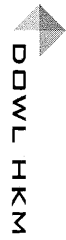




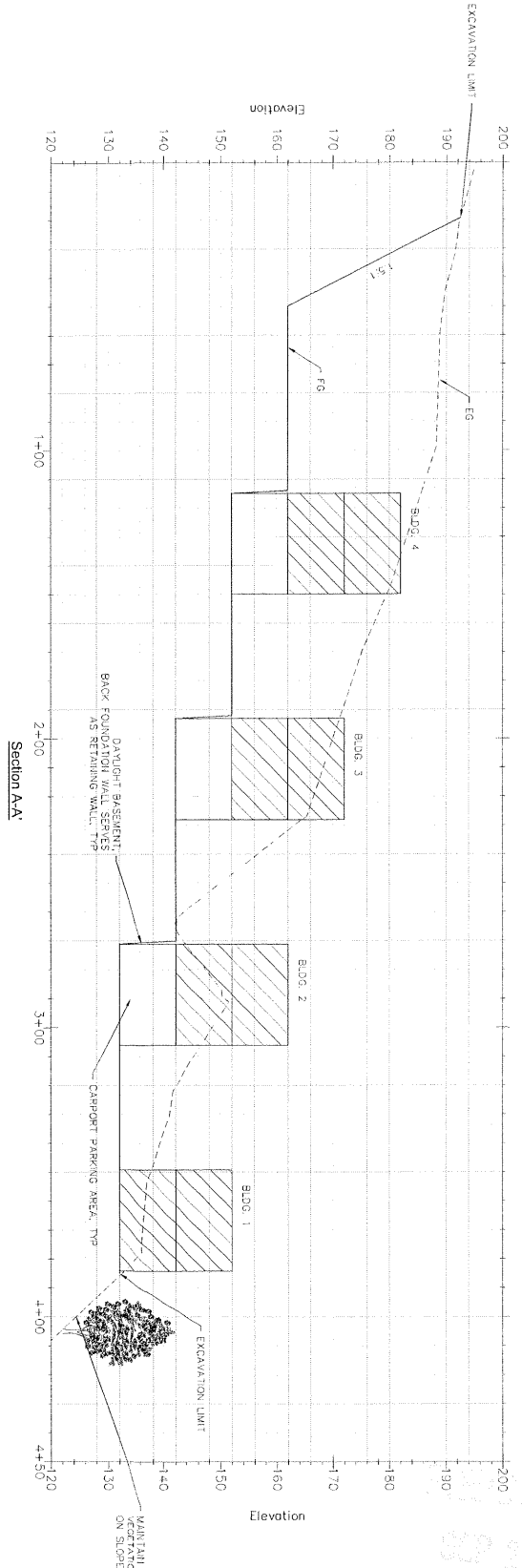
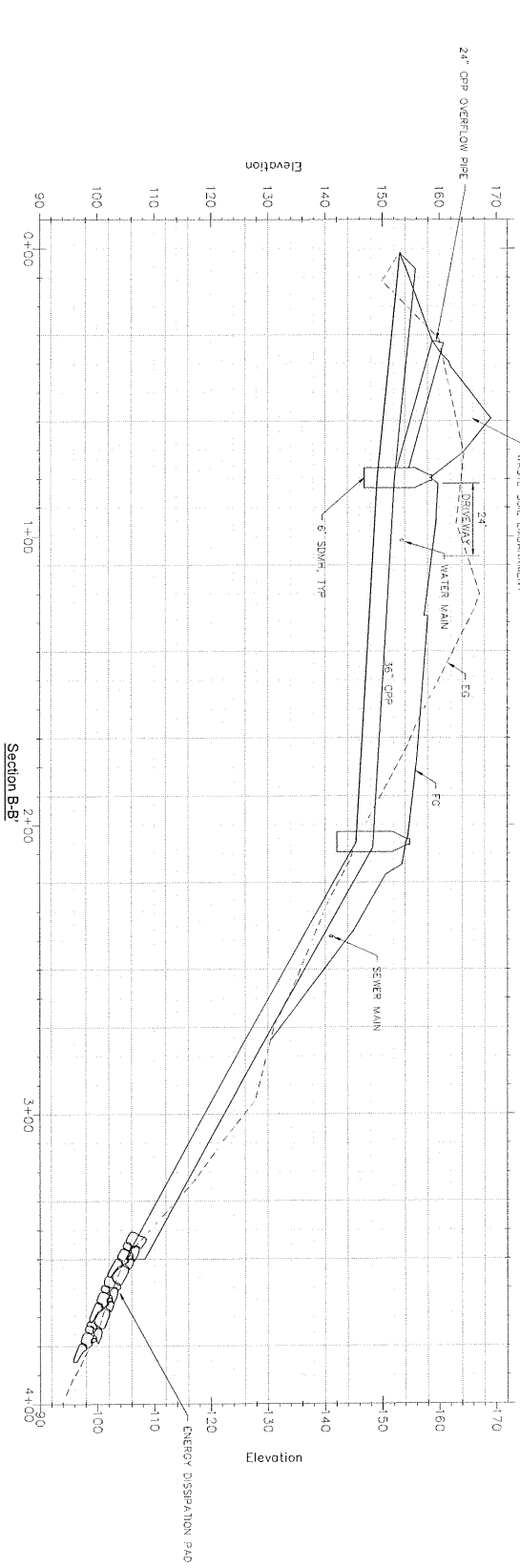
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 DRAWN BY: STAFF
 CHECKED BY: STAFF
 DATE: AUG 2013



