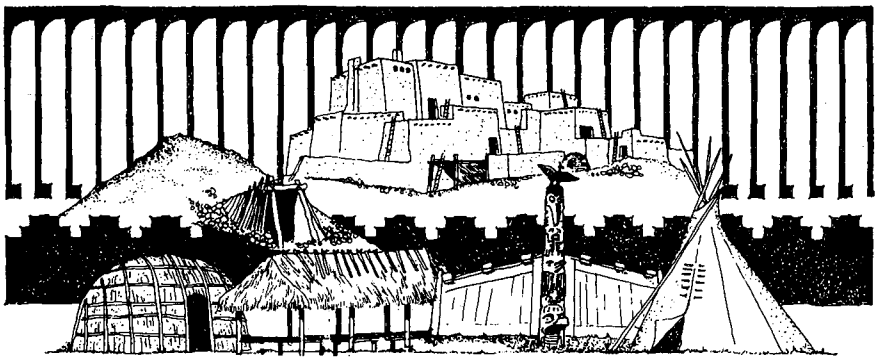
OUR HOME

ROAD DESIGN FOR INDIAN HOUSING



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EVERYTHING HAS A BEGINNING.

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INTRODUCTION

PURPOSE: The purpose of this "Road Design Guidebook" is to provide a concise reference for Indian Housing Authority (IHA) directors and tribal members to use in organizing, managing, and administering a successful IHA road development program.

BACKGROUND: This section provides a brief overview of the IHA road and street construction program.

Organization - Each IHA is incorporated as a legal entity that has its own governing board with authority and responsibility as a housing corporation in a given geographical location. Board members have the authority to hire an IHA director and, in turn, establish that IHA director's authority to contract on behalf of the IHA.

The authority to contract often presents problems of a financial nature that are best solved with decisions based upon inputs from the IHA director, the IHA board of commissioners, and technical resources.

IHA Roads and Streets - In addition to many other responsibilities, the board of commissioners tasks the IHA director with the responsibility for the planning, construction, maintenance, and operation of roads and streets within the confines of the IHA property. Where applicable, this responsibility includes transfer of road ownership to the Bureau of Indian Affairs (BIA). Such road ownership transfer involves the BIA road engineer and realty offices.

In most cases, IHA thoroughfares can be accepted into the BIA roads maintenance program if and when they meet certain minimum acceptable conditions. These conditions are established by local BIA Area or Agency road design guidelines that have been developed in accordance with Federal requirements for design, construction, materials, condition, and ownership.

Physical Influences - It is here that the similarities between IHAs end and the differences begin. In general, IHAs are located on or near Native American or Alaska Native land. These lands differ greatly in geography, geology, and climate; with each difference presenting unique road construction implementation problems and solutions.

Such differences are of a technical nature since resolution of problems related to physical influences involve engineering adjustments to accommodate local terrain, climate, and availability of materials.

Social And Cultural Influences - While individual IHA management and operation methods may have some similarities, in general, they vary because of differences in the social, educational, and cultural backgrounds of IHA residents and administrative personnel.

These differences are of an institutional nature, almost always subjective, and perhaps, best resolved at the local level.

KEY PLAYERS: This document was created to be a "Relationship Document" to show the connections between such "Key Players" as the IHA director, IHA board members, leaders of the associated Native organization(s), and Federal, state, and local government agency representatives. A discussion of the key players is presented below in terms of their respective authority and responsibility in relation to IHA roads.

Tribal Leaders - A few IHAs provide a limited number of housing units for the general public. However, for the most part, IHAs exist to provide housing for members of a given Native population—i.e., Alaska Natives or Native Americans recognized by either a state or the Federal government. The authority and responsibility for development of comprehensive land-use plans, including planning for IHAs, are functions of the respective, sponsoring tribal government or Native Alaskan corporation or village government. In most cases, such land-use plans provide for development of one or more access roads to the IHA property boundary.

The relationship between any given tribe or Alaskan Native corporation and their respective IHA is said to be "at arm's length" in that the IHA is a separate, legal corporation. In spite of this legal distancing, there is a need for clear lines of communication between Native leaders and their respective IHA director, and this is usually established through the IHA board of commissioners.

Communication between key personnel is essential to allow IHA directors to take advantage of all available resources to plan for development of the best possible IHA roads and streets. Effective communication helps ensure road implementation projects remain in agreement with tribal land-use plans.

> When we are in harmony with our family, then we achieve success.
>
> *Ute*

The IHA Board of Commissioners - Although an IHA board has the authority to operate independently under the laws of the state in which the IHA is incorporated, board members have a responsibility to provide adequate and reasonable housing services to members of their respective tribe or Alaskan Native corporation.

Hence, the IHA board members—as well as the IHA director—often function as a bridge between the desires and requirements of the Native membership on one hand and IHA road and street planning, construction, operation, and maintenance on the other hand.

The IHA board's responsibility includes all facets of IHA development including implementation of a roads and streets program within the confines of the IHA property along with all the associated complexities such as rights-of-way, utilities, bridges, drainage, road materials, maintenance, etc.

Although IHA board members generally work closely with Native leaders to ensure the IHA road system improvement program best fits the needs of the tribe or Alaskan Native corporation membership, as a practical matter—depending on the make up of the board—the authority to carry out the IHA road improvement program is delegated to the IHA director.

IHA Directors - IHA directors are employees of their respective IHA governing boards and derive their contractual authority from that relationship. As such, each IHA director is an *agent* of that governing board. If a particular IHA director is a member of the tribe associated with that IHA, then that IHA director may also be a *representative* of the tribe, but the authority to contract comes from the IHA board relationship to the IHA director as its *agent*.

There is a legal difference between being a representative and being an agent. While the former only represents the interests of a specific group or entity, an agent is empowered with specific, designated authority to act on behalf of the group or entity (in this case, the IHA board).

IHA directors normally contract for development of an entire housing community and not just for development of a road improvement program. Accordingly, Indian housing development contracts are comprehensive enough to include the design and construction of all IHA roads and streets.

Even though the design and construction of IHA roads and streets may be a small part of the overall Indian housing development contract, it is, nonetheless, an important part and warrants attention to detail. Accordingly, this guidebook refers only to the roads and streets portion of the Indian housing project.

For many IHA directors, the timely construction of an access road from the nearest all-weather road to the IHA property is a major concern. Since such roads are not normally on IHA property, the authority and responsibility for their planning and construction resides elsewhere. In most cases, construction of such access roads is accomplished by the BIA upon request from the governing tribe or Alaskan Native corporation.

Normally, construction of Indian housing cannot commence without an access road; therefore, the IHA director should make every effort to coordinate access road construction with the BIA to ensure the timely construction of the Indian housing project. Two logical and important points of contact for the IHA director are the BIA road engineering and realty offices.

This initial contact is important because the goal of most IHAs is the timely transfer of road and street ownership to the BIA for maintenance. To accomplish this goal, Indian housing roads developed under the IHA director's purview must meet local BIA design, material requirements, and construction criteria. For similar reasons, it is important for all IHA directors to establish lines of communications with key personnel from other cognizant Federal and state agencies.

Federal Government Representatives - The United States (Federal) government has a unique legal relationship with tribal governments and Alaskan Native or Village Corporations as set forth in the Constitution of the United States, treaties, statutes, and court decisions.

Executive Orders provide guidance to every Federal agency to ensure that the rights of sovereign tribal governments are fully respected.[1] Since each IHA is individually affiliated with one or more Native governments, in general, a special Federal trust responsibility flows from the Federal government to certain programs conducted for the benefit of each IHA.

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[1] Executive Order 12875, "Enhancing the Intergovernmental partnership," and EO 12866, "Regulatory Planning and Review."

While all Federal agencies share in the exercise of this trust responsibility, the BIA has specific, assigned responsibilities concerning IHA access roads, property ownership, and acceptance of roads into their maintenance program.

There are four key Federal organizations—each belonging to a separate department—involved directly or indirectly with IHA road and street construction programs. These four organizations and their respective Federal Departments are the:

- Bureau of Indian Affairs (BIA), Department of the Interior (DOI);
- Federal Highway Administration (FHWA), Department of Transportation (DOT);
- Indian Health Service (IHS), Department of Health and Human Services (DHHS); and
- Office of Native American Programs (ONAP), Department of Housing and Urban Development (HUD).

FEDERAL RESPONSIBILITIES: Federal organizations can be directly involved because of an oversight, trust, or fiduciary responsibility to provide a specified service, or they can be indirectly involved through inter-agency fund transfers or the implementation of specifications and standards. Two Federal organization that are involved with direct support to Indian housing roads are BIA and ONAP, while FHWA and IHS, in general, provide indirect support.

The responsibilities listed here for BIA, IHS, and ONAP have been agreed to by their respective Federal Departments through an interdepartmental agreement. However, individual agency or area field offices may be able to provide services on a case-by-case basis only because of resource availability.

BIA Responsibilities - BIA personnel have the responsibility to review and approve all required trust land lease issues, easements, and real estate appraisals; provide maintenance services for IHA-constructed roads and streets accepted into the BIA road system; and, when available, provide other support necessary for the timely development of Indian housing.[2]

[2] 25 Code of Federal Regulations (CFR) Part 170.

Where resources are available, BIA Area or Agency offices will provide real estate appraisals at the request of the IHA director. When requested by the tribal government and where applicable, BIA road engineers will plan and construct access roads to housing developments. Usually, these access roads lead from the nearest all-weather road to the IHA property line and, of course, the BIA must have ownership of the right-of-way for the access road.

> *The IHA director should bear in mind the fact that a significant amount of lead time is normally required by the BIA to develop access roads. This lead time may be as much as several years. Several major factors contribute to this lead time; the BIA requires advanced planning to obtain Federal funding of road construction projects, and most BIA Area or Agency offices have a road construction priority system for IHA access roads.*

The BIA can accept IHA-developed roads and streets into the BIA road system only when the IHA roads and streets—as well as related curbs, gutters, and drainage features—have been built to acceptable AASHTO specifications and standards, and BIA obtains right-of-way ownership.[3] When resources are available, BIA road engineers can assist the IHA director by providing technical assistance in the design and development of proper road and street drainage. Design and construction of proper road and street drainage is an often overlooked facet of IHA road construction.

