

Final Environmental Assessment

# Fagatogo Stormwater Modification

American Samoa Disaster Relief Office

FEMA-1506-DR-AS, HMGP #1506-4

April 2008



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**FINAL ENVIRONMENTAL ASSESSMENT**

**FOR**

**FAGATOGO STORMWATER MODIFICATION PROJECT  
FAGATOGO, AMERICAN SAMOA  
(FEMA-1506-DR-AS, HMGP #1506-4)**

**Prepared for  
Federal Emergency Management Agency**

**Prepared by  
URS Corporation, Inc.**

**April 2008**

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APE	Area of Potential Effect
ASCMP	American Samoa Coastal Management Program
ASDMWR	American Samoa Department of Marine and Wildlife Resources
ASDOC	American Samoa Department of Commerce
ASDRO	American Samoa Disaster Relief Office
ASEPA	American Samoa Environmental Protection Agency
ASHPO	American Samoa Historic Preservation Officer
CFR	Code of Federal Regulations
CO	carbon monoxide
CZMA	Coastal Zone Management Act
DA	Department of the Army
dBa	decibels A-weighted
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
g	gravitational force
GCR	General Conformity Rule
HHW	household hazardous waste
HMGP	Hazard Mitigation Grant Program
$L_{eq}$	Energy-averaged noise level
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act of 1969
NMFS	National Marine Fisheries Service
NO <sub>x</sub>	nitrogen oxides
O <sub>3</sub>	ozone
PM <sub>10, 2.5</sub>	particulate matter less than 10 or 2.5 micrometers in diameter
PNRS	Project Notification and Review System
POL	petroleum, oils, and lubricants
SO <sub>2</sub>	sulfur dioxide
USACE	U.S. Army Corps of Engineers

USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service



The American Samoa Disaster Relief Office (ASDRO) has applied to the U.S. Department of Homeland Security Federal Emergency Management Agency (FEMA) for funds to conduct a flood control project in the village of Fagatogo. FEMA is proposing to fund the project through the Hazard Mitigation Grant Program (HMGP) under the presidential disaster declaration FEMA-1506-DR-AS for Cyclone Heta, which occurred in January 2004.

FEMA has prepared this Environmental Assessment (EA) to evaluate the impacts of the proposed HMGP project. The EA has been prepared according to the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality regulations implementing NEPA (Title 40 of the Code of Federal Regulations [40 CFR] Parts 1500–1508), and FEMA’s implementing regulations (44 CFR Part 10).

The EA process provides steps and procedures to evaluate the potential environmental, social, and economic impacts of a Proposed Action and its alternatives, as well as an opportunity for the public and local, state/territorial, and other federal agencies to provide input and/or comment through scoping studies and a public comment period. These potential impacts are measured by their context and intensity, as defined in the Council on Environmental Quality’s regulations.

The objective of FEMA's HMGP is to reduce the loss of life and property due to natural disasters and to enable the implementation of long-term hazard mitigation measures during the immediate recovery from a disaster. Through this program, FEMA provides grants to state, territorial, and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Therefore, the project's purpose is to provide HMGP funding to ASDRO.

The village of Fagatogo is located on the southern coast of the island of Tutuila, American Samoa (Figure 1). Three primary drainage channels run through Fagatogo: Lealao'o Stream or Market Stream (Market Stream), Matai Stream or Metro Stream (Metro Stream), and ANZ Stream. Maps of the island and of Fagatogo are enclosed in Appendix A (Drawings 100 and 101). All three streams originate along the ridge above the village and empty into the Pacific Ocean at Pago Pago harbor.

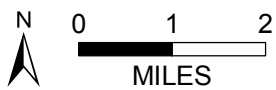
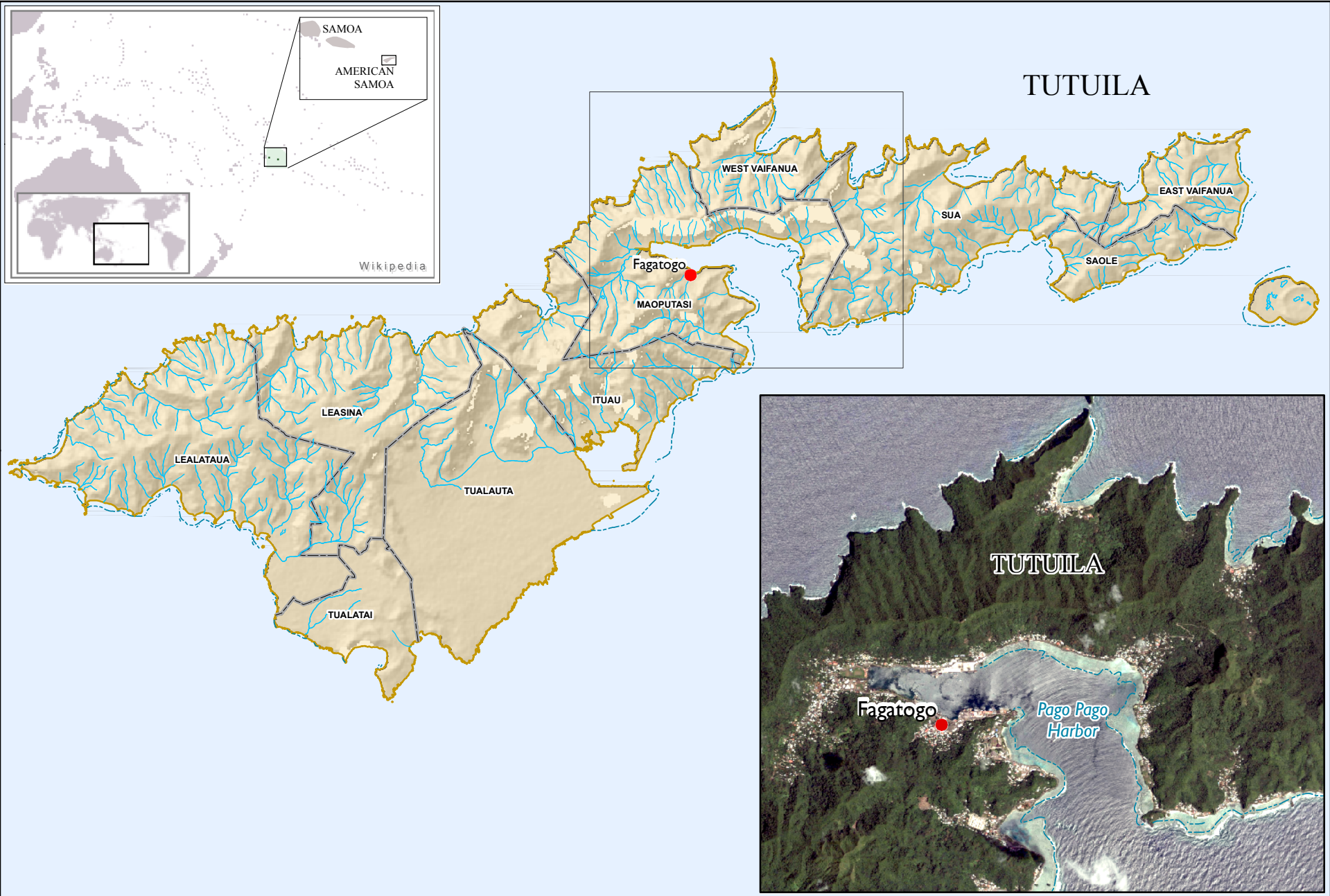
Market Stream provides drainage for the western section of the village. It begins from an existing dam located above the village and empties into the harbor through an open, concrete, tidal channel adjacent to the Farmers' Market. Metro and ANZ streams drain the eastern half of the village. They both empty into the harbor through an open, concrete tidal channel adjacent to the Fagatogo Malae.

Market and Metro streams are almost entirely paved in concrete and surrounded by buildings, roads, bridges, driveways, and residential yards. The level of development adjacent to the streams generally increases as the streams approach Highway 1, the major roadway on the island. Highway 1 is located near the shoreline, just before the streams outlet to the ocean. ANZ Stream is much less defined than the other two streams. Its upstream end has a small natural channel, but as the stream passes through the village, the channel disappears and all streamwater flows unchecked over streets and walkways until it empties into the concrete channel adjacent to the Fagatogo Malae.

The Fagatogo area is a significant commercial center of American Samoa and a place of historic importance as the location of the first government of American Samoa. Fagatogo is still the location of most Samoan government agencies, including the Senate, the District and Supreme Courts, and the Main Administration and Exchange Building for American Samoa Telecommunications Authority. Therefore, the importance of reducing or alleviating the risk of flooding from nearby streams is critical and of high priority.

Flooding is a frequent event in the Fagatogo watershed and occurs several times each year. During the presidentially declared disaster of January 2004, Cyclone Heta caused heavy rains and flooding on the island. The high water overtopped all three streams in Fagatogo, causing damage to the stream embankments, sheet flooding throughout the village, and erosion to the foundations of residential structures close to the waterways.

ASDRO has identified the need to reduce the hazard caused by the flooding of the Fagatogo streams. Reducing these flood hazards would help protect residents and their property, government property, and critical facilities. Therefore, action is needed to reduce the flood hazard of Market, Metro, and ANZ streams in Fagatogo.



**URS**

HMTAP DR-1506-AS

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Fagatogo Stormwater  
Modification Project  
**Vicinity Map**

Figure  
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April 2008

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ASDRO evaluated several alternatives for reducing the flood hazard caused by Market, Metro, and ANZ streams.

### **3.1 ALTERNATIVES NOT CARRIED FORWARD**

ASDRO considered relocating threatened structures or rerouting Market, Metro, and/or ANZ streams to reduce the threat to property and public health and safety caused by the erosion within the streams. However, due to the dense residential neighborhoods surrounding the streams, both plans would require significant economic compensation to residents for costs associated with relocation and/or land acquisition. Therefore, neither of these alternatives was considered feasible.

### **3.2 ALTERNATIVES CARRIED FORWARD**

#### **3.2.1 Alternative 1: No Action**

Under NEPA the inclusion of a No Action Alternative is required in the environmental analysis and documentation. The No Action Alternative is defined as maintaining the status quo with no FEMA funding for any alternative action. The No Action Alternative is used to evaluate the effects of not providing eligible assistance for the project, thus providing a benchmark against which the “action alternatives” can be evaluated. For the purpose of this alternative, it is assumed that ASDRO would be unable to implement the Proposed Action for lack of federal assistance, and the flood hazard would remain unmitigated at the project area. Continued erosion could lead to the flooding of homes adjacent to any of the three streams. The adverse environmental, health, safety, and economic effects resulting from flooding would not be mitigated.

#### **3.2.2 Alternative 2: Proposed Action**

ASDRO proposes to modify the stormwater system in Fagatogo to accommodate 100-year flood events. The Proposed Action would affect a total of 1,370 linear feet of stream channels along Market, Metro, and ANZ streams. A detailed description of the work proposed for each stream is provided below. Corresponding drawings are enclosed in Appendix A.

Access for heavy equipment to the project area is very limited. Much of the work would have to be carried out manually. Where heavy equipment can be used, it would likely consist of an excavator, a front-end loader, and dump trucks. Staging areas would be located within paved and other previously disturbed areas. Work on each stream would likely take between 60 and 90 days to complete.

##### **3.2.2.1 *Market Stream***

ASDRO would excavate and install a box drain beginning at the upstream end of the Fagatogo Back Road near the Christian Congregational Church of American Samoa and extending 300 linear feet upstream (Drawing 102). The reinforced concrete box drain would be 9 feet wide and 4 feet 8 inches high (Elevation Section Type A, Drawing 106). The closed drain would have 2-foot-diameter grates on top spaced every 40 feet. The culvert currently installed where the stream crosses the road at this church would be left in place as the outlet of the box drain; however,

ASDRO would reinforce this structure by placing riprap directly downstream of the culvert. Approximately 175 feet upstream of the Fagatogo Back Road, an existing residence was constructed over the stream. The residence would either need to be temporarily elevated during construction of the box drain or one wall of a residence would need to be demolished and reconstructed on top of the new drain. Work in this area also would require the removal of two foot bridges; they would not need to be replaced as the proposed box drain would be covered.

Near the upstream end of the proposed box drain, where a small road crosses the stream, ASDRO would excavate and install a trench drain to capture flows from a natural spring (Drawing 102). The trench drain would be constructed with 12-inch-diameter pipe, would be installed under the road for a length of approximately 20 feet, and would empty into the new box drain described above. A 3-foot-by-3-foot-square catch basin would be installed at the entrance to the trench drain.

The upstream portion of the new box drain would connect with an existing box drain that runs under the road surface for approximately 300 linear feet. FEMA's Public Assistance Program partially funded the construction of this box drain in response to the heavy rains of May 2003, which were declared a presidential disaster (FEMA-DR-1473-AS). This box drain channels almost all of the flows along this section of Market Stream, except for subsidiary flows that sheet down the top of the box drain during heavy rains. To capture these flows, ASDRO would excavate and install two gated trench drains perpendicular to the existing box drain (Drawing 103). The trench drains would each be 2 feet wide and would extend approximately 10 feet out from the box drain in either direction (Elevation Section—New Trench Drain, Drawing 107). The first trench drain would be located approximately 100 linear feet upstream from the meeting point of the existing box drain with the new box drain. The second trench drain would be located approximately 100 linear feet upstream from the first trench drain.

The inlet to the existing FEMA-funded box drain consists of a concrete inlet flume and a debris rack designed to capture small debris (Plan–Inlet Detail, Drawing 107). ASDRO would reinforce the grate by installing 6 bollards approximately 60 feet upstream of the debris rack (Drawing 103). The bollards would consist of 6-inch-diameter pipes filled with concrete. They would be installed vertically and spaced evenly to block large woody debris from clogging the debris rack (Elevation Section—Bollard Detail, Drawing 107).

ASDRO would install approximately 90 linear feet of gabions along the banks of the stream above the inlet to the existing FEMA-funded box drain to prevent erosion (Drawing 103). The plastic-coated gabions would be 3 feet wide, 3 feet thick, and 9 feet long, and the rocks in the gabions would be 6 to 12 inches in diameter. ASDRO would also install riprap along the streambed between the gabions (Elevation Section—Market Stream Stations 11+20–12+10, Drawing 107).

### **3.2.2.2 Metro Stream**

Metro Stream empties into the open tidal channel that runs next to the Fagatogo Malae through a small culvert running underneath Fagatogo Back Road (Drawing 104) near the former Metro store. ASDRO would excavate and install a larger culvert in this location to accommodate the 100-year flood. The new culvert would be 10 feet wide, 3 feet 6 inches high, and 28 feet long (Elevation Section Type C, Drawing 108). The installation of this culvert would necessitate

raising the road approximately 6 inches, essentially acting as a small speed bump along Fagatogo Back Road at this stream crossing.

Beginning at the upstream side of this culvert, ASDRO would excavate and install a box drain for approximately 265 linear feet (Drawing 104). The reinforced concrete structure would be 6 feet wide and 4 feet high (Elevation Section Type D, Drawing 106). The closed drain would have 2-foot-diameter grates on top spaced every 40 feet. Immediately upstream of Fagatogo Back Road culvert, the Forsgren's store and former Metro store encroach on the existing channel. One of these buildings would need to be modified to permit the 6-foot-wide box drain in this location. Modification could include the partial demolition and reconstruction of one building or excavation and reconstruction of one building as a cantilevered structure over the box drain. At the upstream portion of the proposed box drain, an existing concrete slab spanning the stream for approximately 35 linear feet would be removed to facilitate construction of the box drain. Once completed, the covered box drain would restore the area to its original levels. At the inlet to the new box drain, ASDRO would install a trash screen to catch small debris (Elevation Section 1-1, Drawing 107). Above the trash screen, ASDRO would install six bollards similar to those to be installed at Market Stream.

Just downstream from the Fagatogo Back Road culvert is a utility line encased in concrete. ASDRO would relocate this utility line under the channel and remove the concrete encasement (Drawing 104).

### **3.2.2.3 ANZ Stream**

The downstream end of ANZ Stream currently has no defined channel, but flows over various streets and walkways until it empties onto Fagatogo Back Road and at the Fagatogo Malae. Therefore, ASDRO would install a box drain to act as a channel for these flows (Drawing 105). The box drain would run for approximately 500 linear feet from the upstream road crossing to Fagatogo Back Road near ANZ bank. It would then run under the road until it hit Fagatogo Malae. This closed box drain structure would be made of reinforced concrete, would measure 6 feet wide by 3 feet 4 inches high, and would have 3-foot by 2-foot grates on top spaced every 40 feet (Elevation Section—Type F, Drawing 106). After crossing under Fagatogo Back Road, the box drain would turn and run under the Malae for approximately 225 linear feet, emptying into the open tidal channel next to the Malae. This box drain structure would also be made of reinforced concrete and measure 6 feet wide by 3 feet 4 inches high, but it would not have grates on top (Elevation Section—Type E, Drawing 106). After construction, ASDRO would place fill and sod over the box drain to return the Malae exactly to pre-construction condition. At the inlet to the new box drain, ASDRO would install a trash screen to catch small debris (Elevation Section 1-1, Drawing 107).

Approximately 50 feet above the inlet to the new box drain on ANZ Stream, a small culvert currently channels streamflows under a road crossing. ASDRO would remove this culvert and replace it with a new culvert measuring 6 feet wide, 4 feet high, and 26 feet long (Elevation Section—Type G, Drawing 107). At the inlet to the culvert, ASDRO would install a trash screen similar to that to be installed at the top of the box drain on ANZ Stream and six bollards similar to those to be installed along Market and Metro streams.

**3.2.3 Alternative 3: Original Design Plan**

In August 2004, ASDRO submitted an initial stormwater modification design plan for Market, Metro, and ANZ streams. This alternative called for paving the entire length of all three streams as they pass through the village. It would affect a total of 2,210 linear feet. This alternative would include the removal of all debris and damaged concrete from the existing channels, removal of all vegetation along the length of the channels, excavation of all damaged pavement, compaction of all subgrade channel floors, construction of new channel floors and walls, and backfilling behind all new channel walls. The inside of the new channels would measure approximately 5 feet wide and 3 feet deep. The channels would have at least 1 foot of fill on the bottom, and 8 inches of fill on each side. Thus, the total excavation would be approximately 6.5 feet wide and 4 feet deep. A site plan and typical elevation drawing associated with this alternative are enclosed in Appendix B. Equipment used, construction duration, and modifications to buildings encroaching on the channels would be similar to those described for the Proposed Action.

This section describes existing conditions in the project area, evaluates the potential for the three alternatives to result in direct and indirect impacts on the environment, and discusses mitigation measures to avoid or minimize these impacts. This section focuses on the environmental resources for which some level of impact may result: geology, seismicity, and soils; air quality; water resources; biological resources; cultural resources; socioeconomics and safety; land use and planning; transportation; noise; and visual resources. No other resource areas require evaluation pursuant to NEPA.

## 4.1 GEOLOGY, SEISMICITY, AND SOILS

### 4.1.1 Geology and Geologic Hazards

The island of Tutuila is of volcanic origin and is characterized by steep mountainsides, small valleys, and a narrow coastal fringe of relatively level land. The island is a narrow mountain range consisting of basic igneous rock, mainly basalt, with small amounts of andesite and trachyte. The mountains extend approximately 20 miles from east to west. At Pago Pago harbor, they have a maximum width of 6 miles and a minimum width of 0.75 mile. The highest peak is 2,142 feet, and the land slopes steeply from the tops of the mountain ridges to the ocean. The land in the Fagatogo area generally slopes north-northeast toward the South Pacific Ocean.

Geologic hazards on Tutuila include landslides, volcanic eruptions, earthquakes, and tsunamis.

Landslides are primarily caused by gravity acting on overly steep slopes. However, many other factors, such as saturation by rainfall, removal of deep-rooted vegetation, and erosion by water channels, contribute to the occurrence of landslides. On Tutuila, landslides often occur when heavy rainfall saturates unstable earth on the island's steep slopes. As a result of both natural and human-induced factors, landslides have a high potential to occur on Tutuila.

The only active volcano in the American Samoa region is the submarine volcano Vanilulu'u. The Ofu-Olosega volcano last erupted in 1866, and the other volcanoes in the region have been silent for thousands of years.

Earthquakes in American Samoa originate from the Tonga Trench, approximately 100 miles southwest of Tutuila. The Tonga Trench is located where the Pacific and Australian tectonic plates collide. The trench is considered an area of high seismic activity and generates large but distant earthquakes that are felt on Tutuila. Such earthquakes can be precursors to volcanic activity but generally do not present a seismic threat to the islands.

Most tsunamis (huge water waves) that affect Tutuila are generated by earthquakes from fault movements along the Pacific Rim in the Aleutian Islands, South America, the Tonga Trench, and other locations. In 1868 and 1960, tsunamis originating in Chile caused damage in the Samoan Islands. The National Oceanic and Atmospheric Administration National Weather Service operates the Pacific Tsunami Warning Center, which monitors sudden earth movements throughout the Pacific Basin. Warnings are broadcast by the news media on radio and television.

