MAINTENANCE AND INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

Prepared for:

U.S. ARMY CORPS OF ENGINEERS-NEW ENGLAND DISTRICT

Concord, Massachusetts

Prepared by:

Harding ESE, Inc., a MACTEC Company

Portland, Maine

January 2004

Project 53955-03

Harding ESE
A MACTEC COMPANY

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Brian B. Johnson, P.E.
Senior Engineer

Nelson Walter, P.E.
Senior Principal Engineer

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1.0 INTRODUCTION

The Post-Construction Maintenance and Inspection (M&I) Plan is part of the Non-time Critical Removal Action (NCRA) for the Causeway at the Stratford Army Engine Plant (SAEP) in the Town of Stratford, Fairfield County, Connecticut (see Figure 1-1).

The removal action was conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and the Base Closure and Realignment (BRAC) Cleanup Plan Guidebook.

SAEP consists of approximately 124 acres, of which an estimated 76 acres are improved land consisting of 49 buildings, paved roadways and grounds, and five paved parking lots. Included in the improved land are an estimated 10 acres along the Housatonic River where fill was placed over tidal sediments during the development of SAEP facility, including the Causeway. An estimated two acres of property compose the Causeway, constructed to provide access to the river channel (see Figure 1-2).

1.1 OBJECTIVE AND PURPOSE

The objective of the post-construction care is to monitor the integrity of the cover system and to maintain the cover's protection of the public health, safety and the environment and to comply with federal and state regulations.

The purpose of the M&I Plan is to identify tasks necessary to monitor the long-term effectiveness of cover system components on the Causeway (Site). Long-term maintenance and inspection of the site shall be performed to document the cover performance in accordance with the requirements of this document.

This M&I Plan describes: (1) procedures for visual inspections to be used to document and monitor the effectiveness of the cover construction, and (2) maintenance activities and corrective measures to be undertaken at the site should inspections indicate that repairs to maintain the integrity of the cover are necessary.

1.2 SITE HISTORY AND SELECTED REMEDY

The Causeway was initially constructed and used as a means of launching seaplanes in the 1930s. Materials, of unknown origin, were deposited along the northern edge of the

Causeway during the 1950s and 1960s. The source of the fill used to construct the Causeway is unknown, but it has been found to contain soil, cobbles, and construction debris (e.g., concrete, brick, and asphalt). Smaller amounts of other material (e.g., wood, glass, cinders, ash, and rebar) were also observed during field investigation activities. It was also reported that paint solvents and wastes were burned on the Causeway as part of fire-training operations.

Chemical sampling and analysis of soil samples collected from the Causeway identified concentrations of various contaminants that exceeded specific CTDEP Remediation Standard Regulation (RSR) criteria or Ambient Water Quality Criteria (AWQC). Evaluation of chemical analytical data is discussed in the Final Causeway Pre-design Investigation Report (Foster Wheeler Environmental Corporation [FW]/HLA, 2000). Low-level radiological contamination was also identified during sampling, and the affected areas were excavated, containerized and transported to an appropriate off-site disposal facility in March 2000. A summarization of these activities is provided in a report titled "Radiological Chemical Characterization Summary" (HLA, 2000).

Based on the results of chemical sampling and the Final Engineering Evaluation/Cost Assessment (EE/CA) report (FW/HLA, 2000a), it was recommended that an erosion control cover system be placed over the Causeway to mitigate possible receptor contact with contaminated soil.

Evaluation of design options by the stakeholders including the regulatory community and the public led the U. S. Army and the regulatory agencies to agreement on the proposed composite cover system.

The final design consisted of installing a composite cover system over the Causeway, and includes subgrade fill, rock drainage, bedding, armored layering, and vegetative support components. Layer materials vary dependent upon location within the cap system as indicated in Figure 1-3.

2.0 COVER SYSTEM CONSTRUCTION COMPONENTS

Major items identified and addressed within the Causeway cover system design included the following:

1. A geotechnical evaluation of cover system stability and settlement;

2. Designs for the demolition of several buildings and structures on the Causeway and the removal and off-site disposal of debris and some contaminated soil;

3. Design for construction of the Causeway cover system, including a wave analysis, an ice abrasion evaluation, and vegetative cover material selection;

4. A two-phase design to allow early initiation of preliminary construction activities; and

5. Provisions for documentation necessary for application for a site-specific Environmental Land Use Restriction (ELUR).

The constructed cover for the Causeway consists of a lower cover system and an upper cover system. The cover thickness was minimized due to geotechnical constraints associated with the stability and compressibility of the tidal sediments beneath the Causeway fill material. Due to the expected differential movement, the cover system required flexibility, while still rendering the underlying soils inaccessible.

The lower cover system includes rock filled polymeric marine mattresses (PMMs), consisting of rock encased in a polypropylene plastic web material or geogrid. The upper cover system includes articulating concrete blocks (ACB) that are slightly narrow or chamfered at the top cross-section, with gravel placed between the blocks acting to lock the blocks in place, making removal difficult. These two cover components allow movement as the Causeway settles and are not expected to develop cracks, such as those that would develop if a more rigid type cover system like concrete or asphalt were utilized.

These components, in conjunction with a required Environmental Land Use Restriction (ELUR) for the proposed cover system, meet the intent of the CTDEP RSRs as an equivalent “existing permanent structure” to make the Causeway soils inaccessible.

A project file containing materials specifications, U.S. Army Corps of Engineers New England Division (CENAE) approved shop and vendor drawings, and other supporting documentation are identified within the list of references in this plan and are on file at the

SAEP facility and CENAE offices. Additionally, a selection of construction photos is presented in Appendix A.

2.1 LOWER COVER SYSTEM COMPONENTS

The following paragraphs provide a description of the materials used in the lower cover system starting at the base of the cover system, (refer to Figure 1-3).

Gravel Fill: Gravel Fill was required to provide a uniform and stable base for the placement of the PPMs. The following conditions were identified for use of this material: 1) voids created due to the removal of oversized debris from the side slopes of the Causeway, 2) soft pockets of fill material containing high water content which would not provide adequate support, and 3) uneven excavation surface in excess of allowable cover material tolerances.

Geogrid Composite: At the perimeter of the Causeway, the thickness and nature of the fill materials was variable, and the ability of these materials to support the PMMs required additional support. For this purpose a geo-grid composite with a woven geotextile to provide additional support on soft sediments was placed in one roll-width (12-feet) around the toe of the Causeway.

Rock Fill. A graded rock fill was installed at the toe of the Causeway slope to prevent scour of Causeway fill material from wave action on PMMs. Rock fill material is similar to the material used to fill the PMMs.

Woven Geotextile. A woven geotextile was placed between the Rock Filled Toe and the PMMs. This geotextile was provided to limit migration of Causeway fill material (i.e., silt and fine sand) from beneath the PMMs during wave events.

Polymeric Marine Mattresses. PMMs, constructed of a graded rock fill enclosed in a geogrid, were used to stabilize the side slopes of the Causeway. These PMMs were placed upon the excavated slope. The PMMs were tied together at end seams with ultraviolet resistant 3/8-inch braided rope.

The approximate dimensions of the PMMs are 5 feet wide, 10 feet long, and 1 foot deep. The rock fill selected for use in the PMMs, due to environmental loading, was selected to be a well graded stone ranging from 2- to 6-inches.

2.2 UPPER COVER SYSTEM COMPONENTS

The following provides a description of the materials utilized in the upper cover system and the design requirements, starting with the base of the cover system, (refer to Figure 1-3).

Sand Bedding. Installed directly above the prepared Causeway subgrade, the sand bedding formed a smooth, dense layer to support the ACB. The sand bedding layer was installed in one layer to a nominal thickness of 6 inches.

Woven Geotextile. A woven geotextile was placed directly above the sand bedding prior to placement of the ACB. The geotextile was installed to limit damage to the sand bedding during installation of the ACB, provide additional support in the event of differential settlement, and to act as additional protection against contact with the underlying fill materials.

Articulating Concrete Blocks. Four-inch-thick ACB were placed on the upper portion of the Causeway above the 3H:1V slope. The ACB were laid by hand and configured/trimmed to incorporate surface features on the Causeway. The concrete used in the manufacture of the ACB is suitable for the intended use and environment.

Interstitial Gravel. Gravel was used to lock the ACB together, enhancing the system's ability to limit access to the underlying fill materials. The material was selected based on the results of a filter analysis conducted for the specified vegetative support soil. The gravel was spread over the entire surface of the upper cover system and worked into the void space within and between the ACB.

2.3 RIP-RAP TRANSITION

Between the upper and lower cover system (near the crest of the side slopes), a rip-rap transition zone was installed to provide a transition between the upper cover system and the lower cover system to facilitate drainage from the upper cover system (Figure 1-3). Rock fill material, the same used to fill the PMMs, extends beneath the upper and lower cover system to enhance drainage. The rock fill transition extends beneath the upper cover a distance of three to six feet, and is sloped at between 2 and 5% toward the outside of the Causeway.

2.4 VEGETATIVE SUPPORT LAYER

The vegetative support layer consists of vegetative support soil, grass seed, and an erosion control mat. The vegetative support layer is not considered a part of the cover

system, for the purpose of limiting exposure to contaminated Causeway fill. The vegetative support soil consists of 6- to 8-inchs of sandy loam capable of supporting grass growth. The vegetation established post construction on the upper cover system is from a grass mix capable of growth under the periodic saltwater inundation, which occurs at the Causeway.

A 100 percent cotton erosion control mesh was used to retain the vegetative support soil during precipitation and high tide events until adequate vegetation was established on the surface. The erosion control mesh will disintegrate over time.

2.5 POST-CONSTRUCTION TOPOGRAPHIC SURVEY

A topographic record survey was completed following the placement of the vegetative support layer to document the final constructed elevations on the Causeway. This record drawing is presented in Appendix B**,** and can also be found in the document titled NCRA Phase I and Phase II Causeway Surface Design, Project Completion Report (Weston, 2003).

2.6 ENVIRONMENTAL LAND USE RESTRICTION

The Causeway will be the subject of an ELUR. ELURs are defined in section 22a-133q-1 of the regulations of Connecticut State Agencies. The CTDEP views the ELUR as essential to the long-term permanence of the Causeway cover system, and relates to the following issues:

- Prevention of the penetration of the cover system for any purpose;
- Prevention of dredging of the adjacent tidal flats;
- Prevention of placement of structures on top of the Causeway, with loads in excess of 1000 pounds per square foot; and
- Long-term monitoring of the maintenance and monitoring of the cover system performance.

2.7 TOWN OF STRATFORD SURFACE DESIGN COMPONENTS

Via a modification to the Causeway construction contract facilitated by CENAE, the Town of Stratford provided surface features, which were consistent with the protective, cover intent and facilitated future use considerations for the Causeway. The design was prepared by Vanasse Hangen Brustlin (VHB), Inc. of Middletown, CT.

These ancillary components included utility infrastructure, fence support components (i.e., concrete fence post bases), lighting components, and foundations associated with

potential future structures proposed upon the Causeway. Acceptability of materials as well as installation, inspection, and testing for the surface design features was reviewed and approved by the Town of Stratford and their identified representatives. Copies of the VHB design are provided in the aforementioned Project Completion Report.

2.8 REGULATORY REQUIREMENTS

M&I activities related to the Causeway are to be performed in compliance with requirements identified in any contract documents developed for the maintenance and inspection program, and this M&I plan, as approved by the CENAE.

2.9 HEALTH AND SAFETY

M&I personnel shall be responsible for following safe working practices while conducting M&I post-closure tasks. Hazards associated with these tasks include the physical hazards associated with the operation of power equipment (e.g., lawnmowers), heavy equipment for maintenance activities, slips, trips and falls, negotiation of steep grades, potential exposure to rodents, birds and insects (e.g., ticks), and potential exposure to severe weather, storm tides and working around marine environments in general.

A specific M&I HASP is not presented as part of this plan. The selected M&I contractor shall prepare a task-specific HASP including a hazard analysis of anticipated safety concerns using the final CTDEP approved Non-Time Critical Removal Action 100% Design, this post-construction M&I plan; and appropriate Occupational Health and Safety Administration (OSHA) guidance for general construction safety to guide work at the site.

3.0 COVER SYSTEM MONITORING

The Causeway cover system monitoring program shall consist of:

- Cover System monitoring (surface), and
- Settlement monitoring

The Monitoring Schedule for the program during the first and subsequent years is provided in Appendix C.

3.1 MONITORING

Site monitoring, (i.e., historical evaluation/long-term performance of the protective systems) shall be performed by an individual experienced in protective cover system construction and maintenance activities. Notification shall be provided to the U.S. Army and the CTDEP five working days prior to beginning each site Inspection event. The frequency of visual inspection is outlined below and may be decreased in the absence of significant detrimental findings (i.e., significant settlement, erosion), as approved by the U.S. Army and the CTDEP.

Observations shall be recorded in writing as quantitatively as is practical; a minimum of twenty five photographs shall be taken and cataloged as a supplement to inspection reports of general site conditions at each inspection. Photos shall be labeled and identified on a site figure as to location and compass direction to facilitate comparative photographic views over time. Additional photographs shall be collected if deemed appropriate by the inspector relative to specific inspection issues identified. A sample photographic log is provided in Appendix G.

Observations shall be summarized in a letter report following each inspection. Reporting of monitoring events associated with long-term inspection activities shall be as follows, and as presented in Appendix C:

- First two years (semi-annual);
- Subsequent years (annual);
- Every fifth year, evaluation of trends, procedures and overall cover systems performance; and
- Reporting frequency (per event)

A visual inspection checklist is presented as **Appendix D**. If site monitoring observations indicate damage to the cover system, an assessment of the existing conditions shall be undertaken by the inspector, in consultation with U.S. Army and CTDEP, to identify appropriate corrective and/or preventative measures in accordance with this plan.

Site monitoring shall include observation of the following:

- Location and dimensions of erosion rills, surface cracks, depressions, animal burrows;
- Condition of vegetative cover including bare spots, stress areas, and evaluation of mowing requirements;
- General condition or observed deterioration of fence posts, gates, locks, and signage;
- Condition of groundwater monitoring wells including labels, covers, and protective casings (Groundwater monitoring efforts are not a requirement of this M&I program scope);
- Sediment accumulation from erosion;
- Condition of marine mattresses (procedures and inspection criteria are presented in Appendix E); and
- General visual assessment of surface settlement over the upper and lower cover system and at the interface of the lower cover/riverine sediment interface.

3.1.1 ANTICIPATED DURABILITY PERFORMANCE OF COVER SYSTEMS

The materials used in the cover system have been selected and engineered to withstand conditions to which they are expected to be exposed. The following provides a brief description of the durability issues addressed.

Salt Water. The materials used in the cover systems shall be exposed to salt water, the Causeway is located in a tidal area. The lower cover system generally extends throughout the intertidal zone (mean low low water (MLLW) at elevation –2.72 ft MSL to mean high high water (MHHW) at elevation 6.0 ft MSL). The lower cover system is exposed to daily tidal cycles and the upper cover system (above MHHW) is subjected to periodic exposure to salt water due to wave run-up, overtopping, spray, and periodic flooding of the river.

Waves. A wave analysis was performed (Harding, 2001) in conformance with U.S. Army Corps of Engineers' recommendation for irregular wave conditions on revetments of dumped rip rap. The lower cover system has been designed to withstand anticipated wave heights. In general the ACB are not expected to be subject to wave action, since they are located on the upper, flat portion of the Causeway and above wave action elevations. The rip-rap apron's underlying materials have been graded to allow water under the ACB to flow towards the tidal flats.

Submersion. The '100-year Frequency Tidal Flood' is not expected to exceed elevation 10.5; consequently the Causeway is not expected to become completely submerged during a 100-year event. It is more likely that the Causeway would be exposed to a

hurricane tidal flood, at elevation 13.28. ft MSL. The tidal flood shall generate buoyant and current-induced forces on the cover system. The buoyant force shall have little or no effect on the highly permeable, PMMs. The upper cover system is underlain by a permeable system intended to lessen the possibility of trapped air causing buoyant uplift.

Ice Flows. The ability of the PMMs to withstand ice forces is necessary due to seasonal ice flows in the Housatonic River. Two major exposure conditions are considered to likely exist at the Causeway: 1) abrasion, and 2) shear of the PMM shell. Manufacturer testing to assess reductions in tensile strength of the PMM shell indicated that when exposed to 50 cycles of abrasion of the materials by ice, no significant reduction in ultimate tensile strength of the geogrid was observed.

3.2 SURFACE DESIGN COMPONENTS AND UTILITIES

The Town of Stratford surface design was reviewed for compliance and consistency with the established regulatory criteria, protective integrity and global geotechnical stability of the Causeway. As previously discussed, construction and acceptance of these surface features was determined by the Town's representatives. This plan does not incorporate applicable inspection and maintenance activities to address long-term integrity of the surface design components (i.e., utility infrastructure, fence support components, lighting components, and foundations). However, the manholes permitting access to the utility vaults shall be opened to evaluate potential water collection which, if frozen could have the potential to impact the upper cover system (i.e., through frost heaving).

3.3 SETTLEMENT/HEAVE MONITORING

The objective of post-construction settlement/heave monitoring is to verify that adequate slopes of the cover are maintained to shed storm water off the cover without ponding, and to determine the existence of detrimental conditions, which may affect the effectiveness of the cover. Some settlement of the cover is expected.

Changes in slopes after construction shall be detected by scheduled instrument surveys to record ground elevations based on topographical survey. Extent and accuracy requirements for the survey are presented in Appendix F. A construction baseline established during cover installation traverses the long axis of the Causeway (Figure 3-1). The baseline stationing shall be recreated as part of initial M&I activities to locate any observations of settlement, heave and other visual observations identified during inspections. Coordinate locations for the baseline are provided on Figure 3-1. Additional survey points may be established if localized settlement/heave discontinuities are observed during site inspections.

Settlement monitoring shall be performed as scheduled throughout the post-closure care period based on visual inspections. A complete topographic survey of the Causeway cover system shall be made within two years of construction completion (which occurred in September 2002), and at five year intervals thereafter. Topographical contours developed from future survey events shall be compared to post-construction record drawings and subsequent surveys for overall settlement evaluation.

Differential settlement due to the varied nature of the Causeway fill and likely variations in the underlying organic sediments, as well as added loading due to cover system construction, is expected to result in some differential settlement. Quantification of this is impractical; however, the magnitudes are not expected to be excessive. For this reason, a flexible cover system has been constructed. The upper cover system ACB component is capable of distortion and can be exposed to moderate strains due to the gravel-filled voids between the blocks. The polymeric marine mattresses are a very flexible structure and are specifically designed to accommodate differential settlement.

3.4 SETTLEMENT EVALUATION

A settlement analysis was performed (Harding ESE, 2001) to estimate the magnitude of settlement that may be expected to occur due to construction of the cover system on the Causeway. Results of the analysis performed indicate the following:

- The Causeway should be expected to settle approximately 7 inches within the first year following construction.
- The Causeway should be expected to continue to settle at a decreasing rate and may settle an additional 1 to 5 inches over the ensuing 50 years.

Long-term stability of the Causeway is expected to increase over time, as the underlying soils consolidate and gain strength. Should settlement decrease existing slopes below three percent and hinder free runoff and drainage, an assessment of remedies will be required.

4.0 MAINTENANCE PLAN

Items identified during the site inspection requiring routine corrective maintenance shall be repaired within 60 days of required Maintenance & Inspection Report submittal to the Government and CTDEP, provided weather or access do not restrict repair activities and the scope of repairs can reasonably be accomplished within the 60-day period. Major repair schedules shall be developed as part of the assessment of significant detrimental effects to the vegetative cover. Reports of all maintenance activities shall be provided to the U.S. Army and CTDEP within 30 working days after completing inspection event activity.

4.1 VEGETATIVE COVER SYSTEM MAINTENANCE

The vegetative cover shall be mowed a minimum of twice per year to encourage the development of good grass growth. Areas noted during inspections to have poor vegetative growth shall be re-seeded and the area maintained as outlined in the cover system design specifications (Harding ESE, 2001). Animal burrows into the cover system shall be repaired as needed. Burrows into the vegetative soil shall be filled and seeded with suitable materials.

4.2 EROSION CONTROL MAINTENANCE

Erosion of the vegetative cover, as identified during site inspections, shall be repaired as needed and in a manner that provides a long-term solution to such damage. The activities required to repair erosive damage to the cover shall depend on the extent of erosion into the cover. At a minimum, the eroded area shall be re-graded and filled to the vertical and lateral extent of the affected area with materials meeting the requirements of the Causeway cover system design specifications.

Deterioration of the runoff controls (rip-rap, displacement of the ACB or marine mattresses), as identified during site inspections, shall be repaired as needed in a manner and schedule similar to that described above. The activities required to repair cover component damage shall also depend on the extent of damage. The final grades of all repaired areas shall conform to the grades and slopes of the surrounding areas and comply with the limits of existing grades and slopes identified in this M&I Plan.

Maintenance activities resulting in unconfined excavation, which may be required below approximate elevation 6.0 MSL, shall be required to consider the following limitation;
The lower reaches of the Housatonic River, where the Causeway cover system was constructed, include areas of shellfish and finfish resources. The CTDEP does not allow what it considers to be unconfined excavation or filling work in the lower reaches of the Housatonic during certain time periods in order to protect shellfish and finfish resources.

The relevant "closed" period for unconfined dredging is from April 1 through September 30 (April 1 to June 30 for finfish, and June 1 to September 30 for shellfish).

Work above approximate elevation 6.0 MSL is acceptable at any time under the CTDEP requirements. Review by CTDEP and implementation of best management practices shall be required during all maintenance work within the tidal zone area.

4.3 SETTLEMENT AND SUBSIDENCE CONTROL MAINTENANCE

The grades and slopes of the site are expected to be sufficient to provide positive drainage even after subsidence. Should damage to the vegetative cover as a result of excessive post-closure settlement be identified during site inspections, repair of the vegetative cover shall be implemented as necessary to confirm that positive slope is maintained. Because subsidence typically occurs gradually the inspection frequencies identified, after the first year, should be sufficient to identify settlement problems.

The corrective action for ponding water caused by subsidence of the vegetative cover shall be the addition of soil material to conform to pre-existing slopes and grades and grades of the surrounding area to provide uninterrupted positive drainage.

4.4 OTHER ROUTINE MAINTENANCE

Routine maintenance shall include oiling gate hinges and replacing inoperable locks. Repair of holes in adjacent chain-link fencing, replacement of posts and supporting rails to insure integrity of the gate and, repairs as necessary to maintain controlled access as needed and identified by the Government is also required. Such repairs should occur within 60 days of submittal of the scheduled M&I Inspection Report, provided weather or access does not restrict repair.

5.0 REPORTS

At the end of each inspection and/or maintenance event, a report summarizing inspections and maintenance activities and recommendations for follow-on activities or critical concerns shall be prepared by the Contractor. The report shall include the observations and information collected during the monitoring events, plus relevant historical data. Trends in settlement and/or continuing maintenance issues may be updated and presented. The compiled first two year's data shall be used to establish baseline measurements of conditions for subsequent evaluation of cover performance. Based on the results of the first two year's data, a revised monitoring program may be proposed for regulatory approval to eliminate or reduce inspection frequency. Revisions to the monitoring program in subsequent years shall be justified and documented. See Appendix G for a summary report format of general documentation.

Subsequent annual reports shall note unusual events associated with the year's inspections and maintenance, and add monitoring information to the information collected from previous years.

A Site Review Report issued by the M&I Contractor every five years shall summarize maintenance activities, analyze monitoring trends, and propose necessary changes in post-closure care. Statistically significant changes (increases or decreases) in settlement monitoring shall be the basis for assessing the need to make changes to the monitoring program or to plan corrective actions.

Five year site review actions shall be attended by the U.S. Army and CTDEP. The site review meeting shall consider the monitoring data and proposals, if any, to modify post-closure activities. The site review process shall request CTDEP approval for U.S. Army activities for the next period of post-closure care.

6.0 WARRANTIES

Product Warranties are provided and discussed in the Remedial Action Contractor's Project Completion Report (Weston 2003).

ACB	articulating concrete blocks
AWQC	Ambient Water Quality Criteria
BRAC	Base Closure and Realignment
CENAE	U.S. Army Corps of Engineers New England Division
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CTDEP	Connecticut Department of Environmental Protection
EE/CA	Engineering Evaluation/Cost Assessment
ELUR	Environmental Land Use Restriction
FW	Foster Wheeler Environmental Corporation
HLA	Harding Lawson Association
M&I	Maintenance and Inspection
MHHW	mean high high water
MLLW	mean low low water
MSL	mean sea level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCRA	Non-time Critical Removal Action
OSHA	Occupational Health and Safety Administration
PMM	
RSR	Remediation Standard Regulation
SAEP	Stratford Army Engine Plant
Site	Causeway
VHB	Vanasse Hangen Brustlin

Foster Wheeler/Harding Lawson Associates (FW/HLA), 2000. Pre-design Investigation Report Causeway and Dike NCRA, prepared for the U.S. Army Corps of Engineers – New England District. April 14, 2000.