> *Drainage considerations are not only important because of physical road and property damage by erosion and sedimentation, but because of the danger of diseases introduced by unsanitary conditions resulting from improper allowance for road drainage or rain collection in holding ponds.*

FHWA Responsibilities - FHWA support of an IHA road construction program is applied indirectly through funding of BIA road engineers; however, FHWA's road construction standards and specifications play an important, and more direct, role in how IHA roads are developed.[4]

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[3] AASHTO - American Association of State Highway and Transportation Officials.

[4] U. S. Department of Transportation, Federal Highway Administration, "Standard Specifications For Construction Of Roads And Bridges On Federal Highway Projects, FP-92," 1992.

IHS Responsibilities - IHS has the primary responsibility and authority to provide Native American homes and communities with necessary sanitation facilities and related services.[5] Efforts by IHS to carry out this responsibility normally impact the IHA road project indirectly through planning requirements to accommodate rights-of-way for water and sewer utilities.

IHS engineers assume a more direct role in support of IHA directors in Alaska because of the impact of extreme climate and geological conditions on water and sewer utilities and because villagers often require access roads to sewer lagoons and/or land fills.

ONAP Responsibilities - As an office of HUD, ONAP provides direct financial and technical assistance for low income housing and community developments in American Indian and Alaska Native areas. To provide access to these housing and community sites, roads must be designed and constructed. Although development of an Indian housing project involves far more than the design, construction, and maintenance of streets and roads, these thoroughfares are integral and important parts of the IHA.

Hence, ONAP's responsibility to the IHA includes the development of all on-site roads and streets in accordance with AASHTO standards—a necessary requirement for acceptance of IHA roads and streets into the BIA road maintenance system.

There are many ways in which an IHA can request technical assistance from the ONAP Area Office. The IHA director may request that the project be developed under the **Assisted Method**. This decision is based on a number of factors, such as the size or complexity of the housing project or experience of the IHA staff. The **Assisted Method** consists of direct support by the cognizant ONAP Area Office for implementation of all procedures, guidelines, and requirements associated with the establishment of an Indian housing development.

Since a trust responsibility exists between the Federal government and the IHA, the **Assisted Method** can also be implemented unilaterally by ONAP when a determination has been made that additional assistance, monitoring, and/or supervision is required during the IHA development process.

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[5] Indian Sanitation Facilities Act of 1959 known as Public Law 86-121 (PL 86-121), as amended by the Health Care Improvement Act of 1988 (PL 100-713).

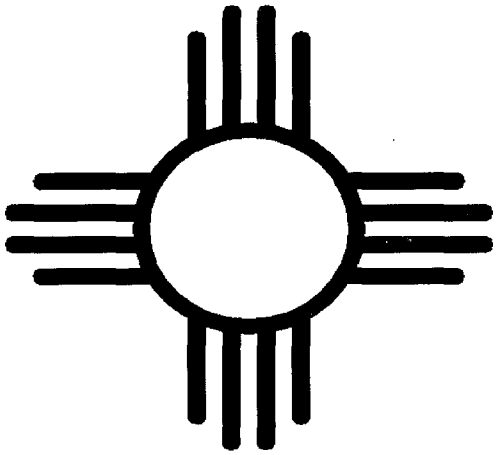
Although IHAs are autonomous corporations, a Federal government trust responsibility exists because, in general, IHA board members represent interests of a tribal government. The manner in which that trust responsibility is administered is based on judicial decisions, legislative action, and executive policy.

SELF-GOVERNANCE - The Federal government recognizes the desire and needs of Native peoples to self-govern. To this extent, the 93rd Congress passed public law (PL 93-638) to encourage tribal self-government. The act was subsequently amended by the 100th Congress.[6]

The "Self-Determination" acts empower Native governments to select which Congressionally funded programs they want to contract unto themselves in lieu of having them provided by Federal agencies. Federal government policy encourages tribal governments to exercise their rights under "Self-Governance" principles and to contract for services directly instead of receiving them through a Federal agency. Accordingly, as the number of tribal governments electing to operate under the principles of self-governance increase, the Federal government has, in general, been able to reduce the number of Federal agency personnel available at the local level to assist those tribes. Hence, the cumulative effect of increased tribal contracting under these acts has been a planned reduction in available Federal services at the local level. While the argument may be made that this reduction in the size of local Federal government agency staff should not appreciably affect the availability of technical assistance or the provision of personnel to perform oversight responsibility in Indian housing projects receiving Federal aid, the reality of the situation is that IHA directors may have to share the services of fewer Federal employees.

Each man must make his own path.
Chetan Luta

[6] Public Law 93-638, the "Indian Self-Determination And Educational Assistance Act" of 1975 as amended by PL 100-472, the "Indian Self-Determination Amendments" of 1987.



THERE ARE NO SECRETS. THERE IS NO MYSTERY.
THERE IS ONLY COMMON SENSE.

HAUDENOSAUNEE

THE IHA ROADS PROGRAM

This section discusses the role of the IHA director in the planning process, provides a methodology for classifying problems, and outlines seven milestones for organizing an effective IHA road improvement program.

PROGRAM PLANNING: In most cases, IHA road improvements are included as a portion of the entire IHA construction contract. However, for planning purposes, this guidebook treats the development of IHA roads as a separate program.

This approach has the advantage of emphasizing the importance of the roads improvement program and it covers those instances when road improvements must be contracted separately.

ROLE OF THE IHA DIRECTOR: In regard to IHA roads, the role of the IHA director is to **ensure the success of the entire Indian Housing road improvement program and to oversee it from beginning to end.** Certainly, this is no small task.

The IHA director is often the person who orchestrates the needs, desires, and requirements of the IHA board and tribal members on one hand and balances these factors against the requirements and available resources of the tribe or Alaskan Native corporation and various Federal agencies on the other hand.

This role can be very complex—given all the other managerial duties of the IHA director—and quite taxing in attention, time, and effort. Obviously, IHA directors require clear authority to carry out their many responsibilities and coordinate IHA development plans with the more comprehensive tribal or Alaskan Native corporation plans.

The authority to contract for the Indian housing roads—as part of the larger IHA construction program—carries with it the responsibility to identify and resolve road development problems as they occur and, more importantly, to have a methodology to identify and handle such problems.

Accordingly, the following problem resolution methodology has been kept broad in scope to accommodate the individuality of the IHA director and staff.

PROBLEM RESOLUTION METHODOLOGY: The main reason for using any such methodology is to allow a timely and cost-effective application of available resources to resolve problems. Another reason is because IHA directors serve in a unique role that demands unique solutions.

Three Problem Categories

The problem resolution methodology consists of two parts; "Problem Recognition," and "Problem Resolution." Although the methodology is simple and easy to apply, its successful application relies heavily on the IHA director's ability to establish and use lines of communication with all available resources at local, state, and Federal levels.

PROBLEM RECOGNITION - Problems with the road improvement program can be classified as being ***financial, institutional,*** or ***technical*** in nature. Once a problem has been properly recognized and classified, the IHA director can better identify the proper resources to use in resolving the problem. The three problem categories are defined as:

Financial: Problems associated with the cost of designing, constructing, or maintaining the IHA road program are classified as financial problems. This includes the cost of managing or administering the construction contract.

Institutional: These problems are associated with the choices that have to be made by the IHA director--*often on behalf of or in consultation with tribal or Alaskan Native corporation members*--that affect future land use, placement of access roads, development of alternative solutions, assignment of priorities, and the acquisition of title to land for construction and roads.

Technical: This category refers to the types of problems associated with conducting an inventory of the existing road system, identifying traffic flow patterns in the housing complex, classifying streets and roads as to type, selecting acceptable road design criteria, and determining realty matters such as ownership of land and proposed rights-of-way.

PROBLEM RESOLUTION - While this guidebook cannot supply specific guidance for solving problems associated with Indian housing programs, problem resolution is made easier when the IHA director and/or IHA staff recognize the problem categories stated above and assign the proper resources to resolve the problem accordingly. To this end, the IHA director and staff should consider using the following resources to address the three problem areas stated above.

RESOURCES - There are a number of resources that can be brought to bear to resolve problems. For the purposes of this guidebook, resources are separated into two main categories; Federal and non-Federal. Federal resources are considered to be *external* resources while non-Federal resources can be either *internal* (IHA employees or board members) or *external* tribal or Alaskan Native corporation personnel, consultants, contractors, or subcontractors).

Federal Resources - For Federally subsidized IHA road projects, there are four key Federal agencies; BIA, FHWA, IHS, and ONAP. As discussed earlier (page 1-5), the BIA and ONAP are involved directly with IHA road and street construction programs.

The availability of assistance from Federal agency field offices will vary from one IHA location to another. However, the IHA director should make use of all available Federal assistance as early into the roads improvement program portion of the Indian housing development as possible to save valuable resources, time, and effort later on.

BIA Resources - Two essential technical resources from the BIA are those of the Realty and Road Engineering offices. Technical assistance from the BIA Realty office will be required to assure right-of-way access and eventual roadway ownership. The BIA Road Engineering office will require such ownership problems to be resolved before access road construction or acceptance of IHA roads and streets. Hence, there is a definite need for the IHA director to involve the BIA Realty personnel early in the Indian housing development project.

Similarly, the IHA directors should involve BIA Road Engineering personnel in the IHA road improvement process as early as possible. There are several reasons for prompt requests by IHA directors for assistance from the BIA Road Engineering office. One reason is because BIA Area offices normally service a number of tribal governments or Alaskan Native corporations with limited BIA personnel. A second reason is that annual road construction funds appropriated to the BIA Area and/or Agency offices are limited and are used to construct IHA access roads in accordance with a locally maintained priority list. The end result to the individual IHA director is that planning and scheduling may have to be modified according to the availability of Federal assistance at the local level and according to schedule of the cognizant BIA Road Engineering office for construction of any required access road.

It is highly recommended that the IHA director involve representatives of the BIA Road Engineer and Realty offices as early in the IHA planning stages as possible to facilitate BIA budgeting of assets to support the IHA.

ONAP Resources - HUD's Area ONAP personnel are available to provide Federal assistance to IHA directors and staff for all facets of the IHA construction, including the roads improvement program. In particular, ONAP staff can assist the IHA director in identifying costs in the IHA road improvement program proposal, including so-called "hidden" costs.