#### 4.1.1.1 *Alternative 1: No Action*

Under the No Action Alternative, erosion and the resulting loss of soil would continue to occur along the sections of Market, Metro, and ANZ streams with exposed soils. The geology and



potential for volcanic eruptions, earthquakes, and tsunamis in the project area would not change under the No Action Alternative. However, increased potential for small-scale landslides may result along portions of the streams where continued erosion may decrease the stability of the embankments.

#### *4.1.1.2 Alternative 2: Proposed Action*

Under the Proposed Action, the geology and potential for volcanic eruptions, earthquakes, and tsunamis in the project area would remain unchanged. As the Proposed Action would only install box drains in places where Market and Metro streams are already paved over, the Proposed Action would have a negligible direct effect on the potential for small-scale landslides caused by erosion of the embankments of these two streams. However, because the Proposed Action would be designed to convey the 100-year flood event, the potential for small-scale landslides would be decreased on all three streams as stormwater associated with smaller events would no longer overflow the existing channels, erode the channel banks and surrounding areas, and contribute to landslides. Further, because the Proposed Action would excavate a new channel for ANZ Stream in a location where the streamwater currently flows over roads, driveways, residential yards, and unreinforced embankments, the Proposed Action would reduce the potential for small-scale landslides along ANZ Stream.

#### *4.1.1.3 Alternative 3: Original Design Plan*

Like the Proposed Action, Alternative 3 would not alter the geology and potential for volcanic eruptions, earthquakes, and tsunamis in the project area. However, the potential for small-scale landslides caused by erosion would be reduced along all three streams because Alternative 3 would channelize additional portions of Market, Metro, and ANZ streams, most of which have unreinforced embankments.

### **4.1.2 Seismicity**

FEMA classifies the island of Tutuila as Seismic Zone 3, which means it will experience earthquake ground shaking of approximately 0.2g peak horizontal acceleration (where g is the unit used to express gravitational force) and has a 1 in 500 chance per year of sustaining light to moderate building damage (i.e., a 10 percent probability of experiencing ground shaking of at least 0.2g every 50 years). This Seismic Zone 3 designation considers all probable earthquake sources affecting American Samoa, local and distant, and translates their effects into different estimates of ground shaking.

Executive Order (EO) 12699, Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction, requires construction of new buildings to meet standards for seismic safety set by the National Earthquake Hazard Reduction Program. However, this EO applies only to the construction of new buildings, which are defined as structures used or intended for sheltering persons or property. As none of the alternatives involves new building construction, EO 12699 does not apply to this project.

#### **4.1.2.1**    *Alternative 1: No Action*

Under the No Action Alternative, no impacts would occur to the existing seismicity.

#### **4.1.2.2**    *Alternative 2: Proposed Action*

Under the Proposed Action, the potential for earthquakes remains unchanged. An earthquake of 0.2g is unlikely to affect the proposed stream channel improvements.

#### **4.1.2.3**    *Alternative 3: Original Design Plan*

Like the Proposed Action, Alternative 3 would not change the potential for earthquakes. An earthquake of 0.2g is unlikely to affect the stream channel improvements proposed in this alternative.

### **4.1.3**        **Soils**

The soils in the project area consist of Aua very stony silty clay loam and Leafu silty clay (U.S. Department of Agriculture 1983). The soils are characterized by high organic matter content in the surface horizon and silty clay loam and silty clay surface textures. The soils are formed in colluvium and alluvium derived dominantly from basic igneous rock, and rooting depths are typically 60 inches or greater. The subsoil may be stony in places. Due to gentle slopes and clay textures, the soils have slow to medium runoff rates and slight to moderate susceptibility to water erosion. The soils are subject to occasional, brief periods of flooding during prolonged, heavy rainfall. The hazard of water erosion is slight to moderate.

#### **4.1.3.1**    *Alternative 1: No Action*

Under the No Action Alternative, erosion may continue to cause soil loss along the embankments of Market, Metro, and ANZ streams.

#### **4.1.3.2**    *Alternative 2: Proposed Action*

As a result of the construction activities related to the Proposed Action, soils would be disturbed through excavation within the streams, heavy equipment use in and around the streams, and vegetation removal. Construction activities could cause compaction and leave soils exposed and susceptible to water and wind erosion. Therefore, the Proposed Action would increase soil loss in the project area during construction. In the long term, the Proposed Action would not directly affect erosion along Market Stream or Metro Stream because it would only install box drains in places where these two streams are already paved over. However, because the Proposed Action would be designed to convey the 100-year flood event, the potential for erosion and soil loss would be decreased on all three streams as stormwater associated with smaller events would no longer overflow the existing channels, erode the channel banks and surrounding areas, and carry soils downstream. The Proposed Action would also reduce erosion and soil loss along ANZ Stream due to the construction of a new channel in places where streamwater currently flows over unchanneled areas with exposed soils.

To minimize potential erosion caused by construction activities, ASDRO would prepare and implement an erosion control plan. The erosion control plan would include phased construction to minimize the amount of exposed soil at any given time and would require all work to cease during heavy rains. It would also require that ASDRO cover all soil that is stockpiled on-site for use as fill or that has been excavated from the action area, construct a sediment barrier around on-site stockpiles to prevent sediment loss, and develop a debris disposal plan to insure that all excavated material is transferred to a designated and pre-approved debris disposal site. ASDRO would also implement permanent erosion control measures such as the placement of stones (or core-loc units) on any underlayer fills used in the project as soon after placement as practicable and revegetation with native riparian species, where appropriate, when construction is completed. Lastly, ASDRO would limit construction activities to the noncyclone months, April through October, to minimize erosion due to water.

#### *4.1.3.3 Alternative 3: Original Design Plan*

Construction activities related to Alternative 3 would disturb area soils in a similar manner as the Proposed Action, but the amount of disturbance would be greater because this alternative would affect 2100 linear feet of stream channels, whereas the Proposed Action would affect only 1370 linear feet.

The long-term effects of Alternative 3 on erosion and soil loss would be beneficial for all three streams, as this alternative would result in the construction of a new channel in places where streamwater currently flows over unchanneled areas with exposed soils. However, the amount of soil loss associated with Alternative 3 would likely be greater than the amount associated with the Proposed Action because Alternative 3 does not show that it would contain 100-year flood events within the channels, as described in Section 4.3.2.3.

If ASDRO were to select this alternative, it would prepare and implement an erosion control plan and conduct measures similar to those described in Section 4.1.3.2.

## **4.2 AIR QUALITY**

The Federal Clean Air Act of 1970 was enacted to regulate air emissions from area, stationary, and mobile sources. This law authorized the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. The six criteria pollutants regulated by the Clean Air Act are carbon monoxide (CO), lead, nitrogen oxides (NO<sub>x</sub>), ozone (O<sub>3</sub>), particulate matter (less than 10 micrometers [PM<sub>10</sub>] and less than 2.5 micrometers [PM<sub>2.5</sub>]), and sulfur dioxide (SO<sub>2</sub>).

Under the 1977 amendments to the Clean Air Act, states with air quality that does not achieve the NAAQS are required to develop and maintain state implementation plans. These plans constitute a federally enforceable definition of the state's approach (or plan) and schedule for the attainment of the NAAQS. Air quality management areas are designated as "attainment," "nonattainment," or "unclassified" for each individual pollutant depending on whether or not they exceed an applicable NAAQS. Areas that have been redesignated from nonattainment to attainment are called maintenance areas.

Prior to approval of any federal action, the General Conformity Rule (GCR) (Title 40 CFR Part 51.853) states that a "a conformity determination is required for each criteria pollutant or

precursor where the total of direct and indirect emissions of the criteria pollutant or precursor in a nonattainment or maintenance area caused by a federal action would equal or exceed” (40 CFR 51.853 b) any of the threshold screening rates specified in the GCR.

American Samoa is classified as being in attainment or is unclassified for all criteria pollutants (USEPA 2008). Therefore, under the GCR, conformity determination requirements do not apply to projects in American Samoa.

#### 4.2.1 Alternative 1: No Action

Under the No Action Alternative, air quality standards would not be directly affected. However, minor, short-term increases in particulate matter emissions may occur if future floods leave soils exposed to wind erosion and/or deposit sediment in or around homes adjacent to the stream.

#### 4.2.2 Alternative 2: Proposed Action

Although conformity determination requirements do not apply to projects in American Samoa, a comparison of the Proposed Action’s emissions to the applicable threshold rates listed in the GCR has been provided to demonstrate that the Proposed Action’s emissions are well below GCR threshold rates. A summary of the comparative GCR emission threshold rates for American Samoa is presented below.

##### **Applicable GCR Emission Threshold Rates**

<b>Pollutant</b>	<b>Nonattainment (tons/year)*</b>
CO	100
NO <sub>x</sub>	100
PM <sub>10</sub>	100
PM <sub>2.5</sub>	100
SO <sub>2</sub>	100
VOCs	100

\*Note: American Samoa is federally designated as in attainment or is unclassified for all criteria pollutants. The threshold rates above are the least stringent values for nonattainment areas, in lieu of the fact that threshold rates do not exist for attainment and unclassified areas.

Implementation of the Proposed Action would result in temporary impacts to the existing air quality in the area. These impacts include temporary increases of fugitive dust (PM<sub>10</sub> and PM<sub>2.5</sub>) and combustion emissions (CO, NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and volatile organic compounds [VOCs]). Fugitive dust emissions would be generated by vehicle movement over paved roads, dirt tracked onto paved areas from unpaved areas, and particulate matter that is suspended during construction. Combustion emissions would be generated from the operation of construction equipment during the construction process.

It is important to note that no NAAQS exist for VOCs. However, VOCs are a precursor to O<sub>3</sub>, which has a NAAQS. The formation of O<sub>3</sub> occurs in the troposphere as precursor pollutants react in the presence of sunlight. Therefore, the only way to regulate/reduce O<sub>3</sub> is through the control of its reactive precursors, one of which is a VOC.

Unmitigated emission estimates were determined using the following basic guidance and assumptions:

- Each stream would require 90 construction days; therefore, a total of 270 construction days would be required for all three streams.
- Operations would consist of 8 hours/day.
- Emissions were estimated using the equipment loading for a permitted construction project with 38 acres of ground disturbance scaled down to the assumed 0.5 of ground disturbance acres of this project.
- Emissions estimates were based on USEPA’s AP-42 Guidance.

Based on the above assumptions, the following unmitigated emissions are expected for this project:

**Estimated Emission Rates of Proposed Action**

<b>Pollutant</b>	<b>Emission Rate (tons/year) <sup>a</sup></b>
CO	2.3
NOx	0.6
PM <sub>10</sub> <sup>b</sup>	0.2
PM <sub>2.5</sub> <sup>b</sup>	0.06
SO <sub>2</sub>	0.002
VOCs	0.3

<sup>a</sup> Emissions include contributions from construction equipment and employee vehicle contributions

<sup>b</sup> Includes particulate from fugitive dust and combustion activities

Even without mitigation measures, the emissions caused by the Proposed Action are far below the comparative GCR threshold emission rates. Therefore, the air quality impacts caused by the implementation of the Proposed Action would be temporary and would not cause or contribute to a violation of NAAQS.

To minimize temporary air quality impacts, ASDRO would employ the following measures to limit emissions, fugitive dust, and exhaust: maintaining and covering soil piles, covering the load of haul vehicles containing fill or cut, and keeping construction equipment properly tuned.

**4.2.3 Alternative 3: Original Design Plan**

Implementation of Alternative 3 would result in air quality impacts similar to those associated with the Proposed Action. If ASDRO were to select this alternative, it would be responsible for implementing the mitigation measures described in Section 4.2.2.

### 4.3 WATER RESOURCES

Surface water formations in Tutuila are perennial and ephemeral streams. The streams provide habitat for freshwater fish, plants, and invertebrates, and are a source of drinking water in some remote parts of the island. All surface waters on the island discharge directly into marine water bodies. Groundwater is the principal source of domestic and industrial water supply, as it is more abundant and has a higher quality than surface water.

The primary drainage features in Fagatogo are Market, Metro, and ANZ streams. Market Stream provides drainage for the western section of the village. It begins from an existing dam located above the village and empties into the harbor through an open, concrete, tidal channel adjacent to the Farmers' Market. Metro and ANZ streams drain the eastern half of the village. They both empty into the harbor through an open, concrete tidal channel adjacent to the Fagatogo Malae.

The flows of all three streams are often affected by heavy precipitation events, which are common on Tutuila. American Samoa has a tropical climate with an average annual rainfall of 200 inches. The heaviest rainfall occurs from December to March, during which time typhoons are common. Rainfall occurs on the island on about half of the days of the year.

#### 4.3.1 Coastal Zone Management

In recognition of the increasing pressures of overdevelopment on the nation's coastal resources, the United States Congress enacted the Coastal Zone Management Act (CZMA) in 1972 and the Coastal Zone Act Reauthorization Amendments in 1990. These laws make federal funds available to preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs as well as the fish and wildlife using those habitats. The CZMA makes federal financial assistance available to any coastal state or territory that is willing to develop and implement a comprehensive coastal management program. These acts apply to all actions within a designated coastal zone, and require that any federal agency whose activities directly affect the coastal zone be consistent, to the maximum extent practicable, with approved state or territory coastal zone management programs.

The entire island of Tutuila and the sea within 3 miles of the shoreline are within the coastal zone designated by the American Samoa Coastal Management Program (ASCMP). The ASCMP is part of the American Samoa Government Department of Commerce (ASDOC). American Samoa faces coastal concerns of fishery habitat loss, coastal hazards (such as hurricanes, flooding, and erosion), marine debris, and solid waste. To help mitigate the effects of human activity, the ASCMP oversees all construction and earth-moving activities on the island. The federal consistency provisions of the CZMA require that all federally funded, licensed, or permitted projects affecting the coastal zone of American Samoa be conducted in a manner that is consistent with the federally approved ASCMP.

##### 4.3.1.1 *Alternative 1: No Action*

Under the No Action Alternative, no new facilities would be built and existing facilities would not be improved. Therefore, this alternative would not impact the coastal zone, and would not require a federal consistency determination.

#### *4.3.1.2 Alternative 2: Proposed Action*

ASDRO would be responsible for coordinating with the ASCMP and obtaining a federal consistency determination from the ASCMP to comply with the CZMA. Impacts to coastal resources would be minimized by the application of the mitigation measures described in Sections 4.1.3.2 and 4.3.3.2 of this EA.

#### *4.3.1.3 Alternative 3: Original Design Plan*

Implementation of Alternative 3 would result in similar impacts to coastal resources as those associated with the Proposed Action. Therefore, if ASDRO were to select this alternative, it would be responsible for obtaining a federal consistency determination from the ASCMP and for employing the mitigation measures described in Sections 4.1.3.2 and 4.3.3.2 of this EA.

### **4.3.2 Flood Hazards**

According to FEMA's Flood Insurance Rate Map (FIRM) Community Panel Number 600001 0028B, effective date May 2, 1991, the project areas along Market and Metro streams are designated special flood hazard areas because they are located within Zone A, the 100-year floodplain. The FIRM does not recognize ANZ Stream as a special flood hazard area, despite the fact that it is a drainage channel susceptible to recurrent flooding.

EO 11988, Floodplain Management, requires federal agencies to avoid, to the extent possible, the short- and long-term adverse impacts associated with the occupancy and modification of floodplains. FEMA's regulations for complying with EO 11988 are found in 44 CFR Part 9, Floodplain Management and Protection of Wetlands.

#### *4.3.2.1 Alternative 1: No Action*

Under the No Action Alternative, no improvements would be made to Market, Metro, and ANZ streams. The flow capacities of the streams would not be altered. Therefore, the risk of flooding to structures adjacent to the streams would remain, and the FIRM would not be altered. FEMA would not be required to comply with EO 11988 or 44 CFR Part 9.

#### *4.3.2.2 Alternative 2: Proposed Action*

The Proposed Action would replace existing sections of all three stream channels with wider and deeper box drains, open drains, perpendicular trench drains, and culverts, which would increase the flow efficiency and carrying capacities of the channels. Installation of bollards and debris racks would decrease the chance of vegetation and trash obstructing the channels and contributing to flooding. The Proposed Action would not change the alignment of Market, Metro, or ANZ streams. The improved flow efficiency, and higher carrying capacities within the channels would decrease the flood hazard risk to structures adjacent to the streams and permit the channels to contain a 100-year flood event.

Because the Proposed Action would alter the floodplain along two streams mapped on the FIRM as being in Zone A, ASDRO would be responsible for obtaining a Letter of Map Revision from FEMA upon completion of the Proposed Action.

FEMA applies the Eight-Step Decision-Making Process to ensure that it funds projects that are consistent with EO 11988. The NEPA compliance process involves essentially the same basic decision-making process to meet its objectives as the Eight-Step Decision-Making Process. Therefore, the Eight-Step Decision-Making Process has been applied through implementation of the NEPA process. FEMA published an Initial Public Notice at the declaration of the disaster. FEMA would ensure publication of a Final Public Notice in compliance with EO 11988 before implementation of the Proposed Action.

#### *4.3.2.3 Alternative 3: Original Design Plan*

The original design plan did not include a detailed project description or hydraulic analysis, so FEMA cannot determine exactly how Alternative 3 would affect the carrying capacities or alignments of Market, Metro, or ANZ streams. If ASDRO were to select this alternative, it would be responsible for providing a detailed project description and hydraulic analysis so that that FEMA could conduct the Eight-Step Decision-Making Process and determine whether Alternative 3 complies with EO 11988. Further, ASDRO would be responsible for obtaining a Letter of Map Revision from FEMA upon completion of Alternative 3.

#### **4.3.3 Water Quality**

The American Samoa Environmental Protection Agency (ASEPA) maintains programs in water quality and drinking water under the American Samoa Office of the Governor. The ASEPA has identified three major water quality concerns on Tutuila: (1) sediment, generated by improper land use practices, that enters streams and coastal waters after heavy rains; (2) nutrient enrichment from human and animal wastes in populated areas; and (3) contamination in Pago Pago Harbor.

In 1991, the USEPA determined that elevated levels of various heavy metals and pesticides were present in fish, seawater, and sediment in the inner portion of Pago Pago Harbor. Health advisories have been issued warning residents not to eat fish caught in the inner harbor and to always clean and gut fish that are caught in the outer harbor before eating. The outlets of Market, Metro, and ANZ streams are all in Pago Pago Harbor.

Potential groundwater contamination is another concern on Tutuila. Groundwater is the principal source of domestic and industrial water supply because it is more abundant and has a higher quality than surface water (CSREES 2004). However, the volcanic soil and bedrock of the island are highly permeable and do not act as good filters. Therefore, the groundwater is easily threatened by surface contaminants.

Market, Metro, and ANZ streams are considered tributaries to navigable waters of the United States. Section 404 of the Clean Water Act requires that project proponents receive a U.S. Department of the Army (DA) permit for work involving the discharge of dredged or fill materials in waters of the United States. The U.S. Army Corps of Engineers (USACE) is responsible for reviewing projects for DA permits. In addition, Section 401 of the Clean Water Act requires that applicants for federal permits or licenses that are conducting work involving any discharge into waters of the United States receive a Water Quality Certification or waiver. ASEPA is responsible for reviewing projects for Water Quality Certification.



#### *4.3.3.1 Alternative 1: No Action*

Under the No Action Alternative, erosion would continue to occur along the embankments of Market, Metro, and ANZ streams, causing sediment to be washed down the stream and into the ocean. In addition, floods that exceed the capacities of the streams would flow across roads, driveways, and residential yards; collect residues of spills from petroleum, oils, and lubricants (POL), household hazardous waste (HHW), and trash; and eventually deposit these chemicals and debris in the harbor. Existing surface water and ground water quality conditions would remain unchanged.

#### *4.3.3.2 Alternative 2: Proposed Action*

In the short term, the construction associated with implementation of the Proposed Action could adversely affect surface water quality by increasing erosion which could result in increased sedimentation into the streams and the harbor. To minimize erosion, ASDRO would be responsible for employing the mitigation measures described in Section 4.1.3.2 of this EA. ASDRO would minimize turbidity and siltation through the appropriate use of effective silt containment devices. ASDRO would ensure that the project would cause no contamination of adjacent marine/aquatic environments, including both the harbor and the stream channels, by implementing the following measures: all equipment (dredges, barges, backhoes, etc.) to be placed in the water would be cleaned of pollutants prior to use, no materials (fill, revetment rock, pipe, etc.) would be stockpiled in the water, and fueling of project-related vehicles and equipment would take place away from the water. Lastly, the potential exists for construction equipment to break a water or sewer line. To mitigate for such accidental releases, ASDRO would store absorbent pads and containment booms on site and would prepare a spill response plan that would include cleaning the site of the spill, repairing and restoring service as quickly as possible, and disinfecting the potentially contaminated water system.

