CHAPTER 15. VISUAL RESOURCES

15.1 INTRODUCTION

This chapter discusses potential environmental consequences associated with implementing the alternatives within the region of influence on visual resources. A description of the affected environment for visual resources is provided in Volume 2. The locations described in Volume 2 include the region of influence for the utilities and roadway projects as they relate to visual resources.

15.2 ENVIRONMENTAL CONSEQUENCES

15.2.1 Approach to Analysis

15.2.1.1 Methodology

Utilities

Information on visual resources was gathered through onsite visits, background research, and participation in stakeholder and public meetings. The analysis of potential impacts on visual resources is based on the long-term (operational) effects (i.e., after construction has occurred and all buildings, facilities, and structures are in place). Construction-related activities would be relatively minimal in their impacts (i.e., earth-moving equipment clearing vegetation and constructing facilities and other structures).

Off Base Roadways

This visual assessment was prepared consistent with the methodologies established by the Federal Highway Administration's Visual Impact Assessment for Highway Projects (1981). This methodology divides the views into landscape or character units that have distinct but not necessarily homogenous visual character. Typical views, called key viewpoints, are selected for each unit to represent the views to/from the project. The view of the motorist is also considered as a separate character unit.

Existing visual quality from the viewpoints is judged by three criteria: vividness, intactness, and unity. Descriptions for the three criteria are:

- Vividness: The memorability of the landscape components as they combine to form striking or distinctive patterns.
- Intactness: The integrity of visual order in the view and its freedom from visual encroachment.
- Unity: The visual coherence and composition of the landscape viewed to form a harmonious visual pattern.

These criteria provide a method for describing the form, line, color, and texture of the components found within a view. As in all things aesthetic, "beauty is in the eye of the beholder;" therefore, there is a subjective component to this or any visual analysis evaluation. However, as outlined in the Federal Highway Administration methods, the use of these descriptors allows for a basis for understanding the evaluator's rationale behind a visual quality determination. Visual character terms are descriptive and non-evaluative, meaning that they are based on defined attributes that are neither good nor bad by themselves. Changes in visual character cannot be described as having good or bad attributes until compared with viewer responses to the change.

15.2.1.2 Determination of Significance

Utilities

For the purpose of the Environmental Impact Statement, the proposed actions would cause a significant impact to visual resources if they:

- Substantially alter the views or scenic quality associated with particularly significant and/or publicly recognized vistas, view sheds, overlooks, or features.
- Substantially change the light, glare, or shadows within a given area.
- Substantially affect sensitive receptors (i.e., viewers with particular sensitivity [or intolerance] to a changed view.
- Significant impacts that cannot be mitigated to less-than-significant levels are considered unavoidable.

A discussion is presented for each significance criterion listed that would be triggered by the utility alternatives.

Off Base Roadways

The National Environmental Policy Act (NEPA) requires consideration of visual resource impacts of projects in preparation of environmental documents. NEPA guidelines for the assessment of visual impacts stipulate that environmental documents:

- State whether the project alternatives have a potential for visual quality impacts.
- Identify the impacts on the existing visual resources.
- Identify the relationship of the impacts on potential viewers of and from the project.
- Identify measures to avoid, minimize, or reduce the adverse impacts.

For projects that do not create a substantial impact on existing visual quality, a more nuanced approach categorizes impact levels as low, moderate, moderately high, and high based on the following descriptions:

- Low: Minor adverse change to the existing visual resource, with low viewer sensitivity to any change. May or may not require mitigation.
- Moderate: Adverse change cannot be described as minor or viewer response is thought to be greater. Impacts can be mitigated within 5 years using conventional practices.
- Moderately High: Moderate adverse change in the visual resource with high viewer response or high adverse change with a moderate viewer response. Extraordinary mitigation measures may be required, and landscape treatments required may take more than 5 years to mitigate.
- High/Substantial: High level of adverse change or a high level of sensitivity to the change such that architectural design and landscape treatments cannot mitigate impacts. An alternative project design may be required to avoid adverse impacts.

For this analysis, the proposed roadway project would be considered to have a substantial impact if it were to result in the obstruction or impairment of important views from a public roadway or scenic vista, result in the substantial modification to the height of the existing structures or topography of an area, or cause a large reduction in the landscape/vegetation within the project area. Such impacts would be considered substantial only if it was not possible to mitigate the impacts on the visual environment of the project.

15.2.1.3 Issues Identified during Public Scoping Process

No issues regarding impact on visual resources as a result of proposed utility and road improvements were raised at the April 2007 public scoping meetings.

15.2.2 Power

15.2.2.1 Basic Alternative 1: Recondition up to Five Existing Guam Power Authority–Permitted Facilities to Provide Peaking Power/Reserve Capacity

Basic Alternative 1 would recondition up to five existing Combustion Turbines and upgrade Transmission and Distribution (T&D) systems and would not require new construction or enlargement of the existing footprint of the facilities. Reconditioning would be made to the existing permitted facilities at the Marbo, Yigo, Dededo (2 units), and Macheche Combustion Turbines. The T&D system upgrades would be on existing above-ground and underground transmission lines. This alternative supports Main Cantonment Alternatives 1 and 2. Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

The Basic Alternative 1 presented would recondition the existing Guam Power Authority facilities, and it is assumed new distribution lines would be routed within the existing utility corridors. Therefore, any changes to the landscape at these affected areas would be consistent with the existing environment and any impacts on visual resources would be less than significant. Table 15.2-1 summarizes the potential impacts of the Basic Alternative 1.

Proposed Mitigation Measures

No mitigation measures are needed.

15.2.2.2 Summary of Impacts

Table 15.2-1. Summary of Potential Impacts on Visual Resources – Power

*Basic Alternative 1**
Views toward upgraded GPA facilities
NI

Legend: GPA = Guam Power Authority; NI = No impact. * Preferred Alternative.

15.2.3 Potable Water

As discussed in Volume 6, Chapter 2, Section 2.2.2, potable water alternatives are not distinguished as interim or long-term.

15.2.3.1 Basic Alternative 1 (Preferred Alternative)

Basic Alternative 1 would provide additional water capacity of 11.3 MGd (42.8 MLd), which is anticipated to be met by an estimated 22 new wells at Andersen Air Force Base (AFB), rehabilitate existing wells, interconnect with the Guam Waterworks Authority (GWA) water system, and associated treatment, storage and distribution systems. Two new 2.5 MG (9.5 ML) water storage tanks would be constructed at ground level at NCTS Finegayan. Up to two new elevated 1 MG (3.8 ML) water storage tanks would be constructed at Finegayan within the Main Cantonment footprint.

New Water Supply Facilities

The proposed development would be confined to Department of Defense properties and keeping with other planned and surrounding facilities. Views from Route 3 into NCTS Finegayan vary from altered landscapes (i.e., the existing gate and NCTS facilities in the south) to a natural-appearing landscape in the

north. Ground-level water storage tanks proposed at NCTS Finegayan would be located near the training area at the Main Cantonment and would not be visible as seen from the existing view corridor along Route 3. Elevated storage tanks situated inside of the Main Cantonment and Route 3, respectively, would be visible from the view corridor on Route 3, though on a varying degree. The resulting view of the elevated water storage tank adjacent to Route 3 would be apparent because of the height of the proposed structure and proximity to the view corridor. However, the resulting view impact would not be significant because a similar existing structure (i.e., elevated water storage tank) presently exists on NCTS Finegayan. The elevated water storage tank situated at the interior of the Main Cantonment would appear distant as seen from the view corridor and may appear to blend in with the proposed base facilities. Inland facilities at NCTS Finegayan would be visible in the middle ground or background and would have less impact on the skyline and visual resources. The proposed water storage tank would not impede upon any particularly significant and/or publicly recognized vistas, view sheds, overlooks, or features. Furthermore, no substantial change would occur related to the light, glare, or shadows in the area. Therefore, any impacts on visual resources would be less than significant.

Proposed Mitigation Measures

Because adverse impacts are anticipated to be less than significant, no mitigation measures are proposed.

15.2.3.2 Basic Alternative 2

Basic Alternative 2 would provide additional water capacity of 11.7 MGd (44.3 MLd), which is anticipated to be met by an estimated 20 new wells at Andersen Air Force Base (AFB) and 11 new wells at Air Force Base Barrigada, rehabilitate existing wells, interconnect with the Guam Waterworks Authority (GWA) water system, and associated treatment, storage and distribution systems. Two new 1.8 MG (6.8 ML) water storage tanks would be constructed at ground level at NCTS Finegayan and one 1 MG (3.8 ML) water storage tank would be construction at Air Force Base Barrigada. Up to two new elevated 1 MG (3.8 ML) water storage tanks would be constructed at Finegayan within the Main Cantonment footprint.