Two such "hidden" costs are the cost of **access roads** and **administrative and operating expenses involved in maintaining the roads** from the completion of construction until final acceptance of the roads into the BIA or tribal road maintenance program. Due to unexpected delays in transfer of ownership, maintenance costs can be substantial.

> *Because of other priorities, Federal offices may not be able to respond as quickly as desired; therefore, time-table adjustments may have to be made to accommodate Federal resource availability.*

Non-Federal Resources - In general, a non-Federal resource is an entity that the IHA director may have access to—such as State or local agency personnel, tribal government personnel, or private consultants or contractors—that is available to help resolve problems associated with the IHA roads improvement program. Such resources are often trained personnel that can perform a specific function or service to address problems in one or more of the three problem categories; i.e., financial, institutional, or technical.

Internal Resources - Internal resources refer to those assets available from within the IHA organization such as the board members, IHA director, and staff. Except for required outside audits, IHA financial problems (inventory, accounting, invoicing, etc.) that arise in a roads improvement program are usually addressed internally. Institutional problems are an internal concern for the IHA board, director, and staff; however, resolution often involves input from external resources such as tribal or Alaskan Native corporation members.

External Resources - Technical problems in IHA road construction normally require some form of assistance from external resources. IHA directors and their staff are encouraged to seek outside technical support for specialized engineering and contract support services from both Federal and non-Federal resources; including state and local government agencies as well as private contractors and consultants.

As an example of such technical support, the IHA director may hire professional engineers or other technical personnel on a consulting or full-time basis to assist with the implementation and oversight of the roads program. Hiring a professional engineer or contract administrator is highly recommended for large Indian housing road development projects.

PLANNING MILESTONES: This document presents a series of seven steps or "Milestones" for the IHA director to use as a road design guidebook. The seven steps present an over-all view of the Indian Housing road improvement program.

These milestones include functions of the respective tribe or Alaskan Native corporation and the Federal government in conjunction with the functions of the IHA director.

The milestones begin with land-use planning—primarily a tribal function—and end with the ownership transfer of roads and streets—a process that involves the BIA Road Engineering and Realty offices.

As stated earlier, a recommended course of action for the IHA director is to establish lines of communication with all cognizant Federal and state agency personnel that may be part of the IHA road improvement program.

Several logical points of contact for the IHA director to start this communication process are; (1) the ONAP Area office; (2) the BIA Area or Agency Road Engineering office; and (3) the BIA Realty office. Personnel from these offices will assist the IHA director in establishing contact with their state agency counterparts or other representatives the IHA director may require.

This initial contact with the BIA is important because the ultimate goal of an Indian Housing road improvement program should be the timely and cost-effective transfer of IHA roads into the BIA roads maintenance program. To accomplish this goal, Indian housing roads developed under the IHA director's purview must meet local BIA design, material, and construction criteria.

Through proper and early planning, the BIA can furnish the IHA director with the necessary specification criteria to help ensure an acceptable road design and construction time-table for both on-site roads and the off-site access road.

The IHA director should resist submitting design plans for low quality, unpaved roads that just meet minimum BIA design criteria because the result will be poor quality roads with high maintenance costs that will outweigh the initial cost of better quality, paved thoroughfares.

Because of the great diversity in physical conditions between IHAs, each BIA Area and/or Agency office has developed local road design guidelines applicable to IHAs located within their service area. These BIA "Road Design Guidelines" address specific topographical and climatical conditions as well as applicable state and Federal road construction criteria for a given area. Special design considerations exist for Alaskan roads because of extreme temperature and surface conditions.

This guidebook is meant to augment those local road design documents and to encourage IHA directors to involve BIA road engineers--whenever possible--in all phases of the Indian Housing road improvement program.

MILESTONES: Adequate planning is a key ingredient to success in the implementation of any Indian Housing roads improvement program. Although most of the planning takes place prior to construction, the planning mechanism must be flexible enough to meet changing conditions and/or funding shortfalls. The planning process must include the period from the end of construction to final acceptance of the road system by either the BIA or the tribe.

The seven milestones are discussed in greater detail in later chapters; they are summarized here to provide an overview of the remainder of this guidebook. The first milestone is largely a function of the respective tribal government or Alaskan Native corporation. It is presented because IHA plans should be in concert with the comprehensive tribal land use plan. Similarly, the tribal or Alaskan Native corporation roads needs assessment in the second milestone should include Indian housing roads. The five remaining milestones are largely functions of the IHA director.

I. LAND USE PLAN - This milestone marks the completion of a current and proposed land use plan. IHA directors have an interest because of the impact that future land use will have on the IHA in terms of access and traffic flow. Although the land use plan involves housing, utilities, and other features; there are key elements of this milestone that refer directly to design and construction of roads and streets. The goal of this milestone is the development of a technical analysis of the current road system. This analysis is an important part of the next milestone; a roads needs assessment.

II. ROADS NEEDS ASSESSMENT - The roads needs assessment, a necessary ingredient for Federal support of an Indian Housing roads improvement program, is a plan based upon a current land use plan. Local Federal agencies will provide the necessary forms for submittal of a roads improvement plan. Key elements in this milestone lead to the development of an IHA Road Improvement Program Plan that is in harmony with local tribal or Alaskan Native corporation land use planning.

III. ROAD IMPROVEMENT PROGRAM PLAN - Once the elements in Milestone II are adequately addressed, the IHA director can develop a program plan for presentation to the IHA board, tribal members (if necessary), and representatives of the Federal and state service agencies (BIA, ONAP, etc.) providing funding support and resources.

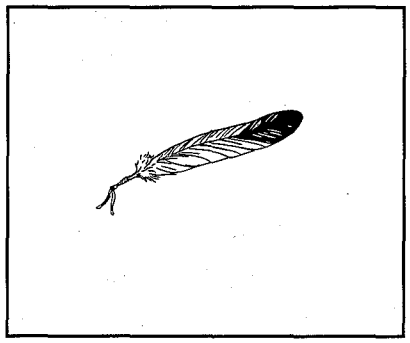
IV. PRE-AWARD CONSTRUCTION PLAN - This milestone marks the efforts expended up to, but not including, the award of a contract for construction. This milestone refers to that portion of the Indian Housing construction program that applies strictly to roads and streets. The pre-award construction plan is quite technical in nature. To ensure success in implementing the actual construction contract, the IHA director should use all available technical support from BIA, ONAP, and any other sources available to develop the plan.

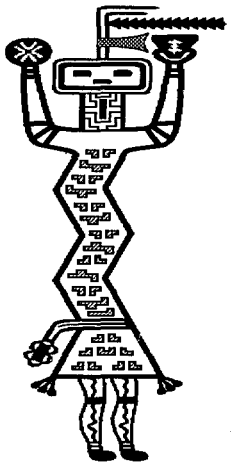
V. CONTRACT AWARD - In most cases, contractual language for construction of IHA roads and streets is included in the larger IHA construction contract and only in a few cases would the IHA director ever be expected to issue a separate road construction contract. However, the key points presented in this milestone are general in nature and apply to either case. While success in achieving this milestone should be relatively straight forward based on planning established in earlier milestones, any contract award is an exacting procedure that requires the support of professional and experienced personnel.

VI. CONSTRUCTION AND INSPECTION - The successful completion of this milestone requires the utmost diligence on the part of the IHA director to ensure that construction contractors and their subcontractors perform in accordance with the agreed upon specifications. It is during this milestone that the IHA director should use Quality Assurance and Quality Control (QA/QC) teams to enforce contract compliance of construction techniques and materials.

VII. OWNERSHIP TRANSFER - The final milestone is accomplished when the Indian housing on-site roads and streets are completed to the satisfaction of the IHA board and ownership of those thoroughfares has been successfully transferred to another organization (BIA, tribe, or corporation) for maintenance.

Ownership transfer implies transfer of a number of agreements, land titles, and other documents. Therefore, it is important for IHA directors to consult with BIA Realty and Road Engineering personnel to ensure the collection of necessary legal documents showing ownership early in the planning of an IHA road improvement program. In some cases, title searches to document land ownership may take several months to complete and should, therefore, be planned for accordingly.





ONE FINGER CANNOT LIFT A PEBBLE.

CREOLE

PROGRAM PLANNING

This section provides guidelines for completing the first three milestones; a Land Use Plan, a Roads Needs Assessment, and a Road Improvement Program Plan. The first two milestones are largely functions and responsibilities of the respective tribal governments or Alaskan Native corporations. However, the results of these first two milestones may have a large impact on the roads planning for the Indian housing program.

The IHA director may enlist the help of Federal and non-Federal technical resources to assist in the accomplishment of these milestones. The BIA and ONAP have separate, specific responsibilities to provide direct support to the IHA in the implementation of an Indian housing road improvement program.

MILESTONE I - LAND USE PLAN: The purpose of developing and promulgating a tribal or Alaskan Native corporation developed Land Use Plan is to help the IHA director avoid potential conflicts with other construction programs on or near the same parcel of land as that to be used by the IHA.

Land use plans should be coordinated with Federal and state agencies and with tribal or Alaskan Native corporation planning personnel. This coordination should minimize the effects of conflict with other current or planned building programs and allow IHA directors the opportunity to take advantage of already planned roads and/or developments.

Two examples illustrate what can happen when there is poor coordination and communication or a lack of access to a Land Use Plan: (1) An IHA purchased land and commenced construction next to a parcel of land that was being developed by IHS into a sewage lagoon. (2) An IHA constructed a low volume collector road through the Indian housing project only to have the tribe build a casino and use the road as a high volume arterial which quickly destroyed the thoroughfare and brought heavy traffic through the housing project.

A number of items should be part of this land use plan, including:

1. **Current Road System Inventory**
2. **Access Road Placement**
3. **Traffic Flow Patterns**
4. **Traffic Loads**
5. **Right-Of-Way & Land Ownership**

6. **Utilities & Drainage Considerations**
7. **Possible Land Use Concerns**

I-1. Current Road System Inventory - An inventory of the current road system provides the IHA director with a starting point for evaluation of road improvements needed for the proposed program. The collection of basic physical data using technical personnel or professional engineers will be needed by tribal or Alaskan Native corporation leaders to make educated decisions concerning the classification of roads and to formulate a plan to meet BIA design, material, and construction criteria.