In the long term, implementation of the Proposed Action would improve surface water quality. The Proposed Action would reduce the potential for erosion along unchannelled portions of ANZ Stream with exposed soils, thereby decreasing the amount of sediment carried downstream into the harbor. In addition, by conveying storms up to the 100-year event, the Proposed Action would reduce the potential for erosion from smaller events overflowing the existing channels, eroding the channel banks and surrounding areas, and depositing the sediment in Pago Pago harbor. Similarly, by conveying storms up to the 100-year event, POL, HHW, and trash on roads, driveways, and residential yards would not be carried by more frequent storm events downstream and into the harbor. The Proposed Action would capture large debris in the bollards, trap small debris in the debris racks, and flush remaining sediment through to the existing open channels downstream. During moderate storms, much of the sediment would settle into the existing open and relatively level downstream channels. During severe events, because the Proposed Action would increase the streams' flow capacities, the water from all three streams would enter Pago Pago harbor at a higher velocity. By carrying sediment further into the harbor and providing it with a larger dispersal area, the Proposed Action would reduce the concentration of sedimentation in the harbor close to the mouths of the streams.

The Proposed Action would require proper maintenance to have the beneficial impacts of trapping large debris and flushing sediment described above, as well as to ensure it conveys flood flows as proposed. Debris would need to be frequently removed from the bollards and

debris racks, and sediment would need to be periodically removed from the box drain via the grates and the open channels. The Village of Fagatogo would be responsible for long-term maintenance of the system and would remove debris from the bollards and debris racks frequently and remove sediment from the box drains via the grates and from the downstream open channels periodically.

Additionally, ASDRO would be required to apply for and obtain a DA permit from USACE to comply with Section 404 of the Clean Water Act. In a letter dated December 19, 2007, FEMA notified USACE and ASDRO that the Proposed Action required a DA permit (Appendix C). ASDRO would also be required to apply for and obtain a Water Quality Certification or waiver from ASEP to comply with Section 401 of the Clean Water Act.

It is anticipated that the Proposed Action would result in negligible impacts to groundwater quality or quantity. The steep topography and highly developed nature of the project area makes it unlikely that these streams contribute to groundwater.

#### **4.3.3.3 *Alternative 3: Original Design Plan***

In the short term, implementation of Alternative 3 would adversely affect surface water quality in the same manner, but to a larger extent than the Proposed Action. If ASDRO were to select this alternative, it would be responsible for employing the mitigation measures to minimize sedimentation described in Sections 4.1.3.2 and 4.3.3.2 of this EA.

The long-term effects of Alternative 3 would be decreased sedimentation on all three streams, as this alternative would result in the construction of a new channel in places where streamwater currently flows over unchanneled areas with exposed soils. Decreased sedimentation would not be as great as under the Proposed Action because Alternative 3 does not show that it would contain 100-year flood events within the channels. Similarly, reductions in POL, HHW, and debris would not be expected as described for the Proposed Action. Neither would Alternative 3 be expected to reduce the concentrations of sediment in the harbor as described for the Proposed Action.

If ASDRO were to select this alternative, it would be required to apply for and obtain a DA permit from USACE to comply with Section 404 of the Clean Water Act. ASDRO would be responsible for notifying USACE of the change in project design. ASDRO would also be required to apply for and obtain a Water Quality Certification or waiver from ASEP to comply with Section 401 of the Clean Water Act. The Village of Fagatogo would be responsible for long-term maintenance of the system and would remove sediment from the box drains via the grates and from the downstream open channels periodically.

It is not anticipated that Alternative 3 would result in impacts to groundwater quality or quantity for the same reasons described for the Proposed Action.

## **4.4 BIOLOGICAL RESOURCES**

Biodiversity of terrestrial species in Tutuila is low due to the island's volcanic origin and remote location (Craig 2002). The main vegetation type found on Tutuila is that of a tropical rainforest, but many nonnative plants have outcompeted the native plants in disturbed environments (Whistler 1995). This situation is true in the Proposed Action area, which consists of three urbanized riparian corridors along Market, Metro, and ANZ streams. The riparian corridors are

all narrow, steep, and substantially disturbed by residential development, and the streams themselves are almost entirely covered in concrete. Where vegetation exists, the stream edges are typical of most streams in Tutuila and are dominated by invasive, ornamental, or agricultural species. Noted examples of vegetation include *Brachiaria mutica*, *Coix* sp., and *Canna* sp., as well as many other weedy species found in taro patches (Volk 1991). Most of the areas adjacent to the streams consist of private homes and landscaped gardens. Mesquite (*Prosopis pallida*), coconut trees (*Cocos nucifera*), and banana trees (*Musa paradisiacal*) occur in the project area. The understory is made up of, among others, the convolvulaceae (morning-glory), asteraceae (sunflower), and malvaceae (mallow) families. Garbage (e.g., household trash) was frequently observed on the streambanks.

A narrow ring around the island contains shallow coastal habitats that support coral reef ecosystems. However, in a November 6, 2007, meeting between representatives of the American Samoa Department of Marine and Wildlife Resources (ASDMWR) and URS Corporation, FEMA's consultant, ASDMWR confirmed that no coral reef is directly offshore from the outlets of Market Stream or Metro Stream in Pago Pago harbor. Deepwater habitats around the island reach depths of 2,000 feet and are located between 0.5 and 2 miles from the coast (Craig 2002). Therefore, the action area does not contain either coral reef or deepwater habitat.

#### 4.4.1 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 establishes a federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. Section 7 of the ESA specifically charges federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction of critical habitat for these species.

FEMA obtained information concerning species that are listed as endangered or threatened, proposed for listing as endangered or threatened, or candidates for listing as endangered or threatened under the ESA that may occur in the project area from the United States Fish and Wildlife Service (USFWS) website (2008) and the *Natural History Guide to American Samoa* (Craig 2002).

Four species of sea turtles that are federally listed as threatened or endangered have the potential to occur in the vicinity of American Samoa, as presented in Table 1. The sea turtles are under USFWS jurisdiction for their use of terrestrial nesting habitats and under the jurisdiction of the National Marine Fisheries Service (NMFS) for their use of off-shore and open ocean habitats. No other species protected under the ESA are known or expected to occur in American Samoa.

**Table 1**  
**Protected Species with Potential to Occur in the Vicinity of American Samoa**

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurrence in Project Area*
<i>Caretta caretta</i>	Loggerhead sea turtle	T	Open ocean. Nests in sandy beaches.	No potential because no sightings around American Samoa. No deepwater, coral, or seagrass bed habitats in the action area.
<i>Chelonia mydas</i>	Green sea turtle	T	Open ocean. Nests in sandy beaches.	Little potential because of low numbers present around Tutuila. No deepwater, coral, or seagrass bed habitats in the action area.
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	Open ocean. Nests in sandy beaches.	No potential because no sightings around American Samoa. No deepwater, coral, or seagrass bed habitats in the action area.
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle	E	Open ocean. Nests in sandy beaches.	Little potential because of low numbers present around Tutuila. No deepwater, coral, or seagrass bed habitats in the action area.

T = threatened, E = endangered

\* Source: USFWS letter of January 24, 2008

Representatives of URS Corporation, consultant to FEMA, conducted a reconnaissance survey of the project area on November 9, 2007. The survey involved identification of vegetation communities in the project area, as well as identifying habitat suitable to support sea turtles. As the project area does not provide sandy beaches suitable for turtle nesting or coral reefs, seagrass beds, or open ocean suitable for turtle foraging and resting, the project area does not contain habitat suitable to support any federally listed species.

#### 4.4.1.1 *Alternative 1: No Action*

Under the No Action Alternative, no new impacts would occur to federally listed, threatened, or endangered species. Erosion may continue to occur along the embankments of Market, Metro, and ANZ streams, causing sediment to be washed down the stream and into the ocean. Storms that exceed the streams' capacities would also wash POL, HHW, and debris into the marine environment. Although no nesting or foraging habitat for sea turtles exists in the project area, turtles passing through the area could be affected by sediment, chemicals, and trash, especially plastic bags, which turtles mistake for jellyfish, a dietary favorite, causing respiratory problems, digestive complications, or death.

#### *4.4.1.2 Alternative 2: Proposed Action*

Implementation of the Proposed Action would not directly affect any federally listed species because project area does not contain habitat suitable to support sea turtles.

Protected sea turtles could be indirectly affected during construction activities. Sedimentation caused by construction activities in the streams could reach Pago Pago harbor and indirectly affect sea turtles passing through the area where Market, Metro, and ANZ streams empty into Pago Pago harbor. However, this effect would be temporary because it would only last during the construction activities. Further, as this area is not nesting or foraging habitat, impacts to sea turtles would be minor and infrequent. To minimize short-term impacts to sea turtles, ASDRO would be responsible for implementing the mitigation measures described in Sections 4.1.3.2 and 4.3.3.2 of this EA. In addition, before initiating the Proposed Action, ASDRO would be responsible for providing copies of the final erosion control plan, spill control plan, and debris disposal plan to USFWS for reference.

Long-term impacts on the sea turtles would be beneficial because the proposed project is designed to reduce the amount of debris and the concentrations of sediment deposited by streams into Pago Pago harbor at Fagatogo, as described in Section 4.3.3.2. The village of Fagatogo would be responsible for carrying out the long-term maintenance described in Section 4.3.3.2.

In a letter dated January 24, 2008, USFWS concurred with FEMA's determination that the Proposed Action is not likely to adversely affect any federally listed species under the ESA (Appendix C) because the project area does not provide habitat to support nesting sea turtles. In a letter dated February 7, 2008, FEMA notified NMFS of its determination that the Proposed Action will have no adverse short-term impacts and beneficial long-term impacts on sea turtles in off-shore habitats (Appendix C). Thus, the Proposed Action complies with Section 7 of the ESA.

#### *4.4.1.3 Alternative 3: Original Design Plan*

Similar to the Proposed Action, Alternative 3 would not directly affect any federally listed species because habitat suitable to support the species identified in Table 1 is not present in the project area. If ASDRO were to select this alternative, it would be responsible for implementing the mitigation measures described in Sections 4.1.3.2 and 4.3.3.2 of this EA to minimize temporary impacts to the marine environment downstream of the project area where protected turtles have the potential to occur.

In the long term, implementation of Alternative 3 would have a beneficial impact on sea turtles because the concrete channels would reduce the amount of sedimentation into Pago Pago harbor at Fagatogo. If ASDRO were to select this alternative, the village of Fagatogo would be responsible for long-term maintenance, as described in Section 4.3.3.2 of this EA.

Alternative 3 is expected to comply with Section 7 of the ESA. However, if ASDRO were to select this alternative, FEMA would reconsult with USFWS before ASDRO initiates construction.

#### **4.4.2 Executive Order 13112: Invasive Species**

EO 13112 was promulgated in 1999 to prevent the introduction of invasive species and to provide for their control. Under this order, the federal government may not authorize, fund, or

carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to the guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

Subject to the availability of appropriations and within administration budgetary limits, federal agencies must use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to, and control, populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; and (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded.

As described in Section 4.4, many invasive (nonnative) vegetative species currently occur in the project area.

#### **4.4.2.1 *Alternative 1: No Action***

Under the No Action Alternative, no impacts would occur to invasive species.

#### **4.4.2.2 *Alternative 2: Proposed Action***

Under the Proposed Action, some vegetation would be cleared from the construction area. The cleared vegetation would consist of both invasive and native species. On completion of the Proposed Action, the cleared areas would be revegetated with native species, as appropriate, thus decreasing the amount of invasive species in the project area. ASDRO would ensure that any imported fill or other construction materials would be certified as being free of invasive species.

#### **4.4.2.3 *Alternative 3: Original Design Plan***

Alternative 3 would affect invasive species in a similar way to the Proposed Action. If ASDRO were to select this alternative, it would be responsible for implementing the mitigation measures described in Section 4.4.2.2 of this EA.

### **4.4.3 Executive Order 11990: Protection of Wetlands**

EO 11990 requires federal agencies to take action to minimize the destruction or modification of wetlands by considering both direct and indirect impacts to wetlands that may result from federally funded actions. FEMA's regulations for complying with EO 11990 are found in 44 CFR Part 9, Floodplain Management and Protection of Wetlands.

American Samoa has both saltwater and freshwater swamps and marshes, cultivated and ruderal wetlands, and perennial streams. Much of the most important wetlands are the mangrove swamps and coastal freshwater marshes (United Nations Environment Programme 2008). However, according to the American Samoa Geographic Information System Users Group (2008), wetlands are not mapped within the village of Fagatogo. Also, no jurisdictional wetlands were observed in the project area during site reconnaissance on November 9, 2007.

#### **4.4.3.1** *Alternative 1: No Action*

Under the No Action Alternative, no impacts to wetlands would occur, as no wetlands are present within the project area.

#### **4.4.3.2** *Alternative 2: Proposed Action*

Under the Proposed Action, no direct or indirect impacts would occur to wetlands as no wetlands are present in the project area. Therefore, compliance with the Eight-Step Decision-Making Process described in 44 CFR Part 9 is not necessary.

#### **4.4.3.3** *Alternative 3: Placement of Riprap at Sites 1 to 5*

Under Alternative 3, no direct or indirect impacts would occur to wetlands, as no wetlands are present in the project area. Therefore, compliance with the Eight-Step Decision-Making Process described in 44 CFR Part 9 is not necessary.

### **4.4.4** **Executive Order 13089: Coral Reef Protection**

EO 13089 requires federal agencies to ensure that actions they authorize, fund, or implement will not degrade the conditions of coral reef ecosystems. As mentioned previously in Section 4.4, much of Tutuila, including the offshore area not far from the confluence of the Fagatogo streams and the South Pacific Ocean, is surrounded by a fringing coral reef.

Coral reefs surrounding Tutuila are impacted by poor water quality. Natural phenomena such as hurricanes and disease have always taken their toll on reefs, but their effects are exacerbated by human activities in the ocean and on land. Besides destructive fishing practices and coral collecting, impacts come from sediments eroded from agricultural and construction operations, sewage, and other effluents. Coral reefs exist approximately 0.3 mile east of where Market, Metro, and ANZ streams flow into the Pacific Ocean.

#### **4.4.4.1** *Alternative 1: No Action*

Under the No Action Alternative, no new impacts would occur to coral reefs around the island. Erosion may continue to occur along the embankments of Market, Metro, and ANZ streams, causing sediment to be washed down the stream and into the ocean. Sediment deposited in this vicinity would have a slight potential to adversely affect coral reefs.

#### **4.4.4.2** *Alternative 2: Proposed Action*

The Proposed Action has the potential to cause minor, short-term, adverse impacts to coral reefs downstream of the project area by increasing erosion along the streams during construction. However, the implementation of the mitigation measures described in Sections 4.1.3.2 and 4.3.3.2 of this EA would limit these impacts. In the long term, the Proposed Action may marginally benefit coral reefs by reducing the deposition of sediment that may come from erosion along Market, Metro, and ANZ streams. In addition, transport of POL, HHW, and trash is also expected to decrease under the long term. To minimize sedimentation in Pago Pago harbor, ASDRO would be responsibly for implementing the mitigation measures described in Section

4.3.3.2 of this EA. ASDRO would also ensure that coral is not a component of fill materials or used in the concrete mixture for the Proposed Action. The Proposed Action is expected to comply with EO 13089.

#### **4.4.4.3 *Alternative 3: Original Design Plan***

Alternative 3 would affect coral reefs in a similar manner as the Proposed Action. If ASDRO were to select this alternative, it would be responsible for implementing the mitigation measures described in Section 4.4.4.2 of this EA. Therefore, Alternative 3 is expected to comply with EO 13089.

### **4.5 CULTURAL RESOURCES**

In addition to review under NEPA, consideration of impacts to cultural resources is mandated under Section 106 of the National Historic Preservation Act. Requirements include identifying significant historic properties and districts that may be affected by a federal undertaking and mitigating adverse effects to those resources.

On January 16, 2006, URS, as a consultant to FEMA, conducted a pedestrian archaeological reconnaissance along Market, Metro, and ANZ streams to evaluate the Area of Potential Effect (APE) associated with the original design plan (Alternative 3). The survey results were negative for any prehistoric or historic archaeological or built-environment cultural resources. No properties eligible to the National Register of Historic Places were identified through a literature review and pedestrian survey of the three streams.

#### **4.5.1 Alternative 1: No Action**

Under the No Action Alternative, no impacts would occur to cultural resources, as no cultural resources are expected to occur immediately adjacent to Market, Metro, or ANZ stream in Fagatogo.

#### **4.5.2 Alternative 2: Proposed Action**

Most of the project area associated with the Proposed Action overlaps with the project area associated with the original design plan. Therefore, the cultural review conducted for Alternative 3, as described in Section 4.5.3 of this EA, is applicable to the portion of the Proposed Action's APE that overlaps with Alternative 3's APE.

In a letter dated December 19, 2007, FEMA notified the American Samoa Historic Preservation Officer (ASHPO) that the scope of work associated with Alternative 3 had been altered and provided a detailed description of the scope of work associated with the Proposed Action. FEMA requested concurrence that the previous cultural review conducted for Alternative 3 is applicable to the Proposed Action. In subsequent discussions with the Deputy SHPO, it was determined that the Proposed Action involves the construction of an underground box drain across the Fagatogo Malae, a large grassy area in the center of the Naval Station Historic District. Additionally, this proposed channel may intersect a Naval Administration-era concrete road, which has not been formally evaluated for eligibility to the National Register of Historic Places, but will be considered eligible for purposes of this specific undertaking. In a letter dated February 4, 2008,



FEMA requested concurrence from the ASHPO that, with the implementation of the appropriate avoidance and minimization measures (described below), the Proposed Action, including the work on the Fagatogo Malae and the adjacent road, would not adversely affect historic resources. In a letter dated February 19, 2008, the ASHPO concurred with this determination (Appendix C).

According to the measures outlined in the correspondence between FEMA and the ASHPO, ASDRO would be required to ensure that a qualified archaeological monitor is present for those portions of the trenching operation that take place within the Fagatogo Malae and the parking lot between the Fagatogo Malae Pavilion and the former Metro store. At the completion of the trenching operation, the Fagatogo Malae, where disturbed, would be returned to its original condition as it appeared at the start of construction. Furthermore, before initiating construction, ASDRO would ensure that a qualified cultural resources specialist conducts limited archival research on the Naval Administration-era concrete road and that a qualified monitor is present in the zone where the Naval Administration-era concrete road is thought to be present. If the road is intersected during construction, a limited recordation of the road would be made. Construction type, materials and episodes of construction would be recorded in a manner consistent with requirements of the ASHPO. Lastly, ASDRO would be responsible for halting work in the event of an unanticipated discovery during construction and notifying FEMA as soon as practicable. FEMA may then require ASDRO to stop construction in the vicinity of the discovery and would require ASDRO to take all reasonable measures to avoid or minimize harm to the property until FEMA concludes consultation with the ASHPO. Should human remains be encountered, ASDRO would be required to halt work in the vicinity and notify the Territorial Coroner.

#### 4.5.3 Alternative 3: Original Design Plan

During the initial project evaluation, FEMA informed the ASHPO of a potential project along Market, Metro, and ANZ streams in the village of Fagatogo and provided the ASHPO with a description of the original design plan. In a letter dated June 14, 2005, the ASHPO wrote to the Lieutenant Governor of American Samoa, the Honorable Aitolfele F.T. Sunia, explaining the scope of work associated with Alternative 3. This letter indicated that after review of the project description and a field visit to the proposed project location, the ASHPO determined that the project was not expected to adversely affect known and/or previously documented historic properties. URS, as a consultant to FEMA, met with the Deputy ASHPO on January 16, 2006, to further discuss the scope of work associated with Alternative 3. On February 6, 2006, FEMA sent the ASHPO a letter requesting written concurrence that Alternative 3 was not expected to adversely affect known and/or previously documented historic properties. In a letter dated February 17, 2006, the ASHPO concurred with this determination.

#### 4.6 SOCIOECONOMICS AND SAFETY

According to the 2000 Census of American Samoa (U.S. Department of Commerce Census Bureau 2008), the population of the village of Fagatogo is 2096, which is 3.7 percent of the population of American Samoa (57,291). The Census indicates that 52.8 percent of the village population is male, and 92.7 percent is ethnic Samoan (one ethnicity). The median age is 22.7 years, with 61.8 percent of the village population aged 16 or older, and 56 percent of this age group in the labor force. The primary industry for the employed population is manufacturing (42.8 percent), although a significant section of the population works in agriculture, forestry,

fishing and hunting, and mining (10.2 percent) or educational, health and social services (9.9 percent). The major occupations are production, transportation, and material-moving occupations (36.9 percent), management, professional and related occupations (22.9 percent), and sales and office occupations (14.8 percent).

The village has 359 housing units, of which 351 are occupied and 209 are detached, one-unit structures. The average household size is 5.83 people. The median household income is \$16,528, the median home cost is \$45,600, and 224 (63.8 percent) of the households have no vehicles. Between 1995 and 2000, 17 homes were built.

#### **4.6.1 Environmental Justice**

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs federal agencies to make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high adverse human health, environmental, economic, and social effects of its programs, policies, and activities on minority and low-income populations. The majority of the village of Fagatogo identifies itself as ethnic Samoan. Therefore, Fagatogo can be considered a minority community for the purposes of this EO.

##### **4.6.1.1 *Alternative 1: No Action***

Under the No Action Alternative, the flood hazard would remain along the embankments of Market, Metro, and ANZ streams, potentially causing property damage and risk to human health and safety. However, the No Action Alternative does not involve the implementation of a federal program, policy, or activity. Therefore, EO 12898 does not apply.