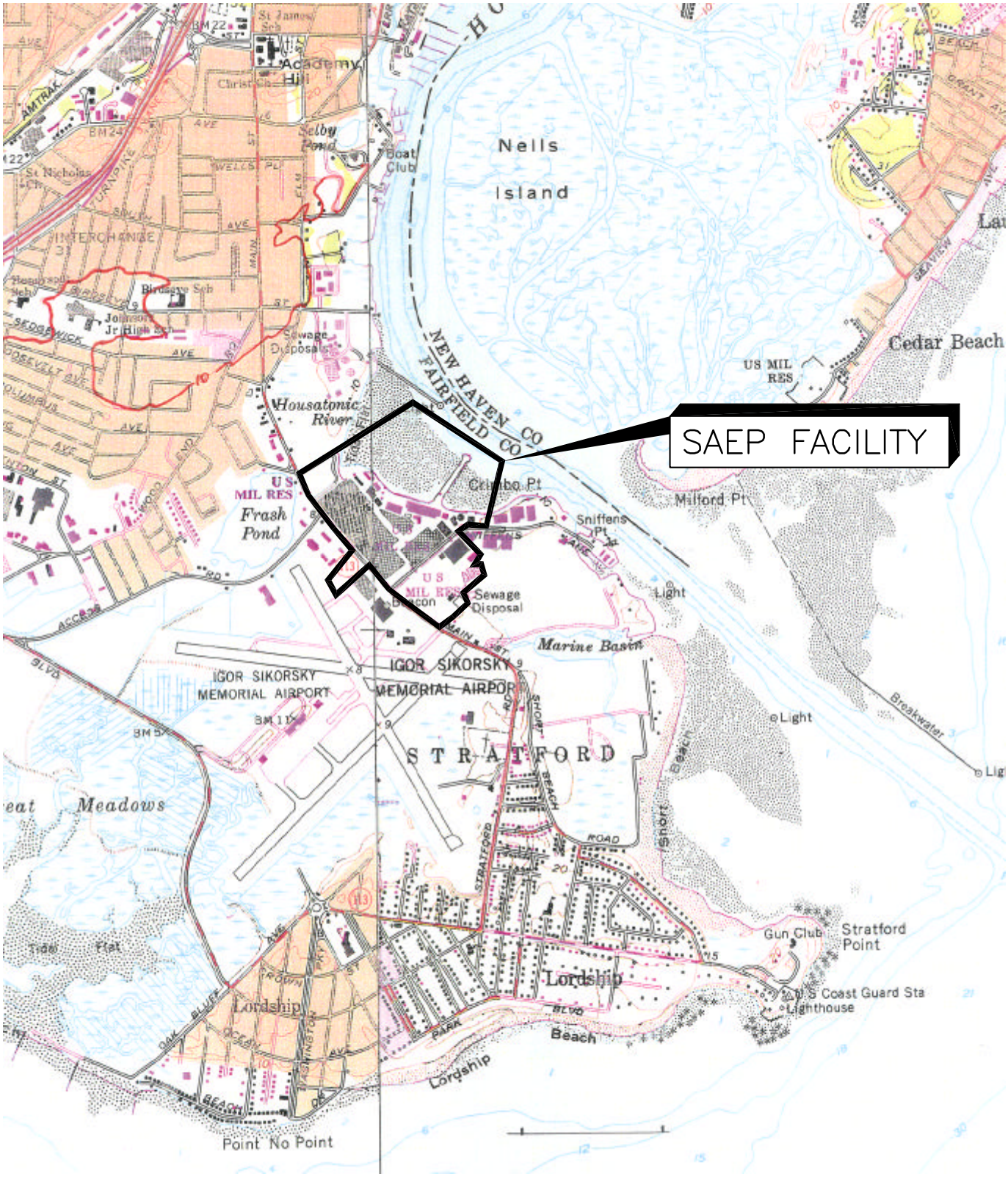
Foster Wheeler/Harding Lawson Associates (FW/HLA), 2000b. Final Engineering Evaluation/Cost Analysis for the Causeway and Dike, Stratford Army Engine Plant, prepared for the U.S. Army Corps of Engineers – New England District. September 22, 2000a.

Harding Lawson Associates (HLA), 2000. Radiological Chemical Characterization Summary for the Causeway and Dike, Stratford Army Engine Plant, prepared for the U.S. Army Corps of Engineers – New England District. 2000.

Harding ESE, Inc, a MACTEC Company (Harding), 2001. 100% Basis of Design Phases I and II, Non-Time Critical Removal Action, Stratford Army engine Plant. Prepared for U.S. Army Tank-automotive and Armaments Command (TACOM). August 2001.

R. F. Weston (Weston), 2003. Project Completion Report Non-Time Critical Removal Action, Stratford Army Engine Plant. Prepared for the U.S. Army Corps of Engineers – New England District. April 2003.

FIGURES



MAP SOURCE:

FROM BRIDGEPORT & MILFORD, CT. USGS QUADRANGLE MAP. 1970 & 1960, PHOTOREVISED 1984. REVISED FROM: URS Greiner Woodward Clyde - WAYNE, NEW JERSEY. DATED MARCH 2, 2000.

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SCALE (FEET)

FIGURE 1-1
FACILITY LOCATION
MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT

Harding ESE

Site Map

0 150 300 Feet

Prepared by BRP | Checked by WBJ

Legend

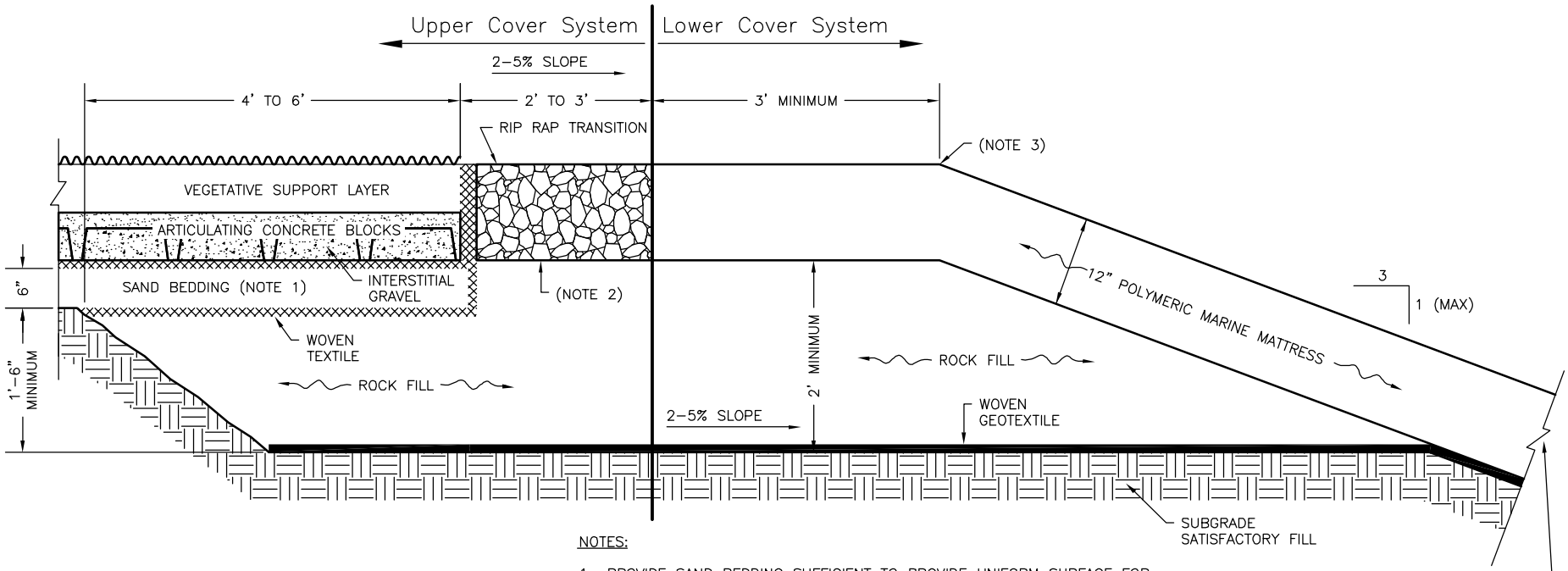
- Buildings, Riprap
- Former Buildings
- Drainage Channels, Ponds
- Fences
- Roads
- Boundary
- Buildings
- Open Paved/Concrete Areas
- Open Grassed Areas
- Roads/Parking Lots
- Water

FIGURE 1-2
FACILITY DETAIL MAP

MAINTENANCE & INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT
Harding ESE

P:\Projects\CBDCOM\SAEP\RI-FS-PP\RI Report\GIS-Av8\MapDocuments\CausewayConstruction.mxd P:\Projects\CBDCOM\SAEP\RI-FS-PP\RI Report\GIS-Av8\Figures\CausewayConstruction\Figure1-2.pdf

CREATED BY: BGF
CHECKED BY: WBJ

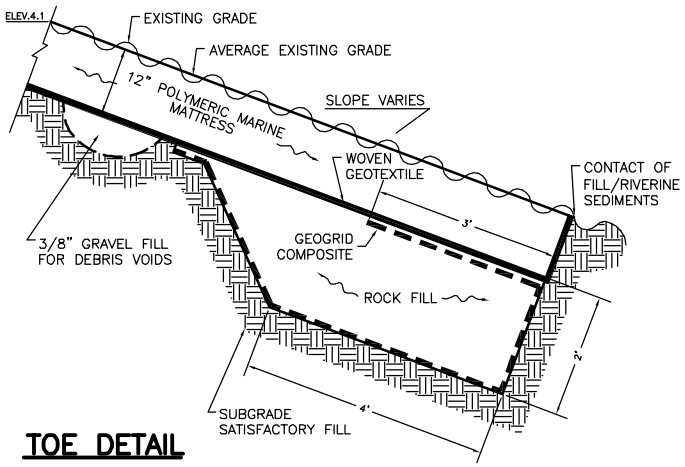


TRANSITION DETAIL

NOT TO SCALE

NOTES:

1. PROVIDE SAND BEDDING SUFFICIENT TO PROVIDE UNIFORM SURFACE FOR PLACEMENT OF INTERLOCKING CONCRETE BLOCKS.
2. EXTEND LOWER POLYMERIC MARINE MATTRESS SHELL MATERIAL BETWEEN ROCK FILL AND RIP RAP AND BENEATH INTERLOCKING CONCRETE BLOCKS A TOTAL OF 5 FEET MINIMUM TO SECURE MATTRESS.
3. DO NOT INSTALL BUTTED ENDS WITHIN 5 FEET OF THE BREAK IN SLOPE.
4. POLYMERIC MARINE MATTRESS SHALL NOT ENCROACH BEYOND THE AVERAGE EXISTING GRADE BETWEEN THE CONTACT OF FILL/RIVERINE SEDIMENTS AND ELEVATION 4.1–FEET MSL.
5. SOURCE: HARDING ESE SHEET REFERENCE NO. C–303. ENTITLED "MISCELLANEOUS DETAILS" DATED 8/30/01.



TOE DETAIL

NOT TO SCALE

FIGURE 1–3
CAUSEWAY COVER SYSTEM PROFILE
MAINTENANCE AND INSPECTION PLAN
FOR CAUSWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNTECTICUT

Hardina ESE

Created By: BGF

Checked By: WBJ

MERIDIAN IS REPORTED TO BE NORTH AMERICAN DATUM OF 1983 AS PROVIDED BY CLIENT

APPROXIMATE LIMIT OF LOWER COVER SYSTEM

TIDAL FLATS

APPROXIMATE CONTACT OF FILL/RIVERINE SEDIMENTS

HOUSATONIC RIVER

RIP-RAP SLOPE

BIT. CONC. PAVEMENT

COORDINATES OF STATION 0+00
N 623595.62
E 897824.31

MONITORING WELLS

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00

APPROXIMATE LIMIT OF LOWER COVER SYSTEM

COORDINATES OF STATION 7+00
N 624169.03
E 898225.82

RIP-RAP SLOPE (TYPICAL)

EDGE OF WATER AT LOW TIDE

APPROXIMATE LIMIT OF LOWER COVER SYSTEM

APPROXIMATE CONTACT OF FILL/RIVERINE SEDIMENTS

LEGEND

- RETAINING WALL
- 1' CONTOUR
- +7.9 SPOT GRADE (– INDICATES NEGATIVE)
- APPROXIMATE CONTACT OF FILL/RIVERINE SEDIMENTS
- EDGE OF WATER AT LOW TIDE
- EXISTING RIPRAP
- LIMIT OF WORK

0 40 80
Scale in feet

NOTES:

1. FOR FINAL GRADING CONDITIONS REFER TO TOPOGRAPHIC SURVEY RECORD DRAWING APPENDIX B.
2. FOR SCHEDULED SURVEY REQUIREMENTS REFER TO APPENDIX F.
3. FOR DETAILS OF TOWN OF STRATFORD SURFACE DESIGN, INCLUDING UTILITIES, LIGHTING, AND FOUNDATIONS, REFER TO PROJECT COMPLETION REPORT (WESTON, 2003). SECTION 2.3.6 AND SURVEY REPORT DRAWING APPENDIX B.
4. FOR SPECIFIC LOCATIONS OF SITE COVER SYSTEM FEATURES REFER TO PROJECT COMPLETION REPORT (WESTON, 2003), AND SURVEY RECORD DRAWING APPENDIX B.

FIGURE 3–1
GENERAL SITE CONDITIONS
MAINTENANCE AND INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNTECTICUT

Harding ESE

P:\Projects\CBDOOM\SAEP\Causeway\phase1\C472545P07.dwg Tue, 06 Jan 2004 - 10:52am bgfurey

APPENDIX A
SELECTED CONSTRUCTION PHOTOGRAPHS

1. Subgrade soil, 1-foot cut to accommodate lower cover system marine mattresses placement.

2. Compaction of acceptable subgrade fill in upper cover area (static load only).

3. Marine mattress deployment over geogrid reinforced toe detail.

4. Marine mattress deployment at low tide (looking north towards Housatonic River channel).

CERTIFICATION REPORT PHOTOS
MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM
APPENDIX A
STRATFORD ARMY ENGINE PLANT

5. Filling factory fabricated marine mattresses with crushed D50 = 3-inch aggregate in South Parking Lot SAEP.

6. Detail of aggregate filling operations for marine mattress. Note tamping of stone into mattress baffles.

7. Reinforced geogrid utilized under riverine sediment/causeway fill interface details to provide support for marine mattresses.

8. Relocating subgrade spoil excavation from lower cover system for scarification and drying.

CERTIFICATION REPORT PHOTOS
MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM
APPENDIX A
STRATFORD ARMY ENGINE PLANT

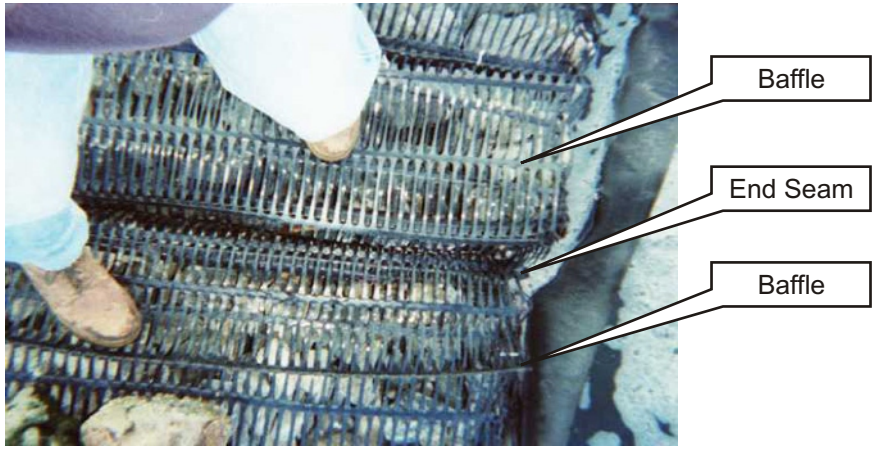
9. Marine mattresses staged in South Parking Lot after fabrication. Note QC flagging on individual units.

10. Survey of causeway and intertidal settlement/heave monitoring platforms.

11. Deployment of lower cover system marine mattresses over woven geotextile. Elevation 6.0 MSL is at silt fence line.

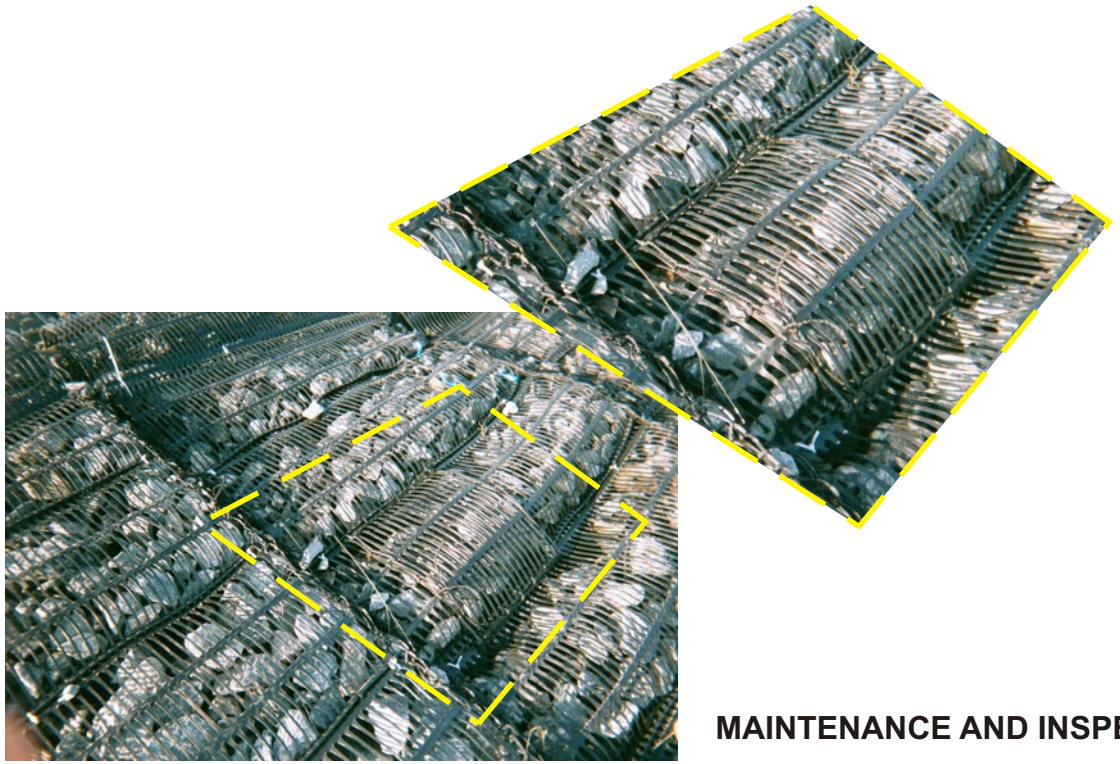
12. Scarification and grading of lower cover system “acceptable” fill material on upper cover area to achieve subgrade contouring.

CERTIFICATION REPORT PHOTOS
MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM
APPENDIX A
STRATFORD ARMY ENGINE PLANT



13. Deployed marine mattress end seam gap.

14. Deployed marine mattress side seam gap. Note individual baffle pillows within mattress units.



15. Typical marine mattress grid repair (Right center of photo).

16. Completed area of marine mattress on east side of causeway. Note red flagging indicating QA inspection identified deficiencies.

CERTIFICATION REPORT PHOTOS
MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM
APPENDIX A
STRATFORD ARMY ENGINE PLANT

17. Rock filled transition between upper and lower cover systems.

18. View of deployed marine mattresses to the north and east on the Causeway tip. Note Sea grass windrow and algae accumulation on mattresses.

19. Example fauna in attendance during construction.

20. Completed rip rap transition with installed fence post bases as a component of Town of Stratford surface design. Note geogrid tab restraints under rip rap.

CERTIFICATION REPORT PHOTOS
MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM
APPENDIX A
STRATFORD ARMY ENGINE PLANT

21. Pallets of articulating concrete block staged near Building No. 4 inside south guard post.

22. Application of bedding sand and compaction prior to articulating concrete block deployment.

23. Deployment of articulating concrete block over woven geotextile, all deployment was performed by hand. Note concrete light pole base in immediate background.

24. Transition from marine mattress to rip rap apron to upper cover system looking to the south west at approximate baseline station 5+50.

CERTIFICATION REPORT PHOTOS
MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM
APPENDIX A
STRATFORD ARMY ENGINE PLANT

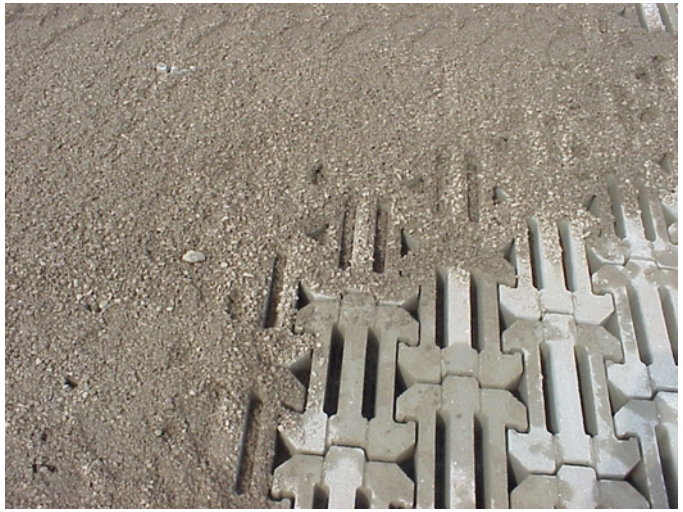
25. Rip-rap transition interface with articulating concrete block.

26. Final detailing of articulating concrete block along rip rap apron. Geotextile layer intended to retain vegetative soil from migration into rip rap stone.

27. Survey documentation of Causeway cover system component limits.

28. Completed articulating concrete block deployment prior to placement of interstitial gravel fill, (photo courtesy of R. F. Weston).

CERTIFICATION REPORT PHOTOS
MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM
APPENDIX A
STRATFORD ARMY ENGINE PLANT



29. Filling of articulating concrete block with interstitial gravel fill (photo courtesy of R. F. Weston).

30. Looking north along Causeway with final grading, jute mat application and straw mulch, (photo courtesy of R. F. Weston).

31. Full aerial view of Causeway at completion of sand application, (photo courtesy of R. F. Weston).

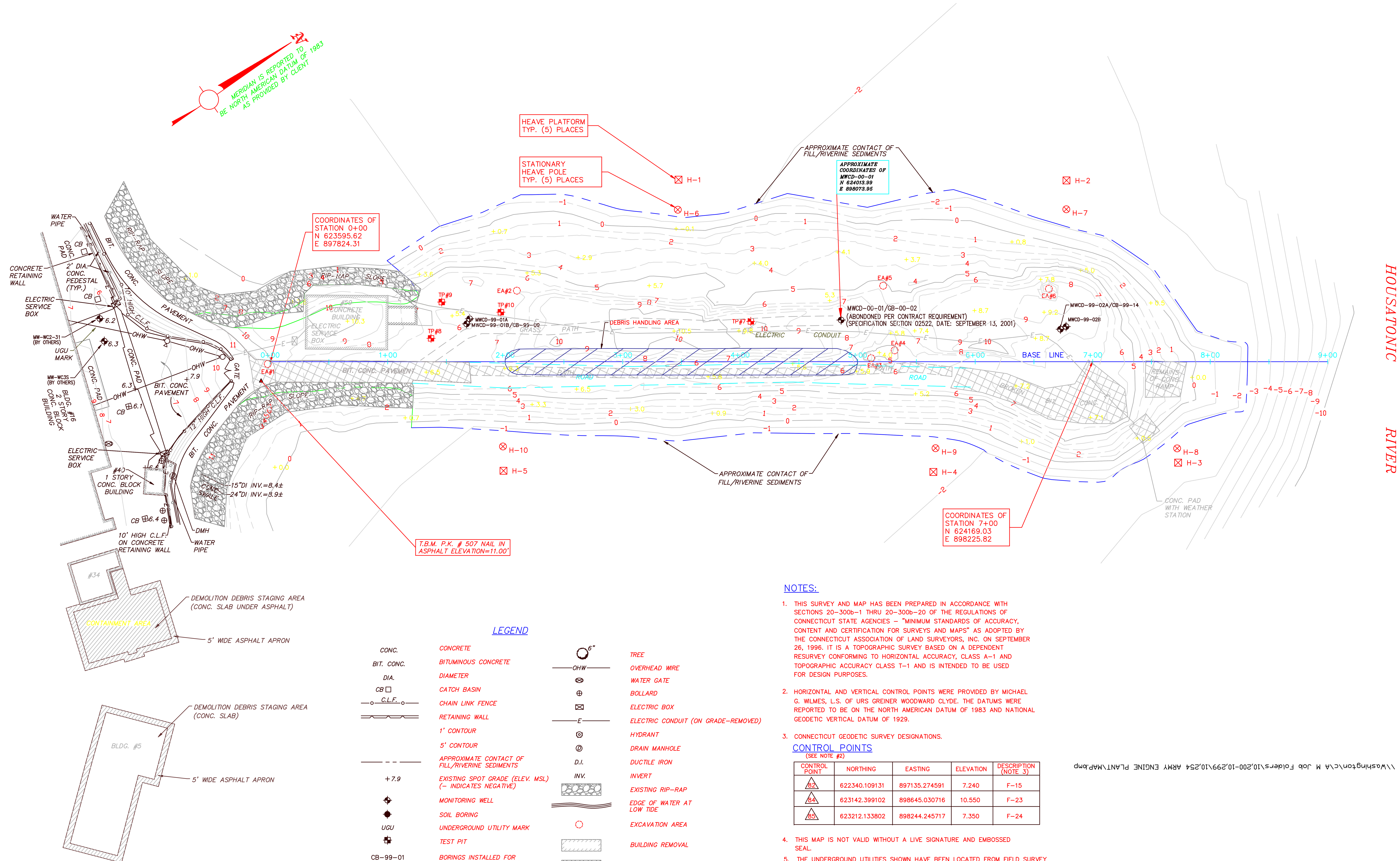
32. Aerial view of Causeway tip post bedding sand application. Note grayish color of marine mattresses indicating algae growth, (photo courtesy of R. F. Weston).