New Water Supply Facilities

The proposed development of up to 20 potable water supply wells at Andersen AFB and up to 11 water supply wells at Air Force Barrigada would be consistent with other planned and surrounding facilities and would not be visible outside of the installations. Therefore, no impacts on existing visual resources are anticipated. New water storage facilities (tanks) proposed at NCTS Finegayan and Air Force Barrigada would be installed at ground level and partially visible as the result. One of the water storage facilities proposed at NCTS Finegayan would be located adjacent to Route 3, and the facility at Air Force Barrigada would be located approximately 1/2 mile (1 kilometer [km]) north of Route 15. Two of these types of water storage facilities already exist at Finegayan (one at NCTS and the other at South Finegayan), and both are adjacent to Route 3.

Views from Route 3 into NCTS Finegayan vary from an altered landscape (i.e., the existing gate and NCTS facilities in the south) to a naturally appearing landscape in the north. The resulting view of the elevated water storage tanks adjacent to Route 3 would be apparent because of the height of the proposed structure and proximity to the view corridor. However, the resulting view impact would not be significant because a similar existing structure presently exists on NCTS Finegayan. The elevated water storage tank situated interior of the Main Cantonment would appear distant as seen from the view corridor and may appear to blend in with the proposed base facilities.

Inland facilities at NCTS Finegayan and Air Force Barrigada would be seen in the middle ground or background and have less impact on the skyline and visual resources, because they would be partially visible. These storage facilities would be adjacent to other installation facilities. None of the proposed water storage tanks would degrade any particularly significant and/or publicly recognized vistas, view sheds, overlooks, or features. No substantial change would occur to the light, glare, or shadows in the area. Therefore, any impacts on visual resources are anticipated to be less than significant.

Proposed Mitigation Measures

Because adverse impacts are anticipated to be less than significant, no mitigation measures are proposed.

15.2.3.3 Summary of Impacts

Table 15.2-2 summarizes the potential impacts of each action alternative.

Table 15.2-2. Summary of Potential Impacts on Visual Resources – Potable Water

*Basic Alternative 1**	*Basic Alternative 2*
Views along Highway 3 adjacent to Finegayan	
LSI	LSI

Legend: LSI = Less than significant impact. *Preferred Alternative.

Both of the alternatives related to potable water supply and storage would introduce new features into the landscape. Due to the size and location of the water supply and treatment features, only the water storage elements (i.e., ground-level tanks and elevated water storage tanks) would be expected to have an impact on visual resources. One of the two new water towers would be located inland of readily visible public features, making them middle ground and background visual elements in the landscape and causing a less than significant impact on visual resources. One elevated water tower would be located directly adjacent to a public highway (Route 3) making it visible in the foreground as well.

15.2.4 Wastewater

15.2.4.1 Basic Alternative 1a (Preferred Alternative) and 1b

Basic Alternative 1 (Alternative 1a supports Main Cantonment Alternatives 1 and 2; and Alternative 1b supports Main Cantonment Alternatives 3 and 8) combines upgrade to the existing primary treatment facilities and expansion to secondary treatment at the Northern District Wastewater Treatment Plant (NDWWTP). The difference between Alternatives 1a and 1b is a requirement for a new sewer line from Barrigada housing to NDWWTP for Alternative 1b.

Upgrading and expanding the primary and secondary treatment system, respectively, would not be visible outside of the facility. The existing visual character of the proposed location would not be altered. Therefore, no impacts on existing visual resources are anticipated.

Proposed Mitigation Measures

No mitigation measures are needed.

15.2.4.2 Alternative 1b

Alternative 1b is identical to Alternative 1a with the additional requirement for a new sewer line from Barrigada housing to NDWWTP. The development of a sewer line would involve ground-level construction work, and while views may be interrupted by the presence of construction equipment, no permanent degradation of visual resources is expected. Therefore, less than significant impacts on visual resources are anticipated.

Proposed Mitigation Measures

No mitigation measures are needed.

15.2.4.3 Summary of Impacts

Little, if any of the features associated with the new or upgraded wastewater treatment facilities would be visible from public viewpoints, particularly those along Route 3. Therefore, no impacts on visual resources are anticipated under any of the wastewater treatment alternatives. Table 15.2-3 summarizes the potential impacts of each interim alternative. An analysis of long-term alternatives was not developed because the alternatives are not ready for project-specific analysis.

Table 15.2-3. Summary of Potential Impacts on Visual Resources – Wastewater

*Basic Alternative 1a**	*Basic Alternative 1b*
Views from Highway 3 near Finegayan South	
NI	LSI

Legend: LSI = Less than significant impact; NI = No impact. * Preferred Alternative.

15.2.5 Solid Waste

15.2.5.1 Basic Alternative 1 (Preferred Alternative)

The Preferred Alternative would be to continue to use the Navy Landfill at Apra Harbor for municipal solid waste (MSW) until the new Government of Guam (GovGuam) Layon Landfill at Dandan is available for use. Disposal of other waste streams excluded from Layon Landfill would continue at the Navy Landfill. Construction and demolition (C&D) debris would continue to be disposed at the Navy hardfill.

The proposed location in Layon is a rocky badland at high elevation adjacent to the Inarajan Village. The proposed mound-shape landfill, situated approximately 435 feet (ft) (133 meters [m]) above mean sea level, is likely to be visible from different vantage points, from road travelers on Route 4 and adjoining villages on the fringe of the rolling southern mountains. Although the proposed landfill location is situated at least 1.5 miles (2.4 km) inland from Route 4, the mound shape of the new landfill could potentially appear prominently among the existing mountain peaks and rolling hills. However, this landfill is already in construction and has been through a separate NEPA review. These potential impacts are not due to the action proposed in this Environmental Impact Statement. Therefore, there are no additional visual impacts from this solid waste alternative from this proposed action.

Proposed Mitigation Measures

Because there are no visual impacts from solid waste alternatives caused by the proposed action, no mitigation measures would be required (see Table 15.2-4).

Table 15.2-4. Summary of Potential Impacts on Visual Resources – Solid Waste

*Basic Alternative 1**
NA

Legend: NA = not applicable.

15.2.6 Off Base Roadways

The visual impact of project alternatives is determined by assessing the visual resource change due to the project and predicting viewer response to that change. Visual resource change is the total change in visual character and visual quality. The first step in determining visual resource change is to assess the compatibility of the proposed project with the existing visual character of the landscape. The second step

is to compare the visual quality of the existing resources with the projected visual quality after the project is constructed. Viewer response to the changes is the sum of viewer exposure and viewer sensitivity to the project, as previously described. The resulting level of visual impact is determined by combining the severity of resource change with the degree to which people are likely to oppose the change.

Existing Viewer Sensitivity

Viewer response is based on two elements – viewer sensitivity and viewer exposure. These elements combine to form a method of predicting how the public might react to visual changes that result from the roadway improvements.

Viewer sensitivity can be defined as an individual's concern for scenic quality and his/her response to change in the visual environment that creates the view. Local values and goals may place greater significance on certain landscape components or locations that might appear unremarkable to an outside observer. Viewer exposure is typically assessed by considering the number of viewers exposed to the view, the type of viewer activity associated with the view, the duration of their view, the speed at which the viewer moves through the environment, and the position of the viewer.

Given the number of changes to the island anticipated as part of the relocating of forces to Guam, it is likely that there would be a high degree of sensitivity on the part of local residents to changes to the visual environment of the island. In addition, because tourism is such a large part of the economy of the island, the overall visual quality would be an important consideration to tourists and those on the island that cater to them.

Local Policy and Goals

In anticipation of the upcoming relocation of Marines from Okinawa to Guam and its effects to the island, the GovGuam has begun a process to develop a Draft Land Use Plan for the North and Central portions of the island. The following are some of the goals established in this document:

- Promote sustainable community development through such measures as development of green spaces and greenways; develop transit-oriented development or transit-ready development; provide diverse opportunities for arts, recreation, and entertainment; increase in-fill in developed areas; and develop design standards.
- Promote the long-term health, character, and identity of the village communities by the development of design standards and practices among other activities.
- Provide a park and recreation system that enhances the quality of life for residents and visitors to Guam by identifying key parks, trails, and greenways needed; and consider a master-planning process for specific significant areas, such as the buffer along Marine Corps Drive (Route 1) between the Micronesia Mall and Y Send Song, to create attractive and functional public areas.
- Integrate future development with open space and natural amenities, including public views of significant natural features and water.
- Establish an interconnected multimodal street network that adequately addresses the travel needs of the community, consistent with community vision by, among other policy directions, establishing requirements for streetscape and design standards that reflect the community character and provide balanced multimodal access.
- Contribute to the quality of life on Guam through the planned provision of infrastructure by describing the role of capital facilities in responding to growth, encouraging beneficial growth, contributing to community character, protecting public health, and environmental quality.

