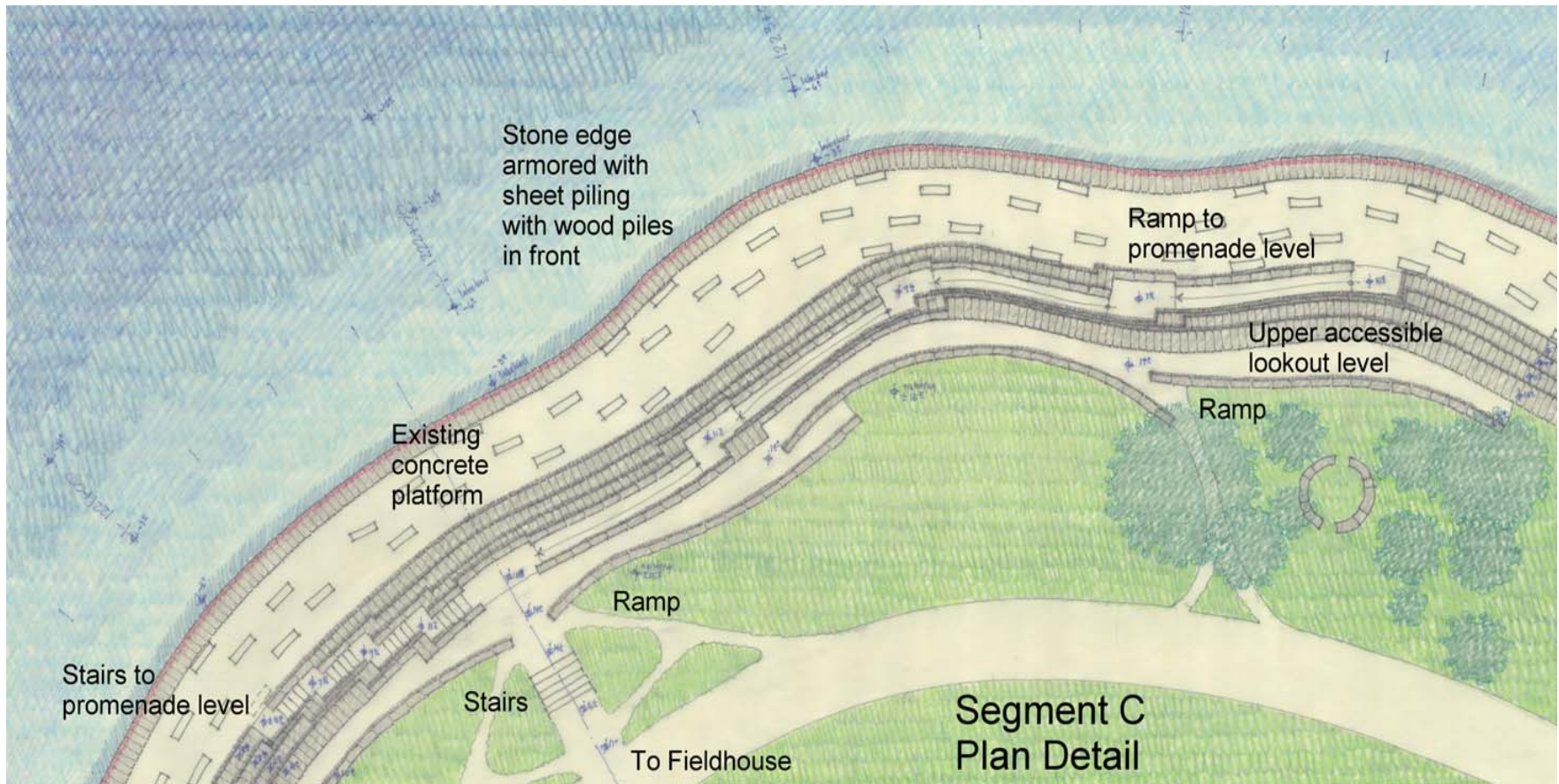
Summary of Features of the Hyde Park Community's Shoreline Preservation Plan

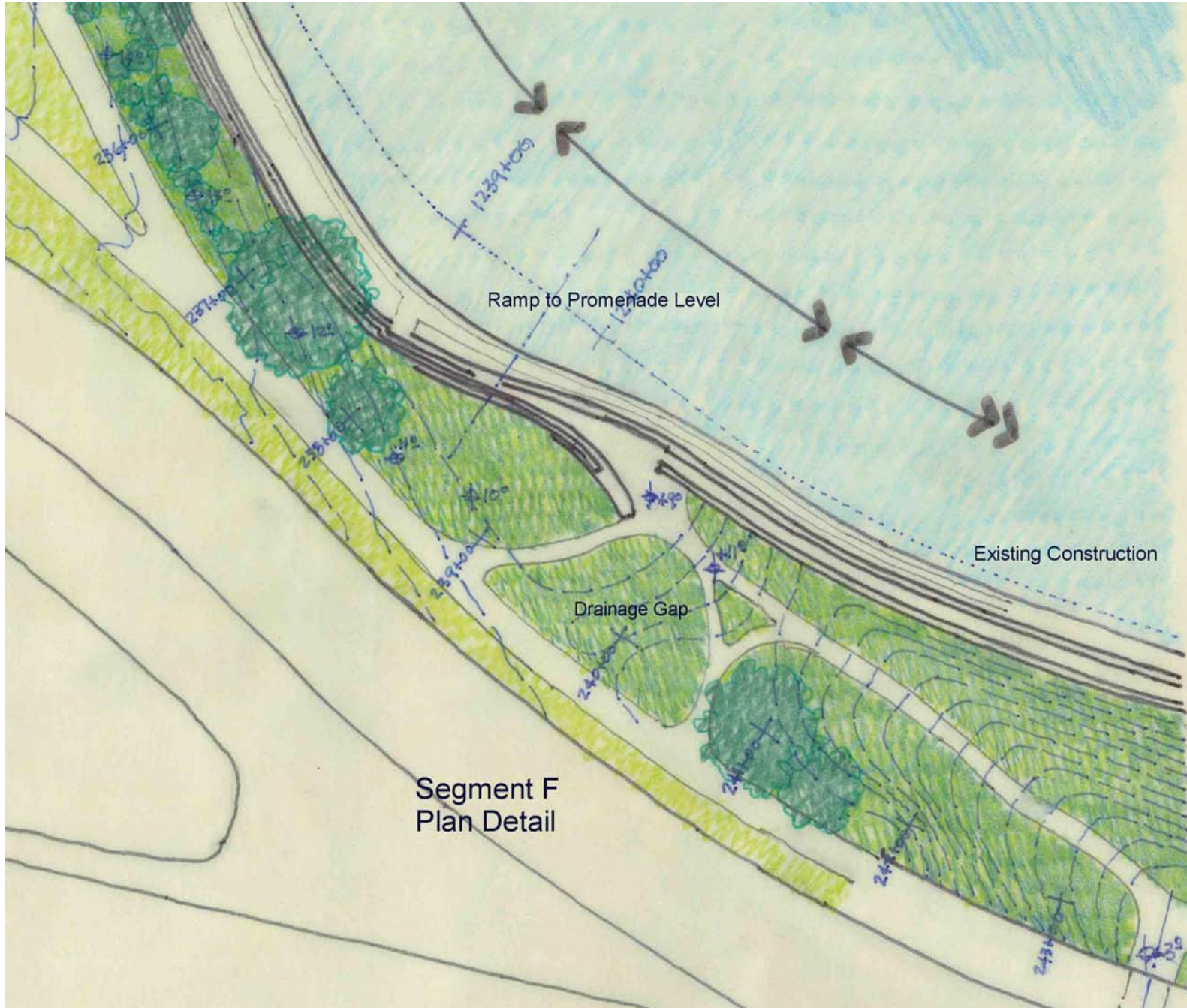
- Existing limestone step-stone revetment and promenade on south side of Point is in good condition and will be preserved and repaired as needed. Voids under stone will be filled with a cement-sand mix.
- Existing concrete platform (promenade – the “coffins”) at east end of the Point is in good condition and will be preserved and repaired. Voids under concrete platform will be filled with a cement-sand mix. Stepped limestone revetment will be reconstructed.
- Historic limestone step-stone revetments in other segments of Point will be restored. Stones will be temporarily removed, substrate will be repaired, filled and compacted, and stones reset on top, much as it was done in the 1930s.
- New steel sheet piling will be installed in front of existing wood piling to provide new armored edge all around perimeter.
- The new sheet piling will be concealed from view by one of two means: At shallow water areas stepped toe stones will be installed in water in front of new sheet piling. At deeper water segments, wood piling will be driven in front of new sheet piling to create ice bumpers and recreate the original historic appearance of shoreline.
- A continuous textured and colored concrete pathway will be constructed within the promenade to provide accessible path of travel for persons with disabilities. It will be set 4” lower than the adjacent stone to create a safety edging and a detectable warning zone. Resting and viewing points will be located at various points along the promenade. Outer edge of new promenade will be limestone blocks set on top of the steel sheet piling.

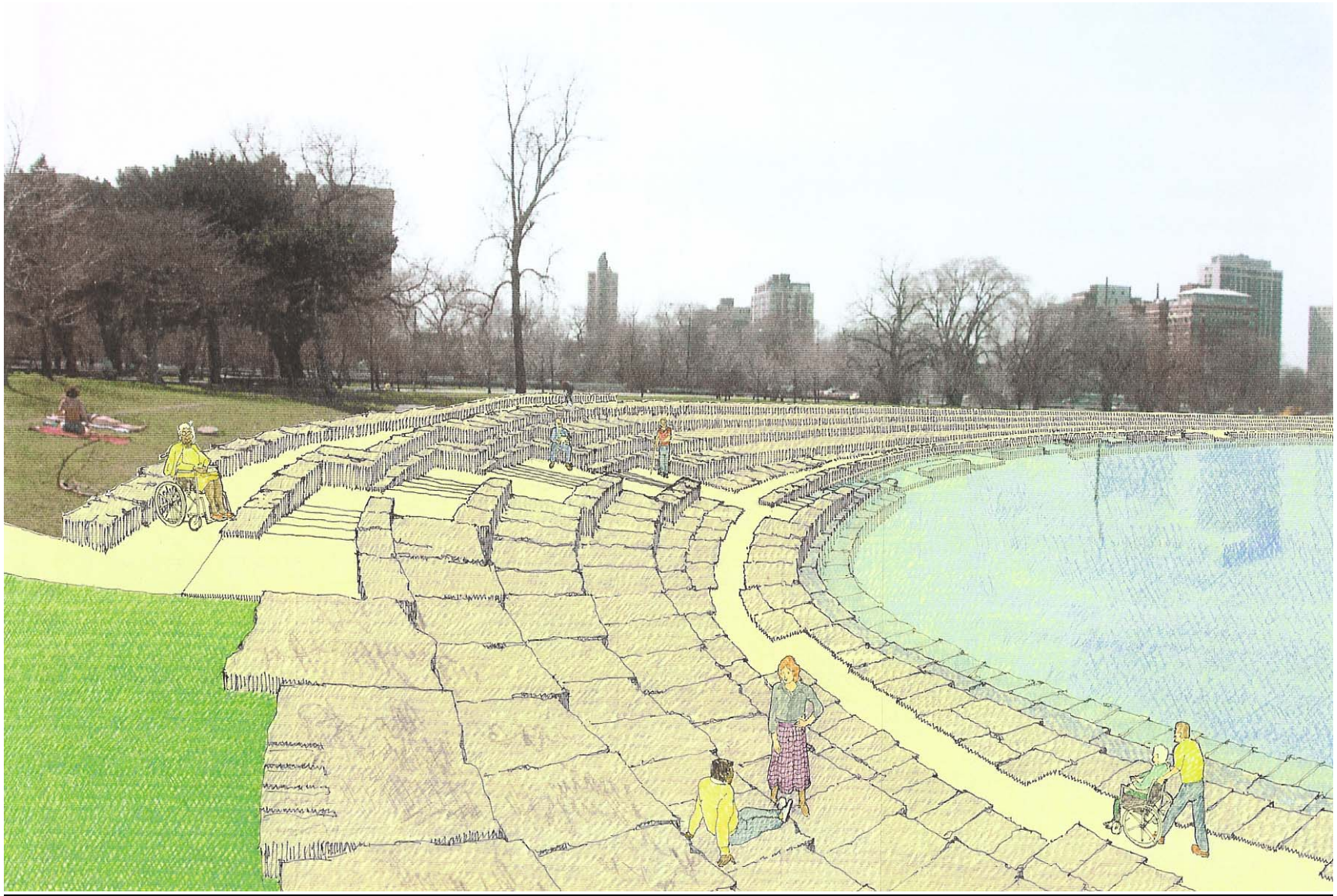
- Ramps and stairs will be constructed within the reconstructed stepped limestone revetment to provide access from existing park walkways to the new promenade level at a gentle slope from both north and south ends of the Point, as well as near the Fieldhouse.
- Access to the water for wading and swimming will be created by a new ramp and steps into water on north side of Point for persons with disabilities and other users.
- Open water swimming access will be created on both north and south sides.
- Alfred Caldwell's landscape design will be restored.
- Among the many advantages of this restoration/preservation approach is reuse of existing materials and structural systems which minimizes disruption to the existing environment and animal habitat. No trees will be required to be removed or transplanted. Responding to Mayor Daley's "green initiative" for public construction in Chicago, little new energy will be used for construction or embodied in materials. There is no need for large stockpiles of materials, since most are being reused locally, augmented by additional readily-available limestone blocks as required, deliverable to the site less expensively than concrete. A small crane can be used for construction, repairing and setting stones as it moves and phasing work into small segments.
- Costs for this plan are less than the city's concrete replacement plan (see attached cost estimate).





