

Remedial Action Completion Report
for
Masonville Cove Uplands
(Access Zone 1)
Baltimore, Maryland 21225/21226

Prepared for

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April 2012

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LIST OF ACRONYMS AND ABBREVIATIONS

GAB	Graded Aggregate Base
HASP	Health and Safety Plan
MDE	Maryland Department of the Environment
MES	Maryland Environmental Service
MHW	Mean High Water
MN	Moffatt and Nichol
MPA	Maryland Port Administration
PPE	Personal Protective Equipment
RD/RA	Remedial Design/Remedial Action
USACE	United States Army Corps of Engineers

1.0 INTRODUCTION

This Remedial Action Closure Report was prepared by Maryland Environmental Service (MES) on behalf of the Maryland Port Administration (MPA). The proposed redevelopment plan for the Masonville Cove Uplands site (“the site”) is a limited-access recreational area to include a limited use, publicly accessible environmental education and preserve area with hiking trails and open-water access. Based on environmental conditions at the site and the proposed future use, Level 2: Public Recreational Area (Moderate Frequency Use) requirements (MDE 2008) were applied. The site has been divided into three sections for remedial construction to allow specific areas (“Access Zones”) to be opened for recreational use once they are remediated and restored. This document describes the remedial approaches implemented to address contamination impacts to Access Zone 1 and to make the area suitable for public use. The actions were implemented from October 2011 through February 2012 in accordance with the approved Remedial Design/Remedial Plan prepared by EA Engineering (EA 2010) as required by the Maryland Department of the Environment (MDE) in its Administrative Consent Order issued for the Masonville Cove Uplands site in February 2010 (MDE 2010).

The Masonville Cove Uplands consist of 52 acres of land on the southern bank of the Patapsco River in Baltimore City, Maryland (Figure 1-1). The uplands area was originally divided into three “Phases” which were determined by intended usage and geotechnical composition. As remediation plans were developed, it became apparent that the sequencing and division of the Phases did not match with the sequencing and division of the site with regard to public access. Therefore, “Access Zones” were created (Figure 1-2). Both “Phase” and “Access Zone” are used in this report as appropriate.

2.0 SITE ACTIVITIES

2.1 Construction Overview

MES was responsible for the redevelopment of approximately 16 acres of land within Masonville Access Zone 1/Phase 1 (Figure 2-1). In accordance with plans prepared by Moffatt and Nichol (MN), MES was responsible for the upland cleaning, clearing and grubbing, grading, capping, shoreline cleanup, shoreline stabilization, tree preservation, plantings, seeding, and wetland creation. MES installed and maintained sediment and erosion control measures during all work activities. Additional work for security fencing, and community piers was constructed through subcontractors. Site photographs can be found in Appendix A.

2.1.1 Soil Cap

Areas of Access Zone 1 were designated for capping. MES provided an adequate cap to minimize the threat to human health by eliminating the potential contact with contaminated soil through implementation of containment technology.

MES cleared the site of any debris, concrete, and non-native vegetation to properly grade the soil and install an MDE-approved geotextile barrier. The geotextile prevents contamination of the clean fill by impacted soil underneath and serves as a warning layer to indicate the presence of impacted soil. The geotextile barrier was placed throughout the impacted area and any cuts or edges of the material were overlapped by at least two feet of additional geotextile.

Clean, offsite fill material was used throughout the site as capping material. All clean material was tested and/or MDE-approved before applying the minimum 2-ft cap. Soil was obtained from the sites known as the I-95 Expansion, Quarantine Road Site, Savage Quarry, Wyndholme/Frederick Road, and Montebello Water Treatment Facility Project; soil texture ranged from clay material to sandy material to silty material. The minimum 2-ft cap was applied throughout the impacted area over the geotextile barrier (Figure 2-2). Clean material ties into the existing grade at the edges of the cap at a 20% or 1:5 grade (Figure 2-3).

The soil cap was temporarily seeded, treated with small amounts of lime and fertilizer, and covered with straw as a part of sediment and erosion control measures. Permanent seeding will occur in spring to allow growth.

Native trees and shrubs were planted no more than 1.5 ft into the 2-ft cap throughout Access Zone 1 (Figure 2-4). Trees and shrubs planted within the upland area received additional organic material called Leafgro, a compost material produced by the Maryland Environmental Service. The compost material was mixed with the clean fill material to support plant growth.

2.1.2 Shoreline Stabilization and Pier

Shoreline stabilization occurred concurrent with cap installation. In each section of shoreline to be stabilized, a solution was engineered to ensure that no erosion occurs due to wave action or other forces. A generalized schematic of shoreline stabilization planned in the different areas of Access Zone 1 is provided in Figure 2-5. Any excavated material was reused onsite for grading under the cap. Pier construction was completed prior to cap construction and shoreline stabilization in Access Zone 1 to avoid disturbing the cap once it was in place.

McLean Contracting Company erected the community piers in the central portion of Access Zone 1. MES completed the preparatory work in this area, which included clearing and grubbing, slope stabilization and protection, and removal of steel and concrete debris. Geotextile was placed on the bottom prior to construction. Class II riprap was then placed on the underlying geotextile at the required slope to complete shoreline stabilization in this area (Figures 2-6 and 2-7). McLean erected the 40 ft by 10 ft floating timber dock with 60 ft aluminum gangway and the 80 ft by 10 ft fixed timber pier. Each timber pile was driven to an elevation of -40 ft MLLW using a vibratory hammer. The floating dock will allow for launching of small kayaks and canoes. The fixed pier will allow for larger boats to dock at the cove. Erection of the community piers was finished in December 2011.

The Phase 1 Remedial Action Erosion and Sediment Control Permit was issued by MDE on August 17, 2011; MES immediately began work on the erosion and sediment control procedures. MES removed any non-native vegetation and debris along the banks of the stream located within

Masonville Cove. Immediately after removing a brick wall and two concrete walls located within the unnamed stream running through the site (referenced here as “Masonville stream”), MES installed a super silt fence along the banks of the stream.

The geotextile barrier from beneath the soil cap was extended under any material emplaced as part of the stream shoreline stabilization. Both banks of the Masonville stream, which runs through Access Zone 1, were capped and stabilized using Class II riprap armoring stone and 2-ft soil cap. Geotextile was placed along the banks to cover the underlying soil, and the Class II riprap was placed to achieve a thickness of 2 ft at the desired locations of both banks (Figures 2-8 and 2-9). In areas where riprap armoring was not required, MES removed the existing soil (which was placed elsewhere onsite), regraded the slope, and placed geotextile. Clean fill was then placed over the geotextile and temporarily seeded. In these areas, the banks of the stream were stabilized from the top of the slope to the bottom of the slope where it intersects the existing floodplain (Figures 2-10 and 2-11).

On October 5, 2011, MPA received the MDE and USACE permit and authorization package that allowed MES to begin shoreline stabilization work on the observation point and to give Notice to Proceed to McLean Contracting to begin work on the armored rock sill in the tidal wetland area east of the community piers.

The observation point (formerly known as the “spit”), which extends into the Cove west of the streambed, was previously created through dumping of rock debris, concrete, and metals. MES was prompted to stabilize this area due to the risk of physical harm presented by the debris. Debris of concern, such as protruding steel, was removed through torching and proper recycling. The observation point was consolidated and stabilized with Class I riprap armoring and gabion stone (Figure 2-12). Approved clean fill was then placed on the widest portions, where the area can support vegetation.

The shoreline east of the community pier is a living shoreline and required armored riprap to protect the tidal wetlands. Living shorelines are constructed as a combined shoreline stabilization and habitat creation technique. Geotextile was installed under the entire area to be stabilized, stretching from the upland area down to the sill of riprap. The sill of riprap stone was then placed atop the geotextile along the outermost boundary, partially above mean high water (MHW). Seven to eight inches of clean sand was placed in the upland area behind the sill of riprap and below MHW stabilizing the shoreline (Figure 2-13). Thus, this area has become a protected wetland area.

The shoreline west of the community piers is a stable, sandy area. Shoreline stabilization here did not require a strenuous stabilization measure such as the rock sill; however, the area did require the installation of geotextile throughout the area extending at least 20 feet into the water and placing seven to eight inches of clean off-site sand atop the geotextile (Figure 2-14).

Super silt fence installation, clean soil placement, and seeding were completed landward of both shoreline areas to complete stabilization.

2.1.3 Tree Preservation Zone

The tree preservation zones are located in the central portion of Access Zone 1, on both sides of the Masonville stream (Figure 2-1). Prior to remediation activities, a qualified arborist evaluated the site to identify existing trees that were native to Maryland and healthy enough to save; trees were marked as such. Measures were taken to preserve as many of these trees as possible, either individually or in groups. The selected trees were preserved using a specialized capping technique and technology that prevents human contact with the impacted soil, while also allowing tree growth.

In each scenario (individuals and groups), the tree preservation zone extends from the tree trunk to the outer edge of the tree canopy. An MDE-approved geogrid replaced the geotextile barrier in these areas. The geogrid provides a durable barrier preventing human contact with the underlying soil, but will allow both water and oxygen to reach the tree roots. The 2-ft soil cap surrounds the edges of the tree preservation areas, overlapping the geogrid and the geotextile placed throughout the site. MES workers used shovels, rakes, and machinery to place a 6-inch cover of #57 stone over the geogrid. The stone was not placed up to the base of the trees; instead a bowl shape was formed around the base of each tree to allow sufficient breathing and to cut down on mold from water runoff. Three to 6 inches of clean, off-site fill material was placed over the #57 stone and was made continuous with the adjacent 2-ft cap outside the outermost edges of each tree canopy (Figure 2-15).

2.1.4 Non-tidal Wetlands

MES developed a total of four non-tidal wetlands in the remediated area. Three of the non-tidal wetlands were not included in the RD/RA, but were constructed in Access Zone 1. MPA must meet permit requirements of 10 acres of non-tidal wetlands in the Masonville Cove Uplands area; while these three wetlands were not originally planned, their construction methods meet the human health and safety requirements of the site.

The largest non-tidal wetland was included in the RD/RA; it measures approximately one acre (Figure 1-2) and is outside of Access Zone 1 (but was completed during Access Zone 1 construction). MES excavated site soil to the proper elevation and used the excavated material to build a berm separating the wetland area from the stabilized shoreline.

The basin of the pond is covered with geotextile and a geosynthetic clay liner, made by CETCO, called Bentomat (see Appendix D for specifications). Bentomat is used in the creation of ponds, wetlands, streams, etc. The liner is created with granular bentonite clay which, when wet, creates an impermeable barrier allowing water to be retained. The Bentomat was placed over the geotextile that covered the impacted soil in the area. The edges of the liner were overlapped with a minimum of 5 ft geotextile layer. The 2-ft soil cap was installed over the Bentomat liner and graded to the desired shape (Figure 2-16). The surrounding area was graded to allow sheet flow toward the wetland area.