The sum of this effort shows a community that is working to develop in ways and with a quality that would enhance the existing visual environment on the island, and specifically for the Guam Road Network (GRN).

Existing Viewer Groups, Exposure, and Awareness

Community Residents

Residents can be expected to have the highest sensitivity and be the most aware of any groups because they have to live with the projects and are the most familiar with the current visual setting. For the proposed roadway improvements, residents are located adjacent to many of the roads. From these homes, the view to the project area would be direct. It is likely that these residents would be highly sensitive to changes in the visual environment.

Business Owners, Employees, and Customers

This user group would be associated with the existing business within the area of the new bridge, although except for a church, most businesses are far enough removed to not have a clear view into the project area. These viewers would likely have a high awareness of the project, but the principal concern is likely to be the effect of any construction on business access for employees or customers. It is anticipated that these viewers would have a low level of concern regarding the changes to the visual environment.

Regular Motorists

Included in this user group are commuters and local residents and workers who frequently travel within the project area. It is likely that these viewers would be aware of any changes to the visual environment because of their repeated exposure. It is anticipated that viewers from the road would be moderately sensitive to the change in the visual environment.

Occasional Motorists

Occasional motorists include tourists and regional residents from outside the immediate area who infrequently travel the area. These viewers generally have a low exposure and awareness of changes to the visual environment.

Tourists

Tourists, particularly from Japan and Asia, make up a large percentage of the people on the island at any one time. It can generally be assumed that tourists are not familiar with the island. Therefore, tourists are less sensitive to changes in the visual environment; however, they would be very sensitive to the overall visual quality, particularly in areas around the resorts.

15.2.6.1 Alternative 1

The affected environment for visual resources for the proposed roadway improvement projects on Guam is described in Volume 2, Chapter 13, in the Affected Environment section.

Pavement strengthening projects are not anticipated to change the visual environment of the proposed roadway corridors. Because these projects are strictly repaving projects within the existing roadway prism, they should not alter the existing views or visual quality, and the changes should be little noticed. Viewer responses to the changes from repaving of the roadways are likely to be very low. The most noticeable changes would be temporary impacts associated with construction equipment and crews. The existing visual quality of the roadway corridor is anticipated to remain after reconstruction of the

pavement. Based on this reason, visual impacts from the proposed pavement strengthening projects are not further analyzed.

In addition to the pavement strengthening projects, the Military Access Points (MAP) are generally not anticipated to alter the existing visual quality of the roadways. In many instances, the proposed improvements are to existing gate locations. These improvements generally include widening approach roadways to facilitate turning movements; but the facility elements, including low buildings, roadways, fencing, and gate arms, would be similar to the existing elements and would not be anticipated to appreciably change the current visual environment. The MAPs are also located some distance from the main island routes, generally between 0.5-mile (0.8-km) to 1.0-mile (1.6-km) off of the main route that also reduces any visual impact to the routes. Based on this reason, visual impacts from the proposed MAP projects are not further analyzed.

Year 2014 (Peak Construction and Population)

Construction of the proposed projects would occur between 2010 and 2014, with 2014 being the peak year for construction. It is anticipated that the relocation of military personnel would be complete by 2015. With this number of projects being constructed in a 4- to 5-year period, it is anticipated that residents and other viewers on the island would likely notice a rapid increase in urbanization on the island. The widened roadways and intersections, combined with the new roadways, would contribute to this change in visual character for many of the roadway corridors. This would also likely be the peak year for temporary impacts associated with views to equipment, signage, and other elements related to construction of the roadway corridors.

Year 2030

For the horizon year of 2030, it is anticipated that all of the construction of all corridors is complete, and only routine maintenance is necessary along the roadways. The temporary impacts associated with construction would no longer be an issue. For the visual environment, it can be anticipated that the island would exhibit a more urban character, particularly in the North, Central, and Apra Harbor Regions, where most of the proposed projects are located.

North Region

Table 15.2-5 identifies all projects within the North Region and the disposition of each project in terms of this analysis. Following the table is a description of the anticipated impact of each of the projects analyzed within the North Region. This information is also summarized in Table 15.2-6. An analysis of a key view for GRN #57 depicts the anticipated changes to the visual environment.

Table 15.2-5. Guam Roads Network Projects Considered for Analysis, North Region

GRN #	*Route Number*	*Alternatives*				*Carried Forward for Further Analysis?*	*Reason for Inclusion or Exclusion*
		1	*2*	*3*	*8*		
8	3	x	x	x	x	No	This project does not require widening (only pavement strengthening), and to modify the access to Okkodo High School on the interior portion of the road.
9	3	x	x	x	x	**Yes**	Pavement strengthening, widen from 2 lanes to 4 lanes, add median and shoulders from NCTS Finegayan to Route 28; add an additional southbound left-turn lane and add northbound right-turn lane to the Route 3/28 intersection.
10	3	x	x	x	x	**Yes**	Pavement strengthening, widen from 2 lanes to 4 lanes, add median and shoulders from NCTS Finegayan to Route 9; eliminate Y-intersection; provide T-intersection with one left-turn and one right-turn lane on Route 3A, a northbound left-turn lane on Route 3.
22	9	x	x	x	x	**Yes**	Pavement strengthening, widen from 2 lanes to 4 lanes, with median from Route 3 to the Andersen AFB North Gate.
22A	9	x	x	x	x	No	This project does not require widening (only pavement strengthening).
23	1	x	x	x	x	No	This project does not require widening (only pavement strengthening) of Route 1, from Chalan Lujuna to Route 9.
38	MAP		x	x		No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
38A	MAP	x			x	No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
39	MAP	x	x	x	x	No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
39A	MAP		x	x		No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
41	MAP		x			No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
41A	MAP	x			x	No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
42	MAP	x	x	x	x	No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
57	28	x	x	x	x	**Yes**	Pavement strengthening, widen from 2 to 3 lanes between Route 1 and Route 3. Provide northbound left-turn, through, through/right-turn, southbound left-turn, through, and through/right-turn, eastbound left-turn, through, and right-turn lane.
117	15	x	x	x	x	**Yes**	Route 15/29 Intersection – signalize, additional northbound, southbound left-turn lanes, southbound right-turn lane.
124	New Road	x	x		x	**Yes**	The Finegayan Connector road would be a new roadway where only dirt roads and forested land currently exist.

Legend: AFB = Air Force Base; GRN = Guam Road Network; MAP = Military Access Point; NCTS = Naval Computer and Telecommunications Station.

Table 15.2-6. General Visual Quality per Road Corridor/Project Area, North Region

GRN #	*Route Number*	*Segment Limits*	*FHWA Visual Assessment Criteria*			*Overall Visual Quality (V + I + U/3)*	*Existing vs. Proposed Visual Quality*
			Vividness	*Intactness*	*Unity*		
9	3	NCTS Finegayan to Route 28	Moderate	Moderate	Moderate	Moderate	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
10	3	NCTS Finegayan to Route 9	Moderate	Moderate	Moderate	Moderate	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
22	9	Route 3 to Andersen AFB (North Gate)	Moderate	Moderate	Moderate	Moderate	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
57	28	Route 1 to Route 3	Moderately High	Moderate	Moderate	Moderately High	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
117	15	Route 15/29 Intersection	Moderate	Moderate	Moderately Low	Moderate	Existing
			Moderate	Moderate	Moderately Low	Moderate	Post-Construction
124	New	Finegayan Connection	Moderately High	Moderate	Moderately High	Moderately High	Existing
			Moderate	Moderate	Moderately High	Moderate	Post-Construction

Legend: AFB = Air Force Base; GRN = Guam Road Network; NCTS = Naval Computer and Telecommunications Station.

GRN #9, Route 3 from NCTS Finegayan to Route 28

This project would widen the existing Route 3 from two to four lanes and add a median. In addition, the intersection with Route 28 would include a new left-turn lane. Most of the traffic that would use this roadway is traveling to and from Andersen AFB. Currently, there is little residential space in the area not associated with the military base, which would tend to limit the viewers exposed to the changes and would equate to a lower sensitivity to the proposed changes.

It is anticipated that the project would increase the appearance of pavement in the views along the roadway. The shoulders are still anticipated to be mown grass, and curb and gutter would not be included in the pavement section, as it would be in a more urban setting. It is anticipated that the overall visual quality would remain at moderate, with moderate vividness, intactness, and unity.