I-2. Access Road Placement - The BIA has responsibility for the construction of access roads under the condition that BIA must have ownership of the road right-of-way. Generally, this BIA responsibility applies to access roads from the nearest all-weather road on Indian reservation land to the IHA property boundary.

Where the IHA property is not on or does not abut the Indian reservation or Alaskan Native corporation land, state agencies may become involved in the approval of the design and construction of IHA access roads. In any case, care should be used in the proposed placement of the access road to the IHA boundary to provide the best possible ingress and egress routes for the residents and to ensure the best possible traffic flow pattern.

I-3. Desired Traffic Flow Patterns - Once placement of the access road has been determined, the traffic flow pattern can be established for the remainder of on-site streets. Traffic flow patterns should take into account the need for emergency services, schools, utility rights-of-way, and commercial uses. This part of the milestone should examine future uses of the roads since there may be plans for future commercial centers close to the IHA.

I-4. Traffic Loads - Care should be taken to accurately estimate the expected traffic load for each of the roads in the IHA, including any and all access roads. The expected load should have a direct relationship to the design of any new roads. Heavier than anticipated traffic loads can damage or destroy roads designed for lighter traffic.

I-5. Right-Of-Way And Land Ownership - Utilities (electricity, water, sewer, telephone, and cable TV) are often routed along the right-of-way of access roads and IHA streets; however, there must also be right-of-way access from those roads and streets to

the individual housing units and/or to the service provider. Since the installation of such utilities may require acquisition of rights-of-way or land ownership, technical support should be obtained from the BIA Area Realty Office.

In this regard, it may become necessary for the IHA director to have recorded data collected on land agreements such as:

- Jurisdiction (land ownership);
- Drainage considerations for run-off, temporary pending, etc.;
- Rights-Of-Way for farming, rural use, commercial use, soil conservation, parks, utility lines, structures, access, drainage, etc.;
- Construction restrictions, building and frontage requirements;
- Provision of services (emergency, transportation, meals on wheels, etc.) to other jurisdictions or Indian housing projects; and
- Special access, easements, or restricted access areas.

I-6. Utilities & Drainage Considerations - Too often, adequate drainage planning is omitted from a Land Use Plan. Poor drainage may result in unnecessary property and road damage through unexpected flooding, erosion, and sedimentation.

Planning the placement of utilities and drainage should be conducted together. Unnecessary flooding due to poor drainage design may lead to contaminated water facilities and create a health problem later.

I-7. Possible Land Use Concerns - In summary, the Land Use Plan should supply technical information to address possible IHA concerns for the following:

- Agricultural Lands
- Existing Housing Projects
- Flood Plains & Drainage
- Future Growth Areas
- Historic Sites
- Industrial Centers
- Recreational Lands
- Tribal Community Center
- Wetlands
- Zoning Restrictions

MILESTONE II - ROADS NEEDS ASSESSMENT: A roads needs assessment provides a basis for the determination of what is necessary to improve the present Indian housing road system to meet the identified community needs. The assessment should be based on current funding constraints and the need to meet established BIA road acceptance criteria.

There are four major elements in this milestone:

1. **Classification of Roads and Streets**
2. **Selection of Road Design Criteria**
3. **Preliminary Cost Analysis**
4. **Fiscal Plan Development**

II-1. Classification of Roads and Streets - Classification is the process of grouping roads and streets having like characteristics into distinct categories. The most common classification of on-site roads and streets is by function:

- Arterial: A road or street that serves a large area. Usually heavily traveled and can be divided into major and minor arterials.

- Collector: Roads or streets that serve smaller population areas. A road that collects traffic from a local low volume road system (LLVRS) and feeds into an arterial system. Collectors may also be divided into major and minor status.

- Local: An LLVRS serving traffic-generating points or terminal points. A local road that provides direct access to the land or to Indian housing residences.

- Minimum Maintenance: Generally, a rural route requiring minimal maintenance and posted with signs to inform the public of its status.

II-2. Selection of Road Design Criteria - IHAs are located in a number of varied geographical and topographical areas. Because of the differences in local road design criteria, construction practices, types of available materials, and climate, most BIA Area or Agency offices prepare their own "Road Design Guidelines" that are tailored for their area and provide local design criteria.

BIA road engineers develop their local "Road Design Guidelines" from the FHWA produced "Standard Specifications For Construction Of Roads And Bridges On Federal Highway Projects" manual--also referred to as "FP-92."

Once the proposed on-site roads and streets have been classified as to type, the design criteria can be selected using local BIA guidelines to establish the following:

- Subdivision Traffic Requirements
- Utility Access and Rights-Of-Way (Easements)
  - Continuity and Alignment of Easements
  - Dedication of Easements
  - Location and Width of Easements
  - Obstructions Within Easements
  - Present and Planned Road Crossings
- Surface/Subsurface Compositions and Surface Management
  - Drainage, Run-Off, Sedimentation and Erosion Designs
  - Repair and Maintenance Estimates
- Snow and Ice Policy Guidelines
  - Traffic Patterns and Volumes
  - Topography or Climate Problems
  - Maintenance Levels and Schedules
- Right-Of-Way Policies and Guidelines (From BIA Realty)

II-3. Preliminary Cost Analysis - The purpose of conducting a cost analysis is to estimate the total funding required and to set priorities accordingly. This analysis will also assist tribal or Alaskan Native corporation leaders in making decisions concerning alternative land use plans. Since an accurate cost analysis involves the use of technical experts familiar with all phases of road construction, it is recommended that the tribal or Alaskan Native corporation leaders obtain the required technical support from Federal or state agency representatives when available and from private consultants or contractors when necessary.

II-4. Fiscal Plan Development - A fiscal plan is an administrative tool used by many tribal or Alaskan Native corporation leaders to assist them in setting priorities and making decisions about alternatives in road designs, surfaces, construction techniques, and use plans. The responsibility for the accomplishment of this milestone is largely that of the tribal government or Alaskan Native corporation, but the data and the results may prove to be beneficial in the development of the IHA road improvement program plan.

Therefore, the IHA director should have access to whatever data and results are available from the tribe or the Alaskan Native corporation to assist the IHA director in the preparation of the funding package for the IHA road improvement program in the next milestone.

It is important to note that the total funding package should include the cost of the BIA access road (if applicable), administration and maintenance of the IHA road system until final acceptance, and monitoring to ensure quality construction techniques and materials are used to meet BIA acceptance criteria.

MILESTONE III - ROAD IMPROVEMENT PROGRAM PLAN: This milestone builds upon the results of the tribal or Alaskan Native corporation Land Use Plan and their Roads Needs Assessment. Completion of this milestone by the IHA director results in compilation of data and documents and results in the comprehensive IHA road improvement program plan. The key steps are:

1. **Physical and Recorded Data**
2. **Required Documents**
3. **Prioritized List of Alternative Road Design Criteria**
4. **Road Improvement Program Plan**

III-1. Physical and Recorded Data - An initial step by the IHA director in the development of the road improvement portion of the Indian housing project is the collection of physical and recorded data that can, and most likely will, be used to substantiate decisions concerning road placement, traffic patterns, and other design considerations. Such data consists of the following:

- Maps showing traffic volumes, population centers, and major traffic generators (schools, clinics, community centers, etc.);
- Aerial photographs showing present and planned land use and geographical and topographical data;
- School bus, emergency vehicle, transit, maintenance, mail routes, and other traffic sources;
- Street origins, destinations, and road distribution geometry; and
- Traffic volumes expressed as Average Daily Traffic (ADT) and projected out to at least five years.

The above list represents typical, essential elements available from the results of completing the first two milestones.

III-2. Required Documents - In addition to the information cited above, there are a number of required documents or agreements that have to be established before questions of right-of-way, land ownership, maintenance, and access can be resolved. The list below is not all inclusive and will differ greatly between geographical locations of IHAs. However, the following is a sample list of documents and agreements that may be required to avoid or settle possible disputes concerning road placements and other design features:

- Construction/maintenance on common routes involving multiple jurisdictions;
- Use and location of rights-of-way for utility lines, structures or access;
- Provision of temporary ponding of storm water;
- Maintenance access to structures and waterways;
- Provision of services for economic development projects;
- Provision of special rights-of-way use for special purposes;
- Provision of special access or restricted access; and
- Building and maintaining frontage routes.

III-3. Prioritized List of Alternative Road Design Criteria - Although the IHA members may desire to have all Indian housing roads paved and fitted with curbs and adequate drainage, choices may have to be made between quality and acceptability based on the amount of funds available. Based on the results of an accurate cost and needs analysis, the IHA director can now assemble a list of alternative road design criteria for consideration by the IHA board and membership.

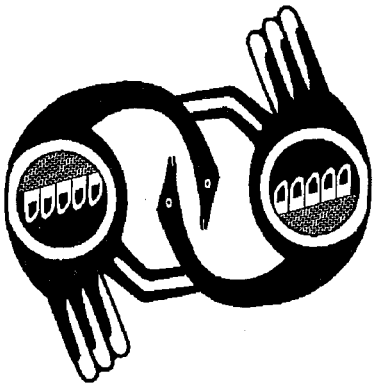
III-4. Road Improvement Program Plan - Although a comprehensive list of items to be included in the Road Improvement Program Plan is beyond the scope of this guidebook, a sample checklist is provided on the next page. The IHA director should request BIA Realty and Road Engineering Offices assistance in identifying and compiling any additional documentation, agreements, or data which may be needed in order to transfer the IHA roads into the BIA roads maintenance program.

Again, it is important that the development of the plan be coordinated with the IHA board, tribe, or corporation, and the three primary Federal offices during the developmental process to avoid possible future conflicts with other construction programs or planned uses.