The location of the three remaining non-tidal wetlands were carefully selected and developed during construction. These non-tidal wetlands were developed in natural low points where water

accumulates and is retained by the properties of the soil, and therefore did not require a geosynthetic liner. Each of these wetland areas was constructed after clean fill material was placed over the geotextile. MES removed excess capped material in the locations of the wetlands but ensured that at least 2 ft of cap material remained in place. Areas surrounding the wetlands were planted with native trees and grasses.

2.1.5 Haul Road

A 15-ft wide haul road was constructed through the capped and uncapped area of Access Zone 1, near the southwestern boundary of Access Zone 1 (Figure 2-1). The haul road runs parallel to the swale that separates the Masonville Cove Uplands from the adjacent Vulcan Materials Company property. A portion of the haul road was constructed on the uncapped portion of Access Zone 2 to provide temporary access during remediation and reconstruction of the area. The haul road is open to construction traffic only.

MES surveyed the area in early June 2011 to locate points to lay out the haul road. MES removed non-native trees and invasive vegetation to allow for proper grading of the area. Stakes with 2-ft markers were driven into the capped portion of the area; stakes with a 6-inch marker were driven into the uncapped portion of the area to assist with proper clean fill placement. The 6-inch cover over the uncapped portion allows for an easy transition along the haul road. Geotextile was then installed on top of the clean fill. As required by the American Association of State Highway Transportation Officials (AASHTO), a minimum of 6 inches of #3 or #2 stone was installed above the geotextile (Figure 2-17).

2.1.6 Pedestrian Path

A paved pedestrian path will be constructed within Access Zone 1, connecting Frankfurst Avenue to the Masonville Cove Environmental Education Center and the community piers (Figure 2-1). Frankfurst Avenue will be inaccessible via gated fence by site users when Access Zone 1 is opened for public use, and will remain inaccessible until construction of Access Zone 2 is completed. The path has not been constructed at the time of this report, but sufficient capping activity has occurred (and will remain in place) in the capped areas to minimize human health risk. The paths are located in the same location as temporary paths that were used during the cleanup and construction phase of remediation; therefore approximately 18 in of compacted stone over geotextile are in place beneath the 2 ft cap already.

The pedestrian path will be 10 ft wide and will be constructed atop the cap (Figure 2-18). The path was staked out for proper location. Six inches of cap material will be removed from the area and placed in other locations of the site. Geotextile will be placed over the excavated area allowing for a minimum of 6 in of clean graded aggregate base (GAB) stone to be placed on top of the geotextile. The GAB will be compacted to improve strength. Once sufficiently compacted, the paths will be paved with asphalt.

2.1.7 Security

Site access was limited during remediation. Security fences installed upon completion of Access Zone 1 reconstruction prevents public access to portions of Masonville Uplands still under construction (Figure 1-2).

Fence construction was completed by Fence Connection Inc., and consists of three chain link fences measuring 8 ft high (Figure 2-19). The western security fence, located approximately 200 ft west of the community piers, runs parallel to the haul road from the shoreline to Frankfurst Avenue, separating Access Zone 2 from Access Zone 1. Portions of the fence are placed on the capped shoreline, the capped upland, and the uncapped upland. Fence posts in the capped shoreline and upland were placed through the soil cap and backfilled with approved concrete for support. Posts did not penetrate the geotextile into the impacted soil. Any impacted soil was removed and placed elsewhere on the site to be covered by capping material. Two 20-ft gated openings allow construction equipment to travel between the Access Zone 1 and Access Zone 2.

Fence Connection erected a temporary fence, similar to the western fence and eastern fence, on the southern boundary of Access Zone 1, parallel to Frankfurst Avenue, connecting to the existing ornamental fence securing the Masonville Cove Environmental Education Center. At some point in the future, the temporary fence will be replaced with an ornamental fence similar to the fence existing at the Education Center. The eastern security fence of Access Zone 1 has been installed along the berm separating Access Zone 1 from Access Zone 3.

3.0 FILL MATERIALS

Clean fill material used in Access Zone 1 was confirmed by MDE as clean and approved for use on the site. Each source of material was tested using specific guidelines and received approval/certification for use (see Appendix B). Access Zone 1 received soil material from five approved locations (Table 1).

Table 1 – Clean Fill Materials Source

Source Location/Site	Approval	Date of MDE Approval
I-95 Expansion	Tested and Approved	August 4, 2010
Quarantine Road	Tested and Approved	February 8, 2011
Montebello Water Treatment Facility Plant	Tested and Approved	June 2, 2011
Savage Stone	Approved through certification	August 15, 2011
Wyndholme/Frederick Road	Tested and Approved	September 8, 2011

Clean fill material was hauled to Access Zone 1 by Strawbridge Hauling and C. Jones Trucking. Each load was tracked using a ticket system. Truck drivers were given a ticket before delivery to the site and tickets were handed to MES for tracking. MES tracked by date, company, source, truck number and ticket number of each load to Masonville (Appendix C).

Stone, aggregate, mulches, and other products were used for various purposes on the project. These products were obtained commercially from approved and certified sources (Table 2).

Table 2- Summary of Fill Materials

Material	Source	Quantity
Class 2 Riprap	FTC Aggregate Supply, Inc.	57.75 tons
Class 2 Riprap	Savage Stone	4,880 tons
#57 Stone	FTC Aggregate Supply, Inc.	107.52 tons
#57 Stone	Savage Stone	187.26 tons
#57 Stone	Vulcan Materials Company	405.5 tons
#2 Stone	Savage Stone	124.52 tons
#3 Stone	Vulcan Materials Company	313.87 tons
Gabion Stone	FTC Aggregate Supply, Inc.	81.57 tons
Gabion	Savage Stone	40.75 tons
#2 Stone	FTC Aggregate Supply, Inc.	1,060.45 tons
Clean Fill	Savage Stone	34,988 cubic yards
Clean Fill	Montebello Water Filtration Plant	2,000 cubic yards
Clean Fill	Frederick Road	5,000 cubic yards
Clean Fill	I-95	7,000 cubic yards
Clean Fill	Quarantine Road	4,082 cubic yards
Clean Concrete Sand	LaFarge Corporation	5,582.76 tons
Curlex (404 sq. ft)	Anne Arundel County Farms Co.	14 rolls
Curlex (808 sq. ft.)	Anne Arundel County Farms Co.	12 rolls
Mulch	Hollins Organic Products, Inc.	80 yards
Leafgro	Anne Arundel County Farms Co.	26- 1.5 cu ft.
Screened Leafgro	Maryland Environmental Service	200 yards
Straw	Anne Arundel County Farms Co.	1,627 bales
Annual Rye Seed (50 lb. bag)	Anne Arundel County Farms Co.	64 bags
Wet Meadow Seed Mix	Anne Arundel County Farms Co.	3 lbs
Lime Pellet (40 lb. bag)	Anne Arundel County Farms Co.	38 bags
Fertilizer (50 lb. bag)	Anne Arundel County Farms Co.	45 bags
Fertilizer (36 lb. bag)	Anne Arundel County Farms Co.	2 bags
Trees	American Native Plants	136 Trees
Tree/small plants	Herring Run Nursery	245 Trees
Small Plants	Homestead Gardens	30 plants

3.1 Material Management

3.1.1 Segregation of Materials

During construction, MES managed both clean and impacted materials, which were kept separate at all times prior to and during construction. Prior to placement of clean material in an area to be capped, MES placed geotextile over the impacted material; clean material was then placed on the geotextile, separating the material.

The upland area west of the stream was designated as a stockpile area. Appropriate MDE sediment and erosion control approvals were obtained; erosion control measures were undertaken. MES received and stockpiled over 12,000 cubic yards of clean material in this area for later placement.

Vehicles possessed the highest probability of cross-contaminating clean and impacted material. All vehicles were required to travel on the haul road to reduce probability of cross-contamination. When placing clean fill over geotextile, clean fill was placed in front of the dozer machine. The operator of the machine pushed the material toward the geotextile creating a path of travel. As more trucks brought material the area of travel would increase allowing for more material placement throughout the site.

Following construction activities, soil was removed from the equipment by brushing, wiping, and power washing prior to removal of equipment from the site.

3.1.2 Dust Suppression

As described in the Site Health and Safety Plan (SHASP) (MES 2009), baseline air monitoring was conducted prior to construction activities in Access Zone 1. Baseline air monitoring occurred in the work area of expected disturbed impacted soil, on selected days in downwind areas. Results from the monitoring determined the dust control procedures and personal protective equipment (PPE) needed for the site.

Fifteen background air samples and four field blanks were tested for arsenic and lead by Batta Laboratories in accordance with the National Institute of Occupational Safety and Health methods. Laboratory results indicated that airborne concentrations of lead and arsenic were below the analytical limits of quantification. The concentrations of arsenic were less than $1.15\mu\text{g}/\text{m}^3$. Concentrations of lead were less than $2.74\mu\text{g}/\text{m}^3$ (Appendix E).

MES implemented dust management practices to suppress airborne dust on site. Each MES employee was supplied with PPE to prevent dust inhalation and contact with skin if disturbed. Employees were fitted for respirators to provide respiratory protection, as needed. Employees were supplied with gloves, protective eye wear, and instructed to wear long sleeves, pants, and steel toed boots.

MES implemented dust control procedures that included minimizing soil disturbance through use of aggregates to cover soil in areas equipment operation and use of water. MES constructed a

temporary haul road with a stabilized construction entrance for travel. The road is constructed of #2 and #3 stone to reduce dust travel caused by heavy equipment. The roadway behind the Masonville Cove Environmental Education Center is lined with geotextile and compacted #57 stone to reduce dust caused by small equipment and pedestrian travel. MES also used a water truck throughout the site, as needed.

3.2 Waste Disposal

Soil removed during grading was reused in other locations onsite. Material removed from the non-tidal wetland and tidal wetland areas were used to shape the observation mound located west of the haul road fencing. Any “excess” impacted material was used onsite. Because no excavated soil was taken offsite, no waste characterization was performed for transportation to a MDE-approved disposal facility.

All excavated debris and rubble were disposed in accordance with applicable local, state, and federal laws and regulations. All debris was placed inside roll-off containers and shipped offsite for disposal. MES disposed of non-native and invasive vegetation, bricks, steel rebar and rods, tires, etc. Material was taken offsite by contractors A2Z Environmental Group and EDIE Waste, Inc. The material was transported to local recycling and/or disposal sites, as appropriate.

