

Alaska, Department of Community and Regional

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Affairs.

HOMER DRAINAGE STUDY  
REPORT  
INCLUDING  
DRAINAGE WAY CONSTRUCTION  
PLANS AND SPECIFICATIONS

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## DRAINAGE PLAN AND DESIGN FOR THE CORE AREA OF HOMER, ALASKA

### Introduction

This manual is a supplement to the Homer Drainage System Maps and serves as a guide for future construction of the drainage system. A complete set of plans (in a reduced format) and specifications for construction of major drainage-ways is included in this manual, along with recommendations for the maintenance and development of minor drainage-ways.

The first section of this manual explains the information contained on the Drainage System Maps. The second section discusses the design for major drainage-ways and provides recommendations for the management of minor drainage-ways. The third section contains operation and maintenance instructions required to have the drainage system operate as designed. The fourth and last section contains the plans and specifications to be used as contract documents for construction of the major channels in the Core Area drainage system.

### Interpretation of Drainage System Maps

The drainage system maps have been produced to aid the City of Homer in developing and enforcing a drainage system, and in administering a drainage ordinance. Both major and minor drainage-ways have been identified on the maps. Major drainage-ways are defined as those that once in 25 years (or with a 4% annual probability) will discharge sufficient runoff to require specifically engineered drainage structures such as culverts, ditches, or other appurtenances. Major drainage-ways also include natural streams that have established a definite course which should not be altered without a specific, engineered design. Minor drainage-ways are those which carry small quantities of water and/or have been constructed specifically to collect runoff, and can therefore be re-routed, to a certain degree, along existing easements and property lines.

Major drainage-ways flowing through developed areas of Homer have been defined in the construction drawings which were prepared in conjunction with this report. Roadside ditches and other minor drainage-ways are not so specifically defined.

Drainage basin boundaries are also shown on the drainage system maps. When new roads and/or culverts are installed in locations where none currently exist, culverts should be installed to maintain existing routing and basin boundaries. In this manner, all downstream drainage structures will remain adequate in size to accommodate new development. If the size of any basin is increased more than an acre or two, the culverts as presently designed may not be adequate to carry the increased flows.

### Design of Drainage-Ways

Major drainage-ways have been designed to carry the expected runoff for a 25 year recurrence interval. The runoff quantities were determined using the Soil Conservation Service Type 1A Storm Distribution Discharge vs. Drainage Area Graph presented in the Homer Drainage Management Plan prepared in August 1979 by CH2M Hill. Culvert sizes, lengths and orientation have been defined and are shown on the construction drawings. If road widths (and therefore culvert lengths) increase by 50 percent or more, the hydraulic capacities of the culverts, engineered for existing conditions, must be recalculated. There are several instances in the construction set of drawings where a drainage-way crosses a non-existent road or road with inadequate depth the suggested road height is shown, dashed, on the drawings. It is necessary that all of the road be built to that height, not just the road right over the culvert. This is not only so a bump in the road is not constructed, but also because a certain height of road embankment is required to contain the water in order to achieve the maximum flow through the culvert. Therefore, if the road is not of adequate height, water will flow over the road rather than through the culvert. The plans also show the road to the campground north of Fairview road to be moved. This road is currently unplatted so would involve a physical change, but not a right-of-way change. Moving the campground road is recommended so as to remove its surcharge load from the bank of the Woodard Creek channel. Presently, the road will serve to cause the bank to slough away, especially in time of high flow levels. This could easily lead to the loss of the road. No design has been completed for major drainage-ways in undeveloped areas of Homer. However, major channels have been identified in their entirety. Therefore, drainage easements can be defined as these areas develop. Easements should be a minimum of 20 feet wide, centered on the natural thread of the channel. Easements for channels that are in a ravine should extend 10 feet beyond the top of bank on both sides of the ravine unless structural improvements are made to contain the channel in less space.

The minor channels are identified and recommended channel locations are shown on the Drainage System Maps. As stated earlier, they may be relocated as required when new development occurs. However, the potential for erosion increases with the artificial collection of runoff and must be considered when drainage is routed. To reduce the potential for erosion and minimize its effects, any channel created should be vegetated and set at a slope not greater than 10 percent, with a preferred slope at less than 7 percent. The recommended grass types suitable for use as channel lining are given in the following table. Channels with a gradient greater than 10 percent must be protected with a riprap channel lining.

RECOMMENDED GRASS COVERS AS CHANNEL LINING

Cover	Germination (percent)	Application (lbs/acre)
Meadow Foxtail (Alopecurus Pratensis)	90	10
Arctared Fescue (Festuca rubra 'Arctared')	90	10
Merion Bluegrass (Poa pratensis 'Merion')	90	10
Manchar Smooth Bromegrass (Bromus inermis 'Manchar')	90	4

- Notes:
1. Garrison Creeping Foxtail may be substituted for Meadow Foxtail, however, Meadow Foxtail is more available. Garrison Creeping Foxtail (Alopecurus arundinaceus) creeps more and spreads easier.
  2. ('Phleum pratense') Timothy 'Engmo' should be substituted for Manchar smooth Bromegrass if the pH of the soil is 5 or below.

The minimum size culvert for under-driveway installation is 18 inches. Culverts under arterial streets must be a minimum of 24 inches. Design has been completed for the larger road crossings of minor drainage-ways, as shown on the construction drawings.

To alleviate some of the problems associated with icing, some road crossings are designed for double culvert installations. In these type of installations, one of the culverts is set at a higher elevation than the other. If the lower culvert becomes blocked by ice buildup, the elevated culvert will still have carrying capacity. The possibility of using high density polyethylene (HDPE) pipe was also considered to overcome the icing problem. HDPE pipe has a lower coefficient of friction than steel or aluminum culverts, and transfers heat at a much lower rate than steel or aluminum, both characteristics which are assumed to help solve the icing problem. The lower coefficient of friction causes water to flow through the culvert at a higher velocity than it would through a corrugated metal culvert. At a higher velocity, water requires more heat loss before freezing than would otherwise be required, causing ice to form at a slower rate. However, higher velocities through the culvert cause a higher velocity of discharge from the culvert, thus increasing the potential for erosion. Because of the high erodibility of most of the soils in Homer, it was decided to experimentally use HDPE pipe in one installation, using a plunge basin to dissipate the energy of the higher velocity.

## Operation and Maintenance

Twice a year all channels, major, minor, and roadside must be inspected and cleared of debris and any road surface material that may have been plowed into roadside ditches. Ditches and channels should be checked and cleared in early summer to remove items accumulated over the winter, and again in late fall, to keep the channels free flowing. It is critical to maintain free flowing conditions through the winter in order to reduce obstructions that may lead to icing, and to allow spring runoff to be safely carried to Kachemak Bay.

Trash racks have been designed for two of the major channels flowing through Homer to catch debris from their upper valleys. The simpler, flat faced trash rack can also be installed across any channel at an upper-reach culvert where debris from the valley is known to accumulate. The trash racks must be cleaned early every spring and soon after every large storm. If the trash racks are not clear before a storm, it is possible that the flows would overtop the road. It may even be necessary to clean the trash racks of debris during a storm. If the culvert entrance is becoming blocked, the debris must be removed as quickly as possible. In that case some raking mechanism should be used for clearing debris from the rack. Lifting the rack, otherwise the normal procedure, during a high flow condition could cause the debris to go through the culvert, negating the use of the trash rack altogether. Both types of trash racks are designed for easy cleaning. A utility truck with a winch or boom is required for cleaning. Each trash rack has a bar across the top and a lifting ring at the bottom. A hook from the winch is attached to the ring and the rack is lifted up and back, rotating on the top bar. The debris is then readily deposited on the embankment for easy pickup and disposal. The trash racks should be lifted out and stored for the winter. Each of the culverts is designed to weigh less than 100 pounds. Removing the trash racks from the channel before freezing occurs will reduce the potential for icing in the culverts.

A recommended thaw wire design is also included in the construction drawing package. Thaw wires should be inspected each fall before they are urgently needed to ensure they are working.

The recommended drainage system improvements are itemized in the following table. These improvements are listed with a description of priority for construction.

DRAINAGE IMPROVEMENTS-PRIORITY LIST

Culvert I.D. from Plans

\*Priority Level

C1A	Moderate
C2A	Moderate w/embankment
C3A	High
C4A	Low
C5A	Moderate
C6A	Plunge basin - high
C1B	High, if upstream improvements are made
C2B	When road is improved
C3B	When road is improved
C4B	Moderate, high when C8B is complete
C5B	Moderate, high when C8B is complete
C6B	Moderate, high when C8B is complete
C7B	When Fairview is built
C8B	Urgent
C9B	Moderate
C10B	Moderate
C11B	Moderate
C12B	Moderate
C1C	None
C2C	None
C3C	Urgent
C4C	None
C5C	Urgent
C6C	None
C7C	Moderate
C8C	Moderate
C9C	Moderate
C10C	Moderate
C1D	When road is built
C2D	Riprap outfall-moderate
C1E	Build up road-high
C2E	None
C3E	High
C4E	Plunge basin-moderate
C5E	High
C6E	Low
C7E	When trail is built
C1F	Low
C2F	Low
C1G	High
C2G	None
C4G	When road is improved
C5G	High
C6G	High



Culvert I.D. from Plans (Con't)

\*Priority Level

C7G	High
C8G	When area develops
C9G	High

Channels may be improved on an as-needed or money-allows basis with the following exceptions where improvements should be made immediately:

- 4A
- 1C (when area develops)
- 5CD
- 5E
- 6E
- 2G
- 3G

Short channels (less than 200 feet) between culverts should be improved as culverts are installed.

\*Unless otherwise indicated, all improvements of any culvert have same priority.

SECTION 00040  
BIDDING REQUIREMENTS AND CONDITIONS

1.01 Qualification of Bidders:

No bid will be accepted from, or contract awarded to, a Contractor to whom bid documents have not been issued by the City.

All Contractors are required to be licensed to do business in the State of Alaska, prior to submitting a bid.

Nothing contained in this section shall be construed as depriving the City of its discretion in the matter of determining the lowest responsible bidder.

1.02 Contents of Proposal Forms:

Upon request, the City will furnish the prospective bidder with a proposal form. This form will state the location and description of the contemplated construction and will show the approximate estimate of the various quantities and kinds of work to be performed or materials to be furnished, and will have a schedule of items for which unit bid prices are invited. The proposal form will state the time in which the work must be completed, the amount of the bid guaranty, special provisions or requirements which vary from or are not contained in the standard specifications and the date, time and place for the opening of proposals.

The plans, specifications, and other documents designated in the proposal form, will be considered a part of the proposal whether attached or not.

As a part of the proposal, the Contractor will be required to furnish the City with information regarding his arrangements to finance the work, his equipment available for the work, and his experience on highway work.

1.03 Issuance of Proposals:

The City reserves the right to disqualify a bidder or refuse to issue a proposal for any of the following reasons:

- A. Uncompleted work of a bidder which, in the judgement of the City, might hinder or prevent the prompt completion of additional work if awarded.
- B. Failure to pay, or satisfactorily settle, all bills due for labor and material on previous contracts in force at the time of issuance of proposals.

- C. Failure to comply with any qualification regulations of the City.
- D. Default under previous contracts, or fraud or dishonesty in the performance of previous contracts.

1.04 Interpretation of Quantities in Bid Schedule:

The quantities appearing in the bid schedule are approximate only and are prepared for the comparison of bids. Payment to the Contractor will be made only for the actual quantities of work performed and accepted or materials furnished in accordance with the contract. The scheduled quantities of work to be done and materials to be furnished may each be increased, decreased, or omitted as hereinafter provided.

1.05 Examination of Plans, Specifications, Special Provisions, and Site of Work:

The bidder is expected to examine carefully the site of the proposed work, the proposal, plans, specifications, special provisions and contract forms, before submitting a proposal. The submission of a bid shall be considered prima facie evidence that the bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the plans, specifications, special provisions, and contract.

Information pertaining to subsurface exploration, borings and/or test pit locations, and other preliminary investigation may appear on the plans or in the special provisions or be available at selected locations for review by the bidder. While such data will have been collected with reasonable care, there is no expressed or implied guaranty that conditions so indicated are exact or entirely representative of those actually existing. The bidder shall put his own interpretation on results of such investigations and satisfy himself as to the conditions to be encountered.

1.06 Preparation of Proposal:

The bidder shall submit his proposal upon the forms furnished by the City. The bidder shall specify a unit price in words and figures, for each pay item for which a quantity is given and shall also show the products of the respective unit prices and quantities written in figures in the column provided for that purpose and the total amount of the proposal obtained by adding the amounts of the several items. All the words and figures shall be in ink or typed. In case of discrepancy between

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the prices written in words and those written in figures, the prices written in words shall govern.

When an item in the proposal contains a choice to be made by the bidder, the bidder shall indicate his choice in accordance with the specifications for that particular item, and thereafter no further choice will be permitted.

The bidder's proposal must be signed with ink by an individual if the bidder is a sole proprietorship; if the bidder is a corporation, proposal shall be signed by the officer or officers having authority to sign such a contract; if the bidder is a partnership, the proposal shall be signed by any authorized member of the partnership; and where the bidder is a joint venture, the proposal shall be signed by one or more representatives of the joint venture authorized to sign. When proposals are signed by an officer of a corporation, a member of a partnership or joint venture, a declaration of authority to sign the proposal from the corporation, partnership, or joint venture shall be submitted with the proposal.

1.07 Irregular Proposals:

Proposals will be considered irregular and shall be rejected for the following reasons:

- A. If the proposal is on a form other than that furnished by the City; or if the form is altered or any part thereof is detached.
- B. If there are unauthorized additions, conditional or alternative bids, or irregularities of any kind which may tend to make the proposal incomplete, indefinite, or ambiguous as to its meaning.
- C. If the bidder adds any provisions reserving the right to accept or reject any award, or to enter into a contract pursuant to an award.

This does not exclude a bid limiting the maximum gross amount of awards acceptable to any one bidder at any one bid letting, provided that any selection of awards will be made by the City.

- D. If the proposal does not contain a unit price for each pay item listed except in the case of authorized alternate pay items.

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1.08 Proposal Guaranty:

No proposal will be considered unless accompanied by a bid guaranty for an amount not less than that prescribed in the Invitation for Bids. The surety of a Bid Bond may be any corporation or partnership authorized to do business in Alaska as an insurer under AS21.09. In lieu of a Bond, a cashier's check made payable to the City of Homer for an amount not less than that prescribed in the Invitation for Bids.

1.09 Delivery of Proposals:

Each proposal should be marked to clearly indicate its contents. When sent by mail, the sealed proposal shall be addressed to the City at the address and in care of the official in whose office the bids are to be received.

1.10 Withdrawal or Revision of Proposals:

A bidder may withdraw or revise a proposal after it has been deposited with the City provided the request for such withdrawal or revision is received by the City, in writing or by telegram, before the time set for opening proposals.

1.11 Combination or Conditional Proposals:

If the City so elects, proposals may be issued for projects in combination and/or separately, so that bids may be submitted either on the combination or on separate units of the combination. The City reserves the right to make awards on combination bids or separate bids to the best advantage of the City. No combination bids, other than those specifically set up on the proposals by the City will be considered.

Conditional proposals will be considered when so stated in the special provisions.

1.12 Public Opening of Proposals:

Proposals will be opened and read publicly at the time and place indicated in the Invitation for Bids. Bidders, their authorized agents, and other interested parties are invited to be present.

1.13 Disqualification of Bidders:

Either of the following reasons may be considered as being sufficient for the disqualification of a bidder and the rejection of his proposal or proposals:

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- A. More than one proposal for the same work from an individual, firm, or corporation under the same or different name.
- B. Evidence of collusion among bidders. Participants in such collusion will receive no recognition as bidders for any future work of the City until any such participant shall have been reinstated as a qualified bidder.

1.14 Material Guaranty:

The successful bidder may be required to furnish a complete statement of the origin, composition, and manufacture of any or all materials to be used in the construction of the work together with samples, which samples may be subjected to the tests provided for in these specifications to determine their quality and fitness for the work.

SECTION 00201  
DEFINITIONS AND TERMS

1.01 Abbreviations:

Wherever the following abbreviations are used in these specifications or on the plans, they are to be construed the same as the respective expression represented:

AASHTO	American Association of State Highway and Transportation Officials
AGC	Associated General Contractors of America
AIA	American Institute of Architects
AISI	American Iron & Steel Institute
AITC	American Institute of Timber Construction
ANSI	American National Standards Institute
ARBTA	American Road Builders & Transportation Association
ASCE	American Society of Civil Engineers
ASLA	Alaska Society of Landscape Architects
ASTM	American Society for Testing & Materials
AWPA	American Wood Preservers Association
AWA	American Welding Society
AWWA	American Water Works Association
BLM	Bureau of Land Management, Department of Interior
CRSI	Concrete Reinforcing Steel Institute
FHWA	Federal Highway Administration, Department of Transportation
FSS	Federal Specifications and Standards, General Services Administration

All references to codes, specifications or publications promulgated by the above shall be the edition current as of the date of the project advertisement.

1.02 Advertisement:

The public announcement, as required by law, inviting bids for work to be performed or material to be furnished.

1.03 Award:

The acceptance by the City of bid.

1.04 Bidder:

An individual, firm, corporation or any acceptable combination thereof, or joint venture submitting a bid for the advertised work.

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1.05 Bid Bond:

The security furnished with a bid to guarantee that the bidder will enter into the contract if his bid is accepted.

1.06 Bridge:

A structure, including supports, erected over a depression or an obstruction, as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads and having a length measured along the center of the roadway of more than 20-feet between backwalls of abutments.

The length of a bridge structure is the over-all length measured along the line of survey stationing back to back of backwalls and abutments, if present, otherwise end to end of the bridge floor, but in no case less than the total clear opening of the structure.

1.07 Calendar Day:

Every day shown on the calendar beginning and ending at midnight.

1.08 Change Order:

A written order issued by the Engineer to the Contractor, covering changes in the plans or quantities or both, within the scope of the contract, at contract unit prices and establishing time adjustments for the changes.

1.09 City

The City of Homer as constituted under the laws of the State of Alaska.

1.10 Contract:

The written agreement between the City and the Contractor setting forth the obligations of the parties thereunder, including, but not limited to, the performance of the work, furnishing of labor and materials, and the basis of payment.

The contract includes the Proposal, Contract Form and Contract Bond, Specifications, Special Provisions, General and Detailed Plans, and Notice to Proceed, also any work orders, change orders and extra work orders that are required to complete the construction of the work in an acceptable manner, all of which constitute one instrument.



1.11 Contract Item (Pay Item):

A specifically described item of work for which a price is provided in the contract.

1.12 Contract Time:

The number of calendar days allowed for completion of the contract, including authorized time extensions.

When a completion date is shown in the proposal, the contract shall be completed by that date, except as otherwise provided in the contract.

1.13 Contracting Officer:

The Contracting Officer shall be designated by the City.

1.14 Contractor:

The individual, firm, corporation, or any acceptable combination thereof, contracting with the City for performance of prescribed work.

1.15 Culvert:

Any structure not classified as a bridge which provides an opening under a roadway or provides an underground channel for drainage.

1.16 Embankment:

A structure of soil, soil-aggregate or broken rock constructed between the original ground (embankment foundation) and the bottom of the subbase layer of a road, or to the top of a drainage-way containment embankment.

1.17 Engineer:

The City shall designate a duly authorized representative, who is responsible for engineering supervision of the construction.

1.18 Equipment:

All machinery together with the necessary supplies for upkeep and maintenance, and also tools and apparatus necessary for the proper construction and acceptable completion of the work.

1.19 Extra Work:

An item of work not provided for in the contract as awarded

but found essential by the Engineer for the satisfactory completion of the contract within its intended scope.

1.20 Extra Work Order:

A written order issued by the Engineer authorizing the performance of work or furnishing of materials involving extra work and establishing the basis of payment, time adjustment and specification change for said extra work.

1.21 Furnishing Materials:

The purchase, production, preparation, transportation and delivery of materials to the site of the work and construction, repair, clearing, stripping, obliteration of access roads and final clean-up necessary to complete the work.

1.22 Highway, Street or Road:

A general term denoting a public way for the purpose of vehicular travel, including the entire area within the right-of-way.

1.23 Holidays:

In the State of Alaska, holidays occur on:

1. New Year's Day - January 1
2. Lincoln's Birthday - February 12
3. Washington's Birthday - Third Monday in February
4. Seward's Day - Last Monday in March
5. Memorial Day - Last Monday of May
6. Independence Day - July 4
7. Labor Day - First Monday in September
8. Alaska Day - October 18
9. Veteran's Day - November 11
10. Thanksgiving Day - Fourth Thursday in November
11. Christmas Day - December 25
12. Every Sunday
13. Every day designated by public proclamation by the President of the United States or the Governor of the State as a legal holiday.

If any holiday listed above falls on a Saturday, Saturday and the preceding Friday are both legal holidays. If the holiday should fall on a Sunday, except (12) above, Sunday and the following Monday are both legal holidays.

1.24 Inspector:

The Engineer's authorized representative assigned to make detailed inspections of contract performance.

1.25 Invitation For Bids:

The advertisement for proposals for all work or materials on which bids are required.

1.26 Laboratory:

A testing laboratory which may be designated by the Engineer.

1.27 Major Contract Item:

Any contract item for which the product of the bid quantity and the bid price equals 10 percent (10%) or more of the total contract amount.

1.28 Minor Contract Item:

Any contract item for which the product of the bid quantity and the bid price equals less than 10 percent (10%) of the total contract amount.

1.29 Materials:

Any substances specified for use in the construction of the project and its appurtenances.

1.30 Median:

That portion of a divided highway separating the traveled ways for traffic in opposite directions.

1.31 Notice To Proceed:

Written notice to the Contractor to proceed with the contract work including, when applicable, the date of beginning of contract time.

1.32 Original Ground (OG):

The ground surface prior to the initiation of the proposed work.

1.33 Pavement Structure:

The combination of subbase, base course, and surface course placed on a subgrade to support the traffic load and distribute it to the roadbed.

1.34 Payment Bond:

The security furnished by the Contractor and his surety to guaranty payment of the debts covered by the bond.

1.35 Performance Bond:

The security furnished by the Contractor and his surety to guaranty performance of the work in accordance with the contract.

1.36 Plans:

The approved plans, profiles, typical cross sections, working drawings and supplemental drawings, or reproductions thereof, which show the location, character, dimensions, and details of the work to be done.

1.37 Preconstruction Conference:

A meeting between the Contractor and the Engineer to discuss the project before the Contractor begins work.

1.38 Profile Grade:

The trace of a vertical plane intersecting the top surface of the layer shown on the typical section, usually along the longitudinal centerline of the roadbed. Profile grade means either elevation or gradient of such trace according to the context.

1.39 Project:

The specific work defined together with all appurtenances and construction to be performed thereon under the contract.