JVOA - JUNEAU 1 HOUSING
 HILLSIDE ENDORSEMENT
 PERMIT SET

DEVELOPMENT CROSS-SECTIONS

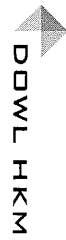
SHEET NO.
 C7.0
 of
 16



0000000000000000



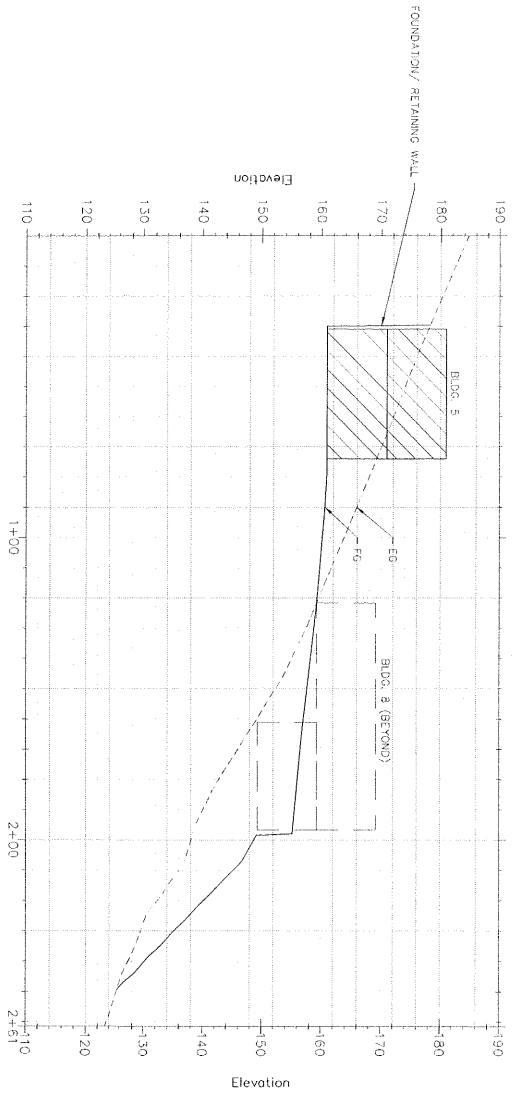
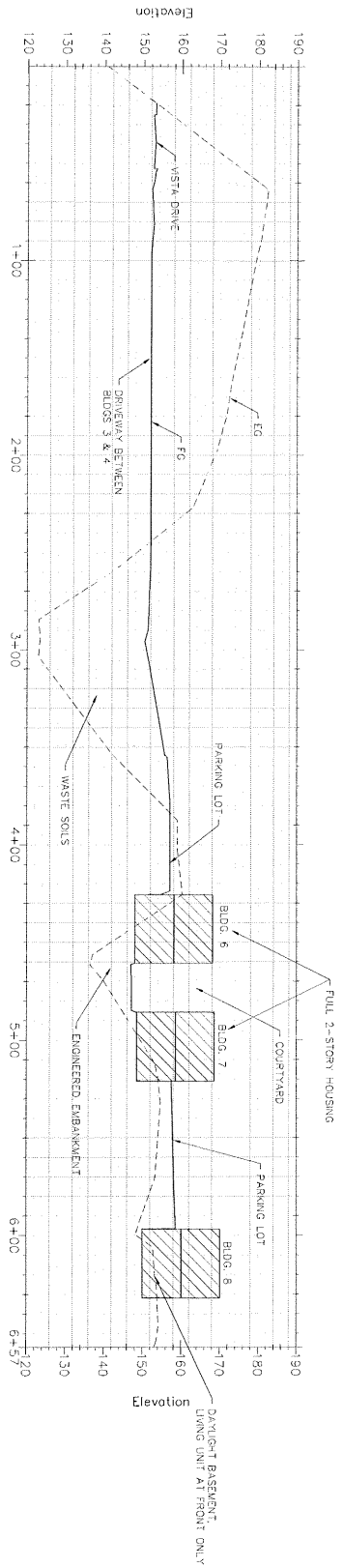
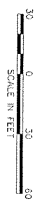
JOB NO. J0584 DRAWN BY: STAFF CHECKED BY: STAFF DATE: AUG 2013



JVOA - JUNEAU 1 HOUSING
 HILLSIDE ENDORSEMENT
 PERMIT SET

DEVELOPMENT CROSS-SECTIONS

SHEET NO.
 C7.1
 of
 16



NOTE:
 SEE FINAL SITE PLAN
 FOR SECTION LOCATIONS

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 AUG 27 2013
 JVOA



DESIGN BY: STAFF | CHECKED BY: STAFF | DATE: AUG 2013



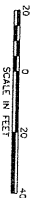
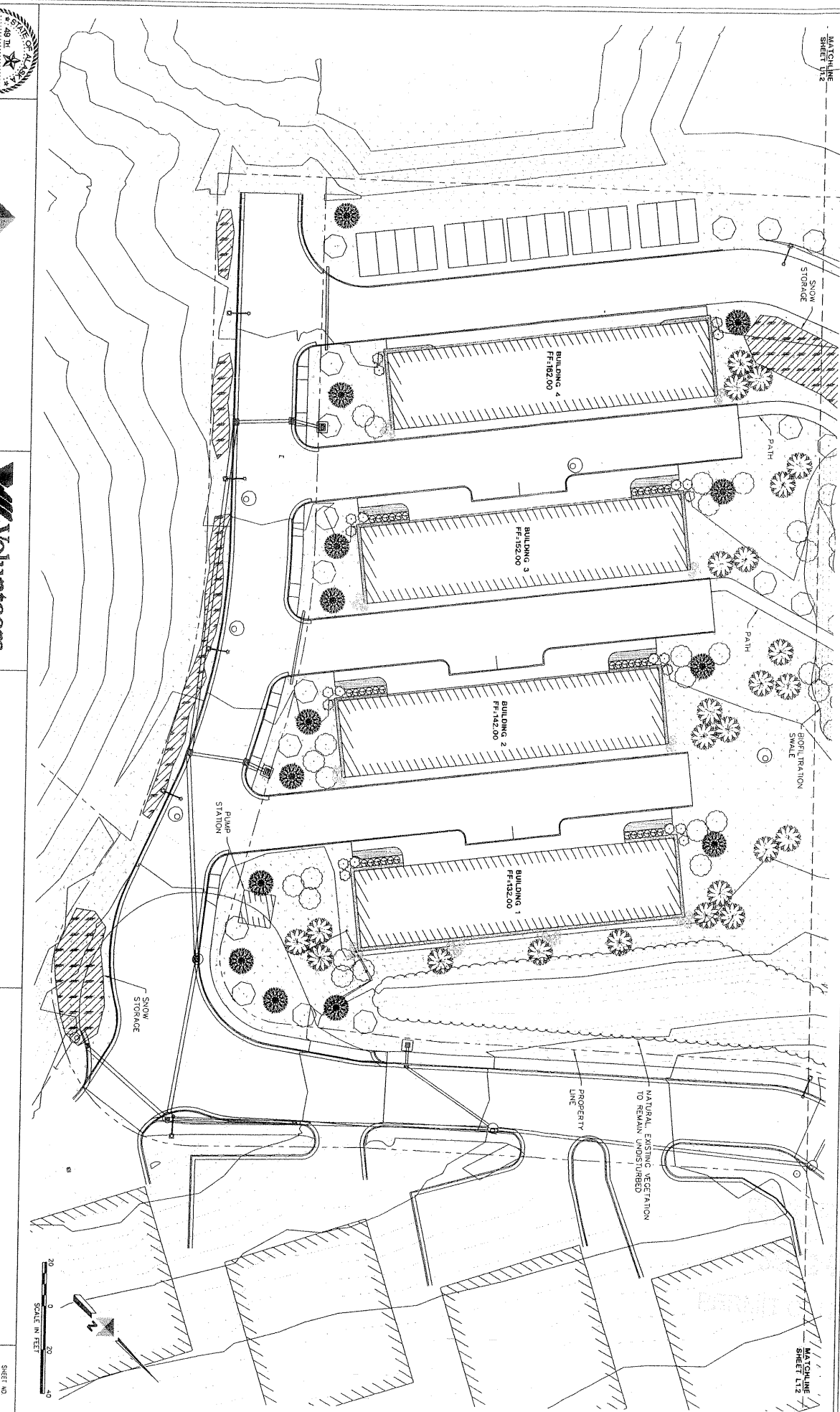
DOWL HKM