GRN #10, Route 3 from NCTS Finegayan to Route 9

This project is a continuation of the widening of Route 3, as described in GRN #9, and the impacts are anticipated to be similar. As with the previous section, the overall visual quality is expected to remain moderate, with moderate vividness, intactness, and unity.

GRN #22, Route 9 from Route 3 to the Andersen AFB North Gate

This project would widen the existing two-lane road to four lanes. The changes would increase the urban appearance of the roadway in the rural-appearing area. There are a few residences that face the roadway in some sections of the road. These viewers could be expected to be more sensitive of the changes to the roadway appearance; however, the average roadway traveler is expected to have a low sensitivity. The

overall visual quality of the corridor would be maintained at moderate, with moderate vividness, intactness, and unity.

GRN #57, Route 28 from Route 1 to Route 3

This project would add a center turn lane to the roadway. In the southern residential sections, it is anticipated that viewer sensitivity would be high. To the north, where there are fewer viewers, this sensitivity could be expected to diminish to some extent. The project is anticipated to lower the existing overall visual quality to moderate, with moderate vividness, moderate intactness, and moderate unity.

GRN #117, Route 15/29 Intersection

This project would increase the overall size of the intersection by adding new left-turn lanes to Route 15, plus a southbound right-turn lane. Given the existing rural character of the intersection, the widening would cause the intersection to have a bigger presence in the landscape; however, the overall effect of the additional pavement is likely to be small to most viewers, thereby maintaining the overall visual quality of the area at moderate, with moderate vividness, moderate intactness, and moderately low unity.

GRN #124, Finegayan Connection

This new roadway would be located in an area that is partially disturbed by dirt roads, including Tanguisson Road, among other less formal dirt roads in the area. Because this area is not regularly traveled, viewer sensitivity is expected to be low. The new roadway would add paving and vehicular traffic where there is none, but there are no residences or other "receptors" that might have a view out to the new corridor.

It is anticipated that the new Finegayan Connection would be expected to lower the visual quality of the area slightly to moderate, with moderate vividness, moderate intactness, and moderate unity from its existing moderately high rating.

Key Viewpoint 1: GRN #57, Route 28 Roadway Widening

Because it is not possible to analyze every view within the project area, it is necessary to select a key viewpoint that typifies the visual effects of the project. The key view represents the specific locations for an individual project, with a view from one of the affected viewer groups that might potentially be affected by the project. A photo simulation of the proposed Route 28 realignment can be seen in Figure 15.2-1.

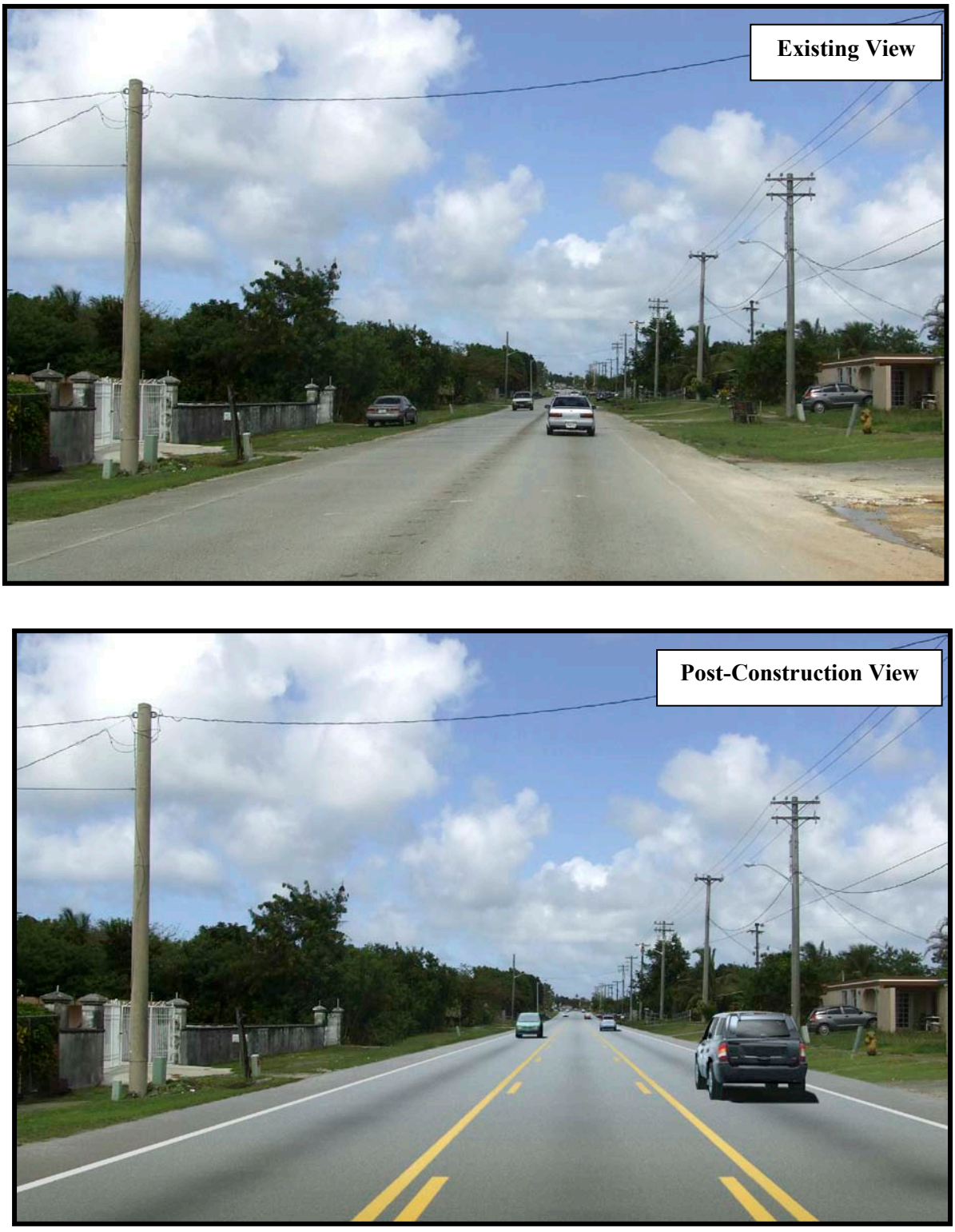

Figure 15.2-1. Key Viewpoint 1. GRN #57, Route 28 Widening

Orientation: The photograph is taken looking north along Route 28. The photograph is taken just north of the Route 28/1 intersection. This view was selected to show the anticipated impacts on a residential area of the proposed roadway widening.

- Existing Visual Character/Quality: The existing visual character of the roadway is that of a residential street. The power lines are considered a visual encroaching element, while the lack of curb and gutter creates a more rural appearance to the residences. The general visual quality of the view is moderate, with moderate vividness, moderately low intactness, and moderate unity.
- Proposed Project Features: The project would add a center turn lane to the existing two-lane roadway, widening the road cross section. There would still be no curb and gutter along the roadway, helping to maintain the "rural" nature of the corridor.
- Changes to Visual Character/Quality: It is anticipated that the existing moderate visual quality would be maintained with the addition of the center turn lane.
- Anticipated Viewer Response: It is anticipated that the primary viewers would be the residents along the roadway and residents traveling along the road. Secondary viewers would be those on the roadway not associated with the area. The residents would be expected to have a moderately high to high sensitivity to the changes in the area, given their familiarity with the existing roadway.
- Resulting Visual Impact: The anticipated resulting visual impact would not substantially alter the existing views.

Summary

Within the North Region, GRN #s 9, 10, 22, 57, 117, and 124 have been identified as having a potential to affect the visual quality of the island, specific to their project areas. In general, the roadways and intersections widened by the GRN projects would have an increased urban character to the views of the roadways. Those traveling on the roadway would likely find the wider pavement sections very noticeable. Pedestrians and those living or working adjacent to the roadway or intersection would likely find the changes very noticeable as well; however, it is not anticipated that these viewers would be highly sensitive to the individual changes, given the cumulative nature of the roadway visual quality changes.

Of the projects in the North Region, it is anticipated that GRN #57 (Route 28 widening), and GRN #124 (new Finegayan Connection), would cause a slight decrease in the existing visual quality of the corridors. In the case of Route 28, viewer sensitivity is expected to be high, given the residential character of portions of the roadway. The Finegayan Connection does not have the viewer sensitivity of Route 28; however, because the roadway would be located through an area of unpaved roads, it would add an urban element where none currently exists.

Indirect impacts of the projects, particularly the roadway and intersection widening projects, would be an increase in the urban character of the North Region of the island from its current, generally rural appearance.