1.40 Proposal:

The offer of a bidder, on the prescribed form, to perform the work and to furnish the labor and materials at the prices quoted.

1.41 Proposal Form:

The approved form on which the City requires bids to be prepared and submitted for the work.

1.42 Questionnaire:

The specified forms on which the Contractor shall furnish required information as to his ability to perform and finance the work.

1.43 Right-Of-Way:

A general term denoting land, property, or interest therein, usually in a strip, acquired for or devoted to a highway, street or other traveled way.

1.44 Roadbed:

The graded portion of a highway within top and side slopes, prepared as a foundation for the pavement structure and shoulders.

1.45 Roadside:

A general term denoting the area adjoining the outer edge of the highway. Extensive areas between the roadways of a divided highway may also be considered roadside.

1.46 Roadside Development:

Those items necessary to complete the highways which provide for the preservation of landscape materials and features; the rehabilitation and protection against erosion of all areas disturbed by construction through seeding, sodding, mulching and the placing of other ground covers; such suitable planting and other improvements as may increase the effectiveness and enhance the appearance of the highway.

1.47 Roadway:

The portion of a highway within limits of construction.

1.48 Shoulder:

The portion of the roadway contiguous with the traveled way for accomodation of stopped vehicles for emergency use, and for lateral support of base and surface courses.

1.49 Sidewalk:

That portion of the roadway constructed primarily for the use of pedestrians.

1.50 Special Provisions:

Additions and revisions to the standard and supplemental specifications covering conditions peculiar to an individual project.

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1.51 Specialty Items:

Pay items so designated in the bid schedule which require equipment and crafts not ordinarily associated with the types of work covered by the contract.

1.52 Specifications:

A general term applied to all directions, provisions and requirements pertaining to performance of the work.

1.53 Standard Specifications

A book of specifications approved for general application and repetitive use.

1.54 Typical Details:

Drawings included with the plans showing details to be used where appropriate.

1.55 State:

The State of Alaska acting through its authorized representative.

1.56 Structures:

Bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, endwalls, buildings, sewers, service pipes, underdrains, foundation drains, and other features which may be encountered in the work and not otherwise classed herein.

1.57 Subbase:

The layer or layers of specified material of designated thickness constructed on the subgrade to support a base course.

1.58 Subcontractor:

An individual, firm, or corporation to whom the Contractor sublets part of the contract.

1.59 Subgrade:

The top surface of the embankment upon which the pavement structure and shoulders are constructed.

1.60 Substructure:

All of that part of the structure below the bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, together with the backwalls, wingwalls and wing protection railings.

1.61 Superintendent:

The Contractor's representative in responsible charge of the work, who shall be authorized to receive and execute work orders and directions of the Engineer.

1.62 Superstructure:

The entire structure except the substructure.

1.63 Surety:

The corporation, partnership or individual, other than the Contractor, executing a bond furnished by the Contractor.

1.64 Time Extensions:

Extensions of the contract time or completion date afforded the Contractor as further defined in Parts 1.08 and 1.20.

1.65 Titles (Or Headings):

The titles or headings of the sections and subsections herein are intended for convenience of reference and shall not be considered as having any bearing on their interpretation.

1.66 Traveled Way:

The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

1.67 Work:

Work shall mean the furnishing of all labor, materials, equipment, and other incidentals necessary or convenient to the successful completion of the project and the carrying of all the duties and obligations imposed by the contract. In this specification work can also refer to the location of the performance of the contract.

1.68 Working Drawings:

Stress sheets, shop drawings, erection plans, falsework plans, framework plans, cofferdam plans, bending diagrams for reinforcing steel, or any other supplementary plans or similar data which the Contractor is required to submit to the Engineer for approval.

1.69 Work Order:

A written order, signed by the Engineer, requiring performance of the work under the terms of the contract by the Contractor without negotiation of any sort.

In order to avoid cumbersome and confusing repetition of expressions in these specifications, it is provided that wherever anything is, or is to be done, if, as, or, when, or where "contemplated, required, determined, directed, specified, authorized, ordered, give, necessary, deemed necessary, permitted, reserved, suspended, established, approval, approved, disapproved, acceptable, unsatisfactory, sufficient, insufficient, rejected, or condemned," it shall be understood as if the expression were followed by the words "by the Engineer" or "to the Engineer".

END OF SECTION



SECTION 01010  
SUMMARY OF WORK

1.01 Intent of Contract:

The intent of the contract is to provide for the construction and completion in every detail of the work described. The Contractor shall furnish all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the plans, specifications and terms of the contract.

1.02 Alteration of Plans or Work:

The City reserves the right to make, at any time during the construction of the project, such increases or decreases in quantities and such alterations in the details of construction, including alteration of the grade or alignment of roads or structures, or both, as may be found necessary or desirable for completion of the intended facility. Such increases or decreases and alterations shall not invalidate the contract nor release the surety, and the Contractor agrees to accept and perform the work as altered, the same as if it had been a part of the original contract.

Where such work does not materially differ from specified contract work, it shall be measured and paid for at contract unit prices, except that an increase or decrease of more than 25% in the quantity of a major item shall be subject to the provisions of Section 01150-1.04 A. and B. If, however, the work or the unit costs of performance are materially changed, an adjustment in compensation shall be made, as agreed upon by the parties to the contract.

If an adjustment in compensation cannot be agreed upon, the Engineer may direct the Contractor to proceed with the work while further negotiations are held. The Contractor shall cooperate with the Engineer in keeping complete daily records of the cost of the work. In the event that subsequent negotiations fail to produce a mutually acceptable adjustment in compensation, the work will be paid for as provided in Section 01150-1.05. Contract time will be adjusted as provided in Section 01030-1.06.

1.03 Changed Conditions:

The Contractor shall promptly, and before such conditions are disturbed, notify the Engineer in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in this contract, or (2) unknown physical conditions at the site, of an unusual nature, differing materially

from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this contract. The Engineer shall promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the Contractors cost of, or the time required for, performance of this contract, an equitable adjustment shall be made and the contract modified in writing accordingly.

No claim of the Contractor under this clause shall be allowed unless the Contractor has given the notice required above; provided, however, the time prescribed therefore may be extended by the Engineer.

No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this contract.

If the parties are unable to agree on the terms of an equitable adjustment, the Engineer may order such work done and pay for such work as provided in Sections 01150-1.04 and 1.05 and allow such additional time for performance as he may deem proper.

1.04 Extra Work:

The Contractor shall perform work for which there is no price included in the contract wherever it is deemed necessary or desirable in order to complete fully the project. Such work shall be performed in accordance with the specifications and as directed, and will be paid for as provided under Subsection 01150-1.04 and 1.05.

1.05 Rights In and Use of Materials Found on the Work:

The Contractor may use on the project, when not shown on the plans but with the Engineer's approval, such stone, gravel, sand, or other material determined suitable by the Engineer, as may be found in the excavation. The Contractor will be paid for the excavation of such materials at the corresponding contract unit price and for the pay item for which the excavated material is used.

The Contractor shall replace at his own expense with other acceptable material all of that portion of the excavated material so removed and used which was needed for use on the project. No charge for the materials so used will be made against the Contractor except that he shall be responsible for payment of any royalties required.

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The Contractor shall not excavate or remove any materials from within the project location which is not within the grading limits, as indicated by the slope and grade lines, without written authorization from the Engineer.

In the event the Contractor has produced or processed materials from City furnished sources in excess of the quantities required for performance of this contract, the City shall take possession of such excess materials, including any waste material produced as a by-product, without obligation to reimburse the Contractor for the cost of their production, or may require the Contractor to remove such materials and restore the premises to a satisfactory condition at the Contractor's expense. This provision shall not preclude the City from arranging with the Contractor to produce material over and above the contract needs, payment for which shall be by written agreement between the City and the Contractor.

1.06 Final Cleanup:

Before final acceptance, the site, materials sources and all ground occupied by the Contractor in connection with the work shall be cleaned of all rubbish, excess materials, temporary structures and equipment; and all parts of the work shall be left in an acceptable condition.

END OF SECTION

SECTION 01011  
AWARD AND EXECUTION OF CONTRACT

1.01 Consideration of Proposals:

After the proposals are opened and read, they will be compared on the basis of the summation of the products of the approximate quantities shown in the bid schedule by the unit bid prices. The results of such comparisons will be immediately available to the public. In the event of a discrepancy between unit bid prices and extensions, the unit bid price shall govern.

The right is reserved to reject any or all proposals, to waive technicalities or to advertise for new proposals, if in the judgment of the awarding authority the best interests of the City will be promoted thereby.

1.02 Award of Contract:

The letter of award, if the contract be awarded, will be issued within 40 calendar days after the opening of proposals to the lowest responsible and qualified bidder whose proposal complies with all the requirements prescribed. The successful bidder will be notified, by letter mailed to the address shown on his proposal, that his bid has been accepted and that he has been awarded the contract.

1.03 Cancellation of Award:

The City reserves the right to cancel the award of any contract at any time before the execution of said contract by all parties without any liability against the City.

1.04 Return of Proposal Guaranty:

Proposal guaranties, other than Bid Bonds, will be returned to all bidders, except the two low bidders, as soon as practicable after the opening of bids. The guaranty of the lowest and the second lowest bidder will be returned immediately after satisfactory bonds have been furnished and the contract has been executed.

1.05 Performance and Payment Bonds:

At the time of execution of a contract exceeding \$50,000, the successful bidder shall furnish a Performance Bond and a Payment Bond for the penal sums as prescribed in the Proposal. The surety on each Bond may be any corporation or partnership authorized to do business in Alaska as an insurer under AS21.09 or

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two responsible individual sureties approved by the contracting officer. When individual sureties are used, the net worth and the total value of the assets located in Alaska of each individual surety may not be less than the penal amount of the Bond. In addition, each individual surety must execute an Affidavit of Individual Surety. Real property shall be valued at its assessed valuation proof of which must accompany the affidavit. Each individual surety affidavit contains a Certificate of Sufficiency which must be signed by an official of an institution having full knowledge of assets and responsibilities of the surety.

In addition, an individual surety shall provide the City with sufficient security equal to one-half the amount of the Bond. The security shall consist of deeds of trusts on otherwise unencumbered real property located within the State, or pledges in the case of other personal property, which property may not be subject to prior security interests.

The contracting officer may require performance and payment bonds for contracts of less than \$50,000.

1.06 Execution and Approval of Contract:

The contract shall be signed by the successful bidder and returned together with the contract bond within 15 days after the contract has been received by the bidder. If the contract is not executed by the City within 15 days following receipt from the bidder of the signed contracts and bonds, the bidder shall have the right to withdraw his bid without penalty. No contract shall be considered as effective until it has been fully executed by all of the parties thereto.

1.07 Failure to Execute Contract:

Failure to execute the contract and file acceptable bonds within 15 days after the contract has been received by the bidder shall be just cause for the cancellation of the award and the forfeiture of the proposal guaranty which shall become the property of the City, not as a penalty, but in liquidation of damages sustained. Award may then be made to the next lowest bidder, or the work may be readvertised and constructed under contract or otherwise, as the City may decide.

END OF SECTION

SECTION 01019  
PROSECUTION AND PROGRESS

1.01 Subletting of Contract:

The Contractor shall not sublet, sell, transfer, assign or otherwise dispose of the contract or contracts, or any portion thereof, or of his right, title, or interest therein, without written consent of the Engineer. In case such consent is given, the Contractor will be permitted to sublet a portion thereof, but shall perform with his own organization, work amounting to not less than 50 percent of the original contract cost, except that any items designated in the contract as "specialty items" may be performed by subcontract and the cost of any such specialty items so performed by subcontract may be deducted from the total cost before computing the amount of work required to be performed by the Contractor with his own organization. Consent to sublet, assign or otherwise dispose of any portion of the contract shall not be construed to relieve the Contractor of any responsibility for the fulfillment of the contract. No subcontracts, or transfer of contract, shall in any case release the Contractor of his liability under the contract and bonds. Subcontracts which are submitted for approval shall be signed by both parties and dated in order to be considered acceptable by the City.

The Contractor shall furnish the City with three (3) copies of any and all contracts entered by himself and a subcontractor for work to be performed in connection with the contract. Prices of subcontracted work shall be furnished by the Contractor. The City will determine the value of the subcontract(s), based on contract unit prices, or upon reasonable value, if entire items are not subcontracted.

The purchase of sand, gravel, crushed stone, crushed slag, batched concrete aggregates, ready-mixed concrete, and any other materials produced at and furnished from established and recognized commercial plants, together with the delivery of such materials to the site of work by means of vehicles owned and operated by such plants or by recognized commercial hauling companies, shall not be considered as subcontracting under these provisions.

1.02 Notice to Proceed:

The "Notice to Proceed" will establish the date from which date contract time will be charged. Commencement of work by the Contractor may be deemed and taken as a waiver on his part of this notice.

1.03 Prosecution and Progress:

Within 15 days of receipt of "Notice to Proceed", the Contractor shall prepare and submit to the Engineer a "Progress Schedule" showing the order in which the Contractor proposes to carry out the work within the contract time and showing the beginning times and completion times for the several salient features of the work provided in the contract. Adequate material, equipment and labor shall be provided by the Contractor to carry out the progress schedule submitted by him to complete the contract within the time specified. The work shall be performed as vigorously and as continuously as weather conditions will permit and in accordance with a schedule which will insure completion within the specified time limit, due allowances being made for possible unfavorable conditions, interference, breakdowns and other causes of delay.

Upon request of the Engineer, the Contractor shall submit supplementary progress schedules in the form required. Such supplemental schedules shall conform with the times of construction and delays which may have been encountered in the performance of the work.

Receipt and acceptance of a schedule submitted by the Contractor shall not be construed to assign responsibility for performance or contingencies to the City or relieve the Contractor of his responsibility to adjust his forces equipment, and work schedules as may be necessary to insure completion of the work within prescribed contract time.

Should the prosecution of the work be discontinued for any reason, the Contractor shall notify the Engineer at least 24 hours in advance of resuming operations.

1.04 Limitation of Operations:

The Contractor shall not open up work to the prejudice or detriment of work already started. The Engineer may require the Contractor to finish a section on which work is in progress before work is started on any additional section if the opening of such section is essential to public convenience. The Contractor shall not be allowed to stop or otherwise impede traffic outside of the project limits without written permission.

1.05 Character of Workmen, Methods and Equipment:

The Contractor shall at all times employ sufficient labor and equipment for prosecuting the several classes of work to full completion in the manner and time required by these specifications.

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All workmen shall have sufficient skill and experience to perform properly the work assigned to them. Workmen engaged in special work or skilled work shall have sufficient experience in such work and in the operation of the equipment required to perform all work properly and satisfactorily.

Any person employed by the Contractor or by any subcontractor who, in the opinion of the Engineer, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Engineer, be removed forthwith by the Contractor or subcontractor employing such person, and shall not be employed again in any portion of the work without the approval of the Engineer.

Should the Contractor fail to remove such person or persons as required above, or fail to furnish suitable and sufficient personnel for the proper prosecution of the work, the Engineer may suspend the work by written notice until such orders are complied with.

No convict labor shall be employed and no materials manufactured or produced by convict labor shall be used in connection with the work. This provision shall not be construed as applying to convicts on parole or probation.

The Contractor shall not discriminate against any person because of sex, race, creed, color, or national origin.

All equipment which is proposed shall be of appropriate size and in such mechanical condition as to meet the requirements of the work and to produce a satisfactory quality of work.

When the methods and equipment to be used by the Contractor in accomplishing the construction are not prescribed in the contract, the Contractor is free to use any methods or equipment that he demonstrates to the satisfaction of the Engineer will accomplish the contract work in conformity with the requirements of the contract, except as provided above.

When the contract specifies that the construction be performed by the use of certain methods and equipment, such methods and equipment shall be used unless others are authorized.

1.06 Determination and Extension of Contract Time:

A. Calendar Days.

When the contract time is specified on a calendar days basis, it shall consist of the number of calendar days



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stated in the contract, counting from the day immediately following the date of receipt by the Contractor of the Notice to Proceed and shall continue to and include the date of acceptance of the work provided that contract time will only be assessed from May 1 to October 31, inclusive of every year; subject to exclusions hereinafter given.

The Engineer may, by written order, suspend work on the project, in whole or in part, for such periods as he may judge necessary due to inclement weather, unforeseen emergency conditions, or to expedite public traffic. When the work is suspended for one or more calendar days by order of the Engineer, the number of days included in such suspension period shall not be included in the count of time, except as hereinafter stated.

In those instances where the Engineer orders suspension of the work, to correct unsafe conditions for workmen or public, for failure by the Contractor to carry out contractual provisions, or for failure to carry out orders given by the Engineer within the limits of contract requirements, the count of contract time shall continue through the suspension period.

The number of calendar days allowed in the contract, as awarded, is based on the original quantities as defined in Section 01015-1.04. If satisfactory fulfillment of the contract requires performance of work in greater quantities than those set forth in the proposal, the contract time allowed for performance may be increased on a basis commensurate with the amount and difficulty of the additional work at the discretion of the Engineer.

B. Completion Date.

When the contract completion time is specified as a fixed calendar date, it shall be the date on which all work on the project shall be complete.

The time allowed for performance in the contract, as awarded, is based on the original quantities, as defined in Section 01015-1.04. If satisfactory fulfillment of the contract required performance of work in greater quantities than those set forth in the proposal, the contract completion date may be extended on a basis commensurate with the amount and difficulty of the added quantities of work.

C. Extension of Contract Time.

If the Contractor finds it impossible, for reasons beyond his control, to complete the work within the contract time as specified or as extended in accordance with the provisions of this Section, he may, at any time prior to the expiration of the contract time, as extended, make a written request to the Engineer for an extension of time, setting forth therein the complete facts which he believes will justify the granting of such request.

The Contractor's pleas that insufficient time was originally specified shall not constitute a valid reason for extension of contract time. If the Engineer determines that the prosecution of the work was delayed or hampered by conditions beyond the control and without the fault of the Contractor, he may extend the time for completion in such amount as conditions may justify. Such extended time for completion shall then be in full force and effect the same as though it were the original time for completion.

Suspension of work by the Engineer, or extension of the contract time shall not constitute grounds for any claims by the Contractor for damages or extra compensation, but the period of such suspensions or extensions shall be taken into consideration in determining the time for completion, as herein provided. When acceptance for traffic and maintenance has been duly made by the Engineer, as prescribed in Section 01400-1.05 the daily time charge will cease.

1.07 Failure to Complete on Time:

For each calendar day that any work shall remain uncompleted after the contract time specified for the completion of the work provided for in the contract, the sum specified in Table 1030 below will be deducted from any monies due the Contractor not as a penalty but as liquidated damages; provided however, that due account shall be taken of any adjustment of the contract time for completion of the work granted under the provisions of Section 01030-1.06.

Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver on the part of the City of any of its rights under the contract.

After the work is determined to be completed to the extent that the City has full and unrestricted use of the facility, both from an operational and safety standpoint, the Engineer may accept the project for traffic and maintenance as per Section 01400-1.15. For overruns in contract time occurring after that date, the City may reduce the daily charge for liquidated damages to the amount specified in Table 1030, for the value of the uncompleted work. The value of the uncompleted work for any estimate period will be the value of the progress estimate for the preceding period subtracted from the estimated final contract amount.

Table 1030  
Daily Charge for Liquidated Damages  
For Each Calendar Day of Delay

Original Contract Amount.

<u>From More Than</u>	<u>To and Including</u>	<u>Daily Charge</u>
\$ 0	100,000	150
100,000	500,000	250
500,000	1,000,000	350
1,000,000	2,000,000	450
2,000,000	5,000,000	650
5,000,000	10,000,000	850
10,000,000	<hr style="width: 100px; margin: 0 auto;"/>	1,000

Liquidated damages will only be charged against the Contractor within the period between May 1 and October 31, except at the end of the job.

1.08 Termination for Default of Contract:

If the Contractor:

- A. Fails to begin the work under the contract within the time specified in the "Notice to Proceed", or
- B. Fails to perform the work with sufficient workmen and equipment or with sufficient materials to assure the prompt completion of said work, or
- C. Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or
- D. Discontinues the prosecution of the work, or
- E. Fails to resume work which has been discontinued within a reasonable time after notice to do so, or

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- F. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or
- G. Allows any final judgment to stand against him unsatisfied for a period of 60 days, or
- H. Makes an assignment for the benefit of creditors without the consent of the Engineer, or
- I. For any cause whatsoever, fails to carry on the work in an acceptable manner,

the Engineer will give notice in writing to the Contractor and his surety of such delay, neglect, or default.

If the Contractor or surety, within the time specified in the notice, shall not proceed in accordance therewith, then the City may, upon written notification from the Engineer of the fact of such delay, neglect or default and the Contractor's failure to comply with such notice, have full power and authority without violating the contract, to take the prosecution of the work out of the hands of the Contractor. The City may appropriate or use any or all materials and equipment on the ground as may be suitable and acceptable and may enter into an agreement for the completion of said contract according to the terms and provisions thereof, or use such other methods that in the opinion of the Engineer are required for the completion of said contract in an acceptable manner.

The Engineer may, by written notice to the Contractor and his surety or his representative, transfer the employment of the work from the Contractor to the surety, or if the Contractor abandons the work undertaken under the contract, the Engineer may, at his option with written notice to the surety and without any written notice to the Contractor, transfer the employment for said work directly to the surety. The surety shall submit its plan for completion of the work, including any contracts or agreements with third parties for such completion, to the City for approval prior to beginning completion of the work. Approval of such contracts shall be in accordance with all applicable City requirements and procedures for approval of subcontracts, except that the 50 percent limitation shall not apply.

Upon receipt of such notice the surety shall enter upon the premises and take possession of all materials, tools, and appliances thereon for the purpose of completing the work included under the contract and employ by contract or otherwise any person or persons to finish the work and provide the materials therefor, without termination of the continuing full force and

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of this agreement. In case of such transfer of employment to the surety, the surety shall be paid in its own name on estimates covering work subsequently performed under the terms of the contract and according to the terms thereof without any right of the Contractor to make any claim for the same or any part thereof.

In case of discontinuance of employment by the Engineer as aforesaid, the Contractor shall not be entitled to receive any further balance of the amount to be paid under the contract until the work shall be fully finished, at which time, if the unpaid balance of the amount to be paid under this contract shall exceed the expenses incurred by the Engineer in finishing the work and all damages sustained, or which may be sustained by the City by reason of such refusal, neglect, failure or discontinuance of employment, such excess shall be paid by the State to the Contractor, but if such expense and damage shall exceed the unpaid balance, the Contractor and his surety and each thereof shall be jointly and severally liable therefor to the City, and shall pay the difference to the City.

If, after notice of termination of the Contractor's right to proceed under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, or that the delay was excusable under the provisions of this clause, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to Section 01030-1.09 as a termination for convenience of the City.