**JVOA - JUNEAU I HOUSING
HILLSIDE ENDORSEMENT
PERMIT SET**

**LANDSCAPING PLAN
(1 OF 2)**

L1.1





JOB NO. J1234 DRAWN BY: STAFF REVISIONS BY: GJ CHECKED BY: STAFF DATE: AUG 2013

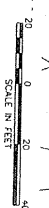
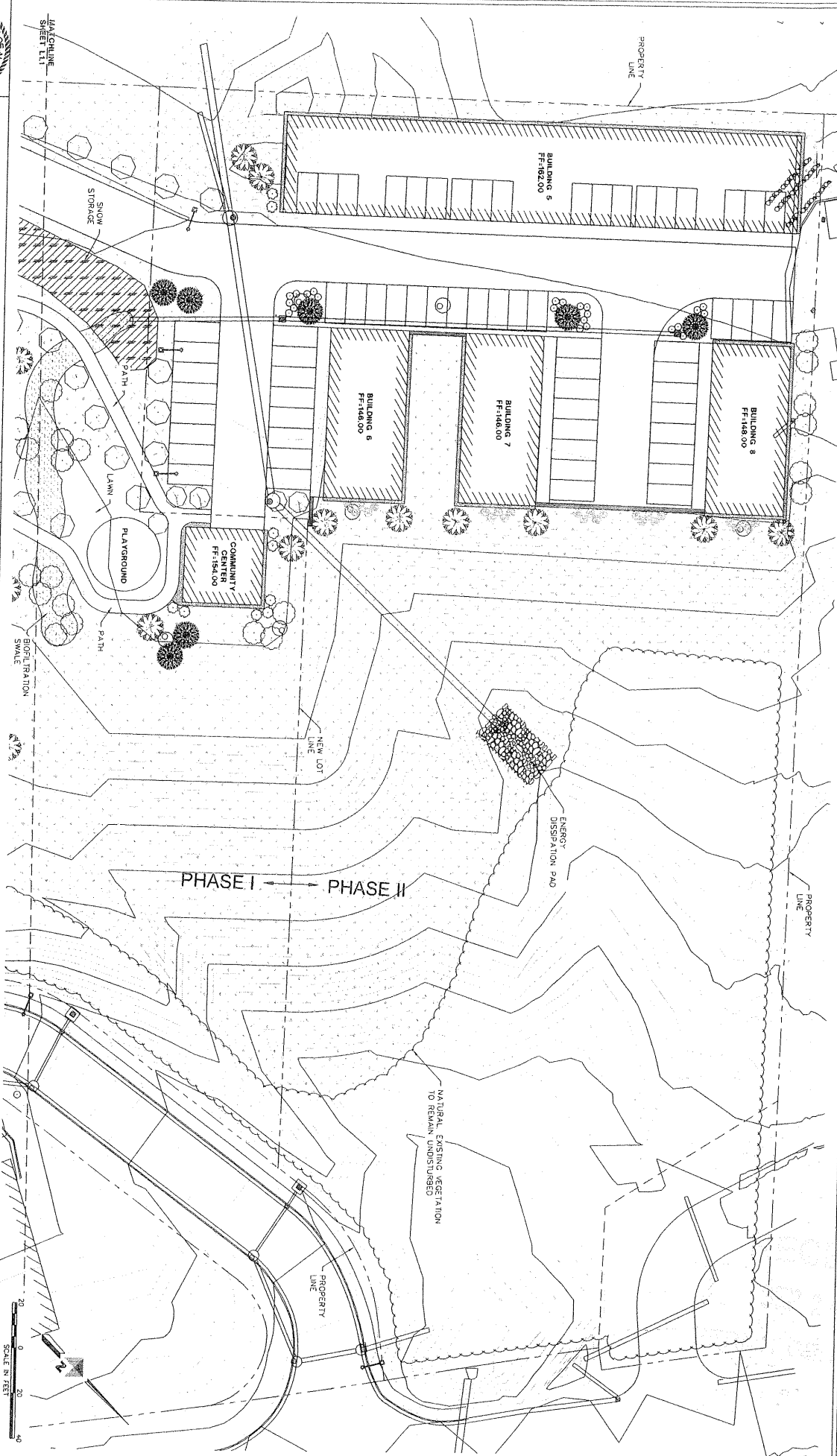
DOWL HKM



**JVOA - JUNEAU I HOUSING
HILLSIDE ENDORSEMENT
PERMIT SET**

**LANDSCAPING PLAN
(2 OF 2)**

SHEET NO
L1.2



05/08/2013 10:54:00



JOB NO. J10551 DRAWN BY: STAFF DESIGNED BY: GJL CHECKED BY: STAFF DATE: AUG 2013

DOWL HKM



JVOA - JUNEAU I HOUSING HILLSIDE ENDORSEMENT PERMIT SET

LANDSCAPING DETAILS

SHEET NO. **L2.1**

PLANT SCHEDULE

SYMBOL	KEY	QUANTITY	COMMON NAME	BOTANICAL NAME	SIZE	NOTES
DECIDUOUS TREES						
	BP	31	WHITE PAPER BIRCH	BETULA PAPERIFERA	2" CAL.	CONT.
	MP	5	PINK SPIRES CHABAPPLE	MALUS 'PINK SPIRES'	2" CAL.	BBB
	PT	41	QUAKING ASPEN	POPULUS TREMULOIDES	2" CAL.	CONT.
EVERGREEN TREES						
	CN	21	ALASKA YELLOW CEDAR	CUPRESSUS NOOTMANENSIS	6" HT.	B & B
	AL	34	SUBALPINE FIR	ABIES LASIOCARPA	6" HT.	B & B
SHRUBS						
	RR	50	RAMADO RHODODENDRON	RHODODENDRON RAMARO	12" HT.	#5 CONT.
	RC	6	BOURGEAULT RHODODENDRON	RHODODENDRON 'BOURGEAULT'	18" HT.	#5 CONT.
	SP	52	MISS KIM LILAC	SPRING PRUNELLA MISS KIM	18" HT.	#2 CONT.
	SS	23	FALSE SPIREA	SORBARIA SORBIFOLIA	18" HT.	#2 CONT.
GRASSES, FERNS AND PERENNIALS						
			CALLUN'S GIANT BUDSWEED	CALLUNA VERTICILLATA		QUARTS
			CALLUN'S GIANT	CALLUNA VERTICILLATA		QUARTS
			BLUE JOINT REEDGRASS	CAULAGRASSIS CAUDICENSIS		3.1BS PER 1000 S.F.
			NATIVE GRASS SEED MIX			3.1BS PER 1000 S.F.
MISC.						
			ROCK MULCH			SEE NOTES
			SNOW STORAGE AREA			SEE NOTES