CERTIFICATION REPORT PHOTOS
MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM
APPENDIX A
STRATFORD ARMY ENGINE PLANT

33. View of Causeway with established vegetative cover post-construction (Oct 2002), (photo courtesy of R. F. Weston).

CERTIFICATION REPORT PHOTOS
MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM
APPENDIX A
STRATFORD ARMY ENGINE PLANT

APPENDIX B
TOPOGRAPHIC SURVEY RECORD DRAWING



LEGEND

CONC.	CONCRETE		TREE
BIT. CONC.	BITUMINOUS CONCRETE	OHW	OVERHEAD WIRE
DIA.	DIAMETER		WATER GATE
CB	CATCH BASIN		BOLLARD
C.L.F.	CHAIN LINK FENCE		ELECTRIC BOX
	RETAINING WALL	E	ELECTRIC CONDUIT (ON GRADE–REMOVED)
	1' CONTOUR		HYDRANT
	5' CONTOUR		DRAIN MANHOLE
	APPROXIMATE CONTACT OF FILL/RIVERINE SEDIMENTS	D.I.	DUCTILE IRON
+7.9	EXISTING SPOT GRADE (ELEV. MSL) (– INDICATES NEGATIVE)	INV.	INVERT
	MONITORING WELL		EXISTING RIP-RAP
	SOIL BORING		EDGE OF WATER AT LOW TIDE
UGU	UNDERGROUND UTILITY MARK		EXCAVATION AREA
	TEST PIT		BUILDING REMOVAL
CB-99-01	BORINGS INSTALLED FOR PRE-DESIGN INVESTIGATION		PAVEMENT OR PATHWAY REMOVAL
GB-00-08	BORINGS INSTALLED FOR GEOTECHNICAL INVESTIGATION		REMAINING BUILDINGS
			ASPHALT AREA

NOTES:

1. THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20–300b–1 THRU 20–300b–20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS OF ACCURACY, CONTENT AND CERTIFICATION FOR SURVEYS AND MAPS" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996. IT IS A TOPOGRAPHIC SURVEY BASED ON A DEPENDENT RESURVEY CONFORMING TO HORIZONTAL ACCURACY, CLASS A–1 AND TOPOGRAPHIC ACCURACY CLASS T–1 AND IS INTENDED TO BE USED FOR DESIGN PURPOSES.

2. HORIZONTAL AND VERTICAL CONTROL POINTS WERE PROVIDED BY MICHAEL G. WILMES, L.S. OF URS GREINER WOODWARD CLYDE. THE DATUMS WERE REPORTED TO BE ON THE NORTH AMERICAN DATUM OF 1983 AND NATIONAL GEODETIC VERTICAL DATUM OF 1929.

3. CONNECTICUT GEODETIC SURVEY DESIGNATIONS.

CONTROL POINTS
(SEE NOTE #2)

CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION (NOTE 3)
82	622340.109131	897135.274591	7.240	F–15
84	623142.399102	898645.030716	10.550	F–23
85	623212.133802	898244.245717	7.350	F–24

4. THIS MAP IS NOT VALID WITHOUT A LIVE SIGNATURE AND EMBOSSED SEAL.

5. THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

TO THE BEST OF MY KNOWLEDGE & BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON

0' 40' 80' 120'

*FIELD SURVEY PERFORMED ON OR BETWEEN 10/03/01 TO 10/29/01

US Army Corps of Engineers
New England District

U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
CONCORD, MASSACHUSETTS

A M ENGINEERING
TILTON & ASSOC., INC.

NON-TIME CRITICAL REMOVAL ACTION
CAUSEWAY COVER DESIGN (PHASE I)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

PHASE I
TOPOGRAPHIC SURVEY

Sheet reference number:
SHEET 1 OF 1

NOTES:

1. THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300b-1 THRU 20-300b-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS OF ACCURACY, CONTENT AND CERTIFICATION FOR SURVEYS AND MAPS" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996. IT IS A TOPOGRAPHIC SURVEY BASED ON A DEPENDENT RESURVEY CONFORMING TO HORIZONTAL ACCURACY, CLASS A–2 AND TOPOGRAPHIC ACCURACY CLASS T–2 AND IS INTENDED TO BE USED FOR DESIGN PURPOSES.

2. HORIZONTAL AND VERTICAL CONTROL POINTS WERE PROVIDED BY MICHAEL G. WILMES, L.S. OF URS GREINER WOODWARD CLYDE. THE DATUMS WERE REPORTED TO BE ON THE NORTH AMERICAN DATUM OF 1983 AND NATIONAL GEODETIC VERTICAL DATUM OF 1929.

3. CONNECTICUT GEODETIC SURVEY DESIGNATIONS.

CONTROL POINTS
(SEE NOTE #2)

CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION (NOTE 3)
A2	622340.109131	897135.274591	7.240	F–15
A4	623142.399102	898645.030716	10.550	F–23
A5	623212.133802	898244.245717	7.350	F–24

4. THIS MAP IS NOT VALID WITHOUT A LIVE SIGNATURE AND EMBOSSED SEAL.

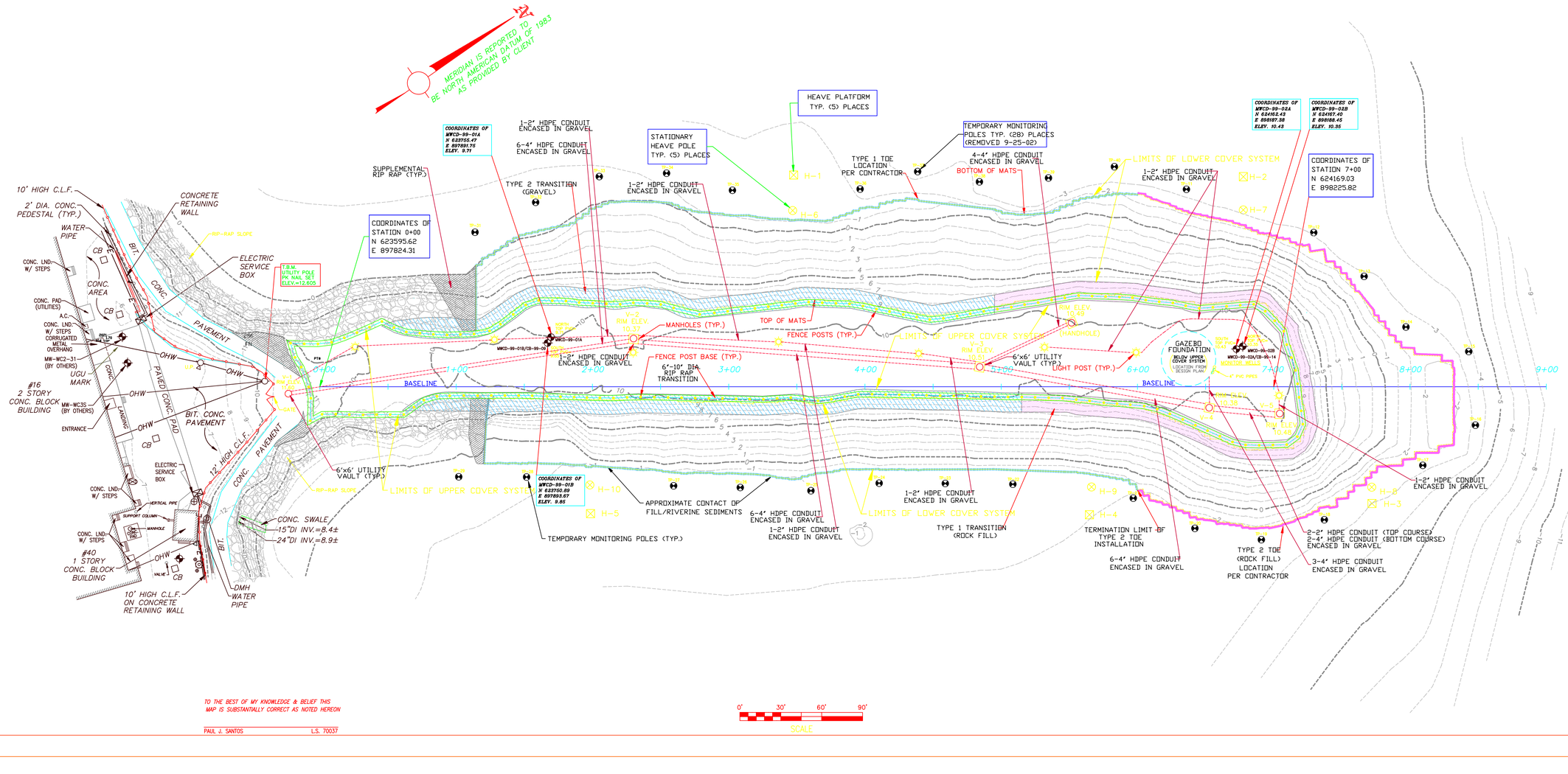
5. THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

LEGEND

CONC.	CONCRETE	TREE	MANHOLE
BIT. CONC.	BITUMINOUS CONCRETE	OHW	OVERHEAD WIRE	HEAVE PLATFORM
DIA.	DIAMETER	WATER GATE	STATIONARY HEAVE POLE
CB □	CATCH BASIN	BOLLARD	TEMPORARY MONITORING POLE
C.L.F.	CHAIN LINK FENCE	ELECTRIC BOX	LIGHT POST
	RETAINING WALL	E	ELECTRIC CONDUIT (ON GRADE)	LND.	LANDING
	1' CONTOUR	HYDRANT	A.C.	AIR CONDITIONER
	5' CONTOUR	DRAIN MANHOLE	SUPPLEMENTAL RIP RAP
+7.9	EXISTING SPOT GRADE (ELEV. MSL) (– INDICATES NEGATIVE)	D.I.	DUCTILE IRON
	MONITORING WELL	INV.	INVERT
	SOIL BORING	EXISTING RIP–RAP
UGU	UNDERGROUND UTILITY MARK	TYPE 1 TRANSITION (ROCK FILL) LOCATION PER CONTRACTOR
	TEST PIT	TYPE 2 TRANSITION (GRAVEL) LOCATION PER CONTRACTOR

*FIELD SURVEY PERFORMED ON OR BETWEEN 2/06/03 AND 2/11/03
*TEMPORARY HEAVE MONITORING POINTS REMOVED NOVEMBER 25, 2002

\\Washington\c\A M Jobfolders\10,200-10,299\10,254 ARMY ENGINE PLANT\MAP.bmp



TO THE BEST OF MY KNOWLEDGE & BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON

PAUL J. SANTOS L.S. 70037

US Army Corps of Engineers
New England District

No.	Description	Date	Appr.
Mark			
Mark			

Date:
Design file no.:
Drawing code:
Plot scale:
Plot date:
Designed by:
Drawn by:
Cad by:
Reviewed by:
Submitted by:
Chief, Appl. Branch

U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT CONCORD, MASSACHUSETTS

A.M. ENGINEERING

STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT
PHASE II
TOPOGRAPHIC SURVEY

Sheet reference number:

SHEET 1 OF 1

APPENDIX C
COVER SYSTEM INSPECTION SCHEDULE

INSPECTION SCHEDULE

MAINTENANCE AND INSPECTION PLAN
CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

		INSPECTION FREQUENCY																							
		FIRST AND SECOND YEAR												SUBSEQUENT YEARS											FIVE YEAR
INSPECTION ITEM	MONTH	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	5
Erosion						X				X								X								X
RIP-RAP Areas						X				X								X								X
Marine Mattresses						X				X								X								X
Gates and Locks						X				X								X								X
Vegetative Growth						X				X								X								X
Fence Components						X				X								X								X
Sediment Accumulation						X				X								X								X
Settlement (visual assessment)						X				X								X								X
Marine Mattress Damage Inspection						X				X								X								X
Topographic Survey																										X

NOTES:

1. Seasonal inspection may be adjusted to best fit time when frost is not present in the cover.
2. Inspection schedule semi-annual for first two years, annual thereafter.
3. Second and five year inspections and cover performance assessment evaluations are required and included a topographical survey as provided in Appendix F of the M&I Plan.
4. Based on two-year reviews and absence of conditions detrimental to the cover materials, inspections may be reduced at the discretion of the U.S. Army and the CTDEP.
5. Reporting to be provided within 30 days of inspection completion.
6. Polymeric Marine Mattress Damage Inventory guidelines are presented in Appendix E of the M&I Plan.
7. Cover system monitoring inspection and maintenance requirements are provided in Sections 3.0 and 4.0 of the M&I Plan.

APPENDIX D
VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

MAINTENANCE AND INSPECTION PLAN
CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

SHEET ___ OF ___

LOCATION/COMPONENT	CHECKED BY (Initials)	COMMENTS/NOTES (Use additional sheets as necessary)
VEGETATIVE COVER		
Erosion rill/channel/depression, length, width, depth and baseline location		
Eroded areas with exposure of ACB		
Eroded areas with exposure of geotextile		
Surface cracks in vegetative cover description and baseline location		
Condition of vegetation (bare, sparse, stressed, woody growth)		
Evaluation of mowing requirements and/or needs		
Sediment accumulation		
Apparent ponding areas		
RIP-RAP TRANSITIONS AND APRON AREAS		
Settlement of RIP-RAP fill		
Displacement of RIP-RAP fill		
Sedimentation of RIP-RAP void space		
Geotextile exposure		
FENCES,GATES AND LOCKS		
Locks lubricated and functional		
Gate hinges adjusted and lubricated		
Fence fabric intact within 100-feet of Causeway east and west		
VISUAL OBSERVATIUON OF SETTLEMENT[(A)]		
Settlement observations of upper cover areas		

VISUAL INSPECTION CHECKLIST

MAINTENANCE AND INSPECTION PLAN
CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

SHEET ___ OF ___

LOCATION/COMPONENT	CHECKED BY (Initials)	COMMENTS/NOTES (Use additional sheets as necessary)
Settlement observations of lower cover areas		
Cracking or settlement in tidal flats within 100-feet of lower cover limits		
POLYMERIC MARINE MATTRESSES		
Inspect per M&I Plan Appendix E		
MONITORING WELLS		
Well Identification clearly marked		
Flush mount casings and collars intact		
Condition of PVC riser		
Well cap in place		
INSPECTION OF SURFACE DESIGN FEATURES(B)		
OTHER		

NAME_____ **SIGNATURE** _____

FIRM_____ **DATE/TIME** _____

NOTES:

1. Observations should be as quantitative as practical. And located relative to construction baseline distance and off-set as depicted on record drawings
2. Supplement inspection with photographic documentation as follows:
   a. A minimum of 25 Photos will be collected at each inspection event. Photos will be cataloged and locations and compass direction indicated on a site figure to facilitate historical comparison of conditions.
   b. Additional photos will be collected at the inspector's discretion relative to identified inspection issues.
3. Erosion channel or depression length, width, depth and location shall be recorded.

(A) Settlement monitoring will be evaluated and assessed at initial 2-year period and 5-year schedule after construction

(B) Surface design feature inspection is to be reviewed with Town of Stratford personnel for applicable concerns and procedures and incorporated into the plan.

M&I = Maintenance and inspection Plan

ACB = Articulating Concrete Block

APPENDIX E
POLYMERIC MARINE MATTRESS INSPECTION AND REPAIR PROCEDURES

APPENDIX E
MAINTENANCE AND INSPECTION PROCEDURES FOR
POLYMERIC MARINE MATTRESSES

MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT

1.0 BACKGROUND

The purpose of this maintenance and inspection procedure for the polymeric marine mattresses (PMMs) is to identify the tasks necessary to monitor the long-term effectiveness of the PMMs on the Causeway (Site).

This Appendix describes (1) procedures for visual inspections used to document and monitor the performance of the PPM components, and (2) maintenance activities and corrective measures to be undertaken should inspections indicate that repairs to maintain the integrity of the PMMs are necessary.

Installation of the PMMs generally consisted of the following, (refer to Maintenance and Inspection (M&I) Plan Figure 1-3):

- Reinforcement of the lower toe of the cover system at the riverine/sediment fill interface with geogrid composite to restrict scouring and tidal erosion at the outer reaches of the Causeway;
- Geotextile underlayment to provide support for the cover system, and act as a barrier to prevent migration of and receptor exposure to underlying soil/sediment; and
- PMM deployment to resist erosion from storm tides and ice accumulation while allowing for: 1) minimization of intertidal zone encroachment; 2) minimization of excavation costs; 3) maximization of weight distribution over soft sediments; and 4) provide additional barrier protection against exposure to underlying soils.

2.0 CONSTRUCTION INSTALLATION

The excavation limits for side slopes in the lower cover system area did not exceed 1-foot vertical, or the thickness of the fabricated PMMs. Excavation of subgrade was limited to areal coverage which could be deployed in one tide cycle to avoid erosion or sedimentation of intertidal areas.

The PMMs structural grid component panels were cut and fabricated at the vendor facility and then filled with specified aggregate material once delivered to the site field fabrication area. Attachment E-1 provides a typical configuration of prefabricated PMMs. Aggregate was utilized to fill the mattresses via a manufacturer detailed filling frame (see M&I Plan Appendix A - Selected Construction Photographs).

All PMMs were QC inspected prior to release for installation on the Causeway by the project QC Manager. The PMMs were then palletized and transferred to the Causeway final deployment upon slope surfaces of the lower cover system.

After installation, the PMMs were inspected and repair processes were developed by the Contractor to identify and correct non-conforming conditions. A final quality assurance (QA) inspection was provided which generated final repair and acceptance documentation for the project record (Attachment E-2), including:

- Separation of the lower cover system into approximate 100 linear foot areas referenced to the construction baseline;
- Identification of QA repair requirements within the referenced areas; and
- Contractor and U.S. Army Corps of Engineers (USACE) representative certification and acceptance of the PMMs via "Deployed PMM Acceptance" forms by.

As part of QA documentation an inventory repair log was created which cataloged approximately 20 percent of all repairs affected during construction (Attachment E-3). The intent of this inventory is to provide baseline data with which to access historical long term performance of the PMMs and includes.

- Reference to inventory area based on Attachment E-2 baseline locations;
- Deficiency code identifiers based on the Contractor's repair guideline criteria, (Attachment E-4);
- Type of repair affected to the PMM; and
- Specific comments relative to conditions of the PMM inventory area in general.

The 20 percent repair inventory areas were selected by a random number generator based on the number of rows in a given acceptance certification area. The identified rows shall be the subject of future 5-year inspections described below and required by the M&I Plan to assess long term performance of the PMMs.

3.0 ANNUAL INSPECTIONS

Annual inspections shall be executed at the frequency indicated in the M&I Plan Appendix C. Inspection will require consideration of tidal cycles and shall be scheduled at low lunar tide cycle. Visual inspection of the PMM components shall be performed to provide general observation of the PMM conditions and any potential impacts from

environmental conditions which may require short term maintenance including but not limited to the following:

- Regulatory design requirements dictated that the PMMs be deployed with a maximum of 2-inch gaps between adjoining units. Inspections should assess this requirement in regards to possible shifting of the PMMs. It was anticipated that with time the PMM rock fill would tend to settle and spread the interior baffles of the mattresses. The result being a cover with PMM units becoming more closely abutted;
- Abutting PMMs were required to be stitched together at the end seam tabs to create a continuous protective cover system**.** Attachment E-5 provides stitching details for the end tab seams. The end seams should be observed in general for broken stitching, deformation or broken geogrid components.
- General walk over inspection to observe PPM conditions, (1942 units covering approximately 2.2 acres) for the following:

    - Broken aperture or traverse ribs in the geogrid in excess of repair criteria;
    - Internal baffle separation (i.e., severe bodkin rod shifting);
    - Existing patch or repair deterioration;
    - Observations of geosynthetic deterioration (i.e., cracking, crazing, tensile failure, stress discoloration);
    - Exposure or deterioration of underlying geotextile fabric, or geogrid composite toe reinforcement;
    - Obvious fraying or loose lengths of braided rope stitching material;
    - Damaged to PMMs caused by drift wood, ice, or suspected wave action;
    - Type and general distribution of marine organism growth upon and within the PMMs, (i.e., algae, shellfish, sea grass); and
    - Type of vegetative materials taking root upon/within PMMs.

The PMM geogrid is manufactured from a copolymer polypropylene resin that is inert to biological, chemical, and weather attack, as well as environmental stress cracking. Installation procedures allowed for a 15 percent component impact from broken abraded components while still meeting design criteria. These conditions, although anticipated, will be repaired where obvious in conjunction with the requirements of repair criteria.

APPENDIX E
MAINTENANCE AND INSPECTION PROCEDURES FOR
POLYMERIC MARINE MATTRESSES

MAINTENANCE AND INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

4.0 FIVE YEAR INSPECTIONS

Five year inspections will be executed as indicated in the M&I Plan Schedule. Visual inspection of the PMM components as described in annual inspection criteria will be performed as well as assessment of the 20 percent repair inventory areas described in Section 2.0.

Due to the presence of marine organisms, potential vegetative growth or other conditions which may provide significant habitat value, an evaluation of repair assessment value may be appropriate. At a minimum several areas randomly selected from the repair log inventory be exposed from the rip-rap transition to the Causeway fill/riverine sediment interface (lower cover system limits). This will be accomplished by pressure washing or other approved cleaning approach of the PPM surface components. Cleaning will allow visual inspection of the seating of the PMMS into the underlying sediments and evaluation of previously affected repairs.

5.0 DOCUMENTATION

Documentation will provided as described in Section 5.0 of the M&I Plan. Tables and or reporting forms which are consistent with previously created reporting consistency would be advisable for consistency of the PMM assessment.