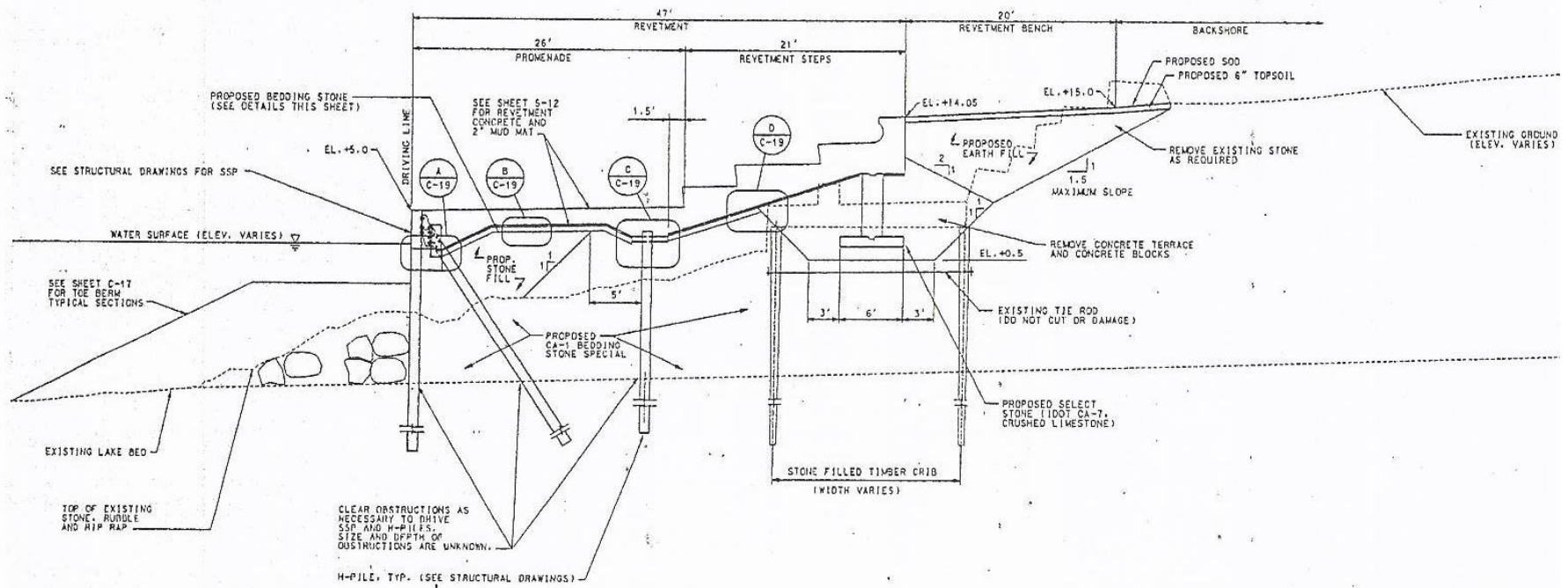




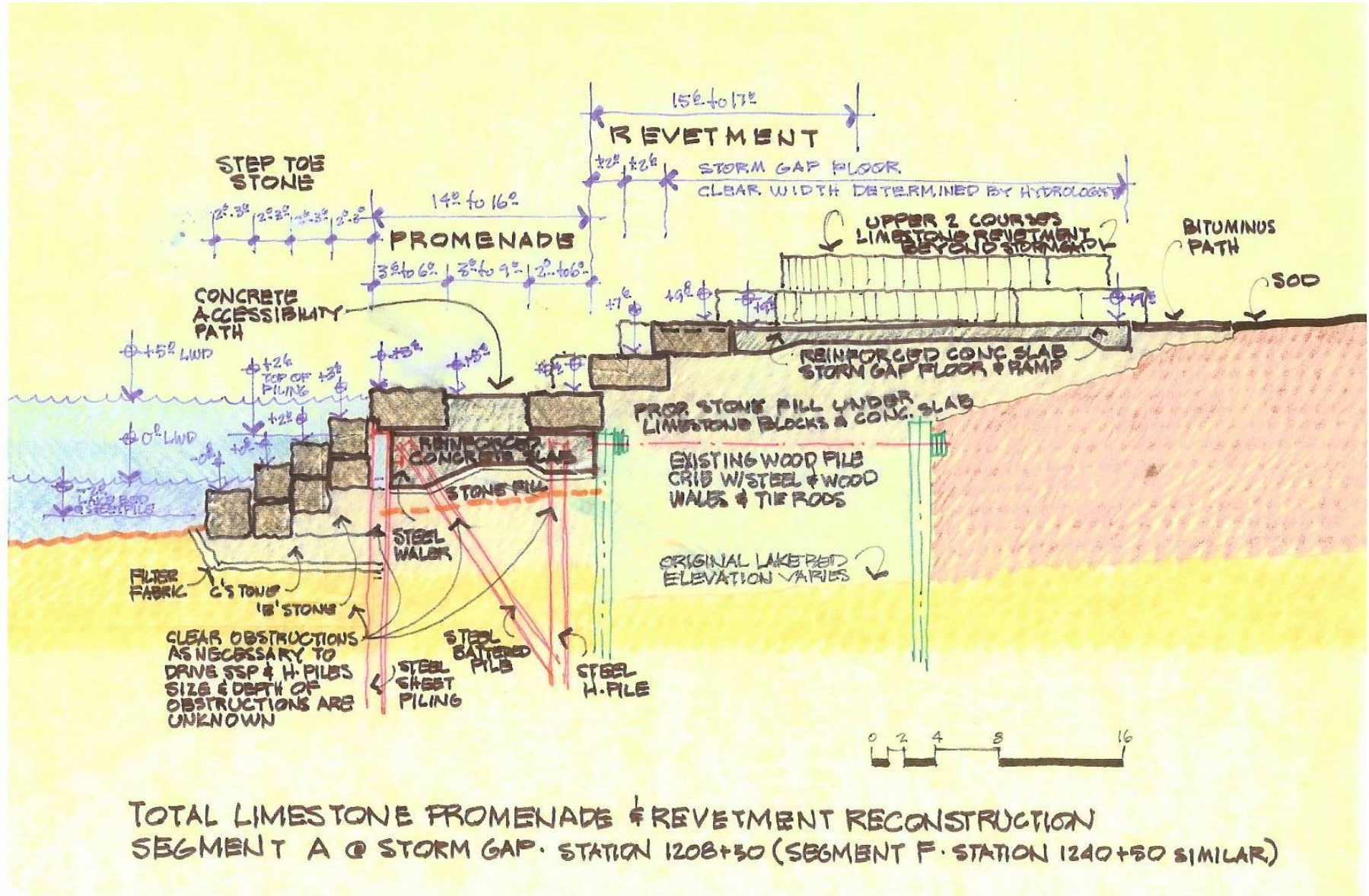


Sections through Segments

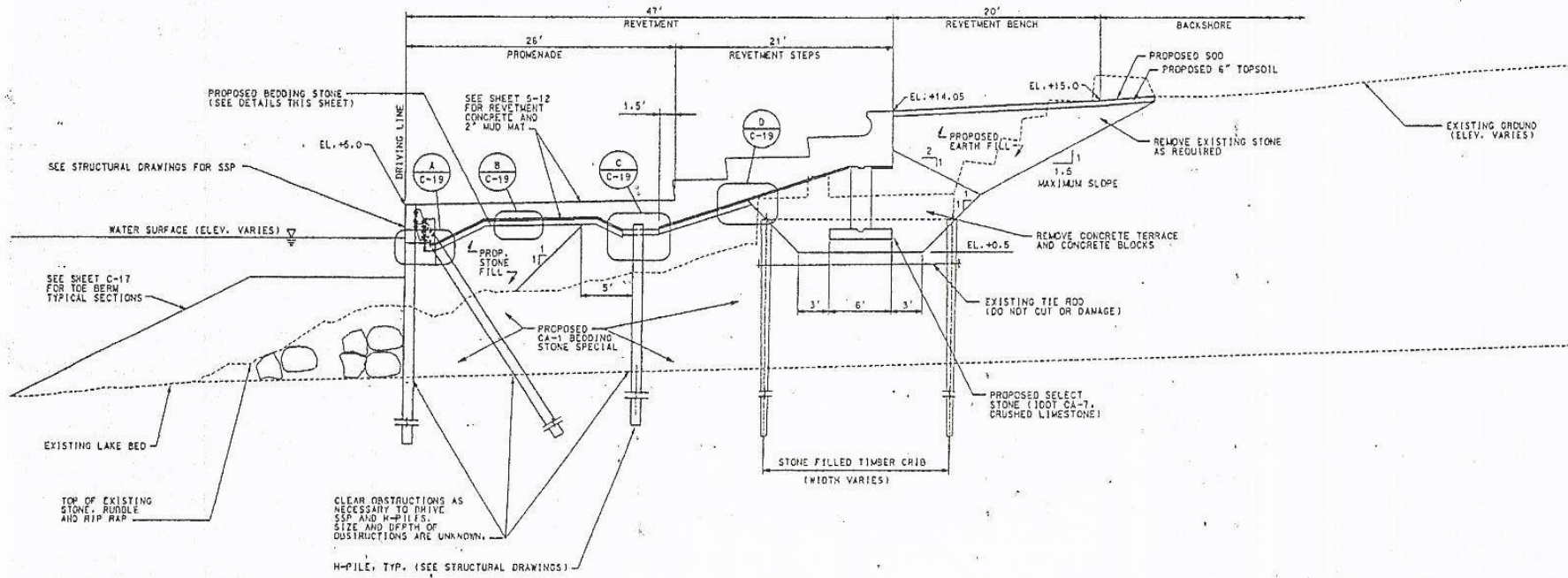
The sections shown on the next 12 pages show the construction and structure of each segment of the Point, with the City's concrete proposal and the Hyde Park Community preservation plan proposal shown side-by-side.



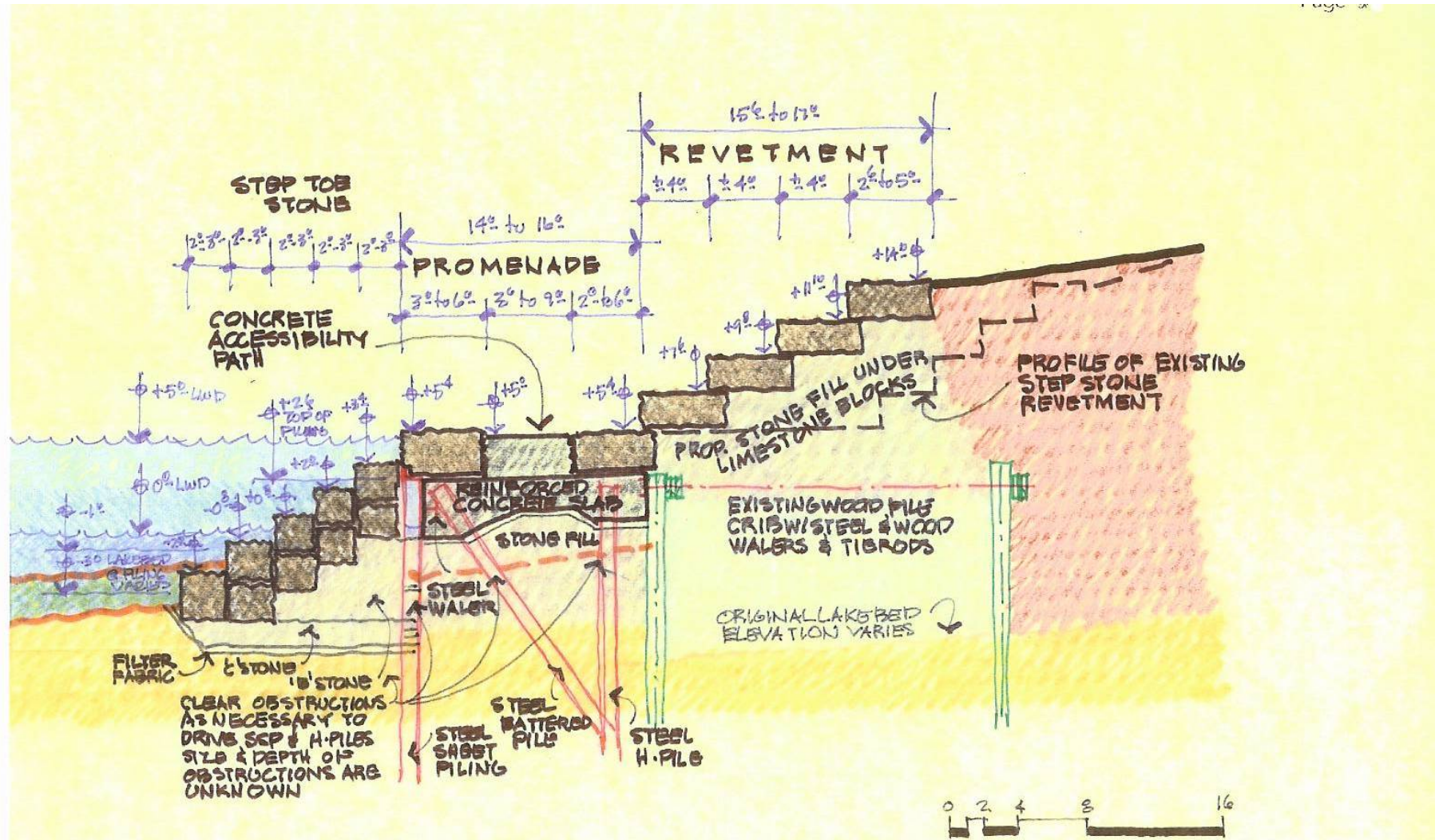
Section of segment A at Storm Gap – City Proposal