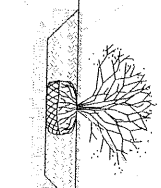
VEGETATION SURVIVAL

LOT SIZE: 12,100 S.F.
 NATURAL VEG: 18,600 S.F.
 NEW LANDSCAPING: 47,354 S.F.
 % VEGETATION: 49%

3 SHRUB PLANTING

L2.1 NTS

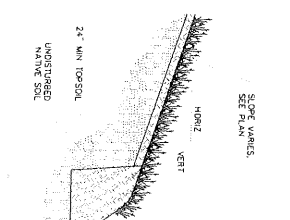
3" DEPTH MULCH THROUGHOUT
 BED TYPE AS SHOWN ON
 PLAN. MULCH SHALL BE
 1" AWAY FROM MAIN STEM



3" UN TROPICAL SANDFILL
 THROUGHOUT PLANTING BEDS
 UNDISTURBED NATIVE SOIL
 OR COMPACTED SUBGRADE

4 SLOPE PLANTING

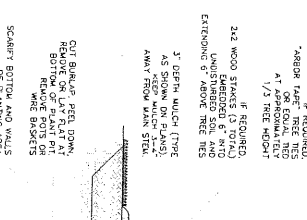
L2.1 NTS



24" UN TROPICAL SANDFILL
 THROUGHOUT PLANTING BEDS
 UNDISTURBED NATIVE SOIL
 OR COMPACTED SUBGRADE

1 DECIDUOUS TREE PLANTING

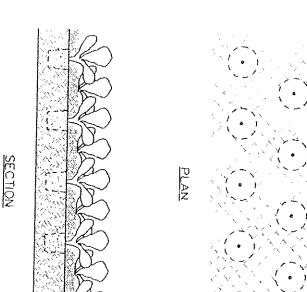
L2.1 NTS



24" UN TROPICAL SANDFILL THROUGHOUT PLANTING BEDS
 UNDISTURBED NATIVE SOIL OR COMPACTED SUBGRADE

2 GROUND COVER PLANTING

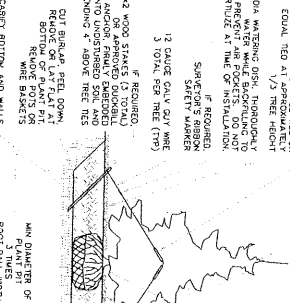
L2.1 NTS



2" DEPTH MULCH
 6" DEPTH TROPICAL SANDFILL

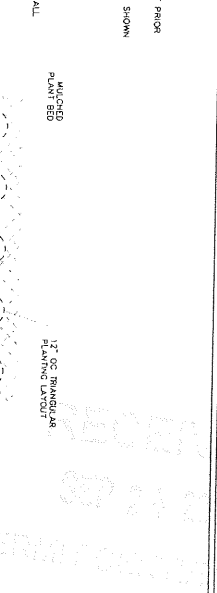
5 EVERGREEN TREE PLANTING

L2.1 NTS



24" UN TROPICAL SANDFILL THROUGHOUT PLANTING BEDS
 UNDISTURBED NATIVE SOIL OR COMPACTED SUBGRADE

- LANDSCAPE NOTES**
- ALL PLANT MATERIAL SHALL CONFORM TO AMERICAN STANDARD FOR NURSERY STOCK, ANSI Z601.1-2004.
 - CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT ABOUT SITE CONDITIONS THAT REQUIRE MODIFICATION OF PLANT LAYOUT PRIOR TO INSTALLATION OF ANY PLANT MATERIAL.
 - ALL SURFACE DISTURBANCE RELATED TO THIS PROJECT SHALL BE RESTORED WITH 4" TOPSOIL AND SPECIFIED SEED MIX AS SHOWN IN LANDSCAPE PLAN. SEE SPECIFICATIONS FOR SEED MIX.
 - ALL PLANTING SHALL RECEIVE SHREDDER BARK MULCH OR ROCK MULCH AS SHOWN ON THE PLANS. BARK MULCH SHALL CONSIST OF SHREDDER BARK AND WOOD CHIPS AND NOT ACCEPTABLE. ROCK MULCH SHALL BE 3" RIVER CORAL.
 - CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ALL VEGETATION DURING CONSTRUCTION OPERATIONS.



APPENDIX B:
ENGINEERING GEOLOGIC REPORTS
(By R&M Engineering)

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SEP 24 2003
PROPERTY CONTROL



R&M ENGINEERING, INC.

6225 GLACIER HWY

PO BOX 34276

JUNEAU, ALASKA 99803

PHONE 907 780 4380
FAX 907 780 4277

ENGINEERS
GEOLOGISTS
SURVEYORS

October 12, 1995

A. Terry Brenner, P.E., L.S.
CBJ Engineering Department
City and Borough of Juneau
155 S. Seward St.
Juneau, Alaska 99801

COPY

Re: Geologic Assessment
Gastineau Vista Park Development
R&M Project No. 951165

Dear Terry:

The Emerald Development Gastineau Vista Park site was geotechnically investigated to assess the project geologic factors. A Caterpillar excavator was used to dig 13 pre-construction test pits to determine the nature and distribution of existing soils (see attached civil engineering plan sheets No. 3 & 9). The site was revisited on October 11, 1995 to observe the access road cut, further checking the nature and distribution of in-situ soils.

The site is a modest sloping bench bounded on both sides by steep sided stream valleys. The bench is glacial till, deposited by the glacier that carved the Gastineau Channel fiord. The uphill sand and gravel are probable mountain stream fan deposits layed down as the glacier receded. The site does not present any special geomorphological problems. Construction should be and was planned to avoid introducing sediment in the adjacent streams.