1.09 Termination of Work for City's Convenience:

The performance of the work under the contract may be terminated by the City in accordance with this section in whole or in part, whenever, for any reason the Contracting Officer shall determine that such termination is in the best interest of the City. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination, specifying termination is for the convenience of the City, the extent to which performance of work under the contract is terminated, and the date upon which such termination becomes effective.

After receipt of a Notice of Termination and except as otherwise directed by the Contracting Officer, the Contractor shall:

- A. Stop work under the contract on the date and to the extent specified in the Notice of Termination;

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- B. Place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the work under the contract as is not terminated;
- C. Terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination;
- D. With the approval or ratification of the Contracting Officer, to the extent he may require, settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, the cost of which would be reimbursable, in whole, or in part, in accordance with the provisions of the contract;
- E. Submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory exclusive of items the disposition of which had been directed or authorized by the Contracting Officer;
- F. Transfer to the Contracting Officer the completed or partially completed plans, drawings, information, and other property which, if the contract had been completed would be required to be furnished to the City.
- G. Take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to the contract which is in the possession of the Contractor and in which the City has or may acquire any interest.

The Contractor shall proceed immediately with the performance of the above obligations notwithstanding any delay in determining or adjusting the amount of any item of reimbursable cost under this clause.

When the City orders termination of work under a contract effective on a certain date, all completed units of work within each pay item as of that date will be paid for at the contract unit bid price. Payment for partially completed work will be made either at agreed prices or by force account methods as described in Section 01150-1.05 of the specifications. Payment for materials included in the material inventory described in E. above will be made at actual cost delivered to the project or storage site, including transportation charges, to which cost 15 percent will be added.

After receipt of a Notice of Termination, the Contractor shall submit to the Contracting Officer, within 90 days of the effective

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date, his claim for additional damages or costs not covered above or elsewhere in these specifications. Such claim may include such cost items as reasonable idle equipment time, mobilization efforts, bidding and project investigative costs, overhead expenses directly allocable to the project termination and not covered under work paid for at agreed unit prices or contract bid prices, legal and accounting charges and other expenses reasonably necessary in claim preparation, subcontractor costs not otherwise paid for, actual idle labor costs if work is stopped in advance of termination date, guaranteed payments for private land usage as part of the original contract, and any other cost or damage items for which the Contractor feels reimbursement should be made. The intent of negotiating this claim would be an equitable settlement figure to be reached with the Contractor. In no event, however, will loss of anticipated profits be considered as part of any settlement.

The termination claim shall be submitted promptly, but in no event later than 90 days from the effective date of termination, unless one or more extensions in writing are granted by the Contracting Officer upon request of the Contractor made in writing within the 90 day period. Upon failure of the Contractor to submit his termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor so determined.

The Contractor and the Contracting Officer may agree upon whole or any part of the amount or amounts to be paid to the Contractor by reason of the total or partial termination of work pursuant to this section. The contract shall be amended accordingly, and the Contractor shall be paid the agreed amount.

In the event of the failure of the Contractor and the Contracting Officer to agree in whole or in part, as provided heretofore, as to the amounts with respect to costs to be paid to the Contractor in connection with the termination of work the Contracting Officer shall determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall pay to the Contractor the amount determined as follows:

- A. There shall be included therein all costs and expenses reimbursable in accordance with the contract not previously paid to the Contractor for the performance of the work prior to the effective date of the Notice of Termination;
- B. There shall be included therein, so far as not included under A. above, the cost of settling and paying claims

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arising out of the termination of work under subcontracts or orders which are properly chargeable to the terminated portions of the contract;

- C. There shall be included therein the reasonable costs of settlement with respect to the terminated portion of the contract heretofore, to the extent that these costs have not been covered under the payment provisions of the contract.

The Contractor shall have the right of appeal under the City's claim procedures for any determination made by the Contracting Officer, except if the Contractor has failed to submit his claim within the time provided and has failed to request extension of such time, he shall have no such right of appeal.

In arriving at the amount due the Contractor under this section, there shall be deducted:

- A. All previous payments made to the Contractor for the performance of work under the contract prior to termination;
- B. Any claim for which the City may have against the Contractor;
- C. The agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the Contractor or sold pursuant to the provisions of this section and not otherwise recovered by or credited to the City; and,
- D. All partial payments made to the Contractor under the provisions of this section.

The City will from time to time, under such terms and conditions as it may prescribe, make partial payments on account against costs incurred by the Contractor in connection with the terminated portion of the contract whenever in the opinion of the Contracting Officer the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder, otherwise the Contractor shall not be entitled to receive further payments until final settlement is reached.

Where the work has been terminated by the City, said termination shall not affect or terminate any of the rights of the City against the Contractor or his surety then existing or which may thereafter accrue because of such default. Any retention or payment of monies by the City due to the Contractor under the terms of the contract shall not release the Contractor or his surety from liability.



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Unless otherwise provided for in the specifications or the contract, or by applicable statute, the Contractor, from the effective date of termination and for a period of three years after final settlement under this contract, shall preserve and make available to the City at all reasonable times at the office of the Contractor, all its books, records, documents, and other evidence bearing on the cost and expenses of the Contractor under his contract and relating to the work terminated hereunder.

SECTION 01062  
LEGAL RELATIONS AND  
RESPONSIBILITY TO PUBLIC

1.01 Laws to be Observed:

The Contractor shall keep fully informed of all Federal and State laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. He shall at all times observe and comply with all such laws, ordinances, regulations, orders and decrees; and shall protect and indemnify the State and its representatives against claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by himself or his employee.

1.02 Permits, Licenses, and Taxes:

The Contractor shall procure all permits and licenses, pay all charges, fees and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the work. As a condition of performance of this contract, the Contractor shall pay all Federal, State and local taxes incurred by the Contractor, in the performance of this contract. Proof of payment of these taxes is a condition precedent to final payment by the City under this contract.

1.03 Patented Devices, Materials and Processes:

If the Contractor employs any design, device, material, or process covered by letters of patent, trademark or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner. The Contractor and the surety shall indemnify and save harmless the City, any affected third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the City for any costs, expenses, and damages which it may be obliged to pay by reason of any infringement, at any time during the prosecution or after the completion of the work.

1.04 Federal Aid Provisions:

When the United States Government pays all or any portion of the cost of a project, the Federal laws and the rules and regulations made pursuant to such laws must be observed by the

Contractor, and the work shall be subject to the inspection of the appropriate Federal agency. Such inspection shall in no sense make the Federal Government a party to this contract and will in no way interfere with the rights of either party hereunder.

1.05 Protection and Restoration of Property and Landscape:

The Contractor shall be responsible for and shall protect carefully from disturbance all land monuments and property marks until the Engineer has approved the witnessing or otherwise referenced their location and shall not move them until directed.

The Contractor shall be responsible for all damage or injury to property of any character resulting from any act, omission, neglect, or misconduct in his manner or method of executing the work, or at any time due to defective work or materials, during the prosecution of the work, and said responsibility will not be released until the project shall have been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect or misconduct in the execution of the work, or in consequence of the non-execution thereof by the Contractor, he shall restore, at his own expense, such property to a condition similar or equal to that existing before such damage or injury, all in an acceptable manner.

The Contractor's attention is drawn to the State's requirements regarding air and water pollution control, in particular, Chapter 3, Articles 3 and 4 of Title 46 of the Alaska Statutes.

1.06 Responsibility for Damage Claims:

The Contractor shall indemnify and save harmless the City, its officers and employees, from all suits, actions, or claims of any character brought because of any injuries or damage received or sustained by any person, persons or property on account of or in consequence of any neglect in safeguarding the work; or through the use of unacceptable materials in constructing the work; or because of any act of omission, neglect, or misconduct of said Contractor; or from any claims or amounts arising or received under the "Workman's Compensation Act", or any other law, order, or decree; and so much of the money due the said Contractor under and by virtue of his contract as may be considered necessary by the City for such purpose may be retained for the use of the City; or, in case no money is due, his surety may be held until such suit or suits, action or actions, claim or claims for injuries or damages as aforesaid shall have been

settled and suitable evidence to that effect furnished to the City; except that money due the Contractor will not be withheld when the Contractor produces satisfactory evidence that he is adequately protected by public liability and property damage insurance.

It is specifically agreed between the parties executing this contract that it is not intended by any of the provisions of any part of the contract to create the public or any member thereof a third party beneficiary hereunder, or to authorize anyone not a party to this contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this contract.

1.07 Contractor's Responsibility for Work:

Until final acceptance of the project by the Engineer, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the nonexecution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God, of the public enemy or governmental authorities.

In case of suspension of work from any cause whatever, the Contractor shall be responsible for the project and shall take such precautions as may be necessary to prevent damage to the project, provide for normal drainage and shall erect any necessary temporary structures, signs, or other facilities at his expense. During such period of suspension of work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established plantings, seedings, and soddings furnished under his contract.

1.08 Contractor's Responsibility for Utility Property and Services:

At points where the Contractor's operations are adjacent to properties of railway, communications, pipelines, and power companies, or are adjacent to other property, damage to which might result in considerable expense, loss, or inconvenience, work shall not be commenced until all arrangements necessary for the protection thereof have been made.

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The Contractor shall cooperate with the owners of any underground or overhead utility lines in their removal and rearrangement operations in order that these operations may progress in a reasonable manner, that duplication or rearrangement of work may be reduced to a minimum, and that services rendered by those parties will not be unnecessarily interrupted.

In the event of interruption to water or utility service as a result of accidental breakage or as a result of being exposed or unsupported, the Contractor shall promptly notify the utility owner and the Engineer. If water service is interrupted, repair work shall be continuous until the service is restored. No work shall be undertaken around fire hydrants until provisions for continued service has been approved by the City.

When utilities are damaged by the Contractor, the utility owner has the choice of repairing the utility himself or having the Contractor repair the damage. In the following circumstances, the Contractor will reimburse the utility for repair costs or provide at no cost to the utility owner or City, all materials, equipment and labor if he repairs the damage himself.

- A. When the utility is shown on the plans.
- B. When the utility has been located by the owner.
- C. When no locate was requested by the Contractor.
- D. All visible utilities.

The Contractor will not be responsible for the costs of repairing utilities under either of the following circumstances:

- A. When the buried utility locations on the plans or the locate are off more than 2.5 feet horizontally or 2.5 feet vertically.
- B. When the location or existence of the buried utility is unknown by the Engineer or utility owner.

In these cases, any repair work done by the Contractor will be considered Extra Work and he shall be reimbursed in accordance with Subsection 01010-1.04. This shall not be construed as relieving the Contractor of his obligations under Sections 01015-1.05 and 01400-1.06.

1.09 Furnishing Right-of-Way:

The City will be responsible for securing all necessary rights-of-way and easements in advance of construction. Any exceptions will be indicated in the Contract.

1.10 Personal Liability of Public Officials:

In carrying out any of the provisions of these specification, or in exercising any power or authority granted to them by or within the scope of the contract, there shall be no liability upon the Engineer, or his authorized representatives, either personally or as officials of the City, it being understood that in all such matters they act solely as agents and representatives of the City.

1.11 No Waiver of Legal Rights:

The City shall not be precluded or estopped by any measurement, estimate, or certificate made either before or after the completion and acceptance of the work and payment therefore, from showing the true amount and character of the work performed and materials furnished by the Contractor, nor from showing that any measurement, estimate or certificate is untrue or is incorrectly made, nor that the work or materials do not in fact conform to the contract. The City shall not be precluded or estopped, notwithstanding any such measurement, estimate, or certificate and payment in accordance therewith, from recovering from the Contractor or his sureties, or both, such damages as it may sustain by reason of his failure to comply with the terms of the contract. Neither the acceptance by the City, or any representative of the City, nor any payment for or acceptance of the whole or any part of the work, nor any extension of time, nor any possession taken by the City, shall operate as a waiver of any portion of the contract or of any power herein reserved, or of any right to damages. A waiver by the City of any breach of the contract shall not be held to be a waiver of any other subsequent breach.

1.12 Gratuity and Conflict of Interest:

The Contractor agrees that he will not extend any loan, gratuity or gift of money of any form whatsoever to any employee of the City nor will he rent or purchase any equipment or materials from any employee of the City or to the best of his knowledge from any agent of any employee of the City. Before payment of the final estimate, the Contractor shall execute and furnish the City an affidavit certifying that he has complied with the above provisions of the contract.

END OF SECTION

SECTION 01150  
MEASUREMENT AND PAYMENT

1.01 General:

Wherever it is provided in the Plans or Specifications that "the work is incidental" or it is stated that certain provisions or work be "without extra compensation"; it is understood in both cases that the Contractor's compensation for such work is to be included in other items of work.

1.02 Measurement of Quantities:

All work completed under the contract will be measured according to the United States standard measure.

A station when used as a definition or term of measurement will be 100 linear feet.

Unless otherwise specified, measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures having an area of 9 square feet or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing.

Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.

All items which are measured by the linear foot, will be measured parallel to the ground surface upon which such structures are placed, unless otherwise specified.

In computing volumes of excavation by the average end area method, the distance between end areas will be measured along the centerline.

The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fractions of inches.

The term "ton" will mean the short ton consisting of 2,000 pound avoirdupois. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material be paid for.

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Car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as directed, and each truck shall bear a plainly legible identification mark.

Material to be measured by volume in the hauling vehicle shall be measured therein at the point of delivery. Vehicles for this purpose may be of any acceptable size or type provided that the body is of such shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level capacity and all loads shall be leveled when directed. When legal loads are applicable, the approved volume measurement shall not exceed the legal capacity of the vehicle.

When requested by the Contractor and approved in writing, material specified to be measured by the cubic yard may be weighed and such weights will be converted to cubic yards for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined and shall be agreed to by the Contractor before such method of measurement of pay quantities is used.

On projects where asphalt is a pay item, an alternate method to measurement by weight may be the gallon. All materials shall be converted to gallons at 60 degrees F., using ASTM D 1250 for asphalts. Whichever method is used, it must be used for the duration of the project.

When asphalt materials are shipped by truck or transport, net certified weights or volume subject to correction for loss or foaming, may be used for computing quantities.

Timber will be measured by the thousand board measure (MBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.

Lump sum items shall not be measured for payment.

Portland Cement shall be measured by the ton, hundred weight or sack of 94 pounds.

When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.



1.03 Scope of Payment:

The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials and for performing all work under the contract in a complete and acceptable manner and for all risk, loss, damage, or expense of whatever character arising out of the nature of the work or the prosecution thereof, subject to the provisions of Section 01025-1.11.

If the "Basis of Payment" clause in the specifications relating to any unit price in the bid schedule requires that the said unit price cover and be considered compensation for certain work or material essential to the item this same work or material will not also be measured or paid for under any other pay item which may appear elsewhere in the specifications.

The term "lump sum", when used as a basis for payment, shall mean full payment for the work described in the contract, including all necessary fittings and accessories.

If changes or additions in the work are ordered which will vary the quantity of work to be paid under a lump sum pay item, the lump sum payment will be increased or decreased in amount determined by multiplying the changed quantity by the contract lump sum price divided by the estimate quantity shown on the plans.

Due to possible variations in the specific gravity of the aggregates, the tonnage used may vary from the proposal quantities and no adjustment in contract unit price will be made because of such variation.

1.04 Compensation for Altered Quantities:

Payment to the Contractor shall be made only for the actual quantities of work performed and accepted or materials furnished, in conformance with the contract. When the accepted quantities of work or materials vary from the quantities stated in the bid schedule, the Contractor shall accept as payment in full, payment at the original contract unit prices for the accepted quantities of work and materials furnished, completed and accepted; except as provided below:

- A. When the quantity of work to be done or material to be furnished under any major item of the contract is increased by more than 25 percent of the quantity stated in the bid schedule, either party to the contract, upon demand, shall be entitled to an equitable unit price adjustment on that portion of the work above 125 percent of the quantity stated in the bid schedule.

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- B. When the quantity of work to be done or material to be furnished under any major item of the contract is decreased by more than 25 percent of the quantity stated in the bid schedule, either party to the contract, upon demand, shall be entitled to an equitable price adjustment for the quantity of work performed or material furnished, limited to a total payment of not more than 75 percent of the amount originally bid for the item.

For changes and variations in accepted quantities of major items, in accordance with Section 01010-1.02, the prices agreed upon and any agreed adjustment in contract time will be incorporated in the Extra Work Order issued by the Engineer, which shall indicate acceptance on the part of the Contractor as evidenced by his signature.

If prices cannot be agreed upon, the City may order the work performed in accordance with the provisions of Section 01150-1.05.

Except as provided above and in Section 01010-1.02, no allowance shall be made for any increased expenses, loss of expected reimbursement or loss of anticipated profits suffered or claimed; either directly from such alterations in quantities or indirectly from unbalanced allocations among the contract items of overhead expense on the part of the bidder and subsequent loss of expected reimbursements therefore, or any other causes.

1.05 Extra and Force Account Work:

Altered work and/or extra work performed in accordance with the requirement and provisions of Sections 01010-1.02, 01010-1.03 or 01010-1.04 will be paid for at the unit prices or lump sum stipulated in the order authorizing the work, or the City may require the Contractor to do such work on a force account basis and to be compensated in the following manner.

A. Labor.

For all labor and foremen in direct charge of the specific operations, the Contractor shall be paid the rates listed in the Extra Work Order authorizing the work, but at rates not to exceed those for comparable labor currently employed on the project as determined by the Engineer. These rates shall include subsistence and travel allowances, camp costs, workman's compensation (supported by proof of rates), health and welfare benefits, pension fund benefits or other benefits, when such amounts are required by collective bargaining agreement or other employment contract generally applicable to the classes of labor employed on the work. If any employee is due and receives subsistence or camp

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privileges on his days off, this amount shall be divided by the number of days worked that week and shall be added to his daily subsistence for force account entitlement. If the employee did not work an entire day on force account work, that day's entitlement shall be a direct proportion of the hours worked on force account and the hours worked elsewhere.

An amount equal to 30 percent of the sum of the straight time labor rate shall also be paid the Contractor to cover additional bond, property damage liability insurance, unemployment insurance contributions, social security and other taxes, for administrative overhead costs and profit.

When specialty services not normally provided by a general Contractor otherwise fully qualified to perform the majority of the work are required, and such services, to include materials, labor and equipment rentals, are purchased from a firm specifically organized and fully qualified to perform such specialty work, the Contractor will be paid the invoice cost of the service plus 15%.

B. Materials.

For materials accepted by the Engineer and used, the Contractor shall receive the actual cost of such materials delivered on the work, including transportation charges paid by him (exclusive of machinery rentals as hereinafter set forth) to which cost 15% will be added.

C. Equipment.

For any machinery or special equipment (other than small tools) which has been authorized by the Engineer, the Contractor shall receive the rental rates specified in the Extra Work Order authorizing the work. The hourly rental rates shall be determined from the applicable monthly schedule in the current edition of the "Rental Rate Blue Book for Construction Equipment", published by the Equipment Guidebook Company, as follows:

The established rental rate shall be equal to the monthly rate for the basic equipment plus the monthly rate for applicable attachments, both divided by 176, plus the estimated hourly operating costs, all multiplied by the area adjustment factor.

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The "Equipment Life" adjustment factor sections shall not apply. Attachments shall not be divided unless required for the directed work.

For equipment not listed in this schedule, the Contractor shall receive a rental rate as agreed upon before such work is begun. If agreement cannot be reached, the City reserves the right to establish a rate based on similar equipment in the schedule or prevailing commercial rates in the area.

These rates shall apply for equipment used during the Contractor's regular shift of ten (10) hours per day. Where the equipment is used more than 10 hours per day, either on the Contractor's normal work or on force account, an overtime rate, computed as follows, shall apply:

The overtime rate shall be equal to the monthly rate for the basic equipment plus the monthly rate for applicable attachments, both divided by 352, plus the estimated hourly operating costs, all multiplied by the area adjustment factor.

Equipment which must be rented or leased specifically for work required under this section shall be authorized in writing by the Engineer. The Contractor shall be paid invoice price plus 15 percent.

When it is necessary to obtain equipment from sources beyond the project limits exclusively for force account work, the actual cost of transferring the equipment to the site of the work and return will be allowed as an additional item of expense. Where the move is made by common carrier, the move-in allowance will be limited to the rental rate for the hauling unit plus operator wages. In the event that the equipment is transferred under its own power, the moving allowance will be limited to one-half of the normal hourly rental rate plus operator's wages. In the event that the move-out is to a different location, payment will in no instance exceed the amount of the move-in. Move-in allowance shall not be made for equipment brought to the project for force account work which is subsequently retained on the project and utilized for completion of contract items, camp maintenance, or related work.

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Equipment ordered to be on a stand-by basis shall be paid for at the stand-by rental rate for the number of hours in the Contractor's normal work shift, but not to exceed 8 hours per day. The stand-by rental rate shall be computed as follows:

The stand-by rate shall be equal to the monthly rate for the basic equipment plus the monthly rate for applicable attachments, both divided by 352, all multiplied by the area adjustment factor.

Time will be recorded to the nearest one-quarter hour for purposes of computing compensation to the Contractor for equipment utilized under these rates.

The equipment rates as determined above shall be full compensation, including overhead and profit for providing the required equipment and no additional compensation will be made for other costs such as, but not limited to, fuels, lubricants, replacement parts or maintenance costs. Cost of repairs, both major and minor, as well as charges for mechanic's time utilized in servicing equipment to ready it for use prior to moving to the project and similar charges will not be allowed.

For those sections of the "Blue Book" containing an "Area Adjustment Map", the area that determines percentage adjustment shall be stated in the Special Provisions.

D. Miscellaneous.

No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.

E. Statements.

The Engineer will maintain a daily record of labor, equipment and materials utilized in the work and will prepare and transmit to the Contractor itemized statements of the cost of such force account work, prepared from the City's daily records and from the Contractor's itemized invoices and freight bills supporting the unit of costs of materials.

F. Compensation.

The Contractor's representative shall check the statements and sign them if he finds the statement correct. Payment for force account work will be made in the progress estimate following receipt of the executed statement from the Contractor.

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Statements shall be accompanied and supported by invoices for all materials used and transportation charges. However, if materials used on the force account work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices the Contractor shall furnish an affidavit certifying that such materials were taken from his stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

G. Work by a Subcontractor.

The Contractor shall receive a percentage of the total force account work defined in A through E above performed by an approved subcontractor. This percentage will be based on the following table and will be for administrative expenses incurred in connection with the work. No percentage will be paid on work covered under bid items in the original contract. No percentage over the amount covered above will be paid if the work is done by a sub-subcontractor.

To	\$1,000	10%
Over	\$1,000 to \$10,000	\$100 plus 5% of excess over \$1,000
Over	\$10,000	\$550 plus 3% of excess over \$10,000

1.06 Partial Payment:

Partial payments will be made at least once a month as the work progresses. Estimates may be paid twice each month if the amount of work performed is sufficient to warrant such payment. Said payment will be based upon estimates of the value of the work performed and materials delivered in accordance with Section 01150-1.07.

No partial payment will be made when the total value of the work done since the last estimate amounts to less than \$3,000.00.