4.0 SITE SECURITY AND ACCESS

Site access is limited through perimeter fencing. Description of the construction methods and fencing is provided in Section 2.1.7 and illustrated in Figure 2-19.

The general public will have access to the area behind the Masonville Cove Environmental Education Center and Access Zone 1. This is limited to the area west of the eastern security fence and east of the western security fence. Access Zone 1 is limited to daylight hours for operation and public use. At the close of each day, all fencing will be closed and locked.

5.0 HEALTH AND SAFETY

The primary routes of exposure for site personnel during construction activities were inhalation of airborne dust and the incidental ingestion of contaminated soil. All construction contractors were required to comply with the SHASP and provide a Health and Safety Plan that would be used to reduce the potential for exposure to soil contaminants by the contractor’s employees and other present on site.

To minimize exposure to workers, dust suppression and usage of appropriate PPE were implemented during construction. Construction workers were informed of the proper measures and protocols upon incidental contact with any contaminants.

During site operations, the health and safety of site workers were maintained through on-going training and adherence to the Health and Safety Plan. Site user and occupant safety will be

provided through routine cap inspections and maintenance. Air monitoring activities will continue in the areas of active remediation and Access Zone 1 to ensure worker and public safety.

6.0 ENVIRONMENTAL COVENANT

An Environmental Covenant (Appendix F) has been developed for Access Zone 1. Once approved by MDE, the document will be recorded in the Baltimore City land records prior to site use. The activity and use limitations associated with the remedial action and use of the site are defined in the Environmental Covenant and will govern site operations.

7.0 CONCLUSIONS

The remedial actions implemented and described in this report took place between October 2011 and February 2012 in accordance with the approved Remedial Design/Remedial Action Plan (RD/RA) dated November 2010. As such, the measures taken in the area described are sufficient to protect human health from possible exposure to site contaminants. Access Zone 1 can be safely opened for public use while the other areas of the site undergo remedial actions. In addition, MPA will begin monitoring activities as described in the RD/RA.

8.0 REFERENCES

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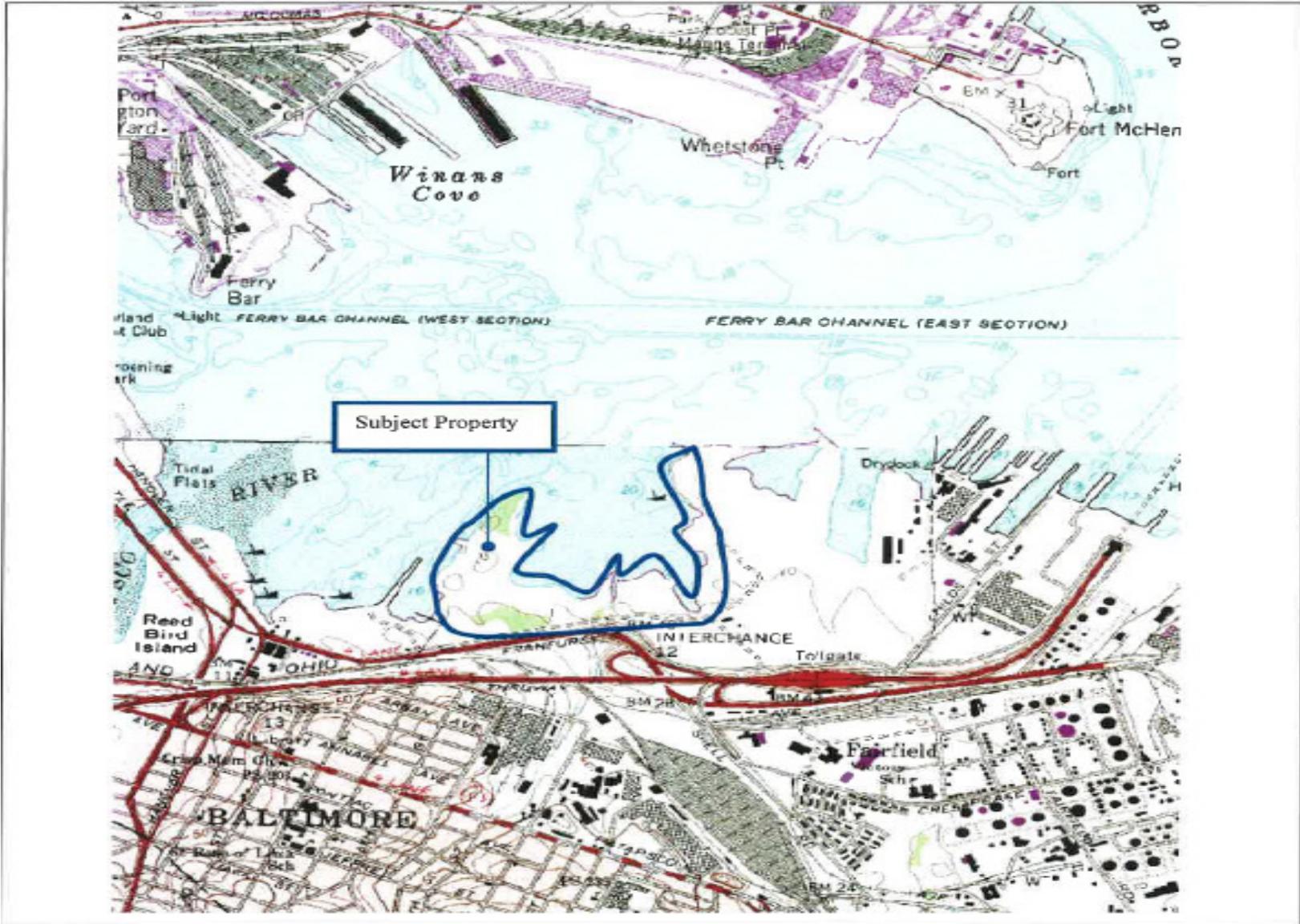


Figure 1-1. Site Location Map

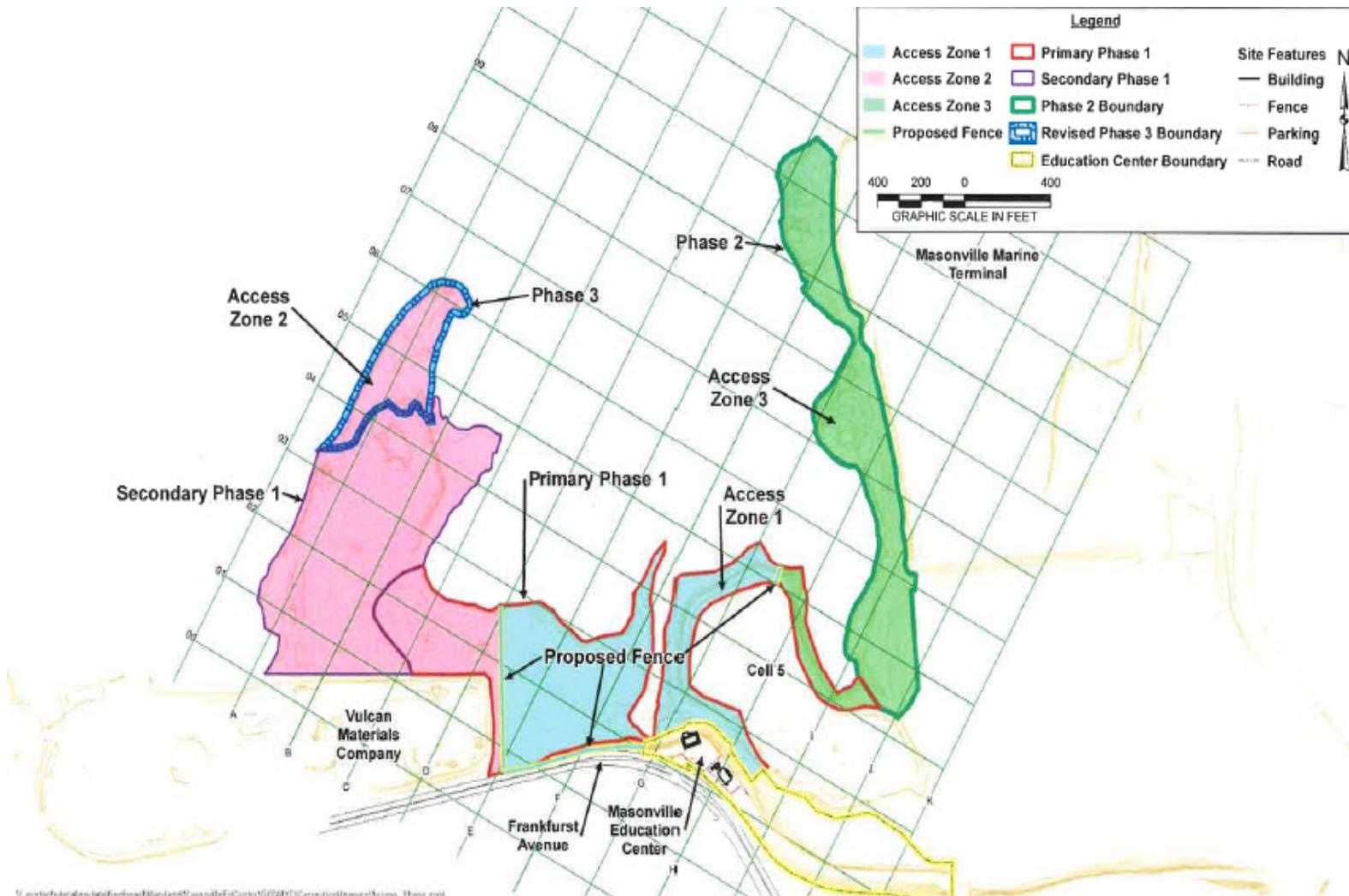


Figure 1-2. Remedial Construction Phases, Access Zones, and Surrounding Properties