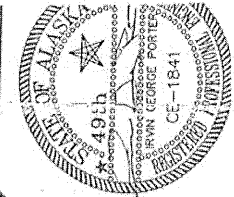
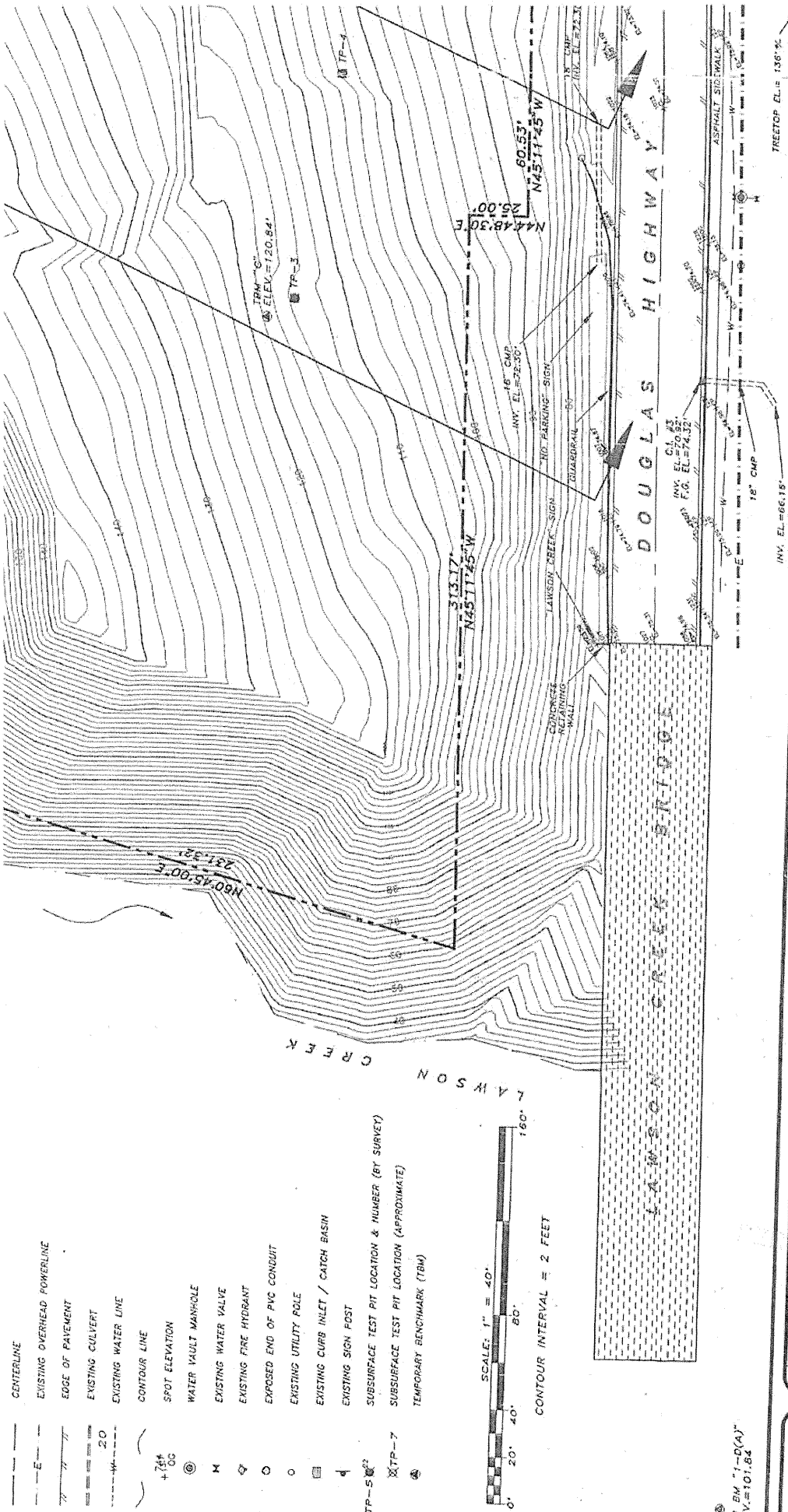
The area is covered by a Spruce Hemlock forest with Blueberry and devils club underbrush. Alder trees line the former Douglas Highway clearing limits. The organic mat is from 0.5' to 2.5' thick. The northerly site limits has, underlying the organic mat, a compressed blue gray silty sandy gravelly (glacial till). The southern fraction on the site is composed of a free draining gravelly sand as shown in the log of test pits.

The sand and gravel deposits are well drained, coarse, angular, and unbedded. This material is relatively dry and useable as a construction material. It is also a satisfactory soil for spread footing foundations.

The glacial till is a poorly sorted silty sandy gravel with cobbles. This material is generally stable when undisturbed and not saturated. Wet conditions and construction activities can cause disturbed areas of till to flow. Cuts and grades should avoid disturbing or wetting till deposits when feasible. Shot rock embankment is recommended to cover this glacial till material both for a street/roadway base as well as slope erosion

RECEIVED
OCT 14 1995

10/14/95



TOPOGRAPHIC SURVEY MAP
EXISTING PRE-CONSTRUCTION
SITE CONDITIONS

NO.	DATE	REVISION	BY	APPRVD.

DESIGN	I.G.P.
DRAWN	N.R.S.
CHECK	I.G.P.
APPROVED	M.A.M.

LOG OF TEST PITS
GASTINEAU VISTA PARK

TEST PIT NO.	DEPTH TO DESCRIBED MATERIAL						COMMENTS
	ORGANIC MATTER	FEAT	ORGANIC RICH GRAY SILTY SAND	SANDY GRAVEL W/TRACE OF SILT	SAND	GRAVELLY SAND	
1	0 - 0.5		0.5 - 1.5				BLUE GRAY SILTY SAND GRAVEL W/ GL COBBLES (L)
2	0 - 1.0		1.0 - 6.0		0 - 1.0		6.0 - 10.0 GROUND WATER AT 2.0
3	0 - 2.0		2.0 - 11.0		1.0 - 12.0		12.0 - (4) TRACE OF SILT 1.0 - 12.0
4	0 - 4.0			4.0 - 6.0			6.0 - (3) GROUND WATER AT 6.0
5	0 - 2.0				2.0 - 16.0		6.0 - 12.0 GROUND WATER AT 2.0
6	0 - 2.0						16.0 - 18.0 GROUND WATER AT 16.0
7	0 - 2.0						
8	0 - 2.0						
9	0 - 2.0						
10	0 - 0.5						
11	0 - 2.0						
12	0 - 2.0						
13	0 - 1.0		1.0 - 4.0		4.0 - 14.0		

TEST PITS 1 - 6 WERE CONDUCTED ON 6/26/85 USING A 215 CAT EXCAVATOR.
TEST PITS 8 - 13 WERE CONDUCTED ON 7/26/85 USING A 225 CAT EXCAVATOR.