When we are in harmony with our family, then we achieve success.
Ute

ROAD IMPROVEMENT PROGRAM PLAN CHECKLIST

- ☐ Accident records, where available.
- ☐ Agreements with other agencies.
- ☐ Annual average daily traffic volumes and planned volumes (five year plan).
- ☐ Condition - riding quality, structural strength (base and surface) and drainage (grade line, cross section, culverts, etc.).
- ☐ Depth of surface and depth and type of base (if applicable from construction records), year built and year resurfaced (where applicable).
- ☐ Detailed land use data.
- ☐ Environmental concerns.
- ☐ Intersections showing route number or street name.
- ☐ Location and size of all drainage structures - culverts, storm sewers, manholes, drainage catch basins, etc.
- ☐ Location of Indian housing limits and other boundaries.
- ☐ Location of curb, gutter, and sidewalks.
- ☐ Location of utility lines and/or water and sewer service.
- ☐ Other traffic aids (guardrails, warning signs, no passing zones, etc.).
- ☐ Parking and road use or access regulations.
- ☐ Railroad crossings - location, name of railroad, number of tracks, type of protection.
- ☐ Right-of-way width.
- ☐ Structures - location, bridge number, name and direction of stream or name of railroad or highway if separation structure, type bridge, deck width, load limit, clearance, waterway opening.
- ☐ Traffic controls (stop signs, traffic lights, speed zones, etc.).
- ☐ Traffic generators such as schools, churches, parks, quarries, sawmills, industrial sites.
- ☐ Travelway widths.
- ☐ Types of road surfaces.



ALL THINGS ARE CONNECTED. WHATEVER BEFALLS THE EARTH BEFALLS THE CHILDREN OF THE EARTH.

CHIEF SEATTLE

CONSTRUCTION CONTRACT

Notwithstanding the fact that most roads construction contracts are normally negotiated as part of the overall Indian housing construction program, this section treats the roads construction contract as a separate entity. This does not diminish the importance of the material presented here.

In general, there are four phases to a roads construction contract; these phases are discussed in this section as Milestones IV and V, respectively:

- **Pre-Award Construction Plan**
- **Solicitation, Evaluation, and Contract Award**

MILESTONE IV - PRE-AWARD CONSTRUCTION PLAN: There are at least two parties to every Indian housing road improvement contract: the IHA director and the construction contractor. Each party has administrative responsibilities. Therefore, it is important for the IHA director to have a pre-award, or pre-solicitation, construction plan to help coordinate and communicate responsibilities to all personnel concerned with the administration of the proposed contract.

Although there are exceptions, road construction procurement is normally performed through competitive bidding with the construction contract awarded to the bidder with the lowest *responsible* bid. The key word, of course, is "responsible." Since this determination is made by the IHA director's administration team, it is important to have determined the definition of what constitutes a responsible bid; hence the need for a pre-award plan.

The essential ingredients of a pre-award plan include the following:

1. **Cost Estimates**
2. **Design Considerations**
3. **Incidental Construction and Utilities**
4. **Contract Administration Costs**
5. **Quality Assurance and Quality Control Costs**
6. **Post-Construction Administration Costs**
7. **Advertisement and Pre-Award Considerations**

IV-1. COST ESTIMATES - Cost estimates are required for materials, roadway preparation, incidental construction, BIA access roads (if applicable), drainage, rights-of-way, and the IHA director's road contract administration team.

Many of the cost estimates will have already been compiled prior to submittal of the request for funding. While most of the items cited above are routinely provided, the last item is often overlooked. The IHA director must estimate how much time the contract administration team will be allotted to administer the road improvement project, this time should include unscheduled delays in construction and/or final acceptance by either the tribe or the BIA.

Road construction cost estimation is a technical matter and requires the expertise of those most capable of providing reliable estimates. BIA road engineers or other professional engineers, certified in the state in which the IHA is located can provide this expertise. Administrative costs are an institutional matter and are, perhaps, best provided by the IHA director's staff.

IV-2. DESIGN CONSIDERATIONS - Road design considerations are, for the most part, decided upon by the time the Roads Needs Assessment (Milestone II) has been completed. However, the road design plans need to be assembled into the IHA's Request For Proposal (RFP) package that will be provided to contractors responding to the road construction advertisement. The compilation of these design plans form the design criteria that will be used to specify road construction contract requirements.

While the design criteria for an RFP is the same as that developed for the needs assessment and the subsequent Road Improvement Program Plan, the format used to describe these criteria may vary. Again, this is a technical matter and can best be addressed by a professional engineer or with assistance from the BIA Road Engineering Office.

The IHA director's staff should maintain a Design File to allow easy access to important information pertaining to the approved design. Appendix A illustrates a sample list of items to be inserted and maintained in a design file.

This design file can be further grouped into the following, broadly associated, subject areas:

- Location
- Drainage
- Geometry
- Surfaces

Location - With the exception of Alaska, the United States has—at great expense in time, effort, and cost—conducted a coast-to-coast land survey of most of the country. Two Federal agencies; the United States Coast and Geodetic Survey (USC&GS) and the United States Geological Survey (USGS) services have installed permanent "benchmarks" across the land to provide accurate reference points for local survey teams.

These benchmarks, or other permanent public survey monuments of record, serve as starting points for almost all IHA project site surveys. Although the benchmarks are clearly marked on USGS and USC&GS charts, they are not always easily found in the field since they usually consist of simple, round, four to six inch brass markers embedded in concrete near or at ground level. While the IHA director is not expected to have personal knowledge of the existence of benchmarks, the location and description of IHA project benchmarks, when available, must be shown and/or otherwise noted on the site survey, grading and drainage plans, and on plan and profile drawings for streets and utilities.

Surveying is a function normally performed by road engineers (BIA or private) and is required in the process of laying out roads, streets, and subdivision building lots. Surveying often reveals land ownership issues which will require the services of the BIA Realty Office or other land record offices to resolve.

Accurate records of rights-of-way and descriptions of title are required by the BIA for ownership transfer of IHA-constructed roads and streets. Consequently, the IHA director should be aware of the importance of accurate surveys to avoid possible future litigation. IHA project designs for proposed site improvements should be verified by qualified and certified field survey teams prior to the preparation of any construction documents.

Drainage - Drainage considerations must be a part of the road construction contract package. Proper drainage is a community concern since it involves health and property. Poor drainage planning and construction can cause premature damage to established roads and streets. Proper drainage planning is important to prevent erosion and control sedimentation and flooding as well as allow for ease of snow removal (where required).

For streets with curbs and gutters, there is a desirable minimum amount of positive curvature built into the road to facilitate storm run-off. For roadways on flat terrain, the center of the road is designed to be slightly higher in the middle. This high point is referred to as the "crown." Figures 4-1(a) through 4-1(c) on the following page illustrate typical roadway cross sections.

Figure 4-1(a) Typical Roadway Cross Section - Uncurbed

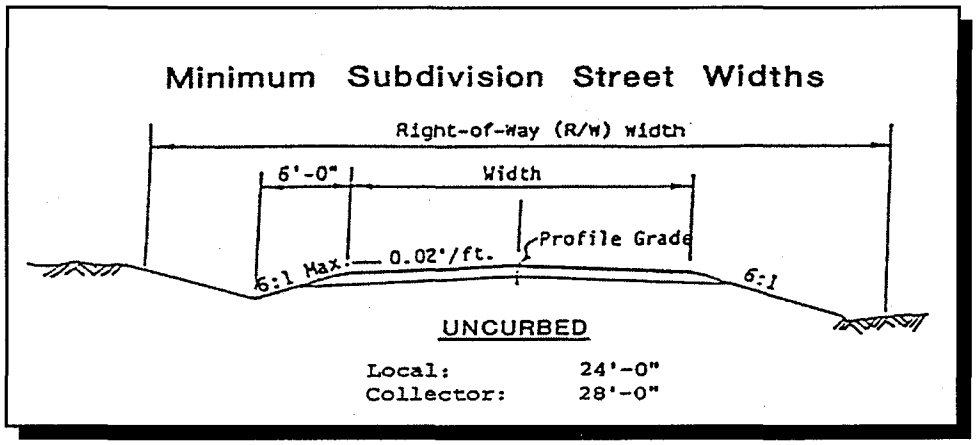


Figure 4-1(b) Typical Roadway Cross Section - Rolled Curb & Gutter

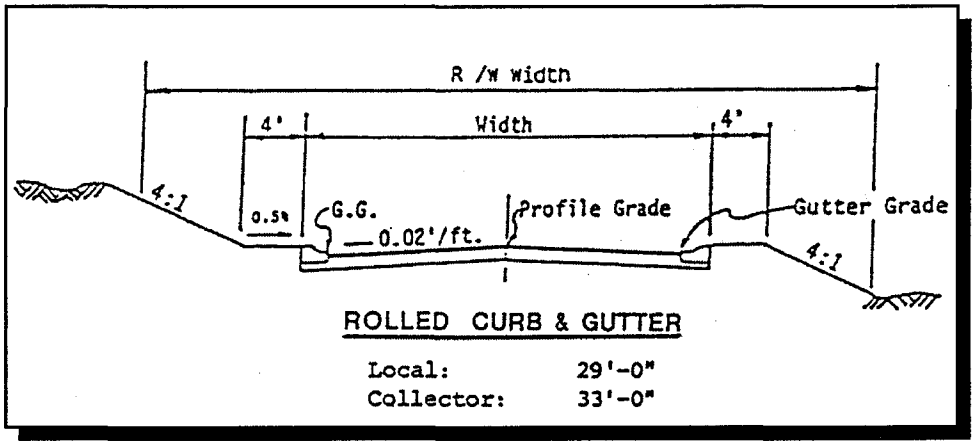
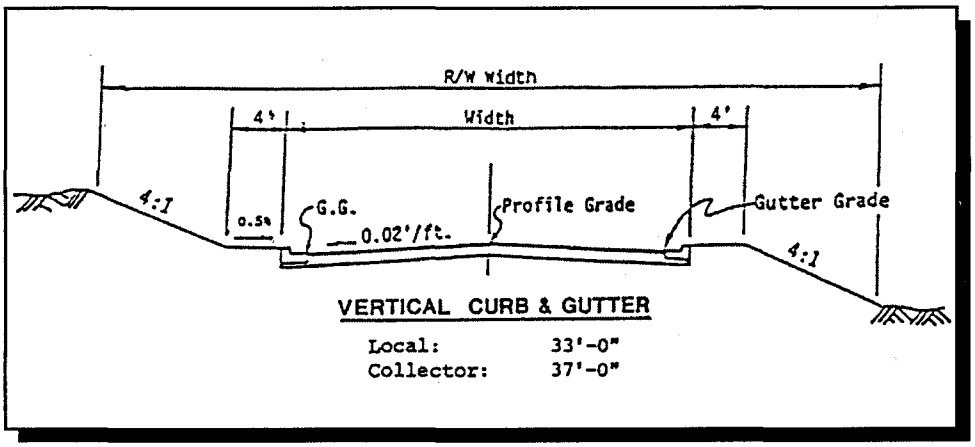


Figure 4-1(c) Typical Roadway Cross Section - Vertical Curb & Gutter



Another term that the IHA director should be familiar with is "grade", as it is used to express the inclination of a roadway; usually in a direction parallel to the centerline of the roadway.