##### **4.6.1.2 *Alternative 2: Proposed Action***

Under the Proposed Action, the community would benefit from increased protection of homes and property from the flooding of Market, Metro, and ANZ streams. The Proposed Action would reduce the risk of the adverse health, environmental, economic, and social effects that are likely to occur during and after flooding of the streams. No substantial adverse environmental impacts have been identified in this EA. Therefore, the federally funded action would not cause disproportionately high adverse human health, environmental, economic, or social effects on minority populations and would comply with EO 12898.

##### **4.6.1.3 *Alternative 3: Original Design Plan***

Since the original design plan did not include a detailed project description or hydraulic analysis, FEMA was unable to determine whether it would resolve the recurring flooding issue along Market, Metro, and ANZ streams. Therefore, it is unclear whether Alternative 3 would reduce the risk of the adverse health, environmental, economic, and social effects that are likely to occur during and after flooding of the streams. Therefore, FEMA cannot determine whether this alternative would comply with EO 12898.

#### 4.6.2 Public Safety

During intense storm events, Market, Metro, and ANZ streams are likely to flood. In extreme cases, the streams would overflow and erode surrounding structures and facilities. The overflow of the stream is a public safety hazard as it could bring contaminated water into homes and expose residents to dangers such as hazardous waste, pathogens, and mold. Unchanneled stormwater flows that cross residential yards and driveways also pose a direct danger to residents, especially children, who could be knocked over or swept away by flood waters.

Secondary roads crisscross through Fagatogo and connect residents in the village to the main road that traverses the island, Highway 1. The secondary roads cross Market, Metro, and ANZ streams at four locations. Emergency vehicles use these secondary roads to access the village from Highway 1. Flooding of the streams would prohibit residents and emergency vehicles from getting in or out of the village on these secondary roads.

##### 4.6.2.1 *Alternative 1: No Action*

Under the No Action Alternative, the flood risk would remain unmitigated. In severe storms, the people who live adjacent to the streams could be exposed to contaminated floodwater in their homes. Contaminated water in homes would expose residents to dangers such as hazardous waste, pathogens, and mold. Unchanneled stormwater flowing across yards and driveways could also pose a direct hazard to residents. Under the No Action Alternative, accessibility to and from the village would not change.

##### 4.6.2.2 *Alternative 2: Proposed Action*

Implementation of the Proposed Action would reduce the risk of flood damage due to the encroachment of Market, Metro, and ANZ streams onto adjacent properties. In addition, by covering sections of the streams in concrete, the Proposed Action would reduce the risk of residents being knocked over or swept away by high waters during flooding incidents. Therefore, the Proposed Action would have a positive impact on public safety. During construction, access restrictions may be needed at the bridges over the streams in the project area and in the areas where buildings would have to be modified to allow for the installation of box drains. However, all roads would be accessible in cases of emergency.

##### 4.6.2.3 *Alternative 3: Original Design Plan*

As described in Section 4.3.2.3 of this EA, FEMA cannot determine whether Alternative 3 would resolve the recurring flooding issues along the streams. If ASDRO were to select this alternative, it would be responsible for submitting a detailed project description and hydraulic analysis so that the project's exact impact on public safety could be determined.

#### 4.7 LAND USE AND PLANNING

The village of Fagatogo is urbanized, with primarily commercial and governmental land use in the lower portion of the village and residential land use in the hills. Over 96 percent of the land in American Samoa is owned in a traditional communal manner, where the village chief (*matai*) regulates the occupancy and use of land within his/her village.

In American Samoa, all projects are required to be submitted to ASDOC for review under the Project Notification and Review System (PNRS). As part of its review, ASDOC would ensure that all government land use and planning laws and regulations are met.

#### **4.7.1 Alternative 1: No Action**

Because no new facilities would be built and no existing facilities would be modified, the No Action Alternative would not affect land use and would not require a PNRS review.

#### **4.7.2 Alternative 2: Proposed Action**

The Proposed Action, which includes excavation, construction, and staging, would occur on land held by the village of Fagatogo. ASDRO would request and obtain permission from the chief of the village of Fagatogo to complete the Proposed Action. The chief of the village of Fagatogo would be responsible for obtaining written agreement to the project from all landowners directly affected by the Proposed Action. No changes in land ownership would occur, and no land transfers would be necessary. Implementation of the Proposed Action would not modify existing land use in or around the project area. ASDRO would be responsible for applying for and obtaining PNRS approval for the Proposed Action.

#### **4.7.3 Alternative 3: Original Design Plan**

Similar to the Proposed Action, Alternative 3 would include excavation, construction, and staging, and would occur on land held by the village of Fagatogo. If ASDRO decided to pursue this alternative, it would be responsible for implementing the conditions described in Section 4.7.2 of this EA.

### **4.8 TRANSPORTATION**

Highway 1 is the main arterial road that connects the east and west sides of the island. Secondary roads crisscross through Fagatogo and connect residents in the village to Highway 1. The secondary roads only provide access within the village; no arterials other than Highway 1 allow travel between Fagatogo and other villages. The secondary roads cross Market, Metro, and ANZ streams at four locations in the village. Emergency vehicles use these secondary roads to access the village from Highway 1.

#### **4.8.1 Alternative 1: No Action**

Under the No Action Alternative, no impacts would occur to transportation along Highway 1 or the secondary roads through the village of Fagatogo, except in cases where severe flooding would have the potential to disrupt traffic on these roads.

#### **4.8.2 Alternative 2: Proposed Action**

Implementation of the Proposed Action would result in temporary, minor impacts to transportation. Construction on the bridges where the secondary roads cross Market, Metro, and ANZ streams would temporarily halt traffic flow. Private residences immediately adjacent to the

project area may experience traffic congestion and road blockages, including difficulty parking at their residences during project construction. Some residents would temporarily have to use alternate routes to access their homes and would have to park vehicles at nearby locations during parts of project construction.

To minimize adverse impacts to traffic and circulation, ASDRO would be required to implement the following mitigation measures:

- ASDRO would stage construction equipment, materials, and vehicles so as to minimize hindrances to traffic flow.
- ASDRO would provide advance written notice of the construction schedule to all residents who would have limited access to their homes or driveways during construction. The written notification would identify a local contact person.
- ASDRO would review traffic patterns to determine if and when traffic restrictions are required during construction. If necessary, traffic would be temporarily rerouted along adjacent roadways during construction activities.

#### 4.8.3 Alternative 3: Original Design Plan

Implementation of Alternative 3 would result in similar impacts to transportation as those that would be caused by the Proposed Action. If ASDRO were to select this alternative, it would be responsible for implementing the mitigation measures described in Section 4.8.2 of the EA.

### 4.9 NOISE

Commonly defined as unwanted and/or unwelcome sound, noise is federally regulated by the Noise Control Act of 1972. Although the Noise Control Act tasks the USEPA to prepare guidelines for acceptable ambient noise levels, it only charges those federal agencies that operate noise-producing facilities or equipment to implement noise standards. By the nature of its mission, FEMA does not have statutes defining noise.

Some land uses are considered sensitive to noise. Noise-sensitive receptors are located at land uses associated with indoor and outdoor activities that may be subject to stress or significant interference from noise. These land uses often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, educational facilities, and libraries. Many residences are present along Market, Metro, and ANZ streams.

The area typically experiences noises associated with a residential village, such as sounds from vehicles, televisions, radios, barking dogs, and human voices.

#### 4.9.1 Alternative 1: No Action

Under the No Action Alternative, noise would remain at current levels.

#### 4.9.2 Alternative 2: Proposed Action

Construction noise is unavoidable and could adversely affect nearby residents. However, the noise would be temporary and limited to the duration of project construction, which would occur

for 60 to 90 days on each stream. The combination of noise-producing equipment that would be in use during any particular period is difficult to predict. However, the noise levels from construction activity during various phases of similar construction projects have been evaluated, and their use yields an acceptable prediction of the project's potential noise impacts. Based on USEPA (1971) data of similar public works projects, average noise levels generated by the Proposed Action are estimated to be 88 A-weighted decibels (dBA)  $L_{eq}$  (the energy-averaged noise level) at a distance of 50 feet. Noise levels of this magnitude, although temporary, would be readily audible and would dominate the noise environment in the area during construction operations. Typically, the magnitude of construction noise emission varies over time because construction activity is intermittent and power demands on construction equipment (and the resulting noise output) are cyclical.

Noise levels generated at any point source decrease at a rate of approximately 6 decibels per doubling of distance away from the source (Diehl 1973). Therefore, noise levels would be 82 dBA at 100 feet from the center of construction activity, 76 dBA at 200 feet, and 70 dBA at 400 feet. This calculated reduction in noise level is based only on losses resulting from spreading of the sound wave as it leaves the source and travels outward. Shielding, such as buildings, that block the line of sight would attain an additional 5 dBA or more reduction.

ASDRO would be responsible for implementing the following measures to reduce noise levels and their effects to the extent practicable:

- Construction operations would not occur between 5:00 pm and 7:00 am Monday through Friday. Construction operations would not take place on Saturday, Sunday, or holidays. All components of construction, including maintenance activities and transportation of materials, would be restricted to the periods and days listed.
- All noise-producing project equipment and vehicles using internal combustion engines (including haul trucks) would be fitted with mufflers, air-inlet silencers, where appropriate, and any other appropriate shrouds, shields, or other noise-reducing features. These devices would be maintained in good operating condition so as to meet or exceed original factory specifications. Mobile or fixed "package" equipment (e.g., arc welders or air compressors) would be equipped with the shrouds and noise control features that are readily available for that type of equipment.
- All mobile or fixed noise-producing equipment used on the project that is regulated for noise output by a local, state/territorial, or federal agency would comply with such regulation while used in the course of project activity.
- At least 20 days before the commencement of construction, ASDRO would provide written notification to property owners and residents within 500 feet of the project area and to the chief of the village of Fagatogo. A notice would also be posted at the construction site. The notice would provide a construction schedule, the required noise mitigations measures for the project, and the name and telephone number of the project manager who can address questions and problems that may arise during construction.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, would be for safety warning purposes only.
- All project workers exposed to noise levels above 80 dBA would be provided with personal protective equipment for hearing protection (i.e., earplugs and/or earmuffs). Areas where

noise levels are routinely expected to exceed 80 dBA would be clearly posted with signs stating “Hearing Protection Required in this Area.”

#### **4.9.3 Alternative 3: Placement of Riprap at Sites 1 to 5**

Under Alternative 3, the construction noise would be similar to the noise caused by the Proposed Action. If ASDRO were to select this alternative, it would be responsible for implementing the measures described in Section 4.9.2 of this EA.

### **4.10 VISUAL RESOURCES**

Market and Metro streams are streams that average approximately 10 feet wide and 5 feet deep in the village of Fagatogo. The streambeds are mostly lined with concrete as they pass through the village. In some places, the streams are covered and run underground. Towards the upper end of the village, these two streams are lined with rocks and soil. Riparian vegetation, as described in Section 4.4, grows along the banks of the streams in these locations, except where grouted riprap or concrete walls replace the vegetation. The upstream end of ANZ Stream has a small natural channel lined with rocks, soil, and riparian vegetation, but as the stream passes through the village, the channel disappears and all streamwater flows unchecked over paved streets and walkways until it empties into the concrete channel adjacent to the Fagatogo Malae.

Residential structures are located immediately adjacent to the streams in many locations; in others, residential structures are located approximately 20 to 30 feet away. The level of development increases downstream, as the streams approach Highway 1.

The existing visual characters of all three streams are typical within the region, and no areas of scenic importance exist. Viewers of the project area consist primarily of the residents of the village.

#### **4.10.1 Alternative 1: No Action**

Under the No Action Alternative, no impacts would occur to existing visual resources.

#### **4.10.2 Alternative 2: Proposed Action**

The Proposed Action would have a temporary effect on the character of the setting. During construction, the existing channel walls and foundation, along with vegetation, rock, soil, and debris, would be removed from immediately surrounding areas, and construction activities would be visible from nearby residences and roads. The viewers that would be directly affected by construction would be the residents located adjacent to the project area and their invited guests. Because these residents would also be the primary beneficiaries of the Proposed Action, the short-term, minor adverse effects to visual resources caused by implementation of the Proposed Action would be outweighed by the project’s beneficial impacts to flood hazards and public safety.

In the long term, the Proposed Action would have a negligible impact on visual resources because the project area is already disturbed. As described in Section 4.4 of this EA, most sections of Market, Metro, and ANZ streams are covered in concrete, and the riparian corridors along the streams are narrow, steep, and substantially disturbed by residential development. Vegetation along the streams consists of both invasive and native species. ASDRO would be responsible for

revegetating all areas disturbed during construction with native species, as appropriate, thus decreasing the amount of invasive species in the project area. ASDRO would also be responsible for contouring finished surfaces to blend with adjacent natural terrain to achieve a natural appearance when the project is complete. Areas of fill and newly constructed channels would remain at or near the pre-existing elevation of the natural channels and would not obstruct views from nearby residences and roads. Therefore, implementation of the Proposed Action would not permanently alter the scenic resources along Market, Metro, and ANZ streams.

#### 4.10.3 Alternative 3: Original Design Plan

Alternative 3 would have similar temporary effects on the visual resources of the project area. As described in Section 4.10.2 of this EA, the viewers affected by construction would also be the direct beneficiaries of the project.

Implementation of Alternative 3 would permanently alter the visual character of the setting to a larger extent than the Proposed Action because Alternative 3 would involve the channeling the entire lengths of Market, Metro, and ANZ streams. If ASDRO were to select this alternative, it would be responsible for implementing the mitigation measures described in Section 4.10.2 of this EA.

#### 4.11 CUMULATIVE IMPACTS

The Council on Environmental Quality defines a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions...” (40 CFR Part 1508.7). FEMA is not aware of planned residential or commercial developments or industrial activity in the project vicinity in the near future. The village is completely built out within the project area, and the existing encroachment of residences and businesses on the streams makes new development in the project area highly unlikely. No cumulative impacts are expected to result.



FEMA is the lead federal agency for conducting the NEPA compliance process for the HMGP project. It is the lead agency's responsibility to expedite the preparation and review of NEPA documents in a way that is responsive to the needs of Fagatogo and American Samoa residents while meeting the spirit and intent of NEPA and complying with all NEPA provisions.

FEMA, with the assistance of ASDRO, conducted an informal scoping program at the beginning of the NEPA review process. ASDRO and FEMA met with representatives of the following agencies and organizations to gather their input on this HMGP project: ASDOC, ASEPA, ASHPO, the American Samoa Department of Public Works, and ASDMWR. FEMA has also consulted via written correspondence with USACE, USFWS, NMFS, and SHPO. Copies of this correspondence are enclosed in Appendix C.

ASDRO and FEMA circulated the Draft EA for a 2-week public comment period. The public was notified of the Draft EA availability via the FEMA website, direct mailings to known interested parties (Appendix C), and publication of a public notice in the *Samoa Post* on March 19, 20, and 24, 2008. During the public comment period, FEMA accepted written comments on the Draft EA addressed to FEMA Region IX Environmental Officer, 1111 Broadway, Suite 1200, Oakland, California 94607. FEMA received no comments on the Draft EA.

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**7.1 FEDERAL EMERGENCY MANAGEMENT AGENCY REGION IX**

- Alessandro Amaglio, Environmental Officer
- Gen Tamura, Pacific Area Office Mitigation Specialist

**7.2 URS CORPORATION**

- Morgan Griffin, Senior Project Manager
- Natalie Allan, Graduate Planner
- Désirée Joseph, Environmental Planner
- Phil Mineart, Senior Project Engineer
- Lorena Solórzano-Vincent, Senior Biologist
- Bryon Bass, PhD, Senior Archaeologist

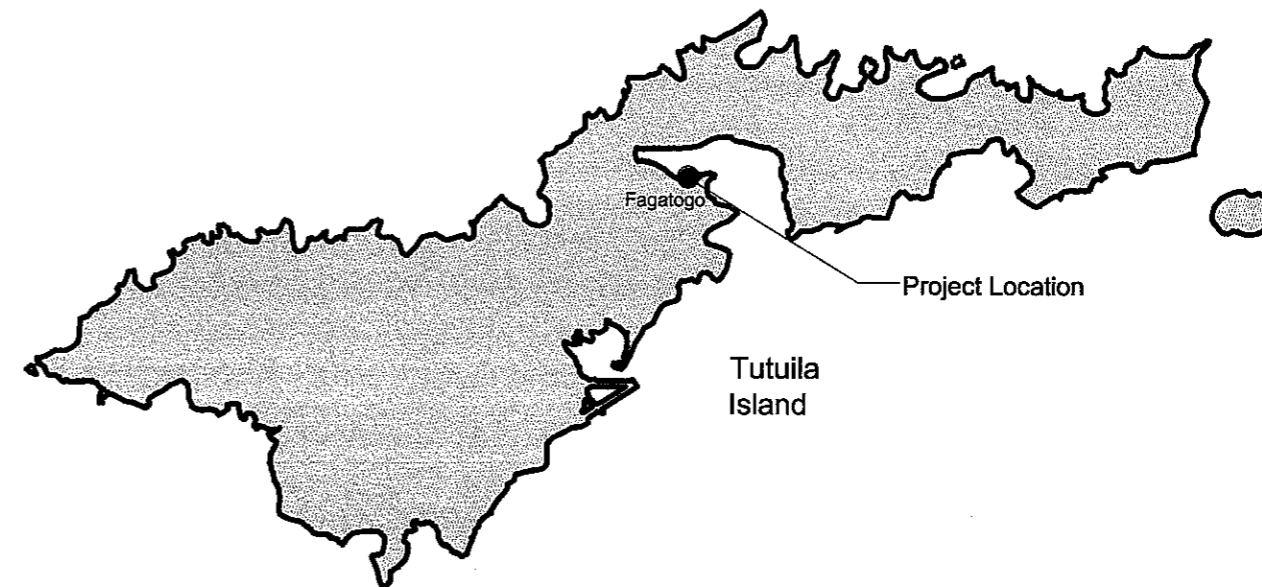
**Appendix A**  
**Drawings for Proposed Action**

# FAGATOGO STREAMS FLOOD MITIGATION

## PAGO PAGO AMERICAN SAMOA

### DRAWING INDEX:

Drwg No.	DRAWING TITLE
100	Drawing Index & Cover Sheet
101	Vicinity Map
102	Proposed Upgrade Market Stream 1
103	Proposed Upgrade Market Stream 2
104	Proposed Upgrade Metro Sream Plan
105	Proposed Upgrade ANZ Sream Plan
106	Section Details - Proposed Drainage Structures
107	Miscellaneous Details
108	Water and Sewer Connection Details

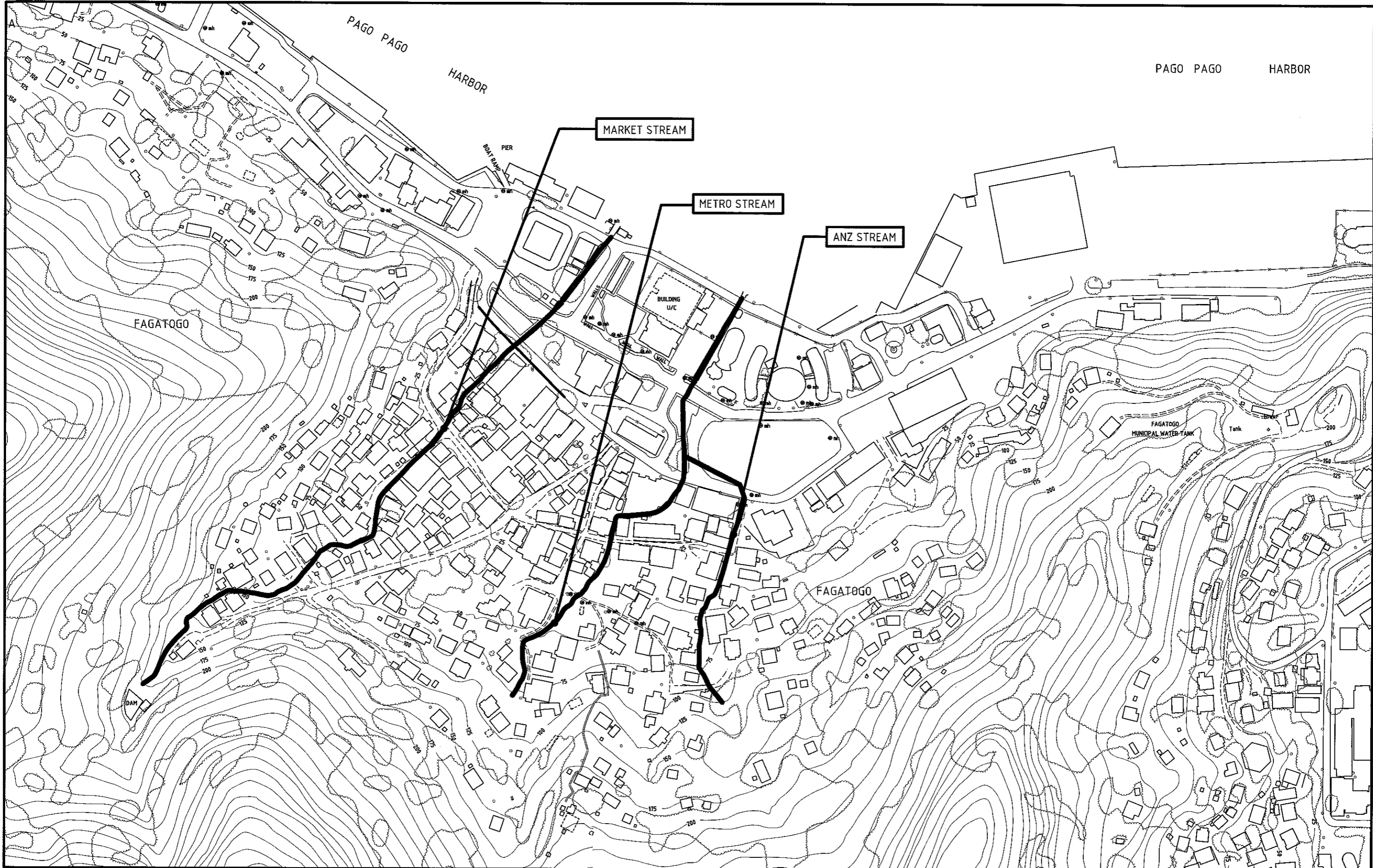


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NOTES:

	DESIGNED BY:	W.C.G.	17 Dec 07	<b>TINAI, GORDON &amp; ASSOCIATES LTD.</b> CIVIL & STRUCTURAL ENGINEERS LEVEL 4, ACB HOUSE, BEACH ROAD P.O. BOX 9581 APIA, SAMOA TEL: (685) 22-908 FAX: (685) 22-913 EMAIL: tga@samoa.ws	CLIENT/PROJECT LOCATION:	American Samoa Government Pago Pago, American Samoa	
	DRAWN BY:	BTP	17 Dec 07		PROJECT NAME, DRAWING TITLE:	Fagatogo Streams Flood Mitigation Drawing Index & Cover Sheet	
	DESIGNED CHECKED:				SCALE AT A1/A3/SIZES:	NTS	
	DRAFTING CHECKED:				JOB NO:	1323-07	
2	Permit Drawings	WCG	17 Dec 07	APPROVED:	<b>NOT FOR CONSTRUCTION</b>	DRAWING NO:	100
1	Preliminary Design	WCG	05 July 07	Copyright of this drawing shall remain the property of Tnai, Gordon & Associates Limited.		REVISION NO:	2
REV	REVISION DESCRIPTION	BY	DATE				

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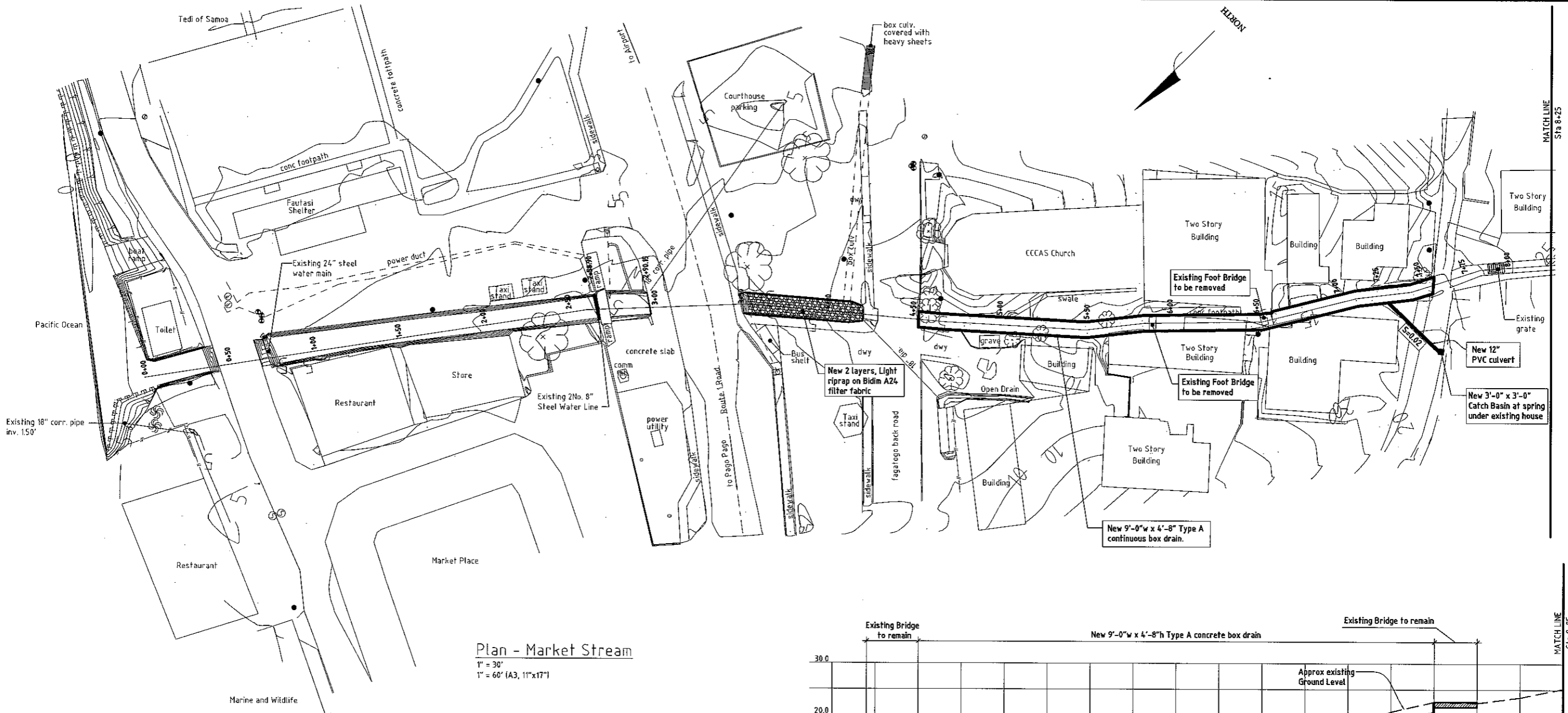
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	1	Preliminary Design	WCG	05 July 07	DRAWN BY:	BTP	17 Dec 07
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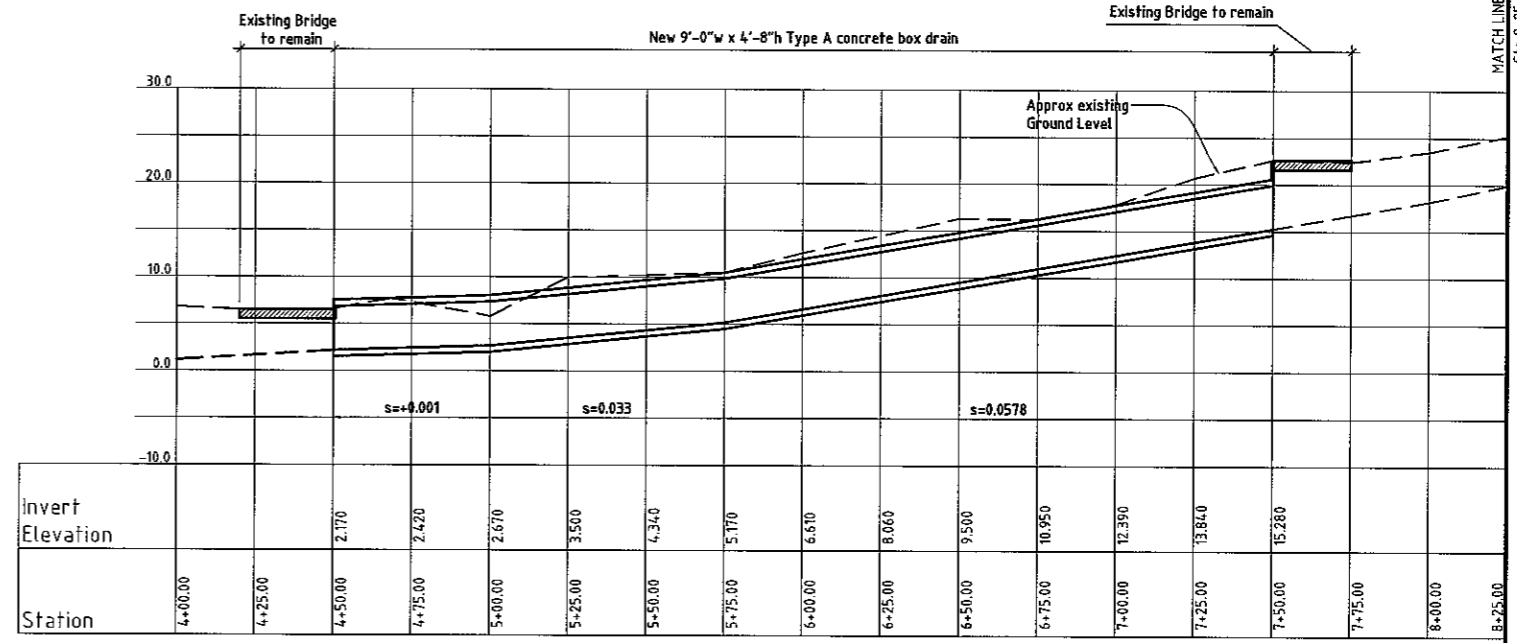
<b>American Samoa Government</b> Pago Pago, American Samoa	
PROJECT NAME, DWG TITLE: <b>Fagatogo Streams Flood Mitigation</b>	
Vicinity Map	
SCALE (AS SHOWN):	NTS
DRAWING NO.:	101
REVISION NO.:	2

Y:\FEMA - TAC and BTP\AP\WITP 06 TO 002 - 1508 AS\Project Files\Fagatogo Storm Channel\Engineering Drawings 12.18.07\Market Stream - Plan - 102\_103.dwg Plot 01 - Market Stream 12/21/2007 2:09:36 PM



**Plan - Market Stream**  
 1" = 30'  
 1" = 60' (A3, 11"x17")

NOTES:  
 1. Dimensions shown are internal dimensions.

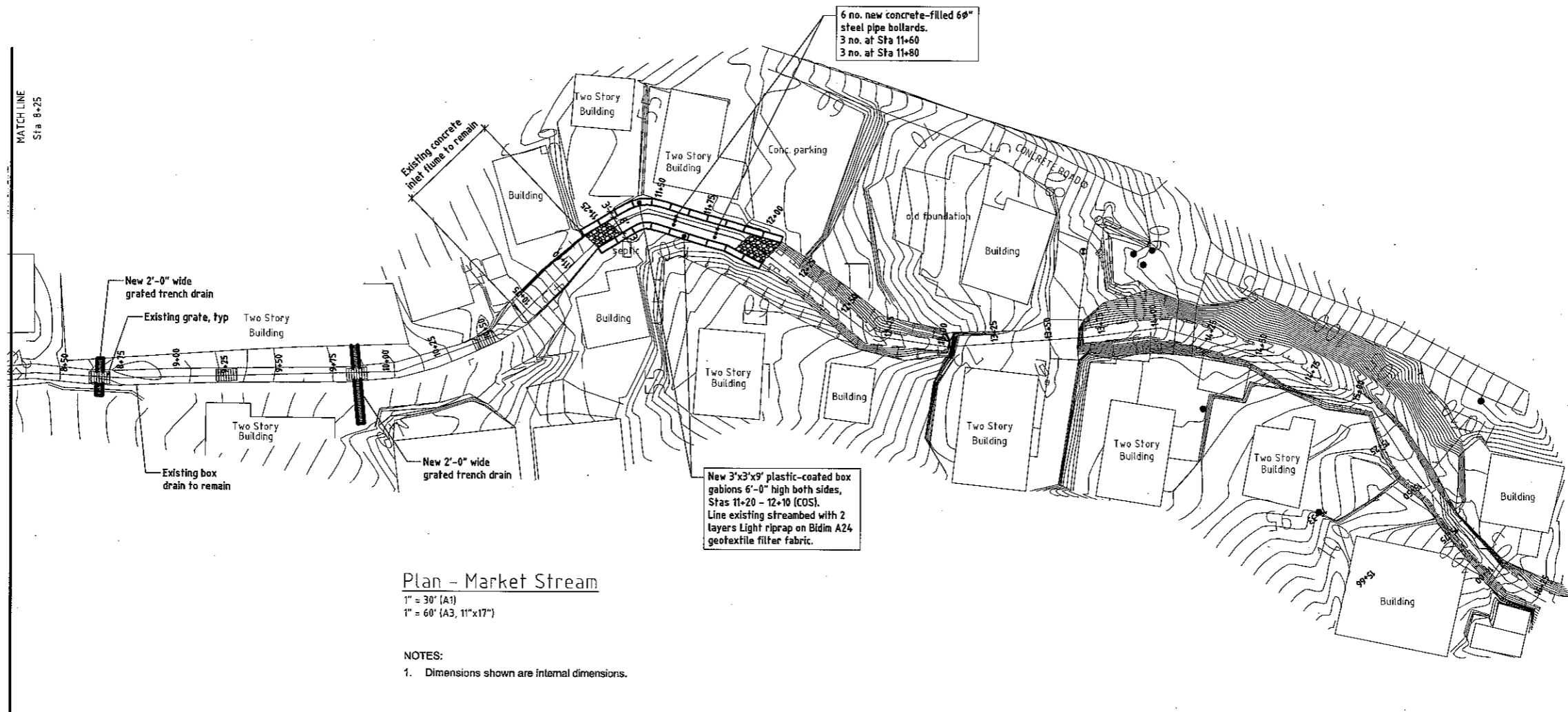


**Profile**  
 1" = 30' hor (A1) 1" = 60' hor (A3, 11"x17")  
 1" = 10' vert (A1) 1" = 20' vert (A3, 11"x17")

NOTES:

	DESIGNED BY:	W.C.G.	17 Dec 07		CLIENT, PROJECT LOCATION:	American Samoa Government Pago Pago, American Samoa	
	DRAWN BY:	BTP	17 Dec 07		PROJECT FILE, DWG TITLE:	Fagatogo Streams Flood Mitigation Proposed Upgrade - Market Stream 1	
2	Permit Drawings	WCG	17 Dec 07	APPROVED:	SCALE (AT A1/A3 SIZE):	1" = 30' (A1) / 1" = 60' (A3, 11"x17")	
1	Preliminary Design	WCG	05 July 07	NOT FOR CONSTRUCTION	JOB NO.:	1323-07	
Copyright of this drawing shall remain the property of Tinal, Gordon & Associates Limited.				TEL: (685) 22-908 FAX: (685) 22-913 EMAIL: tga@samoa.ws	DRAWING NO.:	102	
						REVISION NO.:	2

Y:\FEA - TAC and MATAP\MATAP 06 TO 002 - 1506 AS\Project Files\Fagatogo Storm Channel\Engineering Drawings 12:18:07\Market Stream - Plan - 102\_103.dwg Plot 02 - Market Stream 12/21/2007 2:10:00 PM



**Plan - Market Stream**

1" = 30' (A1)  
1" = 60' (A3, 11"x17")

- NOTES:**
- Dimensions shown are internal dimensions.

NOTES:

				DESIGNED BY: W.C.G. 17 Dec 07		CLIENT / PROJECT LOCATION: <b>American Samoa Government</b> Pago Pago, American Samoa
				DRAWN BY: BTP 17 Dec 07		CONSULTANT: <b>TINAI, GORDON &amp; ASSOCIATES LTD.</b> CIVIL & STRUCTURAL ENGINEERS LEVEL 4, ACB HOUSE, BEACH ROAD P.O. BOX 9581 APIA, SAMOA
						SCALE (A1 & A3 SIZE): 1" = 30' (A1) / 1" = 60' (A3, 11"x17")
						JOB NO.: 1323-07
						DRAWING NO.: 103
						REVISION NO.: 2

REV	REVISION DESCRIPTION	BY	DATE
2	Permit Drawings	WCG	17 Dec 07
1	Preliminary Design	WCG	05 July 07

**NOT FOR CONSTRUCTION**

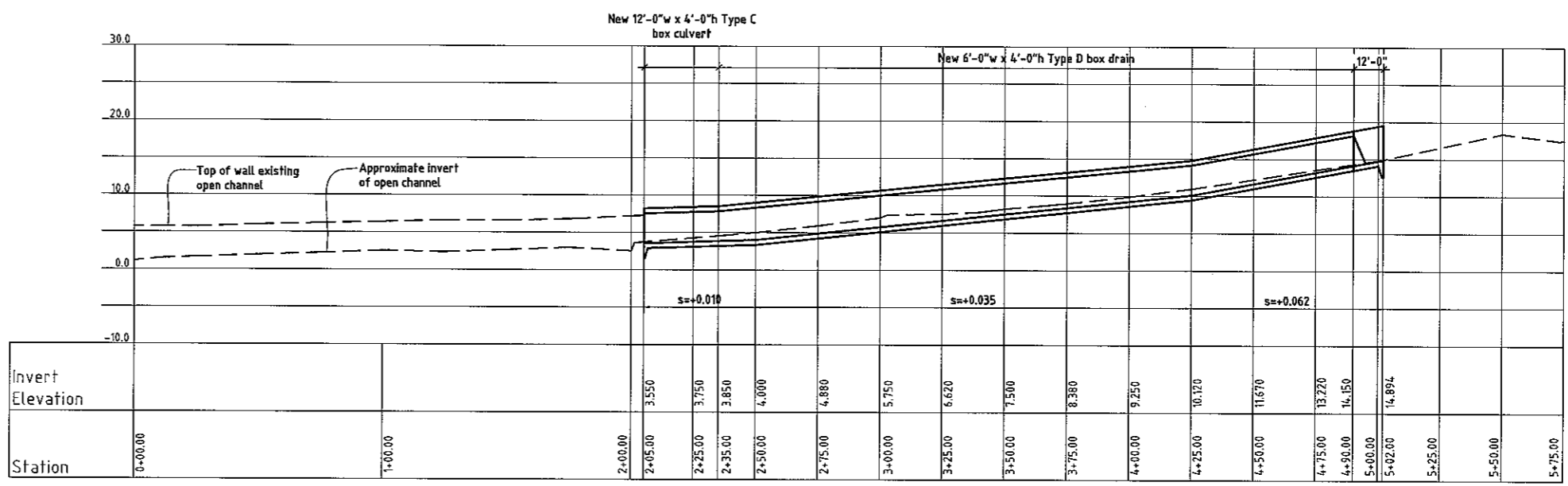
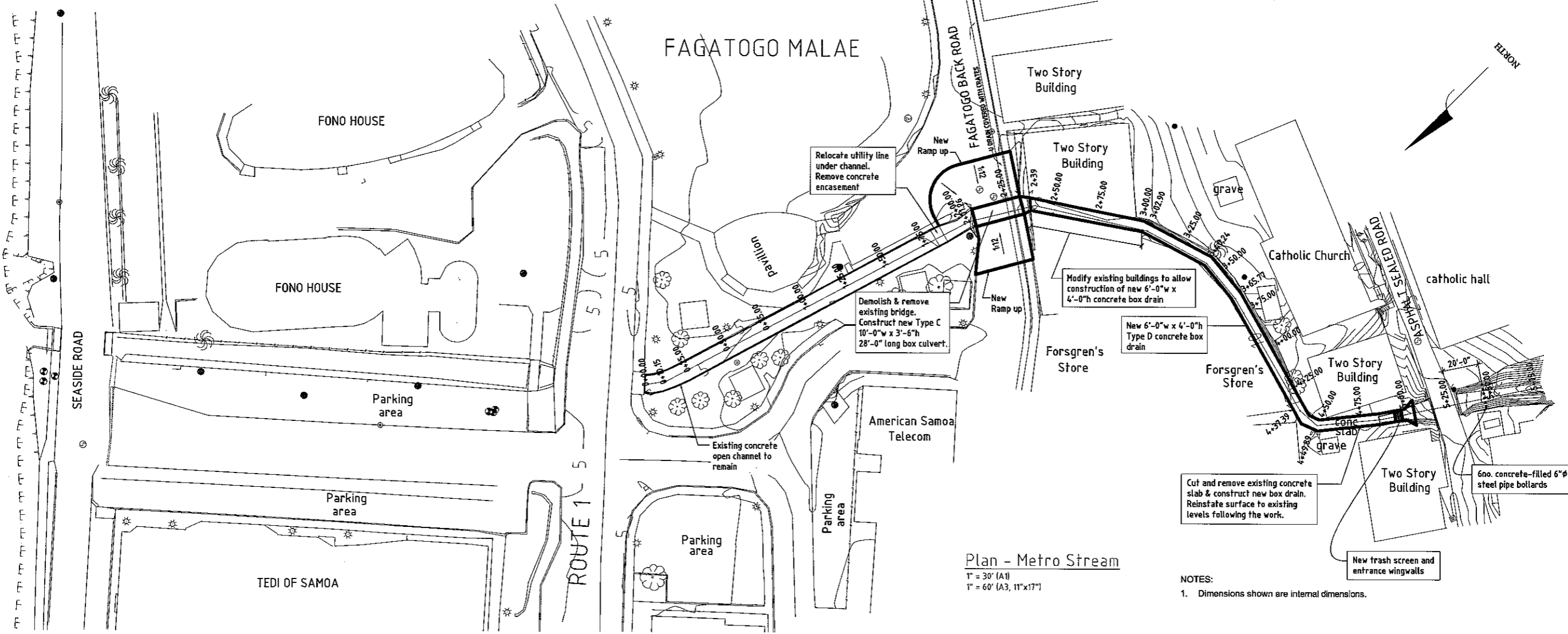
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TEL: (885) 22-906  
FAX: (885) 22-913  
EMAIL: tga@samoa.ws