GENERAL NOTES:

1. BASIS OF BEARING FOR THIS SURVEY WAS THE LINE-OF-SIGHT BETWEEN RECOVERED ORIGINAL GLO MONUMENTS CORNERS 2 & 3, U.S. SURVEY NO. 1900, HAVING A RECORD BEARING OF S 43°23'15" E.
2. BASIS OF VERTICAL CONTROL WAS CBJ BENCHMARK NO. "1-D(3)" WHICH IS A SPIKE NEAR THE ELEVATION OF A POWER POLE EAST OF LAWSON CREEK BRIDGE ON THE NORTH SIDE OF DOUGLAS HIGHWAY AT THE SOUTHWEST CORNER OF OLD GILLOWS' CEMETERY. ELEVATION OF BENCHMARK IS 101.84' ABOVE MEAN LOWER LOW WATER (M.L.L.W.), U.S.C. & G.S. GASTINEAU CHANNEL TIDAL DATUM.

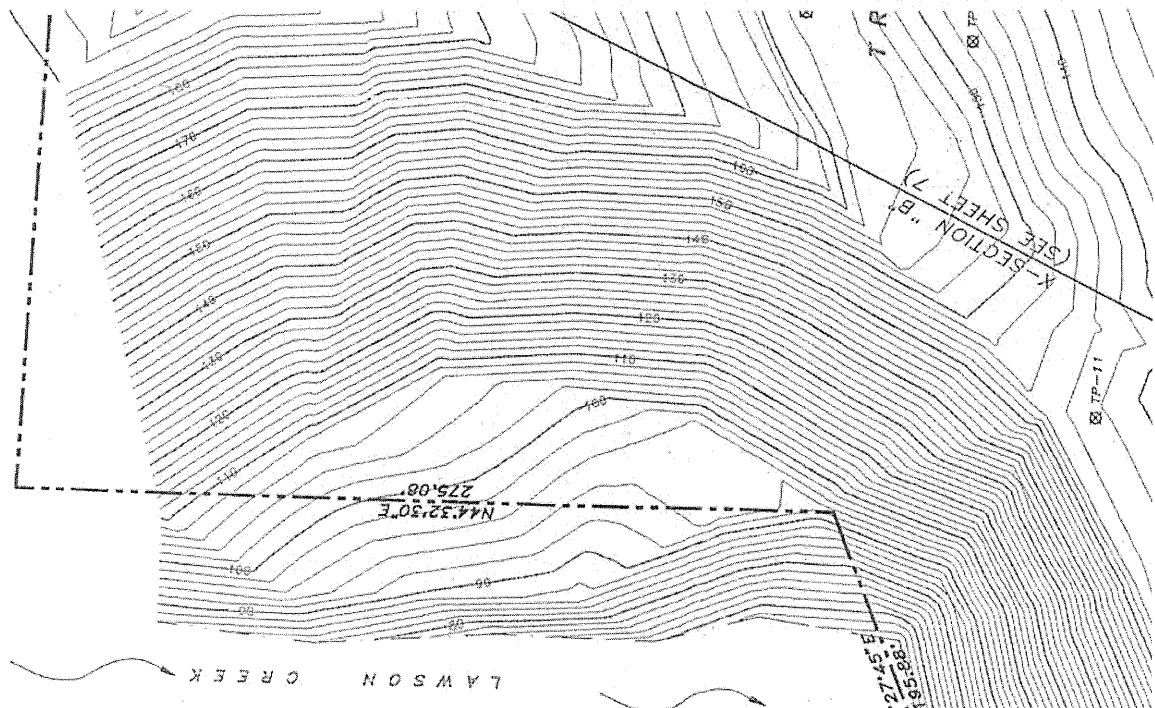
TIDAL DATUM

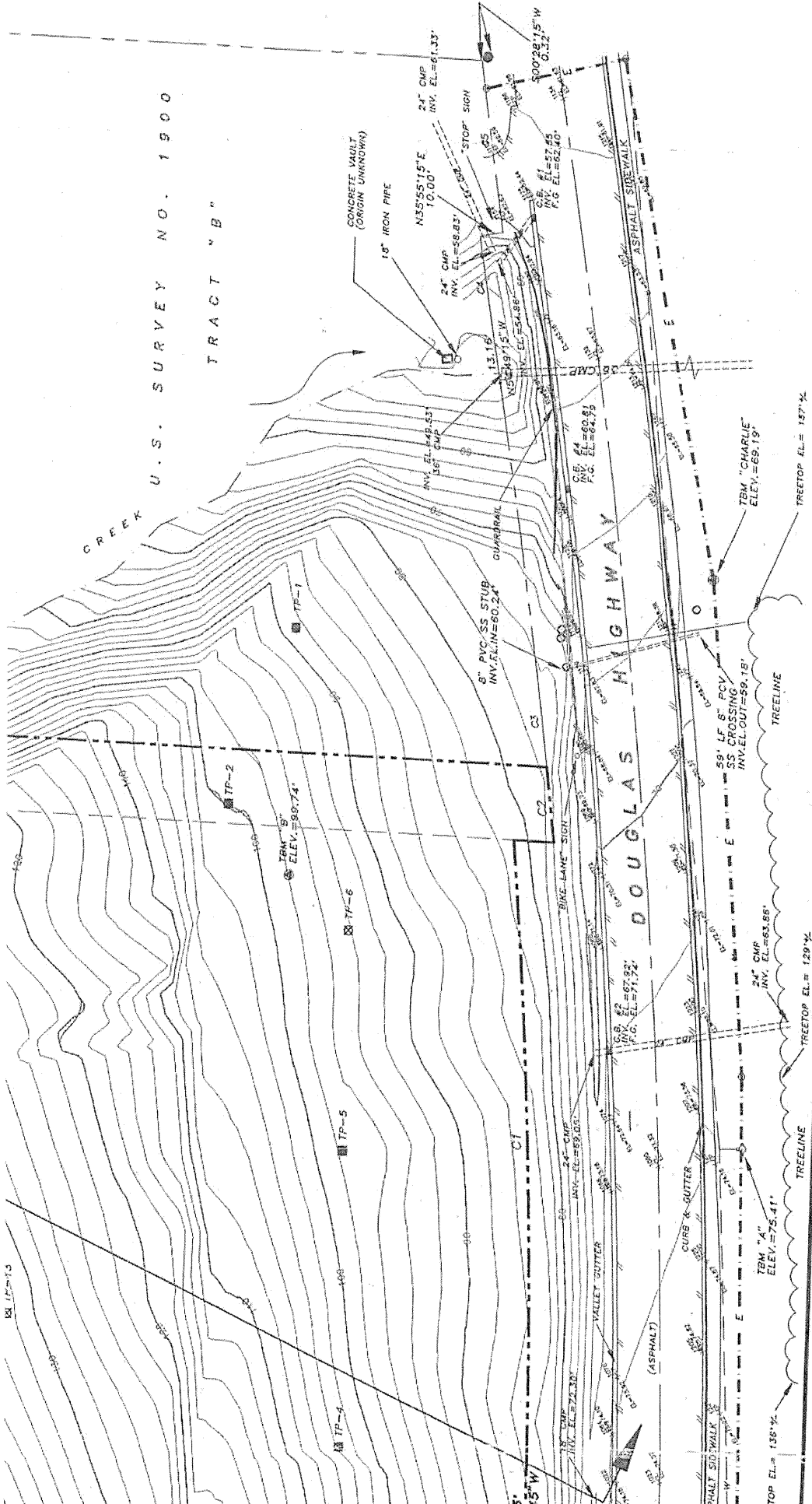
JUNEAU, GASTINEAU CHANNEL	
MEAN HIGHER HIGH WATER	16.40'
MEAN HIGH WATER	15.40'
MEAN TIDE LEVEL	14.50'
MEAN LOW WATER	13.50'
MEAN LOWER LOW WATER	0.00'