The term "grade" is a carry over from railroad engineering days when a locomotive could only manage a certain climb without spinning its wheels. The angle formed between the railroad bed and the horizon is called the angle of inclination. The tangent of that angle (the rise over the run) is called the "slope," and, when expressed in percent, becomes the "grade." For example, the tangent of 10 degrees is 0.176 and the grade is 17.6% as illustrated in the below figure.

Vertical Rise

Horizontal Run

Road construction does not stop at the edge of the road surface. It includes the area from the road edge to the end of the road right-of-way; this area is often referred to as the "cut" and "fill" area since the contractor often has to excavate (cut) or haul in (fill) material to control drainage or provide for other factors such as safety, utilities, or other factors.

Just as there are guidelines and acceptable criteria for cut and fill, there are minimum acceptable criteria for just about every aspect of road construction. Minimum design requirements also exist for the placement of culverts, paved dip sections, and drainage outlets such as spillways or curb openings to protect against erosion.

Due to the technical nature of roads construction it is important for the IHA director to involve professional road engineers in the early stages of planning and design. Local BIA Road Engineering personnel can provide information on acceptable design criteria for drainage (as well as all other aspects of roadway construction).

Geometry - The geometrical requirements involve proper roadway alignments within residential areas to ensure driving and pedestrian safety as well as proper drainage and speed control. The geometric design should be based on estimated traffic requirements twenty years after construction. This will allow for community growth and the resulting increase in traffic flow.

The roads construction portion of the Indian housing construction package contains the necessary drawings and aerial views to show the topology and proposed street lay out to

assist construction bidders in making accurate construction time and cost estimates. This package should also contain the approved minimum road design criteria. Hence, the pre-award construction plan should state what design criteria are desired and what criteria minimums are acceptable to meet the requirements of a responsible bid.

The roads construction package is quite detailed. As one example of this detail, consider the minimum specifications for street curves. Street curves are arcs or segments of circles, and the arc is designated as having a certain radius of curvature. Normally, a minimum radius of thirty meters (approximately one hundred feet) is recommended for a residential street curve. Figure 4.2 illustrates another use of radii of curvature; the minimum curvature between approaches or intersecting roadways.

> *Road design criteria such as the radius of curvature values are necessary because lower radius of curvature values cause a reduction in safe speed, an increase in curve banking, or a combination of both. Either of these changes may impact driving and pedestrian safety.*

State and Federal governments mandate minimums for some standards in the case of certain geometrical, roadway, and area construction features, such as:

- Street and right-of-way widths, including residential area sidewalks
- Horizontal clearances from the edge of the pavement of curbed and uncurbed streets to above ground obstructions such as utility poles, light poles, and fire hydrants
- Minimum roadway curvature radii for turnouts (both commercial and residential)
- Turning radii from the back of the curb or edge of the pavement to the driveway approaches, cul-de-sacs, and intersection returns
- Turning areas at the closed ends of local streets
- Compression strength values for concrete used for curbs, gutters, sidewalks, and other roadway structures
- Number and construction of handicapped ramps at the roadway intersections in accordance with the U.S. DOT, September 6, 1991, final rule implementing Title IV of the American with Disabilities Act (July 26, 1990)

Refer to Figure 4-2 for an example of a typical overhead (plan) view of street intersections. Figure 4-3 provides both horizontal and vertical views of intersection curvatures and clearance of a traffic sign.

Figure 4-2 Typical Overhead View Of Road Intersection

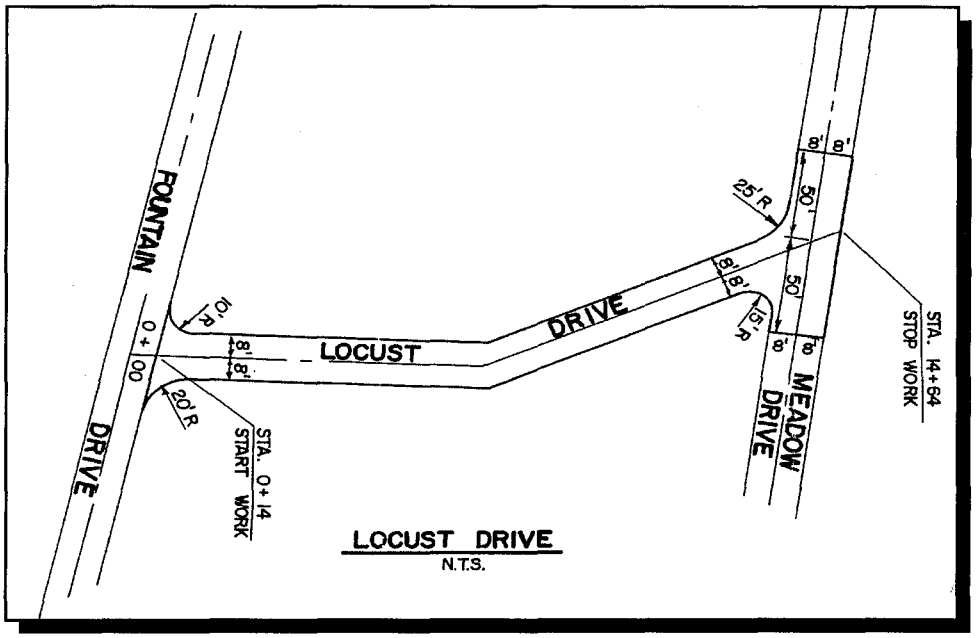
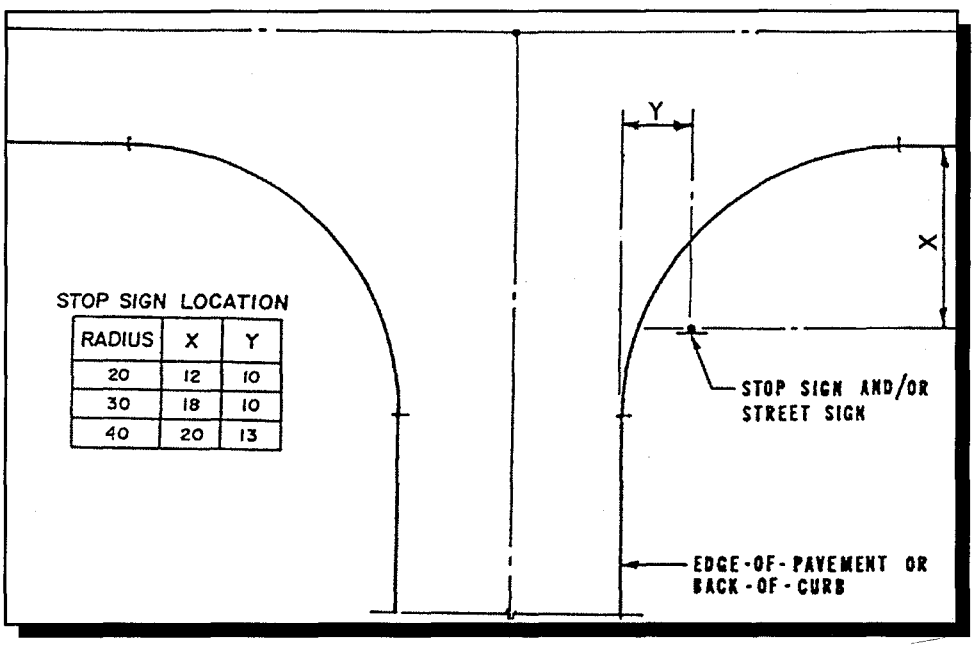


Figure 4-3 View Showing Typical Intersection Curvature



There are other minimum requirements that are area-specific due to differences in climates, geography, and availability of local materials. To address specific requirements, the IHA director can contact local road construction experts from the BIA, FHWA, or state organizations. If funding constraints limit the time and availability of assistance

from these government offices it may be necessary to procure the services of a professional engineer or consultant.

The IHA director should obtain copies of the following documents from BIA road engineers to use as reference material for the IHA staff:

(1) The FHWA-developed "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects," (FP-92);
(2) The "American Association of State Highway Transportation Officials," (AASHTO) specifications and standards;
(3) "Local Low Volume Roads and Streets," by the American Society of Civil Engineers, in cooperation with FHWA;
(4) "Uniform Traffic Control Devices for Streets and Highways," by FHWA;
(5) "Federal Lands Highway Project Development and Design Manual" Volume I, by FHWA.

Surfaces - For construction contractors, design criteria for roadway surfaces and sub-surfaces can be divided into four groups.

- Surface Composition and Geometry;
- Sub-Surface (or Sub-Base) Composition and Geometry;
- Surface and Sub-Surface Material Compaction; and
- Surface and Sub-Surface Material Composition.

These general areas are further defined and supported with specifications adapted to local conditions by BIA road engineers. To a large extent, the specifications for each of the above categories are defined by the availability of materials and the impact of climate, local weather conditions, and terrain at the construction site. However, for lower life-cycle road maintenance costs, the road surfaces should be composed of the best possible materials available; which indicates that paved roads are the preferred road surface.

IV-3. Incidental Construction and Utilities - There may be circumstances where the IHA director will contract for preliminary road construction work. The removal or relocation of existing facilities or the placement of utility lines (electrical power, water, sewage, telephone, etc.) may have to be accomplished prior to or in conjunction with IHA road construction. Usually, this involves work that is scheduled to precede the actual road or street construction and, while the work should be a part of the overall Indian housing construction package, it may be part of a separate contractual effort. In any case,

such preliminary work will have to be part of the program plan and scheduled accordingly, especially if any delay in incidental construction and/or the laying of utilities could possibly cause a comparable delay to the IHA roads construction program.

IV-4. Contract Administration Costs - IHA directors should not overlook the cost of contract administration in the original proposal for funding. An effective contract administrator monitors all work on the roads contract by the construction company to ensure compliance with contract requirements. This includes the review of invoices, requisitions, payments to subcontractors, and Federal and state deductions for employees. The contract administrator also maintains the record file of all documentation required by the BIA at the completion of the roads construction program for acceptance into the BIA road improvement program.