A cumulative impact is defined as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. The cumulative nature of all of the proposed projects associated with Alternative 1 across the island is to change the overall visual character to a more urban view.

Central Region

Table 15.2-7 identifies all of the projects within the Central Region and indicates the disposition of each project in terms of this analysis. Following the table is a description of the anticipated impact of each of the projects analyzed within the Central Region; this information is also summarized Table 15.2-8. An analysis of a key view for GRN #36 depicts the anticipated changes to the visual environment.

Table 15.2-7. Guam Road Network Projects Considered for Analysis, Central Region

GRN #	*Route Number*	*Alternatives*				*Carried Forward for Further Analysis?*	*Reason for Inclusion or Exclusion*
		1	*2*	*3*	*8*		
1	Route 1/ Route 8	x	x	x	x	**Yes**	Project widens the existing Route 1/8 intersection by providing 2 left-turn lanes and 2 right-turn lanes for northbound Route 8 approaching Route 1.
2	Route 1/ Route 3	x	x	x	x	**Yes**	Project would widen the existing Route 1/3 intersection by providing a southbound left-turn lane, a combined left-/right-turn lane, and free right-turn lane with acceleration lane. Also includes east-to-north double left-turn lane.
3	1	x	x	x	x	**Yes**	Replacement of an existing bridge over the Agana River.
6	1	x	x	x	x	No	This project does not require widening (only pavement strengthening).
7	1	x	x	x	x	No	This project does not require widening (only pavement strengthening).
11	Chalan Lujuna	x	x	x	x	**Yes**	This project includes pavement strengthening (2 lanes) from Route 1 to Route 15; add turning lane and intersection improvements for trucks.
12	15	x	x	x	x	No	This project does not require widening (only pavement strengthening).
13	1	x	x	x	x	No	This project does not require widening (only pavement strengthening).
14	1	x	x	x	x	No	This project does not require widening (only pavement strengthening).
15	1	x	x	x	x	No	This project does not require widening (only pavement strengthening).
16	8	x	x	x	x	**Yes**	Project includes pavement strengthening, widening from 4/6 lanes to 6 lanes, with median from Tiyan Parkway/Route 33 (east) to Route 1.
17	8	x	x	x	x	No	This project does not require widening (only pavement strengthening).
18	16	x	x	x	x	No	This project does not require widening (only pavement strengthening).
19	16	x	x	x	x	**Yes**	Pavement strengthening, widening from 4 to 6 lanes, with median from Route 10A to Sabana Barrigada Drive.
20	16	x	x		x	No	This project does not require widening (only pavement strengthening).
21	27	x	x	x	x	No	This project does not require widening (only pavement strengthening).

GRN #	*Route Number*	*Alternatives*				*Carried Forward for Further Analysis?*	*Reason for Inclusion or Exclusion*
		1	*2*	*3*	*8*		
28	26	x	x	x	x	**Yes**	Pavement strengthening, widen from 2 lanes to 4 lanes from Route 1 to Route 15. Provide northbound left-turn, through, through/right, southbound left-turn, 2 through lanes, and right-turn, eastbound left-turn, left-through, and right-turn lane. Southbound right-turn should have raised island and free right to westbound Route 25 curb lane.
29	25	x	x	x	x	**Yes**	Pavement strengthening and widen from 2 lanes to 4 lanes from Route 16 to Route 26.
30	10	x	x	x	x	No	This project does not require widening (only pavement strengthening).
31	8A	x	x		x	No	This project does not require widening (only pavement strengthening).
32	15	x	x	x	x	No	This project does not require widening (only pavement strengthening).
33	1	x	x	x	x	No	This project does not require widening (only pavement strengthening).
35	1	x	x	x	x	**Yes**	Replacement of the existing bridge over the Fonte River.
35	1	x	x	x	x	**Yes**	Replacement of the existing bridge (culvert) No. 1 over the Asan River.
35	1	x	x	x	x	No	Replacement of the existing bridge (culvert) No. 2 over the Asan River tributary.
36	15	x	x	x	x	**Yes**	This project would require a new road alignment through forested areas.
44	MAP	x	x	x	x	No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
46	MAP	x	x	x	x	No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
47	MAP			x		No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
48	MAP			x		No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
49	MAP			x		No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
49A	MAP			x	x	No	MAP 13A, new access across from Chada Street.
63	16			x		**Yes**	Pavement strengthening, widening from 4 to 6 lanes, with median from Route 10A to Sabana Barrigada Drive.
74	8A			x		**Yes**	Widen to provide median and shoulders along roadway.
113	7	x	x	x	x	No	Signing, striping, and minor intersection construction to establish 2-lane circulation around "Y" intersection.

Legend: GRN = Guam Road Network; MAP = Military Access Point.

Table 15.2-8. General Visual Quality per Road Corridor/Project Area, Central Region

GRN #	*Route Number*	*Segment Limits*	*FHWA Visual Assessment Criteria*			*Overall Visual Quality (V + I + U/3)*	*Existing vs. Proposed Visual Quality*
			Vividness	*Intactness*	*Unity*		
1	1	Route 1/8 Intersection	Moderate	Moderate	Moderately Low	Moderate	Existing
			Moderate	Moderate	Moderately Low	Moderate	Post-Construction
2	1	Route 1/3 Intersection	Moderately High	Moderately High	Moderate	Moderately High	Existing
			Moderately High	Moderately High	Moderate	Moderately High	Post-Construction
3	1	Agana Bridge Replacement	Moderate	Moderate	Moderate	Moderate	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
11	Chalan Lujuna	Route 1 to Route 15	Moderately High	Moderately High	Moderate	Moderately High	Existing
			Moderately High	Moderately High	Moderate	Moderately High	Post-Construction
16	8	Tiyan Parkway/ Route 33 (east) to Route 1	Moderate	Moderate	Moderate	Moderate	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
19	16	Route 10A to Sabana Barrigada Drive	Moderate	Moderate	Moderate	Moderate	Existing
			Moderate	Moderate	Moderately Low	Moderate	Post-Construction
28	26	Route 3 to Andersen AFB (North Gate)	Moderately High	Moderately High	Moderately High	Moderately High	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
29	25	Route 1 to Route 3	Moderately High	Moderately High	Moderately High	Moderately High	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
35	1	Fonte Bridge Replacement	Moderately High	Moderate	Moderate	Moderate	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
35	1	Asan Bridge No. 1 Culvert Replacement	Moderately High	Moderate	Moderate	Moderate	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
36	15	Route 15 Realignment	Moderate	Moderately High	Moderately High	Moderately High	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
63	16	Route 10A to Sabana Barrigada Drive	Moderate	Moderate	Moderate	Moderate	Existing
			Moderate	Moderate	Moderately Low	Moderate	Post-Construction
74	8A	Route 10A to Sabana Barrigada Drive	Moderately High	Moderately High	Moderate	Moderately High	Existing
			Moderate	Moderate	Moderately High	Moderate	Post-Construction

Legend: AFB = Air Force Base; GRN = Guam Road Network.

GRN #1, Route 1/8 Intersection

Changes to the visual environment for the intersection include creating double turn lanes (both right and left) for Route 8 as it approaches Route 1. It is anticipated that this change would not alter the existing visual quality of the area. The overall visual quality of the interchange should remain at moderate, with moderate vividness, moderate intactness, and moderately low unity.

GRN #2, Route 1/3 Intersection

The intersection would be modified by outside pavement widening along southbound Route 1 and southbound Route 3 to accommodate increased traffic volumes. The approaches to the intersection would consist of two left and three through lanes (northbound Route 1); one u-turn, three through, and one right-turn lanes (southbound Route 1); and one left, one shared left/right, and one right lane (southbound Route 3). The departures from the intersection would replicate the existing conditions, except that an acceleration lane would be added on Route 1 south of the intersection to facilitate right turns from southbound Route 3. The interchange improvements would not require the removal of trees or other large vegetation. It is anticipated that the overall visual quality of the intersection would remain at moderately high, with moderately high vividness, moderately high intactness, and moderate unity.

GRN #3, Bridge Replacement on Route 1 over the Agana River

The new structure would be lengthened to approximately 54.5 ft (16.6 m) with 15 ft (5 m) approach slabs to adequately accommodate the hydraulic flow of the river. The width of the new structure would be similar to the existing, at approximately 84 ft (26 m), accommodating six 11-ft (3-m) wide lanes, a 4.5-ft (1.4-m) wide median, and a 5.5-ft (1.7-m) wide sidewalk with a 1.0-ft (0.3-m) barrier on each side. Figure 15.2-2 shows an elevation of a typical replacement bridge. The new structure, although larger, is anticipated to appear approximately the same in scale within the visual environment. Providing an open railing to the bridge would help connect the traveler on Route 1 to the surrounding landscape. Given that the bridge is near one of the tourist attractions on the island, the aesthetics of the visible bridge elements should be considered in the overall design of the bridge. It is anticipated that the overall visual quality of the area would remain at moderate, with moderate vividness, intactness, and unity. Additional mitigation measures that address the aesthetics of the bridge could increase the vividness to moderately high, if applied.