3. UTILITIES SHOWN HEREON WERE DETERMINED BY A COMBINATION OF FIELD SURVEYED LOCATIONS AND CBJ UTILITY AND ENGINEERING DEPARTMENT FURNISHED "AS-BUILT" INFORMATION.
4. ALL BEARINGS DENOTED BY THIS PLAT HAVE BEEN ROUNDED TO THE NEAREST 0'00"15" OF ARC.
5. AN 8" DIAMETER WATER MAIN EXISTS ON THE NORTHWESTERLY SIDE OF DOUGLAS HIGHWAY BUT IS NOT PLOTTED HEREON BECAUSE OF UNAVAILABLE ACCURATE DATA PER CBJ WATER UTILITIES DEPARTMENT.

SYMBOLS

- ⊗ GLO/BLM MONUMENT (RECOVERED)
- ⊙ 3088-S SECONDARY MONUMENT (RECOVERED)
- - - PROPERTY / BOUNDARY LINE
- CENTERLINE

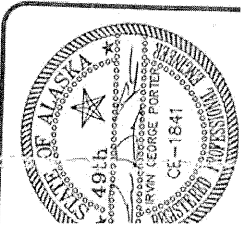


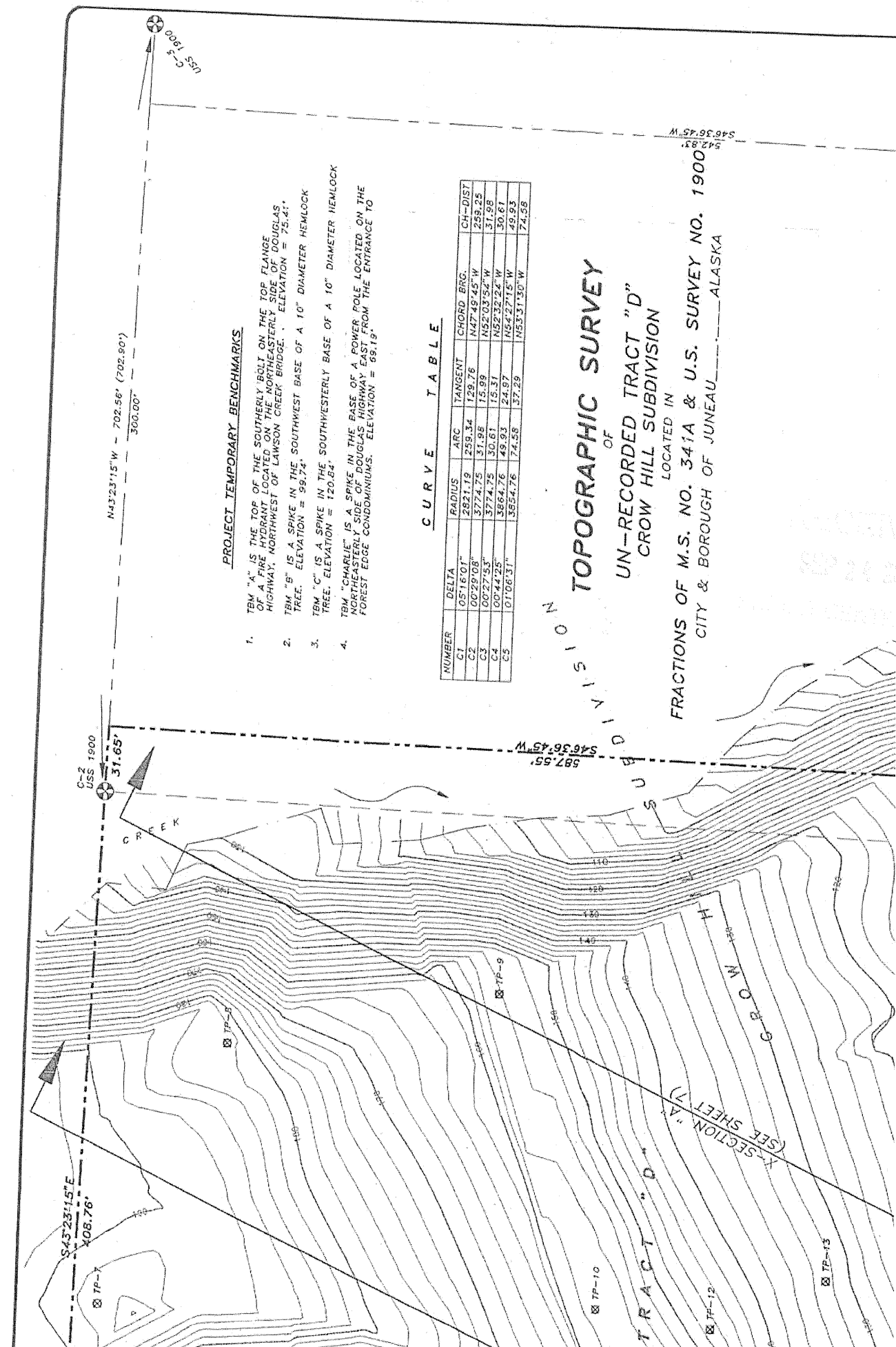


DATE: 3/19/96
R & M NO. 951735

**CREST @ LAWSON CREEK
CONDOMINIUMS
CONSTRUCTION IMPROVEMENT PLANS**

R & M ENGINEERING, INC.
ENGINEERS
GEOLOGISTS
SURVEYORS





N43°23'15"W - 702.56' (702.90')
300.00'