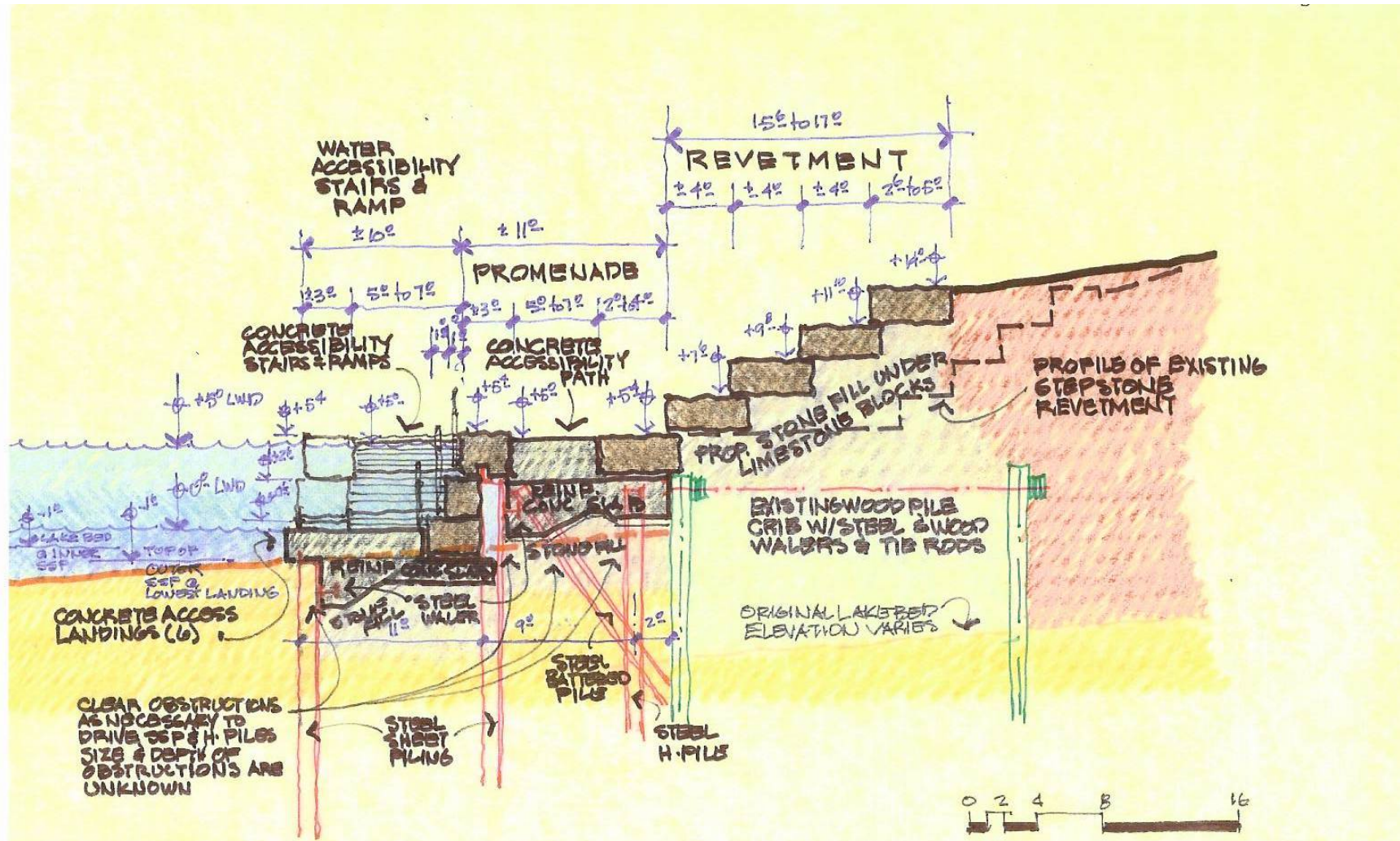
TOTAL LIMESTONE PROMENADE & REVEMENT RECONSTRUCTION
SEGMENT A @ STORM GAP. STATION 1208+50 (SEGMENT F. STATION 1240+50 SIMILAR)



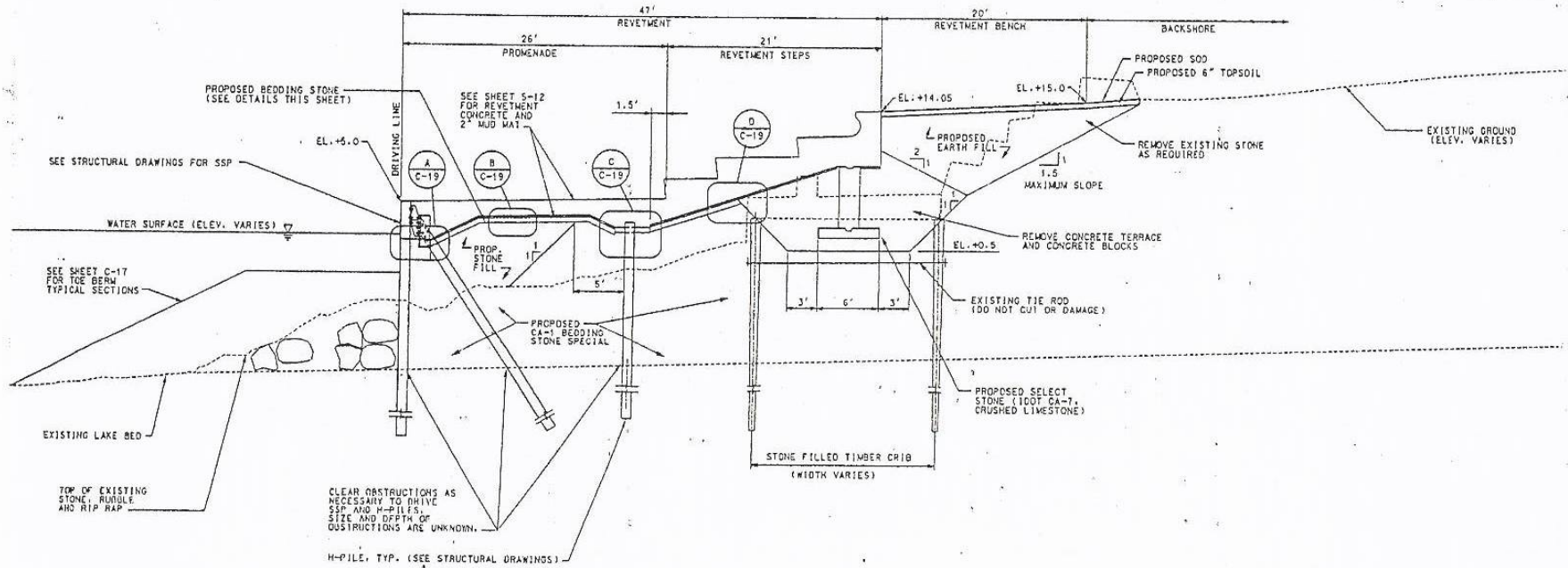
Section of segment B Submerged Beach 1210 – 1219 – City Proposal



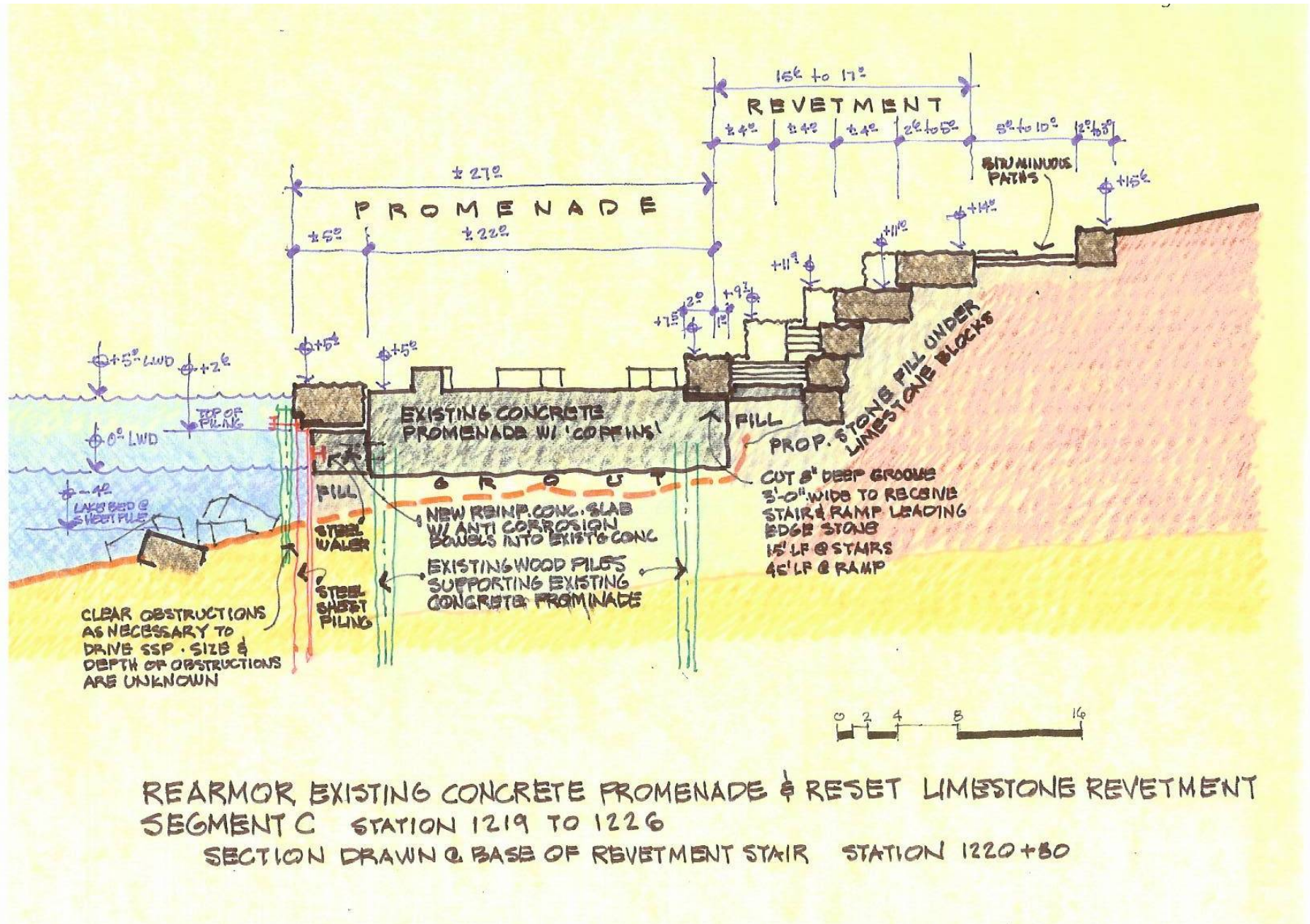
TOTAL LIMESTONE PROMENADE & REVETMENT RECONSTRUCTION
SEGMENT B (SUBMERGED BEACH) STATION 1210 TO 1219
STEP TOE STONE ('A' STONE 3 TONS OR GREATER)
STATION 1219 TO 1216
WOOD PILE ICE BUMPER STATION 1216 TO 1219

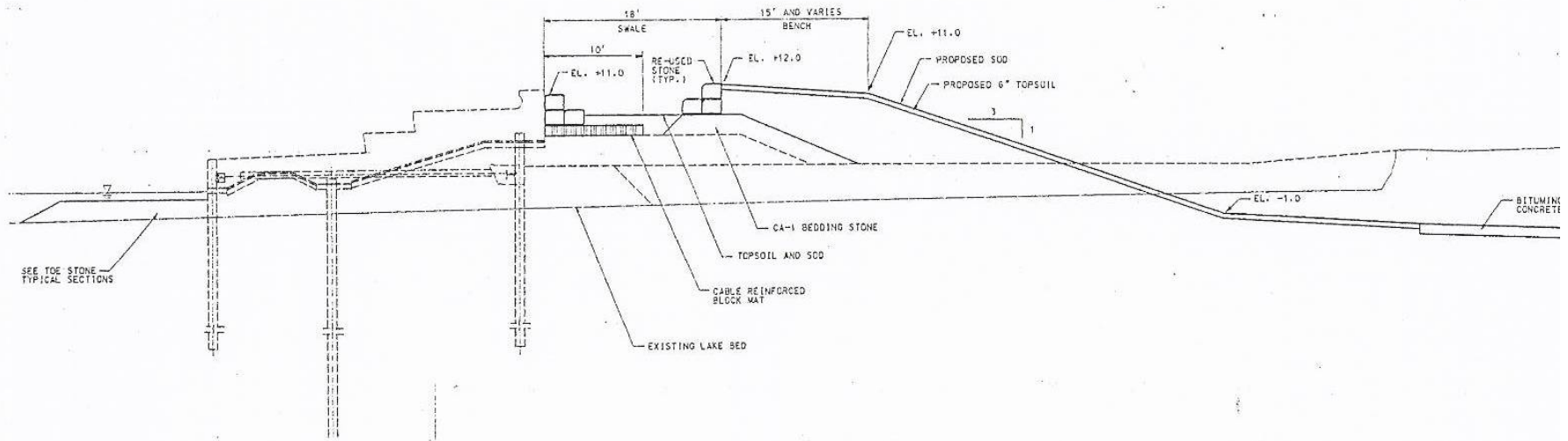


TOTAL LIMESTONE PROMENADE & REVELMENT RECONSTRUCTION
SEGMENT B (SUBMERGED BEACH) STATION 1212+25 TO 1214+50
WATER ACCESSIBILITY STAIRS & RAMP
EDGE STONE TYPE 'A' STONE - MIN. 4 TONS - KEYED INTO SSP SAME AS
PROMENADE EDGE STONE