Y:\FEMA - TAC and HWY\TAP\MAP 06 TO 002 - 1508 AS\Project Files\Fogatogo Storm Channel\Engineering Drawings 12.18.07\Metro Stream - Plan - 104.dwg Metro Stream 12/21/2007 2:10:23 PM

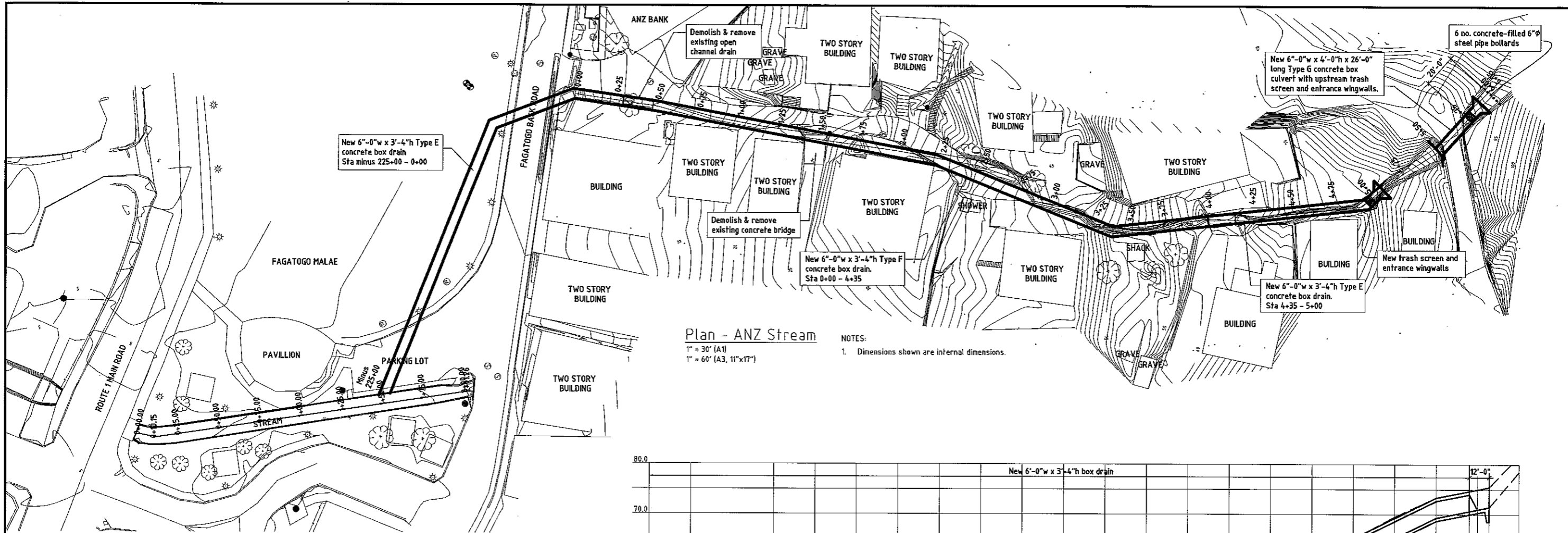
PACIFIC OCEAN



NOTES:

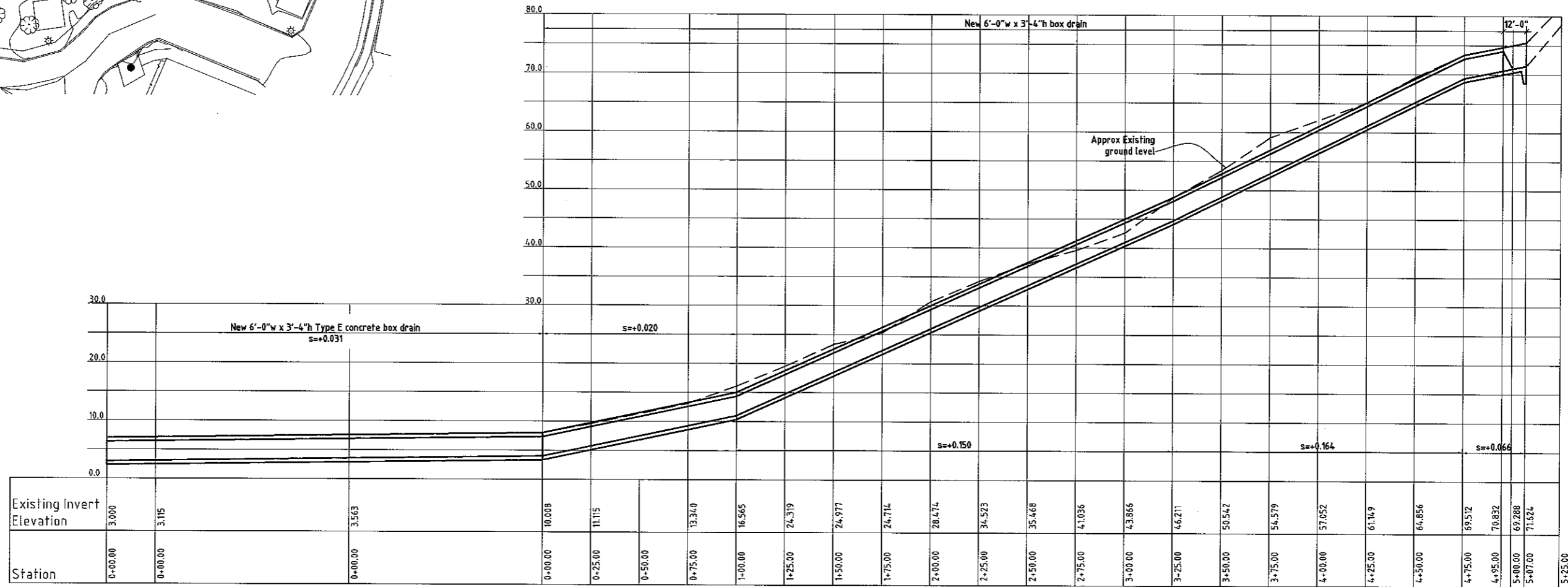
	DESIGNED BY:	W.C.G.	17 Dec 07		<b>TINAI, GORDON &amp; ASSOCIATES LTD.</b> CIVIL & STRUCTURAL ENGINEERS LEVEL 4, ACB HOUSE, BEACH ROAD P.O. BOX 9581 APIA, SAMOA TEL: (685) 22-906 FAX: (685) 22-913 EMAIL: tga@samoa.ws	CLIENT, PROJECT LOCATION: <b>American Samoa Government</b> Pago Pago, American Samoa PROJECT NAME, DWG TITLE: <b>Fogatogo Streams Flood Mitigation</b> Proposed Upgrade - Metro Stream SCALE (AS SHOWN): 1" = 30' (A1) / 1" = 60' (A3)	
	DRAWN BY:	BTP	17 Dec 07				JOB NO.: 1323-07
DESIGNED CHECKED:							
DRAFTING CHECKED:							
APPROVED:	WCG	17 Dec 07	<b>NOT FOR CONSTRUCTION</b>				
1	Preliminary Design	WCG	05 July 07	Copyright of this drawing shall remain the property of Tinai, Gordon & Associates Limited.			DRAWING NO.: 104
2	Permit Drawings	WCG	17 Dec 07				REVISION NO.: 2

Y:\FEMA - TAC and HMTAP\HMTAP 06 TO 002 - 1566 AS\Project Files\Fogotogo Storm Channel\Engineering Drawings 12.18.07\ANZ Stream - Plan - 105.dwg Plan - ANZ Stream 12/21/2007 2:08:04 PM



**Plan - ANZ Stream**  
 1" = 30' (A1)  
 1" = 60' (A3, 11"x17")

NOTES:  
 1. Dimensions shown are internal dimensions.

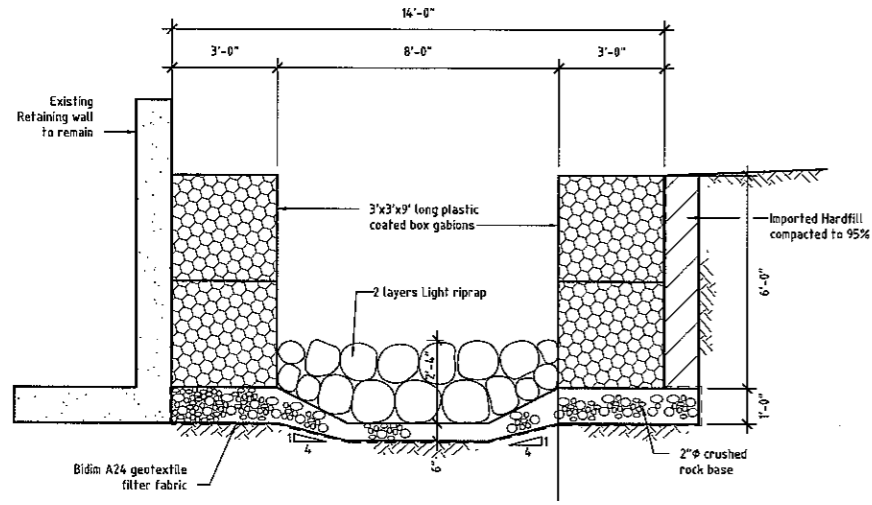


**Profile** - 1" = 30' hor (A1) 1" = 30' hor (A1)  
 1" = 10' vert (A1) 1" = 10' vert (A1)

NOTES:

	DESIGNED BY: W.C.G. 17 Dec 07 DRAWN BY: BTP 17 Dec 07 DESIGNED CHECKED: DRAFTING CHECKED:	CONSULTANT: <b>TINAI, GORDON &amp; ASSOCIATES LTD.</b> CIVIL & STRUCTURAL ENGINEERS LEVEL 4, ACB HOUSE, BEACH ROAD P.O. BOX 9581 APIA, SAMOA TEL: (685) 22-906 FAX: (685) 22-913 EMAIL: tga@samoa.ws	CLIENT, PROJECT LOCATION: <b>American Samoa Government</b> Pago Pago American Samoa PROJECT NAME, END TITLE: Fagatogo Streams Flood Mitigation Proposed Upgrade - ANZ Bank Stream SCALE (BY A1/A3 SIZE): 1" = 30' (A1) / 1" = 60' (A3) JOB NO: 1323-07 DRAWING NO: 105 REVISION NO: 2
	2 Permit Drawings WCG 17 Dec 07 1 Preliminary Design WCG 05 July 07		

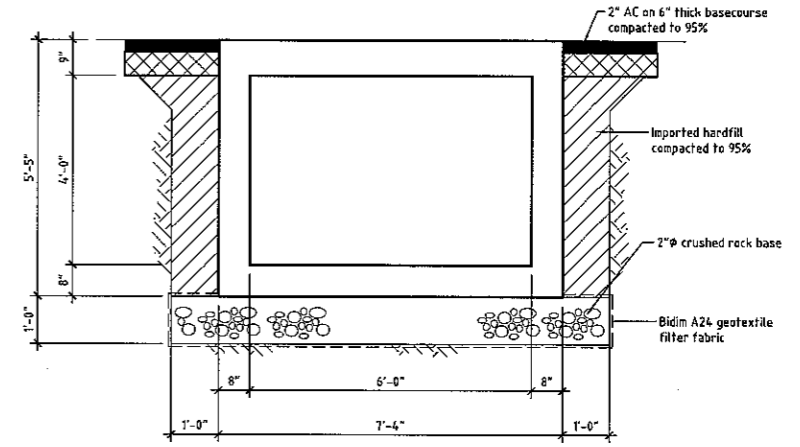
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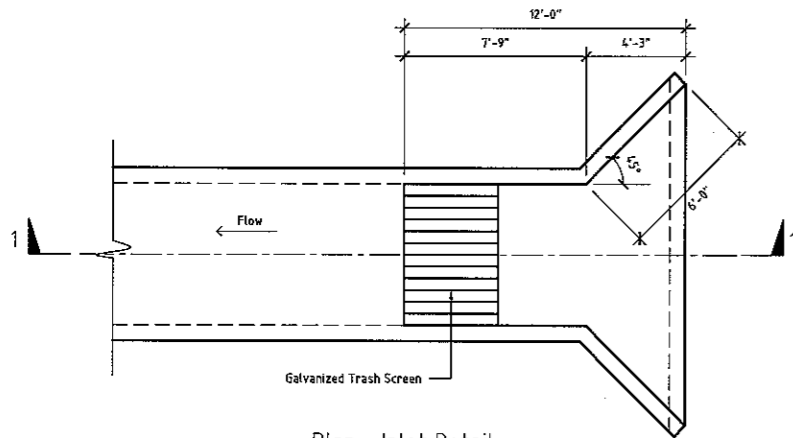
Elevation Section - Market Stream Stas 11+20 - Sta 12+10  
3/8" = 1'-0"

**Riprap Gradation**

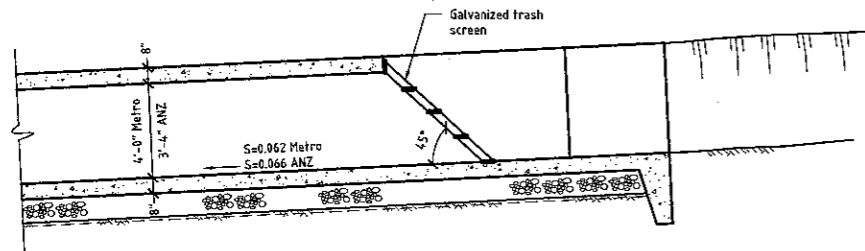
Class	Rock Size (ft)	Rock Size, (lbs)	Percent of Riprap Smaller than
Light	1.80	500	100
	1.30	200	50
	0.40	5	10



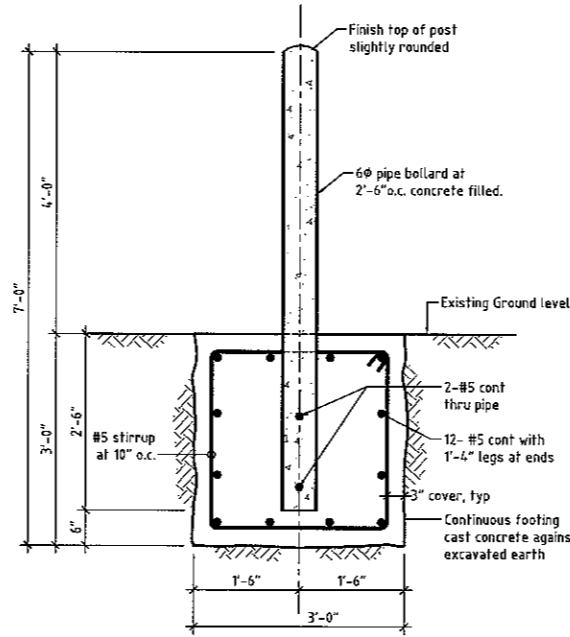
Elevation Section - Type G, 6'-0" w x 4'-0" h Box Culvert  
3/8" = 1'-0"



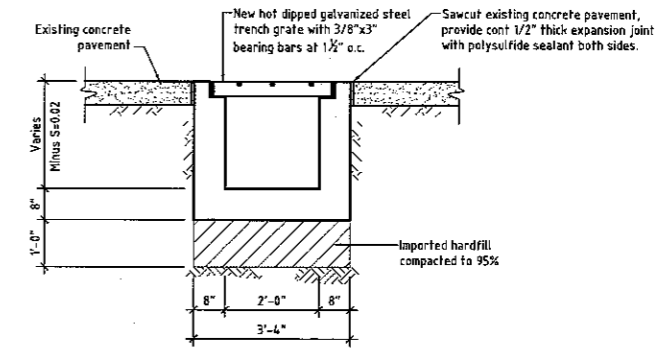
Plan - Inlet Detail  
1/4" = 1'-0"



Elevation Section 1 - 1  
1/4" = 1'-0"



Elevation Section - Bollard Detail  
3/4" = 1'-0"

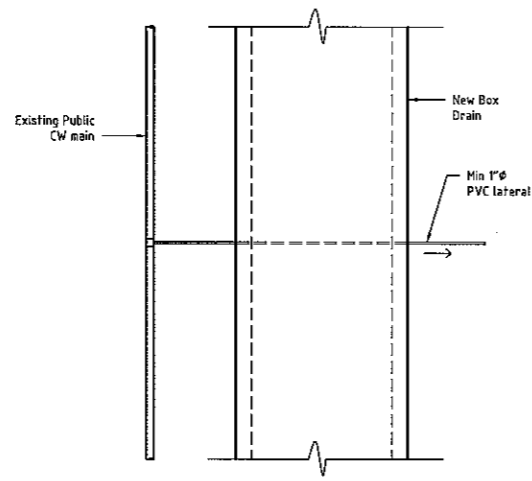


Elevation Section - New Trench Drain  
1/2" = 1'-0"

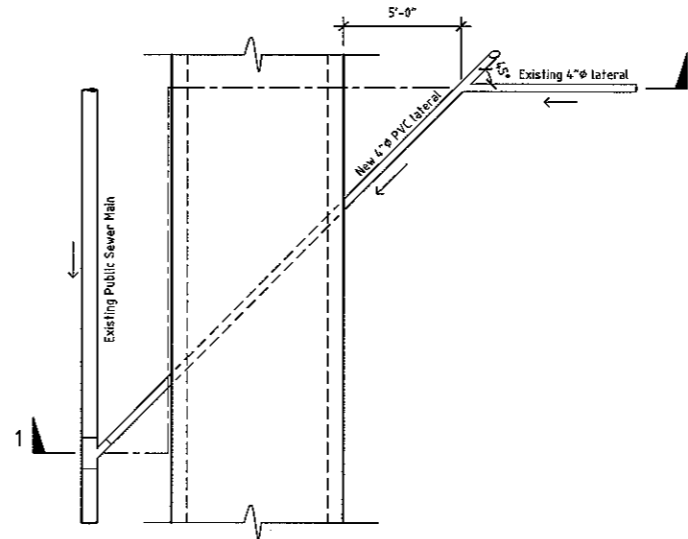
NOTES:

	DESIGNED BY:	W.C.G.	17 Dec 07		<b>TINAI, GORDON &amp; ASSOCIATES LTD.</b> CIVIL & STRUCTURAL ENGINEERS LEVEL 4, ACB HOUSE, BEACH ROAD P.O. BOX 9581 APIA, SAMOA TEL: (685) 22-906 FAX: (685) 22-913 EMAIL: tga@samoa.ws	CLIENT, PROJECT LOCATION:	American Samoa Government Pago Pago, American Samoa
	DRAWN BY:	BTP	17 Dec 07			PROJECT NAME, DWG TITLE:	Fogatogo Streams Flood Mitigation Miscellaneous Details
	DESIGNED CHECKED:					SCALE (AT A3 SIZE):	As Shown (A1)
	DRAFTING CHECKED:					DWG NO:	1323-07
	APPROVED:	<b>NOT FOR CONSTRUCTION</b> Copyright of this drawing shall remain the property of Tinai, Gordon & Associates Limited.				DRAWING NO:	107
2	Permit Drawings	WCG	17 Dec 07			REVISION NO:	2
1	Preliminary Design	WCG	05 July 07				

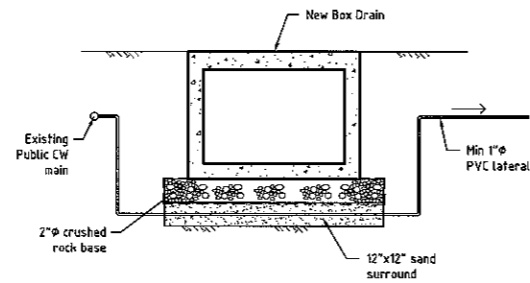
Y:\FEMA - TAC and HITAP\HITAP 06 TO 002 - 1508 AS\Project Files\Fogotogo Storm Channel\Engineering Drawings 12.18.07\Water & Sewer Connection - 108.dwg DETAILS 12/21/2007 2:11:48 PM



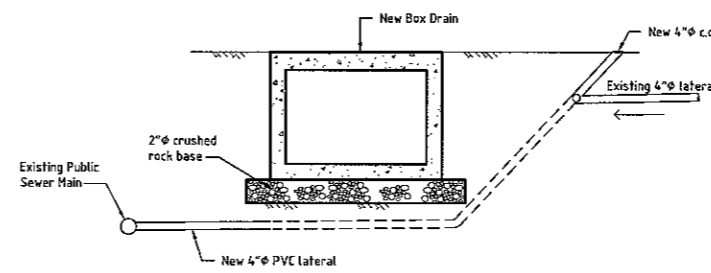
Plan - Water Connection Detail  
1/4" = 1'-0"



Plan - Water Connection Detail  
1/4" = 1'-0"