Progress payment at 100% of the estimated value of the work accomplished, less all previous payments, shall be made to the Contractor, except as provided hereafter:

At any time the Engineer finds that satisfactory progress is not being made he may retain an amount equal to 10% of the total amount earned on all subsequent progress payments. This retainage may be released at such time as the Engineer finds that satisfactory progress is being made.

1.07 Payment for Material on Hand:

Partial payment may be made for the actual cost of materials meeting the applicable specifications stockpiled on or in the vicinity of the project for future incorporation into the work, not to exceed 50% of the contract pay item provided under the contract. No payment for stockpiled material will be made for perishable materials such as portland cement, asphalt, and others that could be rendered useless because of long storage periods.

In no case shall payment be considered without receipt of invoice.

No partial payment will be made on living plant materials until planted.

1.08 Acceptance and Final Payment:

Final acceptance of the work shall be withheld until the Contractor furnishes all certificates, guarantees, releases, affidavits, etc., required by these specifications or the special provisions.

When the project has been accepted as provided in Subsection 01400-1.15 the Engineer will prepare the final estimate of the quantities of the various classes of work performed. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

If the Contractor approves the estimate, or if he files no claim within 90 days of receiving the final estimate, the estimate shall be processed for final payment. After approval of such final estimate by the Contractor, he will be paid the entire sum found to be due after deducting all previous payments and all amounts to be retained or deducted under the provisions of the contract.

The execution of the final estimate by the Contractor shall constitute acceptance by him of the total amount shown as payment in full for the amount due him under the contract. This, however, does not exclude any claims timely filed in accordance with the terms of the contract prior to the signing of the final estimate by the Contractor. Any timely filed claims must be listed as exceptions to the final estimate by the Contractor. Any claims listed as exceptions on the final estimate that have not been timely filed (as provided under the terms of the contract) prior to the signing of the final estimate by the Contractor will be considered null and void. Any claims timely filed under the terms of the contract and not listed as exceptions on the final voucher shall be considered null and void and not subject to further consideration or legal action.

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If the Contractor fails or declines to approve the final estimate within 90 days and files no claim, the City will consider the estimate approved and process the estimate for final payment.

1.09 Contingent Sum Pay Item:

When the bid schedule contains a Contingent Sum Pay Item, the work covered shall be performed only upon written order of the Engineer and payment shall be made as provided in the order.

END OF SECTION



SECTION 01400  
QUALITY CONTROL

PART 1 - CONTROL OF WORK

1.01 Authority of the Engineer:

The Engineer will decide: all questions which may arise as to the quality and acceptability of materials furnished and work performed and as to the rate of progress of the work; all questions which may arise as to the interpretation of the plans and specifications, all questions as to the acceptable fulfillment of the contract on the part of the Contractor.

The Engineer will have the authority to suspend the work wholly or in part due to the failure of the Contractor to correct conditions unsafe for the workmen or the general public; for failure to carry out provisions of the contract; for failure to carry out orders; for such periods as he may deem necessary due to unsuitable weather; for conditions considered unsuitable for the prosecution of the work or for any other condition or reason deemed to be in the public interest.

1.02 Plans and Working Drawings:

Plans will show details of all structures, lines, grades, typical cross sections of the roadway, location and design of all structures and a summary of items appearing on the proposal. The Contractor shall keep one set of plans available on the work at all times.

The plans will be supplemented by such working drawings as are necessary to adequately control the work. Working drawings for structures shall be furnished by the Contractor and shall consist of such detailed plans as may be required to adequately control the work and are not included in the plans furnished by the City. They shall include stress sheets, shop drawings, erection plans, falsework plans, framework plans, cofferdam plans, bending diagrams for reinforcing steel or any other supplementary plans or similar data required of the Contractor. All working drawings must be approved and such approved drawings shall become part of the contract and shall not be changed without written approval, further, such approval shall not operate to relieve the Contractor of any of his responsibility under the contract for the successful completion of the work. The title block for all drawings shall include the project name and number. All working and detail drawings shall be either 22 inches by 36 inches or 24 inches by 36 inches in overall dimensions. All prints shall be made full size on white paper and have blue or black lines.

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The Contractor shall submit to the Engineer for approval not less than three sets of any required preliminary detail or shop working drawings. These plans shall be submitted in sufficient time to allow review and correction prior to beginning the work they cover. Prior to the approval of these drawings, any work done or materials ordered for the structures involved shall be at the Contractor's risk. One set of these drawings will be returned to the Contractor approved or marked with corrections to be made. The other sets shall be retained by the Engineer.

The Contractor shall be responsible for agreement of dimensions and details as well as for conformity of his working drawings with the approved plans and specifications.

The contract price will include the cost of furnishing all working drawings.

1.03 Conformity with Plans and Specifications:

All work performed and all materials furnished shall be in reasonably close conformity with the lines, grades, cross sections, dimensions and material requirements, including tolerances, shown on the plans or indicated in the specifications.

In the event the Engineer finds the material or the finished product in which the materials are used is not in conformity with the plans and specifications but that reasonably acceptable work has been produced, he shall then make a determination if the work shall be accepted and remain in place. In this event, the Engineer will document the basis of acceptance by contract modification which will provide for an appropriate adjustment in the contract price for such work or materials as he deems necessary to conform to his determination.

In the event the Engineer finds the materials or the finished product in which the materials are used or the work performed are not in conformity with the plans and specifications and have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor.

1.04 Coordination of Plans, Specifications and Special Provisions:

These specifications, the plans, special provisions, and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, calculated dimensions will govern over scaled dimensions; plans will govern over both specifications and plans.

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The Contractor shall take no advantage of any apparent error or omission in the plans or specifications. In the event the Contractor discovers such an error or omission, he shall immediately notify the Engineer. The Engineer will then make such corrections and interpretations as may be deemed necessary for fulfilling the intent of the plans and specifications.

1.05 Cooperation by Contractor:

The Contractor will be supplied with a minimum of two full size sets of approved plans and contract assemblies including special provisions, one set of which the Contractor shall keep available on the work at all times. If cross-sections are available, one set shall be supplied to the Contractor upon request.

The Contractor shall give the work the constant attention necessary to facilitate the progress thereof, and shall cooperate with the Engineer, his inspectors, and other contractors in every way possible.

The Contractor shall have on the work at all times, as his agent, a competent superintendent capable of reading and thoroughly understanding the plans and specifications and thoroughly experienced in the type of work being performed, who shall receive instructions from the Engineer or his authorized representatives. The superintendent shall have full authority to supply such materials, equipment, tools, labor and incidentals as may be required. Such superintendence shall be furnished irrespective of the amount of work sublet.

1.06 Cooperation with Utilities:

The contract will indicate the various utilities known to be within the work zone and indicate whether they are to remain in place, be adjusted by others, or be adjusted by the Contractor. The City will notify all utility companies and endeavor to have all necessary adjustments to be made by others completed as soon as practicable. The Special Provisions will specify the completion dates for the utility adjustments.

The location and elevation of existing underground utilities shown on the plans is approximate only. Before starting construction at points of possible conflict, the Contractor shall locate and uncover the existing utilities. Should conflicts occur which are not indicated on the plans, or utilities be discovered that are not shown on the plans, the Engineer shall make contract adjustments in accordance with Section 01010.

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It is understood and agreed that the Contractor has considered in his bid all of the permanent and temporary utility appurtenances in their present or relocated positions as shown on the plans, and the completion dates for the various utility adjustments as stated in the Special Provisions, and that no additional compensation will be allowed for any delays, inconvenience or damage sustained by the Contractor due to any interference from the various utility adjustments. If the completion of the various utility adjustments is delayed beyond the completion dates specified in the Special Provisions, and the delay is not a consequence of any action on the part of the Contractor, then contract time may be extended in accordance with Section 01030.

1.07 Cooperation Between Contractors:

The City reserves the right at any time to contract for and perform other or additional work on or near the work covered by the contract.

When separate contracts are let within the limits of any project, or projects each Contractor shall conduct his work so as not to interfere with or hinder the work being performed by other Contractors. Contractors working on the same project shall cooperate with each other. He shall join his work with that of the others in an acceptable manner and shall perform it in proper sequence to that of others.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with his contract and shall protect and save harmless the City from any and all damages or claims that may arise because of inconvenience, delay, or loss experienced by him because of the presence and operations of other contractors.

1.08 Survey Control:

The Engineer will provide sufficient horizontal and vertical control data to enable the Contractor to establish the planned lines, grades, shapes and structures.

1.09 Duties of the Inspector:

Inspectors employed by the City will be authorized to inspect all work and materials furnished. The inspector will not be authorized to issue instructions contrary to the plans and specifications, or to act as foreman for the Contractor.

1.10 Inspection of Work:

All materials and each part or detail of the work shall be subject to inspection. The Engineer shall be allowed access

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to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

If the Engineer requests it, the Contractor, at any time before acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the specifications. Should the work thus exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as extra work; but should the work so exposed or examined prove unacceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed, will be at the Contractor's expense.

Any work done or materials used without supervision or inspection by an authorized City representative may be ordered removed and replaced at the Contractor's expense unless the City representative failed to inspect after having been given reasonable notice in writing that the work was to be performed.

When any unit of government or political subdivision or any railroad corporation is to pay a portion of the cost of the work covered by this contract, its respective representatives shall have the right to inspect the work. Such inspection shall in no sense make any unit of government or political subdivision or any railroad corporation a party to this contract, and shall in no way interfere with the rights of either party hereunder.

1.11 Removal of Unacceptable and Unauthorized Work:

All work which does not conform to the requirements of the contract will be considered as unacceptable work.

Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause, found to exist prior to the final acceptance of the work, shall be removed immediately and replaced in an acceptable manner. Work done contrary to instructions, work done beyond the lines shown on the plans, or as given, except as herein specified, or any extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of the contract. Work so done may be ordered removed or replaced at the Contractor's expense.

Upon failure on the part of the Contractor to comply forthwith with any order made under the provisions of this Section, the Engineer will have authority to cause unacceptable work to be

remedied or removed and replaced, unless determined acceptable under Section 01400-1.03, and to deduct the cost from any monies due or to become due the Contractor.

1.12 Load Restrictions:

The Contractor shall comply with all legal load restrictions as set forth in "Alaska Oversize and Overwidth Permit Manual", current edition, and current revisions to Title 17, Chapter 25, of the Alaska Administrative Code in the hauling of materials on public roads, beyond the limits of the project, and on all public roads within the project limits that are scheduled to remain in use upon completion of the project.

A special permit will not relieve the Contractor of liability for damage which may result from the moving of equipment.

The operation of equipment of such weight or so loaded as to cause damage to structures or the roadway or to any other type of construction will not be permitted.

1.13 Maintenance During Construction:

The Contractor shall maintain the work during construction and until the project is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces to the end that the roadway or structures are kept in satisfactory condition at all times.

In the case of a contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations.

1.14 Final Acceptance:

Upon receipt of the final estimate assembly without exception and proof of payment of both payroll and revenue taxes, the City will issue the letter of Final Acceptance releasing the Contractor from any obligations under the contract.

1.15 Acceptance for Traffic and Maintenance:

Upon due notice from the Contractor or presumptive completion of the entire project, the Engineer will make an inspection. If all construction provided for and contemplated by the contract is found completed to his satisfaction, that inspection shall constitute the final inspection and the Engineer will make the acceptance and notify the Contractor in writing of the acceptance as of the date of the final inspection.

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If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the Engineer will give the Contractor the necessary instruction for correction of same, and the Contractor shall immediately comply with and execute such instructions. Upon correction of the work, another inspection will be made which shall constitute the inspection provided the work has been satisfactorily completed. In such event, the Engineer will make the acceptance and notify the Contractor in writing of his acceptance as of the date of acceptance. If the inspection by the Engineer shows that all work required under the contract has been completed in accordance with the terms thereof, except: work scheduled under Sections Seeding and Topsoil, the Engineer shall establish the completion date and accept those items, completed as specified. Acceptance shall be in writing and shall relieve the Contractor from any further cost of maintenance and of making any repairs or replacements, but shall not relieve him of any other obligations or responsibilities under the contract. Any repair or replacement of topsoil and seeding as a result of winter shutdown, shall be the Contractor's responsibility and at no additional expense to the City.

1.16 Claims for Adjustments and Disputes:

If the Contractor becomes aware of any act or occurrence which may form the basis of a claim by the Contractor for additional compensation or an extension of time for performance, the Contractor shall immediately inform the Engineer. If the matter cannot be resolved by agreement or change document within 7 days, the Contractor shall, within the next 14 days, submit written notice of the facts which may form the basis of the claim. In addition, all claims by the Contractor for additional compensation or an extension of the time of performance or any dispute regarding a question of fact or interpretation of the contract shall be presented in writing by the Contractor to the Engineer within the next 60 days unless the Engineer agrees in writing to an extension of time for good cause shown. Good cause shown shall include time for the Contractor to prepare its claim and the Engineer shall grant an extension of not more than 60 days for preparation of the claim. The Contractor agrees that unless these written notices are provided, the Contractor will have no entitlement to additional time or compensation for such act, event or condition. The Contractor shall in any case continue diligent performance of the contract.

In presenting the claim, the Contractor shall specifically include, to the extent then possible, the following:

- A. The contract provisions which apply to the claim and under which it is made;

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- B. The bid items and quantities, if any, upon which the claim is based;
- C. The specific relief requested, including the additional compensation claimed and the basis upon which it was calculated or the additional time requested and the basis upon which it was calculated.

The claim will be acknowledged in writing by the Engineer. If the claim is not disposed of by meetings which result in agreement within 60 days, provided additional time is not granted in writing by the Engineer, the claim shall be decided by the Contracting Officer. The Contracting Officer reserves the right to make written request to the Contractor at any time for additional information which the Contractor may possess to support the claim(s). The Contractor agrees to provide the Contracting Officer such additional information within 30 days of receipt for such a request. The Contracting Officer will allow a reasonable time extension for good cause if sufficient information is presented in writing prior to the expiration of the 30 days. Failure to furnish such additional information constitutes a waiver of the claim.

The Contractor will be furnished a written signed copy of the Contracting Officer's Decision within 90 days of receipt of all necessary information from the Contractor upon which to base the decision.

## PART 2 - CONTROL OF MATERIAL

### 2.01 Source of Supply and Quality Requirements:

The materials used on the work shall meet all requirements of the contract. In order to expedite the inspection and testing of materials, the Contractor shall notify the Engineer of his proposed sources of materials at least 30 days prior to shipment. All materials originating outside the State of Alaska may be inspected by an agency designated by the City. Inspectors are not authorized to approve materials. However, approval subject to field inspection may be given on the basis of inspection reports indicating full compliance with the specifications.

Unless otherwise specifically provided for, all equipment, materials and articles incorporated in the work covered by this contract shall be new and of the specified grade. The Contractor shall furnish to the Engineer for his approval the name of the manufacturer of machinery, mechanical and other equipment which he contemplates incorporating in the work, together with their performance capacities and other pertinent



information. Machinery, equipment, materials and articles installed or used without approval shall be at the risk of subsequent rejection.

2.02 Local Material Sources:

A. General.

The Contractor shall furnish all materials required from sources of his choice unless specifically stated otherwise on the plans or in the special provisions. All materials furnished from widened cut sections, borrow pits, and quarries shall comply with the specifications. The Contractor will determine the type of equipment and the amount of work necessary to produce a sufficient quantity of material which will meet specifications requirements.

B. Inspection and Acceptance.

When the specified grading and other qualities of the product do not conform to the specification, the City reserves the right to reject the materials at the time of placement.

C. City Furnished Sources.

The City may acquire and make available to the Contractor the right to take materials from sources indicated on the plans or described in the contract together with the right to use indicated sites for plant sites, stockpiles, and haul roads. It shall be understood that it is not feasible to ascertain from samples the limits for an entire deposit, and that variations shall be considered as normal and are to be expected. The Engineer may order procurement of material from any portion of the deposit and may reject portions of the deposit as unacceptable. All material required may not be procurable from any one furnished source.

D. Contractor Furnished Sources.

If sources of material are not indicated on the plans or described in the contract or if the Contractor desires to use materials from sources other than those indicated on the plans, he shall acquire the necessary rights to take materials from the sources and shall pay all costs related to obtaining and developing the source including any which may result from an increase in length of haul. All costs of exploring and developing shall be borne by the Contractor.

2.03 Samples, Tests, Cited Specifications:

All materials for which tests are specified will be inspected and tested by the Engineer before incorporation in the work. Any work in which untested and unaccepted materials are used without approval or written permission of the Engineer shall be performed at the Contractor's risk and may be considered as unacceptable and unauthorized and will not be paid for. Unless otherwise stated, tests in accordance with Alaska Test Methods, AASHTO, ASTM or other cited methods, shall conform to the edition current on the date of advertisement of bids. Any such tests shall be made by and at the expense of the City, unless otherwise stated. Samples will be taken by a qualified representative of the City. Copies of all tests will be furnished to the Contractor's representative at his request.

2.04 Storage of Materials:

Materials shall be so stored as to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, may again be inspected prior to their use in the work. Stored materials shall be located so as to facilitate their prompt inspection. Approved portions of the right-of-way may be used for storage purposes and for the placing of the Contractor's plant and equipment, but any additional space required therefor must be provided by the Contractor at his expense.

Private property shall not be used for storage purposes without written permission of the owner or lessee. If requested, copies of such written permission shall be furnished. All storage sites shall be restored to conditions specified in the use agreement by the Contractor at his expense.

2.05 City Furnished Material:

The Contractor shall furnish all materials required to complete the work, except those specified to be furnished by the City.

Material furnished by the City will be delivered to the Contractor at the points specified in the special provisions. The cost of handling and placing all materials after they are delivered to the Contractor shall be included in the contract price for the item in which they are used. The Contractor will be held responsible for all material delivered to him, and deductions will be made from any monies due him to make good any shortages and deficiencies, from any cause whatsoever, and for any damage which may occur after such delivery, and for any demurrage charges.

END OF SECTION

SECTION 02217  
RIPRAP

PART 1 - GENERAL

1.01 Description of Work:

This work shall consist of furnishing and placing a protective covering of stone as shown on the plans or as established.

PART 2 - PRODUCTS

2.01 General:

Stone for this work shall be hard angular quarry stones and have a percentage of wear of not more than 50 at 500 revolutions as determined by ASTM C-535. The least dimension of any piece of stone shall be not less than 1/4 its greatest dimension. Stones shall meet the following gradation requirement for the class specified:

Class I - No more than 10% of the stones by total weight shall weigh more than 50 pounds per piece and no more than 50% by total weight of the stones shall weigh less than 25 pounds per piece.

Class II - No more than 10% of the stones by total weight shall weigh more than 400 pounds per piece and no more than 15% by weight of the stones shall weigh less than 25 pounds per piece. The stones shall be evenly graded and a minimum of 50% by weight of the stones shall weigh 200 pounds or more per piece.

PART 3 - EXECUTION

3.01 General:

The stones shall be handled or dumped into place so as to secure a stone mass of the thickness, height and length shown on the plans, or as staked with a minimum of voids.

Undesirable voids shall be filled in with small stones or spalls. The rock shall be manipulated sufficiently by means of a bulldozer, rock tongs, or other suitable equipment to secure a reasonably regular surface and mass stability.

Riprap protection shall be placed to its full course thickness at one operation and in such manner as to avoid displacing the underlying material. Placing of riprap protection in layers or by dumping into chutes or by similar methods likely to cause segregation will not be permitted.

All material going into riprap protection shall be so placed and distributed that there will be no large accumulation or area composed primarily of either the larger or smaller sizes of stone.

Unless otherwise authorized, the riprap protection shall be placed in conjunction with the construction of the plunge basin or embankment with only sufficient lag in construction of the riprap protection as may be necessary to prevent mixture of embankment and riprap material.

### 3.02 Method of Measurement:

The quantity of riprap to be paid for shall be the number of cubic yards measured by neat line measure, or tons, completed in place.

END OF SECTION

SECTION 02221  
TRENCHING, BACKFILLING AND COMPACTING

PART 1 - GENERAL

1.01 Description of Work:

This section shall describe all items of work involved in excavation and backfill of trenches, compaction to 95% of maximum density, furnishing, placing and compacting bedding material, and miscellaneous cleanup of the job site.

1.02 Definitions:

- A. Backfill - Material placed in an excavated area.
- B. Bedding - Ground or supports on which pipe is laid.
- C. Borrow - Material used as fill and/or backfill which is obtained from a source other than required excavation.
- D. Compaction - Tamping by hand or machine to achieve required density in soils.
- E. Disposal Site - Any area where waste from construction is placed.
- F. Excavation - Area or material removed to provide a suitable base for improvement.
- G. Fill - Fill is considered to be material placed above the original or natural ground line.
- H. Non-Frost Susceptible Material - Non-organic soil containing less than 3% by weight of grains smaller than 0.02 mm obtained from minus 3 inch material.
- I. Subgrade - The subgrade is that material below the leveling course or crushed base course which forms the foundation for pavement, sidewalks, curbs and gutters.
- J. Trench - Any excavation for a utility.
- K. Unsuitable Material - Unsuitable material may consist of any material which in the opinion of the Engineer is inadequate for use in the proposed construction.

1.03 Quality Assurance

The latest revision of the following standards of the American Society for Testing and Materials (ASTM) and the American Association of State Highway Officials (AASHO) are hereby made a part of these specifications:

ASTM C-29	Test for Unit Weight of Aggregate
ASTM C-117	Test for Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing
ASTMC-131	Test for Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
ASTM C-136	Test for Sieve or Screen Analysis of Fine and Course Aggregates
ASTM D-422	Test for Particle Size Analysis of Soil
ASTM D-423	Test for Liquid Limit of Soils
ASTM D-424	Test for Plastic Limit and Plasticity Index of Soils
AASHO T-180-D	Test for Moisture-Density Relations of Soils (Modified Hereinafter)
AASHO T-205	Test for Field Determination of Density of Soil In-Place

PART 2 - PRODUCTS

2.01 Bedding Material:

Material for bedding shall conform to the following table:

<u>U.S. Std. Sieve</u>	<u>Cumulative % Passing</u>
2 inches	100
1/2 inch	32-100
10 inches	12-70
40 inches	2-35
100 inches	0-14
200 inches	0-10

Bedding material shall contain no stone larger than 2 inches.

PART 3 - EXECUTION

3.01 Trench Excavation:

The Contractor shall perform all excavation of every description and of whatever substance encountered to the depth indicated in the plans and staked in the field. All excavated materials

suitable for backfill shall be placed in an orderly manner and placed at a distance from the trench section which conforms to all State and/or Federal safety codes.

Time is of the essence; therefore, the Contractor shall not begin excavation of the trench until all materials, equipment, and personnel are present to complete the work in the most expedient manner. Not more than four hundred (400) feet of trench shall be open in advance of pipe or conduit installation unless permission in writing is obtained from the Engineer. Unless otherwise indicated in the plans and specifications, all excavation will be open cut.