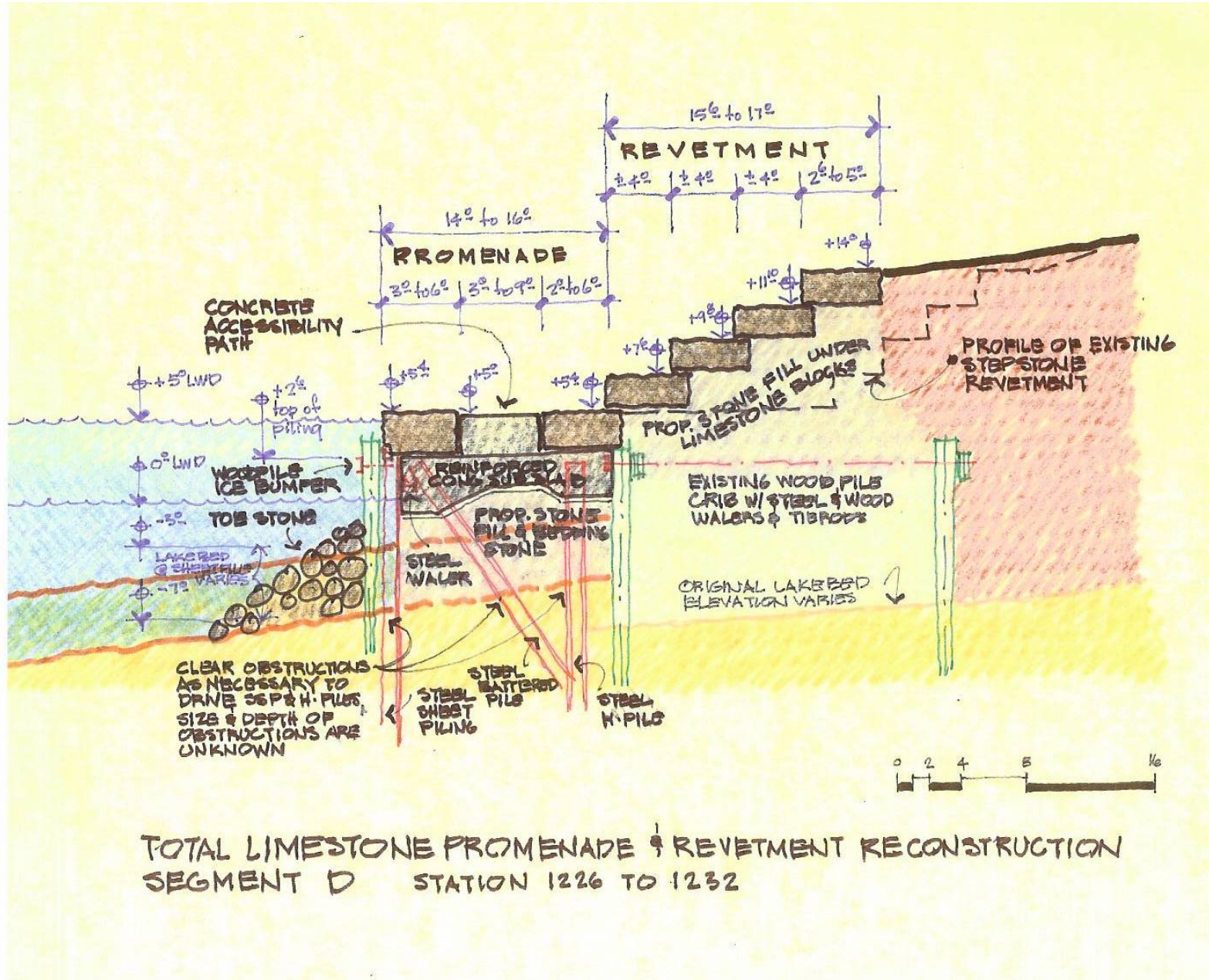


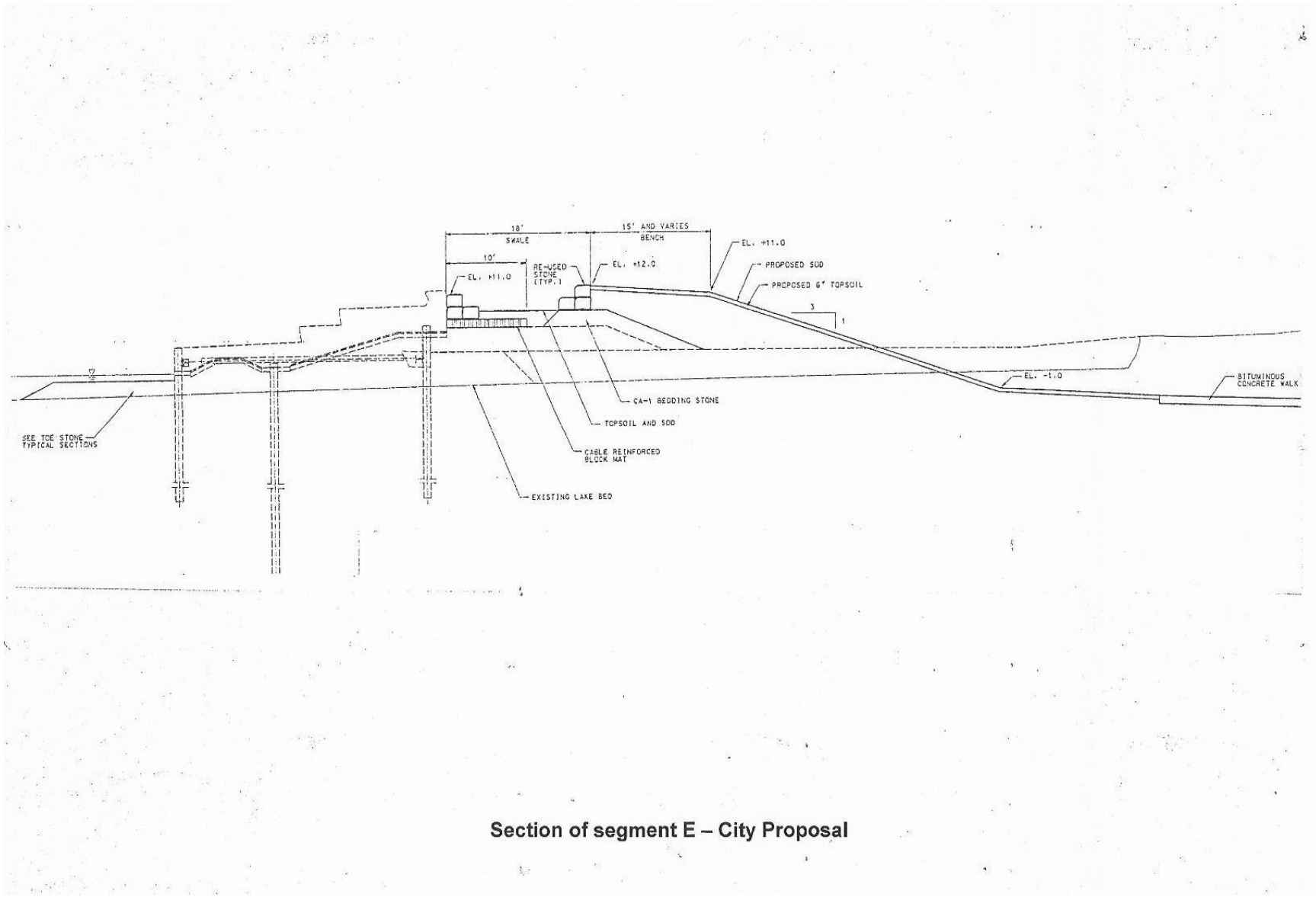
Section of segment C – City Proposal





Section of segment D – City Proposal

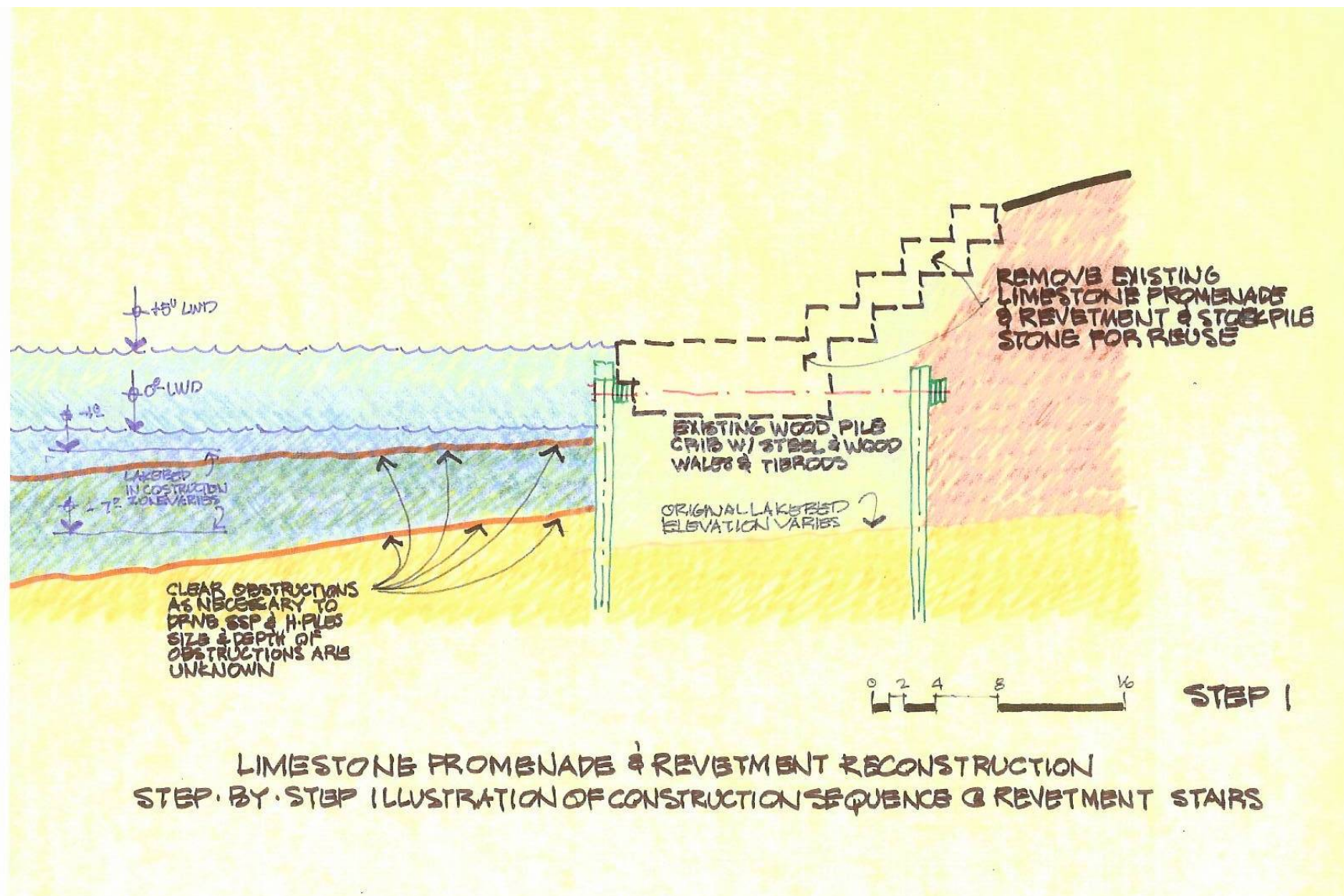


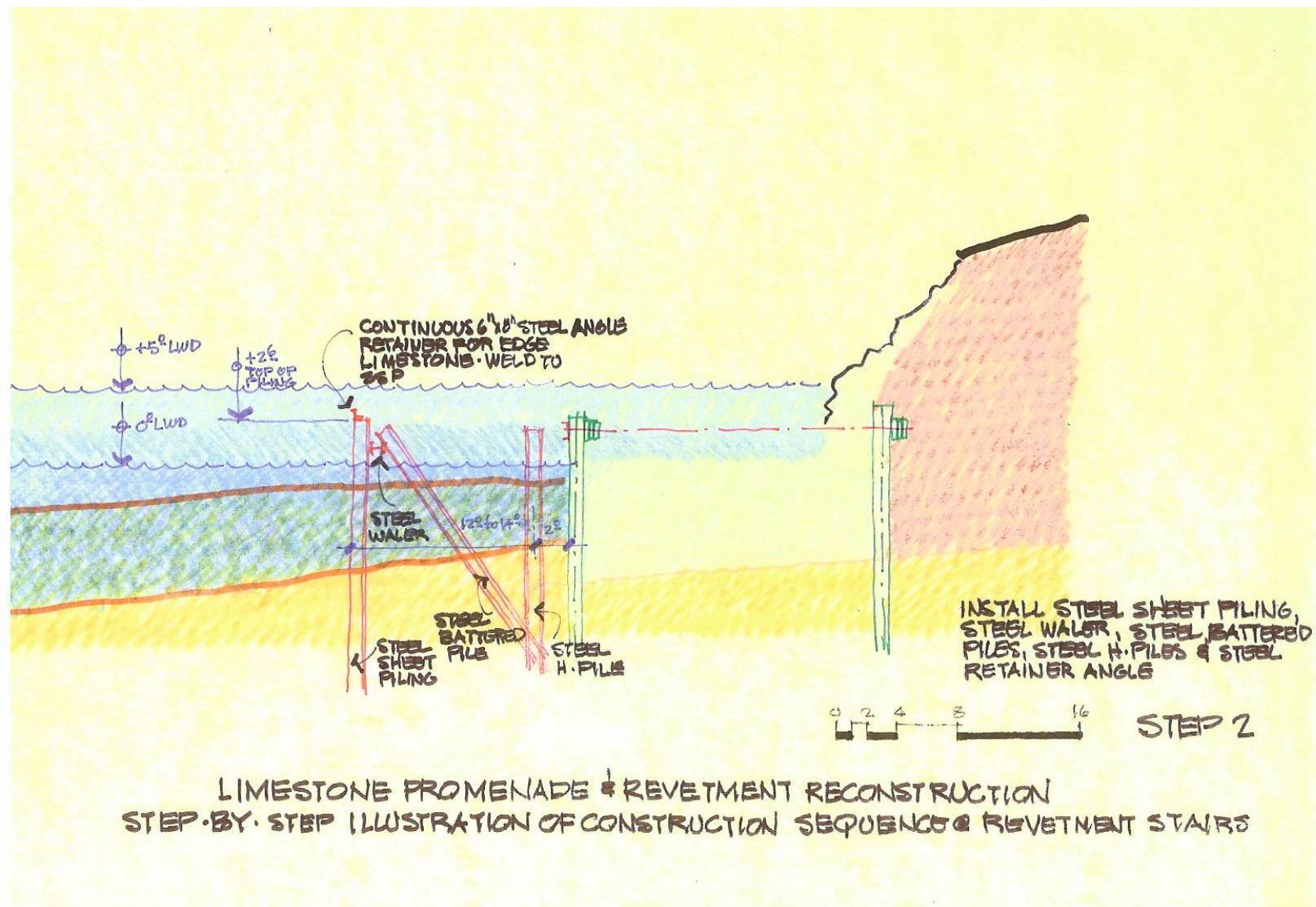


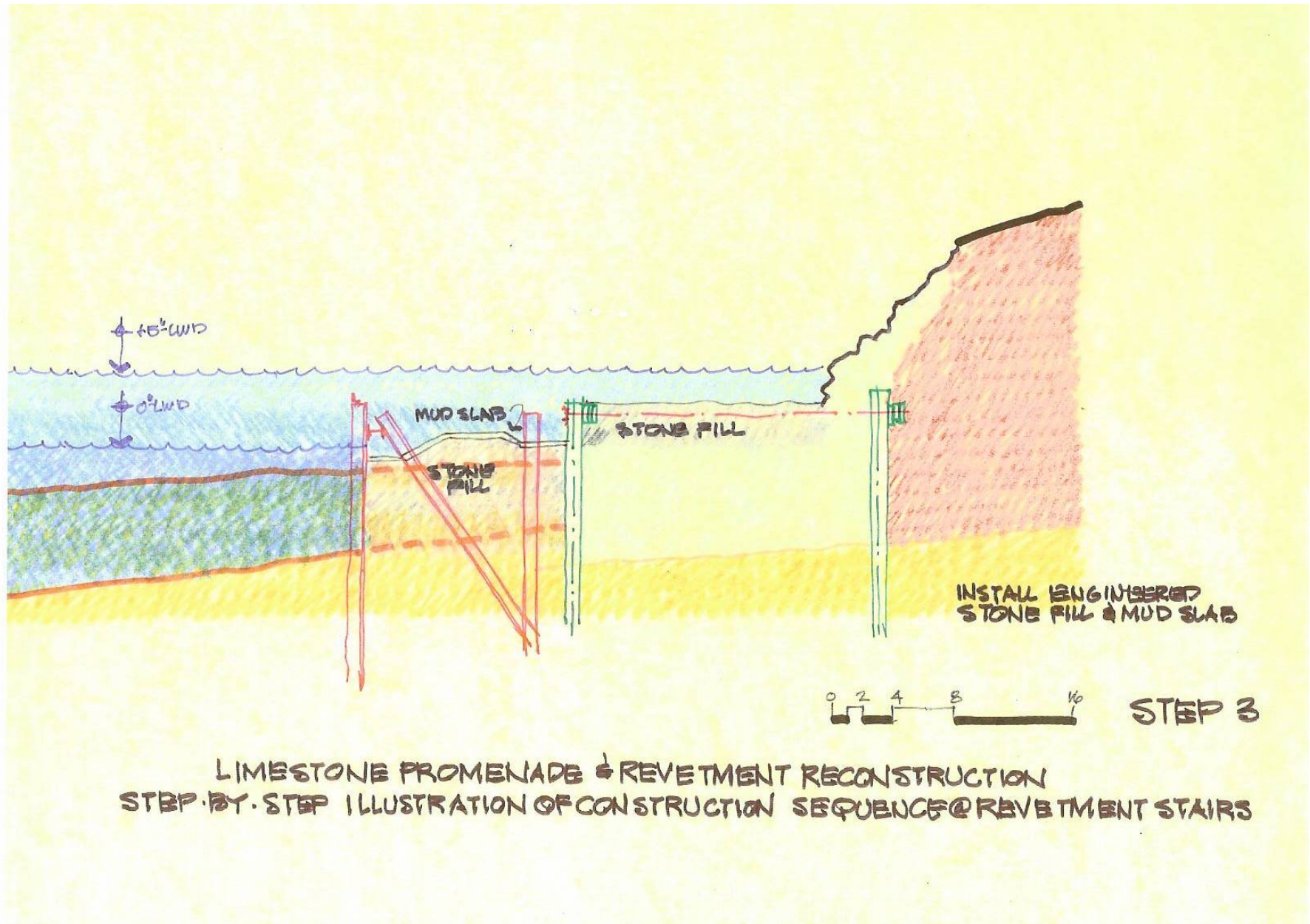