GRN #11, Chalan Lujuna from Route 1 to Route 15

This project would improve the intersections of Chalan Lujuna with Routes 1 and 15 to allow for truck turning movements, which equates to bigger radii at the corners of the intersections. While the intersections may appear slightly bigger due to the increase of corner radii, the roadway itself would retain the same appearance. It is anticipated that the general visual quality for the roadway would remain at moderately high, with moderately high vividness, moderately high intactness, and moderate unity.

GRN #16, Route 8 from Tiyan Parkway (Route 33 East) to Route 1

This project would widen the existing Route 8 from four to six lanes. Portions of the existing Route 8 are already at six lanes, leaving sections approaching Route 1 to be widened. Since portions of the road are already at six lanes, the project is not anticipated to change the overall visual quality of the roadway; therefore, the general visual quality of the roadway should maintain a moderate rating, with moderate vividness, intactness, and unity.

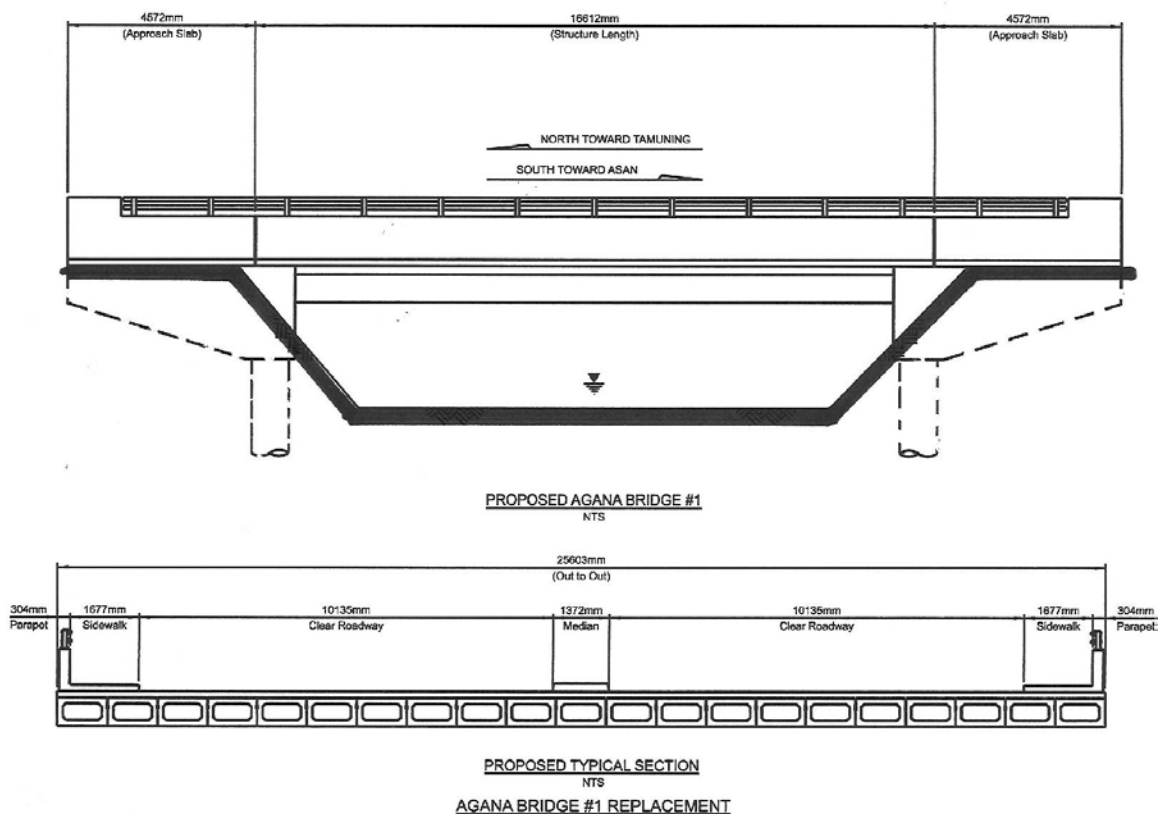

Figure 15.2-2. Typical Bridge Replacement Elevations

GRN #19, Route 16 from Route 10A to Sabana Barrigada Drive

This project would add a lane in each direction, making Route 16 a six-lane facility with a center median. In addition a four lane, signalized, access would be provided to the new MAP. Given the urban nature of the development along the roadway, it is unlikely that the impacts would substantially alter the existing visual environment. The overall visual quality would likely remain at moderate, with moderate vividness, intactness, and unity. If the median is a planted median, then the vegetation within the median would likely provide a break from the expanse of pavement created by the six-lane facility and could improve the visual quality of the roadway.

GRN #28, Route 26 from Route 1 to Route 15

This project would widen an existing two-lane road to four lanes. The roadway currently travels through heavily residential areas. The sensitivity of the viewers, especially residents, is expected to be high. The widening project would reduce the overall moderately high visual quality to moderate, with moderate vividness, intactness, and unity. This is due to the widened pavement section and the anticipated sensitivity of the viewers.

GRN #29, Route 25 from Route 16 to Route 26

This project would widen the existing narrow two-lane road to a four-lane road. The area is heavily residential. It is anticipated that the project would reduce the overall visual quality from moderately high to moderate, with moderate vividness, intactness, and unity. The reduced visual quality is caused by the anticipated high viewer sensitivity from the residences and the anticipated removal of vegetation along the roadway that would likely change the character of the existing roadway.

GRN #35, Bridge Replacement on Route 1 over the Fonte River

The new bridge over the Fonte River is anticipated to be 78 ft (24 m) long, matching the existing structure length. The width would also match the existing 100-ft (30-m) width, which accommodates six 12-ft (4-m) wide lanes and a 14-ft (4-m) wide median, with a 6-ft (2-m) wide sidewalk and a 1-ft (1-m) barrier on each side. In addition to the concrete abutments supported on drilled shafts, the new Fonte Bridge would include concrete columns founded on spread footings, drilled shafts, or steel piles.

The existing visual quality of the bridge and area is anticipated to remain at moderate, with moderately high vividness, moderate intactness, and moderate unity. The removal of utilities visibly suspended across the bridge and the use of an open railing would improve the visual quality of the bridge.

GRN #35, Culvert Replacement on Route 1 over the Asan River (Asan Bridge No. 2)

The new bridge over the Asan River is anticipated to match the existing structure length. The width would also match the existing 100-ft (30-m) width, which accommodates six 12-ft (4-m) wide lanes and a 14-ft (4-m) wide median, with a 6-ft (2-m) wide sidewalk and a 1-ft (1-m) barrier on each side. The new Asan Bridge No. 1 would be a large box culvert.

The existing visual quality of the bridge and area is anticipated to remain moderate, with moderately high vividness, moderate intactness, and moderate unity. The removal of utilities visibly suspended across the bridge and the use of an open railing would improve the visual quality of the bridge.

GRN #36, Route 15 Realignment

For drivers on Route 15, its realignment would provide new views to the roadway. The new Route 15 would have a wider cross section in the landscape, with wider shoulders and a median for future widening. East of the new alignment would be a buffer road that parallels the alignment. This road would be on military property and separated from Route 15 by a fence. It is also anticipated that this new road would sit higher in the landscape, and the area between the two roads would be cleared of vegetation other than grasses. The new buffer road would have two new bridges that would cross over the new Route 15 and be very noticeable to those traveling on the road. These bridges would represent a new element in the landscape. Currently, there are very few bridge overcrossings on the island. It is anticipated that the effects to the general visual quality of the area would be moderate, with moderate vividness, intactness, and unity. This equates to maintaining the vividness visual quality from existing and lowering the intactness and unity ratings from moderately high to moderate.

GRN #63, Route 16 from Route 10A to Sabana Barrigada Drive

Similar to GRN #19, this project would add a lane in each direction, making Route 16 a six-lane facility with a center median. In addition a four lane, signalized, access would be provided to the new MAP. Given the urban nature of the development along the roadway, it is unlikely that the impacts would substantially alter the existing visual environment. The overall visual quality would likely remain at moderate, with moderate vividness, intactness, and unity. If the median is a planted median, then the vegetation within the median would likely provide a break from the expanse of pavement created by the six-lane facility and could improve the visual quality of the roadway.