The Contractor shall perform whatever work necessary to prevent flow and accumulation of surface water or ground water in trenches. Unless otherwise provided in the special provisions, all work associated with pumping or dewatering shall not be paid for directly, but shall be considered as a subsidiary obligation of the Contractor.

### 3.02 Bedding:

All pipe shall be placed in bedding.

Where bedding material is available from trench excavation, the Contractor shall use care to separate it from unsuitable material. Bedding material shall be placed under and around the pipe in lifts not to exceed 12 inches, and compacted to 95% of maximum density. In no case shall bedding material be placed above the spring line of the pipe in a single lift.

Where bedding materials are encountered in the trench bottom, the trench shall be accurately graded to provide uniform bearing and support for each section of the pipe for its entire length, except for the portion of the pipe sections where it is necessary to excavate for the bell holes and other type joints and for the proper sealing of the joints. Bell holes and depressions for joints shall be dug after the trench bottom has been graded and, in order that the pipe will rest on the prepared bottom for as near its full length as practical, bell holes and depressions shall be only of such length, depth, and width as required for properly making the particular type of joint. Where unsuitable material such as, but not limited to hard pan or rock is encountered, the trench shall be over-excavated so a minimum 6 inch depth of bedding material is required to bring the trench bottom up to the specified grade. This bedding material shall be compacted to 95% of maximum density prior to the installation of the pipe. If the Engineer determines that excavated material is unsuitable for bedding, the Contractor shall furnish bedding material.

3.03 Trench Backfill:

Trench backfill is defined as the placement of material above the level of bedding material. Material for backfill shall be obtained from trench excavation. If the Engineer determines that the excavated material is unsuitable for trench backfill, he may direct the Contractor to furnish non-frost susceptible material for use as backfill. Furnishing non-frost susceptible material for use as trench backfill shall be paid for separately and shall be measured by the ton. Backfill shall be placed in lifts and compacted in a manner such that 85% of maximum density is obtained, except within a roadway where 95% of maximum density is required. No separate payment will be made for compaction.

3.04 Cleanup:

This item consists of cleanup and finishing of all construction areas to their original condition or better.

3.05 Roadway Construction:

If construction is within a roadway, the roadway shall be returned to its original or better condition, including but not limited to furnishing and installing subgrade material, base course, and asphalt concrete. Returning a roadway to its original or better condition is incidental to the trenching, backfilling and compacting bid item and no separate payment will be made.

3.05 Method of Measurement:

Measurement of trench excavation and backfill will be per linear foot of horizontal distance as set forth in the bid proposal. Measurement will be from station to station as surveyed in the field.

END OF SECTION



SECTION 02421  
PLUNGE BASIN

PART 1 - GENERAL

1.01 Description of Work:

This work consists of the construction of plunge basins where shown on the Plans and according to the details shown on the Plans.

PART 2 - PRODUCTS

2.01 Riprap, Class II:

Riprap, Class II shall be as specified in Section 02517, Riprap.

2.02 Coarse Gravel:

All stones shall be sound and durable and have a maximum size of 8 inches in greatest dimension. No more than 50% by weight of material shall pass a 3 inch sieve. Stones required may be obtained from excavation performed under this contract. No deduction will be made from stones obtained from excavation for use. Additional stones required shall be obtained from approved sources.

2.03 Filter Fabric:

Filter fabric shall consist of linear polypropylene or polyethylene monofilament yarn, coated or uncoated, woven or unwoven, and formed into sheets of varying thickness. The length and width of sheets may be sized to meet manufacturer's requirements. Transverse seams conforming to the strength requirements of the fabric will be permitted to form the sheets into rolls. Fibers of other plastic or metal may be woven into the cloth for reinforcing purposes, provided such fibers shall equal or exceed the durability of filter cloth. Non-woven fabric cloth shall be needle-punched or heat bonded.

Filter fabric shall conform to the following strength requirements:

<u>Fabric Property</u>	<u>Testing Procedure</u>	<u>Non-Woven</u>	<u>Woven</u>
Tensile Strength (lbs.)	ASTM D 1682	100	90
Grab Elongation (%)	ASTM D 1682	15 min.-70 max.	15 min.-70 max.
Burst Strength (psi)	ASTM D 751	200	200

PART 3 - EXECUTION

3.01 Plunge Basin:

Plunge Basin shall be constructed where shown on the plans and according to the details shown on the plans.

3.02 Method of Measurement:

Plunge Basins will be measured by the unit completed and accepted in final position.

END OF SECTION

SECTION 02422  
TRASH RACK

PART 1 - GENERAL

1.01 Description of Work:

This work consists of the construction and installation of trash racks where shown on the plans and according to the details in the plans.

1.02 Quality Assurance:

The latest revision of the following standards are hereby made a part of these specifications:

AISC	Manual of Steel Construction, Specifications
ASTM A36	Structural Steel
ASTM A53	Welded and Seamless Steel Pipe
ASTM A501	Hot Formed Welded & Seamless Carbon Steel Structural Tubing
AWS D1.1	Structural Welding Code
AWS A5.1	Specification for Mild Steel Covered Arc- Welding Electrodes
ASTM A615	Specification for Billet Steel Bars for Concrete Reinforcing
ASTM C94	Specification for Ready-Mix Concrete
ASTM A123	Specification for Hot Dipped Galvanizing

PART 2 - PRODUCTS

2.01 Steel Members for Trash Racks:

Steel bars shall conform to ASTM A36. They shall be new and unused, and in a clean, non-rusty condition suitable for hot-dip galvanizing. Steel pipe shall conform to ASTM A53. They shall be new and unused, and in a clean, non-rusty condition suitable for hot-dip galvanizing. Steel structural tubing for the trash rack upright supports shall conform to ASTM A501. They shall be new and unused, and in a clean, non-rusty condition suitable for hot-dip galvanizing.

2.02 Trash Rack Foundations:

Concrete used in the trash rack footings shall conform to ASTM C94. The compressive strength shall not be less than 3000 psi. Reinforcing shall be deformed steel bars conforming

to ASTM A615, Grade 60. It shall be free from loose scales, excessive rust or coatings or any characteristic which will reduce the bond between the steel and concrete. Reinforcing steel shall not be welded.

2.03 Miscellaneous:

The hardware called out on the trash rack details of the Plans shall be suitable for the application in which it is to be used. All metal hardware shall be steel so as to eliminate any contact between two dissimilar metals.

PART 3 - EXECUTION

3.01 Fabrication:

The trash rack shall be fabricated by welding. An E70XX electrode shall be used to make the welds which shall be made in accordance with AWS D1.1. The trash rack shall be hot-dip galvanized in accordance with ASTM A123 after fabrication.

3.02 Installation:

The concrete footings may be poured-in-place. The soil beneath the footings shall be tamped prior to placement of the footings. The footings shall be cured for not less than 7 days prior to backfilling. Backfilling shall be done in 12-inch lifts, each lift being tamped prior to placement of the next. The structural tubing uprights shall be placed in the concrete footings as they are poured. A bituminous coating, specified elsewhere, shall be applied to the base of the structural tubing where it is to be in contact with concrete.

3.03 Submittals:

Shop drawings showing trash rack fabrication shall be submitted in accordance with AISC Specification Section 1.1.2 and the General Provisions of this specification. Fabrication of the trash rack shall not commence prior to approval of the shop drawing submittal.

3.04 Method of Measurement:

Trash racks shall be measured lump sum per installation.

END OF SECTION

SECTION 02423  
OPEN DITCH

PART 1 - GENERAL

1.01 Description of Work:

This section shall describe all items of work involved in constructing a new open ditch or altering an existing ditch including, but not limited to, furnishing and installing fill material, constructing embankments, compaction and miscellaneous cleanup of the job site.

1.02 Definitions:

This section incorporates the definitions in Section 02221 - 1.02.

PART 2 - PRODUCTS

2.01 Fill Material:

Fill material shall be non-frost susceptible material unless otherwise approved by the engineer.

PART 3 - EXECUTION

3.01 Excavation:

Excavation shall be to the grade and ditch cross section shown on the plans. The final ditch shall have no projections of roots, stumps, rock, or similar matter.

3.02 Embankment:

Embankment shall be to the shape and at the location shown on the plans. The type of material utilized to construct ditch banks and dikes shall be as noted on the plans, or as approved by the Engineer.

3.03 Cleanup:

The Contractor shall maintain the ditch and keep it open and free from all debris, as directed by the Engineer until final acceptance.

3.04 Method of Measurement:

Measurement for open ditch or embankment construction will be per linear foot along the slope of the ditch or embankment.

END OF SECTION

SECTION 02431  
MANHOLES AND CATCH BASIN MANHOLES

PART 1 - GENERAL

1.01 Description of Work:

This item consists of the construction and installation storm drain manholes, and catch basin manholes complete with frames and covers as shown on the plans and in accordance with the appropriate details except that such minor modifications may be made as will meet the approval of the Engineer. Should the Contractor be equipped with special forms for making concrete manholes which may differ only slightly in pattern from those detailed, permission may be given to use such forms.

1.02 Quality Assurance:

ASTM A-48 and ASTM A-438 strength requirements for manhole frames and covers are hereby made a part of these specifications.

PART 2 - PRODUCTS

2.01 General:

Materials used in the construction of manholes shall conform to the requirements of ASTM Specification Designation C-478 and Standard Details. Cones shall be Type (b), eccentric, unless otherwise approved.

Forty-eight inch reinforced concrete pipe may be used for manhole riser sections as an alternate. This pipe shall conform to ASTM Specification Designation C-76 with a minimum thickness of 5 inches.

2.02 Gasket:

Each precast concrete barrel section shall be set and sealed by use of a plastic gasket pipe joint sealer as manufactured by K.T. Snyder Co., Inc., Ram-Nek Gasket Division, 2100 Travis Street, Houston, Texas, or equal.

Use of, and installation of, these pre-molded plastic gaskets for manhole construction shall be strictly in accordance with the manufacturers printed instructions. Ram-Nek Gaskets will be trimmed on the inside of the manhole to prevent the excess gasket material from entering the storm drain lines.

2.03 Mortar:

Cement for mortar used in the construction of manholes shall conform with ASTM Specification Designation C-150, Type II. Sand shall conform with AASHTO Specification M-45. The mortar shall be composed of one part cement and three parts sand. The joints shall be made so as to produce a smooth, regular water-tight surface. Only enough water shall be added to provide plasticity in placing the mortar.

2.04 Frames and Covers:

Frames and covers shall be as specified in the details on the Plans.

PART 3 - EXECUTION

3.01 General:

The manhole rings and covers shall be brought to the grades shown on the Plans unless otherwise approved by the Engineer. Manhole rings shall be set in a full bed of mortar and made secure.

All portions of precast manholes must be Owner approved prior to installation in the storm drain. The precast manhole manufacturer shall provide timely notice (at least two working days in advance) to allow time for the Owner to arrange for necessary tests. Installation of manhole sections without the Owner's stamp of approval will not be allowed. This approval does not relieve the Contractor of the responsibility for protection of manholes against damage during handling and installation.

Manholes shall be installed at the locations shown on the plans such that primary leads enter radially at the invert elevations specified. The base section shall be set plumb on a prepared surface.

Where indicated on the plans, a stub shall be provided for future connections to the manhole. The stub shall be sized and positioned as indicated. The end of the stub shall be stopped with a wooden plug, concrete biscuit, or other adequate methods to prevent water, earth or other substances from entering the pipe.



In the case of poured-in-place manhole construction, if the Contractor elects to accomplish the manhole construction utilizing more than one continuous concrete pour, a keyed construction joint shall be used. These manholes shall have poured-in-place bases.

There shall be a minimum of 8 inch catch constructed in the invert of the manholes unless otherwise specified. After the mortar is set, holding the pipe in place, the pipe is to be cut off evenly so that not more than 2 inches of the pipe protrudes into the manhole.

3.02 Method of Measurement:

Manholes and catch basin manholes shall be measured as units complete in place. No separate payment will be allowed for frames and covers but shall be included in the unit price for manholes.

END OF SECTION

SECTION 02433  
DRAINAGE PIPE

PART 1 - GENERAL

1.01 Description of Work:

This item consists of furnishing and installing drainage pipe and flared end sections where indicated on the plans and in accordance with the details on the plans.

1.02 Quality Assurance:

The latest revision of the following standards of the American Society for Testing and Materials (ASTM), the American Association for State Highway Officials (AASHTO) are hereby made a part of these specifications.

AASHTO M-36	Corrugated Aluminum Pipe & Fittings
AASHTO M-196 and M-197	Corrugated Aluminum Pipe & Fittings
AASHTO M-190	Bituminous Coating of CMP
ASTM D-124	Polyethylene Plastics Moldings and Extension Materials
ASTM D-2321	Underground Installation of Flexible Thermoplastic Sewer Pipe

PART 2 - PRODUCTS

2.01 Corrugated Metal Pipe:

Corrugated metal pipe is intended to refer to both steel and aluminum. The pipe shall conform to the following specifications:

- A. Steel - Corrugated steel pipe shall meet the current requirements of AASHTO Specifications Designations M-36. Corrugations may be either annular or helical. Pipe shall have helical corrugations, or a continuous lock seam paralleling the corrugations, or a continuous welded longitudinal seam extending from end to end of each length of pipe. The seams will be fabricated in such a manner that they will not affect the shape or the nominal diameter of the pipe and so that they do not create an element of weakness in the pipe. The pipe shall be fabricated from galvanized coiled sheets or strips as provided under AASHTO Specification M-36.

- B. Aluminum - Corrugated aluminum pipe shall meet the requirements of the current AASHTO Specification Designation M-196 and M-197. Corrugations may be either annular or helical.

All wyes and fittings for corrugated steel and aluminum pipe shall meet the current requirements of AASHTO Specification Designations M-36 and M-197, and the manufacturer's recommendations.

Jointing for corrugated steel and aluminum pipe shall be made through the use of one-piece coupling bands applied as recommended by the manufacturer and approved by the Engineer. Any aluminum pipe or aluminum fittings found in contact with dissimilar metal will be removed and reinstalled. Nonconducting material must be used to prevent corrosion; insulation material recommended by the manufacturer should be used. Other materials approved by the Engineer may be used. All angles, bolts and nuts shall be as recommended by the manufacturer for the type of pipe used and as approved by the Engineer.

The metal gage for pipe to be used shall be as shown on the Plans and/or as noted in the Contract documents.

If bituminous coating of CMP is required, the bituminous coating shall conform to the current requirements of AASHTO Specification Designation M-190 and shall be one of the following types:

Type A - Fully bituminous coated pipe shall be uniformly coated with bituminous material inside and outside to a minimum thickness of 0.05 inches measured on the crest of the corrugations.

Type B - Paved invert pipe shall be coated so as to form a smooth pavement of invert (inside bottom of pipe when installed) filling the corrugations for at least 25% of the circumference for shape I and shape II and 40% of the circumference for shape III. The invert paving shall have a minimum thickness of 1/8 inch above the crest of the corrugations except where the upper edges thereof intersect the corrugations.

Type C - Half bituminous coated, paved invert pipe shall be coated for approximately the lower one-half of the circumference (bottom of pipe installed) inside and outside to a minimum thickness of 0.05 inch and in addition, the bituminous material shall be so applied as to form a smooth pavement in the invert (inside bottom of pipe when installed) filling the corrugations for at least 25% of the circumference for shape I and shape II, and

40% of the circumference for shape III. The invert pavement shall have a minimum thickness of 1.8 inch above the crest of the corrugations except where the upper edges thereof intersect the corrugations.

Type D - Fully bituminous coated, paved invert pipe shall be fully coated as specified for Type A and in addition a smooth invert pavement shall be provided as specified for Type C.

Shapes for corrugated steel and aluminum pipe shall conform to one of the following:

Shape I - This pipe shall be of a true circular cross section.

Shape II - This pipe shall be fabricated to form an ellipse, and installed with the long axis vertical. The long axis shall be nominally 5% greater and not less than 3% greater than the diameter of a corresponding circular pipe.

Shape III - This pipe shall be fabricated to a multicenter pipe having an arch top with a slightly convex curved integral bottom. The pipe shall conform to the requirements in Table IV (refer to AASHTO, M-36).

Aluminum pipe shall not be specified for use in direct contact with steel pipe or other metals. Where it is necessary to repair an existing facility by replacing a section of steel with aluminum, or aluminum with steel, a proper insulation of the 2 dissimilar metals will be effected by use of a bituminous coating, rubber or neoprene sheeting, special fabricated coupling, or concrete expansion block or other methods as approved by the Engineer.

All welding performed by the Contractor on aluminum pipe shall incorporate the use of 4043 or 5356 alloy for welding wire. The welding shall be accomplished by either the "TIG" tungstem, (inert gas shielded) or "MIG" (metal arc welding, inert gas shielded) process.

#### 2.02 End Sections for Corrugated Metal Pipe:

Galvanized steel and aluminum end sections shall be flared, beveled shop-assembled units to serve as structural, hydraulic and aesthetic treatment to corrugated metal pipe culverts. They may be attached to culverts by threaded bolts, by riveting

or bolting per manufacturer's standard procedure. End sections shall have a turned-down lip or toe plate at the wide end to act as a cutoff, and toe plate extensions shall be available at extra cost.

Materials for steel end sections shall be galvanized steel meeting the requirements of AASHTO M-36. The gauge shall be as follows:

- 16 Ga. - Through 24 inches round or 29 inches x 18 inches pipe-arch
- 14 Ga. - 30 inches round and 36 inches x 22 inches pipe-arch  
36 inches round and 43 inches x 27 inches pipe-arch
- 12 Ga. - Over 36 inches round and 43 inches x 27 inches pipe-arch (except that the center panels of 60 inches round and larger and 72 inches x 44 inches pipe-arch and larger, shall be 10 Ga.)

Galvanized stiffener angles shall supplement the usual reinforced side edges for 60 inches round and larger, 79 inches x 49 inches pipe-arch and larger.

If the end section is shop attached to a stub of pipe (manufacturer's standard Type No. 3 connection), the pipe stub shall not be lighter in gauge than the end section.

Materials for aluminum end sections shall comply with the provisions of AASHTO Designation M-196 and fabrication shall comply with the requirements above.

The end sections will be paid for separately from the pipe except in the case of the Type No. 3 Manufacturer's Standard Connection which will be paid for as pipe.

#### 2.03 High-Density Polyethylene Pipe:

High-Density Polyethylene (HDP) Pipe shall be produced from high molecular weight polyethylene pipe material meeting the requirements of Type III, Class C, Grade P34 as defined in ASTM D-1248.

### PART 3 - EXECUTION

#### 3.01 Pipe Laying:

All pipe shall be laid with bedding material unless otherwise indicated on the plans or ordered by the owner.

Pipe laying shall in all cases proceed upgrade. Each pipe shall be laid true to line and grade and in such a manner as to form a close concentric joint with the adjoining pipe. The alignment of the installed pipe shall appear straight to the naked eye. Each section of pipe shall be carefully handled and placed accurately. Each section of pipe shall be properly supported to insure true alignment and an invert which is smooth and free from roughness or irregularity. A flared end section, when used for vertical transition at a downstream invert shall be properly supported by bedding material.

At all times, when work is not in progress, open ends of pipe and fittings shall be securely and satisfactorily closed so that no undesirable substances will enter the pipe or fittings. At no time shall the Contractor's work obstruct the flow of a drainage-way.

### 3.02 Cleanup:

During the time that the work is in progress, the Contractor shall make every effort to maintain the sites in a neat and orderly condition. All refuse, broken pipe, excess fill material, cribbing, etc., shall be removed as soon as practicable.

The work will not be considered complete until all rubbish, unused material or equipment shall have been removed and the premises left in a condition satisfactory to the Engineer.

After backfilling and cleaning, but before final acceptance, all sections of installed line may be checked for line and grade. Any excess deviation in line and/or grade shall be corrected by the Contractor prior to final acceptance of the project.

All cleanup shall be considered a subsidiary obligation under furnish and install pipe and no extra payment will be allowed for this portion of work.

### 3.03 Method of Measurement:

Drainage pipe shall be measured per linear foot of pipe installed. Flared end sections shall be measured complete in place.

END OF SECTION

SECTION 02435  
HEAT TRACING

PART 1 - GENERAL

1.01 Description of Work:

This section shall describe all items of work involved in constructing heat tracing in drainage facilities, including but not limited to, furnishing and installing heat trace wire, installing electrical connection and miscellaneous cleanup of the job site.

1.02 Quality Assurance:

- A. Bolts and nuts shall conform to ASTM A307. All bolts and nuts shall be galvanized in accordance with ASTM A153.
- B. Wooden posts shall conform to the requirements of AASHTO M168.
- C. All electrical materials shall comply with all applicable standards of the National Electric Code and the National Electric Safety Code.

PART 2 - PRODUCTS

2.01 Heat Trace:

Heat trace shall be Chemelex brand 8ATV or equal, as approved by the Engineer.

2.02 Wooden Posts:

Wooden posts shall be 6 inch x 6 inch nominal dimension, S4S Douglas Fir, construction grade, conforming to "Standard Grading and Dressing Rules, latest edition, West Coast Lumber Inspection Bureau". After fabrication, the posts shall be treated in accordance with the latest applicable standards of the American Wood Preservers Institute.

2.03 Service Entrance Cable:

Service entrance cable shall be single conductor, stranded, type RHW, USE Neoprene jacket, underwriters approved 600 volt cable at 75 degrees C. direct burial.

2.04 Thermostat Control:

Thermostat controls, where required, shall meet NEMA4 requirements.

PART 3 - EXECUTION

3.01 General:

The installation, as specified under this section, shall comply with all applicable requirements and recommendations of the National Electric Code and the National Electric Safety Code.

The Contractor shall furnish the Engineer with circuit and wiring diagrams.

At the Contractor's option, he may install a post and meter combination for each individual heat trace, or he may install a single post and meter combination for any group of heat trace.

Heat tracing shall be installed as indicated on the Plans and directed by the Engineer.

The Contractor shall coordinate with the electric utility and shall meet all requirements necessary for connection to the utility system.

3.02 Heat Trace:

Heat trace shall be installed where shown on the Plans and in accordance with the manufacturer's directions.

3.03 Method of Measurement:

Heat tracing shall be measured as a lump sum, complete in place including furnishing and installing heat trace, connecting to the electric utility, and any other work necessary to provide an operational heat tracing system.

END OF SECTION



SECTION 02486  
TOPSOIL AND SEEDING

PART 1 - GENERAL

1.01 Description of Work:

This section shall describe all items of work involved in installing topsoil and seeding in conjunction with drainage improvements.

PART 2 - PRODUCTS

2.01 Topsoil:

Topsoil shall consist of a natural friable surface soil without admixtures of undesirable subsoil, refuse, or foreign materials. It shall be reasonably free from roots, hard clay, coarse gravel, stones larger than 2 inches in any diameter, noxious weeds, tall grass, brush, sticks, stubble or other litter, and shall have indicated by a healthy growth of crops, grasses, trees, or other vegetation that it is free-draining and non-toxic.