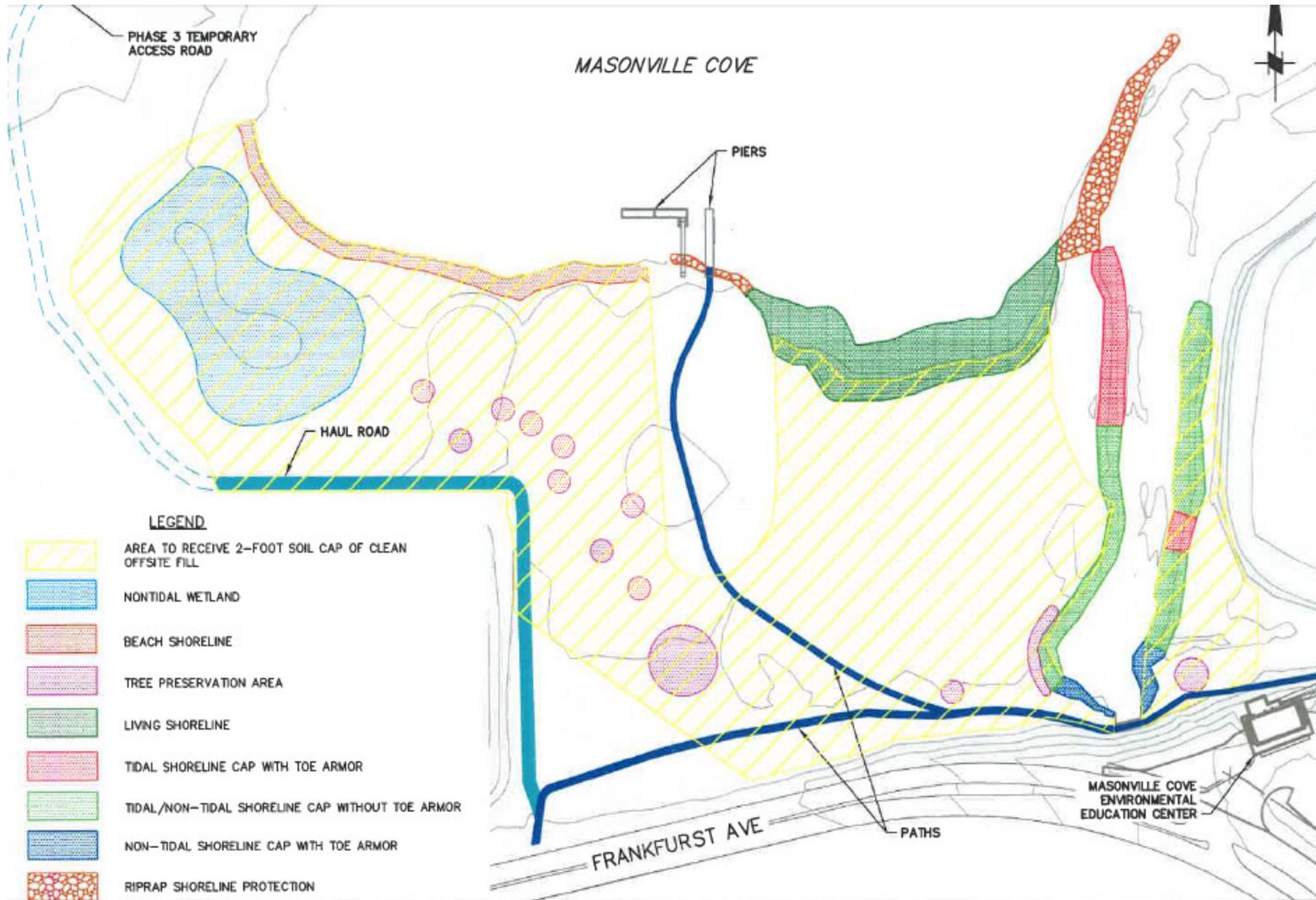


Figure 2-1: Phase 1 Site Plan

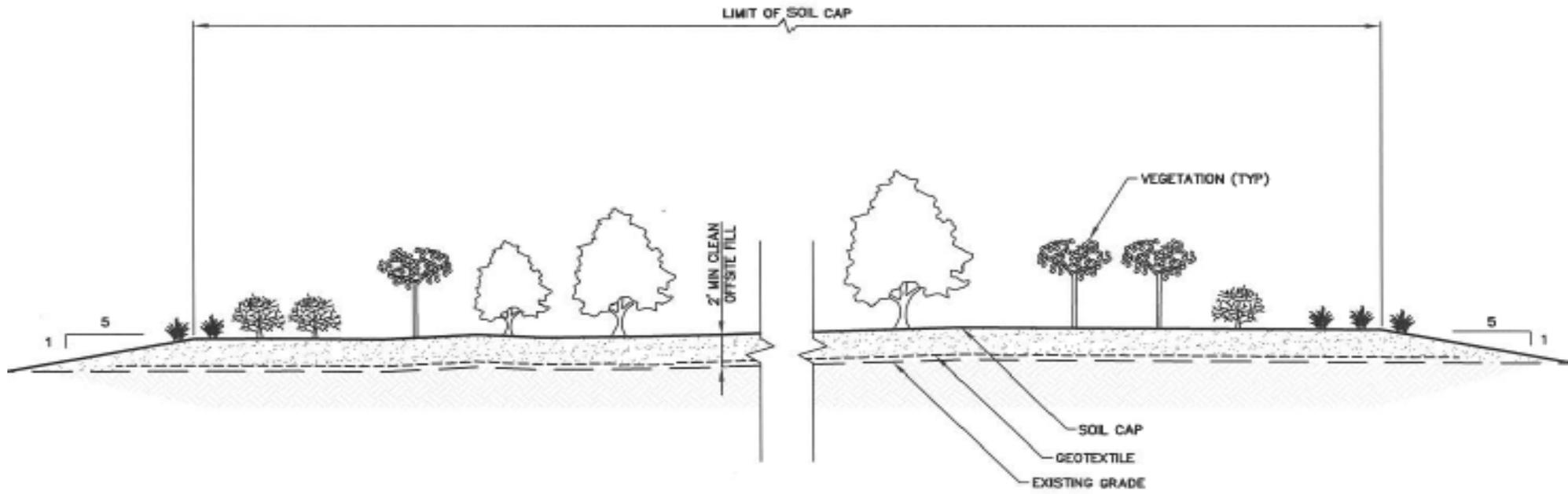


Figure 2-2: Cross Section of Soil Cap

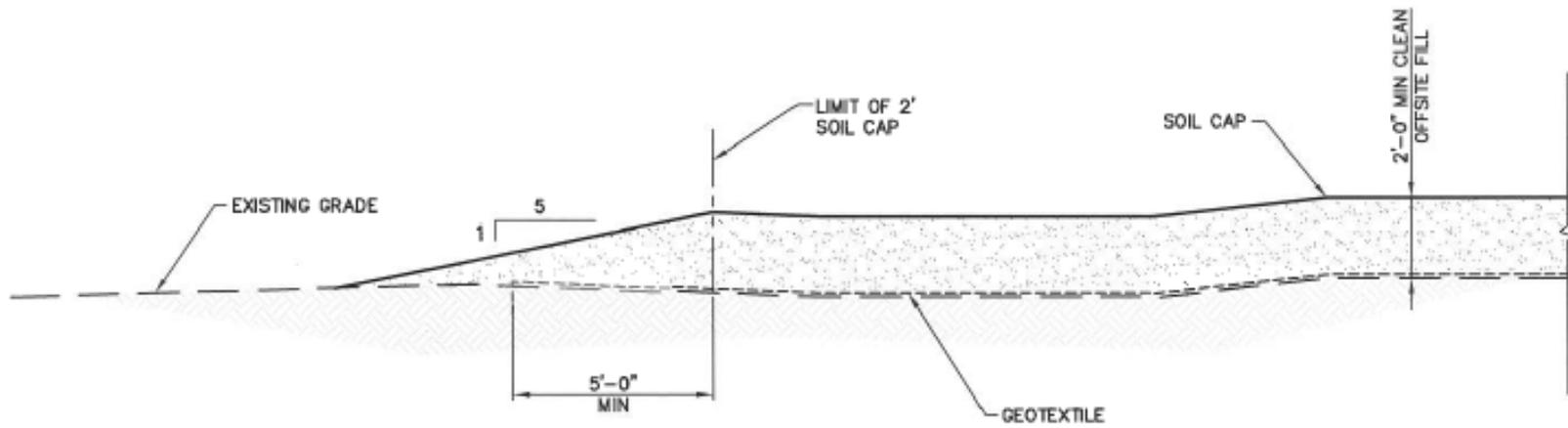


Figure 2-3. Cap Tie-in to Existing Grade

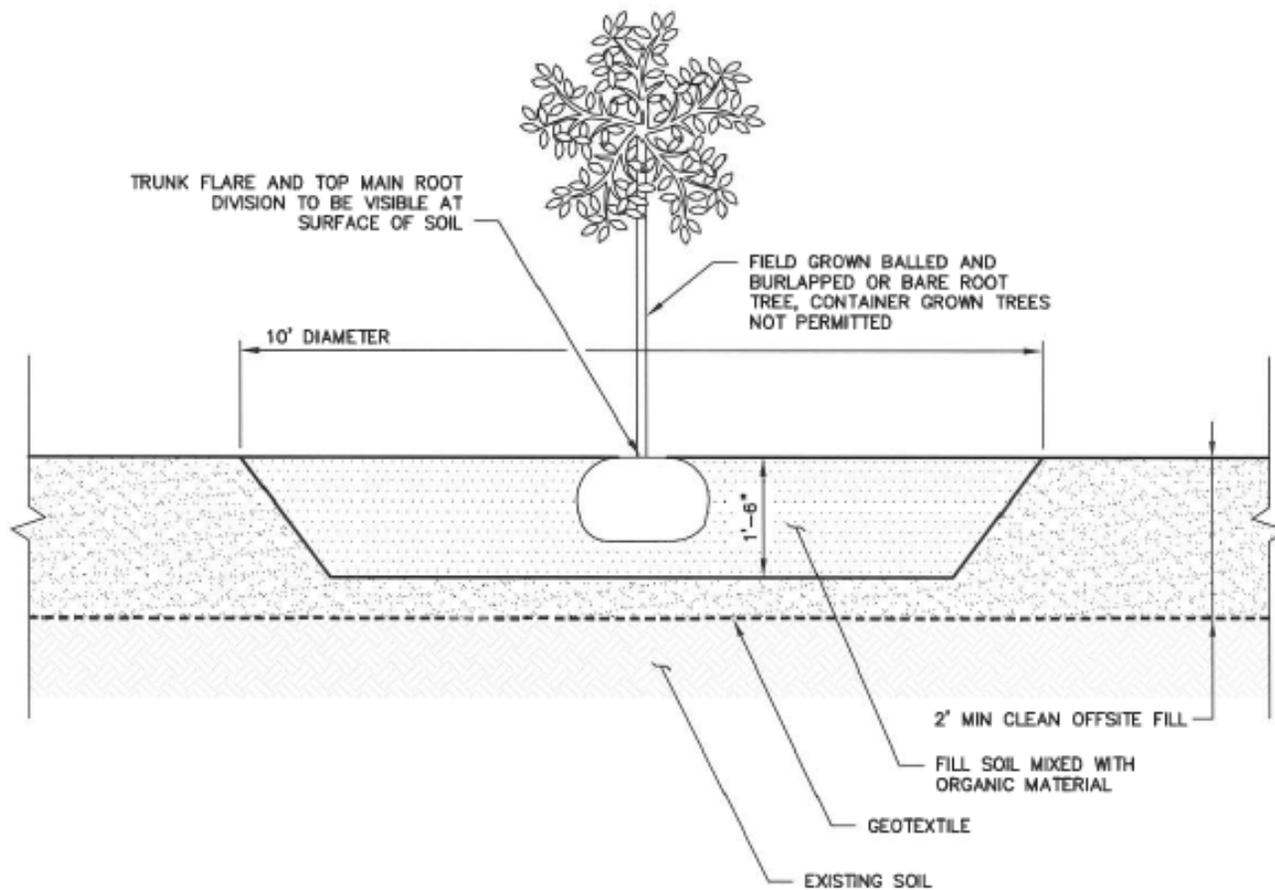


Figure 2-4. Tree Planting in Cap