IV-5. Quality Assurance and Quality Control Costs - It is vitally important that quality be a prime concern for the IHA director. Quality is best ensured when the IHA director employs a Quality Assurance/Quality Control (QA/QC) professional or team to work under the direction of the contract administrator to monitor the work in the field. The cost of such field inspections, as well as the tests required for BIA acceptance of the IHA roads into the BIA roads improvement program, should be part of the original roads program plan funding. The duties of a QA/QC team are discussed further in Milestone VI.

IV-6. Post-Construction Administration Costs - IHA directors normally plan on BIA or tribal acceptance of the completed IHA roads project in accordance with a given schedule. Unfortunately, there are often delays which extend the length of time that the IHA must provide administration over the road system. This may lead to additional costs for QA/QC personnel, the contract administrator, road tests, and unscheduled road maintenance. This extended service, while difficult to plan for, should be budgeted as a contingency cost in the original Indian housing road improvement program plan.

IV-7. Advertisement and Pre-Award Considerations - Several planning steps should be taken while the road improvement program is still in the developmental stage before a solicitation or advertisement is published.

One such planning step is the preparation of a **Statement of Work** (SOW) for the solicitation. (Caution must be exercised in drafting the SOW to avoid misinterpretation which usually results from not including sufficiently detailed design criteria, plans, or drawings or in allowing too much leeway on the part of the contractor.) The SOW describes the work to be performed and may also describe the methods to be used. Since the SOW specifically states what the contractor is expected to perform, it can also prove useful in determining compliance to the provisions of the contract.

A second planning step is the preparation of **proposal evaluation criteria**. The IHA director can retain the services of an engineer, private contractor, or a BIA representative to assist in the development of the evaluation criteria. This criteria should be developed prior to the release of the RFP. Since these criteria form the standard by which all proposals are to be evaluated, it is important that the criteria be chosen carefully and in sufficient detail to emphasize those factors considered to be critical to the selection of a contractor.

Typical evaluation criteria may include the following which are normally weighted by points:

(1) Understanding of the problem and scope of work;

(2) Soundness of technical approach;

(3) Compliance with RFP requirements;

(4) Special technical factors;

(5) Technical organization;

(6) Managerial organization;

(7) Personnel;

(8) Facilities and other equipment;

(9) Need for government-furnished property; and

(10) Importance of cost vs technical strength.

A third planning step is the preparation by the IHA staff of the **road and street construction documentation** that will become either a portion of the RFP to contract for all aspects of the Indian housing project or a separate RFP for IHA road and street construction. Issuance of the RFP marks the end of the presolicitation phase of planning and the beginning of the solicitation phase.

MILESTONE V - CONTRACT AWARD: For the purposes of this guidebook, the Solicitation and Evaluation steps have been combined with the Contract Award step to form the second phase of the road contracting procedure.

V-1. Solicitation - A contracting officer normally prepares the RFP with two purposes in mind:

(1) Convey to the prospective contractors the information they will need to prepare a responsive proposal; and

(2) Solicit information that procurement and technical personnel will need to appraise contractor proposals.

In addition to containing all necessary information that will enable prospective contractors to be equally responsive when submitting offers, an RFP must:

(1) Be in writing;
(2) Specify where and when (date and hour) the proposals must be returned to be considered responsive; and
(3) State that all questions concerning the RFP are to be referred to a specific individual with name, address, and telephone number given.

RFPs should address the following:

- The statement of work;
- The period of performance;
- Estimated cost and funding source;
- Background description of reports, plans, drawings, etc.;
- Listing of the type, items, and quantities of government property to be used by the successful contractor(s); and
- The technical proposal criteria and instructions.

IHA directors should consult with their local BIA road engineers and contract specialists to include other pertinent items in the RFP. After the advertisement has been published, RFPs are provided to prospective contractors, proposals are collected for evaluation, and an award determination is made.

Normally, bidders are requested to separate their RFP responses into two categories, technical and cost. If stated in the RFP, the two portions of the bid should be submitted in two separate packages.

V-2. Evaluation - Once the proposals are received, a thorough evaluation can begin during which each proposal should be assessed in strict conformance with the evaluation criteria published in the RFP. These evaluations consider two categories; technical capability and cost (or business) factors. Usually, each category is reviewed separately and by different IHA personnel. The first evaluation criteria should establish the technical capability of the contractor prior to evaluating the cost portion of the proposal.

Technical evaluations are conducted by an assigned roads project officer or a panel of technical resource personnel who are primarily concerned with:

(1) The bidder's understanding of the scope and statement of work as shown by the technical approach they proposed;
(2) The experience of the key personnel involved;
(3) Availability of equipment and personnel;
(4) Experience with the type of work involved;
(5) Assurance of timely and acceptable performance; and
(6) The reasonableness of labor hours required by the project.

After the technical proposal is evaluated, it is assigned a score and a ranking relative to the other proposals received. A technical report is prepared by the assigned evaluator and it becomes a permanent part of the contract file.

Cost evaluations are conducted by the contracting officer who is primarily concerned with those factors relating to cost/price analysis and with making a determination of the contractor's financial strength and management capability. In some instances, an evaluation will need to be made of the contractor's stated certifications and qualifications concerning Indian-owned businesses, use of indigenous labor, and accounting practices. The contractor's financial strength, management capability, and reasonableness of proposed cost can be determined by an examination of the contractor's financial resources, ability to comply with the performance schedule, and the contractor's history of satisfactory performance on similar contracts. Of course, all of the above evaluation factors assume that the information to address these factors is requested in the RFP.

When more than one prospective contractor falls within the pre-established competitive range, the technical evaluation team may elect to meet separately with each offeror to solicit their ideas on how a particular offerer intends to accomplish the project if awarded the contract. This also allows the offerer to explain any special construction techniques included in the bid. These sessions usually include a short question and answer period for the IHA technical evaluation team to again rate each bidder. The final results are tabulated and submitted to the IHA contracting officer for selection of the successful bidder package.

V-3. Negotiation - Prior to entering into the negotiation phase of the contract award, the IHA contracting officer may request a Best And Final Offer (BAFO) from the competing and qualified bidders. The combined results of the technical evaluations and the BAFOs are then used by the IHA contracting team to select a successful bidder for construction contract negotiations. The goal of these contract negotiations is, of course, to reach an

agreement that is acceptable to all parties involved; hence, it is important for the IHA director to have formally stated the acceptance criteria and received approval from the IHA board on these criteria before contract negotiations commence.

V-4. Contract Award - Once an award decision has been reached, the IHA contracting officer prepares the contract document. This document should reflect all the agreements reached during the negotiation phase and its preparation should be in consultation with BIA road construction personnel and ONAP Area Office personnel. The contract is then forwarded to the successful contractor for review and signature and returned to the IHA for implementation. The IHA director schedules a preconstruction conference with IHA staff, board members, tribal leaders, and outside technical resources. Appendix B illustrates a typical pre-construction conference agenda.

V-5. Post Contract Award and Post Award Contract Administration - Usually actions taken during this administrative portion of the contract are to ensure that work proceeds according to schedule and that performance is in accordance with the written terms of the contract.

Monitoring Performance - While the construction contractor has primary responsibility for the performance of the contract and subcontractors, the IHA director and staff should continually monitor every aspect of the construction project. The emphasis on monitoring is to ensure compliance with contract requirements.

Technical Progress Reports - These are reports that should be submitted by the contractor to the IHA director. Technical progress reports provide information on the status of construction work to the contract administrator and IHA director. While the reports usually include assurances that work is on schedule and that interim goals are being met, the reports are also used to specify problems the contractor may encounter that could require action by the IHA director to resolve.

Financial Reports - In addition to technical reports, financial reports are sometimes requested by the IHA contract administrator. These reports should contain information regarding the financial status of the contract, aid in monitoring the expenditures of the contractor, help avoid cost overruns, and assist the contract administrator in identifying potential problem areas.

Contract Modifications - During the life of the Indian housing construction contract, modifications may be required to incorporate new requirements or to resolve problems that occur after work has begun. These alterations must be made in writing by the IHA director or his appointed contracting officer in order to avoid any misunderstanding between everyone involved in the contract.

Subcontracting - Most contracts will contain provisions for the use of subcontractors by the contractor. A subcontract clause allows the IHA director to approve or disapprove of the use of a subcontractor and permits a degree of control over those involved in the actual work performance.

Inspection and Acceptance - Essentially the work performed must be reviewed and evaluated prior to acceptance. This topic is covered in more detail in the next section.

> Strive to be that person who
> is never absent from an important act.
>
> *Osage*

THOSE WHO HAVE ONE FOOT
IN THE CANOE AND ONE FOOT ON THE SHORE
ARE GOING TO FALL INTO THE RIVER.

TUSCARORA

CONSTRUCTION, INSPECTION, AND OWNERSHIP TRANSFER

This section discusses Milestones VI and VII, the construction, inspection, and ownership transfer phases of the Indian housing road improvement program. Milestone VI has two parts, on-site construction monitoring and inspection, while Milestone VII discusses the preparation required by the IHA director to accomplish ownership transfer at the end of the Indian housing road improvement program.

MILESTONE VI - CONSTRUCTION AND INSPECTION: An experienced road engineer understands that a well constructed road is directly related to quality control and assurances, contractor performance, and life-cycle cost analysis of repair and maintenance.

The IHA director should use the services of the BIA road engineer to establish construction criteria that are within state and Federal rules, regulations, specifications, and construction standards, and tailored for the IHA's terrain, climate, and resources. The BIA road engineer is available to assist in executing construction contracts and ensuring compliance with the plans and specifications as drawn up by the IHA director and staff and approved by the IHA board.

Regardless of who serves as the IHA roads project officer during the construction phase, the IHA director is responsible for the provision of close, on-site supervision to oversee the construction process. The recommended method for satisfying this responsibility is in the use of an IHA roads contract administrator and a QA/QC inspection team to ensure contractor compliance and to maintain adequate record of land ownership, utility placements, materials, construction, and tests for eventual transfer of road ownership to the BIA.

VI-1. Preconstruction Conference - Once the contractor has been selected, holding a preconstruction meeting is highly recommended. This meeting can be held at the construction site and should include representatives from the tribe, IHA, BIA, contractor, subcontractors, and the architect or engineer. Typical agenda items for the preconstruction conference are shown in Appendix B.