Section of segment E – City Proposal

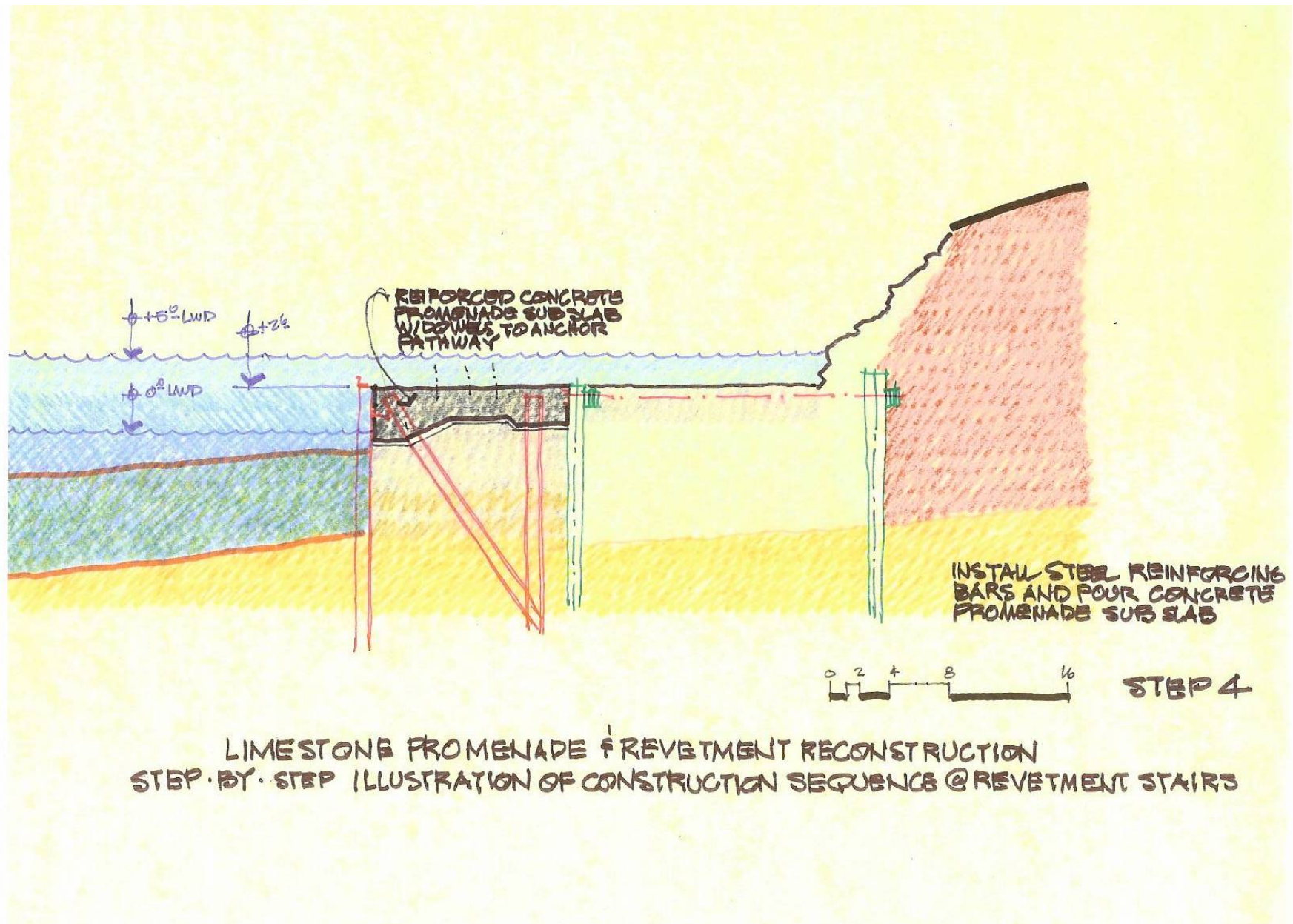
Sections Illustrating Sequence of Construction

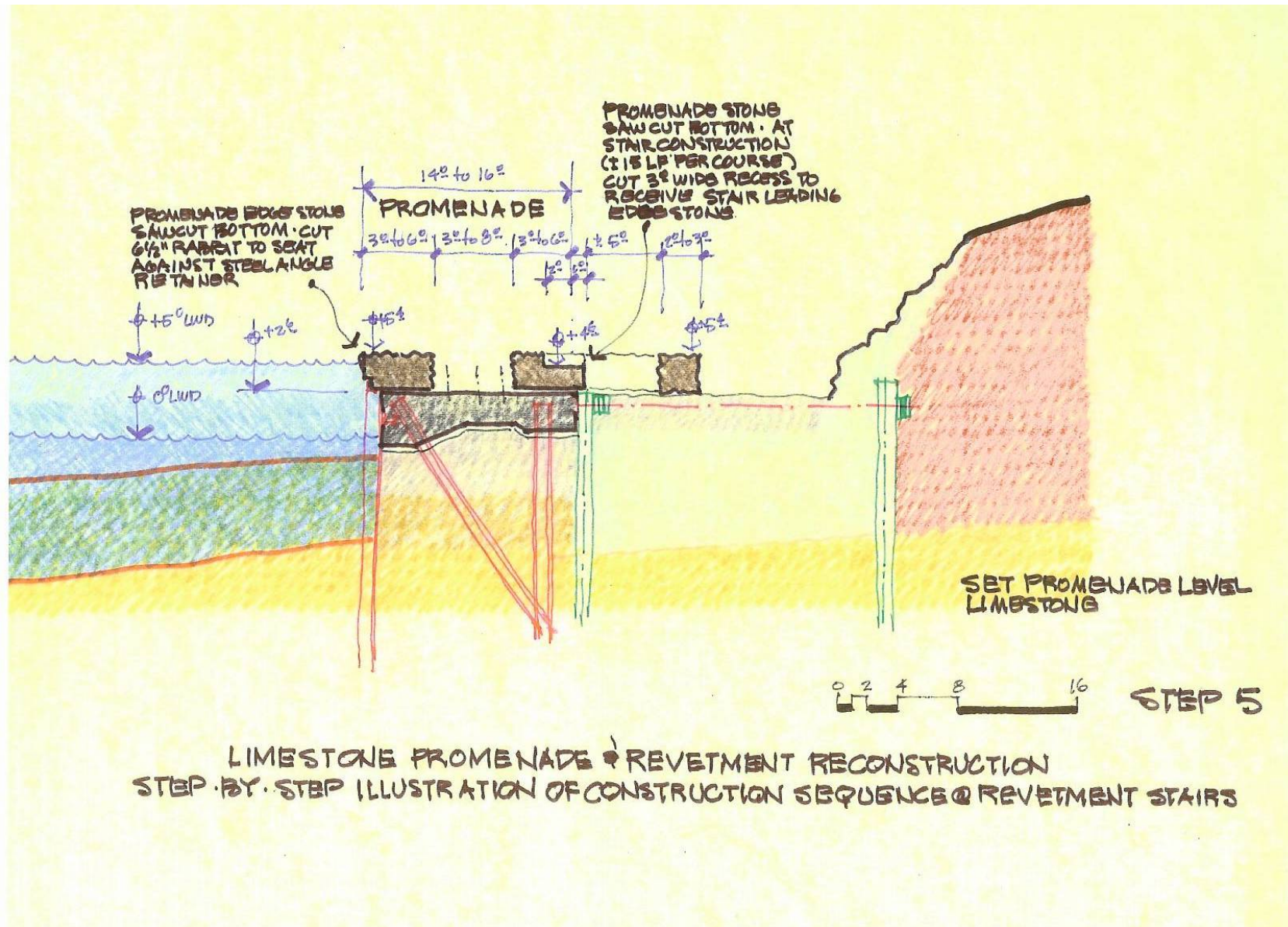
The sections shown on the next 10 pages illustrate the step-by-step sequence of construction for the preservation plan.