Topsoil shall conform to any of the following AASHTO classifications with modifications indicated. The classification shall be determined by AASHTO M-145.

Classification	Modification
A-2	Not less than 75% by weight passing the NO. 100 sieve.
A-4	Not more than 80% by weight passing the NO. 200 sieve.
A-5	
A-6	

Topsoil shall contain not less than 20%, nor more than 35% organic matter.

The Contractor shall notify the Engineer of the location from which he proposes to furnish topsoil at least 30 calendar days prior to delivery of topsoil to the project from that location. The topsoil and its source will be inspected and tested by the Engineer before approval will be granted for its use.

Unsuitable topsoil sources may be used if, prior to delivery to the project, sufficient organic matter in the form of

pulverized peat moss or rich organic soil from other sources is thoroughly mixed with the topsoil to provide a product meeting the above requirements.

2.02 Fertilizer:

Fertilizer shall be of standard commercial types supplied separately or in mixtures, and furnished in moisture proof containers. Each container shall be marked with the weight and with the manufacturer's guaranteed analysis of the contents showing the percentage for each ingredient contained therein.

The proportion of chemical ingredients furnished shall be a mixture such as to provide the total available nitrogen, phosphoric acid, and potassium as required by the soil analysis or as specified in the Special Provisions. The fertilizer shall contain slow release nitrogen and shall be supplied in the form of inorganic chemicals to the amount of at least 75% of the nitrogen carrying agents.

Tolerances of the chemical ingredients shall be plus or minus 2%.

No cyanamid compounds or hydrated lime will be permitted in mixed fertilizers.

2.03 Seed:

Seed furnished shall conform to me of the following mix types:

<u>Cover</u>	<u>Germination (percent)</u>	<u>Application (percent)</u>
Meadow Foxtail (Alopecurus Pratensis)	90	10
Arctared Fescue (Festuca rubra 'Arctared')	90	10
Meriod Bluegrass (Poa pratensis 'Merion')	90	10
Manchar Smooth Bromegrass (Bromus inermis 'Manchar')	90	4

- Notes: 1. Garrison Creeping Foxtail may be substituted for Meadow Foxtail.
2. ('Phleum pratense') Timothy 'Engmo' shall be substituted for Manchar smooth Bromegrass if the pH of the soil is 5 or below.

2.04 Limestone:

Limestone shall contain not less than 85% of calcium and magnesium carbonates. Agricultural ground limestone suitable for application by a fertilizer spreader shall conform to the following gradation:

<u>Sieve Designation</u>	<u>Minimum Percent Passing, by Weight</u>
No. 10	100
No. 20	90
No. 100	50

PART 3 - EXECUTION

3.01 Seeding Seasons:

All seeding shall be performed between May 15 and August 15. Seeding at other than the specified dates will only be allowed upon written permission of the Engineer.

No seeding shall be done during windy conditions or when climatic conditions or ground conditions would hinder placement or proper growth.

3.02 Topsoil Application:

The topsoil shall be evenly spread on the designated areas to a depth which, after settlement and compaction, shall be that shown on the plans. Spreading shall not be done when the ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the work. Roadway surfaces shall be kept clean during hauling and spreading operation.

After spreading has been completed, large clods, stones larger than 2 inches in any diameter, roots, stumps, and other litter shall be raked up and removed.

### 3.03 Soil Preparation:

After grading of areas has been completed in conformity with the lines and grades shown of the plans or staked by the Engineer, and before beginning seeding operation, the areas to be seeded shall be cultivated to provide a reasonably firm but friable seedbed. Cultivation shall be carried to a depth of 2 inches or as directed by the Engineer. On slopes steeper than 3:1 depth of cultivation may be reduced as directed. All cultivated areas shall be raked or cleared of stones 2 inches in diameter and larger and all weeds, plant growth, sticks, stumps, and other debris or irregularities which might interfere with the seeding operation, growth of grass, or subsequent maintenance of the grass covered areas, shall be removed.

### 3.04 Fertilizer and Limestone Application:

The application rates of the fertilizer and limestone per 1000 square feet of ground area of topsoil furnished by the Contractor shall be determined by the Engineer, based on soil analysis tests so that the total natural and applied chemical constituent are as follows:

Nitrogen	1.0 lb. min. - 1.5 lb. max. per 1000 square feet
Phosphoric Acid	1.0 lb. min. - 2.0 lb. max. per 1000 square feet
Potassium	1.0 lb. min. - 2.0 lb. max. per 1000 square feet.
Limestone	Sufficient to Attain a Ph of 6.5 to 7.5

Fertilizer and limestone for use in a hydraulic sprayer shall be soluble or ground to a fineness that will permit complete suspension of insoluble particles in water.

### 3.05 Seed Application Methods:

Apply grass seed mixture specified at rate required by the Engineer for the specific application. Seed, fertilizer, ground limestone and mulch material may be placed by the following methods.

#### A. Hydraulic Method

Seeding by hydraulic methods shall consist of furnishing and placing a slurry made of seed, fertilizer, ground limestone, dried peat moss or cellulose wood fiber and water.

The dried peat moss or cellulose wood fiber and limestone shall be added to the water slurry in the hydraulic seeder after the proportionate amounts of seed and fertilizer have been added. The slurry mixture shall then be combined and applied in such a manner that the rate of application will result in an even distribution of all materials.

Hydraulic seeding equipment shall be capable of maintaining a continuous agitation so that a homogeneous mixture can be applied through a spray nozzle. The pump shall be capable of producing sufficient pressure to maintain a continuous, non-fluctuating spray capable of reaching the extremities of the seeding area with the pump unit located on the roadbed. Sufficient hose shall be provided to reach areas not practical to seed from the nozzle unit situated on the roadbed.

B. Dry Methods

Mechanical spreaders, seed drills, landscape seeder, cultipacker seeders, fertilizer spreaders or other approved mechanical spreading equipment may be used when seed and fertilizer are to be applied in dry form.

Fertilizer shall be spread separately at the specified rates and then incorporated in one operation to a minimum depth of 2 inches. Seeded areas shall be compacted within 24 hours from the time the seeding is completed, weather and soil conditions permitting, by cultipacker, roller or other equipment satisfactory to the Engineer. Compacting equipment shall be operated at right angles to the slope. Compaction shall not be performed when the soil is in such condition that it will be picked up by the equipment nor shall heavy soils be compacted at all if so directed by the Engineer.

Hand broadcasting may be substituted provided that the rate of application for both seed and nutrient is twice that of dry mechanical methods, and that the end result required is attained.

3.06 Maintenance of Seeded Areas:

The Contractor shall protect seeded areas against traffic by warning signs or barricades, as approved by the Engineer. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading, reseeding, and remulching, as directed

and the Contractor shall otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

The seeded areas shall be watered by the Contractor as required for proper germination and growth. Equipment used in watering shall be capable of reaching all seeded areas from the traveled way.

No extra compensation will be paid to the Contractor for work incurred under maintenance of seeded areas.

### 3.07 Inspection:

Final inspection to determine final acceptance of the grass shall be made upon written request by the Contractor to the Engineer at least 7 days prior to the anticipated date. Request for final acceptance of grass shall occur at the end of the maintenance period.

Conditions governing final acceptance by the Engineer are that a healthy and uniform stand of grass be achieved, free of weed, disease and showing no signs of a chloritic condition.

### 3.08 Method of Measurement:

The quantity of topsoil and seeding to be paid for shall be the number of 1000 square foot units, measured to the nearest .1 unit on the ground surface.

When hydraulic seeding methods are used, mixing water in the hydraulic application will not be measured for payment.

The quantity of topsoil and seeding specified shall include all topsoil, cultivating, seed, limestone, if required, fertilizer, and mulch material of the type specified, completed and accepted.

END OF SECTION

HOMER DRAINAGE PLAN

# DRAINAGE - WAYS CONSTRUCTION PLANS

OCTOBER 1981

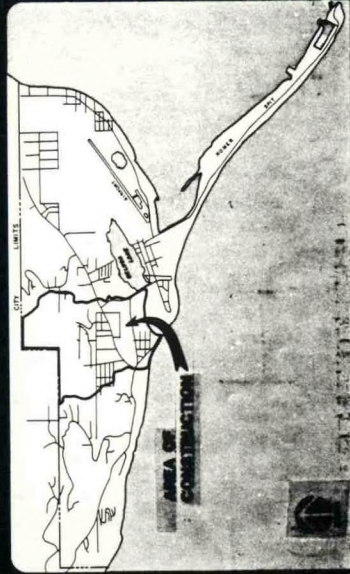
PREPARED FOR

CITY OF HOMER  
HOMER, ALASKA



## INDEX OF DRAWINGS

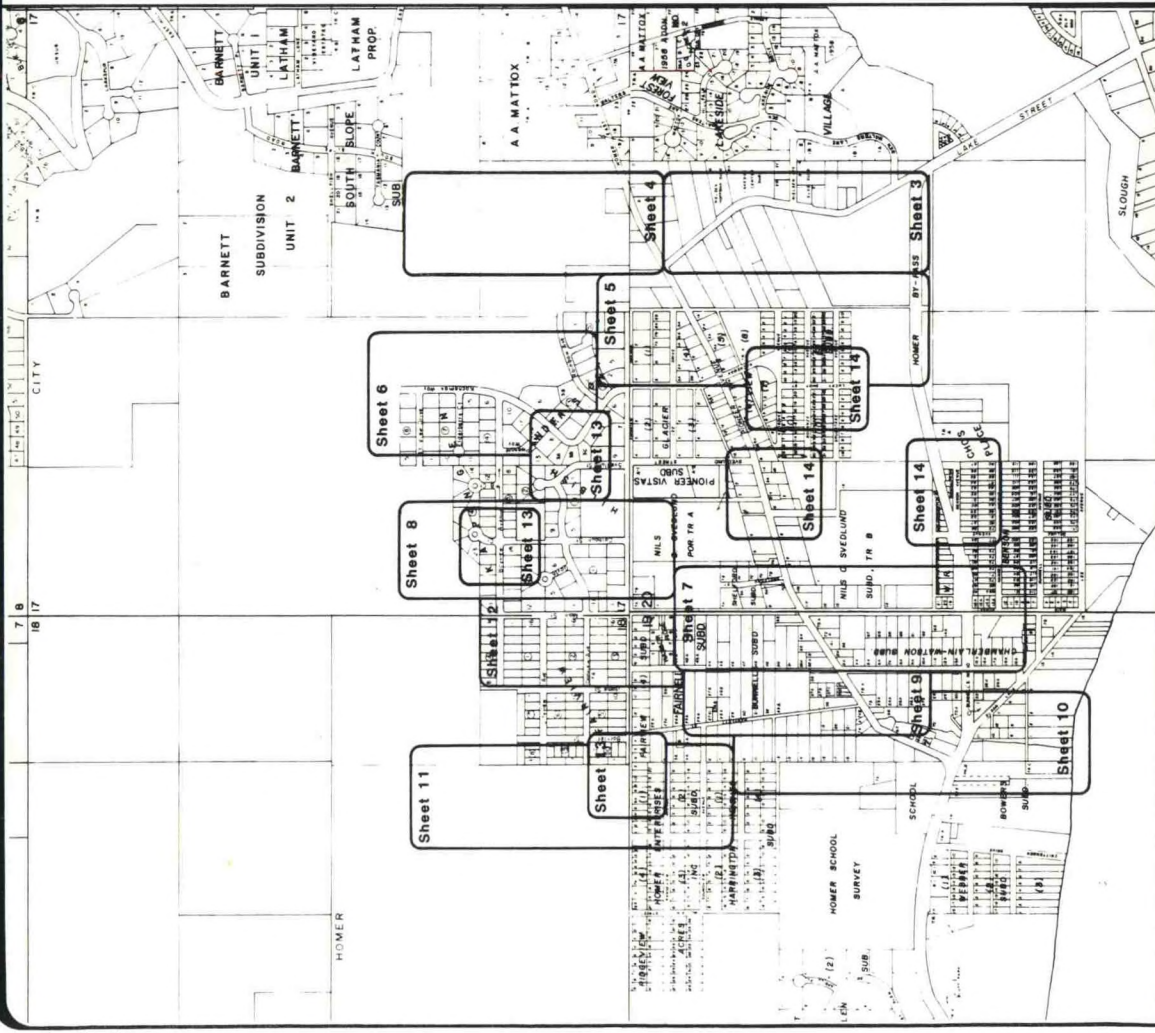
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VICINITY MAP



**QUADRA**  
**QUADRA**  
ENGINEERING, INC.



**Legend**

- PROFILE**
- EXISTING GROUND SURFACE
  - ASSUMED EXISTING GROUND SURFACE
  - FINAL GRADE
  - EXISTING CULVERT
  - NEW CULVERT
- PLAN**
- FINAL CHANNEL THREAD
  - ORIGINAL CHANNEL THREAD WHERE REALIGNMENT IS TO OCCUR
  - CULVERT, EXISTING, AND/OR PROPOSED
  - SLOPE, FT./FT.
  - L LENGTH, FT.
  - S CORRUGATED METAL PIPE, DIAMETER, IN
  - MDPE HIGH DENSITY POLYETHYLENE PIPE

**General Notes:**

- WHEN EXCAVATING A CHANNEL THE CENTERLINE OF THE STREAM SHALL BE MOVED UP TO 5 FEET TO THE LEFT OF THE EXISTING CHANNEL AND TO BE PLACED INTO THE EXISTING BANK. SEE SECTION A-A ON SHEET 11.
- BECAUSE CHANNEL LENGTHS ARE APPROXIMATE, FIELD CONDITIONS MAY NOT RESULT IN THE DESIGN AS SHOWN. IN THOSE INSTANCES FIELD CONDITIONS SHALL BE MAINTAINED AND THE FOLLOWING PARAMETERS SHOULD BE ADHERED TO IN SUCH INSTANCES:
  - NO CHANNEL BOTTOM SHALL BE ABOVE THE CULVERT OUTLET.
  - IN THE EVENT THE VERTICAL DISTANCE FROM THE CULVERT OUTLET TO THE CHANNEL BOTTOM IS GREATER THAN 24 INCHES A FLARED END-SECTION SHALL BE INSTALLED.
  - IF THE VERTICAL DISTANCE FROM THE CULVERT OUTLET TO THE CHANNEL BOTTOM IS 24 INCHES OR LESS, THE CHANNEL BOTTOM SHALL BE INCREASED AS TO DECREASE THE VERTICAL DISTANCE BETWEEN THE OUTLET INVERT AND CHANNEL BOTTOM TO 24 INCHES. THE CHANNEL BOTTOM SHALL BE CONSTRUCTED AND A FURNISHING SHALL BE CONSTRUCTED AT THE OUTLET. IF THE RESULTING SLOPE IS GREATER THAN 4 PERCENT THE CITY'S DESIGNER SHALL RECOMMEND AN ALTERNATE SOLUTION.
- WHEN IT IS NOTED IN PLANS TO RIPRAP A SLOPE THE CHANNEL BOTTOM AND SIDES SHALL BE LINED WITH 6 INCHES OF COARSE GRAVEL COMPACTED TO 95%.
- WHERE EXISTING CULVERTS ARE BEING REPLACED THE EXISTING CULVERT SHALL BE COMPLETELY REMOVED AND DISPOSED OF BY THE CONTRACTOR.
- THE CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA PRIOR TO BEGINNING ANY WORK.
- FINAL DRAINAGE EASEMENT CENTERED ON THREAD CULVERTS SHALL BE 20' UNLESS OTHERWISE NOTED ON PLANS.
- DISTANCES SHOWN ARE APPROXIMATE.
- ELEVATIONS OF CONTOURS ON PLANS ARE BASED ON 100.00 AT MEAN SEA LEVEL.

**LOCATION MAP**



**QUADRA**  
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Homer Drainage Plan  
**DRAINAGE-WAYS  
CONSTRUCTION PLANS**

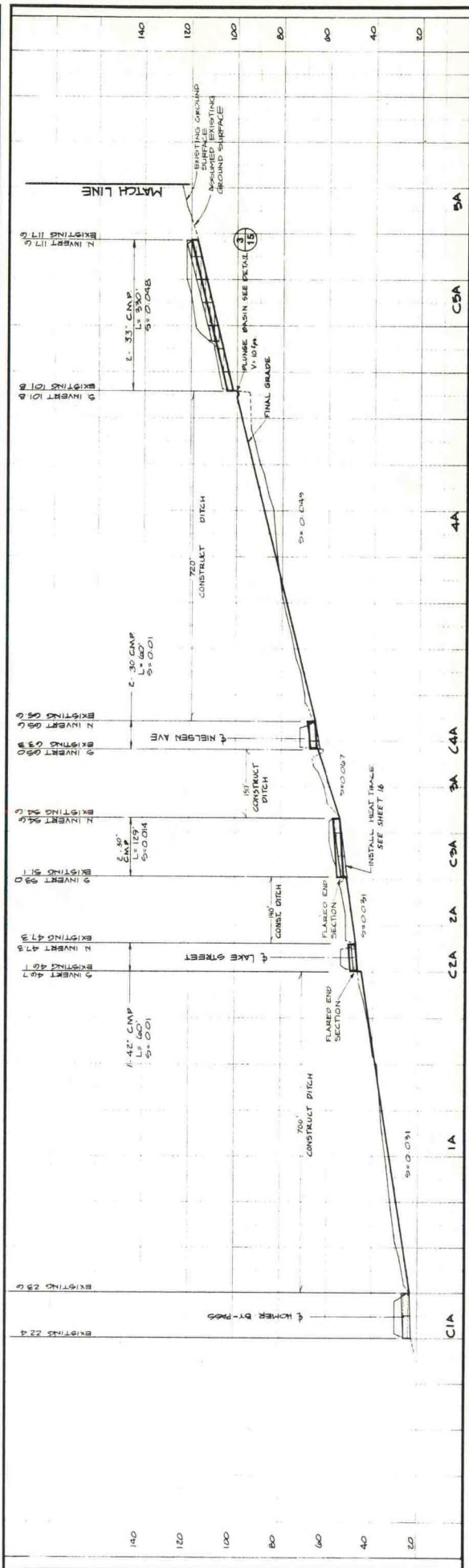
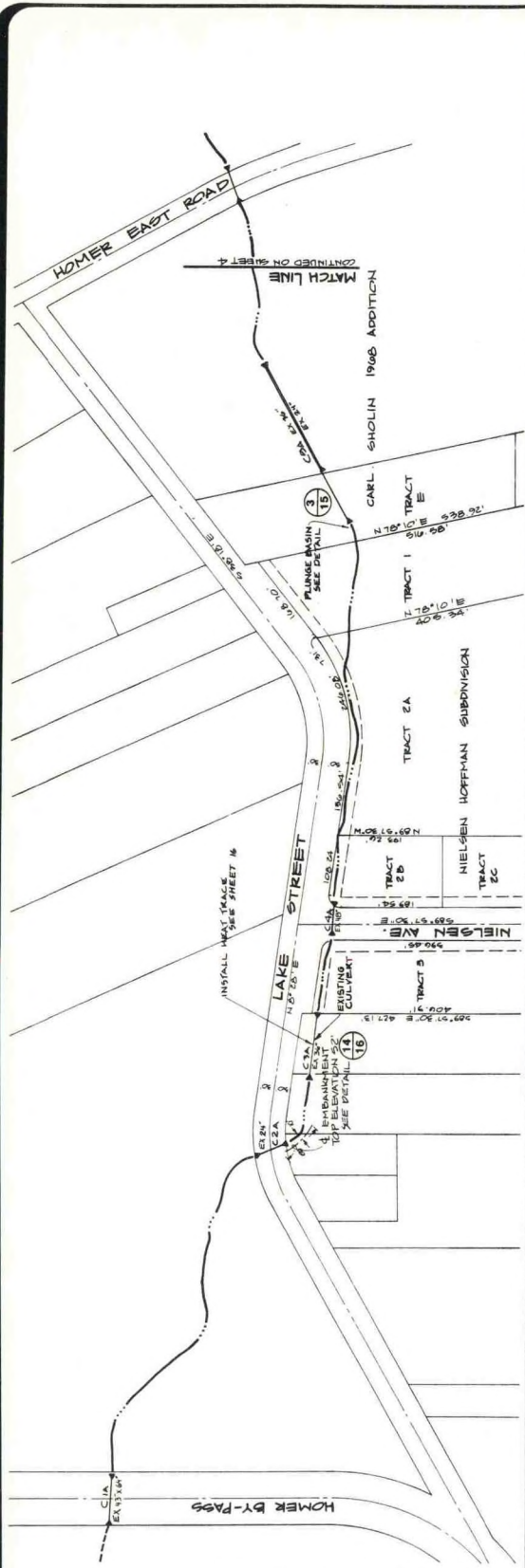
NO.	DATE	REVISIONS