The emphasis at the preconstruction meeting is on the entire Indian housing construction program; however, the roads portion of the construction contract should be a major focus of attention. Regularly scheduled meetings between the contractor, IHA staff, and other

concerned parties should also be arranged to provide updated information on the progress of the road construction and to help resolve any issues that were not anticipated during the preconstruction conference.

Two important factors should be established during the preconstruction conference, the time-frame of the overall Indian housing construction program and the identification of the IHA staff assigned to monitor the various phases of the construction program.

Contract Time - Scheduling the construction project using a complicated set of factors provides, at best, a *reasonable estimation* of the length of time required to complete the various phases of construction. The schedule can be affected by any number of unforeseen circumstances such as; local weather conditions, the complexity of the operation, the availability of contractors and materials, or work restrictions imposed by hazardous conditions or night work.

Project Staffing - There are no strict guidelines for IHA roads project staffing. Depending on the size of the project and the funds available, the IHA may be able to provide one person or a large staff to monitor the construction project. The contractor likewise must estimate his staffing requirements and labor force numbers. It is important to have adequate staffing by both parties to ensure that the project is not delayed.

> *One way for the IHA director to remain in control of the Indian housing roads improvement program is to have an adequate number of support staff assigned to the roads construction project; i.e., a roads construction contract administrator and a QA/QC team.*

VI-2. Road Construction Monitoring Program - The IHA director should establish a roads construction monitoring program that focuses on three key items:

- Change Orders
- Construction Materials
- Construction Procedures

Change Orders - It is unrealistic to begin something as complex as a road construction project and not expect changes along the way. No one can anticipate every change, so the IHA director, contractor, and staff must remain flexible. When circumstances arise where it becomes necessary for the IHA director to consider a change request from the construction contractor, the proposed changes should be reviewed in accordance with the following general principles:

1. Can the proposed change result in a better solution to the problem at no substantial increase in cost or time?
2. Can the proposed change result in an equivalent solution to the problem with savings in cost or time, or both?
3. Is the proposed change an absolute necessity regardless of cost or time?

Adequate IHA staffing of the roads construction project will help with early identification of many problems requiring change orders and will facilitate the review and approval process.

Construction Materials - Materials used to build roads are usually taken from the local area to reduce costs. Otherwise, materials must be shipped in from other locations, and can significantly increase expenses. Materials used in road construction commonly require laboratory testing to determine their suitability for the intended use. BIA road engineers will have information on locally available materials and acceptable test procedures to ensure the quality of the road construction material.

While the IHA director is not responsible for conducting such tests, the road construction contractor often is held responsible for supplying such test results to the IHA for inclusion in the records that are to be provided to the BIA during the ownership transfer process.

National organizations such as the American National Standards Institute (ANSI), and the American Association of State Highway and Transportation Officials (AASHTO) publish reliable testing data for numerous construction materials. The results from the material tests should be recorded by the IHA contract administrator and/or staff and results should be maintained in the design file for future submittal to the BIA Road Engineering Office.

To ensure road construction compliance in accordance with both the contract specifications as well as with criteria specified in regulations published by the above organizations, the IHA director should have knowledgeable IHA staff perform on-site inspections and request test results from the road construction contractor for the materials used in road construction. This is not only good practice, but most likely will be required by the BIA to document acceptable road construction prior to acceptance of the IHA roads into their road maintenance program.

A danger foreseen is half avoided.
Cheyenne

Construction Procedures - Road construction procedures and techniques are just as important to the successful development of an acceptable road as the choice of materials to be used in building the roads. Preparation of the roadbed and application of the road material affect the strength and integrity of the roadbed as significantly as the type and quality of material used to construct the road.

The IHA director must have confidence in the contractor's construction procedures. This confidence can be established and maintained by examining the road contractor's construction procedures from two different aspects; physical, on-site inspections and the paper documentation of construction procedures and test results.

VI-3. Inspections, Quality Assurance and Quality Control - Quality assurance (QA) includes all the planned steps necessary to ensure, with adequate confidence, that the project will be performed satisfactorily and will comply with the requirements listed in the statement of work. Quality control (QC) refers to the specific procedures involved in the QA process. This can include planning, coordinating, scheduling, and reviewing the road construction through on-site inspections or through off-site audits of construction test results and procedures. The costs associated with the QA/QC functions should be included in the overall cost of administering the roads construction contract.

On-Site inspections should be conducted by knowledgeable IHA staff on a periodic, but irregular basis to ensure that construction procedures and techniques are in compliance with Federal and state guidelines and contract requirements.

Off-Site inspections should be conducted by knowledgeable IHA staff on a regular basis to examine purchase orders, invoices, test results, hiring practices, and other compliance matters. In addition to monitoring contract compliance, off-site inspections ensure that the proper documentation is collected and maintained in the roads document file to facilitate the eventual transfer of roads ownership to the BIA.

The importance of an effective QA/AC team cannot be over stressed because frequent testing and inspections keep the contractors honest in their use of materials and in their construction practices and procedures. While it is recognized that the cost of a QA/QC

team has to be born by the Indian housing project, such services are cost-effective in the long run and result in better IHA roads and streets.

MILESTONE VII - OWNERSHIP TRANSFER: The transfer of road ownership from the IHA to the BIA's Indian Reservation Road system for maintenance is the final phase of the Indian housing roads and streets program.

The road transfer starts with the IHA passing the finished roads over to the tribe or Alaskan Native corporation and receiving their respective approval of the project. Once the tribe or Alaskan Native corporation has approved the finished project and has assumed legal responsibility for the roads, they, in turn, may petition the BIA to accept the roads into the BIA road maintenance program.

Ownership transfer implies the assignment of a number of agreements, land titles, and other documents from the IHA to the tribe or Alaskan Native corporation for further transfer to the BIA. Title research and agreements between agencies and/or tribal governments can be both time consuming and tedious, but necessary for legal transfer.

If the IHA has followed the guidance provided by the BIA, maintained the necessary documentation, and monitored the construction process through testing and inspections then the finished roads project should be acceptable to the BIA.

The following list illustrates the types of agreements that the IHA director may have to establish in order to fulfill BIA requirements for ownership transfer. The list is not meant to be all-inclusive, but it is representative of the types of agreements sometimes required.

> There are many paths to a
> meaningful sense of the
> natural world.
>
> *Blackfoot*

Examples Of Types Of Agreements

Affecting Development Of Roads
And Streets In Indian Housing

1. Construction and/or Maintenance Agreements with other organizations on common routes involving multiple jurisdictions.

2. Use and location of public right-of-way for utility lines, structures, or access.

3. Provisions for temporary ponding for storm water run-off and drainage to satisfy local and Federal Government regulations.

4. Maintenance access rights-of-way to structures and waterways.

5. Agreements for Provision of services on the IHA thoroughfares.

6. Provision of special rights-of-way for crop farming, soil conservation, recreation facilities, etc.

7. Agreements for special or restricted access or use.

8. Agreements for the construction and maintenance of frontage routes.

APPENDIX A

INDIAN HOUSING ROADS

PROJECT DESIGN FILE

INDIAN HOUSING ROADS PROJECT DESIGN FILE

The IHA Director should work closely with the technical personnel providing road and street design support. It is recommended that the IHA director and/or staff maintain a file containing all matters pertaining to the design of the project. The design file should include the following:

The Design Speed - This is the safe maximum speed that can be maintained over a specific section of road when conditions are favorable. It is influenced by the choice of terrain, type of road, traffic volumes and economic considerations.

Average Daily Traffic, both present and future (5 years and beyond). The Average daily traffic should be noted as either an actual or estimated count and include date of count.

A typical section sketch should be prepared by the designer showing the proposed geometric section, including finished and subgrade widths, ditch dimensions, crown and subelevation, and cut and fill slope selections.

The file should show the design criteria used in determining drainage requirements such as 25 year flood frequency and USGS hydrologic charts.

Right-of-way widths should be noted, including agreements for construction easements.

If a soil profile has been taken, it should be part of the file. In some areas, a chemical analysis at culvert locations may be required to determine the need for protective coating of pipes.

The designer should record whether the profile grade should roll with the terrain, avoiding high fills and cuts, or whether grades should be as smooth as possible.

All control profile elevations should be noted such as, existing pavements to be matched, minimum pipe cover requirements, railroad elevation crossings, bridge elevations to be matched, as well as any other elevation requirements which may have been agreed upon with abutting property owners.

Location of possible aggregate and borow pits for cut and fill, respectively, should be listed.

The designer should note the requirements for earth work balancing such as maximum balance distance, whether tight balance or borrow and waste designs should be followed and whether ditches can be widened or slopes flattened to achieve better balanced design.

Shrinkage and swell factors should be noted, whether calculated or estimated, and location of rock outcrops, swamps and springs.

The need for fencing, gates, cattle guards, cattle passes, curbing, guard rails, etc., and the criteria used to determine those needs should all be maintained in the design file.

The need for road approaches, acceleration, deceleration and passing lanes should be noted.

All available information on base course and surfacing should be noted to determine thickness, asphalt requirements, need for bituminous seal coats, or permafrost requirements, etc.

If the proposed roads are to be maintained by the BIA, there are special design requirements that must be addressed early in the design phase.

All other items that may have a bearing on the design should be maintained in the design file so that all personnel involved with the design will be aware of the criteria and design requirements. The designer should obtain copies of all correspondence on the project and make it a part of the design file. The IHA Director and assigned staff should periodically review the design file to stay current on the issues facing the designer, contractors, and members of the inspection team.

APPENDIX B

PRE-CONSTRUCTION CONFERENCE AGENDA

TYPICAL PRE-CONSTRUCTION CONFERENCE AGENDA

- Adherence to Force Accounting
- Certificates of Insurance
- Claims & Disputes Procedures
- Clean-Up Requirements
- Community Relations
- Contractor's Designated Areas
- Correspondence Points of Contact
- Environmental Procedures
- Inspections
- Labor Agreements & Availability
- Lines of Communication
- Material Handling Procedures
- Methods of Payment
- Overtime/Shift Work Procedures
- Procedures for Change Orders
- Project Performance Schedule
- Project Cost Schedule
- Quality Assurance & Quality Control
- Safety and First-Aid Facilities
- Security
- Temporary Facilities & Services