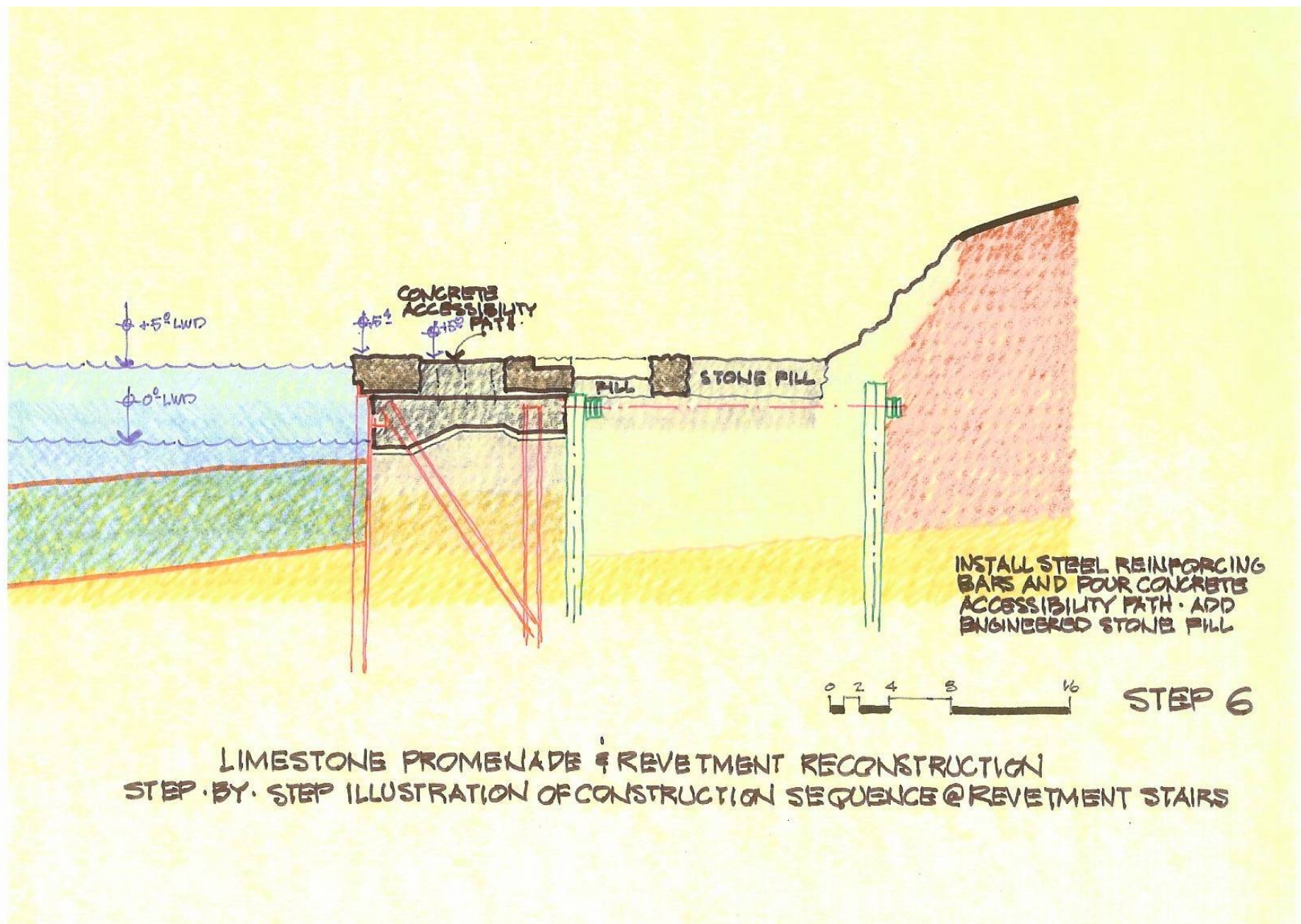


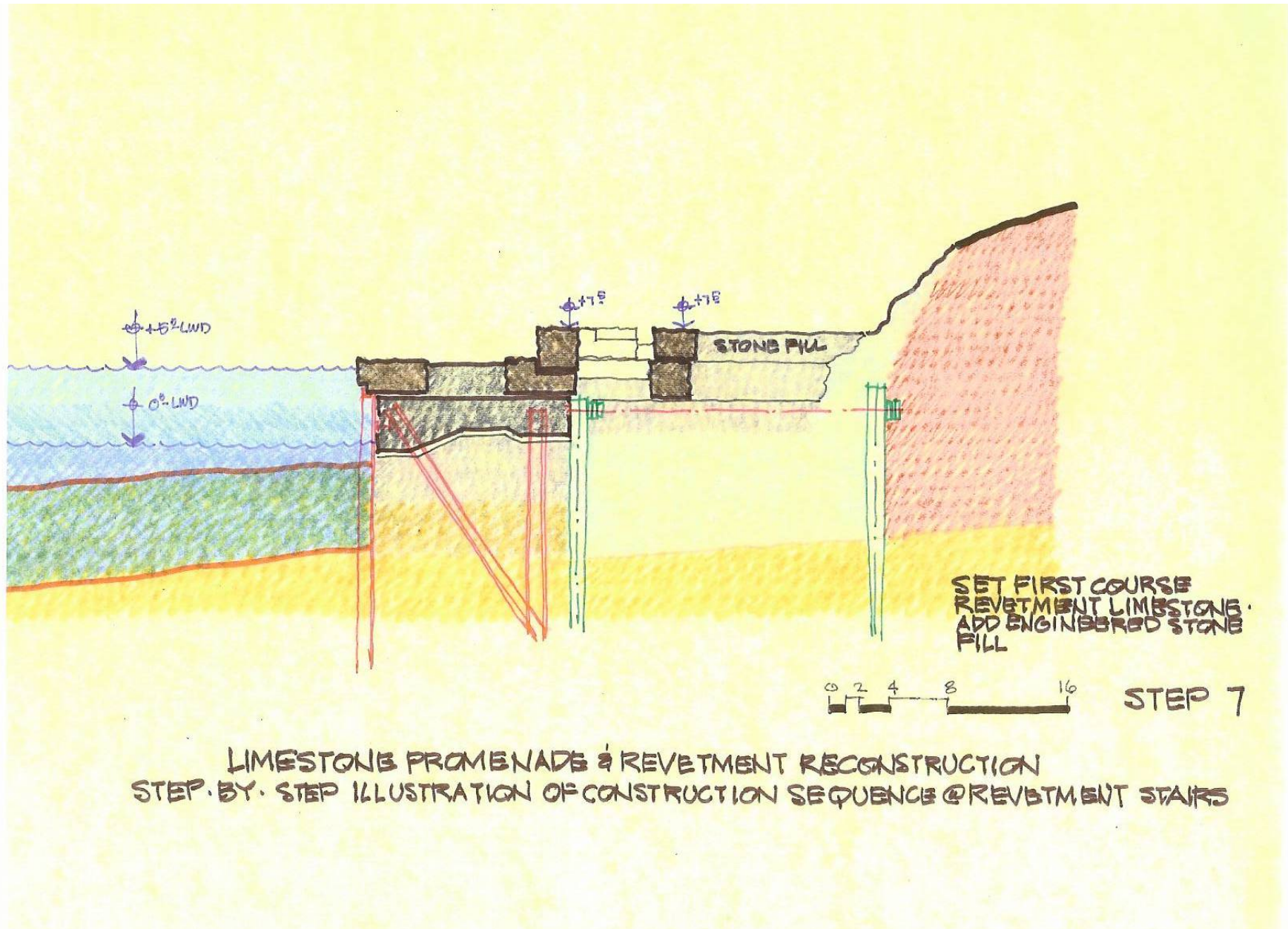


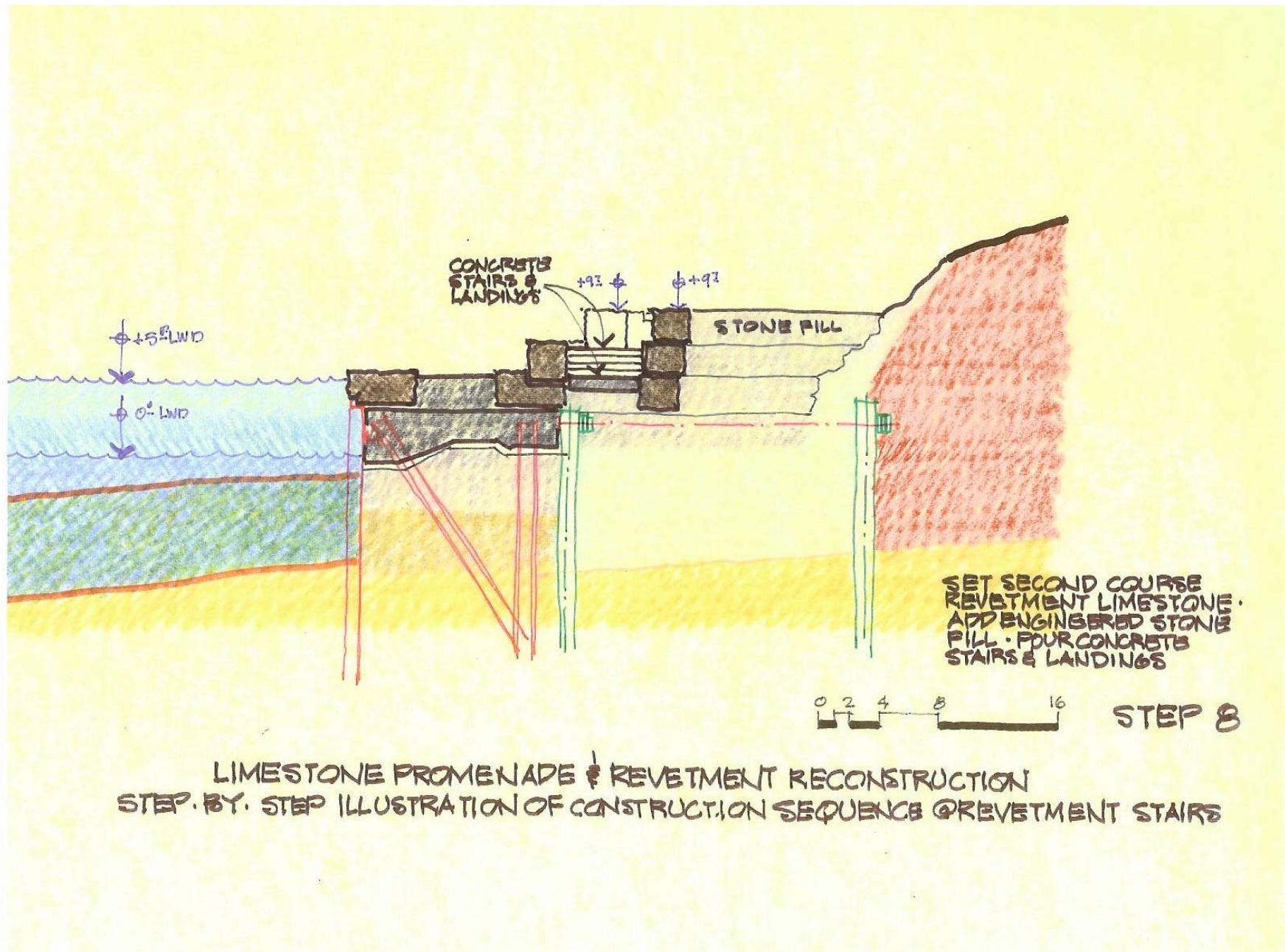


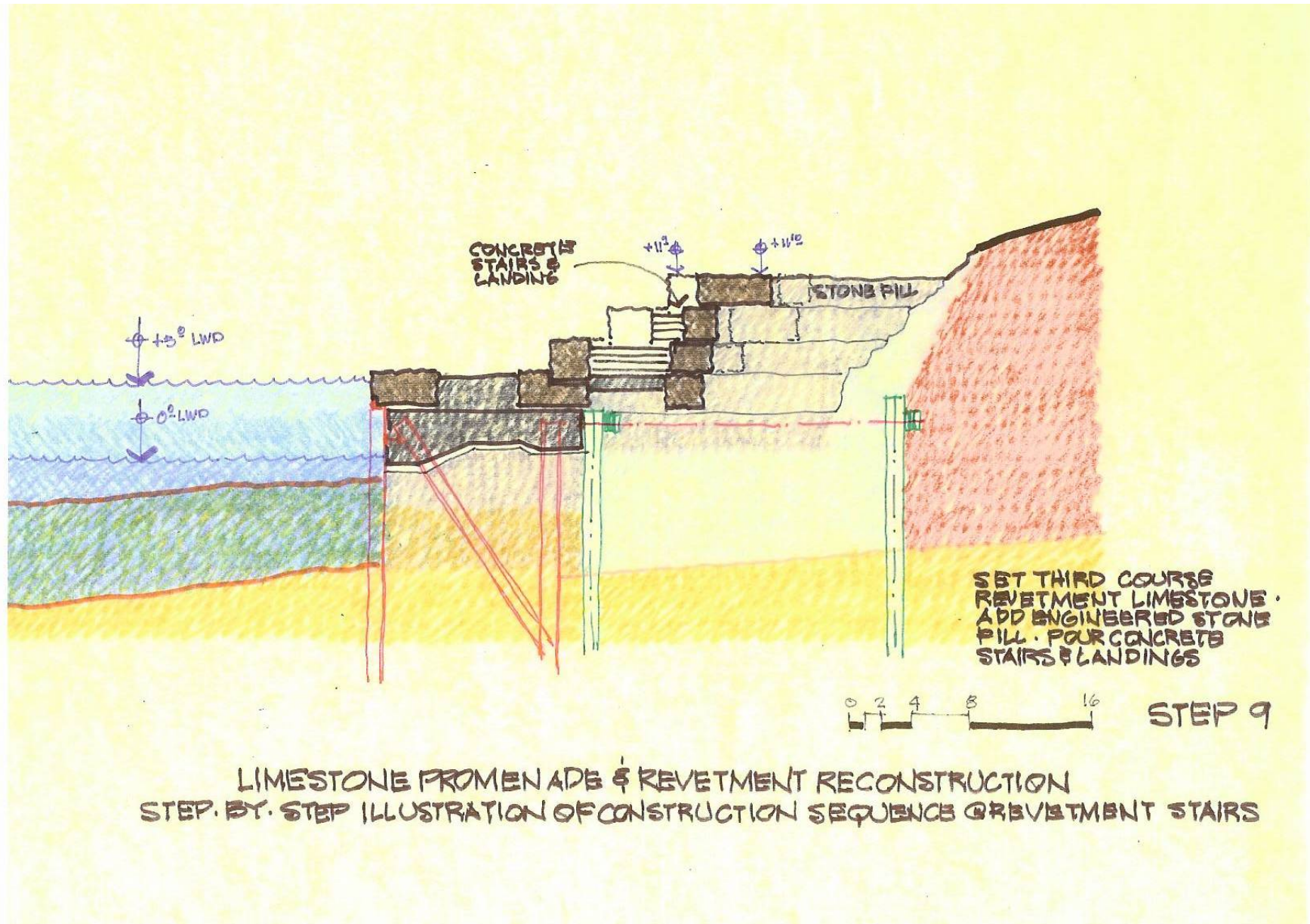


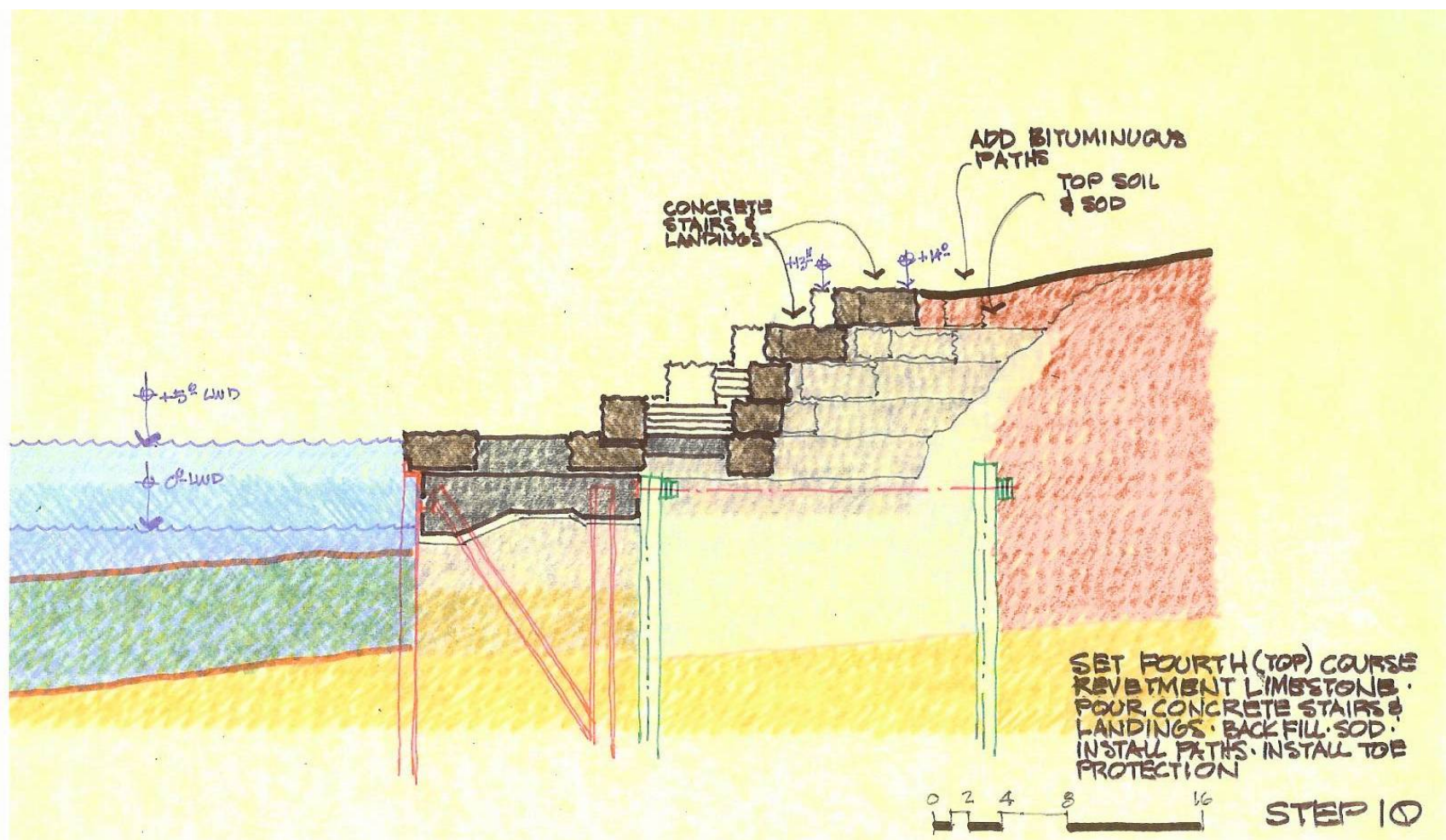












LIMESTONE PROMENADE & REVTMENT RECONSTRUCTION
STEP-BY-STEP ILLUSTRATION OF CONSTRUCTION SEQUENCE @ REVTMENT STAIRS
INSTALL TOE PROTECTION SYSTEMS WHEN APPROPRIATE

Response to STS Critique

The following is a point-by-point response to the review comments by the City's engineering consultant, STS, dated June 18, 2003.

Figure 1

Comment 1a: “Steel Sheet Pile cannot be driven through rubble”

Response: As STS also indicates on its 75% submittal drawings, (sheets C-19, C-20, C-21, S-12, S-13, and S-14) obstructions to sheet pile and H-pile driving will be cleared prior to driving.

Comment 1b: “Clearing rubble at driving line could cause crib failure”

Response: New sheet piling will be fifteen feet in front of wood pile cribbing, and clearing will be done in small sections at a time, so that piling will not fail.

Comment 1c: “SSP [steel sheet piling] crane too heavy for crib”

Response: No heavy equipment is anticipated to be loaded onto crib structure – construction will be done from land behind cribbing or from barge.

Comment 1d: “SSP [steel sheet piling] needs tie back and anchorage systems”

Response: Sheet piling will be provided with steel walers and battered piles for tie back and anchorage.

Comment 2a: “[Batter pile] cannot be driven through rubble and crib”

Response: The community's consulting coastal engineer, in consultation with the Edward E. Gillen Company, the most reputable marine contracting company in the world, states that batter piles can be and have been driven through wood piling and rubble.

Comment 2b: “Batter piles alone not structurally sufficient”

Response: Batter piles in the community's proposal make up a rigid frame which includes the horizontal steel waler, steel sheet piling, vertical H-piles, and a 2'-9”

thick reinforced horizontal concrete slab – see sections at each segment, pages 37, 39, 41, 43, 45 and 47.

Comment 3a: “Tie rods have failed”

Response: Tie rods have no function in the community's proposal.

Comment 3b: “Timber piles have deteriorated”

Response: Existing timber piles are not being used for any function in the community's proposal.

Comment 3c: “Not feasible to tie new wall structure into failed crib”

Response: Existing revetment is not supported on crib, but will be rebuilt on new engineered fill in segments A, B, C, D, and F, and remain in place in its currently stable condition in segment E.

Comment 3d: “Crib cannot support heavy equipment”

Response: No heavy equipment is anticipated to be loaded onto crib structure – construction will be done from land behind cribbing or from barge.

Comment 4a: “Floating' sidewalk will fail”

Response: Concrete sidewalk is structurally supported by the steel sheet piling and the steel H-piles in the community's proposal - see sections at each segment, pages 37, 39, 41, 43, 45 and 47.

Comment 4b: “Narrow concrete path will cause crowding”

Response: Concrete path is designed for accessibility to disabled persons. Ambulatory persons will use stone promenade, just as they prefer to do now.

Comment 4c: “Universal access is too limited”

Response: The width of the smooth path will vary along the perimeter of the Point promenade. In consultation with John McGovern, Executive Director of the

Northern Suburban Special Recreation Association and past chair United States Architectural and Transportation Barriers Compliance Board (Access Board) committee on the development of design requirements for accessibility to outdoor developed areas and recreation facilities, Robin Jones, Executive Director of the Great Lakes ADA & Accessible IT Center, and representatives from various community disability advocacy organizations, it is agreed that a minimum dimension of 5'-0" is appropriate for this function. In addition, it was agreed during several focus group sessions on this subject that having resting points where the width of the path increased and sitting elements are placed as they are in the community's proposal, is far more desirable to a wheelchair user than a straight, featureless path. One of the major reasons for providing access to persons with disabilities is to provide a rich and natural environment for their enjoyment in a non-discriminatory manner.

Comment 4d: "No universal access at times of high water"

Response: Elevation +5'-0" is the established high water level. If water rises above 5'-0" then there is an alternative path at the top of the revetment to allow circumnavigating, if desired. In addition, there are intermediate accessible levels provided for in segments A, C and F.

Comment 5: "Stone toe protection system inadequate"

Response: Toe protection system as shown in the sections at each segment, pages 37, 39, 41, 43, 45 and 47, is designed with a double layer of interlocking armor stone, in an identical manner to STS submittal detail on sheet C-17.

Comment 6a: "Ice and wave attack will cause stones to lift and move"

Response: In accordance with accepted coastal engineering standards, the designed three ton armor stones will withstand the ice and wave action without moving.

Comment 6b: "Steel may become damaged due to stone movement"

Response: Stone will not move (see above response)

Comment 6c: "SSP [steel sheet piling] / stone connection problems"

Response: Stone is not connected to steel sheet piling, but is supported on a reinforced concrete slab.

Comment 7a: "Single layer armor stone not acceptable"

Response: In accordance with accepted coastal engineering standards, and as visibly evidenced by the stability of the existing revetments, a single layer of armor stone is structurally adequate, given the weight of the stones to be used. It is true that loose rubble stone revetments would typically require a double layer, but that is not what is being proposed. However, if the City mandates a double layer of armor stone in the revetment, there is ample funds available in the budget, and it can be provided. Sections show this as an alternate.

Comment 7b: "Steps will settle differentially"

Response: Steps are supported on a reinforced concrete slab keyed into the major concrete structural element. They will also be supported on engineered fill just like the revetment.

Comment 7c: "No universal access is provided on any step level"