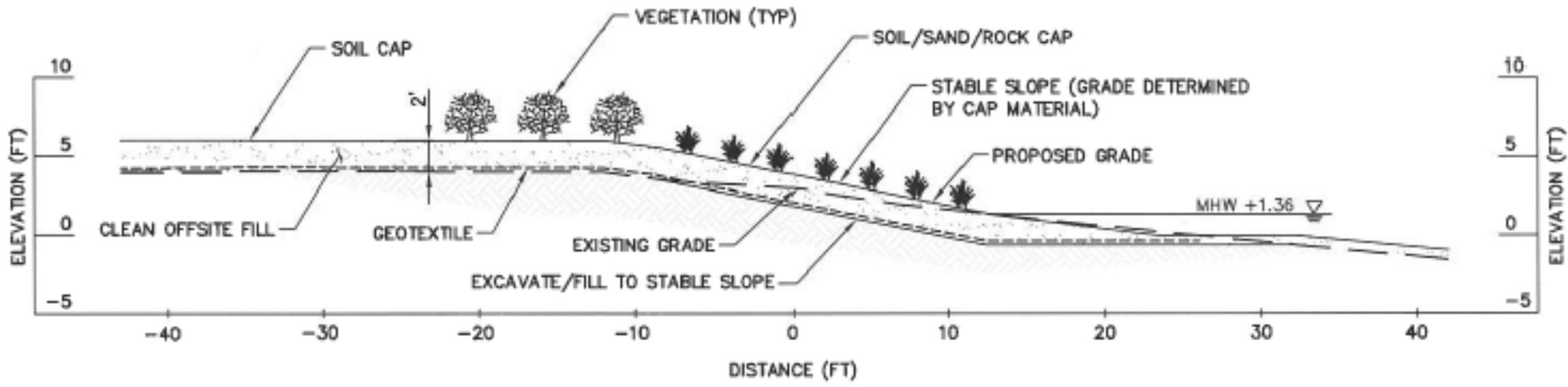


Figure 2-5. Generalized Shoreline Stabilization Plan

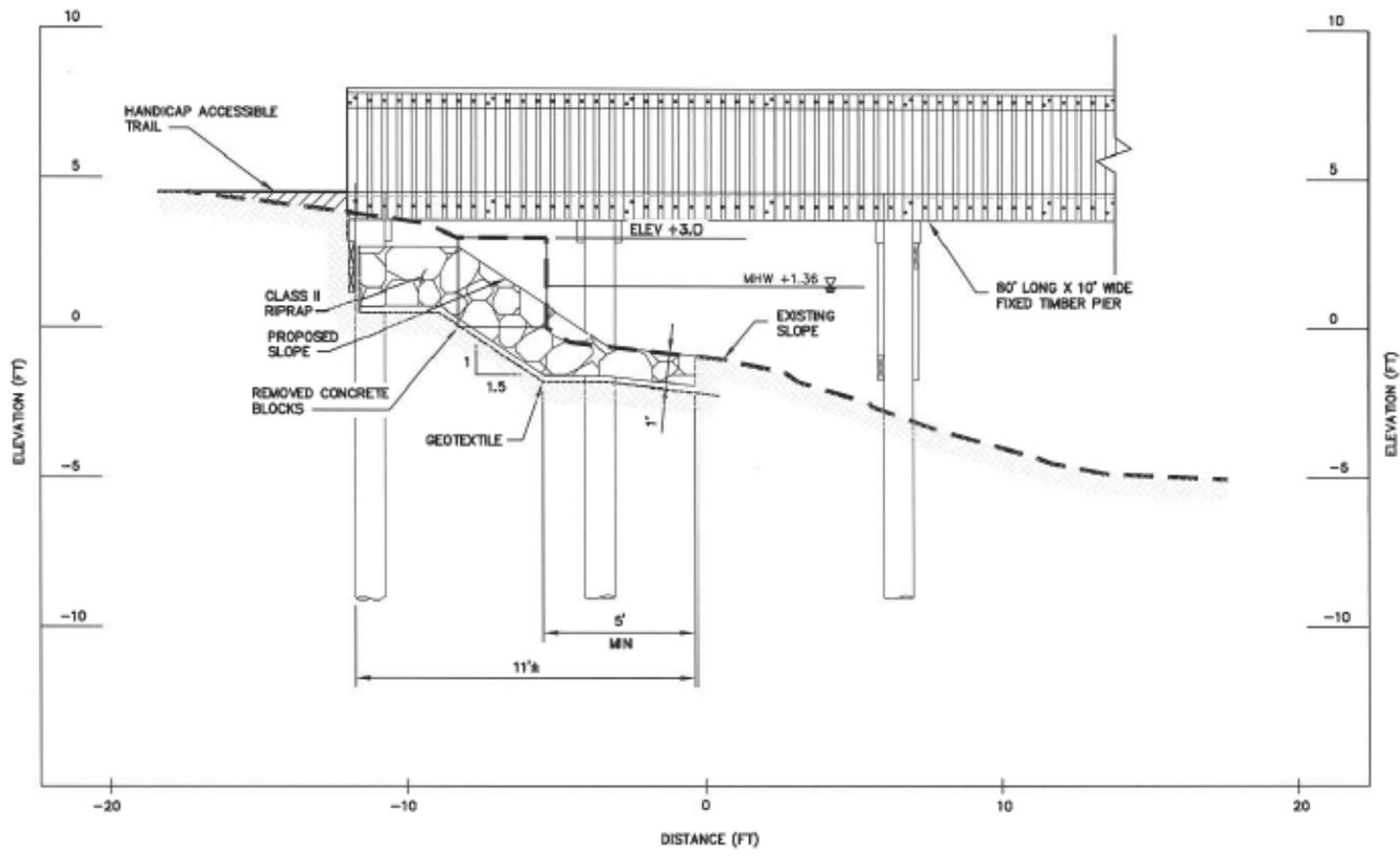


Figure 2-6: Shoreline at Fixed Pier

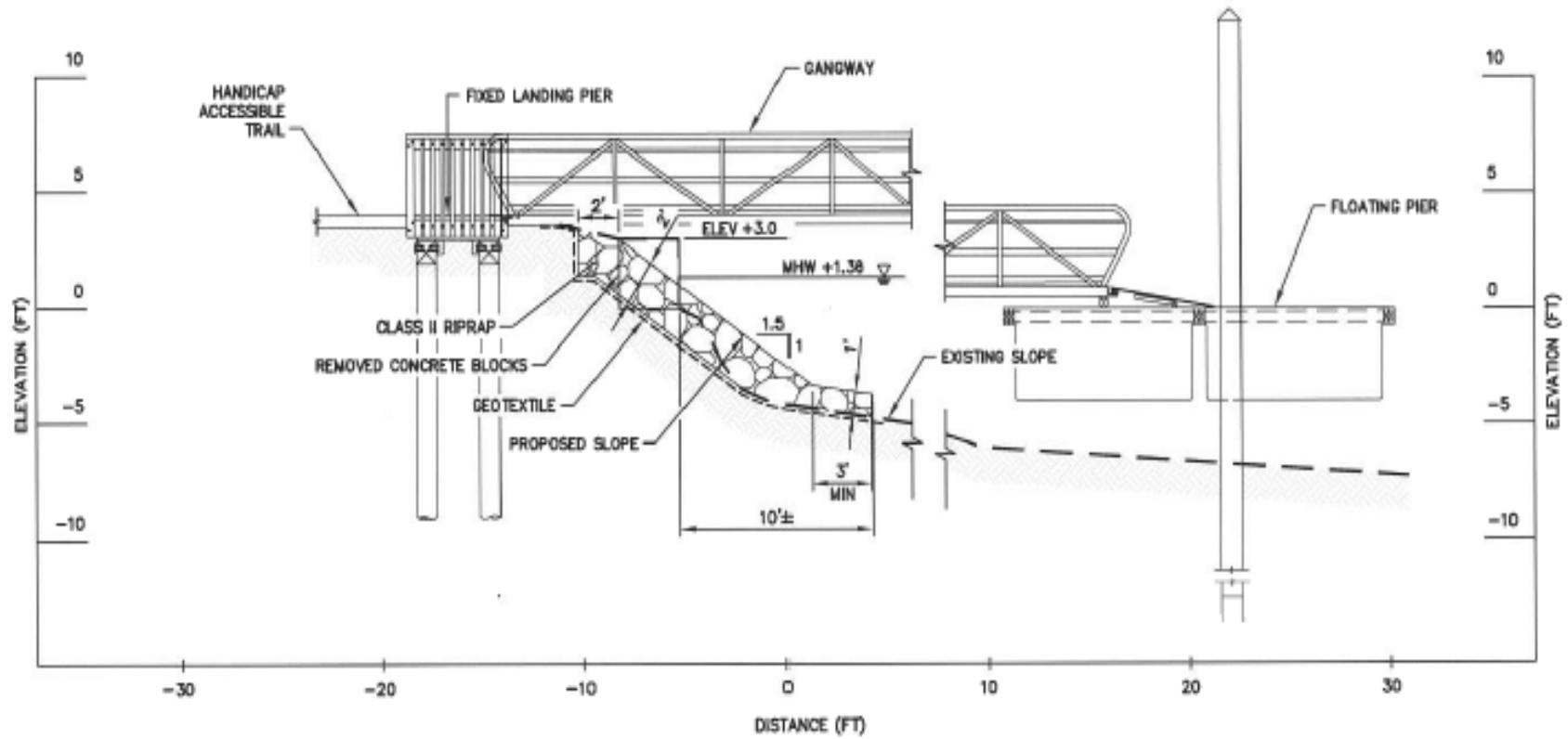


Figure 2-7: Shoreline at Floating Pier

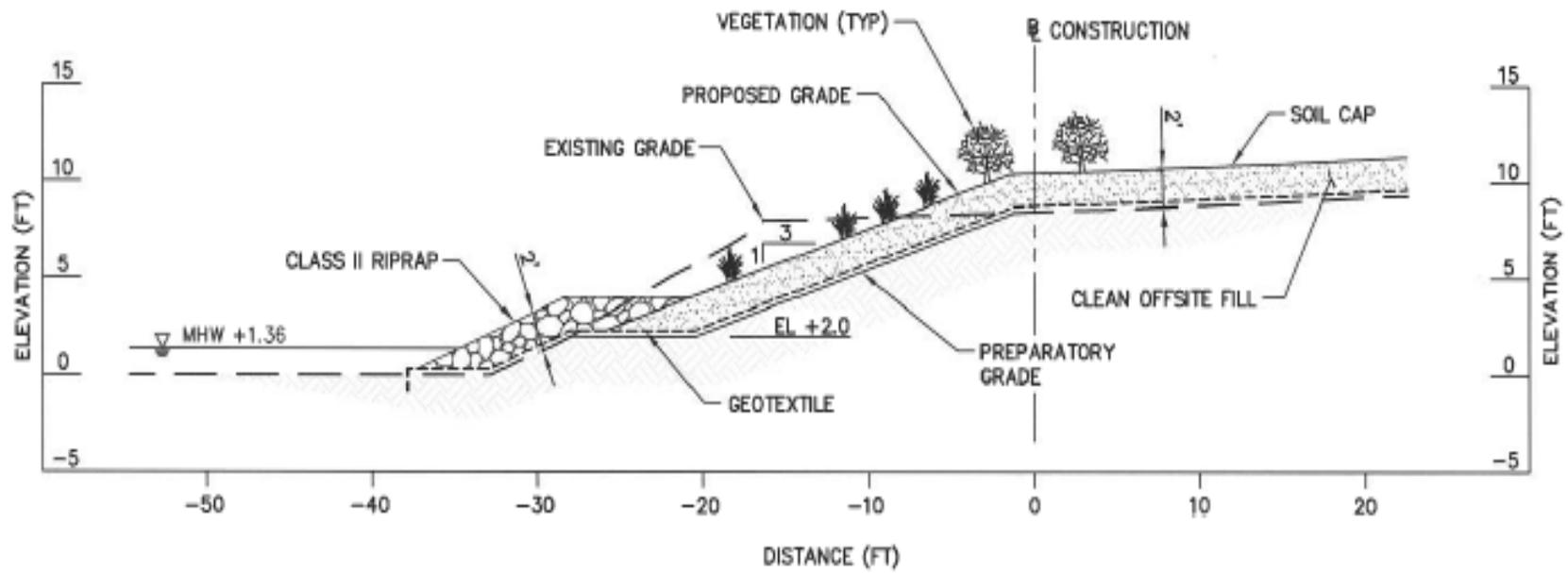


Figure 2-8: East Stream Bank Stabilization with Riprap