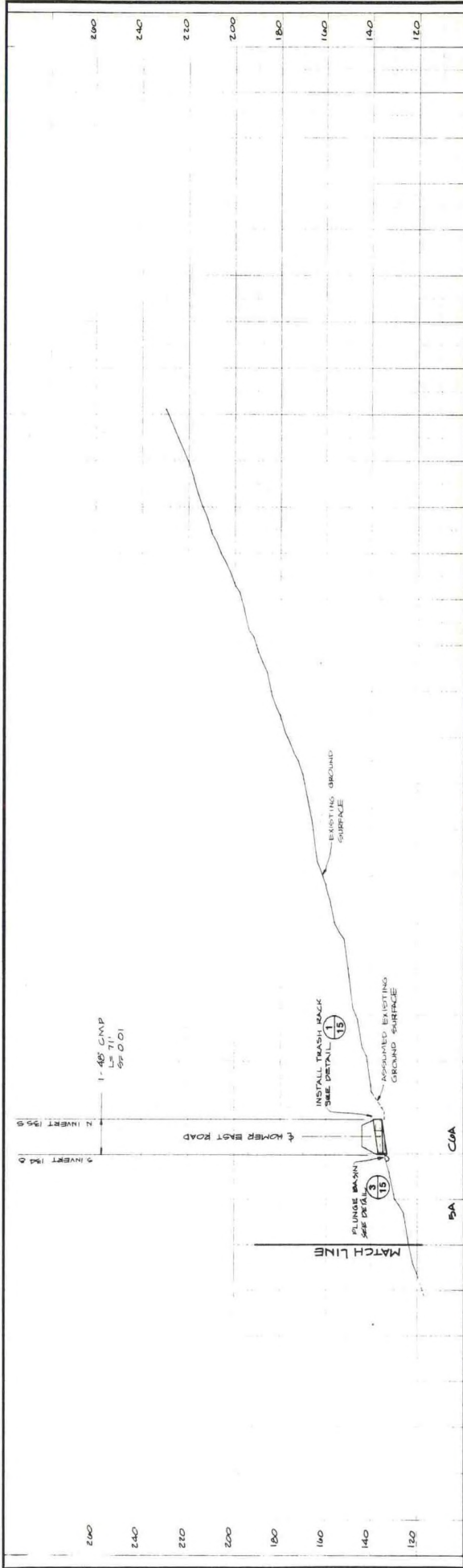
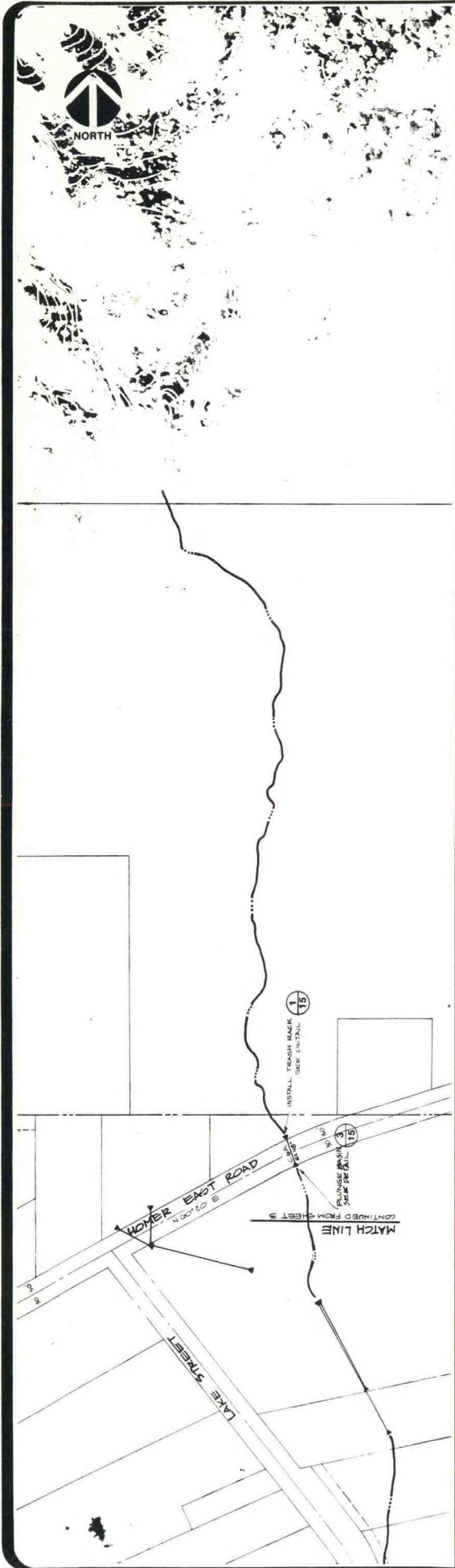


**Notes:**

- 1 TEMPORARY CONSTRUCTION EASEMENT IS 25 FEET BOTH SIDES OF DRAINAGE EASEMENT LIMITS
- 2 DRAINAGE EASEMENT CENTERED ON THE THREAD OF CHANNEL IS 25 FOOT N.O.V. DOWNSTREAM OF NIELSEN AVE



STATUS NO. DATE REVISIONS BY	<b>Homer Drainage Plan</b> <b>DRAINAGE-WAYS</b> <b>CONSTRUCTION PLANS</b>	<b>Drainage-Way "A"</b> <b>PLAN &amp; PROFILE</b>	<b>3</b> SHEET 3 OF 10
DRAWN: [Signature] DESIGNED: [Signature] CHECKED: [Signature]			DATE: 11-4-81 JOB NO.: [Blank] SCALE: 1" = 100' PLAN, 1" = 20' V.



STATUS	DATE PRINTED	BY

NO.	DATE	REVISIONS	BY

DESIGNED	BY	CHECKED	BY

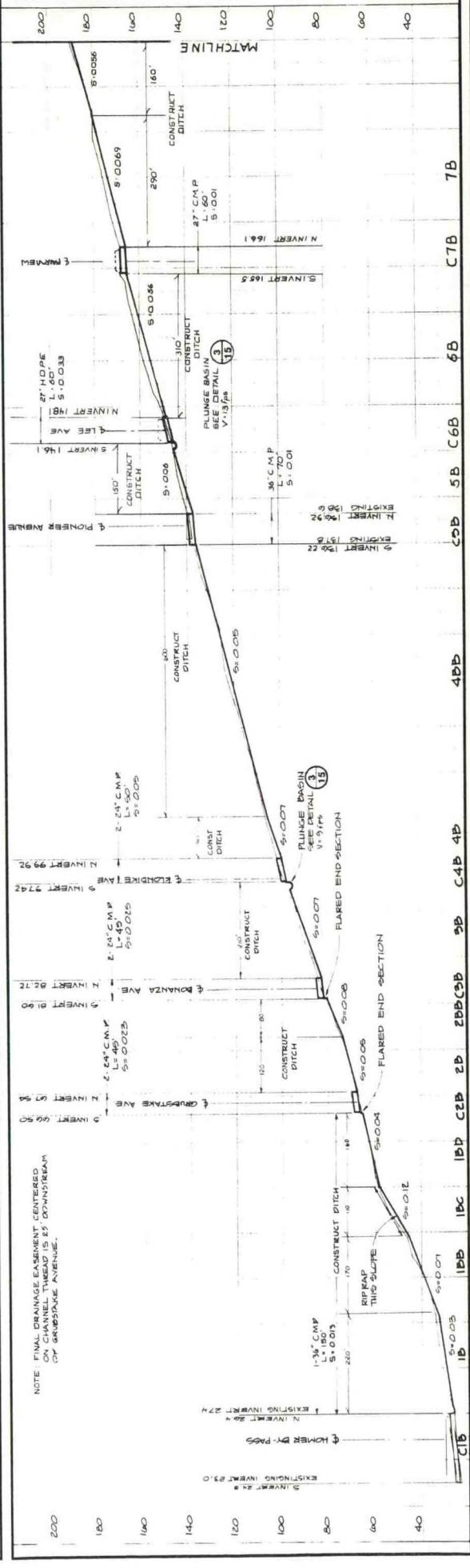
**Homer Drainage Plan**  
**DRAINAGE-WAYS**  
**CONSTRUCTION PLANS**

**QUADRA**  
ENGINEERING, INC.

Drainage-Way "A"  
**PLAN & PROFILE**

DATE 11-4-81  
JOB NO. 1-75  
SCALE 1"=100'-H, 1"=20'-V

**4**  
SHEET 4 OF 16



STATUS	DATE PRINTED	BY
NO.	DATE	REVISIONS

DESIGNED: *[Signature]* CHECKED: *[Signature]*

DRAWN: *[Signature]* DATE: 11-4-81

JOB NO. 1-115 SCALE 1"=100' H. T. COV.

**Drainage-Way "B"**

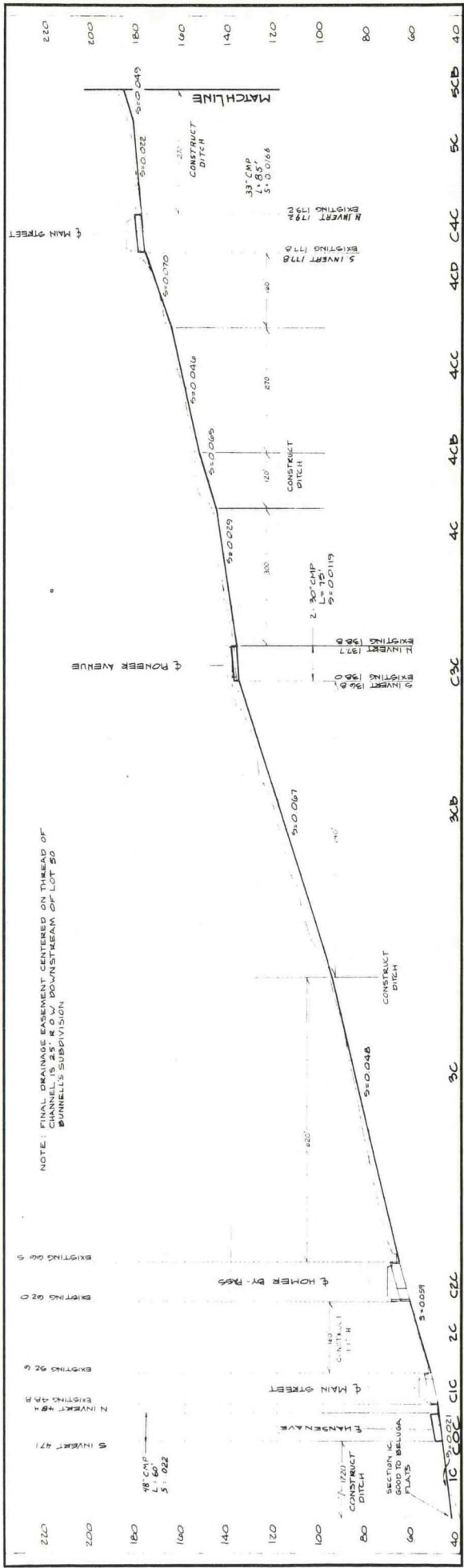
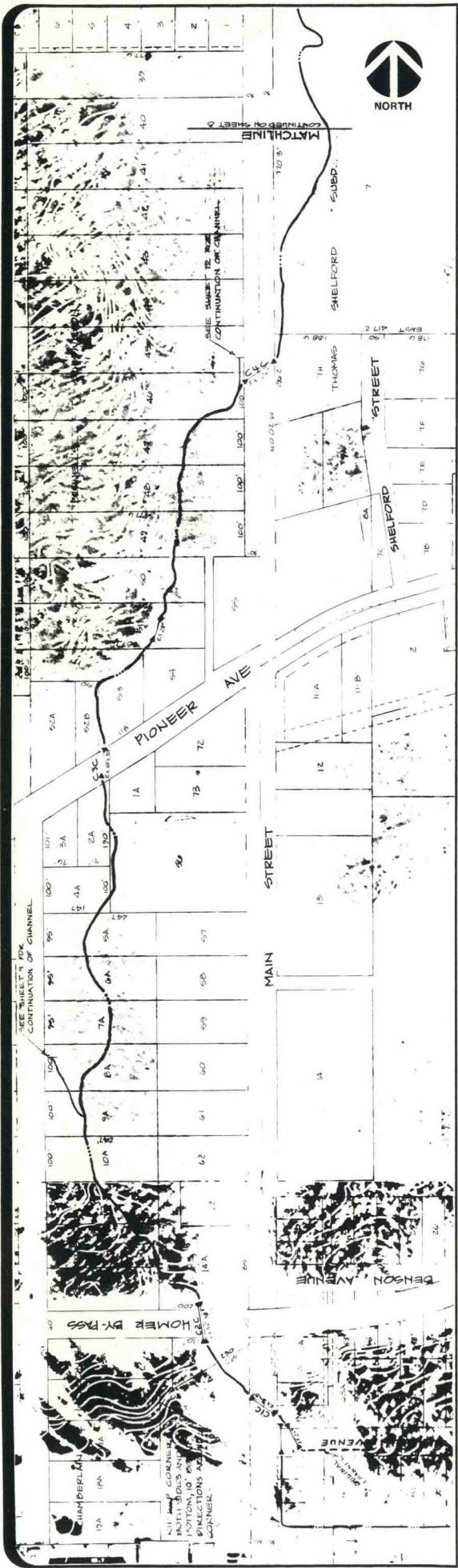
**PLAN & PROFILE**

**5**

SHEET 5 OF 10

**QUADRA**  
ENGINEERING, INC.

Homer Drainage Plan  
DRAINAGE-WAYS  
CONSTRUCTION PLANS



NOTE: FINAL DRAINAGE EASEMENT CENTERED ON THREAD OF DOWNSTREAM CP LOT 50 BUNNELLS SUBDIVISION

STATUS		DATE PRINTED
NO DATE	REVISIONS	BY
DESIGN	DESIGNED	CHECKED
DRAWN	BY	DATE

Homer Drainage Plan  
**DRAINAGE-WAYS**  
**CONSTRUCTION PLANS**

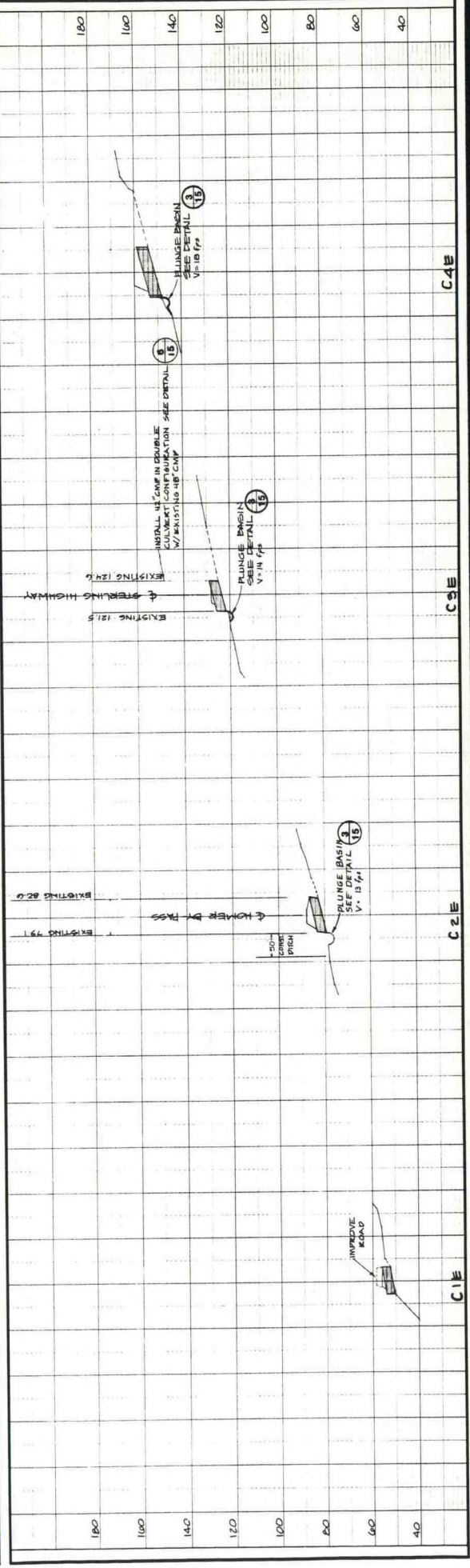
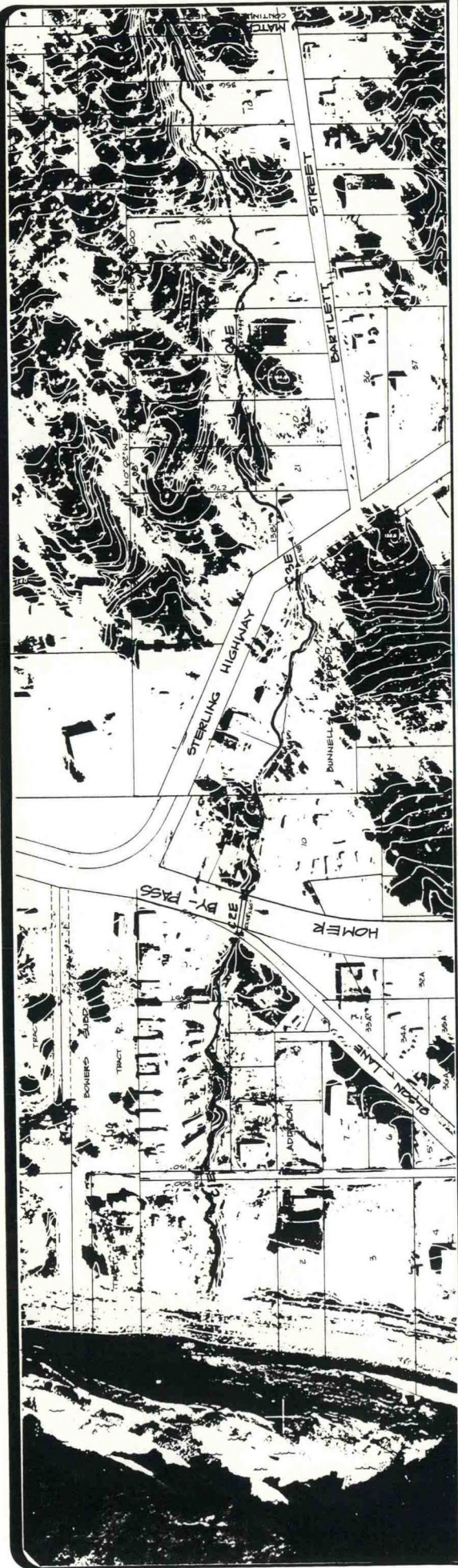
**QUADRA**  
 ENGINEERING, INC.

Drainage-Way "C"  
**PLAN & PROFILE**

SHEET 7 OF 10  
 SCALE 1"=100'-H, 1"=20'V  
 JOB NO. 11-105  
 DATE 11-4-24

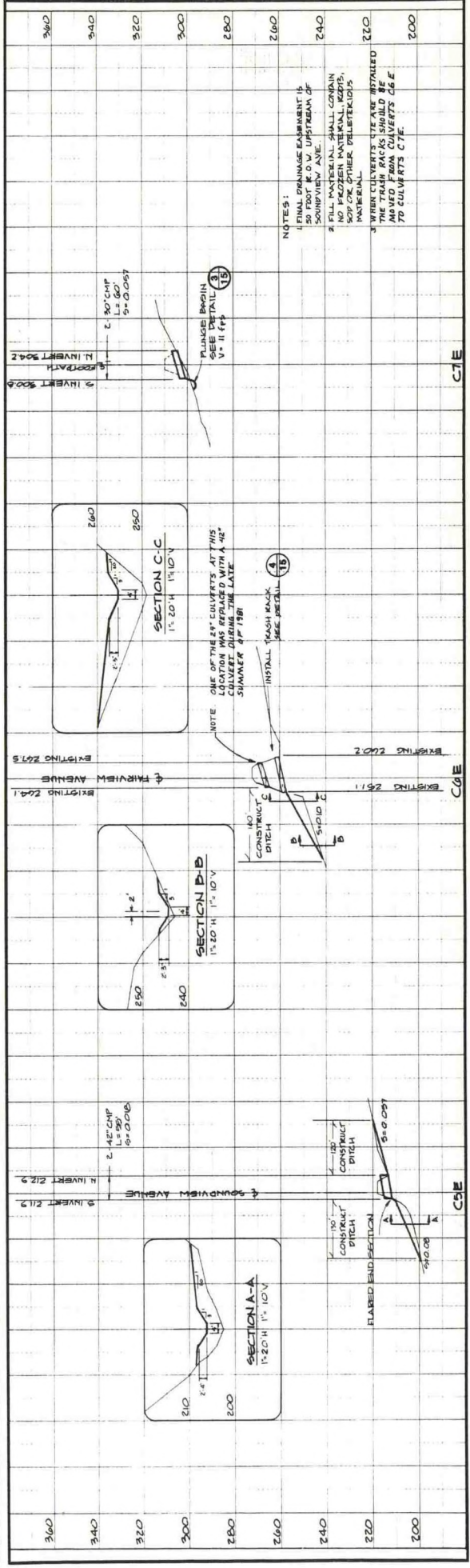
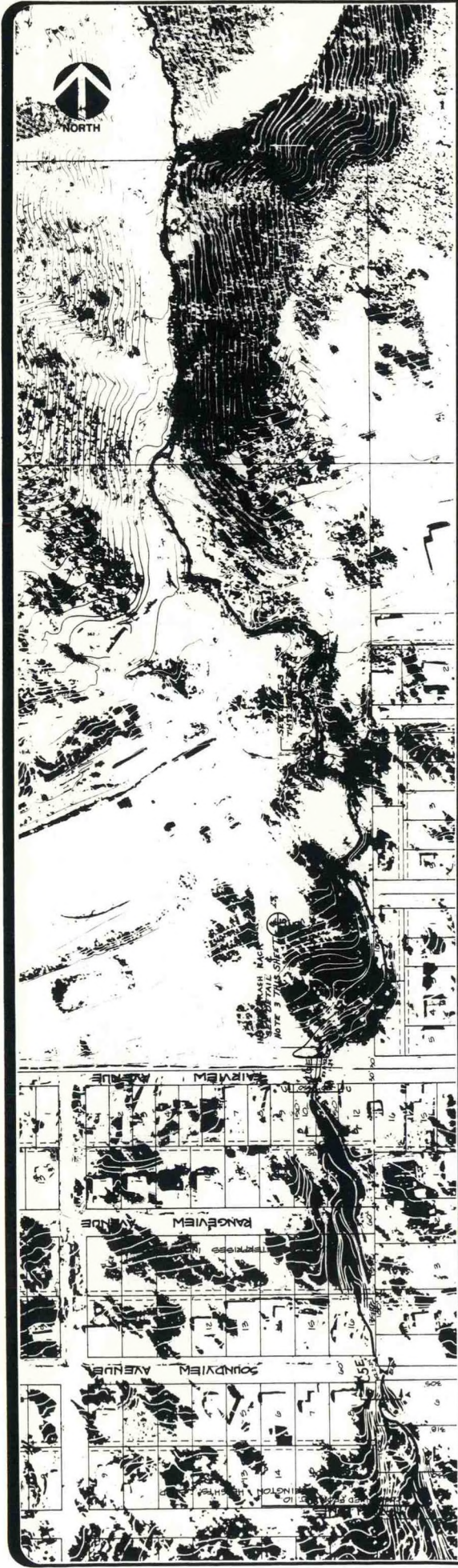






STATUS NO. DATE REVISIONS BY	DATE PRINTED DESIGNED H.C. CHECKED J.P.M. DRAWN	<b>Homer Drainage Plan</b> <b>DRAINAGE-WAYS</b> <b>CONSTRUCTION PLANS</b>	<b>QUADRA</b> ENGINEERING, INC.	<b>Drainage-Way "E"</b> <b>WOODARD CREEK</b> <b>PLAN &amp; PROFILE</b>	<b>10</b> SHEET 10 OF 10
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DATE 11-4-01 JOB NO. 1-152 SCALE 1" = 100' H. - 1" = 20' V.



NOTES:  
 1. FINAL DRAINAGE EMBANKMENT TO BE CONSTRUCTED AT TOP OF SOUNDVIEW AVE. TO TOP OF  
 2. FILL MATERIAL SHALL CONTAIN NO FROZEN MATERIAL, ROOTS, WACKS OR OTHER DEBRIS.  
 3. WHEN CULVERTS ARE INSTALLED THE TRAIL RACKS SHOULD BE MOVED FROM CULVERTS 6&E TO CULVERTS C7E.

**Drainage-Way "E"**  
**WOODARD CREEK**  
**PLAN & PROFILE**

**11**  
 SHEET 11 OF 16

DATE 11-4-01 JOB NO. 1-15 SCALE 1"=100' H., 1"=20' V.