GRN #74, Route 8A from Route 16 to Naval Communication Area Master Station Barrigada

This project would widen Route 8A to include a center median for left turns and shoulders. The changes would increase the paving section. Particularly in the residential and elementary school area, viewers are likely to be very sensitive; however, the changes are not anticipated to change the existing overall visual

quality for the roadway that should remain at moderately high, with moderately high vividness, moderately high intactness, and moderate unity.

Key Viewpoint 2: GRN #36, Route 15 Roadway Realignment

Orientation: The photograph is taken looking north through the old military entrance gate toward the proposed new alignment of Route 15 (see Figure 15.2-3).

- Existing Visual Character/Quality: The existing character has a weedy, abandoned appearance. The surrounding forested areas have been removed, as has the old housing. What is left are the cleared areas and old road network where the housing once was. The general visual quality of the view is moderately low, with low vividness, moderately low intactness, and unity.
- Proposed Project Features: The project would construct a new two-lane roadway through the area, with a second road (the parameter road) paralleling the new Route 15 to the east. This new road would sit higher in the landscape than Route 15. In the distance, the new bridge over Route 15 would be visible.
- Changes to Visual Character/Quality: The project is anticipated to maintain or slightly improve the existing moderately low visual quality in the view. Construction of the two roadways would, in some ways, unify the overall appearance in the view by removing the abandoned elements in the current view. It is anticipated that the vividness would increase to moderate, along with the intactness, while the unity would remain at moderately low.
- Anticipated Viewer Response: It is anticipated that viewers would primarily be associated with roadway travelers. These viewers would have a moderate sensitivity to the changes in the area, with daily commuters having a greater sensitivity than those new to this portion of the island. Residents, who generally live north of the realignment area, would have a higher sensitivity, but because the roadway is not visible from the homes, their views would be associated with roadway travel.
- Resulting Visual Impact: The anticipated resulting visual impact would not substantially alter the existing views.

Summary

Projects within the Central Region that are part of Alternative 1 that have been identified as having potential impacts are GRN #s 1, 2, 3, 11, 16, 28, 29, 35, and 36. These impacts are associated with GRN #s 28, 29, 35, and 36. As discussed in the North Region, the projects would cause an increase in the urban character of the island. Currently, the Central Region is the most densely developed portion of the island, and the widening of these roadways and intersections would extend that urban character farther, causing a slight degradation of the existing rural character of some of these roadways.

In particular, GRN #28 on Route 26 and GRN #29 on Route 25 would reduce the visual quality of the roadways from moderately high to moderate. These roads are currently narrow two-lane roads through residential areas, with substantial vegetation along portions of the roadways. Widening these to four-lane roads would change the character of the roadways to a more urban character. Given that these roadways are residential in nature, it is anticipated that viewer sensitivity would be high. In addition to the roadway and intersection widening projects, there are two bridge replacement projects, all of which would be along Route 1: GRN #3 (Agana Bridge) and GRN #35. Construction of the new bridges, from a driver's perspective on Route 1, is anticipated to cause only a minor change to the visual environment of the Route 1 corridor. Viewer sensitivity of those on Route 1 is anticipated to be low. The most noticeable

change would be associated with the new railing that would be visible from the roadway. Because Route 1 crosses over each of the rivers, the railings are the only visible element of the bridge.

In general terms and given the proximity to adjacent development for most of the bridges, it is unlikely that the new bridges would be noticeable from off the roadway in the long-term. Many of these views are screened from adjacent uses by existing vegetation; however, for the short-term in many of these locations, the most noticeable changes associated with construction of the new bridges would be the need for temporary clearing in and around the bridge sites to make way for the bridge construction.

The bridges do present an opportunity to increase the visual quality of the corridor over the existing moderate to moderately high ratings. Mitigation in the form of urban design elements could increase the visual quality of the structure to those traveling on Route 1. These are discussed further under the Proposed Mitigation Measures subsection.

Indirect impacts of the projects, particularly the roadway and intersection widening projects, would be an increase in the urban character of the Central Region of the island from its current, generally rural appearance.

Apra Harbor Region

Table 15.2-9 identifies all projects within the Apra Harbor Region. The table indicates the disposition of each project in terms of this analysis. Following the table is a description of the anticipated impact of each of the projects analyzed within the region.

Table 15.2-9. Guam Road Network Projects Considered for Analysis, Apra Harbor Region

GRN #	*Route Number*	*Alternatives*				*Carried Forward for Further Analysis?*	*Reason for Inclusion or Exclusion*
		1	*2*	*3*	*8*		
4	11	x	x	x	x	No	This project does not require widening (only pavement strengthening).
5	Route 1/ Route 11	x	x	x	x	**Yes**	Add a second left-turn lane from Route 11 to Route 1, adding an additional 14-ft (4-m) wide lane to the outside of Route 11.
24	5	x	x	x	x	No	This project does not require widening (only pavement strengthening).
26	2A	x	x	x	x	No	This project does not require widening (only pavement strengthening).
35	1	x	x	x	x	**Yes**	Replacement of bridges or culverts over the Atantano, Laguas, Sasa, and Agueda rivers.
50	MAP	x	x	x	x	No	Anticipated changes are expected to be minor and would not alter the existing visual environment.

Legend: GRN = Guam Road Network; MAP = Military Access Point.

Figure 15.2-3. Key Viewpoint #2. GRN #36, Route 15 Roadway Realignment

Table 15.2-10 summarizes the anticipated changes to the visual environment based on the proposed projects.

Table 15.2-10. General Visual Quality per Road Corridor/Project Area, Apra Harbor Region

GRN #	*Route Number*	*Segment Limits*	*FHWA Visual Assessment Criteria*			*Overall Visual Quality (V + I + U/3)*	*Existing vs. Proposed Visual Quality*
			Vividness	*Intactness*	*Unity*		
5	1	Route 1/11 Intersection	Moderate	Moderate	Moderately Low	Moderate	Existing
			Moderate	Moderate	Moderately Low	Moderate	Post-Construction
35	1	Atantano Bridge Replacement	Moderately High	Moderately High	Moderate	Moderately High	Existing
			Moderate	Moderate	Moderate	Moderate	Post-Construction
35	1	Sasa Bridge Replacement	Moderate	Moderately Low	Moderate	Moderate	Existing
			Moderate	Moderately Low	Moderate	Moderate	Post-Construction
35	1	Laguas Bridge Replacement	Moderately High	Moderate	Moderate	Moderate	Existing
			Moderately High	Moderate	Moderate	Moderate	Post-Construction
35	1	Agueda Culvert Replacement	High	Moderately High	Moderately High	Moderately High	Existing
			High	Moderately High	Moderately High	Moderately High	Post-Construction

Legend: FHWA = Federal Highway Administration; GRN = Guam Road Network.

GRN #5, Route 1/11 Intersection

Reconstruction of the intersection, including pavement strengthening and other project elements within the existing roadway associated with the pavement strengthening project (GRN #4), is not anticipated to change the visual environment of the intersection. Given the industrial nature of the area, viewer responses to the changes are likely to be very low to the new intersection. The overall visual quality for the Route 1/11 intersection is anticipated to remain at moderate, with moderate vividness, moderate intactness, and moderately low unity.

GRN #35, Atantano Bridge Replacement

The new bridge over the Atantano River would be lengthened to 60 ft (18 m) to adequately accommodate the hydraulic flows in the river. The bridge would have a similar width to the existing, at approximately 82 ft (25 m), accommodating four 12-ft (4-m) wide lanes, an 8-ft (2-m) wide median, and a 12-ft (4-m) wide shoulder and 1.0-ft (0.3-m) barrier on each side. In addition to the concrete abutments supported on drilled shafts, the new Atantano Bridge would include concrete columns founded on spread footings, drilled shafts, or steel piles.

This new bridge is not anticipated to substantially change the existing visual environment of the area. The bridge does not currently have adjacent development within close enough proximity to see any change to the bridge elevation. The new railing would be a visible element to those on Route 1. The current railing is open, allowing views into the surrounding forested land. As currently proposed, the new railing would be solid, with a railing on the top. This would likely reduce the views out to the forested areas, somewhat

reducing the quality of the existing views. The general visual quality in the bridge area is anticipated to be moderate to moderately high, with moderate to moderately high vividness and intactness, and moderate unity.