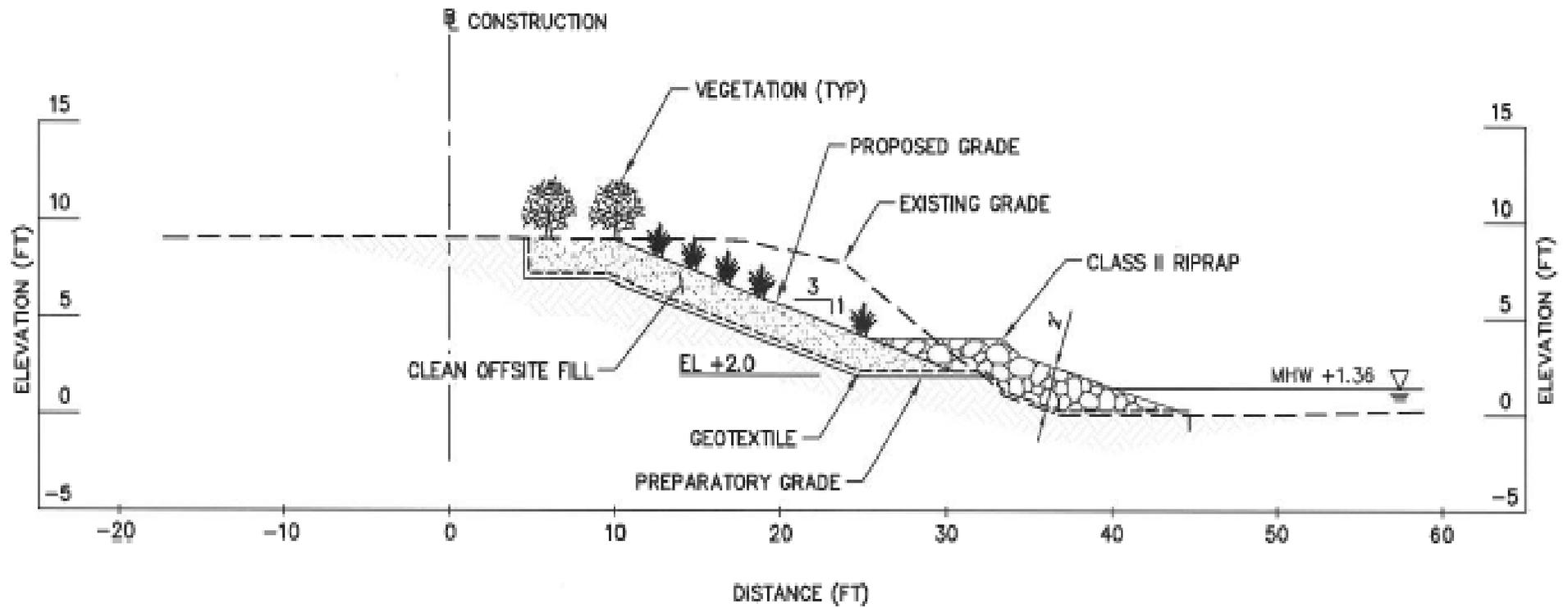


Figure 2-9: West Stream Bank Stabilization with Riprap

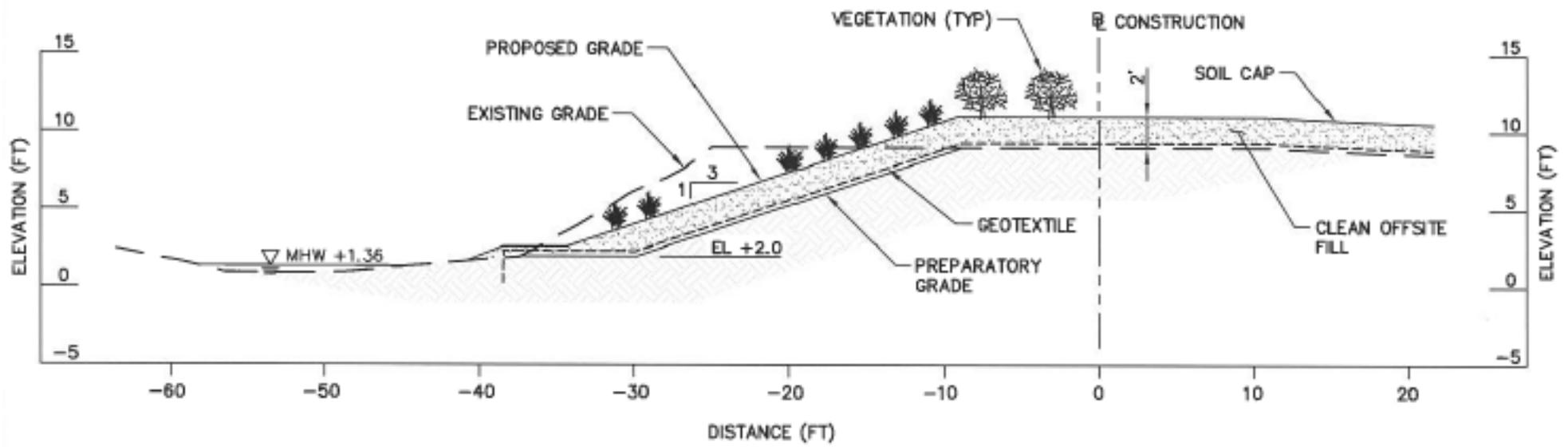


Figure 2-10: East Stream Bank Stabilization without Riprap

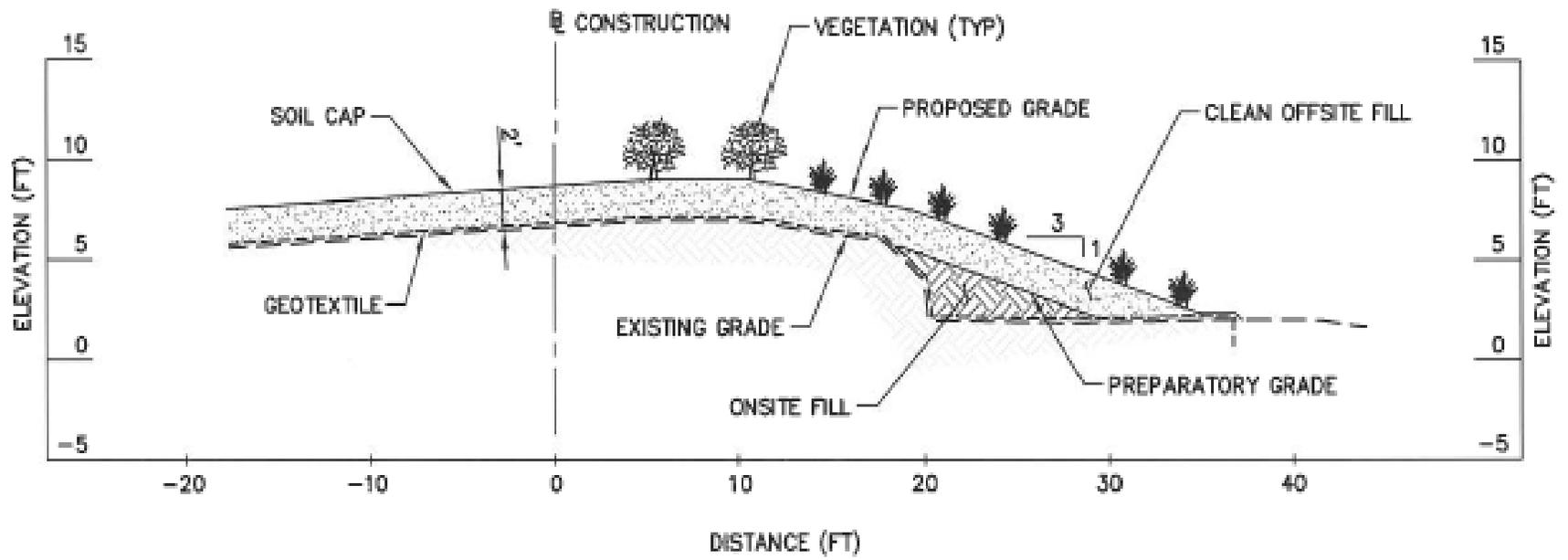


Figure 2-11: West Stream Bank Stabilization without Riprap

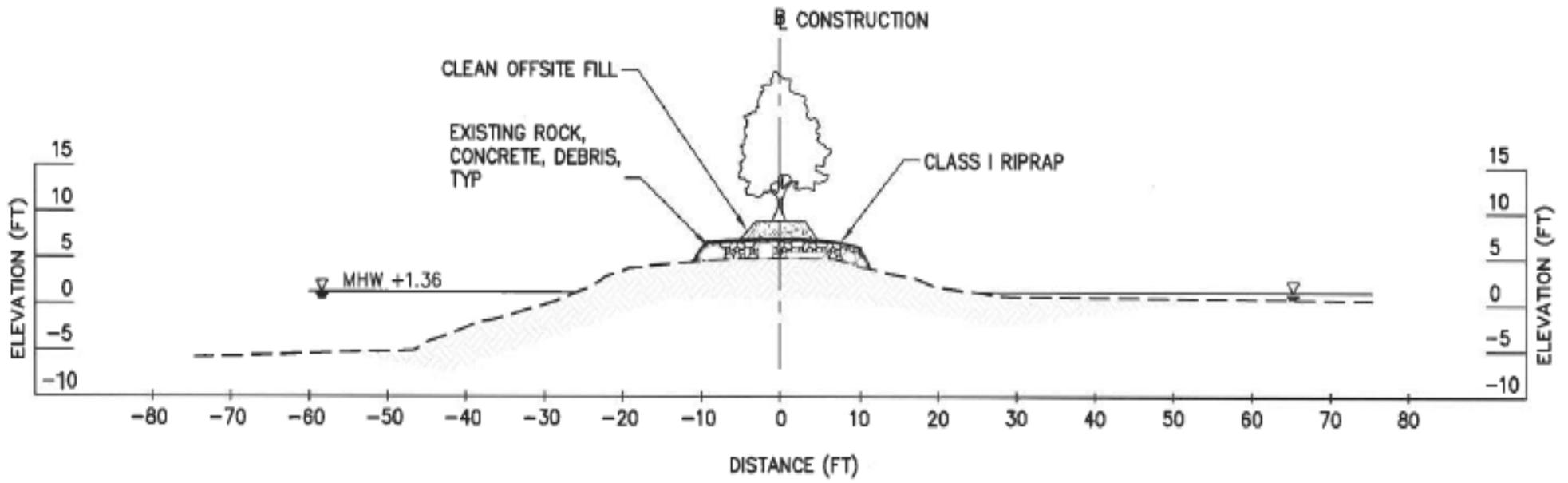


