

FAC 8712 RETAINING STRUCTURE

FY22 SUC: \$0.75 LF

Source: Inflated from previous FY using ENR labor and material cost indices to measure actual inflation

Original Source: Multiple Commercial Sources; R.S. Means Facilities Maintenance and Repair 2010

FAC 8712 V13 Sustainment Unit Cost

Background:

“Because retaining walls are generally not subject to dynamic (changing) loads like bridges are, their expected life is limited more by longevity of their construction material. This is the reason we no longer use wood for walls. Steel binwalls will have an expected life of 40 years, while concrete retaining walls may last well over 100 years if properly constructed and not subject to vehicular damage. Walls fabricated with steel wire gabion baskets may have an expected service life of 30 years.”

PORTLAND OFFICE OF TRANSPORTATION, STRUCTURES MANAGEMENT PLAN Capital Oversight Committee, June 2001

“Follow these simple maintenance steps to ensure a lifetime of performance from your ALLAN BLOCK wall:

- Make a thorough annual inspection of the wall.
- Correct any settling or grading problems around the wall.
- Maintain the landscape surfaces around the wall.
- Take notice of any wall movement - settling, bulging or rotation,
- and then take proper corrective measures.
- Control any random weed growth as necessary.
- Avoid use of salts as deicers around the wall.”

Allan Block Corporation, 5300 Edina Industrial Blvd., #100, Edina, MN • 952-835-5309 • 952-835-0013
– Fax, Tech Sheet #797.

“As far as maintenance activities went, most of it was related to drainage reestablishment, vegetation removal, and minor masonry work (2/3 of the inventory was stone masonry walls). Very little structure maintenance was captured for concrete walls, MSE walls, or bin walls, which made up a smaller portion of the database. Concrete walls were about 15% of the database and either in good shape or needed entire replacement. MSE walls were very limited in use and relatively new and well-functioning. Metal bin walls really aren't that serviceable, and most needed replacement or retrofit with soil nailing.

Not knowing the volume of walls to be included, I can tell you what we had cost-wise re inspections. Generally, inspections required two people to conduct wall measurements, assessment of conditions and develop a brief work order. Accomplished teams can do 10-20 walls/day, depending on wall size and the depth and breadth of your inventory/assessment procedure. Travel, labor, lodging, etc. is predicated on this inventory/assessment work rate.

Settlement correction takes on a lot of definition – is it grade re-establishment at the top of the wall or foundation treatment? Options should ideally be expensed as time and materials – though you'll see we were required to work within a unit cost realm. Vegetation removal/control is largely labor-based, possibly with some equipment rental if not already capital equipment (chippers, haul trucks). The parks bill equipment hours to projects, so we had some base equipment rates in our estimates. Hourly rates were assumed for two-man crews (I recall a \$55/hr labor figure).

Seems pretty straightforward. I will say this – development of the inspection/assessment plan is where the big effort is. Actually collecting the data and developing the contracting is just grinding the process. We spent two years developing the program around the evolving NPS needs. There are a lot of details to be sure! -Matt

Matthew.DEMARCO@dot.gov U.S. Department of Transportation, Federal Highway Administration. Matthew J. DeMarco leads the Geotechnical Team for FHWA's Central Federal Lands Highway Division

U/M: LF

Mean 722 LF, Median 125 LF

Cost Source: R.S. Means Facilities Maintenance and Repair 2010

Cost Elements

Drainage Re-establishment:

- Crew A-18 (Laborer & Farm tractor with attachment)
- Contractor cost: \$631.28 per day
- EPS Standard 11-120 RT 018 0.28530/SY of dirt leveled and graded by hand
 - Assume 9 CF per 100 LF (drainage openings every 25 ft, 4 openings in 100 LF)
 - Approximately 2 CF of material blocking opening or channel
- $\{0.28530 \text{ hr/sy}\} \times \{1/3 \text{ sy/100 lf}\} \times \$631.28/\text{day} \times \{1 \text{ day}/8 \text{ hours}\} = \$0.0750/\text{LF}$

Vegetation Removal:

- Crew A-18 (Laborer & Farm tractor with attachment)
- Contractor cost: \$631.28 per day
- EPS Standard 11-190 RT 056 0.10188 hrs/100 LF
 - Plus set-up time per job 0.05519 hrs
 - Plus debris removal 1.12492 hr/cy (assume .33 cy = 9 cf)
 - Total time = 0.52829 hr/100 LF = .0052829 hr/LF
- $0.0052829 \text{ hr/lf} \times \$631.28/8 \text{ per hr} = \$0.4168/\text{LF}$

Visual Inspection:

- $\$58.30/\text{Hr} (\text{Skilled Worker Foreman}) \times 6 \text{ hr} / (10 \text{ Walls/Day} \times 722 \text{ LF} \times) = \$0.047/\text{LF}$

Total:

- \$0.5388/LF
- Arlington VA Adjustment = 99.6
- $\$0.5388 \times .996 = \$0.5367 / \text{LF}$