GRN #35, Laguas Bridge Replacement

The new Laguas Bridge would be lengthened to approximately 60 ft (18 m) to accommodate hydraulic flows. The width of the proposed bridge would be similar to the existing 82 ft (25 m) and would accommodate the existing four 12-ft (4-m) wide lanes, an 8-ft (2-m) wide median, and a 12-ft (4-ft) wide shoulder and 1.0-ft (0.8-m) barrier on each side. The new bridge is not likely to alter the existing visual quality of the area, which is likely to remain at moderate, with moderately high vividness, moderate intactness, and moderate unity.

GRN # 35, Sasa Bridge Replacement

The new bridge over the Sasa River would match the existing length of 46 ft (14 m) with an 82-ft (25-m) width, similar to the proposed widths for the Laguas and Atantano bridges. It is anticipated that the new bridge would maintain the overall visual quality of the area at moderate, with moderate vividness, moderately low intactness, and moderate unity. Elements that might improve the visual quality would be to remove the utilities from the bridge and include a more open railing to create views to the surrounding forested areas.

GRN #35, Agueda Culvert Replacement

As with the other bridges, the new culvert would match the existing length and widths of the existing culvert. The new culvert is anticipated to maintain the existing overall moderately high visual quality of the area, with the high vividness and moderately high intactness and unity left intact.

Summary

Two projects within the Apra Harbor Region have been identified as having potential impacts on the existing environment. These are GRN #5 and 35. GRN #5 would widen the Route 1/11 intersection. This is anticipated to increase the urban character of the intersection, but it would not substantially alter the existing visual quality of the project area.

GRN #35 includes the replacement of the Atantano, Laguas, Sasa, and Agueda bridges or culverts. Of these projects, the proposed bridge or culvert replacements would maintain the existing visual quality of the project areas for the Laguas, Sasa, and Agueda bridges or culverts and cause a slight degradation of the views at the Atantano Bridge. The degradation is due in part to the removal of the open railing on this bridge that currently allows views into the forested lands beyond the bridge. Proposed mitigation measures for the bridge replacement can be found under the Proposed Mitigation Measures subsection.

Indirect impacts of the projects, particularly the roadway and intersection widening projects, would be an increase in the urban character of the Apra Harbor Region of the island from its current, generally rural appearance.

South Region

Table 15.2-11 identifies all of the projects within the South Region. The table indicates the disposition of each project in terms of this analysis. Following the table is a description of the anticipated impact of each of the projects analyzed within the region. None of the projects in the South Region have been carried forward for further analysis. It is not anticipated that they would have an impact to the visual environment.

Table 15.2-11. Guam Road Network Projects Considered for Analysis˜ South Region

GRN #	*Route Number*	*Alternatives*				*Carried Forward for Further Analysis?*	*Reason for Inclusion or Exclusion*
		1	*2*	*3*	*8*		
25	5	x	x	x	x	No	This project does not require widening (only pavement strengthening).
27	5	x	x	x	x	No	This project does not require widening (only pavement strengthening).
52	MAP	x	x	x	x	No	Anticipated changes are expected to be minor and would not alter the existing visual environment.
110	2	x	x	x	x	No	Convert northbound right-turn lane to a combined through/right-turn lane. No widening required.

Legend: GRN = Guam Road Network; MAP = Military Access Point.

Summary

None of the projects identified as part of Alternative 1 for the South Region are anticipated to have impacts associated with their implementation.

Proposed Mitigation Measures

While the pavement strengthening projects do not require specific mitigation measures because there are no anticipated changes to the visual environment with these projects, as a whole cumulatively for the proposed GRN, the following mitigation measures could be implemented:

Proposed Mitigation Measures Outside of Department of Defense Control

- Provide an open railing to the extent possible to provide views from the bridge out to the adjacent areas.
- Hide utility crossings on the bridge between the girders or other methods of screening utilities from pedestrians on the bridge or adjacent land uses.
- Preserve existing trees or stands of vegetation by shifting the roadway alignment to the extent feasible where roadways are widened.

15.2.6.2 Alternative 2 (Preferred Alternative)

North

The roadway projects proposed for the North Region under Alternative 2 are the same as those proposed under Alternative 1 in terms of the effects to the visual environment; therefore, the impact conclusions are the same as those discussed for the North Region of Alternative 1.

Central

The roadway projects proposed for the Central Region under Alternative 2 are the same as those proposed under Alternative 1 in terms of the effects to the visual environment; therefore, the impact conclusions are the same as those discussed for the Central Region of Alternative 1.

Apra Harbor

The roadway projects proposed for the Apra Harbor Region under Alternative 2 are the same as those proposed under Alternative 1 in terms of the effects to the visual environment; therefore, the impact conclusions are the same as those discussed for the Apra Harbor Region of Alternative 1.

South

None of the projects identified as part of Alternative 2 for the South Region are anticipated to have impacts associated with their implementation.

Proposed Mitigation Measures

Proposed mitigation for Alternative 2 is the same as discussed for Alternative 1.

15.2.6.3 Alternative 3

North

Alternative 3 is substantially the same as Alternatives 1 and 2 for the North Region; however, GRN #s 38A, 39A, 41, 41A and 124, are not included in this alternative. It is anticipated that this project would not alter the existing visual environment of the project area; therefore, the impacts discussed under Alternative 1 for the North Region should be similar for Alternative 3 for the North Region.

Central

Within the Central Region, Alternative 3 includes two additional projects with potential impacts. These projects are GRN #63 that would widen portions of Route 16 from four to six lanes, and GRN #74 that would widen Route 8A to provide shoulders and a median. Neither of these two widening projects is anticipated to alter the existing visual quality of either roadway; therefore, the impacts in the Central Region for Alternative 3 are similar to those discussed for Alternative 1.

Apra Harbor

The roadway projects proposed for the Apra Harbor Region under Alternative 3 are the same as those proposed under Alternative 1; therefore, the impact conclusions are the same as those discussed for Alternative 1 in the Apra Harbor Region.

South

None of the projects identified as part of Alternative 3 for the South Region are anticipated to have impacts associated with their implementation.

Proposed Mitigation Measures

Proposed mitigation for Alternative 3 is the same as those discussed for Alternative 1.

15.2.6.4 Alternative 8

North

Alternative 8 is substantially the same as Alternatives 1 and 2 for the North Region; however, GRN #s 38, 39, and 41 are not included in this alternative. It is anticipated that these projects would not alter the existing visual environment of the project area; therefore, the impacts discussed under Alternative 1 for the North Region should be similar for Alternative 8 for the North Region.

Central

Within the Central Region, Alternative 8 has the same list of projects with potential impacts as that associated with Alternative 1; therefore, the impacts in the Central Region for Alternative 8 are the same as those discussed for Alternative 1.

Apra Harbor

The roadway projects proposed for the Apra Harbor Region under Alternative 8 are the same as those proposed under Alternative 1; therefore, the impact conclusions are the same as those discussed for Alternative 1.

South

None of the projects identified as part of Alternative 8 for the South Region are anticipated to have impacts associated with their implementation.

Proposed Mitigation Measures

Proposed mitigation for Alternative 8 is the same as those discussed for Alternative 1.

15.2.6.5 Summary of Impacts

Table 15.2-12 summarizes the potential impacts of each interim alternative. An analysis of long-term alternatives was not developed because the alternatives are not ready for project-specific analysis. A text summary is provided below.

Table 15.2-12. Summary of Potential Impacts on Visual Resources – Roadway Projects

Potentially Impacted Resource	*Alternative 1*	*Alternative 2**	*Alternative 3*	*Alternative 8*
Existing visual quality changes to a more urban visual character	SI-M	SI-M	SI-M	SI-M
Removal of vegetation in residential areas, changing the visual character	LSI	LSI	LSI	LSI

Legend: LSI = Less than significant impact; SI-M = Significant impact mitigable to less than significant; *Preferred Alternative.

In addition, there is limited land for development on the island, and large portions are already developed or off limits to non-military development. Therefore, as the island population grows, either through the increase in military personnel or through endemic growth on the island, the development patterns would also likely become denser.

Mitigation in the form of aesthetic and design considerations and the preservation of vegetation within developed areas can help diminish or soften these changes to the visual character.

15.2.6.6 Summary of Proposed Mitigation Measures

Table 15.2-13 summarizes the proposed mitigation measures for roadway projects impacts on visual resources.

Table 15.2-13. Summary of Proposed Mitigation Measures for Roadway Projects Impacts on Visual Resources

Phase	*Mitigation Measure*
Construction	None
Operation	• Provide an open railing to the extent possible to provide views from the bridge to the adjacent areas • Hide utility crossings on the bridge between the girders or using other methods of screening utilities from pedestrians on the bridge and adjacent land uses • Preserve existing trees or stands of vegetation by shifting the roadway alignment to the extent feasible where roadways are widened.