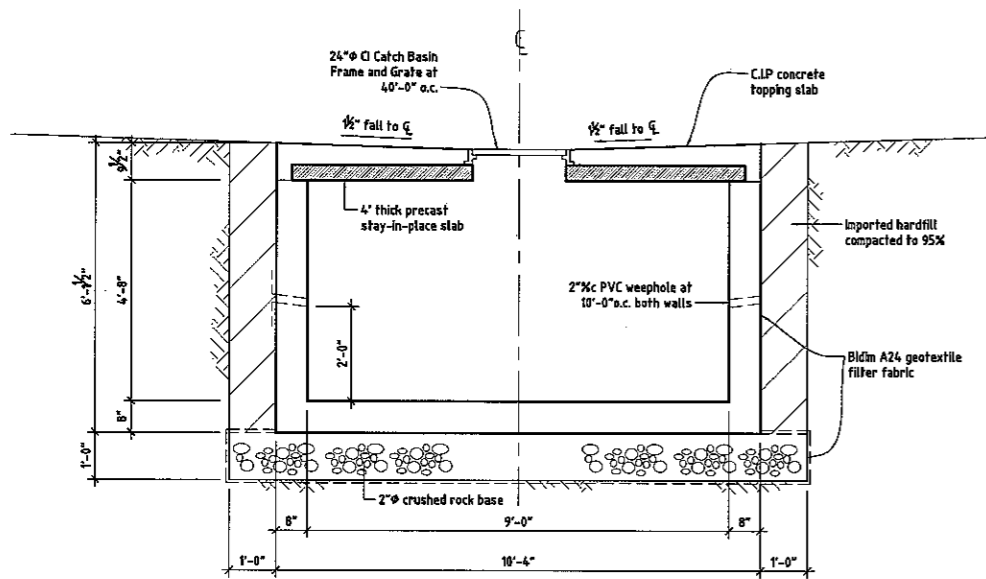
Elevation - Water Connection Detail  
1/4" = 1'-0"



Elevation Section 1-1 Sewer Connection Detail  
1/4" = 1'-0"

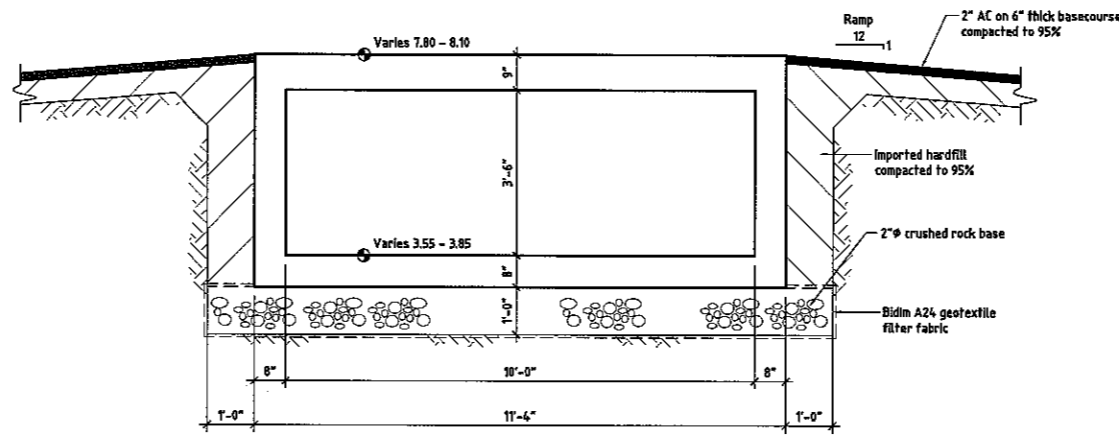
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	DRAWN BY:	BTP	17 Dec 07			PROJECT NAME, DRAWING TITLE:	Fagatogo Streams Flood Mitigation Water and Sewer Connection Details
	DESIGNED CHECKED:					SCALE (AT A1 AS SHOWN):	As Shown (A1)
	DRAFTING CHECKED:					JOB NO.:	1323-07
2	Permit Drawings	WCG	17 Dec 07	APPROVED:	<b>NOT FOR CONSTRUCTION</b>	DRAWING NO.:	108
1	Preliminary Design	WCG	05 July 07	Copyright of this drawing shall remain the property of Tinai, Gordon & Associates Limited.		REVISION NO.:	2

Y:\PBA - TAC and HNTAP\HNTAP 06 TO 002 - 1506 AS\Project Files\Fogatogo Storm Channel\Engineering Drawings 12.18.07\Box Drain Details - 106.dwg Elevation Sections 12/21/2007 2:08:37 PM

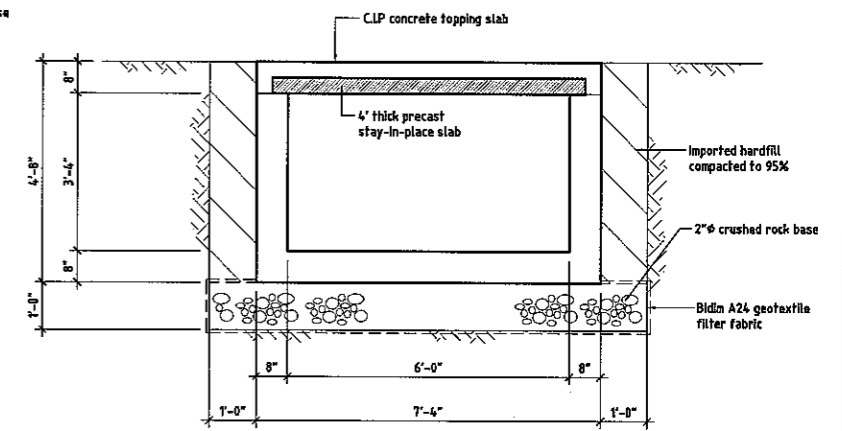


Elevation Section - Type A, 9'-0" w x 4'-8" h Box Drain

Note: Market Stream, Stas 4+50 - 7+50

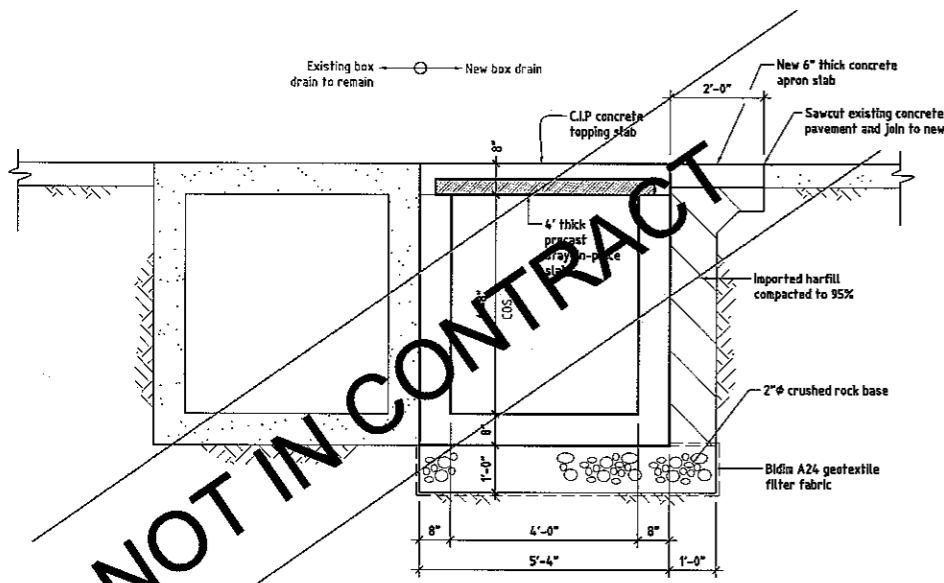


Elevation Section - Type C, 10'-0" w x 3'-6" h Box Culvert



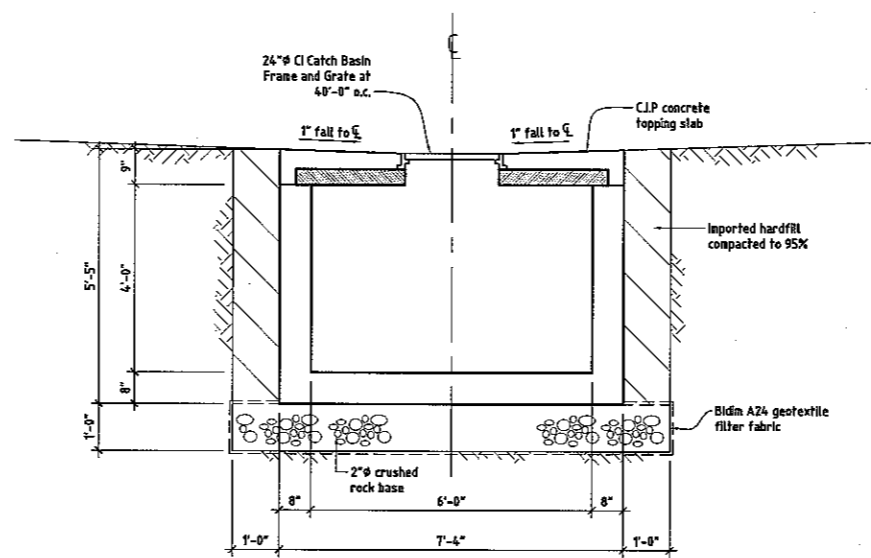
Elevation Section - Type E, 6'-0" w x 3'-4" h Box Drain

Note: ANZ Stream, Stas minus 2+25 - 0+00



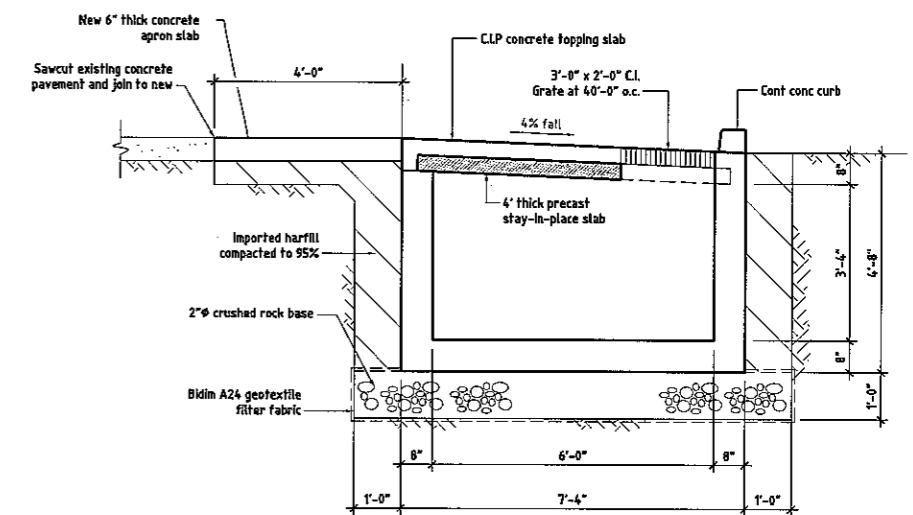
Elevation Section - Type B, 4'-0" w x 4'-8" h Box Drain

Note: Market Stream, Stas 7+75 - 10+50



Elevation Section - Type D, 6'-0" w x 4'-0" h Box Drain

Note: Metro Stream, Stas 2+35 - 5+00



Elevation Section - Type F, 6'-0" w x 3'-4" h Box Drain

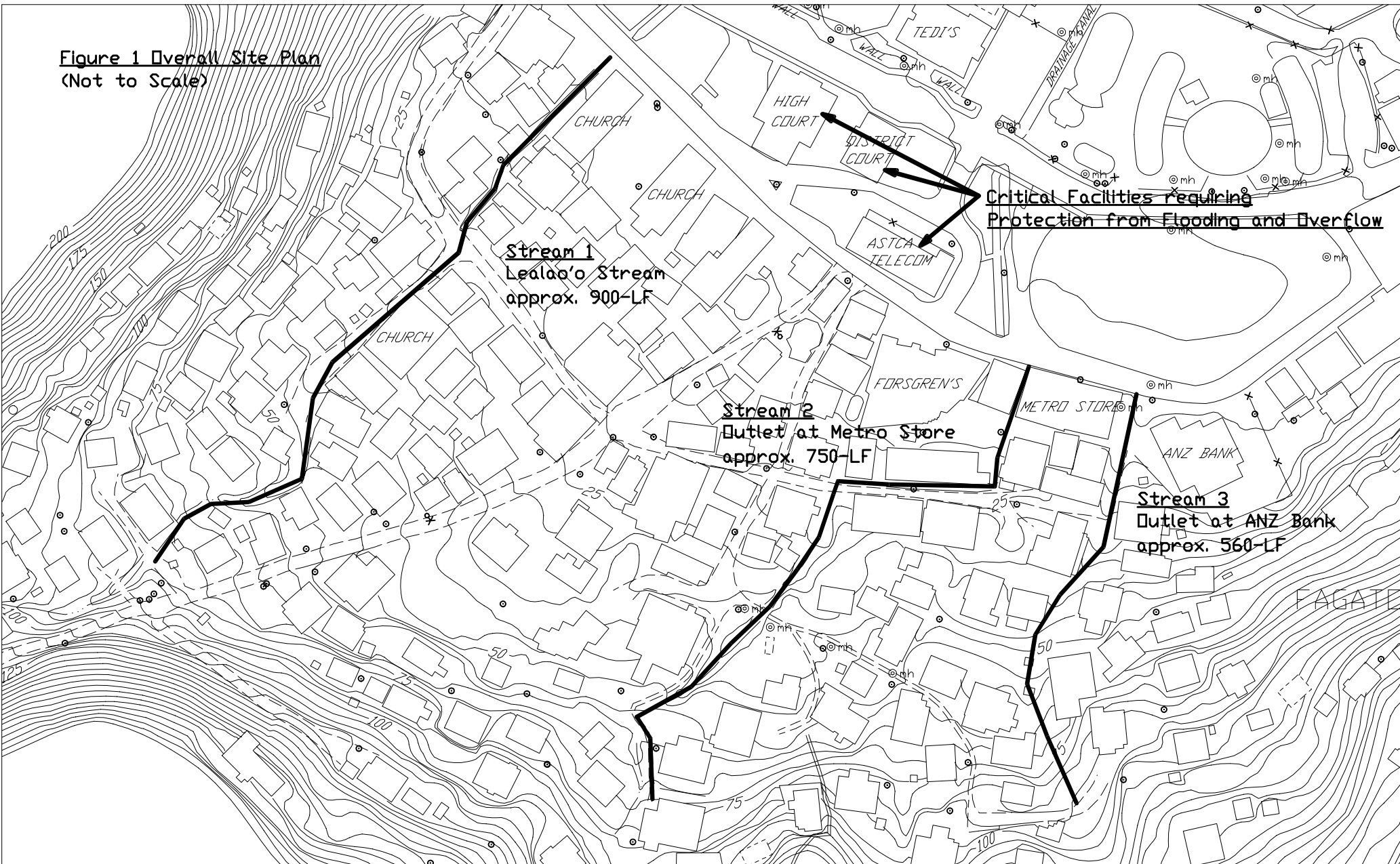
Note: ANZ Stream, Stas 0+00 - 5+00

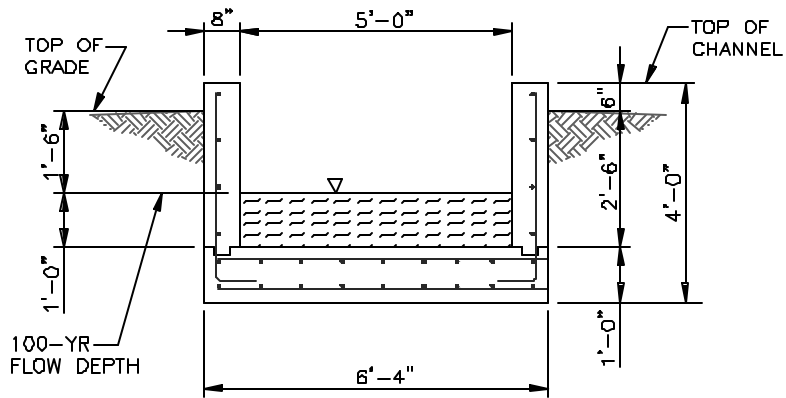
NOTES:

	DESIGNED BY:	W.C.G.	17 Dec 07		<b>TINAL, GORDON &amp; ASSOCIATES LTD.</b> CIVIL & STRUCTURAL ENGINEERS LEVEL 4, ACB HOUSE, BEACH ROAD P.O. BOX 9581 APIA, SAMOA TEL: (685) 22-906 FAX: (685) 22-913 EMAIL: tga@samos.ws	CLIENT, PROJECT LOCATION:	American Samoa Government Pago Pago, American Samoa	
	DRAWN BY:	BTP	17 Dec 07			PROJECT NAME, DWG TITLE:	Fogatogo Streams Flood Mitigation Section Details - Proposed Drainage Structures	
2	Permit Drawings	WCG	17 Dec 07	<b>NOT FOR CONSTRUCTION</b> Copyright of this drawing shall remain the property of Tinal, Gordon & Associates Limited.		SCALE (AT 1/4" = 1'-0")	1/2" = 1'-0" (A1) 1/4" = 1'-0" (A3, 11"x17")	
1	Preliminary Design	WCG	05 July 07			DRAWING NO:	1323-07	
							DRAWING NO:	106
							REVISION NO:	2

**Appendix B**  
**Drawings for Original Design Plan**

**Figure 1 Overall Site Plan**  
(Not to Scale)





TYP CROSS-SECTION



**Appendix C**  
**Interagency Consultations**



**FEMA**

December 19, 2007

Peter Galloway  
U.S. Army Corps of Engineers  
Regulatory Branch  
Building 230  
Fort Shafter, Hawaii 96858-5440

Re: Modification of Fagatogo Storm Water Channel  
FEMA-1506-DR-AS, HMGP 1506-4  
Subgrantee: American Samoa Disaster Relief Office

Dear Mr. Galloway:

The American Samoa Disaster Relief Office (ASDRO) has applied to the Department of Homeland Security's Federal Emergency Management Agency (FEMA) for funds to conduct a storm water control project. FEMA is proposing to fund the project through the Hazard Mitigation Grant Program (HMGP) under the presidential disaster declaration (FEMA-1506-DR-AS) for Cyclone Heta that occurred in January 2004.

The proposed action is located in the Village of Fagatogo on the southern coast of Tutuila, southeast of the Village of Pago Pago. The project would involve modifications to three drainage channels: Lealao'o Stream, Metro Stream, and ANZ Stream. A detailed project description and engineering drawings are enclosed.

The intent of this letter is to apprise your agency that this action appears to require a Department of the Army (DA) permit under Section 404 of the Clean Water Act of 1972 (CWA). FEMA will require, as a condition of the grant, that ASDRO fully complies with Section 404 of the CWA and is responsible for obtaining any necessary DA permits.

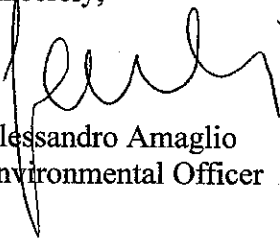
FEMA is initiating consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act (ESA). Based on the agreement between FEMA Region IX and the South Pacific Division of the U.S. Army Corps of Engineers, FEMA is the lead agency for ESA compliance because this project is proposed for funding under the HMGP.

Mr. Peter Galloway  
December 19, 2007  
Page 2

FEMA is also conducting an Environmental Assessment (EA) of the project in compliance with the National Environmental Policy Act. FEMA will provide you with a copy of the Draft EA for review and comment.

If you require further information or clarification regarding this notification, please do not hesitate to contact me in writing at the above address or at (510) 627-7027. Thank you for your cooperation in this matter.

Sincerely,



Alessandro Amaglio  
Environmental Officer

Attachments

cc: Lima Fiatoa, ASDRO



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office  
300 Ala Moana Boulevard, Room 3-122, Box 50088  
Honolulu, Hawaii 96850

In Reply Refer To:  
2008-I-0080

JAN 24 2008

Mr. Alessandro Amaglio  
U.S. Department of Homeland Security  
Federal Emergency Management Agency  
1111 Broadway, Suite 1200  
Oakland, CA 94607-4052

Subject: Informal Consultation Regarding the Proposed Modification of Fagatogo Storm Water Channel (FEMA-1506-DR-AS, HMGP 1506-4), Village of Fagatogo, Tutuila, American Samoa

Dear Mr. Amaglio:

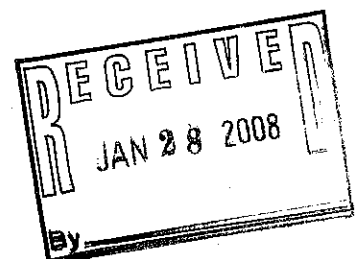
This letter is in response to your December 19, 2007, letter requesting informal consultation for the proposed modification of Fagatogo storm water channel in the village of Fagatogo, Tutuila, American Samoa (proposed project). We received your letter on December 26, 2007. At issue are the potential effects of the proposed project on the threatened loggerhead sea turtle (*Caretta caretta*), threatened green sea turtle (*Chelonia mydas*), endangered leatherback sea turtle (*Dermochelys coriacea*), and endangered hawksbill sea turtle (*Eretmochelys imbricata*) (collectively referred to as sea turtles). This response is in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The U.S. Fish and Wildlife Service consults only on nesting sea turtles and their use of nesting habitats (terrestrial portion of the proposed project). The National Marine Fisheries Service (NMFS) consults on sea turtles and their use of off-shore and open ocean habitats. Therefore, we reviewed the proposed project for potential impacts to nesting sea turtles only. We recommend that you consult with NMFS regarding the potential impacts from the proposed project to sea turtles and their use off-shore and open ocean habitats. The findings and recommendations in this consultation are based on: (1) your December 19, 2007, letter; and (2) other information available to us.