Response: In consultation with John McGovern, Executive Director of the Northern Suburban Special Recreation Association and past chair United States Architectural and Transportation Barriers Compliance Board (Access Board) committee on the development of design requirements for accessibility to outdoor developed areas and recreation facilities, Robin Jones, Executive Director of the Great Lakes ADA & Accessible IT Center, and representatives from various community disability advocacy organizations, it is agreed that access as provided in the community's proposal is appropriate for the functions as designed. One of the major reasons for providing access to persons with disabilities is to provide a visually appealing environment for their enjoyment in a non-discriminatory manner.

Since the promenade level is shared by both wheelchair users and persons who are ambulatory, it is the logical and preferred location for access. Persons who are ambulatory do not seek upper levels of the revetment to circumnavigate the Point. Access on the revetment levels only for the sake of access, with no visual stimulus or natural features, is worse than useless for a person with a disability.

Figure 2

Comments 1 – 6: see responses to Figure 1 comments 1 – 6 above.

Comment 7: [this number is not used]

Comment 8a: “Intricate architectural design not appropriate in wave zone”

Response: The community’s proposal is properly engineered to withstand wave action. Illinois licensed structural and professional engineers are willing to sign and seal the design.

Comment 8b: “Must be structurally tied to SSP [steel sheet piles]”

Response: As shown in the sections for segments B and C (pages 41 and 43) steps and ramp are supported on a reinforced concrete slab which is integrally tied into the SSP and other structural elements.

Comment 8c: “Existing crib piles not sufficient support”

Response: New structure is not supported on cribbing but on a new rigid frame which includes new steel sheet piling, a horizontal steel waler, batter piles, vertical H-piles, and a 2'-9" thick reinforced horizontal concrete slab – see sections on pages 41, and 43.

Comment 8d: “Need batter piles”

Response: Batter piles are shown at all new construction – see sections illustrating the community's proposal.

Comment 8e: "Waler by itself has no purpose"

Response: Purpose of waler is to attach batter piles to SSP – see sections on pages 39, 41, 43 and 47.

Comment 8f: "Universal access limited"

Response: In consultation with John McGovern, Executive Director of the Northern Suburban Special Recreation Association and past chair United States Architectural and Transportation Barriers Compliance Board (Access Board) committee on the development of design requirements for accessibility to outdoor developed areas and recreation facilities, Robin Jones, Executive Director of the Great Lakes ADA & Accessible IT Center, and representatives from various community disability advocacy organizations, it is agreed that access as provided in the community's proposal is appropriate for the functions as designed. One of the major reasons for providing access to persons with disabilities is to provide a visually appealing environment for their enjoyment in a non-discriminatory manner. Since the promenade level is shared by both wheelchair users and persons who are ambulatory, it is the logical and preferred location for access.

Comment 8g: "Promenade too narrow"

Response: The width of the smooth path will vary along the perimeter of the Point promenade. In consultation with John McGovern, Executive Director of the Northern Suburban Special Recreation Association and past chair United States Architectural and Transportation Barriers Compliance Board (Access Board) committee on the development of design requirements for accessibility to outdoor developed areas and recreation facilities, Robin Jones, Executive Director of the Great Lakes ADA & Accessible IT Center, and representatives from various community disability advocacy organizations, it is agreed that a minimum dimension of 5'-0" is appropriate for this function. In addition, it was agreed during

several focus group sessions on this subject that having resting points where the width of the path increased and sitting elements are placed as they are in the community's proposal, is far more desirable to a wheelchair user than a straight, featureless path. One of the major reasons for providing access to persons with disabilities is to provide a rich and natural environment for their enjoyment in a non-discriminatory manner.

Comment 9a: "Stone on concrete cannot resist waves"

Response: In accordance with accepted coastal engineering standards, the designed three ton armor stones will withstand the ice and wave action without moving.

Comment 9b: "Stones moving in waves will undermine concrete steps"

Response: Stones will not move – see response to 9a above.

Comment 9c: "Steps will settle differentially"

Response: Steps are supported on a reinforced concrete slab keyed into the major concrete structural element. They will also be supported on engineered fill just like the revetment.

Comment 9d: "Stones fixed in concrete – Thermal Stress Failure"

Response: According to the Indiana Limestone Institute of America, Inc., the coefficient of thermal expansion for limestone is from 0.0000024 in/in/°F to 0.0000030 in/in/°F. According to *Time Savers Standards for Architectural Design Data*, McGraw-Hill, 1997, the coefficient of thermal expansion for normal weight concrete with limestone aggregate is 0.0000033 in/in/°F. Given the widest range of coefficient of thermal expansion between these two materials and an extreme temperature range of 250°F from -100°F to +150°F, the differential expansion for a 3'-0" long limestone block as opposed to a concrete element of the same length is 0.0081 inches, a microscopic and negligible difference. Since there will be at least 0.125" space between elements, such expansion will be entirely absorbed within the space. An interesting fact of history is that the core of the ancient pyramids is

constructed of an early form of cast concrete blocks on which the facing of limestone is placed. Needless to say, this combination in a much more thermally adverse climate has lasted some 5000 years. Concrete and cementitious products of all kinds have been successfully combined with stone for several millennia. Indeed, the cementitious grout between the limestone blocks at Promontory Point has been permanently adhered to the stones for over 70 years.

Figure 3

Comments 1 – 7: see responses to Figure 1 comments 1 – 7 above.