Figure 2-12: Stabilization of Observation Point

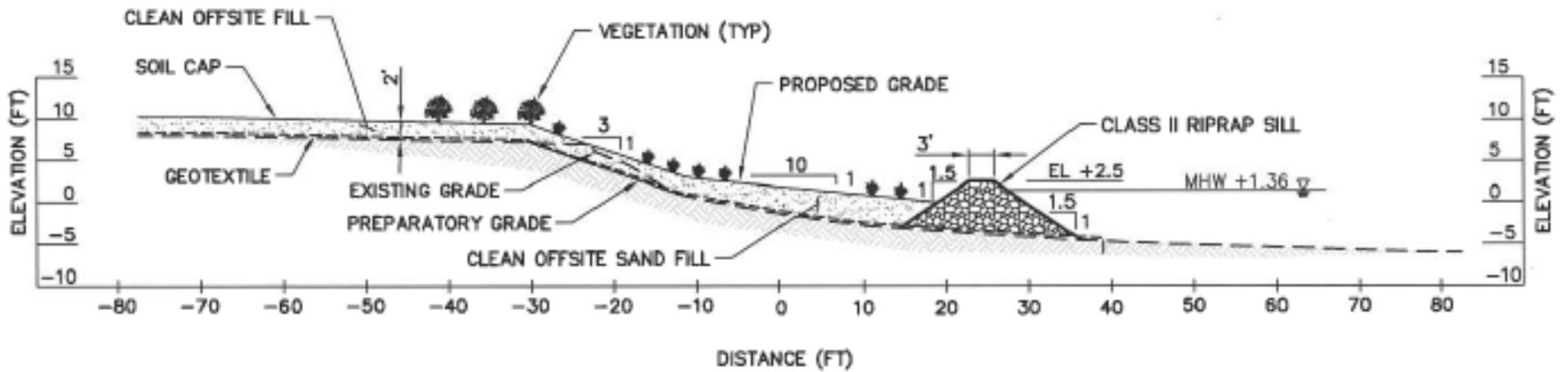


Figure 2-13. Cross Section of Living Shoreline

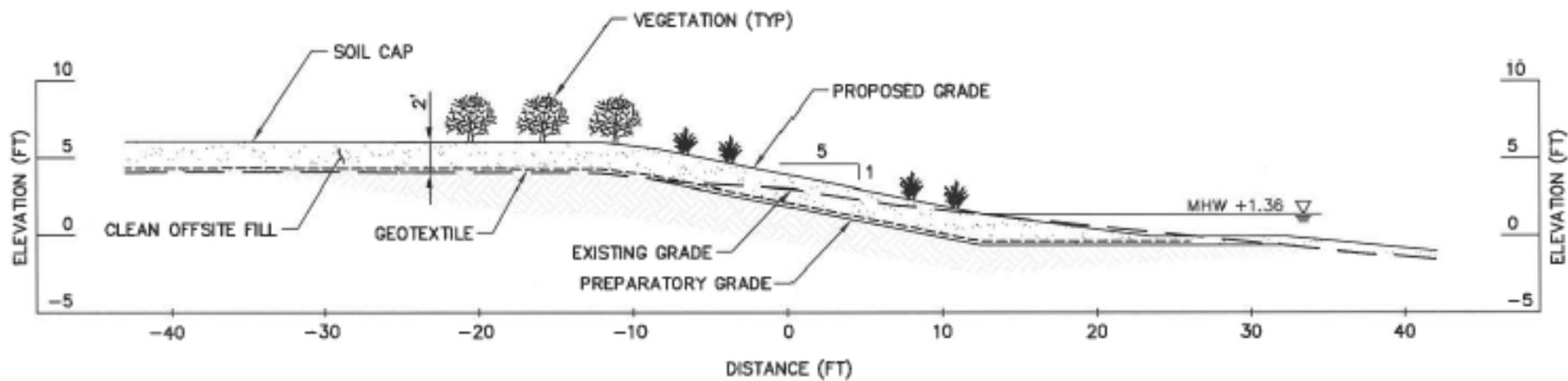


Figure 2-14: Shoreline Stabilization West of Piers

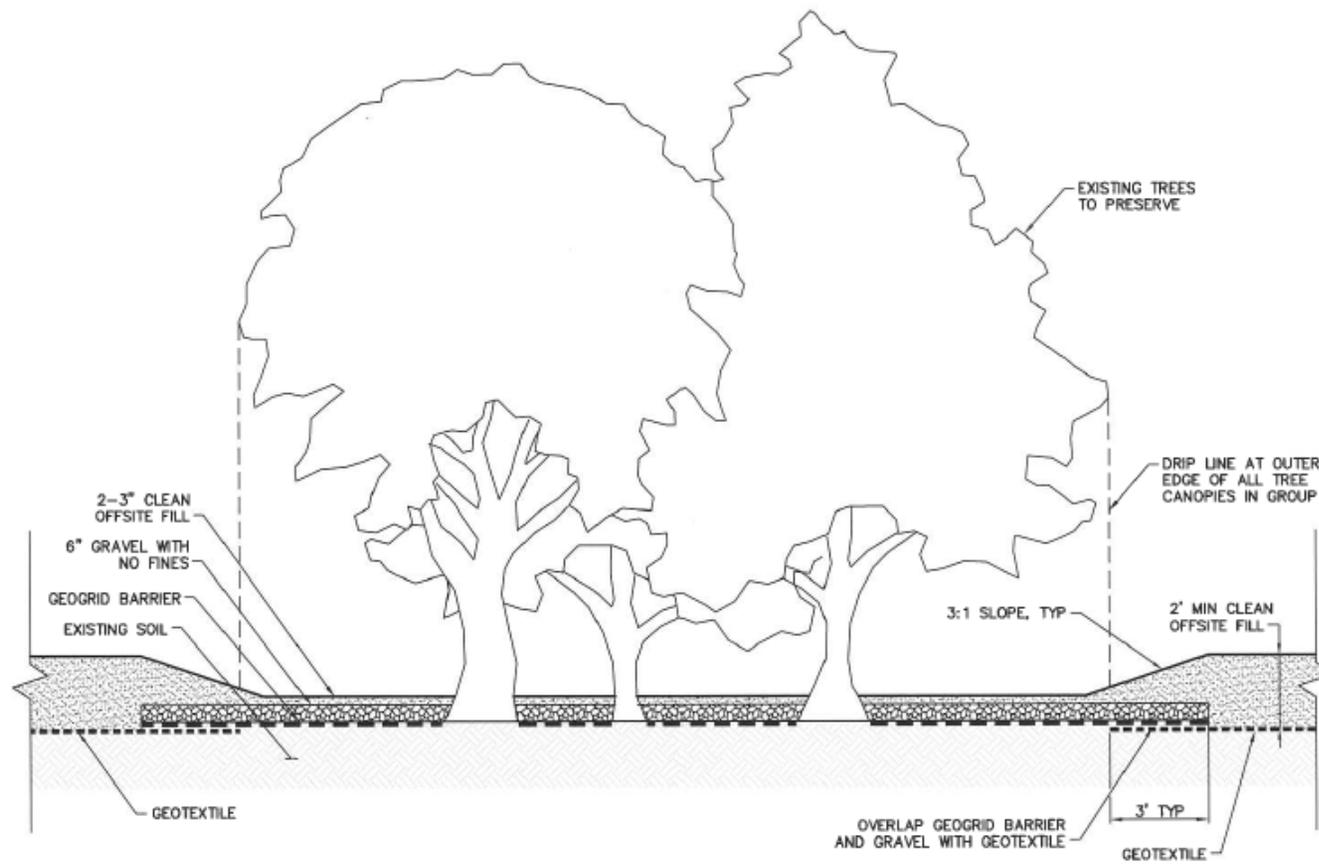


Figure 2-15. Tree Preservation Detail