### Project Description

In your letter you indicated that Federal Emergency Management Agency (FEMA) is proposing to fund the American Samoa Disaster Relief Office (ASDRO) to implement the proposed project

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which will reduce or alleviate the risk of flooding from three streams in the Fagatogo area: Lealao o Stream, Metro Stream, and ANZ Stream. The action area is urban and is generally a road and harbor area reinforced with concrete or other hard impermeable surfaces.

#### *Lealao o Stream*

Lealao o Stream empties into Pago Pago Harbor after passing through an existing open, concrete, tidal channel. Approximately 300 linear feet of the existing concrete stream channel will be excavated. A covered box drain (9 feet wide by 4 feet 8 inches high) will be installed in the excavated area. At an existing culvert modifications will be made to reinforce the culvert and debris rack, capture subsidiary flows, and prevent erosion.

#### *Metro Stream*

Metro stream empties into Pago Pago Harbor after passing through an existing open, concrete tidal channel. Approximately 270 linear feet of the existing stream channel will be excavated and a box drain (6 feet wide by 4 feet high) will be installed. An existing culvert will be replaced and a utility line will be relocated under the stream channel.

#### *ANZ Stream*

ANZ Stream meets with Metro Stream in an existing open, concrete tidal channel; however, ANZ Stream currently has no defined channel of its own. Therefore, approximately 800 linear feet of roadway will be excavated and a box drain (6 feet wide by 3 feet 4 inches high) will be installed to capture flows. The box drain would empty into the downstream end of Metro Stream. At the upstream end of ANZ stream, an existing culvert would be replaced and the stream inlet widened. Bollards and a debris rack would be installed at the new culvert.

#### *Conservation Measures*

Construction activities may cause soil erosion from water and wind action. Erosion and sedimentation could indirectly affect sea turtles abilities to foraging or locate nesting habitat. To limit erosion and sedimentation from the proposed project into Pago Pago Harbor you proposed the following conservation measures within your consultation request to avoid effects to the listed species.

- 1) Limit all construction to the non-cyclone season (April to October).
- 2) Prepare and implement an erosion control plan to reduce potential erosion from construction activities. The erosion control plan will include phased construction to minimize the amount of exposed soil at any given time and would require all work to cease during heavy rains.
- 3) Prepare and implement a spill control plan to reduce potential damage from broken water or sewer mains.
- 4) Cover soil that is stockpiled on-site for use as fill or that has been excavated from the action area. A sediment barrier around stockpiles will be constructed to prevent sediment loss.

- 5) Develop a debris disposal plan to insure that all excavated material is transferred to a designated and pre-approved debris disposal site.
- 6) Implement permanent erosion control measures such as revegetation with native riparian species, where appropriate, when construction is completed.
- 7) Turbidity and siltation from project-related work will be minimized and contained to the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
- 8) All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water will be cleaned of pollutants prior to use.
- 9) No project-related materials (fill, revetment rock, pipe etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).
- 10) No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) will result from project-related activities.
- 11) Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms will be stored on-site, if appropriate, to facilitate the clean-up of accidental petroleum releases.
- 12) Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.

### **Species Affected**

*Loggerhead sea turtle* – The biology and ecology of this species is summarized in its Recovery Plan (NMFS and USFWS 1998a) that indicates there are no known nesting records of loggerhead sea turtles on American Samoa and there has not been any sightings of loggerhead sea turtles around American Samoa. Therefore, we concur with your determination that the terrestrial portion of the proposed project may affect, but is not likely to adversely affect the green sea turtle. We consider these affects discountable because they are extremely unlikely to occur due to the lack of known sightings and nesting of loggerhead sea turtles around American Samoa.

*Green sea turtle* – The biology and ecology of this species is summarized in its Recovery Plan (NMFS and USFWS 1998b) that indicates low level nesting may occur on the island of Tutuila in American Samoa and can occur in the waters adjacent to the island, but not in high numbers. On the south side of Tutuila Island, there is a general degradation of coral reef habitats (NMFS and USFWS 1998b) and few known sea grass beds (resting and foraging habitat) (USFWS 2005) likely due to sedimentation and erosion from human impacts and natural disturbances. Green sea turtles have been sighted in Pago Pago Harbor; however, there are no known nesting sites within the harbor. We concur with your determination that the terrestrial portion of the proposed project may affect, but is not likely to adversely affect the green sea turtle. We consider the

potential affects from the proposed project discountable because they are extremely unlikely to occur due to the limited off-shore habitat to attract green sea turtles to the action area (USFWS 2005), the lack of nesting beaches and nesting records in the action area, and the generally low numbers of green sea turtles present around Tutuila.

*Leatherback sea turtle* - The biology and ecology of this species is summarized in its Recovery Plan (NMFS and USFWS 1998c) indicates there are no known nesting records and only one sighting of a leatherback sea turtle in American Samoa near Swain's Island at a water depth of 1,400 meters (longline capture). Therefore, we concur with your determination that the terrestrial portion of the proposed project may affect, but is not likely to adversely affect the green sea turtle. We consider these affects discountable because they are extremely unlikely to occur due to the lack of known nesting and only one sighting of a leatherback sea turtle near American Samoa.

*Hawksbill sea turtle* - The biology and ecology of this species is summarized in its Recovery Plan (NMFS and USFWS 1998d) and Five-year status review (2007). Fewer than 30 females are estimated to nest in American Samoa and show a decreasing population trend. The majority of these nests are on the island of Tutuila. Nesting generally occurs in Western Samoa between October and June with a peak in January and February; although nesting activity has been reported throughout the year. Hawksbill sea turtles have been sighted in Pago Pago Harbor; however, there are no known nesting sites within the harbor. We concur with your determination that the terrestrial portion of the proposed project may affect, but is not likely to adversely affect the hawksbill sea turtle. We consider the potential affects from the proposed project discountable because they are extremely unlikely to occur due to the limited off-shore habitat to attract the species to the action area (USFWS 2005), the lack of nesting habitat and nesting records within the action area, and because all construction will occur outside of the breeding season in the unlikely event that a turtle is in the area attempting to locate nesting habitat.

### **Summary**

We concur with your determination that the terrestrial portion of the proposed project may affect but is not likely to adversely affect any of the four sea turtle species reviewed in this consultation. We request that you provide us with a copy of the final: erosion control plan, spill control plan, and debris disposal plan for our reference. Please make sure the debris disposal area is not habitat for listed species. We recommend that you contact NMFS in regards to potential impacts to sea turtles in off-shore habitats.

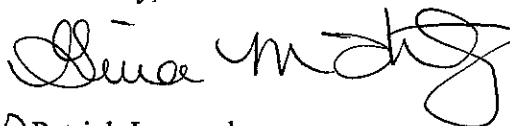
Also, there are several candidate species that occur on American Samoa: mammal - sheath-tailed bat or Pe'ape'avai (*Emballonura semicaudata*); Birds - friendly ground dove or Tu'aimeo (female) and Tutauifa (male) (*Gallicolumba stairi*) and spotless crane (*Porzana tabuensis*); and snails - Tutuila tree snail or Sisi vao (*Eua zebrina*); sisi (*Ostodes strigatus*). Should any of these species be proposed for listing prior to or during implementation of the proposed project, you should contact our office to determine if an informal or formal conference is needed (see section 7(a)4 of the Act). Otherwise, unless the project description changes, or new information reveals that the effects of the proposed action may affect listed species in a manner or to an extent not considered, or a new species or critical habitat is designated that may be affected by the proposed

Mr. Alessandro Amaglio

5

action, no further action pursuant to the Act is necessary. If you have questions regarding this consultation, please contact Holly Herod, Fish and Wildlife Biologist, at 808-792-9400.

Sincerely,

A handwritten signature in cursive script, appearing to read "Patrick Leonard".

for Patrick Leonard  
Field Supervisor



Literature Cited

- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998a. Recovery plan for U.S. Pacific populations of the loggerhead turtle (*Caretta caretta*). National Marine Fisheries Service, Silver Spring, MD.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998b. Recovery plan for U.S. Pacific populations of the green turtle (*Chelonia mydas*). National Marine Fisheries Service, Silver Spring, MD.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998c. Recovery plan for U.S. Pacific populations of the leatherback turtle (*Dermochelys coriacea*). National Marine Fisheries Service, Silver Spring, MD.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998d. Recovery plan for U.S. Pacific populations of the hawksbill turtle (*Eretmochelys imbricata*). National Marine Fisheries Service, Silver Spring, MD.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2007. Hawksbill sea turtle (*Eretmochelys imbricata*) 5-year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, MD.
- U.S. Fish and Wildlife Service. 2005. Final Fish and Wildlife Coordination Act report, Tutuila Harbor study, island of Tutuila, American Samoa. U.S. Fish and Wildlife Service, Honolulu, HI.



**FEMA**

February 7, 2008

Mr. Chris Yates  
Assistant Regional Administrator, Protected Resources  
National Marine Fisheries Service  
Pacific Islands Regional Office  
1601 Kapiolani Boulevard, Suite 1110  
Honolulu, HI 96814

Re: Modification of Fagatogo Storm Water Channel  
FEMA-1506-DR-AS, HMGP 1506-4  
Subgrantee: American Samoa Disaster Relief Office

Dear Mr. Yates:

The American Samoa Disaster Relief Office (ASDRO) has applied to the Department of Homeland Security's Federal Emergency Management Agency (FEMA) for funds to conduct a storm water control project. FEMA is proposing to fund the project through the Hazard Mitigation Grant Program (HMGP) under the presidential disaster declaration (FEMA-1506-DR-AS) for Cyclone Heta that occurred in January 2004. FEMA has consulted with the United States Fish and Wildlife Service (USFWS) on the proposed action in compliance with Section 7 of the Endangered Species Act (ESA), and, in a letter dated January 24, 2008, USFWS concurred that the proposed action is not likely to adversely affect any federally listed nesting sea turtles or their habitat (enclosed). USFWS recommended that FEMA also consult with the National Marine Fisheries Service (NMFS) regarding potential impacts to sea turtles in open water. This letter represents FEMA's notification to NMFS of its determination of no adverse effects to sea turtles under NMFS's jurisdiction.

The proposed action is located in the Village of Fagatogo on the southern coast of Tutuila, southeast of the Village of Pago Pago, in American Samoa (Figure 1). ASDRO has identified the need to reduce the hazard caused by the flooding of three drainage channels in Fagatogo: Market Stream, Metro Stream, and ANZ Stream (Figure 2). Reducing these flood hazards would help protect residents and their property, government employees and property, and critical facilities.

The action area consists of three urbanized riparian corridors, which are all narrow, steep, and substantially disturbed by residential development. The streams are almost entirely covered in concrete. Market Stream empties into Pago Pago Harbor after passing through an existing open, concrete, tidal channel. ANZ Streams meets with Metro Stream in an existing open, concrete tidal

channel before emptying into Pago Pago Harbor. A detailed description of the work proposed for each stream, engineering drawings, and photographs are enclosed.

Representatives of URS Corporation (URS), consultant to FEMA, conducted a reconnaissance survey of the action area on November 9, 2007. The survey involved identification of vegetation communities in the action area, as well as identifying habitat suitable to support federally listed species. Prior to the site visit, information concerning species listed as threatened, endangered, or proposed to be listed as threatened or endangered under the ESA, that may occur in the action area was obtained from the USFWS website (2007) and Craig's Natural History Guide to American Samoa (2002).

Four species of sea turtles that are federally listed as threatened or endangered have the potential to occur in the vicinity of American Samoa, as presented in Table 1. A literature review was conducted to identify habitat requirements and distribution of these species.

**Table 1**  
**Protected Species with Potential to Occur in the Vicinity of American Samoa**

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurrence in Action Area *
<i>Caretta caretta</i>	Loggerhead sea turtle	T	Open ocean. Nests in sandy beaches.	No potential because no sightings around American Samoa. No deepwater, coral, or sea grass bed habitats in the action area.
<i>Chelonia mydas</i>	Green sea turtle	T	Open ocean. Nests in sandy beaches.	Little potential because of low numbers present around Tutuila. No deepwater, coral, or sea grass bed habitats in the action area.
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	Open ocean. Nests in sandy beaches.	No potential because no sightings around Tutuila. No deepwater, coral, or sea grass bed habitats in the action area.
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle	E	Open ocean. Nests in sandy beaches.	Little potential because of low numbers present around Tutuila. No deepwater, coral, or sea grass bed habitats in the action area.

T = threatened, E = endangered

\* Source: USFWS letter of January 24, 2008

As a result of the field survey and literature review, FEMA has determined that the proposed action would not directly affect any federally listed species, as the action area does not provide sandy beaches suitable for turtle nesting or coral reefs, sea grass beds, or open ocean suitable for turtle foraging and resting.

FEMA has determined that protected sea turtles could be indirectly affected during construction activities. Erosion and sedimentation caused by construction activities in the streams could reach Pago Pago Harbor and indirectly affect sea turtles passing through the area where Market Stream and Metro Stream empty into Pago Pago Harbor. However, this effect would be temporary because it would only last during the construction activities. Further, as this area is not nesting, foraging, or resting habitat, impacts to sea turtles would be minor and infrequent. In order to minimize short-term impacts to sea turtles, ASDRO would be required by FEMA to implement the following measures as stipulated by USFWS in its letter dated January 24, 2008:

- Limit all construction to the non-cyclone season: April to October.
- Prepare and implement an erosion control plan to reduce potential erosion from construction activities. The erosion control plan would include phased construction to minimize the amount of exposed soil at any given time and would require all work to cease during heavy rains.
- Prepare and implement a spill control plan to reduce potential damage from broken water or sewer mains.
- Cover soil that is stockpiled on-site for use as fill or that has been excavated from the action area and constructing a sediment barrier around stockpiles to prevent sediment loss.
- Develop a debris disposal plan to insure that all excavated material is transferred to a designated and pre-approved debris disposal site.
- Implement permanent erosion control measures such as revegetation with native riparian species, where appropriate, when construction is completed.
- Turbidity and siltation from project-related work will be minimized and contained to the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
- All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water will be cleaned of pollutants prior to use.
- No project-related materials (fill, revetment rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).
- No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) will result from project-related activities.
- Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms will be stored on site, if appropriate, to facilitate the clean-up of accidental petroleum releases.
- Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.

FEMA has determined that long-term impacts on sea turtles would be beneficial. By constructing bollards and debris racks, the proposed action would reduce the amount of debris deposited by

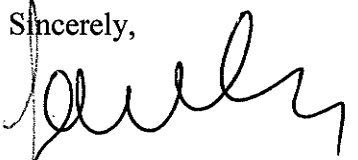
Mr. Chris Yates  
February 7, 2008  
Page 4

streams into Pago Pago Harbor at Fagatogo. Sediment reaching the harbor would also be marginally reduced because the proposed action would reduce the potential for erosion along unpaved and/or unchannelled sections of Market Stream, Metro Stream, or ANZ Stream. In addition, the proposed action would convey water associated with storms up to the 100-year event, thereby reducing the potential for erosion from smaller events overflowing the existing channels, eroding the channel banks and surrounding areas, and depositing the sediment in Pago Pago Harbor. Similarly, by conveying storms up to the 100-year event, petroleum, oils, and lubricants; household hazardous waste; and trash on roads, driveways, and residential yards would not be carried by more frequent storm events downstream and into the harbor. The proposed action would capture large debris in the bollards, trap small debris in the debris racks, and flush remaining sediment through to the existing open channels downstream. During moderate storms, much of the sediment would settle into the existing open and relatively level downstream channels. During severe events, because the proposed action would increase the streams' flow capacities, the water from all three streams would enter Pago Pago Harbor at a higher velocity. By carrying sediment further into the harbor and providing it with a larger dispersal area, the proposed action would reduce the concentration of sedimentation in the harbor close to the mouths of the streams.

The proposed action will require proper maintenance in order to have the beneficial impacts of trapping debris and capturing sediment as described above, as well as to ensure it conveys flood flows as proposed. Debris will need to be frequently removed from the bollards and debris racks, and sediment will need to be periodically removed from the box drain via the grates and the open channels. The Village of Fagatogo will be responsible for long-term maintenance of the system and will remove debris from the bollards and debris racks frequently and remove sediment from the box drains via the grates and from the downstream open channels periodically.

For these reasons, FEMA has determined that the proposed action will have no adverse effects on the four federally listed sea turtles under NMFS's jurisdiction and will have beneficial effects in the long-term.

If you should require any additional information regarding the proposed action or FEMA's determination, please feel free to contact me at (510) 627-7284 or Morgan Griffin of URS at (510) 874-3192.

Sincerely,  
  
Alessandro Amaglio  
Environmental Officer

Attachments

cc: Lima Fiatoa, ASDRO (attachments omitted)



**Executive Offices of the Governor  
American Samoa Historic Preservation Office**

American Samoa Government  
Pago Pago, American Samoa 96799

**Togiola T.A. Tulafono**  
*Governor*

**Altofele T.F. Sunia**  
*Lt. Governor*

**John Enright**  
*Historic Preservation Officer*

Phone: (684) 699-2376  
FAX: (684) 699-2276

February 19, 2008

Mr. Alessandro Amaglio  
Environmental Officer  
FEMA  
U.S. Department of Homeland Security  
1111 Broadway, Suite 1200  
Oakland, CA 94607-4052

**SERIAL:**  
030-08HP

**Re: Modifications of Fagatogo Storm Water Channel**  
FEMA-1506-DR-AS, HMGP 1506-4  
Subgrantee: American Samoa Disaster Relief Office

Dear Mr. Amaglio:

Thank you for your letter of February 4, 2008, addressed to Mr. John Enright, received February 19, 2008 via email, concerning the Fagatogo Storm Water Channel modifications undertaking. I have reviewed your letter and the final design plans received via prior correspondence.

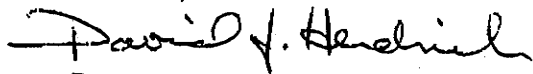
I concur with your determination of no adverse effect on the Fagatogo Malae and the Naval Administration-era concrete road with the implementation of conditions for monitoring of the Fagatogo Malae and the concrete road, limited archival research on the concrete road, and restoration of the Fagatogo Malae to its original condition as it appeared at the start of construction, as specified in your letter.

In addition I concur with you plans for addressing unanticipated discoveries, as per 36 CFR 800.13(b), and the plans for addressing the possible discovery of human remains.

Thank you for your time and attention. This correspondence was provided upon the request of the Federal Emergency Management Agency in order to assist the FEMA with its Section 106 responsibilities under the National Historic Preservation Act of 1966, as amended.

If you have any questions concerning this correspondence please do not hesitate to contact me at (684) 699-2316.

Sincerely,

A handwritten signature in black ink that reads "David J. Herdrich". The signature is written in a cursive style with a large initial "D".

David J. Herdrich  
Acting Historic Preservation Officer

Lima Fiatoa, ASDRO



FEMA

March 14, 2008

Re: Fagatogo Stormwater Modification Project, FEMA-1506-DR-AS, HMGP #1506-4  
Subgrantee: American Samoa Disaster Relief Office

Dear Interested Party:

In accordance with the National Environmental Policy Act and appropriate implementing regulations, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) has prepared a Draft Environmental Assessment (Draft EA) for the subject project.

Attached are a CD with the Draft EA and a list of CD recipients. The Draft EA is also available on-line at [www.fema.gov/plan/ehp/envdocuments/ea-region9.shtm](http://www.fema.gov/plan/ehp/envdocuments/ea-region9.shtm) and at the following location:

American Samoa Disaster Relief Office  
Nu'uuli #26-500  
Pago Pago, American Samoa 96799  
Contact: John Goeke, (684) 699-1329

If you have comments relevant to the Draft EA, please provide them to my attention at the letterhead address. To be considered in the decision-making process, comments must be received by April 2, 2008. Until that date, FEMA will take no further action regarding subject project.

Sincerely,

A handwritten signature in black ink, appearing to read "Alessandro Amaglio".

Alessandro Amaglio  
Environmental Officer

Attachments



**Distribution List: FEMA-1506-DR-AS, HMGP #1506-4**

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Tufono Ionatana  
Mayor, Village of Fagatogo  
c/o Lima Fiatoa  
American Samoa Disaster Relief Office  
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Pago Pago, American Samoa 96799

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American Samoa Department of Commerce  
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Mike Sala  
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Sina Voigt  
American Samoa Department of Public Works  
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Pago Pago, American Samoa 96799

Matt Vojick  
American Samoa Environmental Protection Agency  
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Pago Pago, American Samoa 96799

Mr. Chris Yates  
Assistant Regional Administrator, Protected Resources  
National Marine Fisheries Service  
Pacific Islands Regional Office  
1601 Kapiolani Boulevard, Suite 1110  
Honolulu, HI 96814