END

APPENDIX E
MAINTENANCE AND INSPECTION PROCEDURES FOR POLYMERIC MARINE MATTRESSES

MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT

ATTACHMENTS

ATTACHMENT E-1	**TYPICAL CONFIGURATION OF PREFABRICATED MARINE MATTRESSES**
ATTACHMENT E-2	**DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE DOCUMENTATION**
ATTACHMENT E-3	**POLYMERIC MARINE MATTRESS 20 PERCENT REPAIR INVENTORY LOG**
ATTACHMENT E-4	**POLYMERIC MARINE MATTRESS INSPECTION AND REPAIR GUIDELINES**
ATTACHMENT E-5	**TYPICAL END-TO-END TAB SEAMING DETAIL**

APPENDIX E
MAINTENANCE AND INSPECTION PROCEDURES FOR POLYMERIC MARINE MATTRESSES

MAINTENANCE AND INSPECTION PLAN FOR CAUSEWAY COVER SYSTEM STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT

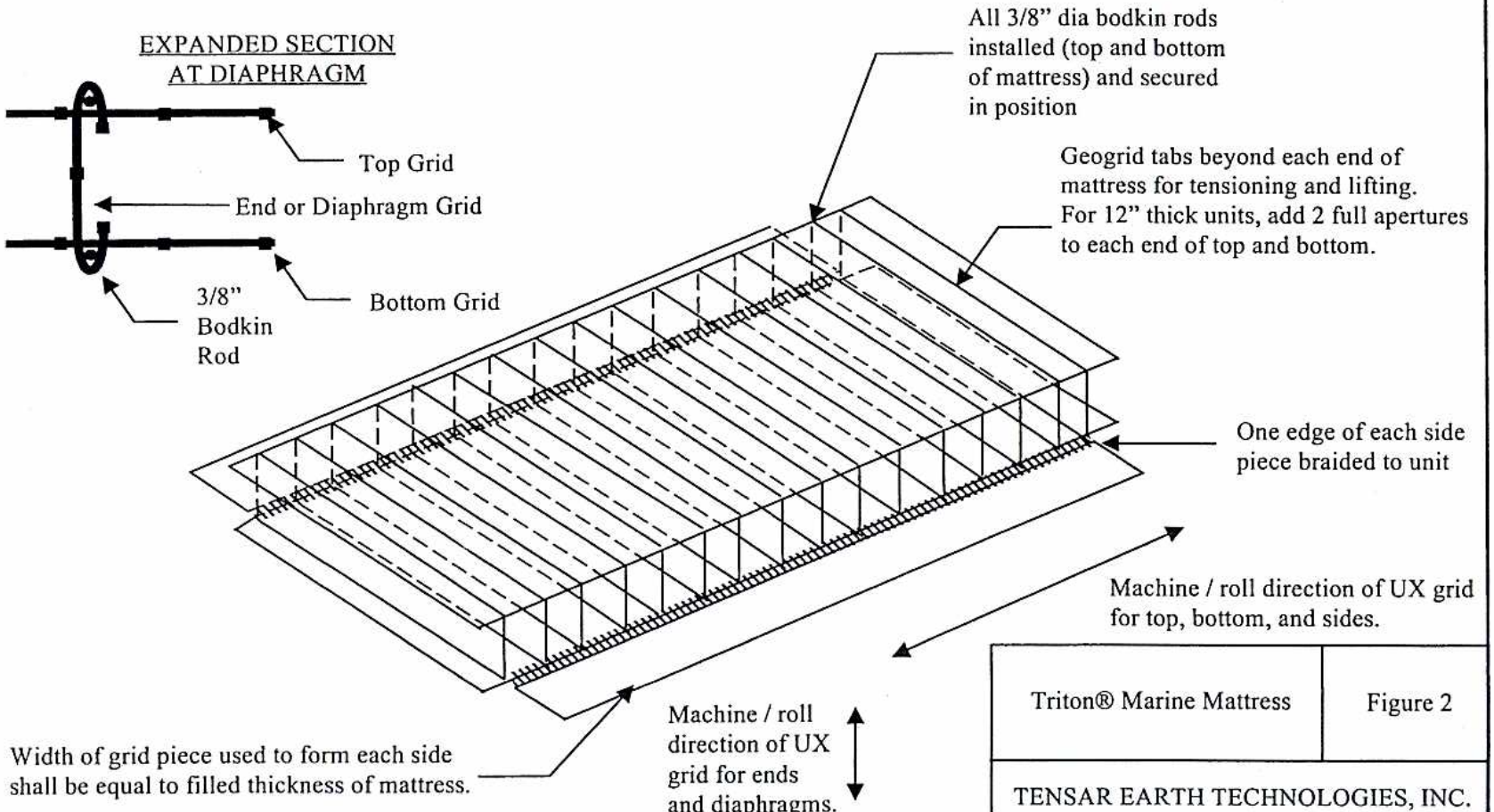
ATTACHMENT E-1

TYPICAL CONFIGURATION OF PREFABRICATED MARINE MATTRESSES

TYPICAL CONFIGURATION OF PREFABRICATED MATTRESSES

Note: Typical spacing of diaphragms is every three aperture lengths (± 19").
A shorter spacing may be used in order to match the required mattress length.
Length of end pieces and internal diaphragm pieces shall be 2 grid apertures long for 12" (filled) mattress thickness:.

See typical configuration of filled mattresses for additional dimensions and material types.



Triton® Marine Mattress	Figure 2
TENSAR EARTH TECHNOLOGIES, INC.	

APPENDIX E
MAINTENANCE AND INSPECTION PROCEDURES FOR POLYMERIC MARINE MATTRESSES

MAINTENANCE AND INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

ATTACHMENT E-2

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE DOCUMENTATION

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/4/02 **ACCEPTANCE FORM NUMBER : 1**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 7500 SF

Description of area: From approximate construction baseline 6+00 to 7+25 on the easterly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 25 rows of PMMs six courses deep.

X _____

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

_____

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 1

CONTRACTOR: R. F. WESTON **USACE CONTRACT No. DAAD05-97-D-7004-DO 0187**

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 1

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
3/7/02	WBJ	X	1	2	1,2,3	4/4/02	Y	WBJ	END/SIDE TAB JUNCT.
		X	4	2	4		Y		END/SIDE TAB
		CSR	18	4	5		Y		
		CSR	18	5	6		Y		
		SBU	19	1	7		Y		
		SBU	20	2	8		Y		
		X	20	3	9		Y		END/SIDE TAB
		SBU	22	3	10		Y		
		SBU	23	2	11		Y		
		X	23	2	12		Y		END/SIDE TAB
		SBU	24	1	13		Y		
		SG	25	1	14		Y		BAFFLE SEAM
							WBJ		

Notes:

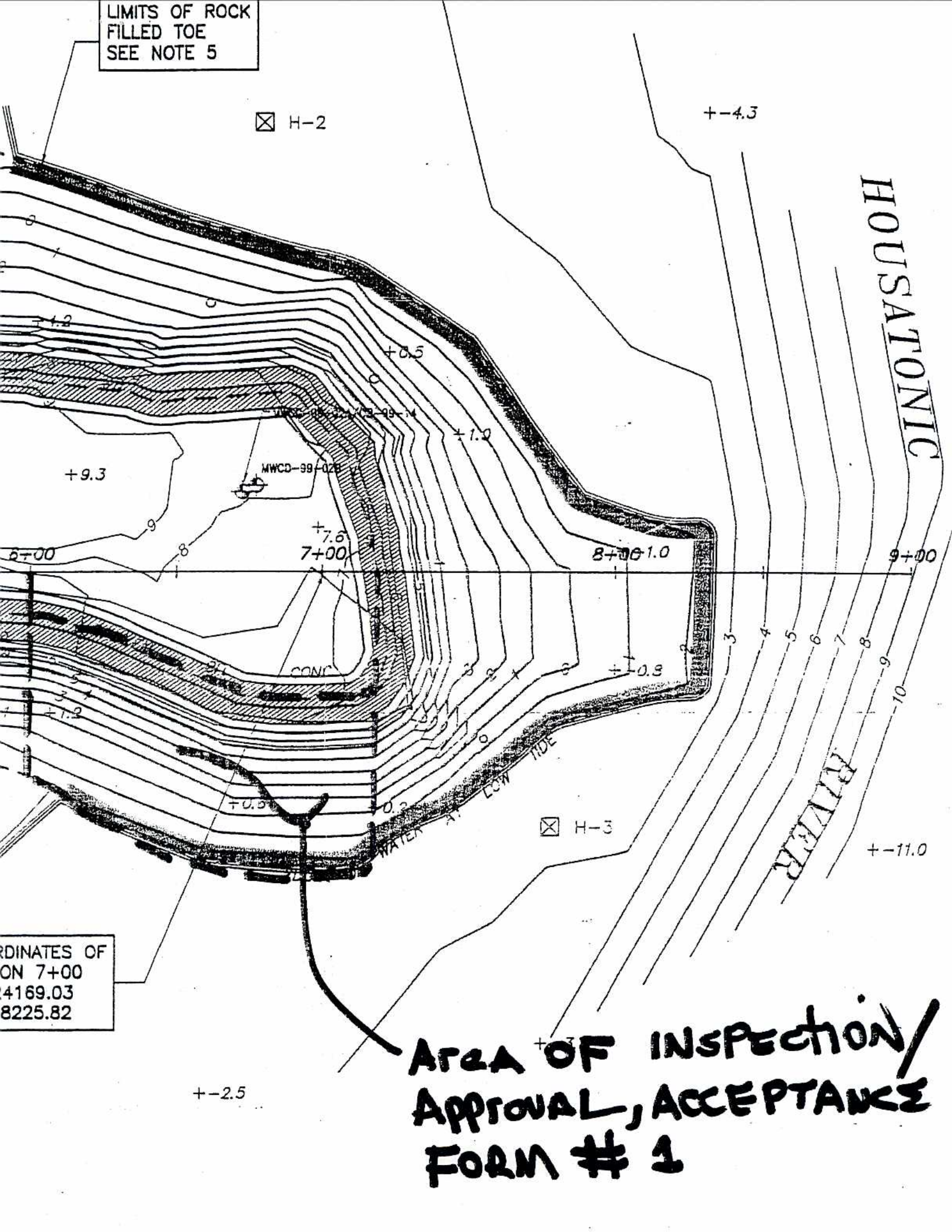
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs
TSR - total severed ribs
SIB - splits in bars
SG - seam gap
DBM - damaged braid material
SBU - spacing between units
x - other

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.


LIMITS OF ROCK FILLED TOE SEE NOTE 5
H-2
+-4.3
HOUSATONIC RIVER
MWCD-99-02B
6+00
7+00
8+00
9+00
CONC
H-3
+-11.0
+-2.5
RDINATES OF
ON 7+00
4169.03
8225.82
AREA OF INSPECTION/ APPROVAL, ACCEPTANCE FORM # 1

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/4/02 **ACCEPTANCE FORM NUMBER : 2**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 6300 SF

Description of area: From approximate construction baseline 5+00 to 6+00 on the easterly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 21 rows of PMMs, six courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 1

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 2

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
3/8/02	WB	CSR	1	1	1	4/4/02	Y	WB	
		SBU	1	5	2		Y		
		SG	5	3	3		Y		
		SBU	5	5	4		Y		
		SBU	6	3	5		Y		
		SBU & X	8	3	6		Y		TRIM END FLAP
		SBU	10	5	7		Y		
		SBU	10	4	8		Y		
		CSR	10	1	9		Y		
		CSR	11	1	10		Y		
		SBU	11	3	11		Y		
		X	20	5	12		Y		TRIM END FLAP
		X	14	2	13		Y		TIE END FLAP Both sides
		X	15	2	14		Y		END FLAP
		X	17	2	15		Y		TIE END FLAP Both sides
						WB			

Notes:

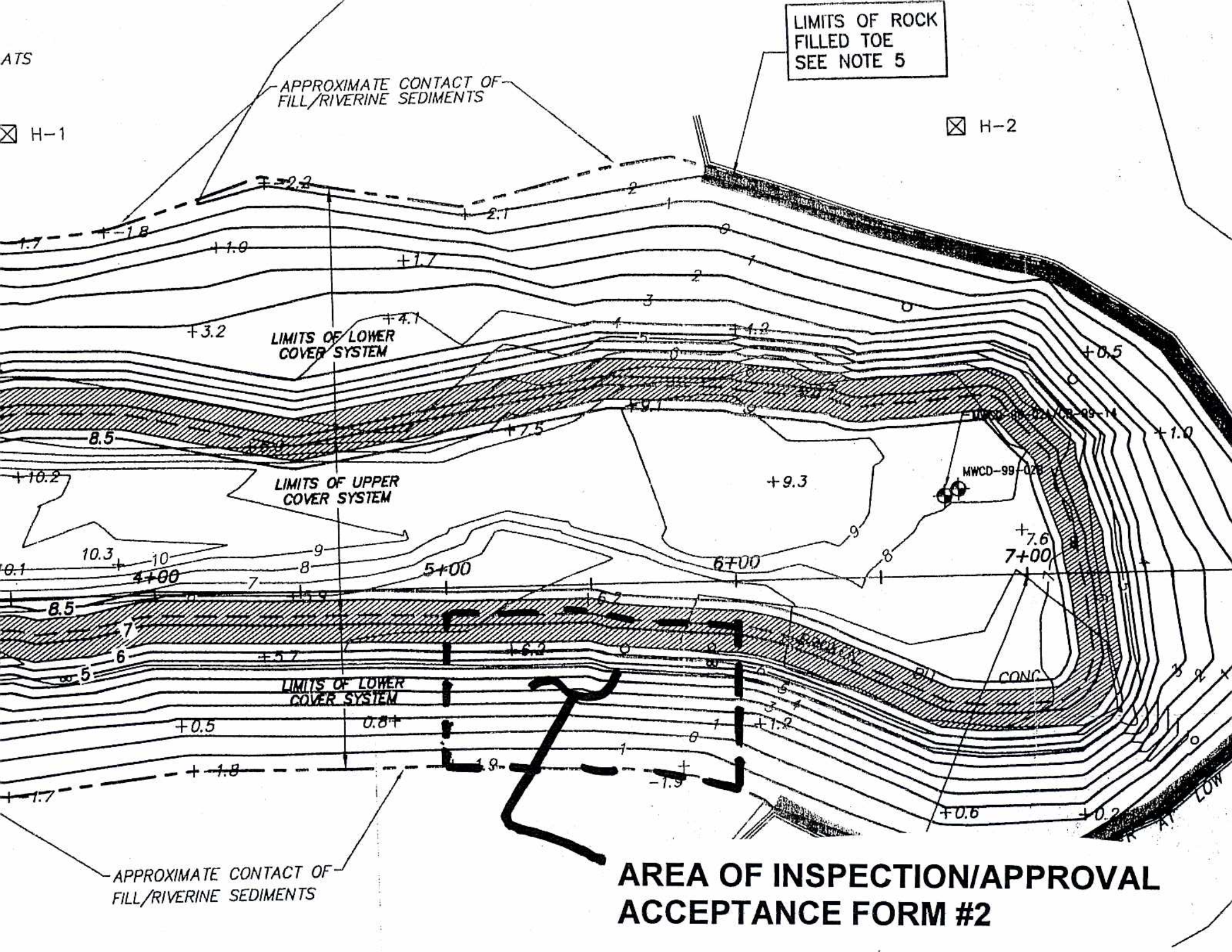
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs SG - seam gap x - other
TSR - total severed ribs DBM - damaged braid material
SIB - splits in bars SBU - spacing between units

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (I.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.



AREA OF INSPECTION/APPROVAL ACCEPTANCE FORM #2

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/4/02 **ACCEPTANCE FORM NUMBER : 3**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 6300 SF

Description of area: From approximate construction baseline 4+00 to 5+00 on the easterly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 21 rows of PMMs, six courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 1

CONTRACTOR: R. F. WESTON USACE CONTRACT NO. DAAD05-97-D-7004-DO 0187

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 3

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
3/8/02	WB	SBU	1	4	1	4/4/02	Y	WB	BOTH SIDES
	"	SBU	1	5	2		Y		
	CMJ	CSR	6	4	3		Y		
		SBU	12	5	4		Y		
		SBU	12	4	5		Y		
		SBU	13	3	6		Y		
		SBU	16	3	7		Y		BOTH SIDES
		CSR	17	1	8		Y		2-LOCATIONS
		SBU	20	5	9		Y		
		"	20	4	10		Y		
		"	20	2	11		Y		BOTH SIDES
		CSR	21	4	12		Y		
		SBU	21	4	13		Y		
		CSR	21	6	14		Y		
							WB		

Notes:

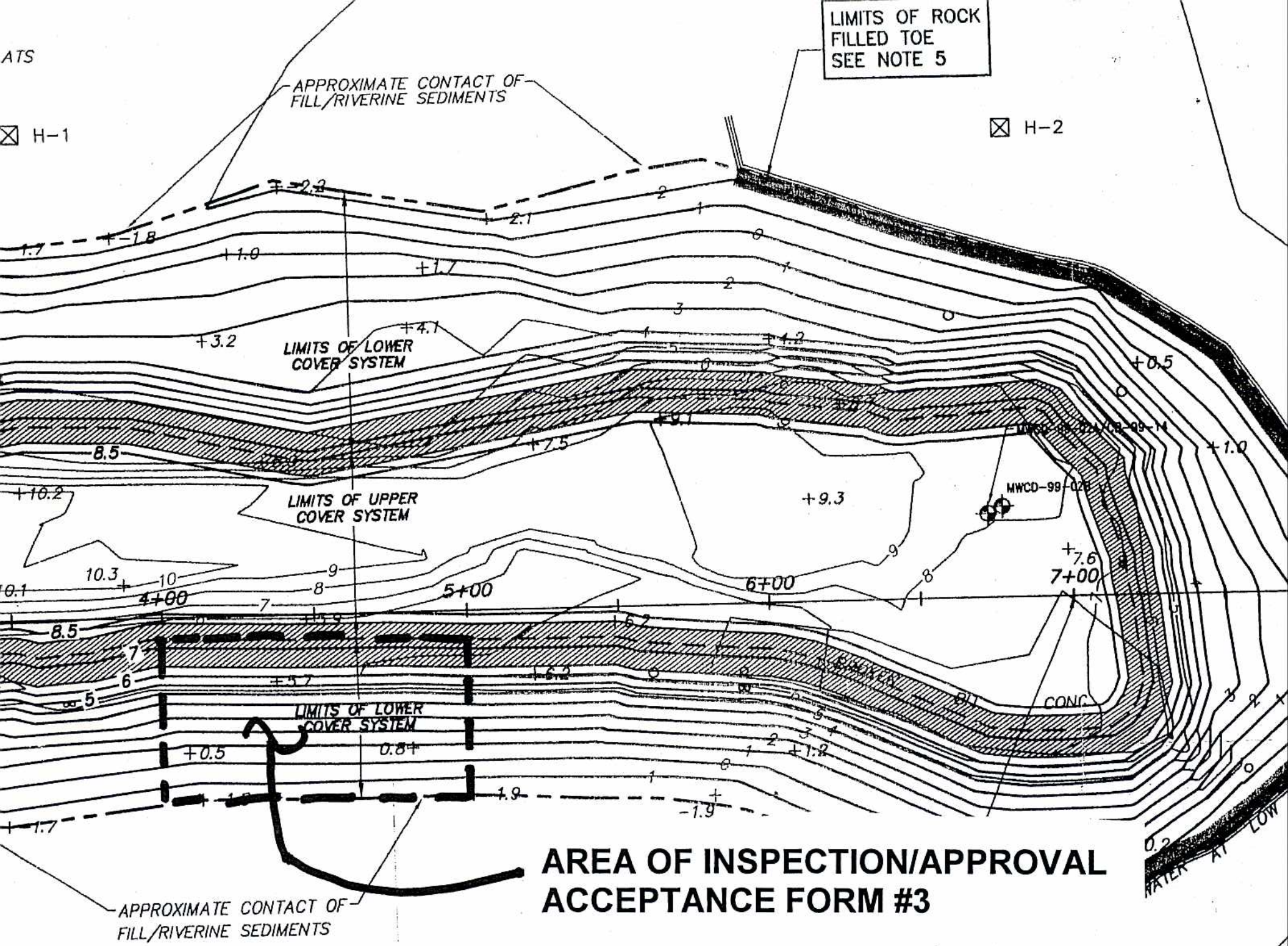
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs SG - seam gap x - other
TSR - total severed ribs DBM - damaged braid material
SIB - splits in bars SBU - spacing between units

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.



AREA OF INSPECTION/APPROVAL ACCEPTANCE FORM #3

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/4/02 **ACCEPTANCE FORM NUMBER : 4**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 6300 SF

Description of area: From approximate construction baseline 3+00 to 4+00 on the easterly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 21 rows of PMMs, six courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 1

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 4

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
3/14/02	WB	CSR	4	2	1	4/4/02	Y	WB	
		SG	10	2	2		Y		
		CSR	12	1	3		Y		
		CSR	14	1	4		Y		
		CSR	15	2	5		Y		
		SBU	15	4	6		Y		
		SBU	18	4	7		Y		Both Sides
		SBU	18	5	8		Y		
		SBU	20	5	9		Y		
		SBU	20	4	10		Y		
					WB				

Notes:

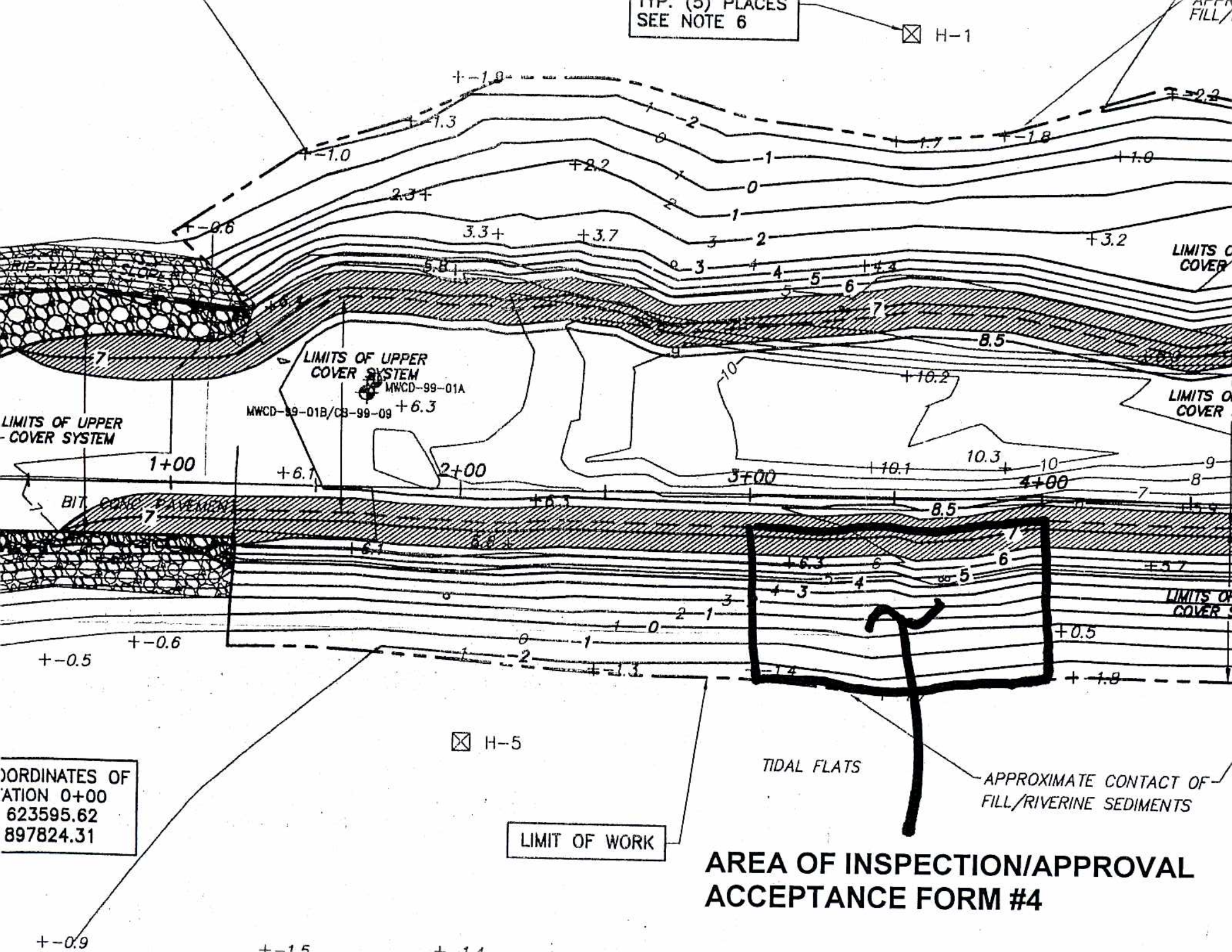
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs SG - seam gap x - other
TSR - total severed ribs DBM - damaged braid material
SIB - splits in bars SBU - spacing between units

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.