STATUS

NO. DATE REVISIONS BY

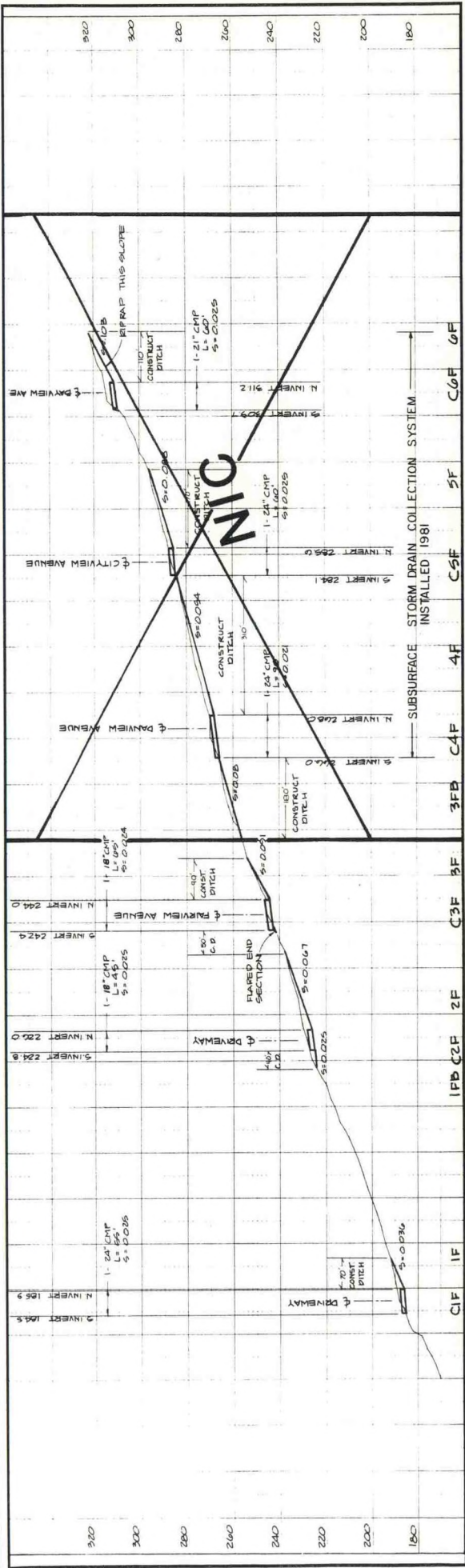
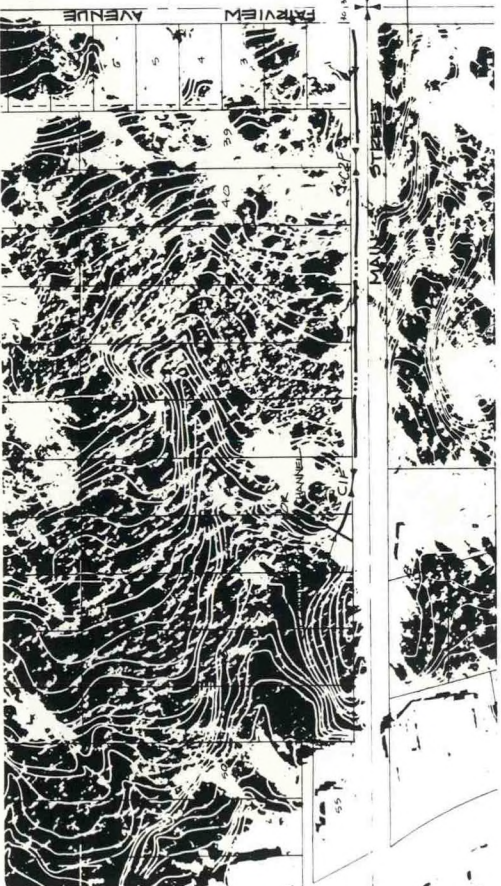
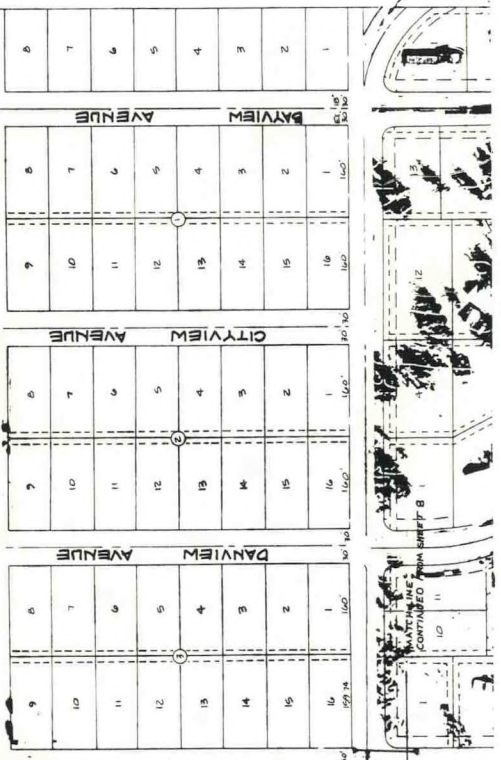
DESIGNED H.C. CHECKED J.P.H.

DRAWN W.R. 9-01

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 ENGINEERING, INC.

Homer Drainage Plan  
 DRAINAGE-WAYS  
 CONSTRUCTION PLANS





12  
SHEET 12 OF 16

Drainage-Way "F"  
**PLAN & PROFILE**

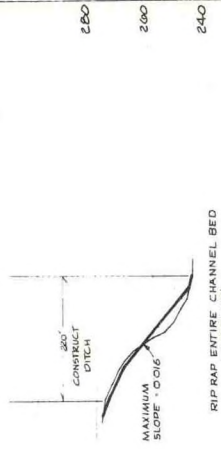
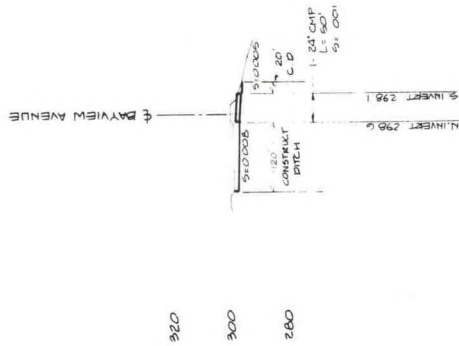
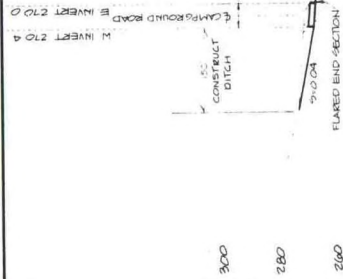
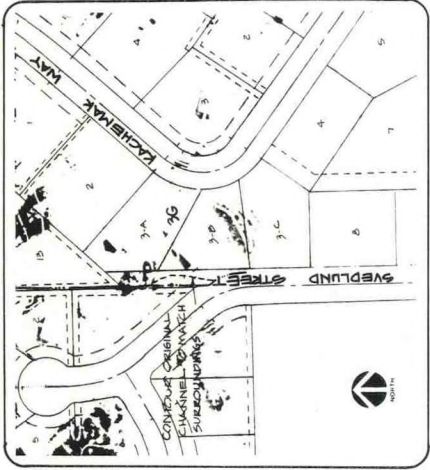
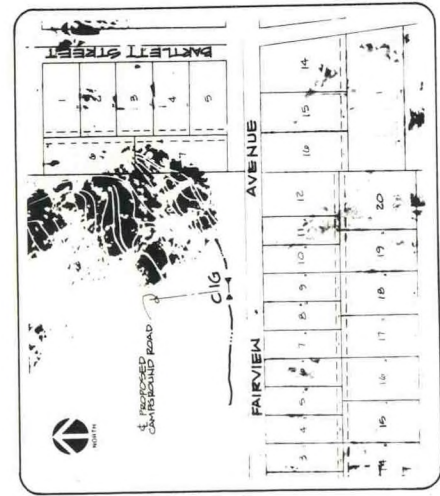


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Homer Drainage Plan  
**DRAINAGE-WAYS  
CONSTRUCTION PLANS**

STATUS	DATE PRINTED	DESIGNED	INCH	CHECKED	DATE
NO. DATE	REVISIONS		BY		

DATE 11-2-81 JOB NO. 1-15 SCALE 1"=100' H 1"=20' V



16 CIG

26 C26

CHANNEL 36

STATUS	DATE PRINTED	BY

Homer Drainage Plan  
DRAINAGE-WAYS  
CONSTRUCTION PLANS

DESIGNED BY: [Signature]  
DRAWN BY: [Signature]  
CHECKED BY: [Signature]

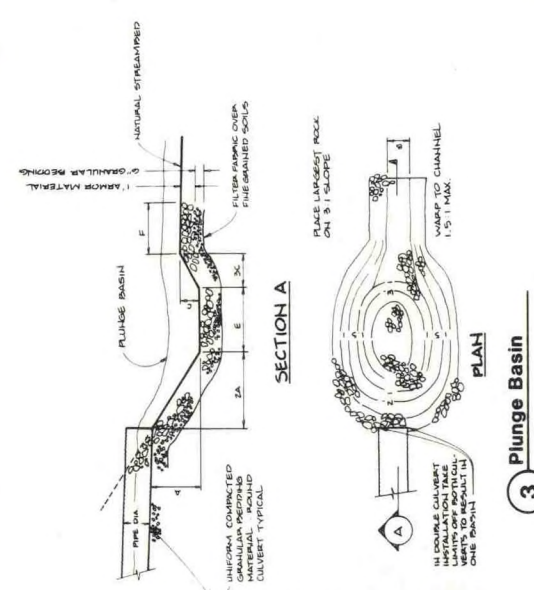


**QUADRA**  
ENGINEERING, INC.

Drainage-Way "G"  
**PLAN & PROFILE**

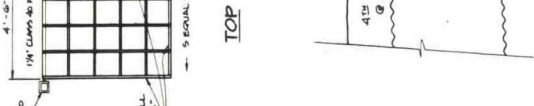
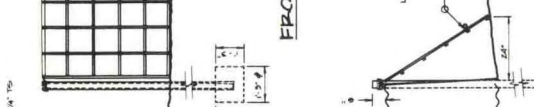
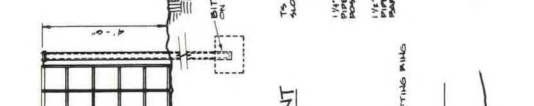
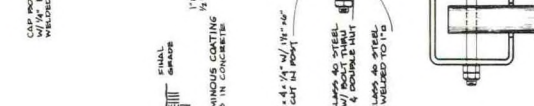
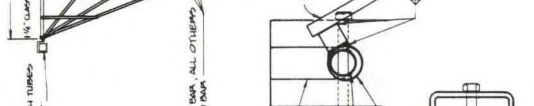
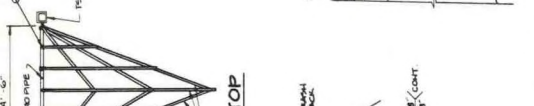
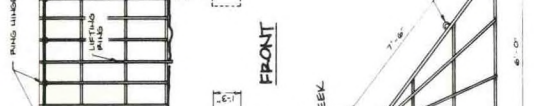
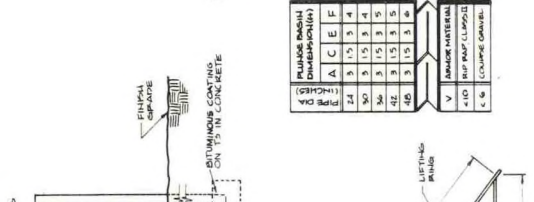
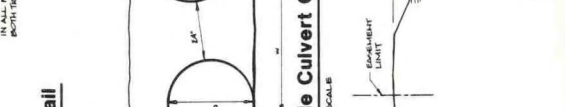
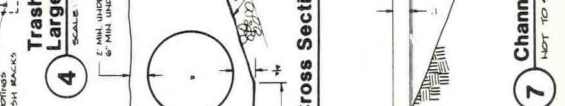
DATE: 11-4-81  
JOB No. 1-145  
SCALE: 1" = 100' V, 1" = 20' H





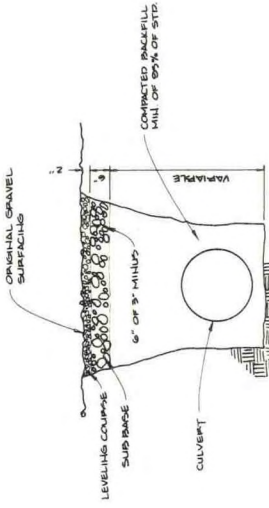
### Channel Schedule

I.D.	SLOPE	MIN. DIPT	I.D.	SLOPE	MIN. DIPT
1A	0.030	4'-0"	2'-0"	0.030	2'-0"
2A	0.031	3'-0"	2'-0"	0.031	2'-0"
3A	0.032	3'-0"	2'-0"	0.032	2'-0"
4A	0.033	3'-0"	2'-0"	0.033	2'-0"
5A	0.034	3'-0"	2'-0"	0.034	2'-0"
6A	0.035	3'-0"	2'-0"	0.035	2'-0"
7A	0.036	3'-0"	2'-0"	0.036	2'-0"
8A	0.037	3'-0"	2'-0"	0.037	2'-0"
9A	0.038	3'-0"	2'-0"	0.038	2'-0"
10A	0.039	3'-0"	2'-0"	0.039	2'-0"
11A	0.040	3'-0"	2'-0"	0.040	2'-0"
12A	0.041	3'-0"	2'-0"	0.041	2'-0"
13A	0.042	3'-0"	2'-0"	0.042	2'-0"
14A	0.043	3'-0"	2'-0"	0.043	2'-0"
15A	0.044	3'-0"	2'-0"	0.044	2'-0"
16A	0.045	3'-0"	2'-0"	0.045	2'-0"
17A	0.046	3'-0"	2'-0"	0.046	2'-0"
18A	0.047	3'-0"	2'-0"	0.047	2'-0"
19A	0.048	3'-0"	2'-0"	0.048	2'-0"
20A	0.049	3'-0"	2'-0"	0.049	2'-0"
21A	0.050	3'-0"	2'-0"	0.050	2'-0"
22A	0.051	3'-0"	2'-0"	0.051	2'-0"
23A	0.052	3'-0"	2'-0"	0.052	2'-0"
24A	0.053	3'-0"	2'-0"	0.053	2'-0"
25A	0.054	3'-0"	2'-0"	0.054	2'-0"
26A	0.055	3'-0"	2'-0"	0.055	2'-0"
27A	0.056	3'-0"	2'-0"	0.056	2'-0"
28A	0.057	3'-0"	2'-0"	0.057	2'-0"
29A	0.058	3'-0"	2'-0"	0.058	2'-0"
30A	0.059	3'-0"	2'-0"	0.059	2'-0"
31A	0.060	3'-0"	2'-0"	0.060	2'-0"
32A	0.061	3'-0"	2'-0"	0.061	2'-0"
33A	0.062	3'-0"	2'-0"	0.062	2'-0"
34A	0.063	3'-0"	2'-0"	0.063	2'-0"
35A	0.064	3'-0"	2'-0"	0.064	2'-0"
36A	0.065	3'-0"	2'-0"	0.065	2'-0"
37A	0.066	3'-0"	2'-0"	0.066	2'-0"
38A	0.067	3'-0"	2'-0"	0.067	2'-0"
39A	0.068	3'-0"	2'-0"	0.068	2'-0"
40A	0.069	3'-0"	2'-0"	0.069	2'-0"
41A	0.070	3'-0"	2'-0"	0.070	2'-0"
42A	0.071	3'-0"	2'-0"	0.071	2'-0"
43A	0.072	3'-0"	2'-0"	0.072	2'-0"
44A	0.073	3'-0"	2'-0"	0.073	2'-0"
45A	0.074	3'-0"	2'-0"	0.074	2'-0"
46A	0.075	3'-0"	2'-0"	0.075	2'-0"
47A	0.076	3'-0"	2'-0"	0.076	2'-0"
48A	0.077	3'-0"	2'-0"	0.077	2'-0"
49A	0.078	3'-0"	2'-0"	0.078	2'-0"
50A	0.079	3'-0"	2'-0"	0.079	2'-0"
51A	0.080	3'-0"	2'-0"	0.080	2'-0"
52A	0.081	3'-0"	2'-0"	0.081	2'-0"
53A	0.082	3'-0"	2'-0"	0.082	2'-0"
54A	0.083	3'-0"	2'-0"	0.083	2'-0"
55A	0.084	3'-0"	2'-0"	0.084	2'-0"
56A	0.085	3'-0"	2'-0"	0.085	2'-0"
57A	0.086	3'-0"	2'-0"	0.086	2'-0"
58A	0.087	3'-0"	2'-0"	0.087	2'-0"
59A	0.088	3'-0"	2'-0"	0.088	2'-0"
60A	0.089	3'-0"	2'-0"	0.089	2'-0"
61A	0.090	3'-0"	2'-0"	0.090	2'-0"
62A	0.091	3'-0"	2'-0"	0.091	2'-0"
63A	0.092	3'-0"	2'-0"	0.092	2'-0"
64A	0.093	3'-0"	2'-0"	0.093	2'-0"
65A	0.094	3'-0"	2'-0"	0.094	2'-0"
66A	0.095	3'-0"	2'-0"	0.095	2'-0"
67A	0.096	3'-0"	2'-0"	0.096	2'-0"
68A	0.097	3'-0"	2'-0"	0.097	2'-0"
69A	0.098	3'-0"	2'-0"	0.098	2'-0"
70A	0.099	3'-0"	2'-0"	0.099	2'-0"
71A	0.100	3'-0"	2'-0"	0.100	2'-0"
72A	0.101	3'-0"	2'-0"	0.101	2'-0"
73A	0.102	3'-0"	2'-0"	0.102	2'-0"
74A	0.103	3'-0"	2'-0"	0.103	2'-0"
75A	0.104	3'-0"	2'-0"	0.104	2'-0"
76A	0.105	3'-0"	2'-0"	0.105	2'-0"
77A	0.106	3'-0"	2'-0"	0.106	2'-0"
78A	0.107	3'-0"	2'-0"	0.107	2'-0"
79A	0.108	3'-0"	2'-0"	0.108	2'-0"
80A	0.109	3'-0"	2'-0"	0.109	2'-0"
81A	0.110	3'-0"	2'-0"	0.110	2'-0"
82A	0.111	3'-0"	2'-0"	0.111	2'-0"
83A	0.112	3'-0"	2'-0"	0.112	2'-0"
84A	0.113	3'-0"	2'-0"	0.113	2'-0"
85A	0.114	3'-0"	2'-0"	0.114	2'-0"
86A	0.115	3'-0"	2'-0"	0.115	2'-0"
87A	0.116	3'-0"	2'-0"	0.116	2'-0"
88A	0.117	3'-0"	2'-0"	0.117	2'-0"
89A	0.118	3'-0"	2'-0"	0.118	2'-0"
90A	0.119	3'-0"	2'-0"	0.119	2'-0"
91A	0.120	3'-0"	2'-0"	0.120	2'-0"
92A	0.121	3'-0"	2'-0"	0.121	2'-0"
93A	0.122	3'-0"	2'-0"	0.122	2'-0"
94A	0.123	3'-0"	2'-0"	0.123	2'-0"
95A	0.124	3'-0"	2'-0"	0.124	2'-0"
96A	0.125	3'-0"	2'-0"	0.125	2'-0"
97A	0.126	3'-0"	2'-0"	0.126	2'-0"
98A	0.127	3'-0"	2'-0"	0.127	2'-0"
99A	0.128	3'-0"	2'-0"	0.128	2'-0"
100A	0.129	3'-0"	2'-0"	0.129	2'-0"

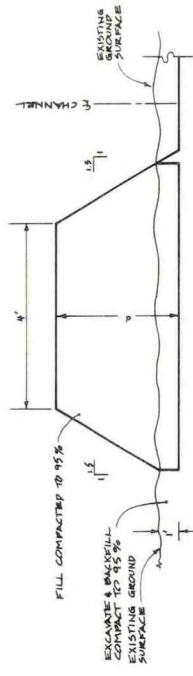


STATUS	DATE PRINTED
NO. DATE	REVISIONS
BY	

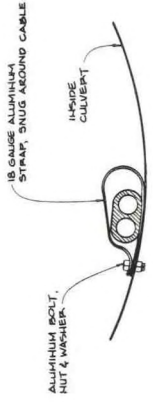
11-800-888-8888



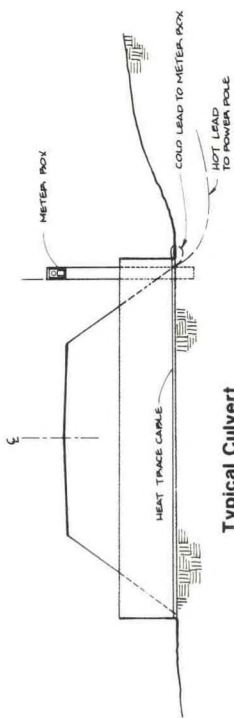
**10** Resurfacing Detail - Typical Gravel Section



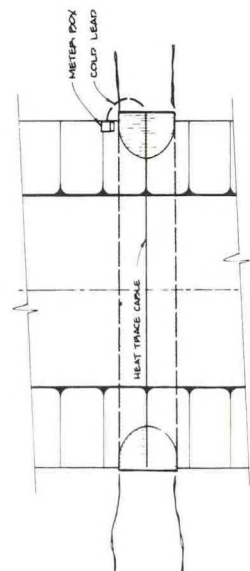
**14** Typical Embankment Cross Section  
N.T.S.



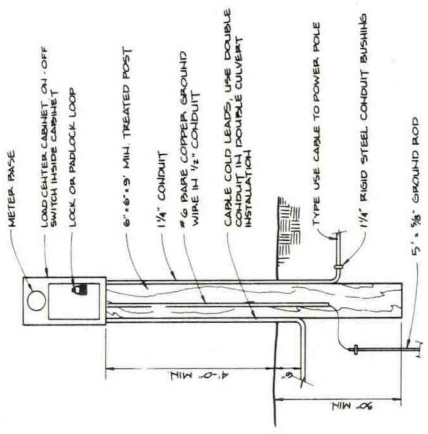
**9** Heat Trace Connection



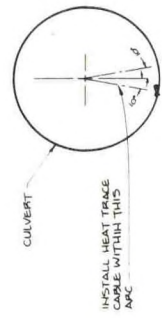
**8** Typical Culvert Cross Section  
NOT TO SCALE



**11** Typical Culvert Plan View



**13** Meter Box Detail



**12** Heat Trace Location

STATUS	DATE PRINTED	BY
NO. DATE	REVISIONS	BY

Homer Drainage Plan  
**DRAINAGE-WAYS**  
CONSTRUCTION PLANS

DESIGNED BY: GRANN D. A. H.  
CHECKED BY: J.C.H.



**MISCELLANEOUS DETAILS**

DATE: 11-4-81  
JOB NO.: 1-17  
SCALE: NOT TO SCALE