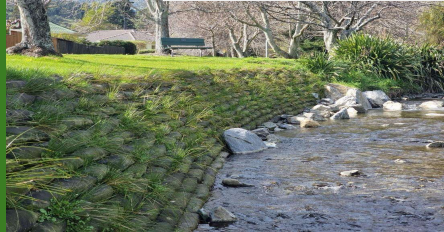




**SUSTAINABILITY FRAMEWORK**

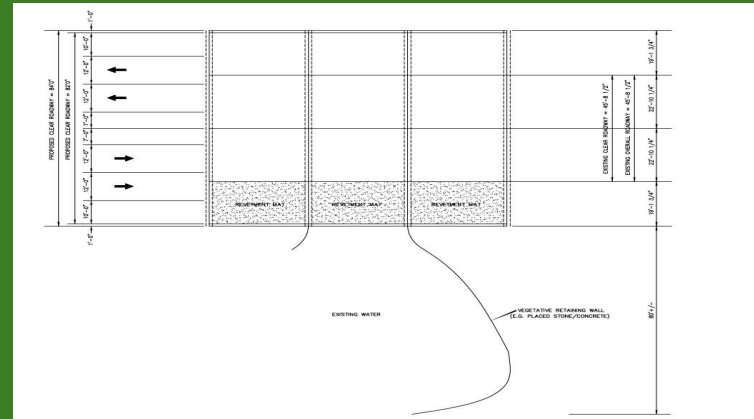
Credit Category	Submitted Score Information		
	Applicable	Submitted	Percentage
Quality of Life	153	52	34%
Leadership	0	0	NaN%
Resource Allocation	139	58	42%
Natural World	192	127	66%
Climate and Risk	122	44	36%
<b>Total Points / %</b>	<b>606</b>	<b>281</b>	<b>46%</b>



Credit Category	Submitted Score Information		
	Applicable	Submitted	Percentage
Quality of Life	153	52	34%
Leadership	0	0	NaN%
Resource Allocation	139	49	35%
Natural World	192	66	34%
Climate and Risk	122	44	36%
<b>Total Points / %</b>	<b>606</b>	<b>211</b>	<b>35%</b>

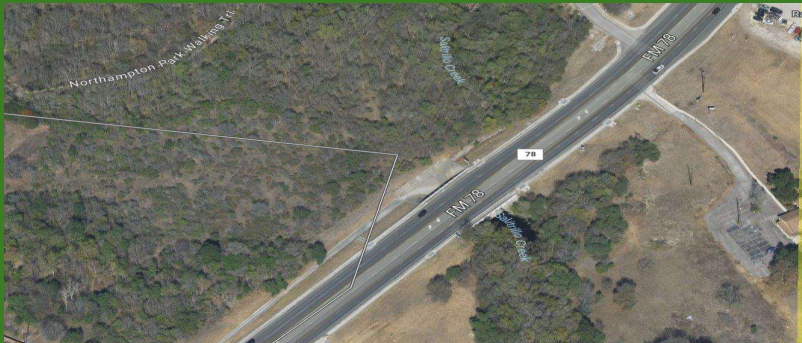


**CONSTRAINTS AND STANDARDS USED**



- 30 CY of revetment mat replacing 30 CY of rip rap.
- ≥ 80 ft of vegetative retaining wall.
- Existing water is not always present.

**SITE-PROBLEM**



Bridge on FM 78 Saltrillo Creek in San Antonio, Texas

- Failed Riprap at the bridge: The riprap that was intended to protect the bridge and creek bed from scour has failed, leaving the area unprotected.
- Semi-Circular Soil Channel Lining Downstream: The soil forms a semi-circular shape that catches the water flow exiting the bridge.
- Scour at the bridge (around and underneath): Scour is occurring around the bridge piers and abutments.

**SUMMARY COST**

CAPITAL COST			
Item	Revetment Mats (\$)	Vegetative Retaining Walls (\$)	Combined (\$)
Geosells/Materials	1,250	700	1,750
Transportation	150	Included in other costs	150
Installation/Labor	2,500	2,300	3,800
Excavation	Included in labor	2,300	2,300
Embankment	N/A	3,400	3,400
Tra Removal	N/A	2,500	2,500
Contingency (20%)	1,380	1,780	3,170
<b>Total Capital Cost</b>	<b>6,340</b>	<b>8,900</b>	<b>17,240</b>

LIFECYCLE COST			
Item	Revetment Mats (\$)	Vegetative Retaining Walls (\$)	Combined (\$)
INITIAL INSTALLATION	6,340	8,900	17,240
MAINTENANCE(100 YEARS)	5,000	5,000	10,000
SALVAGE VALUE	-4.44	N/A	-4.44
<b>TOTAL LIFECYCLE COST</b>	<b>9685.56</b>	<b>13,900</b>	<b>23,486.56</b>

**ALTERNATIVES**

- **CONCRETE REVETMENT MAT:** Revetment mats are layers of interlocking blocks of material (generally concrete) laid over erodible surfaces. They also include a filter layer that allows for particles to filter through the hollow middle
- **VEGETATIVE RETAINING WALL:** A vegetative retention wall is a mechanical structure with added vegetation that helps prevent erosion of the soil, or foundation, and provides slope stabilization.

**OUR TEAM**