AREA OF INSPECTION/APPROVAL ACCEPTANCE FORM #4

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/4/02 **ACCEPTANCE FORM NUMBER : 5**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 5250 SF

Description of area: From approximate construction baseline 2+00 to 3+00 on the easterly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 21 rows of PMMs, five courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 1

CONTRACTOR: R. F. WESTON **USACE CONTRACT No. DAAD05-97-D-7004-DO 0187**

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 5

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
3/14/02	WB	X	3	3	1	4/4/02	Y	WB	END FLAP
		SBU	1	3	2		Y		
		SBU	3	4	3		Y		
		CSR	8	1	4		Y		
		X	8	2	5		Y		END FLAP
		X	9	2	6		Y		END FLAP
		X	10	2	7		Y		END FLAP
		SG	13	3	8		Y		
		X	15	3	9		Y		END FLAP
		CSR	16	4	10		Y		
		CSR	19	4	11		Y		
		CSR	20	4	12		Y		
		SBU	21	4	13		Y		
		SBU	21	5	14		Y		
					WB				

Notes:

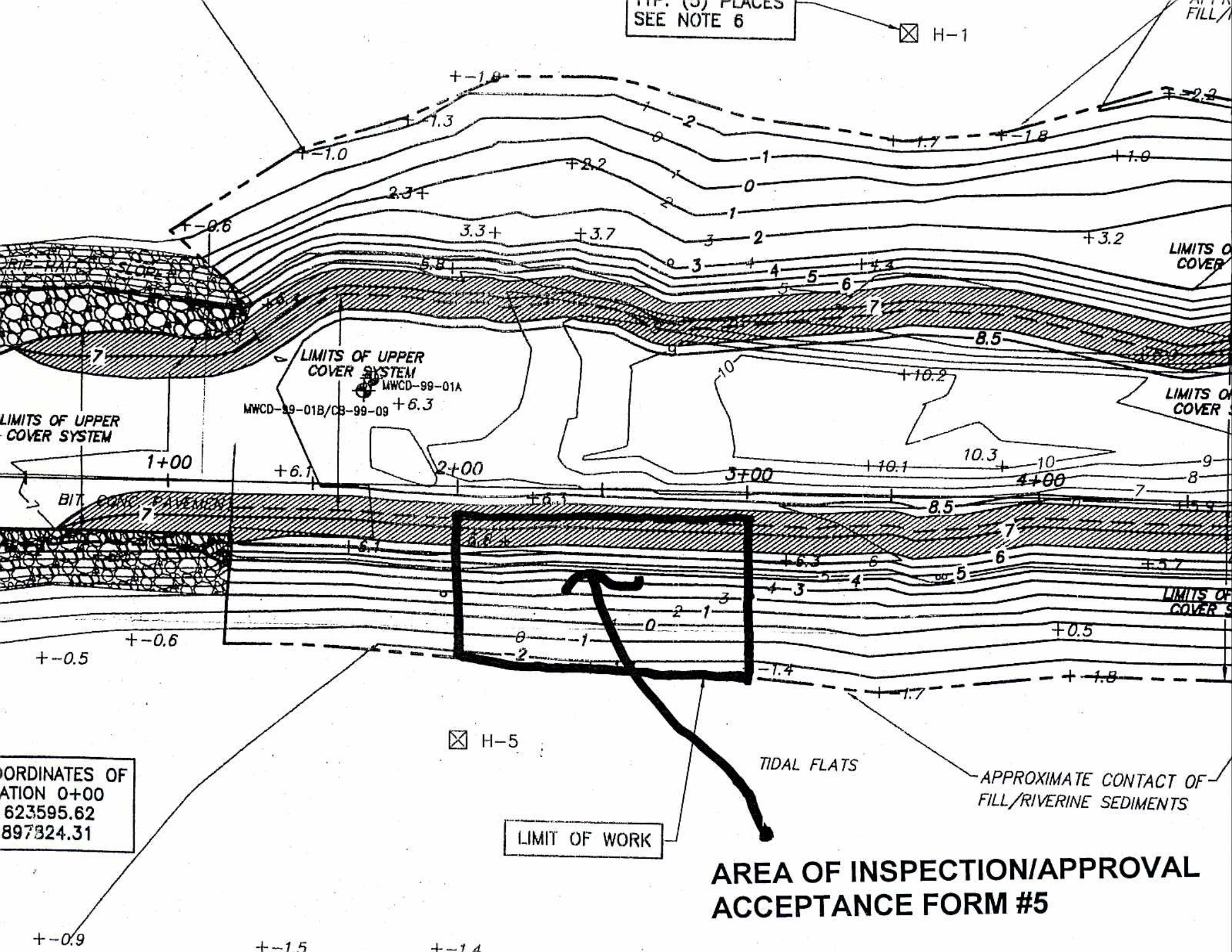
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs
TSR - total severed ribs
SIB - splits in bars
SG - seam gap
DBM - damaged braid material
SBU - spacing between units
x - other

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (I.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.



AREA OF INSPECTION/APPROVAL ACCEPTANCE FORM #5

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/4/02 **ACCEPTANCE FORM NUMBER : 6**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 5250 SF

Description of area: From approximate construction baseline 1+20 to 2+00 on the easterly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 19 rows of PMMs, five courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 1

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 60

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
3/14/02	WB	SBU	1	2	1	4/4/02	Y	WB	
		X	3	2	2		Y		END FLAP
		SBU	4	4	3		Y		
		SBU	6	2	4		Y		
		SBU	9	4	5		Y		
		SBU	10	3	6		Y		
		X	10	3	7		Y		END FLAP
		X	11	3	8		Y		END FLAP
		X	14	3	9		Y		END FLAP
		SBU	14	2	10		Y		
		SBU	15	2	11		Y		
V	V	SBU	17	1	12		Y		
						WB			

Notes:

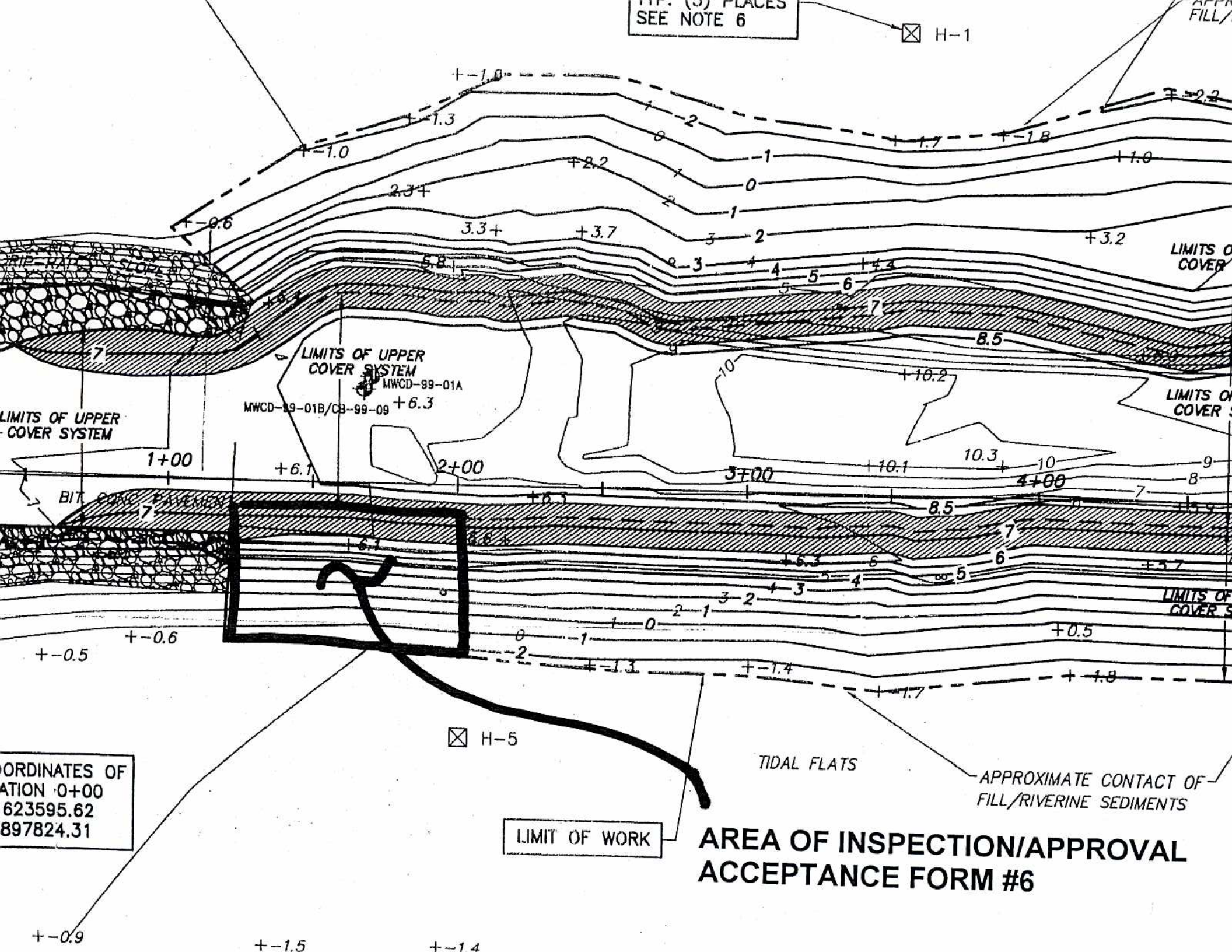
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs
TSR - total severed ribs
SIB - splits in bars
SG - seam gap
DBM - damaged braid material
SBU - spacing between units
x - other

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.



AREA OF INSPECTION/APPROVAL ACCEPTANCE FORM #6

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/5/02 **ACCEPTANCE FORM NUMBER :** 7

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 14800 SF

Description of area: From approximate construction baseline 7+20 to 8+35 on the Northerly end (nose) of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes approximately 41 rows of PMMs, five to 11 courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 2

CONTRACTOR: R. F. WESTON **USACE CONTRACT No. DAAD05-97-D-7004-DO 0187**

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 7

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
3/27/02	WSO	SBU	4	5	1	4/5/02	Y	WSO	
		SBU	7	5	2		Y		
		CSR	9	6	3		Y		
		SBU	10	2	4		Y		
		SBU	10	3	5		Y		
		SBU	10	9	6		Y		
		CSR	11	5	7		Y		
		CSR	11	5	8		Y		
		CSR	11	6	9		Y		
		CSR	11	10	10		Y		
		SBU	12	4	11		Y		
		CSR	12	9	12		Y		
		SBU	13	3	13		Y		
		CSR	13	5	14		Y		
		SBU	15	7	15		Y		
		SBU	17	3	16		Y		
		SBU	17	4	17		Y		

Notes:

(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs
TSR - total severed ribs
SIB - splits in bars
SG - seam gap
DBM - damaged braid material
SBU - spacing between units
x - other

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 2 OF 2

CONTRACTOR: R. F. WESTON **USACE CONTRACT No. ~~DAAD05-97-D-7004-DO~~ 0187**

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 7

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
3/27/02	WB	SBU	17	10	18	4/5/02	Y	WB	
		SBU	18	3	19		Y		
		CSR	18	4	20		Y		
		CSR	18	10	21		Y		
		SBU	20	4	22		Y		
		SBU	20	5	23		Y		
		SBU	22	4	24		Y		
		SBU	22	9	25		Y		
		SBU	23	4	22		Y		
		SBU	23	8	27		Y		
		SBU	25	4	28		Y		
		CSR	27	5	29		Y		
		SG	27	5	30		Y		
		CSR	28	5	31		Y		
		CSR	28	6	32		Y		
		CSR	31	7	33		Y		
		SBU	40	3	34		Y		

Notes:

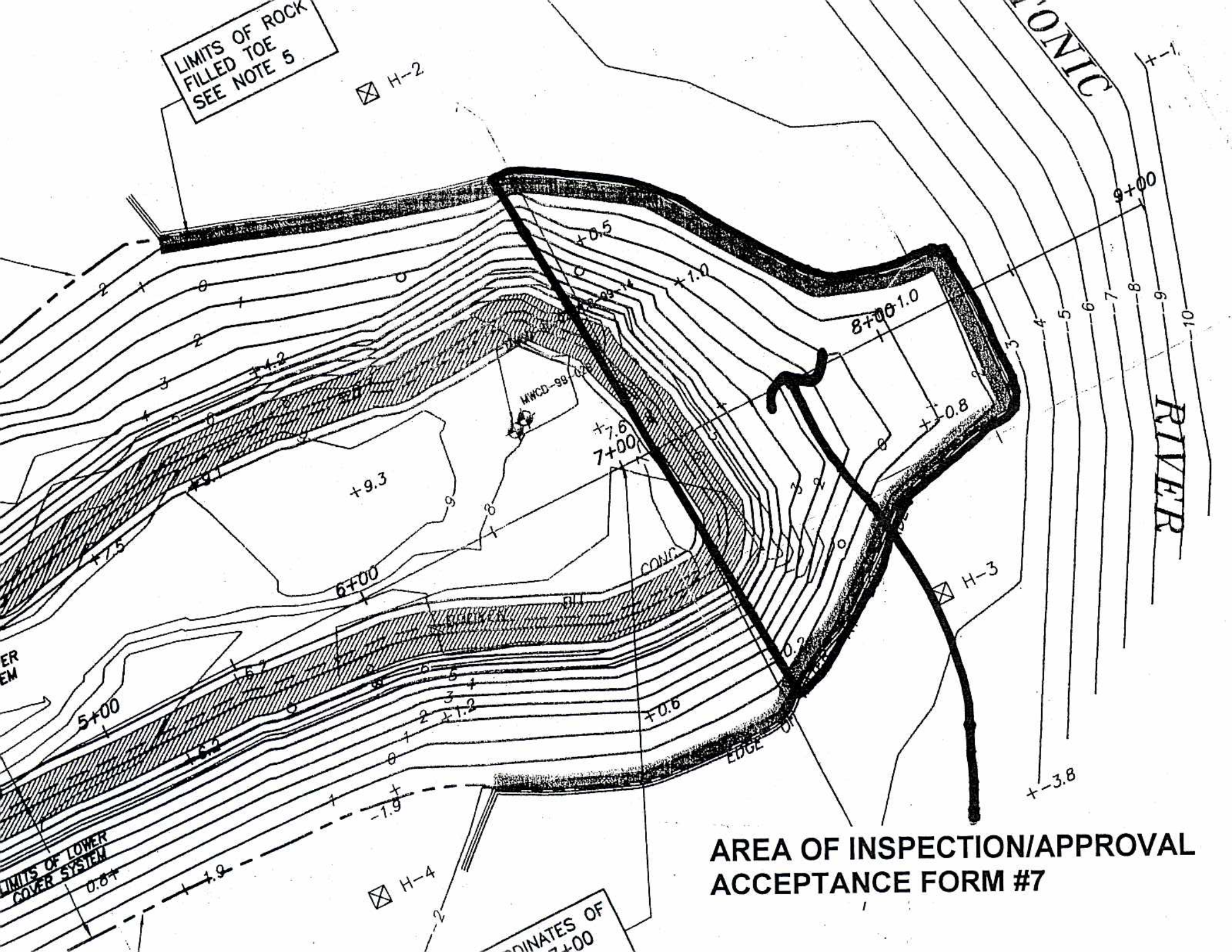
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs
TSR - total severed ribs
SIB - splits in bars
SG - seam gap
DBM - damaged braid material
SBU - spacing between units
x - other

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.


LIMITS OF ROCK FILLED TOE SEE NOTE 5
H-2
H-3
H-4
9+00
8+00
7+00
6+00
5+00
RIVER
AREA OF INSPECTION/APPROVAL
ACCEPTANCE FORM #7

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/5/02 **ACCEPTANCE FORM NUMBER : 8**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 8000 SF

Description of area: From approximate construction baseline Station 6+20 to 7+20 on the Westerly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 20 rows of PMMs, 8 courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 1

CONTRACTOR: R. F. WESTON **USACE CONTRACT No. DAAD05-97-D-7004-DO 0187**

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 8

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
3/27/02	WSJ	SBU	1	3	1	4/5/02	Y	WSJ	
		SBU	1	4	2		Y		
		SBU	1	5	3		Y		
		SBU	1	6	4		Y		
		SBU	2	3	5		Y		
		SBU	2	4	6		Y		
		SBU	2	5	7		Y		
		CSR	3	2	8		Y		
		SBU	3	6	9		Y		
		SBU	4	2	10		Y		
		SBU	4	4	11		Y		
		SBU	4	6	12		Y		
		SBU	5	5	13		Y		
		SBU	7	5	14		Y		
		SBU	15	4	15		Y		
						WSJ			

Notes:

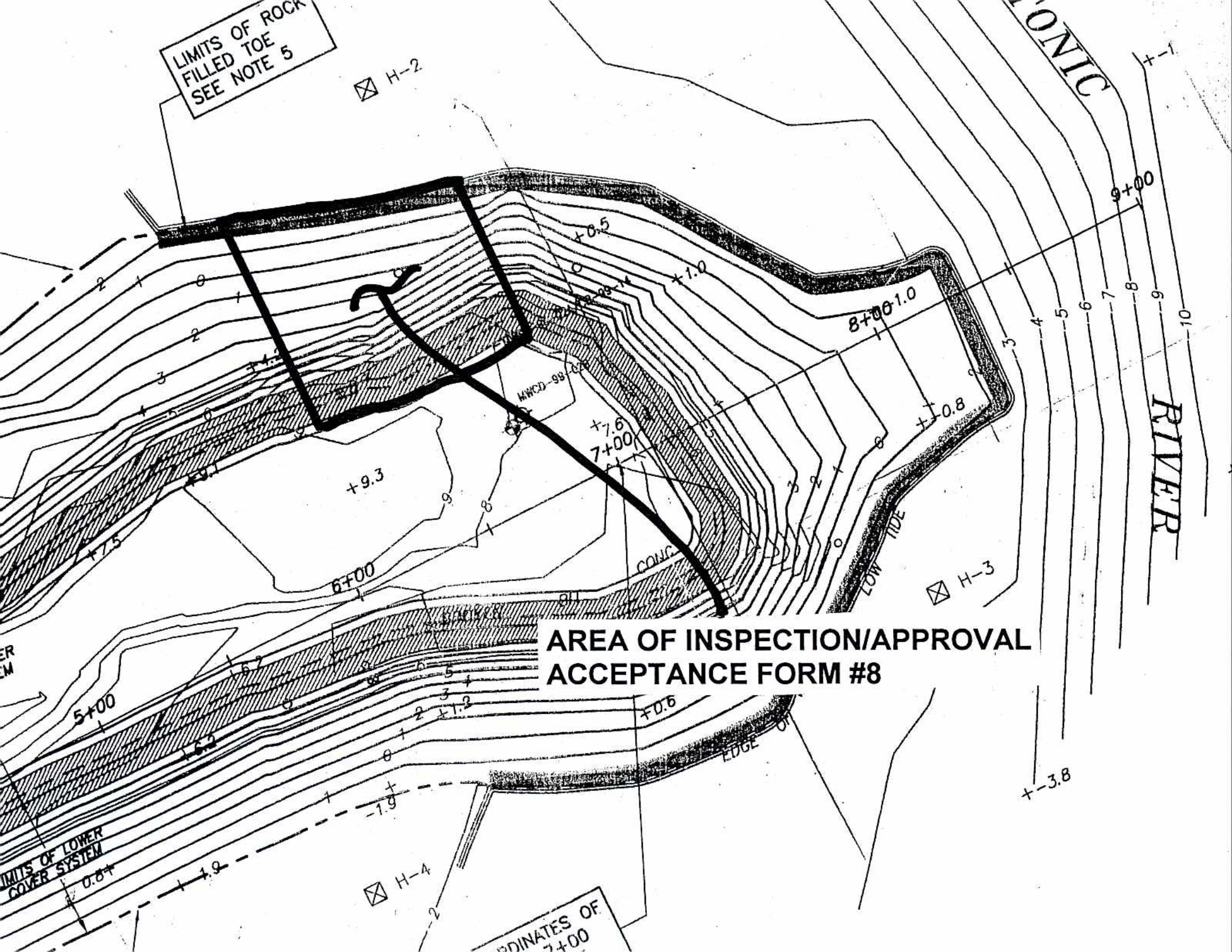
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs
TSR - total severed ribs
SIB - splits in bars
SG - seam gap
DBM - damaged braid material
SBU - spacing between units
x - other

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (I.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.


LIMITS OF ROCK FILLED TOE SEE NOTE 5
H-2
H-3
H-4
AREA OF INSPECTION/APPROVAL
ACCEPTANCE FORM #8
LIMITS OF LOWER COVER SYSTEM
5+00
6+00
7+00
8+00
9+00
LOW TIDE
EDGE OF
RIVER
+0.5
+1.0
+0.8
+0.6
+7.6
+9.3
+7.5
+1.3
-1.9
+-3.8
+-1

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/5/02 **ACCEPTANCE FORM NUMBER : 9**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 7875 SF

Description of area: From approximate construction baseline Station 5+20 to 6+20 on the Westerly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 21 rows of PMMs, 7 to 8 courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 1

CONTRACTOR: R. F. WESTON **USACE CONTRACT No. DAAD05-97-D-7004-DO 0187**

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 9

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
3/27/02	WB	SBU	2	4	1	4/5/02	Y	WB	
		SBU	2	5	2		Y		
		SBU	2	6	3		Y		
		SBU	3	4	4		Y		
		SBU	3	5	5		Y		
		CSR	4	6	6		Y		
		SBU	6	6	7		Y		
		CSR	11	5	8		Y		
		SBU	14	2	9		Y		
		CSR	16	2	10		Y		
		SBU	17	4	11		Y		
		SBU	18	3	12		Y		
		SBU	18	4	13		Y		
		SBU	19	5	14		Y		
						WB			

Notes:

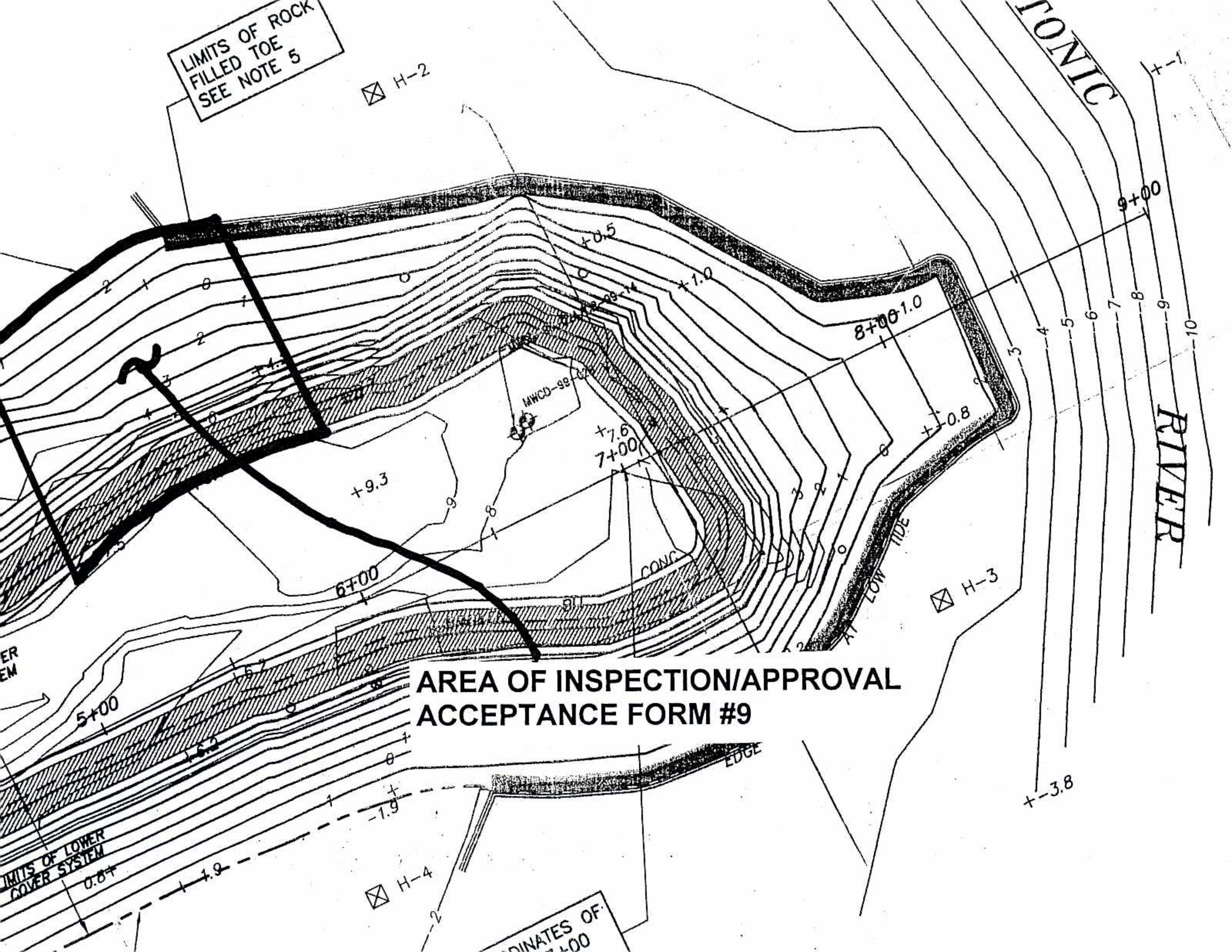
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs
TSR - total severed ribs
SIB - splits in bars
SG - seam gap
DBM - damaged braid material
SBU - spacing between units
x - other

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.