Comment 8: [this number is not used]

Comment 9: see responses to Figure 2 comments 9 above.

Comment 10a: “Precast concrete unit will fail”

Response: No precast concrete will be used in the community’s proposal. Access landings and ramps will be reinforced poured-in-place concrete – see section for segment B, page 41.

Comment 10b: “Stone or Concrete – no stone interlocking”

Response: Stone and concrete are compatible materials and will be used in conjunction with one another as is commonly and successfully done. See response to comment 9d for Figure 2 above. In accordance with accepted coastal engineering standards, the designed three ton armor stones will withstand the ice and wave action without moving.

Comment 10c: “Single layer of stone in wave zone is not acceptable”

Response: A double layer of stone will be provided.

Comment 10d: "Water access liability unacceptable"

Response: Point 7 of the City's so-called "9-point compromise" states that "Open water swim access will be designated from 57th Street Beach to the end of the Point, as defined by a line of buoys."

Figure 4

Comments 1 – 7: see responses to Figure 1 comments 1 – 7 above.

Comment 8: [this number is not used]

Comment 9: [this number is not used]

Comment 10: see responses to Figure 3 comments 10 above.

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Cost Estimate

The following cost estimate was prepared by Shabica and Associates, Inc., Coastal Consulting. It reflects the Hyde Park Community's preservation plan, and relies on the same unit prices and contingencies that STS did in putting together their cost estimate for the city's proposal.

Cost Estimate

Description	Item	Quantity	Units	Unit Price	Amount
MOBILIZATION AND DEMOBILIZATION	001	1	LS	\$1,400,000.00	\$1,400,000.00
TEMPORARY FIELD OFFICE, PROJECT SIGN AND SAFETY SIGN	002	1	LS	\$578,532.50	\$578,532.50
SITE PREPARATION AND DEMOLITION					
Existing Structure Removal	003	1	LS	\$179,523.25	\$179,523.25
Reset Existing Armor "Bedford" Stone as Toe - Segments ABEFD	004	6,285	TON	\$110.00	\$691,350.00
Reclaim Existing Toe Stone	005	12,000	TON	\$50.00	\$600,000.00
EARTH WORK AND EMBANKMENT					
Earth Fill	006	5,000	CY	\$8.00	\$40,000.00
Topsoil Placement	007	7,625	CY	\$11.00	\$83,875.00
SEPARATION/FILTRATION GEOTEXTILE					
Geotextile (Above Water)	008	75,000	SF	\$0.23	\$17,250.00
Geotextile (Below Water)	009	37,500	SF	\$3.35	\$125,625.00
STONE PLACEMENT AND CONSTRUCTION					
Type A- Stone (Saw cut "Bedford" Stone Elliott Quarry)	010	5,300	TON	\$150.00	\$795,000.00
Type A- Stone "Bedford" (Elliott Quarry)	011	5,400	TON	\$135.00	\$729,000.00
Type B- Stone (200 to 800 lbs.)	012	2,140	TON	\$60.00	\$128,400.00
Type C- Stone (1 to 150 lbs.)	013	3,900	TON	\$55.00	\$214,500.00
Select Stone (IDOT CA-7 crushed limestone)	014	16,630	TON	\$22.55	\$375,006.50
Bedding Stone Special (IDOT CA-1 gradation)	015	48,000	TON	\$22.00	\$1,056,000.00
SOD	016	114,942	SF	\$0.40	\$45,976.80
BITUMINOUS CONCRETE PAVEMENT	017	26,300	SF	\$4.30	\$113,090.00
CAST-IN-PLACE REINFORCED STRUCTURAL CONCRETE					
Furnish and Place Reinforced Concrete for Promenade Level Including Stair Sections, ramps, storm gaps	018	5,921	CY	\$380.00	\$2,249,980.00
Grout - below C Promenade, E Stepstones	019	2,500	CY	\$125.00	\$312,500.00
STEEL H-PILES					
Battered HP 12x53	020	6,150	FT	\$35.90	\$220,785.00
Battered HP 14x73	021	12,470	FT	\$41.90	\$522,493.00
Vertical HP 12x74	022	18,415	FT	\$27.60	\$508,254.00
Test Pile Load Test	023	1	LS	\$45,000.00	\$45,000.00
WOOD PILES (Ironwood Lumber, WI)	024	1,430	FT	\$110.00	\$157,300.00
METAL SHEET PILING, WALERS AND STRUTS					
Steel Sheet Pile (PZ27)	025	142,495	SF	\$17.30	\$2,465,163.50
Steel Walers and Struts for Steel Sheet Pile	026	1	LS	\$794,000.00	\$794,000.00
Steel Walers and Channels for Wood Piling	027	1,430	FT	\$225.00	\$321,750.00
Stainless Steel Railing	028	960	FT	\$110.00	\$105,600.00
SUBTOTAL					\$14,875,954.55
CONTINGENCY 15%					\$2,231,393.18
GRAND TOTAL					\$17,107,347.73
Cost estimate assumes a 2 year construction schedule					

APPENDIX 1 - Promontory Park step stone revetment and promenade, assumptions

1. Contract Plans *Chicago Shoreline Damage Reduction 54th Street to 57th Street, Specifications and Contract Documents, 2001, 50% and 75% Submittals*, City of Chicago, and Drawings i, iii and iv in *Promontory Point in Burnham Park 54th to 57th Streets in Chicago, Illinois* dated March 12, 2003, have been used as a basis to provide construction cost estimates for the restoration of the stepped limestone revetment system at Promontory Park. In several cases, the Community's Preservation Plan drawings were altered to conform to modern structural and coastal engineering practices. For instance, the toe stone and promenade designs have been modified in order to assure structural stability and allow for better estimates for quantities of steel, stone and concrete (see revisions 7/2003). There are other design modifications that will need to be made if it is decided to proceed with the Community's Preservation Plan.
2. Available limestone blocks to be reused have dimensions as measured by Cyril Galvin (average dimensions from 250 blocks, measured June 2002).
3. Lengths of sections (NX through SX) are indicated by coordinate system in feet.
4. No work is to be done at sections NX and SX and no work on step stones at sections E and F.
5. 75% of existing Bedford stones can be reused.
6. Second (lower) tier of stone in original promenade as shown by "Burnham Park Permanent Shore Protection at 55th Street, May 16, 1936 (Sheet H-12)" are not incorporated in the estimates but can be reused for a credit to the client.
7. Although the step revetment designs show a single armor layer, this can be modified to a 2 armor layer structure. This will require sawcutting one side (bottom) of all top layer step stones, an additional 4,610 tons of (top-side sawcut) bottom layer step stones, filter-layer stone, bedding stone and additional geotextile. This will increase the estimated construction cost by \$812,000.
8. Steel sheeting and battered piles will be driven lakeward of existing wood pile and stone structure (typically 15 feet). At locations where the plans call for closer sheet piles (for example Segment C, "Coffins"), precautions should be taken to avoid collapse of the wood and concrete when toe stones are rehandled. Options include but are not limited to driving a temporary sheet pile wall farther off the existing wood piles or grouting the voids under the concrete prior to rehandling toe stone and driving piles.

APPENDIX 2 Estimation of available Bedford Stone for reuse in new structures

1. Method 1 Use original Park District design cross-section from "Burnham Park Permanent Shore Protection at 55th Street, May 16, 1936, sheet H-12" to find total volume (ft³) of Bedford stones in step structure, 3400 feet in length (*includes lower tier of 5 Bedford stones not estimated in methods 2 and 3*).

Cross-sectional area 130 ft² x length 3400 ft. = **442,000 ft³ total volume**

Calculate volume of stones replaced by 720 ft. long concrete "coffin" structure at east end of Promontory Point shown in "55th Street Promontory New Concrete Walk Plans & Section, July 16, 1964," coordinates 1218+80 to 1226+00)"

4ft thick x 18ft wide x 720ft long = **51,840 ft³ volume**

Subtract volume of stone replaced by concrete "coffin" structure from total volume

442,000 ft³ - 51,840 ft³ = **390,160 ft³**

Assume limestone density of 144 lbs./ft³ (Associated Geologists, Inc. (AGI) report, 4/4/2001) and porosity of 30%.

$$\frac{144 \text{ lbs./ft}^3 \times 390,160 \text{ ft}^3 \times 0.7}{2000 \text{ lbs./ton}} = \mathbf{19,664 \text{ tons Bedford stone}}$$

The estimated weight of the lower tier of 5 stone is

$$\frac{(4 \times 4 \text{ ft.} \times 2.75 \text{ ft.} \text{ plus } 1 \times 3 \text{ ft} \times 2.25 \text{ ft}) \times 3400 \text{ ft} \times 144 \text{ lb/ft}^3 \times 0.7}{2000 \text{ lb.}} = \mathbf{8696 \text{ tons}}$$

If it is assumed that none of the lower tier stones are available, then the total is reduced to **10,967 tons Bedford Stone**

2. Method 2 Use average dimensions for 250 blocks, measured June, 2002 (Cyril Galvin report, 11/18/02), to calculate volume (ft³) for 3400 foot structure (Shabica Figure 1). *Lower tier of Bedford stones shown in May 16, 1936 drawings not used for area due to unknown sizes and condition of blocks.* This is based on 4 step stone blocks at 4 ft. by 2.25 ft. plus 4 promenade blocks at 4 ft. by 2.25 ft.

$$80 \text{ ft}^2 \text{ cross-sectional area} \times 3400 \text{ ft. length} = \mathbf{256,000 \text{ ft}^3}$$

Calculate volume of stones replaced by 720 ft. long concrete "coffin" structure at east end of Promontory Point based on Galvin measurements

$$4 \text{ stones} \times 2.75 \text{ ft} \times 4 \text{ ft. stone cross-section} \times 720 \text{ft} = \mathbf{31,680 \text{ ft}^3}$$

$$256,000 \text{ ft}^3 - 31,680 \text{ ft}^3 = \mathbf{224,320 \text{ ft}^3}$$

Assume limestone density of 144 lbs./ft³ and porosity of 30%

$$144 \text{ lbs./ft}^3 \times 224,320 \text{ ft}^3 \times 0.7 = \mathbf{11,305 \text{ tons Bedford stone}}$$

3. Method 3 Use Stone Block Inventory from 54th to 57th street by Associated Geologists, Inc. report, April 4, 2001. Individual limestone blocks were measured onsite and listed by row (from promenade-row 1 to upper step-stone row 6). The weight, in tons, for an average stone in a 100 ft long row was calculated by AGI using average stone dimensions and 143.9 lbs/ft³. These per/stone weights were multiplied by the number of stones AGI counted in each row and added together for the 3000 ft. section of revetment measured. The total weight of Bedford stones reported by AGI is approximately **10,000 tons** or 3.333 tons per linear foot of revetment. If this average stone weight per foot is multiplied by the 400 foot section not measured, 1,333 additional tons can be added for a total stone weight of **11,333 tons Bedford stone**.

Conclusion

Based on the above comparisons, we recommend using 11,000 tons as a conservative estimate for existing Bedford stone. This number should be reduced by approximately 1965 tons to **9035 tons** as the stone at sections NX and SX and steps at sections E and F will not be reused. If it is assumed that only 75% of these can be reused in the proposed promenade or steps then the amount of existing Bedford stone available is **6,776 tons**.

It is our opinion that the actual stone available to be reused on site is closer to 8,700 tons if 75% of one-third of the lower promenade tier of Bedford stone shown on sheet H-12 is recovered. In the AGI report it is stated, "In the few instances where the blocks in Row 2 or Row 3 have collapsed, and the interior or the block design can be viewed, additional blocks were observed in about one-third of the cases."

APPENDIX 3 Steel Estimates for Promontory Point Concepts-March 12, 2003 Proposal

STEEL SHEET

Coordinates	Length (ft.)	Sheet Pile Type/ Min. Length	Area (ft.2)	Unit Price	Amount
1207+25 to 1217+51	1026	PZ27/40 feet	41040		
1217+51 to 1228+50	1099	PZ27/45 feet	49455		
1228+50 to 1239+00	1050	PZ27/40 feet	42000		
1212+25 to 1214+50	250	PZ27/40 feet	10000		
Total	3175 ft.		142,495 ft2	\$17.30 per ft2	\$2,462,463.50

BATTERED PILES

Coordinates	Length (ft.)	Battered Pile Type/ Min. Length	Spacing	Total Piles Needed	Total Linear Feet	Unit Price	Amount
1207+25 to 1214+45	720	HP 12x53/50 feet	9'-0" centers	80 +1 for end	4050	\$35.90 per foot	\$145,395
1214+45 to 1228+50	1405	HP 14x73/60 feet	9'-0" centers	156 +1 for end	9420	\$41.90 per foot	\$394,698
1228+50 to 1234+49	599	HP 14x73/50 feet	9'-0" centers (233 feet) 11'-0" centers (366 feet)	26 +1 for end 33 +1 for end	1350 1700	\$41.90 per foot	\$127,795
1234+49 to 1239+00	451	HP 12x53/50 feet	11'-0" centers	41 +1 for end	2100	\$35.90 per foot	\$75,390
Total	3175 ft.			341 piles	18620 feet		\$734,278.00

VERTICAL PILES

Coordinates	Length (ft.)	Vertical Pile Type/ Min. Length	Spacing	Total Piles Needed	Total Linear Feet	Weight (Tons)	Unit Price	Amount
1207+25 to 1217+51	1026	HP 12x74/50 feet	Max. 9'-0" centers	114 +1 for end	5750			
1217+51 to 1228+50	1099	HP 12x74/55 feet	Max. 9'-0" centers	122 +1 for end	6765			
1228+50 to 1239+00	1050	HP 12x74/50 feet	Max. 9'-0" centers	117 +1 for end	5900			
Total	3175 ft.			355 piles	18415 feet		\$27.60 per foot	\$508,254.00

Acknowledgements

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Bruce Johnstone

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Connie Spreen

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Cyril Galvin, Coastal Engineer

Charles Shabica, Coastal Engineer

John McGovern, Accessibility Advisor

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