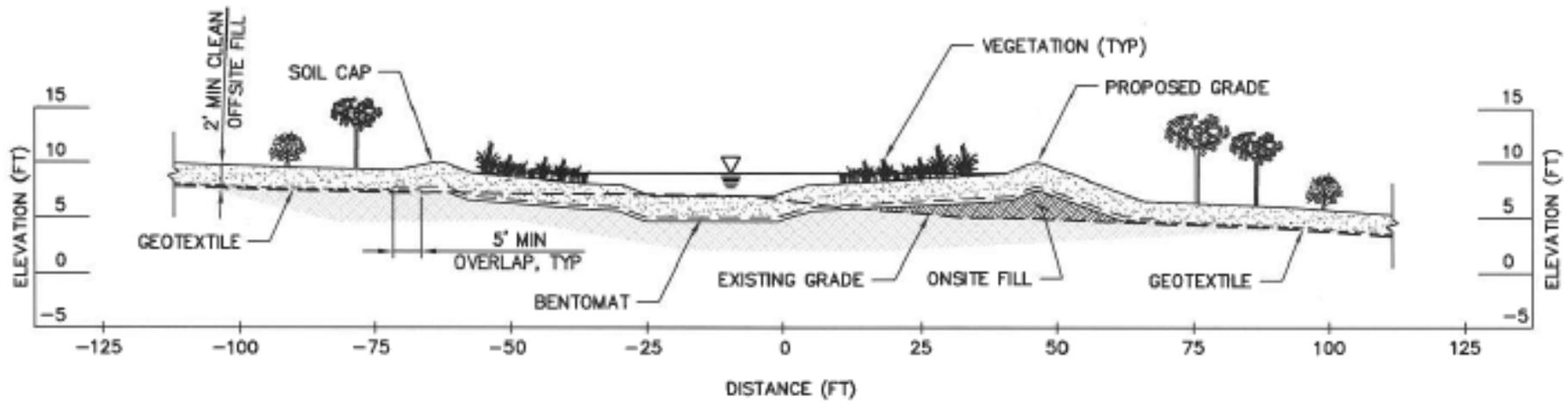


Figure 2-16: Cross Section of Non-tidal Wetland

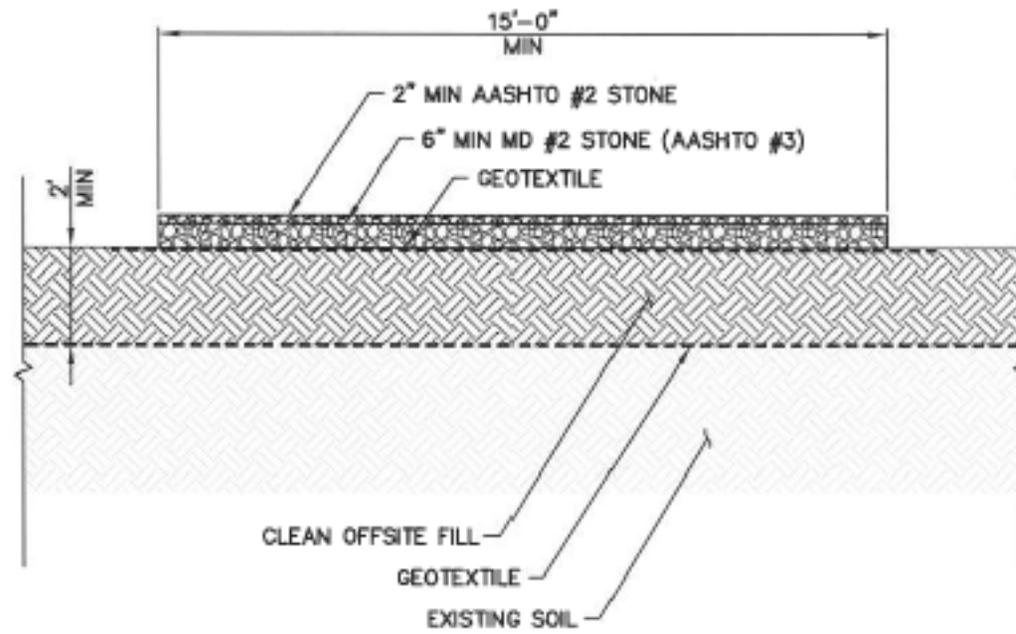


Figure 2-17: Cross Section of Haul Road

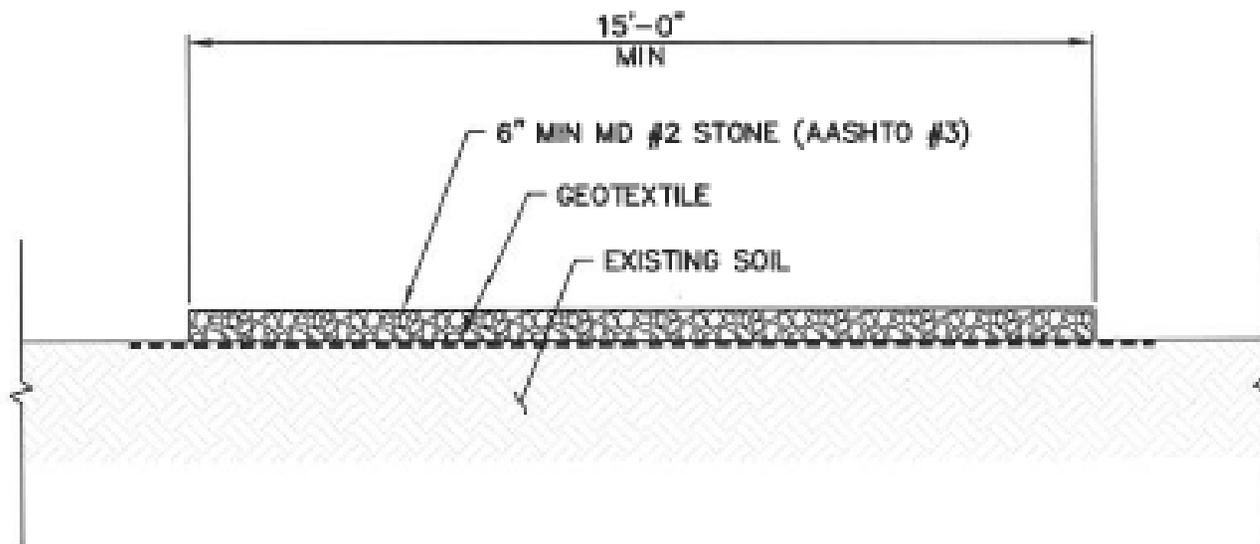


Figure 2-18: Cross Section of Pedestrian Path

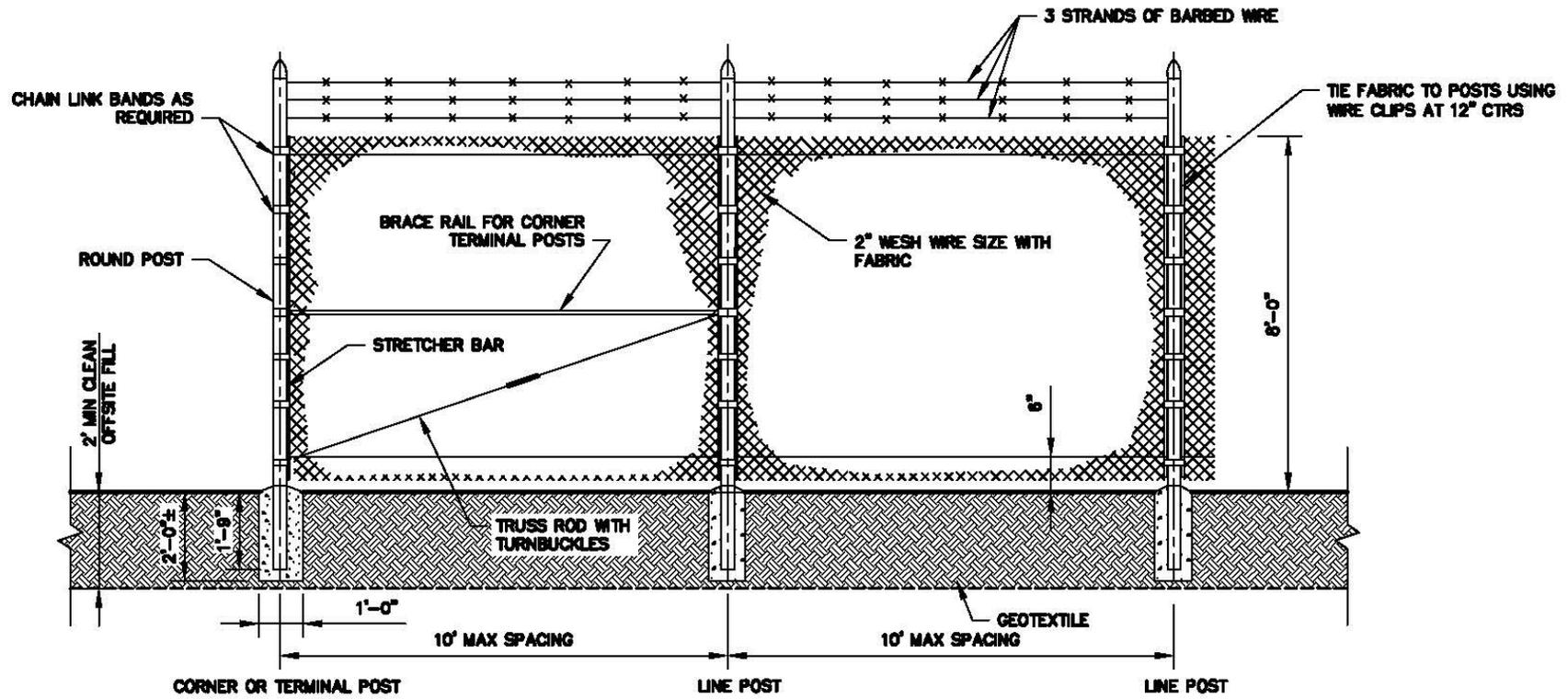


Figure 2-19: Cross Section of Security Fence