LIMITS OF ROCK
FILLED TOE
SEE NOTE 5
H-2
H-3
H-4
TONIC
RIVER
9+00
8+00
7+00
6+00
5+00
+9.3
+7.6
+0.5
+1.0
-1.0
-0.8
-3.8
-1.9
1.9
0.8
CONC
EDGE
AT LOW TIDE
LIMITS OF LOWER
COVER SYSTEM
AREA OF INSPECTION/APPROVAL
ACCEPTANCE FORM #9

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/5/02 **ACCEPTANCE FORM NUMBER : 10**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 7875 SF

Description of area: From approximate construction baseline 4+20 to 5+20 on the Westerly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 21 rows of PMMs, seven to eight courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 3

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 10

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
4/3/02	WB	SBU	1	1	1	4/5/02	Y	WB	
		X	1	3	2		Y		END TAB
		SBU	1	4	3		Y		
		CSR	2	7	4		Y		
		SBU	2	6	5		Y		
		CSR	2	2	6		Y		
		CSR	4	5	7		Y		
		CSR	5	1	8		Y		
		SBU	7	5	9		Y		
		SBU	7	3	10		Y		
		SBU	8	3	11		Y		
		SBU	8	4	12		Y		
		SBU	9	5	13		Y		
		SBU	9	4	14		Y		
		CSR	10	3	15		Y		
		CSR	11	2	16		Y		3 LOCATIONS
		SBU	12	4	17		Y		

Notes:

(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs
TSR - total severed ribs
SIB - splits in bars
SG - seam gap
DBM - damaged braid material
SBU - spacing between units
x - other

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 2 OF ~~3~~

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 10

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
4/3/02	WB	SBU	12	5	18	4/5/02	Y	LSB	
			12	~~8~~ 8	19		Y		
			12	9	20		Y		
			13	9	21		Y		
			13	8	22		Y		
			14	8	23		Y		
			15	9	24		Y		
			15	8	25		Y		
			16	4	26		Y		
			16	5	27		Y		
			16	6	28		Y		
			17	7	29		Y		
			17	3	30		Y		
			17	1	31		Y		
			18	4	32		Y		
			18	5	33		Y		
			18	8	34		Y		

Notes:

(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs SG - seam gap x - other
TSR - total severed ribs DBM - damaged braid material
SIB - splits in bars SBU - spacing between units

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 3 OF 3

CONTRACTOR: R. F. WESTON **USACE CONTRACT NO. DAAD05-97-D-7004-DO 0187**

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 10

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
4/3/02	WBJ	SBU	19	8	35	4/5/02	Y	WBJ	
		SBU	20	2	36	"	Y	"	
		SBU	20	5	37		Y		
		SBU	20	8	38		Y		
		CSR	21	6	39		Y		
		SBU	21	4	40	"	Y	"	
		SBU	21	3	41	"	Y	"	
					WBJ				

Notes:

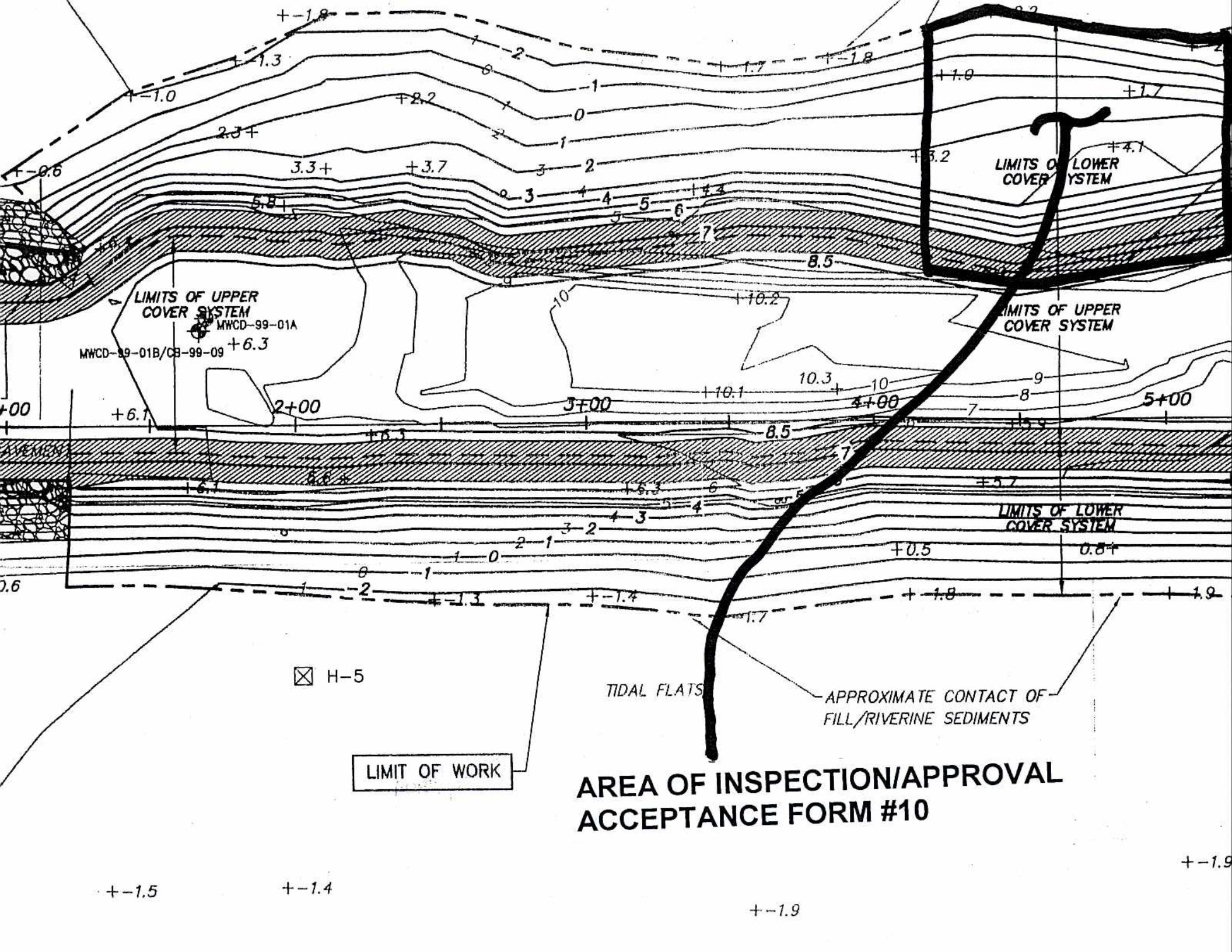
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs SG - seam gap x - other
TSR - total severed ribs DBM - damaged braid material
SIB - splits in bars SBU - spacing between units

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.



AREA OF INSPECTION/APPROVAL ACCEPTANCE FORM #10

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/9/02 **ACCEPTANCE FORM NUMBER : 11**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 7875 SF

Description of area: From approximate construction baseline 3+20 to 4+20 on the Westerly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 21 rows of PMMs, seven to eight courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 2

CONTRACTOR: R. F. WESTON **USACE CONTRACT No. DAAD05-97-D-7004-DO 0187**

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 11

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
4/4/02	C Shah	SBU	1	3	1	4/9/02	Y	WB	
		SBU	1	4	2		Y		
		SBU	1	6	3		Y		
		SBU	2	5	4		Y		
		SBU	2	4	5		Y		
		SBU	3	1	6		Y		
		SBU	3	2	7		Y		
		SBU	3	4	8		Y		
		SBU	3	5	9		Y		
		SBU	4	7	10		Y		
		SBU	5	4	11		Y		
		SBU	5	6	12		Y		
		SBU	6	7	13		Y		
		SBU	7	7	14		Y		
		CSR	7	3	15		Y		
		SBU	10	7	16		Y		
		SBU	10	6	17		Y		

Notes:

(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs
TSR - total severed ribs
SIB - splits in bars
SG - seam gap
DBM - damaged braid material
SBU - spacing between units
x - other

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 2 OF 2

CONTRACTOR: R. F. WESTON USACE CONTRACT NO. DAAD05-97-D-7004-DO 0187

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 11

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
4/4/02	C. Shah	SBU	12	6	18	4/9/02	Y	WSJ	
		SBU	13	6	19		Y		
		SBU	15	1	20		Y		
		CSR	19	7	21		Y		
		SBU	21	3	22		Y		
		SBU	21	5	23		Y		
		X	21	6	24		Y		END TAB
		X	22	6	25		Y		END TAB
						WSJ			

Notes:

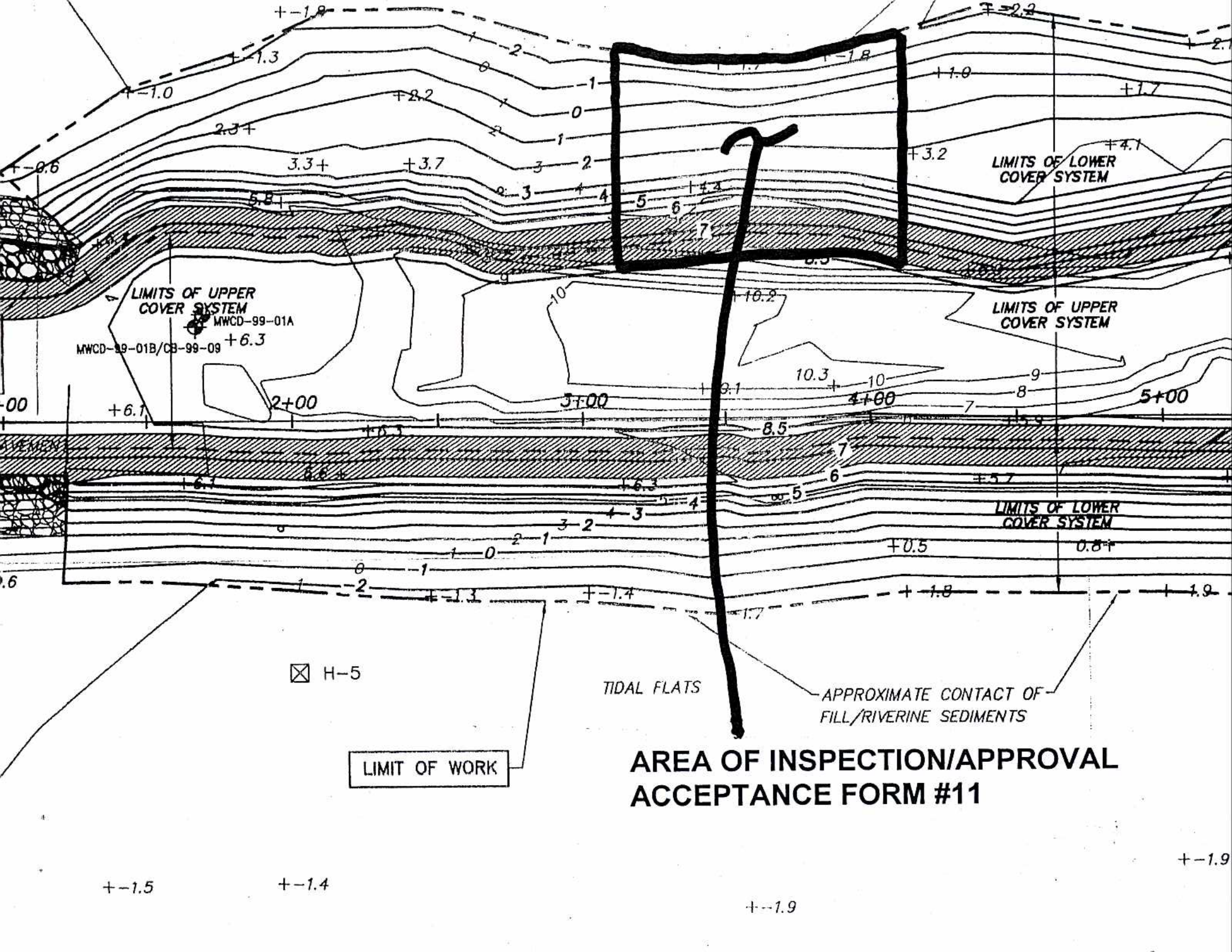
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs SG - seam gap x - other
TSR - total severed ribs DBM - damaged braid material
SIB - splits in bars SBU - spacing between units

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (I.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.


LIMITS OF LOWER COVER SYSTEM
LIMITS OF UPPER COVER SYSTEM
LIMITS OF UPPER COVER SYSTEM
LIMITS OF LOWER COVER SYSTEM
MWCD-99-01A
MWCD-99-01B/CB-99-09
2+00
3+00
4+00
5+00
H-5
TIDAL FLATS
APPROXIMATE CONTACT OF FILL/RIVERINE SEDIMENTS
LIMIT OF WORK
AREA OF INSPECTION/APPROVAL
ACCEPTANCE FORM #11

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/9/02 **ACCEPTANCE FORM NUMBER : 12**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 7875 SF

Description of area: From approximate construction baseline 2+20 to 3+20 on the Westerly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 21 rows of PMMs, seven to eight courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 2

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 12

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
4/3/02	WB	SBU	8	5	1	4/9/02	Y	WB	
		SBU	12	4	2		Y		
		SBU	13	3	3		Y		
		SBU	13	5	4		Y		
		SBU	14	5	5		Y		
		SBU	14	5	6		Y		
		SBU	14	4	7		Y		
		SBU	15	3	8		Y		
		SBU	15	4	9		Y		
		SBU	15	6	10		Y		
		SBU	16	6	11		Y		
		SBU	16	4	12		Y		
		SG	16	4	13		Y		
		SBU	16	1	14		Y		
		SBU	17	2	15		Y		
		SBU	17	3	16		Y		
		SBU	17	4	17		Y		

Notes:

(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs SG - seam gap x - other
TSR - total severed ribs DBM - damaged braid material
SIB - splits in bars SBU - spacing between units

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 2 OF 2

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 12

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
4/3/02	WB	SBU	17	5	18	4/9/02	Y	WB	
		SBU	17	6	19		Y		
		SBU	18	7	20		Y		
		SBU	18	5	21		Y		
		SBU	18	4	22		Y		
		SBU	18	3	23		Y		
		SBU	19	3	24		Y		
		SBU	19	5	25		Y		
		SBU	19	6	26		Y		
		SBU	19	7	27		Y		
		SBU	19	8	28		Y		
		SBU	20	3	29		Y		
		SBU	21	2	30		Y		
		SBU	21	3	31		Y		
		SBU	21	4	32		Y		
		SG	21	5	33		Y		
							WB		

Notes:

(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs SG - seam gap x - other

TSR - total severed ribs DBM - damaged braid material

SIB - splits in bars SBU - spacing between units

(2) Location of deficiency is provided as follows:

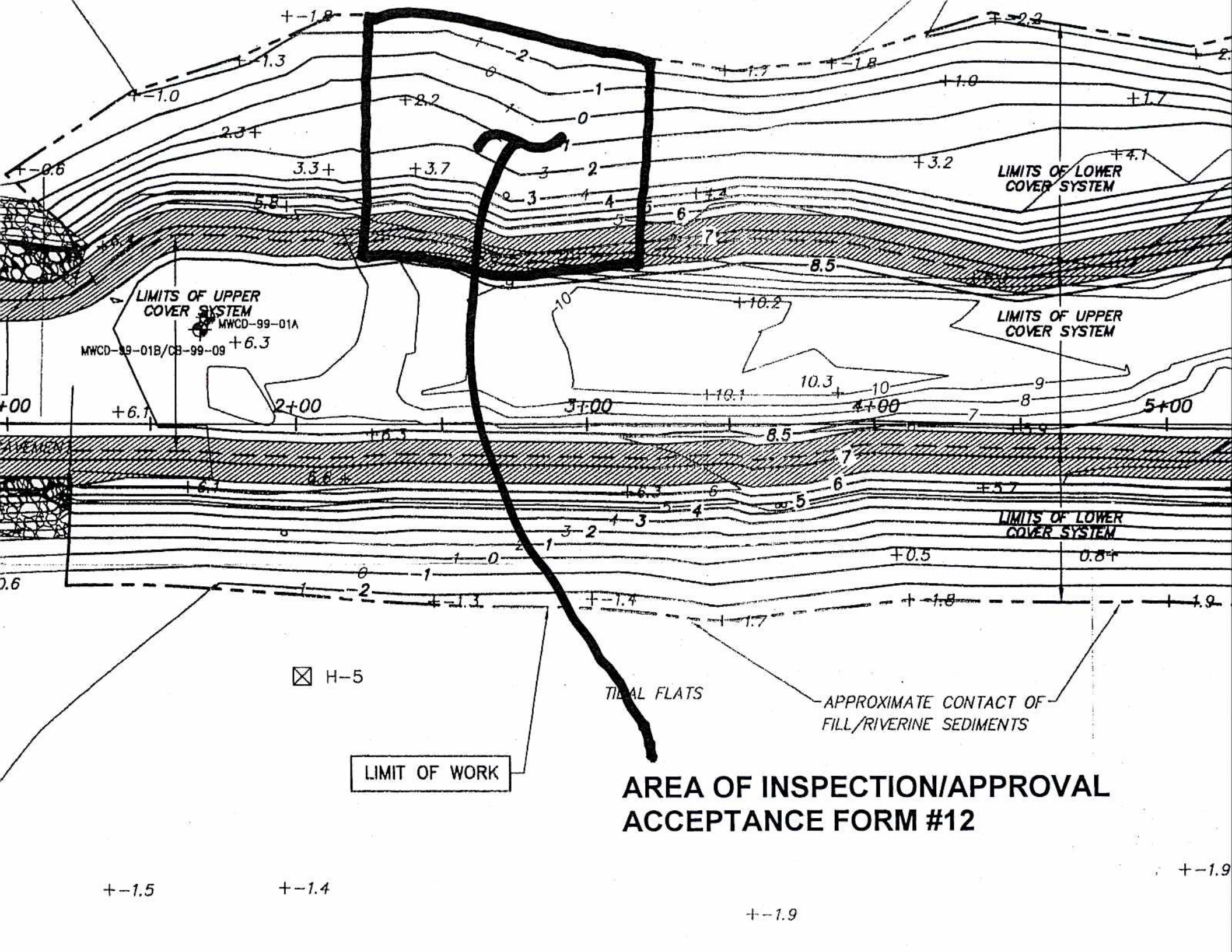
Baseline Station (BL Sta.) is inclusive baseline for inspected area (I.e., 3+00 to 4+00) with designation of east or west offset.

The baseline description corresponds to the description provided on the deployment acceptance sheet.

Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.

The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.



AREA OF INSPECTION/APPROVAL ACCEPTANCE FORM #12

DEPLOYED POLYMERIC MARINE MATTRESS ACCEPTANCE

PROJECT: SAEP CAUSEWAY CONSTRUCTION

LOCATION: STRATFORD, CT

USACE CONTRACT NUMBER: DAAD05-97-D-7004-DO 0187

DATE: 4/4/02 **ACCEPTANCE FORM NUMBER : 13**

I, the undersigned an authorized representative of R. F. Weston, Inc. certify that the polymeric marine mattress (PMM) components deployed on the Causeway project and described below meet the intent of the design documents and the manufacturers minimum handling and installation requirements. Quality control procedures, inspections and repairs are in compliance with the criteria and guidelines presented in Attachments III and IV of Weston's memorandum titled "Resolution of Quality Control Issues Related to Triton Marine Mattresses" dated 1/2/02.

Approximate size of area: 5400 SF

Description of area: From approximate construction baseline 1+30 to 2+20 on the Westerly side of the Causeway from the top of slope transition apron to the toe of slope sediment/fill interface (see attached sketch). The inspected area includes 18 rows of PMMs, five to seven courses deep.

Weston Representative

By signing below the USACE authorized representative acknowledges completion of the PMM components described above. I have inspected the described work and find that it generally meets the design intent and the requirements of Weston's approved quality control program. Signature does not relieve the contractor from responsibility for providing all specified elements of the work. See attached inspection/repair summary log as applicable.

USACE Representative

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS DEFICIENCY/REPAIR SUMMARY LOG

SHEET 1 OF 1

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PPM ACCEPTANCE FORM NUMBER 13

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]		Repair No.	QC Repair Date	Acceptable Repair (Y/N)	QA Inspector	Comments
			Row	Number					
4/3/02	WBJ	CSR	8	4	1	4/4/02	Y	WBJ	
					WBJ				

Notes:

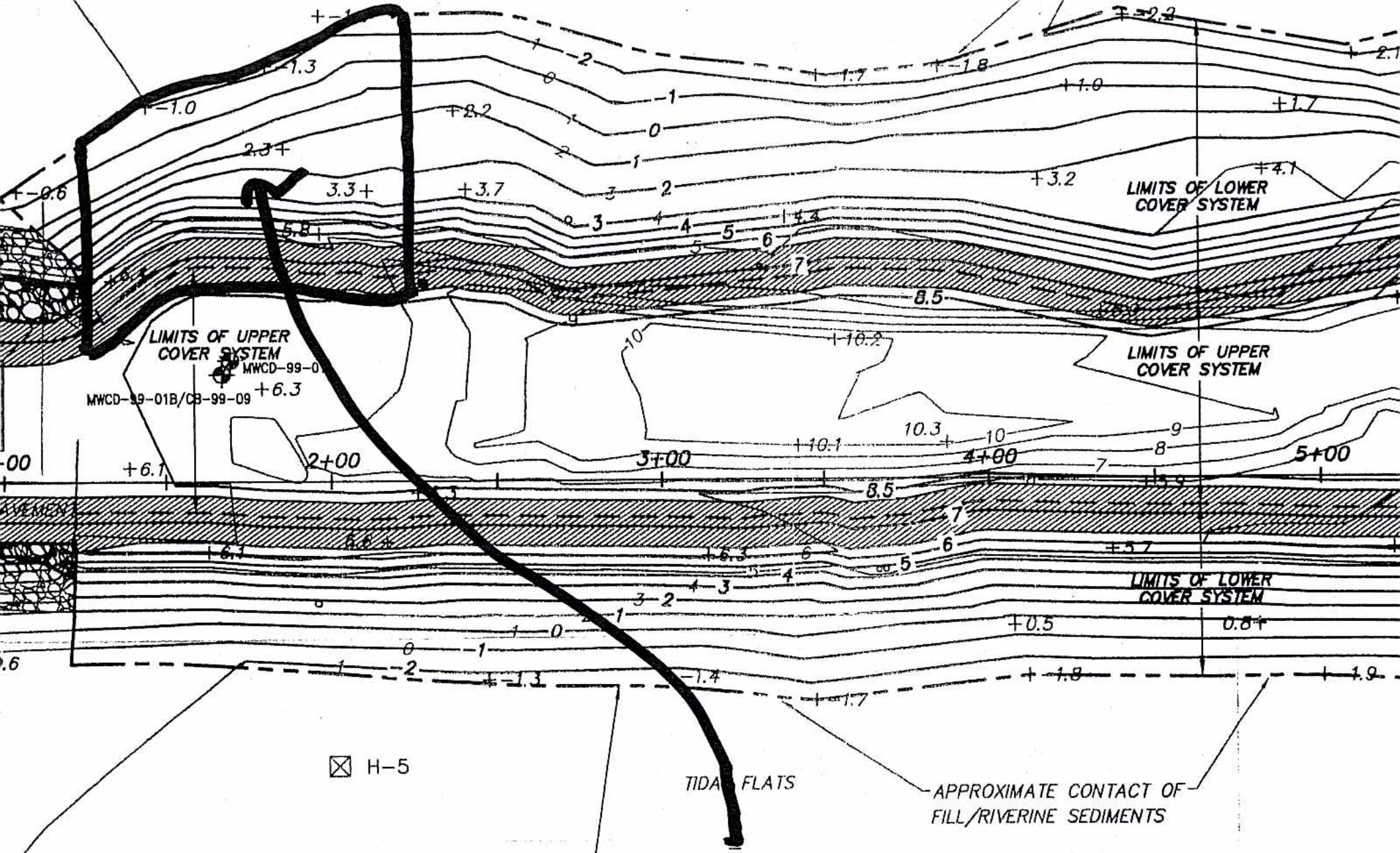
(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix

CSR - consecutive severed ribs
TSR - total severed ribs
SIB - splits in bars
SG - seam gap
DBM - damaged braid material
SBU - spacing between units
x - other

(2) Location of deficiency is provided as follows:

Baseline Station (BL Sta.) is inclusive baseline for inspected area (i.e., 3+00 to 4+00) with designation of east or west offset.
The baseline description corresponds to the description provided on the deployment acceptance sheet.
Row of PMMs counted from from lower to higher baseline location provide for the inspected area beginning with 1.
The number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface).

3. This summary log will be appended by reference and attached to the corresponding PMM acceptance form referenced above.



AREA OF INSPECTION/APPROVAL ACCEPTANCE FORM #13

APPENDIX E
MAINTENANCE AND INSPECTION PROCEDURES FOR
POLYMERIC MARINE MATTRESSES

MAINTENANCE AND INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

ATTACHMENT E-3

POLYMERIC MARINE MATTRESS 20 PERCENT REPAIR INVENTORY LOG

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER ____1_____

Date Inspected	QA Inspector	Deficiency Code (1)	Location of Deficiency (2)			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/9/02	WBJ	N/A	1	N/A	N/A	N/A	-	No repairs observed in row.
4/9/02	WBJ	CSR	18	1	3	BRAID	1	
4/9/02	WBJ	CSR	18	1	6	BRAID	2	
4/9/02	WBJ	CSR	18	2	4	BRAID	3	
4/9/02	WBJ	CSR	18	5	6	BRAID	4	
4/9/02	WBJ	CSR	19	1	6	BRAID	5	
4/9/02	WBJ	SBU	19	1	6	GRID	6	
4/9/02	WBJ	CSR	19	2	2	GRID	7	
4/9/02	WBJ	CSR	19	2	5	BRAID	8	
4/9/02	WBJ	CSR	19	2	5	BRAID	9	
4/9/02	WBJ	CSR	19	2	6	GRID	10	
4/9/02	WBJ	SBU	19	2	6	GRID	11	
4/9/02	WBJ	CSR	21	1	2	GRID	12	
4/9/02	WBJ	CSR	21	1	3	BRAID	13	
4/9/02	WBJ	CSR	21	1	3	BRAID	14	
4/9/02	WBJ	CSR	21	1	6	BRAID	15	
4/9/02	WBJ	CSR	21	1	6	GRID	16	
4/9/02	WBJ	SBU	21	3	6	GRID	17	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 2

Date Inspected	QA Inspector	Deficiency[1] Code	Location of Deficiency[2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/9/02	WBJ	CSR	1	1	4	BRAID	1	
4/9/02	WBJ	CSR	1	2	6	BRAID	2	
4/9/02	WBJ	SBU	1	2	6	GRID	3	
4/9/02	WBJ	SBU	1	3	6	GRID	4	
4/9/02	WBJ	CSR	1	4	3	GRID	5	
4/9/02	WBJ	SBU	1	4	6	GRID	6	
4/9/02	WBJ	CSR	5	1	6	BRAID	7	
4/9/02	WBJ	CSR	5	2a	2	BRAID	8	Identified unit was a custom tiled PMM.
4/9/02	WBJ	CSR	5	2	6	BRAID	9	
4/9/02	WBJ	SBU	5	2	6	GRID	10	
4/9/02	WBJ	CSR	5	3	4	BRAID	11	
4/9/02	WBJ	CSR	5	4	3	BRAID	12	
4/9/02	WBJ	SBU	5	4	6	GRID	13	
4/9/02	WBJ	CSR	7	1	2	GRID	14	
4/9/02	WBJ	CSR	7	1	3	BRAID	15	
4/9/02	WBJ	CSR	7	1	4	GRID	16	
4/9/02	WBJ	CSR	7	4	3	BRAID	17	
4/9/02	WBJ	CSR	7	4	6	BRAID	18	
4/9/02	WBJ	CSR	16	1	8	BRAID	19	
4/9/02	WBJ	CSR	16	2	6	BRAID	20	
4/9/02	WBJ	CSR	16	3	6	BRAID	21	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 3

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/9/02	WBJ	CSR	4	1	2	GRID	1	
4/9/02	WBJ	CSR	4	1	3	BRAID	2	
4/9/02	WBJ	CSR	4	3	5	GRID	3	
4/9/02	WBJ	CSR	4	3	6	GRID	4	
4/9/02	WBJ	CSR	8	1	2	BRAID	5	
4/9/02	WBJ	CSR	8	1	4	GRID	6	
4/9/02	WBJ	CSR	17	1	2	GRID	7	
4/9/02	WBJ	CSR	17	1	3	BRAID	8	
4/9/02	WBJ	CSR	17	1	5	BRAID	9	
4/9/02	WBJ	SBU	17	2	6	GRID	10	
4/9/02	WBJ	CSR	17	3	3	GRID	11	
4/9/02	WBJ	CSR	17	4	3	BRAID	12	
4/9/02	WBJ	CSR	21	1	3	BRAID	13	
4/9/02	WBJ	CSR	21	1	6	BRAID	14	
4/9/02	WBJ	SBU	21	1	6	GRID	15	
4/9/02	WBJ	CSR	21	2	1	BRAID	16	
4/9/02	WBJ	CSR	21	2	3	BRAID	17	
4/9/02	WBJ	CSR	21	2	3	BRAID	18	
4/9/02	WBJ	CSR	21	2	4	BRAID	19	
4/9/02	WBJ	CSR	21	2	5	BRAID	20	
4/9/02	WBJ	SBU	21	2	6	GRID	21	
4/9/02	WBJ	CSR	21	3	5	GRID	22	
4/9/02	WBJ	CSR	21	3	6	BRAID	23	
4/9/02	WBJ	CSR	21	3	6	GRID	24	
4/9/02	WBJ	CSR	21	4	3	GRID	25	
4/9/02	WBJ	CSR	21	4	3	GRID	26	
4/9/02	WBJ	CSR	21	4	3	GRID	27	
4/9/02	WBJ	CSR	21	4	5	BRAID	28	
4/9/02	WBJ	CSR	21	5	6	BRAID	29	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 4

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/9/02	WBJ	CSR	3	1	6	BRAID	1	
4/9/02	WBJ	CSR	3	3	2	BRAID	2	
4/9/02	WBJ	CSR	4	2	1	GRID	3	
4/9/02	WBJ	CSR	4	2	3	BRAID	4	
4/9/02	WBJ	CSR	4	2	3	BRAID	5	
4/9/02	WBJ	CSR	4	3	5	GRID	6	
4/9/02	WBJ	CSR	4	3	6	GRID	7	
4/9/02	WBJ	CSR	8	1	5	BRAID	8	
4/9/02	WBJ	CSR	8	4	3	GRID	9	
4/9/02	WBJ	CSR	8	4	5	BRAID	10	
4/9/02	WBJ	SBU	11	2	4	GRID	11	
4/9/02	WBJ	CSR	11	2	4	BRAID	12	
4/9/02	WBJ	CSR	11	3	5	BRAID	13	
4/9/02	WBJ	CSR	11	4	2	BRAID	14	
4/9/02	WBJ	CSR	11	4	3	BRAID	15	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 5

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/9/02	WBJ	SBU	1	3	6	GRID	1	
4/9/02	WBJ	SBU	1	4	6	GRID	2	
4/9/02	WBJ	CSR	1	5	5	GRID	3	
4/9/02	WBJ	CSR	6	4	2	BRAID	4	
4/9/02	WBJ	CSR	7	2	3	BRAID	5	
4/9/02	WBJ	CSR	7	2	5	GRID	6	
4/9/02	WBJ	CSR	7	3	4	BRAID	7	
4/9/02	WBJ	CSR	7	4	3	BRAID	8	
4/9/02	WBJ	CSR	16	3	5	BRAID	9	
4/9/02	WBJ	CSR	16	4	4	BRAID	10	
4/9/02	WBJ	SBU	16	4	4	BRAID	11	
4/9/02	WBJ	CSR	16	4	5	BRAID	12	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 6

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/9/02	WBJ	N/A	3	N/A	N/A	N/A	-	No repairs observed in row.
4/9/02	WBJ	CSR	8	1	1	GRID	1	
4/9/02	WBJ	SBU	8	4	6	GRID	2	
4/9/02	WBJ	CSR	8	5	2	BRAID	3	
4/9/02	WBJ	SBU	9	3	6	GRID	4	
4/9/02	WBJ	SBU	9	4	6	GRID	5	
4/9/02	WBJ	SBU	16	2	6	GRID	6	
4/9/02	WBJ	CSR	16	4	3	BRAID	7	
4/9/02	WBJ	CSR	16	4	5	GRID	8	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 7

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	SBU	13	3	6	GRID	1	
4/10/02	WBJ	SBU	13	3	6	GRID	2	
4/10/02	WBJ	CSR	13	5	2	GRID	3	
4/10/02	WBJ	CSR	13	5	5	BRAID	4	
4/10/02	WBJ	CSR	13	5	6	GRID	5	
4/10/02	WBJ	CSR	13	6	4	BRAID	6	
4/10/02	WBJ	CSR	13	7	4	BRAID	7	
4/10/02	WBJ	CSR	13	7	5	GRID	8	
4/10/02	WBJ	CSR	13	8	2	GRID	9	
4/10/02	WBJ	CSR	13	8	4	BRAID	10	
4/10/02	WBJ	CSR	13	8	6	GRID	11	
4/10/02	WBJ	CSR	13	9	2	GRID	12	
4/10/02	WBJ	CSR	13	9	4	BRAID	13	
4/10/02	WBJ	CSR	13	9	6	GRID	14	
4/10/02	WBJ	CSR	13	10	6	BRAID	15	
4/10/02	WBJ	CSR	14	2	6	BRAID	16	
4/10/02	WBJ	SBU	14	3	6	GRID	17	
4/10/02	WBJ	CSR	14	4	3	BRAID	18	
4/10/02	WBJ	CSR	14	5	5	BRAID	19	
4/10/02	WBJ	CSR	14	6	1	BRAID	20	
4/10/02	WBJ	CSR	14	6	2	BRAID	21	
4/10/02	WBJ	CSR	14	6	4	GRID	22	
4/10/02	WBJ	CSR	14	6	5	GRID	23	
4/10/02	WBJ	CSR	14	6	6	BRAID	24	
4/10/02	WBJ	CSR	14	7	1	BRAID	25	
4/10/02	WBJ	CSR	14	7	2	BRAID	26	
4/10/02	WBJ	CSR	14	7	5	BRAID	27	
4/10/02	WBJ	CSR	14	8	2	BRAID	28	
4/10/02	WBJ	CSR	14	8	4	BRAID	29	
4/10/02	WBJ	CSR	14	8	6	GRID	30	
4/10/02	WBJ	CSR	14	9	3	GRID	31	
4/10/02	WBJ	CSR	14	9	4	BRAID	32	
4/10/02	WBJ	CSR	14	10	4	GRID	33	
4/10/02	WBJ	CSR	15	1	5	GRID	34	
4/10/02	WBJ	CSR	15	1	6	GRID	35	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 7

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	CSR	15	2	1	GRID	36	
4/10/02	WBJ	CSR	15	2	5	BRAID	37	
4/10/02	WBJ	CSR	15	3	3	BRAID	38	
4/10/02	WBJ	CSR	15	3	6	BRAID	39	
4/10/02	WBJ	CSR	15	4	3	BRAID	40	
4/10/02	WBJ	CSR	15	4	4	BRAID	41	
4/10/02	WBJ	CSR	15	4	5	BRAID	42	
4/10/02	WBJ	CSR	15	4	6	BRAID	43	
4/10/02	WBJ	CSR	15	4	6	GRID	44	
4/10/02	WBJ	CSR	15	6	6	BRAID	45	
4/10/02	WBJ	CSR	15	7	3	BRAID	46	
4/10/02	WBJ	CSR	15	7	6	GRID	47	
4/10/02	WBJ	CSR	15	7	6	GRID	48	
4/10/02	WBJ	CSR	15	9	3	GRID	49	
4/10/02	WBJ	CSR	15	9	6	BRAID	50	
4/10/02	WBJ	CSR	15	10	4	GRID	51	
4/10/02	WBJ	CSR	15	10	2	GRID	52	
4/10/02	WBJ	CSR	16	4	2	BRAID	53	
4/10/02	WBJ	CSR	16	4	4	BRAID	54	
4/10/02	WBJ	CSR	16	4	5	BRAID	55	
4/10/02	WBJ	CSR	16	4	6	BRAID	56	
4/10/02	WBJ	SBU	16	4	6	GRID	57	
4/10/02	WBJ	CSR	16	5	2	BRAID	58	
4/10/02	WBJ	CSR	16	5	3	BRAID	59	
4/10/02	WBJ	CSR	16	5	3	BRAID	60	
4/10/02	WBJ	CSR	16	5	4	BRAID	61	
4/10/02	WBJ	CSR	16	5	4	BRAID	62	
4/10/02	WBJ	CSR	16	5	6	BRAID	63	
4/10/02	WBJ	CSR	16	6	4	BRAID	64	
4/10/02	WBJ	CSR	16	6	6	BRAID	65	
4/10/02	WBJ	CSR	16	7	4	GRID	66	
4/10/02	WBJ	CSR	16	7	6	GRID	67	
4/10/02	WBJ	CSR	16	7	6	BRAID	68	
4/10/02	WBJ	SBU	16	7	6	GRID	69	
4/10/02	WBJ	CSR	16	8	3	BRAID	70	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 7

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	CSR	16	9	4	GRID	71	
4/10/02	WBJ	CSR	16	9	5	BRAID	72	
4/10/02	WBJ	CSR	16	10	3	BRAID	73	
4/10/02	WBJ	CSR	16	10	4	BRAID	74	
4/10/02	WBJ	SBU	16	10	6	GRID	75	
4/10/02	WBJ	CSR	17	1	2	BRAID	76	
4/10/02	WBJ	CSR	17	1	3	BRAID	77	
4/10/02	WBJ	CSR	17	1	4	BRAID	78	
4/10/02	WBJ	CSR	17	1	5	BRAID	79	
4/10/02	WBJ	CSR	17	1	5	BRAID	80	
4/10/02	WBJ	CSR	17	1	6	BRAID	81	
4/10/02	WBJ	CSR	17	2	1	BRAID	82	
4/10/02	WBJ	CSR	17	2	3	GRID	83	
4/10/02	WBJ	CSR	17	2	5	GRID	84	
4/10/02	WBJ	CSR	17	2	6	BRAID	85	
4/10/02	WBJ	SBU	17	2	6	GRID	86	
4/10/02	WBJ	SBU	17	3	6	GRID	87	
4/10/02	WBJ	CSR	17	4	3	BRAID	88	
4/10/02	WBJ	CSR	17	5	3	BRAID	89	
4/10/02	WBJ	CSR	17	6	2	BRAID	90	
4/10/02	WBJ	CSR	17	6	3	BRAID	91	
4/10/02	WBJ	CSR	17	6	4	BRAID	92	
4/10/02	WBJ	CSR	17	6	6	GRID	93	
4/10/02	WBJ	CSR	17	6	6	BRAID	94	
4/10/02	WBJ	CSR	17	6	6	BRAID	95	
4/10/02	WBJ	CSR	17	7	3	BRAID	96	
4/10/02	WBJ	CSR	17	7	4	GRID	97	
4/10/02	WBJ	CSR	17	7	5	GRID	98	
4/10/02	WBJ	CSR	17	7	5	BRAID	99	
4/10/02	WBJ	SBU	17	10	6	GRID	100	
4/10/02	WBJ	CSR	18	1	2	GRID	101	
4/10/02	WBJ	CSR	18	1	2	BRAID	102	
4/10/02	WBJ	CSR	18	1	4	GRID	103	
4/10/02	WBJ	CSR	18	1	4	BRAID	104	
4/10/02	WBJ	CSR	18	1	5	GRID	105	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 7

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	CSR	18	1	6	GRID	106	
4/10/02	WBJ	CSR	18	2	1	GRID	107	
4/10/02	WBJ	CSR	18	2	1	BRAID	108	
4/10/02	WBJ	CSR	18	2	2	BRAID	109	
4/10/02	WBJ	CSR	18	2	4	GRID	110	
4/10/02	WBJ	CSR	18	2	5	GRID	111	
4/10/02	WBJ	CSR	18	2	6	BRAID	112	
4/10/02	WBJ	CSR	18	2	6	GRID	113	
4/10/02	WBJ	SBU	18	2	6	GRID	114	
4/10/02	WBJ	CSR	18	3	6	GRID	115	
4/10/02	WBJ	CSR	18	3	6	BRAID	116	
4/10/02	WBJ	SBU	18	3	6	GRID	117	
4/10/02	WBJ	CSR	18	4	2	BRAID	118	
4/10/02	WBJ	CSR	18	5	5	GRID	119	
4/10/02	WBJ	CSR	18	6	2	BRAID	120	
4/10/02	WBJ	CSR	18	6	3	BRAID	121	
4/10/02	WBJ	CSR	18	6	5	BRAID	122	
4/10/02	WBJ	CSR	18	7	4	BRAID	123	
4/10/02	WBJ	CSR	18	7	6	GRID	124	
4/10/02	WBJ	CSR	18	9	3	BRAID	125	
4/10/02	WBJ	CSR	18	9	3	BRAID	126	
4/10/02	WBJ	CSR	18	9	4	BRAID	127	
4/10/02	WBJ	SBU	18	9	6	GRID	128	
4/10/02	WBJ	CSR	18	10	3	BRAID	129	
4/10/02	WBJ	CSR	18	10	4	BRAID	130	
4/10/02	WBJ	SBU	18	10	6	GRID	131	
4/10/02	WBJ	CSR	19	1	1	BRAID	132	
4/10/02	WBJ	CSR	19	1	5	GRID	133	
4/10/02	WBJ	CSR	19	1	6	BRAID	134	
4/10/02	WBJ	SBU	19	2	6	GRID	135	
4/10/02	WBJ	CSR	19	3	5	BRAID	136	
4/10/02	WBJ	CSR	19	3	6	BRAID	137	
4/10/02	WBJ	CSR	19	5	4	BRAID	138	
4/10/02	WBJ	CSR	19	5	5	GRID	139	
4/10/02	WBJ	CSR	19	6	4	BRAID	140	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 7

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	CSR	19	7	2	BRAID	141	
4/10/02	WBJ	CSR	19	7	3	GRID	142	
4/10/02	WBJ	CSR	19	8	3	BRAID	143	
4/10/02	WBJ	CSR	19	8	4	BRAID	144	
4/10/02	WBJ	CSR	19	9	2	BRAID	145	
4/10/02	WBJ	CSR	19	9	4	BRAID	146	
4/10/02	WBJ	SBU	19	9	6	GRID	147	
4/10/02	WBJ	SBU	20	3	6	GRID	148	
4/10/02	WBJ	SBU	20	4	6	GRID	149	
4/10/02	WBJ	CSR	20	5	3	GRID	150	
4/10/02	WBJ	CSR	20	5	5	BRAID	151	
4/10/02	WBJ	CSR	20	6	3	BRAID	152	
4/10/02	WBJ	CSR	20	6	5	BRAID	153	
4/10/02	WBJ	CSR	20	6	6	BRAID	154	
4/10/02	WBJ	CSR	20	7	2	BRAID	155	
4/10/02	WBJ	CSR	20	10	4	BRAID	156	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 8

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	CSR	2	1	2	BRAID		
4/10/02	WBJ	CSR	2	2	3	BRAID		
4/10/02	WBJ	CSR	2	3	1	GRID		
4/10/02	WBJ	SBU	2	3	4	GRID		
4/10/02	WBJ	SBU	2	3	5	BRAID		
4/10/02	WBJ	CSR	2	3	5	GRID		
4/10/02	WBJ	SBU	2	3	6	GRID		
4/10/02	WBJ	CSR	2	3	6	GRID		
4/10/02	WBJ	SBU	2	3	6	GRID		
4/10/02	WBJ	CSR	2	4	1	BRAID		
4/10/02	WBJ	CSR	2	4	3	BRAID		
4/10/02	WBJ	SBU	2	4	6	GRID		
4/10/02	WBJ	SBU	2	5	1	GRID		
4/10/02	WBJ	SBU	2	5	2	GRID		
4/10/02	WBJ	SBU	2	5	6	GRID		
4/10/02	WBJ	CSR	2	6	3	BRAID		
4/10/02	WBJ	SBU	2	6	6	GRID		
4/10/02	WBJ	CSR	5	1	4	GRID		
4/10/02	WBJ	CSR	5	1	6	GRID		
4/10/02	WBJ	SBU	5	1	6	GRID		
4/10/02	WBJ	CSR	5	3	4	BRAID		
4/10/02	WBJ	SBU	5	5	1	GRID		
4/10/02	WBJ	CSR	5	6	2	BRAID		
4/10/02	WBJ	CSR	5	6	4	BRAID		
4/10/02	WBJ	CSR	5	6	6	BRAID		
4/10/02	WBJ	CSR	17	1	2	BRAID		
4/10/02	WBJ	CSR	17	1	2	GRID		
4/10/02	WBJ	CSR	17	1	4	BRAID		
4/10/02	WBJ	CSR	17	1	4	GRID		
4/10/02	WBJ	CSR	17	1	5	BRAID		
4/10/02	WBJ	CSR	17	1	6	GRID		
4/10/02	WBJ	CSR	17	2	3	BRAID		
4/10/02	WBJ	CSR	17	3	1	GRID		
4/10/02	WBJ	CSR	19	5	3	GRID		

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 9

Date Inspected	QA Inspector	Deficiency(1) Code	Location of Deficiency(2)			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	CSR	11	1	3	BRAID	1	
4/10/02	WBJ	CSR	11	1	3	GRID	2	
4/10/02	WBJ	SBU	11	1	6	GRID	3	
4/10/02	WBJ	SBU	11	1	6	GRID	4	
4/10/02	WBJ	CSR	11	2	1	BRAID	5	
4/10/02	WBJ	CSR	11	2	2	BRAID	6	
4/10/02	WBJ	CSR	11	2	2	BRAID	7	
4/10/02	WBJ	CSR	11	2	3	BRAID	8	
4/10/02	WBJ	CSR	11	3	6	BRAID	9	
4/10/02	WBJ	CSR	11	3	6	BRAID	10	
4/10/02	WBJ	CSR	11	4	3	BRAID	11	
4/10/02	WBJ	CSR	11	4	5	BRAID	12	
4/10/02	WBJ	CSR	11	4	6	BRAID	13	
4/10/02	WBJ	CSR	11	4	6	BRAID	14	
4/10/02	WBJ	CSR	11	4	6	GRID	15	
4/10/02	WBJ	CSR	11	5	4	BRAID	16	
4/10/02	WBJ	CSR	11	5	6	GRID	17	
4/10/02	WBJ	CSR	11	6	1	BRAID	18	
4/10/02	WBJ	CSR	11	6	5	BRAID	19	
4/10/02	WBJ	CSR	13	1	1	GRID	20	
4/10/02	WBJ	CSR	13	1	2	GRID	21	
4/10/02	WBJ	SBU	13	1	3	GRID	22	
4/10/02	WBJ	CSR	13	1	6	GRID	23	
4/10/02	WBJ	CSR	13	6	6	BRAID	24	
4/10/02	WBJ	CSR	14	1	1	BRAID	25	
4/10/02	WBJ	SBU	14	1	6	GRID	26	
4/10/02	WBJ	SBU	14	2	6	GRID	27	
4/10/02	WBJ	CSR	14	4	6	BRAID	28	
4/10/02	WBJ	CSR	14	5	6	GRID	29	
4/10/02	WBJ	SBU	15	1	6	GRID	30	
4/10/02	WBJ	CSR	15	3	5	BRAID	31	
4/10/02	WBJ	CSR	15	3	5	BRAID	32	
4/10/02	WBJ	CSR	15	3	6	GRID	33	
4/10/02	WBJ	CSR	15	5	4	BRAID	34	
4/10/02	WBJ	CSR	15	5	5	BRAID	35	
4/10/02	WBJ	CSR	15	5	6	GRID	36	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 10

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	CSR	7	2	3	GRID	1	
4/10/02	WBJ	CSR	7	2	6	GRID	2	
4/10/02	WBJ	SBU	7	2	6	GRID	3	
4/10/02	WBJ	SBU	7	3	6	GRID	4	
4/10/02	WBJ	SBU	7	5	6	GRID	5	
4/10/02	WBJ	CSR	7	7	1	BRAID	6	
4/10/02	WBJ	CSR	4	1	3	GRID	7	
4/10/02	WBJ	CSR	4	1	4	GRID	8	
4/10/02	WBJ	CSR	4	2	1	BRAID	9	
4/10/02	WBJ	CSR	4	2	2	GRID	10	
4/10/02	WBJ	CSR	4	2	4	BRAID	11	
4/10/02	WBJ	CSR	4	3	3	GRID	12	
4/10/02	WBJ	CSR	4	3	4	BRAID	13	
4/10/02	WBJ	CSR	4	5	3	BRAID	14	
4/10/02	WBJ	CSR	4	5	3	BRAID	15	
4/10/02	WBJ	CSR	4	5	3	BRAID	16	
4/10/02	WBJ	CSR	12	1	4	GRID	17	
4/10/02	WBJ	CSR	12	3	3	BRAID	18	
4/10/02	WBJ	SBU	12	4	6	GRID	19	
4/10/02	WBJ	CSR	12	3	3	GRID	20	
4/10/02	WBJ	CSR	12	6	6	BRAID	21	
4/10/02	WBJ	SBU	12	6	6	GRID	22	
4/10/02	WBJ	SBU	12	6	6	GRID	23	
4/10/02	WBJ	SBU	12	6	6	GRID	24	
4/10/02	WBJ	SBU	12	6	6	GRID	25	
4/10/02	WBJ	SBU	12	6	6	GRID	26	
4/10/02	WBJ	CSR	20	1	2	BRAID	27	
4/10/02	WBJ	CSR	20	1	3	BRAID	28	
4/10/02	WBJ	SBU	20	2	6	GRID	29	
4/10/02	WBJ	CSR	20	3	2	GRID	30	
4/10/02	WBJ	CSR	20	3	5	BRAID	31	
4/10/02	WBJ	CSR	20	3	5	BRAID	32	
4/10/02	WBJ	CSR	20	4	2	BRAID	33	
4/10/02	WBJ	CSR	20	4	3	GRID	34	
4/10/02	WBJ	CSR	20	4	2	GRID	35	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 10

Date Inspected	QA Inspector	Deficiency Code (1)	Location of Deficiency (2)			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	SBU	20	4	6	GRID	36	
4/10/02	WBJ	SBU	20	4	6	GRID	37	
4/10/02	WBJ	CSR	20	5	3	BRAID	38	
4/10/02	WBJ	SBU	20	5	6	GRID	39	
4/10/02	WBJ	CSR	20	6	2	BRAID	40	
4/10/02	WBJ	SBU	20	7	6	GRID	41	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 11

Date Inspected	QA Inspector	Deficiency Code [1]	Location of Deficiency [2]			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	CSR	10	2	4	BRAID	1	
4/10/02	WBJ	CSR	10	4	5	BRAID	2	
4/10/02	WBJ	CSR	10	4	6	BRAID	3	
4/10/02	WBJ	SBU	10	4	6	GRID	4	
4/10/02	WBJ	CSR	10	5	3	BRAID	5	
4/10/02	WBJ	SBU	10	5	6	GRID	6	
4/10/02	WBJ	CSR	16	2	3	BRAID	7	
4/10/02	WBJ	CSR	16	2	5	BRAID	8	
4/10/02	WBJ	CSR	16	2	6	BRAID	9	
4/10/02	WBJ	CSR	16	3	3	BRAID	10	
4/10/02	WBJ	CSR	16	5	6	GRID	11	
4/10/02	WBJ	CSR	13	1	4	GRID	12	
4/10/02	WBJ	CSR	13	4	6	GRID	13	
4/10/02	WBJ	SBU	13	4	6	GRID	14	
4/10/02	WBJ	SBU	15	1	6	GRID	15	
4/10/02	WBJ	CSR	15	3	1	GRID	16	
4/10/02	WBJ	CSR	15	5	3	GRID	17	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 12

Date Inspected	QA Inspector	Deficiency Code (1)	Location of Deficiency (2)			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	CSR	17	2	1	BRAID	1	
4/10/02	WBJ	SBU	17	2	6	GRID	2	
4/10/02	WBJ	SBU	17	3	6	GRID	3	
4/10/02	WBJ	SBU	17	3	6	GRID	4	
4/10/02	WBJ	SBU	17	4	6	GRID	5	
4/10/02	WBJ	SBU	17	4	6	GRID	6	
4/10/02	WBJ	CSR	17	5	2	GRID	7	
4/10/02	WBJ	SBU	17	5	6	GRID	8	
4/10/02	WBJ	SBU	17	5	6	GRID	9	
4/10/02	WBJ	SBU	17	6	6	GRID	10	
4/10/02	WBJ	SBU	17	7	6	GRID	11	
4/10/02	WBJ	CSR	3	6	6	BRAID	12	
4/10/02	WBJ	CSR	3	8	4	GRID	13	
4/10/02	WBJ	CSR	3	8	4	BRAID	14	
4/10/02	WBJ	CSR	11	1	6	BRAID	15	
4/10/02	WBJ	CSR	11	4	6	GRID	16	
4/10/02	WBJ	SBU	11	5	2	GRID	17	
4/10/02	WBJ	CSR	19	2	1	BRAID	18	
4/10/02	WBJ	CSR	19	2	2	BRAID	19	
4/10/02	WBJ	CSR	19	2	2	BRAID	20	
4/10/02	WBJ	CSR	19	2	3	GRID	21	
4/10/02	WBJ	SBU	19	3	6	GRID	22	
4/10/02	WBJ	CSR	19	4	5	GRID	23	
4/10/02	WBJ	CSR	19	4	6	BRAID	24	
4/10/02	WBJ	SBU	19	4	6	GRID	25	
4/10/02	WBJ	SBU	19	4	6	GRID	26	
4/10/02	WBJ	CSR	19	5	6	GRID	27	
4/10/02	WBJ	CSR	19	6	5	BRAID	28	
4/10/02	WBJ	SBU	19	6	6	GRID	29	Full unit length grid patch
4/10/02	WBJ	CSR	19	7	4	BRAID	30	
4/10/02	WBJ	CSR	19	7	6	BRAID	31	
4/10/02	WBJ	SBU	19	7	6	GRID	32	
4/10/02	WBJ	CSR	19	8	6	GRID	33	
4/10/02	WBJ	CSR	19	8	6	BRAID	34	

SAEP CAUSEWAY CONSTRUCTION
STRATFORD, CONNECTICUT

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

CONTRACTOR: R. F. WESTON USACE CONTRACT No. DAAD05-97-D-7004-DO 0187

CORRESPONDING PMM ACCEPTANCE FORM NUMBER 13

Date Inspected	QA Inspector	Deficiency Code (1)	Location of Deficiency(2)			REPAIR TYPE	REPAIR NUMBER	Comments
			Row	Unit	Baffle			
4/10/02	WBJ	CSR	15	1	4	BRAID	1	
4/10/02	WBJ	CSR	15	1	4	GRID	2	
4/10/02	WBJ	CSR	15	2	2	BRAID	3	
4/10/02	WBJ	CSR	15	2	3	GRID	4	
4/10/02	WBJ	CSR	15	2	4	BRAID	5	
4/10/02	WBJ	CSR	15	3	2	BRAID	6	
4/10/02	WBJ	CSR	8	4	4	BRAID	7	
4/10/02	WBJ	CSR	10	3	3	BRAID	8	
4/10/02	WBJ	CSR	3	3	1	GRID	9	
4/10/02	WBJ	CSR	3	3	3	GRID	10	

POLYMERIC MARINE MATTRESS REPAIR 20% QA INVENTORY LOG

Notes:

(1) Deficiency Codes are based on Weston's approved QC inspection and repair matrix dated January 2002.

CSR - consecutive severed ribs	SG - seam gap	X - other
TSR - total severed ribs	DBM - damaged braid material	
SIB - splits in bars	SBU - spacing between units	

(2) Locations of inspection / documentation area is provided as follows:

1. Baseline Station is the inclusive baseline for inspected area (I.e., 3+00 to 4+00) with designation of east or west offset and corresponds to the description provided on the identified deployment acceptance form number.
2. The identified row of PMMs is counted from lower to higher baseline location provide for the inspected area beginning with row 1.
3. The unit number of the PMM is oriented from top (interface with rip-rap transition) to bottom (fill/sediment interface) for each corresponding row number.
4. The baffle number is oriented from top to bottom of individual PMMs and corresponds to the identified segmented portion of each PMM.

3. Selection of documented rows for cataloged inventory repairs in each acceptance area utilized a random unit number generator table.
4. The total of all repairs for the cataloged inventory equals approximately twenty percent of deployed PMMs

APPENDIX E
MAINTENANCE AND INSPECTION PROCEDURES FOR
POLYMERIC MARINE MATTRESSES

MAINTENANCE AND INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

ATTACHMENT E-4

POLYMERIC MARINE MATTRESS INSPECTION AND REPAIR GUIDELINES

QUALITY CONTROL INSPECTION CRITERIA AND REPAIR GUIDELINES

Triton Marine Mattresses – SAEP Causeway Project

INSPECTION CRITERIA	REPAIR GUIDELINES			
	Top or Bottom Piece Either Side Edge [3]	Top or Bottom Piece Overall Area	End Baffle	Side Piece
Inspection Method	Visual	Visual	Visual	Visual
Consecutive Severed [1] Ribs in a single row in the cross-roll direction (XMD)	***Pre-Placement [4]*** 1 ⇒ No Repair 2 ⇒ Braid Patch [6] 3 ⇒ Braid Patch & Grid Patch ≥ 4 ⇒ Replace/Remove ***Post-Placement [5]*** 1 ⇒ No Repair 2 ⇒ Braid Patch ≥ 3 ⇒ Grid Patch	***Pre-Placement [4]*** 1 ⇒ No Repair 2 ⇒ Braid Patch 3 to 7 ⇒ Braid Patch & Grid Patch ≥ 8 ⇒ Replace/Remove ***Post-Placement [5]*** 1 ⇒ No Repair 2 ⇒ Braid Patch ≥ 3 ⇒ Grid Patch	***Pre-Placement [4]*** 1 ⇒ No Repair 2 ⇒ Braid Patch 3 to 14 ⇒ Grid Patch ≥ 15 ⇒ Replace/Remove ***Post-Placement [5]*** Not applicable - inaccessible due to end-to-end seam of adjacent mattresses	***Pre-Placement*** 1 ⇒ No Repair 2 ⇒ Braid Patch ≥ 3 ⇒ Grid Patch ***Post-Placement*** 1 ⇒ No Repair ≥ 2 ⇒ Braid Patch
Total Severed Ribs in a single row in the cross-roll direction (XMD)	***Pre-Placement*** > 6 ⇒ Replace/Remove ***Post-Placement*** See Overall Area ⇒	***Pre-Placement*** > 14 ⇒ Replace/Remove ***Post-Placement*** > 14 ⇒ Grid Patch Row	***Pre-Placement*** ≥ 18 ⇒ Replace/Remove ***Post-Placement*** Not applicable - inaccessible	***Pre-Placement*** > 4 ⇒ Grid Patch ***Post-Placement*** 1 ⇒ No Repair ≥ 2 ⇒ Braid Patch
Damaged [2] Ribs	No limit. No repair required.	No limit. No repair required.	No limit. No repair required.	No limit. No repair required.
Splits in XMD bars [7] consecutive in the roll or cross-roll direction	≤ 2 ⇒ Braid Patch ≥ 3 ⇒ Grid Patch	≤ 2 ⇒ Braid Patch ≥ 3 ⇒ Grid Patch	≤ 2 ⇒ Braid Patch ≥ 3 ⇒ Grid Patch	≤ 2 ⇒ Braid Patch ≥ 3 ⇒ Grid Patch
Gaps Between Ribs or Adjacent to Seam [9]	***Pre-Placement:*** < 2.32 inches ⇒ Acceptable ≥ 2.32 inches ⇒ Braid Patch ***Post-Placement:*** < 2.32 inches ⇒ Acceptable 2.32 to 6 inches ⇒ Braid Patch ≥ 6 inches ⇒ Grid Patch			
Stone Fill Quantity	Acceptable filling of mattress compartments (baffles) is to be inspected prior to removal from the filling aparatus. Shifting of the stone fill during handling is expected and variation in mattress thickness is acceptable.			
Braid Material Condition	*Damaged* braid material (not more than 50% of the filaments broken) is acceptable with no repair. *Severed* braid material (more than 50% of the filaments broken) shall be replaced.			
Spacing Between Adjacent Units [8]	< 2 inches ⇒ Acceptable 2 to 12 inches ⇒ Fill with stone and Grid Patch ≥ 12 inches ⇒ Reposition unit			

Notes:

1. "Severed Rib" is defined as a rib with 100% of the cross-sectional thickness lost at any point to cracks, splits, abbrasions, etc.
2. "Damaged Rib" is defined as a rib with < 100% of the cross-sectional thickness lost at any point to cracks, splits, abbrasions, etc.
3. "Side Edge" is defined as the outermost 10 ribs along the 10-foot dimension of the mattress.
4. "Pre-Placement" inspection are performed on exposed and accessible portions of completed mattresses after being removed from the filling apparatus and staged in the South Lot.
5. "Post-Placement" inspection are performed on the exposed and accessible portions of the completed mattresses after installation on the Causeway sideslope. Transfer of the completed mattresses from the South Lot staging area to the Causeway is to be considered part of placement.
6. "Braid Rib", "Braid Patch", and "Grid Patch" are to be installed according to the procedures provided in the Tensar "Suggested Repair Guidelines" and addendums.
7. The Repair Guideline listed are the same for both the Pre-Placement and Post-Placement inspection.
8. The spacing guidelines listed apply in all directions (end-to-end, side-to-end, side-to-side, and corners).
9. The maximum allowable gap distance recommended in the retention analysis performed by Weston on 12/11/01 was determined to be 2.32 inches.

TENSAR EARTH TECHNOLOGIES

TO: ROY F. WESTON, INC.

FROM: JEFF FISKE

SUBJECT: ADDENDUM TO SUGGESTED REPAIR GUIDELINES
MARINE MATTRESS REPAIR PROCEDURES

DATE: 12/19/01

CC: JIM GIUMARRA, AMERICAN EXCELSIOR COMPANY
STEVE MAHER, TENSAR EARTH TECHNOLOGIES

Mattress Repair Procedures:

1. Braid Patch: Situations in which a braid patch repair is required are defined in the attached "Quality Control Inspection Criteria & Repair Guidelines" table. For the purpose of this repair the term "adjacent" applies in the cross-machine (cross roll) direction. The "braid patch" should be made using the same HDPE braid material used in prefabrication and final seaming.

   The "braid patch" is begun by securely knotting the braid material to the transverse (XMD) bar at least two full apertures before one side of the opening to be repaired. The patch shall then be installed such that the braid snugly engages the XMD bars on either end of the opening, advancing across the opening one aperture at a time. The resulting "zig-zag" configuration shall continue for two (2) full apertures beyond the opening. The "braid patch" is completed by securely knotting the braid to the XMD bar (see figure). If required, a "grid patch" shall be installed following the installation of the "braid patch"

2. In the event that the damage occurs at the edge of the geogrid (i.e., one of the severed ribs was incorporated in a mattress seam), the patch shall begin two (2) full apertures before the non-seam end of the opening. The patch shall then be installed such that the braid snugly engages the XMD bars on either side of the opening, advancing across the opening one aperture at a time. Since the patch cannot extend beyond the edge of the geogrid, the "braid patch" is completed by securing knotting the braid to the XMD bar at one end of the outermost rib. (see figure)

   If a "grid patch" is required in addition to the "braid patch", the grid patch shall extend a minimum of six (6) inches beyond the opening in all directions. If located immediately adjacent to a braided seam, the "grid patch" is not required to extend beyond the edge of the unit, but shall rather be incorporated into the unit through a braided seam repair.
3. Grid patch: Refer to instructions in the "Suggested Repair Guidelines for Triton® Marine Mattress Units" document.
4. Braided seam procedure:
   For the purposes of this repair, the term adjacent applies in the machine (roll) direction. If the braid is severed, loosen the stitch in both directions until a competent rib is reached. Securely knot the braid to the XMD bar at the end of the competent rib. If the seam is loose as a result of damage to geogrid ribs incorporated within it, creating an opening of unacceptable size, sever the braid and follow the previous procedure.

If no more than two (2) adjacent ribs are severed, replace the seam following seaming procedures provided in the submittal document, engaging the nearest competent rib. The repaired seam shall extend a minimum of six (6) inches beyond the damaged section in both directions.

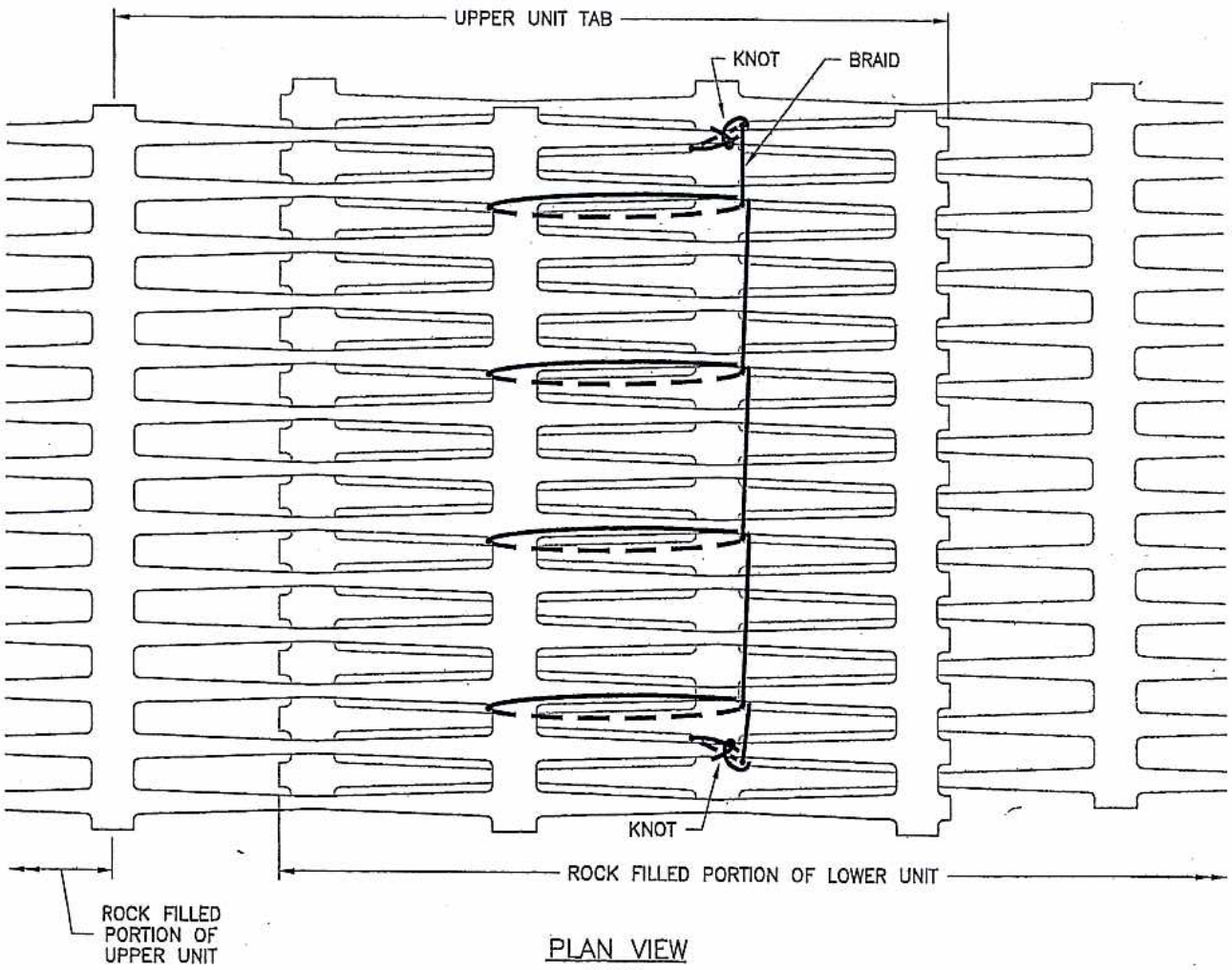
If three (3), or more, adjacent ribs are severed, a "grid patch" shall be installed prior to performing the seam repair. The "grid patch" shall extend a minimum of six (6) inches beyond the damaged section along the seam in both directions and toward the center of the mattress unit. The "grid patch" is not required to extend beyond the edge of the unit, but shall rather be incorporated into the unit through the seam repair. The repaired seam shall extend a minimum of six (6) inches beyond the damaged section in both directions.

APPENDIX E
MAINTENANCE AND INSPECTION PROCEDURES FOR
POLYMERIC MARINE MATTRESSES

MAINTENANCE AND INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

ATTACHMENT E-5

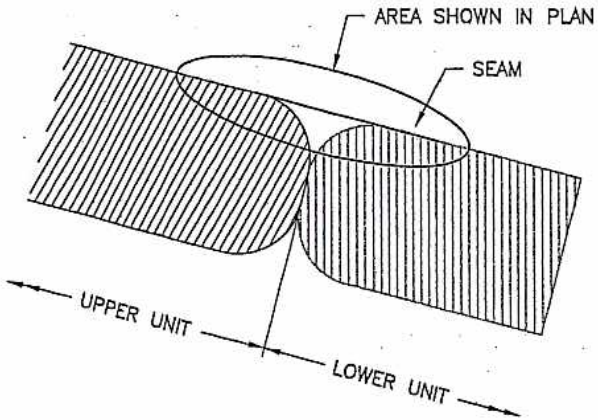
TYPICAL END-TO-END TAB SEAMING DETAIL



PLAN VIEW
N.T.S.

NOTES:

1. KNOTS SHALL BE PLACED AT A MINIMUM OF 3 PER SEAM.
2. BRAIDING SHALL ENGAGE AT A MINIMUM, EVERY THIRD APERTURE AS SHOWN.



CROSS-SECTION VIEW
N.T.S.

NOT TO SCALE

FIGURE 1
TYPICAL END-TO-END SEAMING DETAIL
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

Harding ESE

APPENDIX F
TOPOGRAPHIC SURVEY REQUIREMENTS

APPENDIX F
TOPOGRAPHIC SURVEY REQUIREMENTS

MAINTENANCE AND INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

PART 1 GENERAL

1.1 DESCRIPTION

The Contractor shall be responsible for completion of a topographic survey on the Causeway following completion of maintenance and inspection activities. The work shall commence two years after final construction completion and continue at five year intervals thereafter. The survey shall be conducted by a Land Surveyor licensed in the State of Connecticut and shall comply with the requirements of a Class A-1 survey.

1.2 REFERENCES (NOT USED)

1.3 SUBMITTALS

The Contractor shall submit a copy of the original field survey book and sketches pertaining to the work, including benchmark information and calibration information. The purpose of the submittal is to allow the U.S. Army to complete an assessment of settlement.

The drawing shall be included as part of the M&I Plan Reporting for the Causeway and shall show conditions of the site. In addition, the following information shall be contained in the the3 M&I Plan required reporting:

a. A copy of the original field survey book and sketches pertaining to the work, including benchmark information, traverse station ties (when available), and calibration information.

b. A hard copy of the site plan identifying 1-foot contour intervals of the Causeway and surrounding area and the horizontal locations of any designated landmarks.

c. Electronic files of the site plan on CD-ROM in the format specified by the U.S. Army.

1.4 CONTRACTOR REQUIREMENTS

The Contractor shall complete surveys of the Causeway area. Surveying techniques employed in the field shall follow commonly accepted professional survey practices, which are appropriate for the task at hand. The Contractor must also adhere to the following requirements:

a. The Contractor shall utilize permanent control information provided by the U.S. Army. Any additional control required to complete the survey shall be the responsibility of the Contractor.

b. Vertical and horizontal control shall be established with equipment capable of producing the accuracy specified herein. All surveying work shall be referenced to Connecticut State Plane NAD 83 (horizontal control) and NGVD 29 (vertical control). Calibration of leveling equipment (peg test) shall be performed each morning before initiation of activities when establishing temporary bench marks. The Contractor shall include information regarding the procedures and frequency for calibration of survey equipment.

c. The Contractor shall meet or exceed the horizontal and vertical accuracy criteria as defined by the Standards of Accuracy and General Specifications of the Geodetic Control Surveys

established by the U.S. Department of Commerce. All horizontal and vertical angles should be doubled for accuracy.

d. The Contractor shall reestablish a survey base line and bench marks for M&I activities utilized in identifying observed conditions during inspection activities. Should any of these points be destroyed, the replacement cost will be borne by the Contractor.

e. The Contractor will coordinate surveying with the U.S. Army or his/her representative. He or she shall give the U.S. Army three days notice of survey activities so that the U.S. Army may be present at the agreed upon time.

f. The Contractor shall be responsible for the layout of all grid coordinate locations, lines, grades, and levels necessary for the proper execution of the work. The surveyor shall be responsible for preparation of the topographic survey.

g. The Contractor shall employ, at his own expense, a licensed Land Surveyor in the State of Connecticut to provide surveys necessary to meet these requirements.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 SURVEY

The Contractor shall provide temporary horizontal and vertical control points based upon the benchmark information provided by the U.S. Army. The U.S. Army will furnish site base mapping and construction record drawings to be used for surveying efforts.

The Contractor shall complete a topographic survey of approximately seven acres of area near the Causeway, Topographic survey shall include elevations of 100 linear feet of the SAEP Dike on either side of the Causeway extending 50 feet toward the facility, and elevations of river sediments (i.e., tidal flats) within 75 feet of the Causeway. The survey shall be used to generate detailed elevation information for the Causeway and the surrounding area using 1-foot contours. As an additional requirement data from the previous topographical survey shall be overlain on the drawing in a contrasting color or graphical line weight to aid in assessment of settlement occurance since the last event

If required by the U.S. Army, the location and elevations designated landmarks shall be obtained. Horizontal locations shall be recorded to the closest 0.1 foot and vertical elevations shall be recorded to the closest 0.01 foot.

3.2 SUBMITTAL

As part of the required O&M Reporting the Contractor shall submit the following:

a. A copy of the original field survey book and sketches pertaining to the work, including benchmark information, traverse station ties (when available), and calibration information.

b. A hard copy of the site plan identifying 1-foot contour intervals of the Causeway and surrounding area as described above, and the horizontal locations of any designated landmarks.

c. Electronic files of the site plan on CD-ROM in the format specified by the U.S. Army.

--End of Section--

APPENDIX G
MONITORING REPORT FORM AND SAMPLE PHOTOGRAPH LOG

MONITORING REPORT FORM

MAINTENANCE AND INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

PROJECT NO: _____

CONTRACTOR: _____ **REPORT NO: _____**

CONTRACTOR'S REP: _____ **DATE: _____**

DATE OF LAST INSPECTION: _____
DAYS ELAPSED SINCE LAST INSPECTION: _____
PROJECTED DATE OF NEXT INSPECTION: _____

U.S. Army and CTDEP notified 5 days prior to inspection? YES/NO

WEATHER CONDITIONS:

IMPORTANT DIRECTIONS, DISCUSSIONS, AND MEETINGS RELATIVE TO EVENT:

SUMMARY OF INSPECTIONS PERFORMED AND MAJOR FINDINGS:

- Attach Visual Observation Checklist Sheet
- Attach Photographic Log
- Unusual Events or Conditions
- Recommendations for Maintenance Activities
- Issues to Consider at or prior to next scheduled 5-year site review

ATTACHMENTS

- Historical Data Trends
- Photographic Documentation
- Previous Topographical Survey Annotated with Visual Identified Settlement Areas
- Monitoring Schedule

SUBMITTED BY: _____

PHOTOGRAPH LOG

MAINTENANCE & INSPECTION PLAN
FOR CAUSEWAY COVER SYSTEM
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DATE:_____ PHOTOGRAPHER: _____ SHEET___OF___

PHOTO NUMBER	PHOTO LOCATION AND COMPASS DIRECTION	PHOTO DESCRIPTION
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