C-2
U.S. 1900
31.65'

S43°23'15"E
X08.76'

587.55'
S46°36'45"W

542.83'
S46°36'45"W

PROJECT TEMPORARY BENCHMARKS

1. TBM "A" IS THE TOP OF THE SOUTHERLY BOLT ON THE TOP FLANGE OF A FIRE HYDRANT LOCATED ON THE NORTHEASTERLY SIDE OF DOUGLAS HIGHWAY, NORTHWEST OF LAWSON CREEK BRIDGE. ELEVATION = 75.41'
2. TBM "B" IS A SPIKE IN THE SOUTHWEST BASE OF A 10" DIAMETER HEMLOCK TREE. ELEVATION = 98.72'
3. TBM "C" IS A SPIKE IN THE SOUTHWESTERLY BASE OF A 10" DIAMETER HEMLOCK TREE. ELEVATION = 120.64'
4. TBM "CHARLIE" IS A SPIKE IN THE BASE OF A POWER POLE LOCATED ON THE NORTHEASTERLY SIDE OF DOUGLAS HIGHWAY EAST FROM THE ENTRANCE TO FOREST EDGE CONDOMINIUMS. ELEVATION = 65.19'

CURVE TABLE

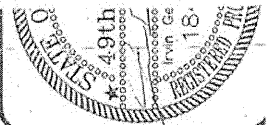
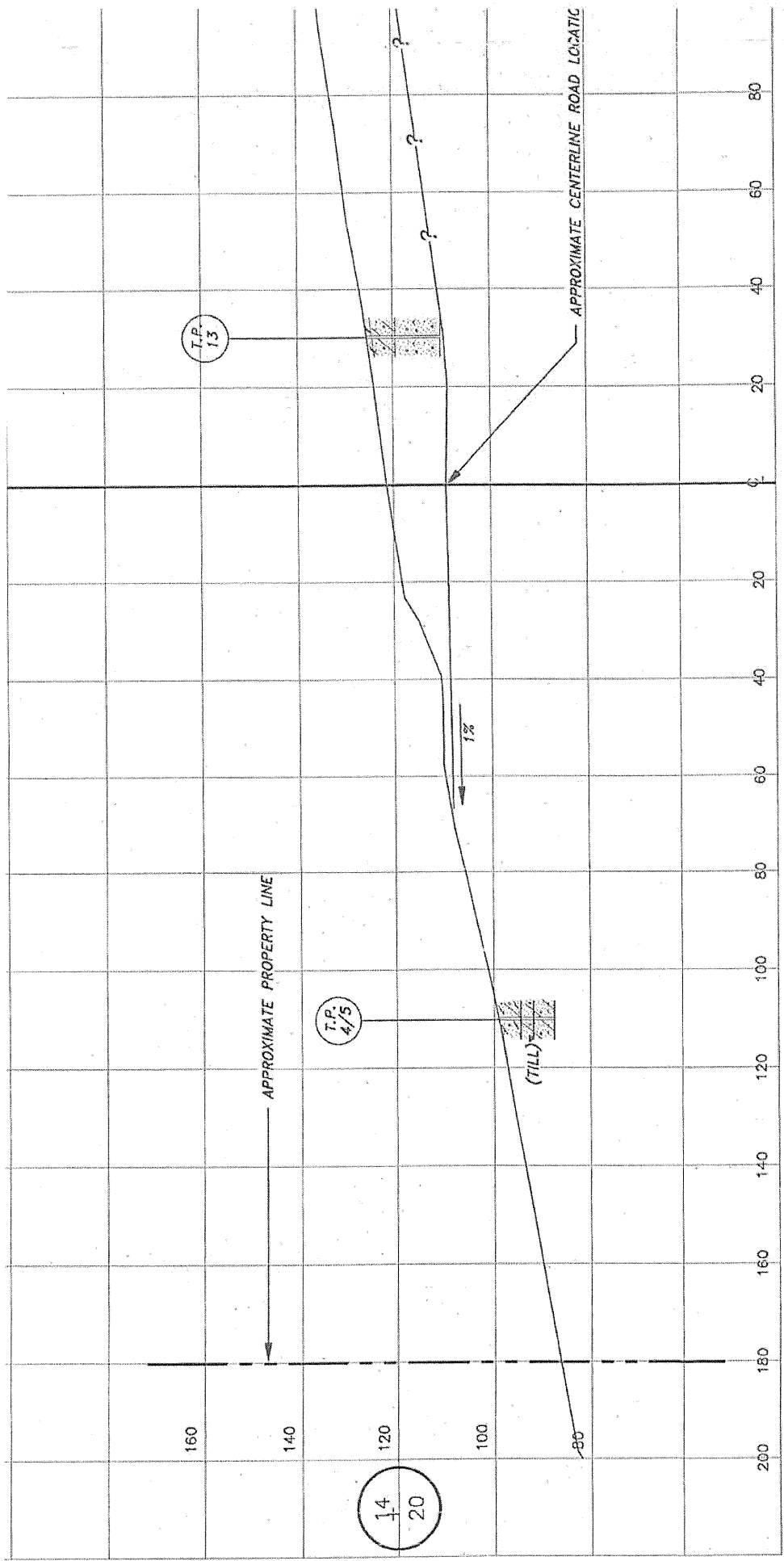
NUMBER	DELTA	RADIUS	ARC	TANGENT	CHORD BRG.	CH-DIST
C1	05°16'01"	2821.79	255.34	129.76	N47°49'45"W	259.25
C2	00°29'08"	3774.75	31.98	15.99	N52°03'54"W	31.98
C3	00°27'53"	3774.75	30.61	15.31	N52°32'24"W	30.61
C4	00°44'36"	3664.76	49.93	24.97	N84°27'16"W	49.93
C5	01°06'37"	3654.76	74.58	37.29	N53°31'30"W	74.58

UN-RECORDED TRACT "D"
CROW HILL SUBDIVISION

LOCATED IN
FRACTIONS OF M.S. NO. 341A & U.S. SURVEY NO. 1900
CITY & BOROUGH OF JUNEAU, ALASKA

X-SECTION "A"
(SEE SHEET 7)

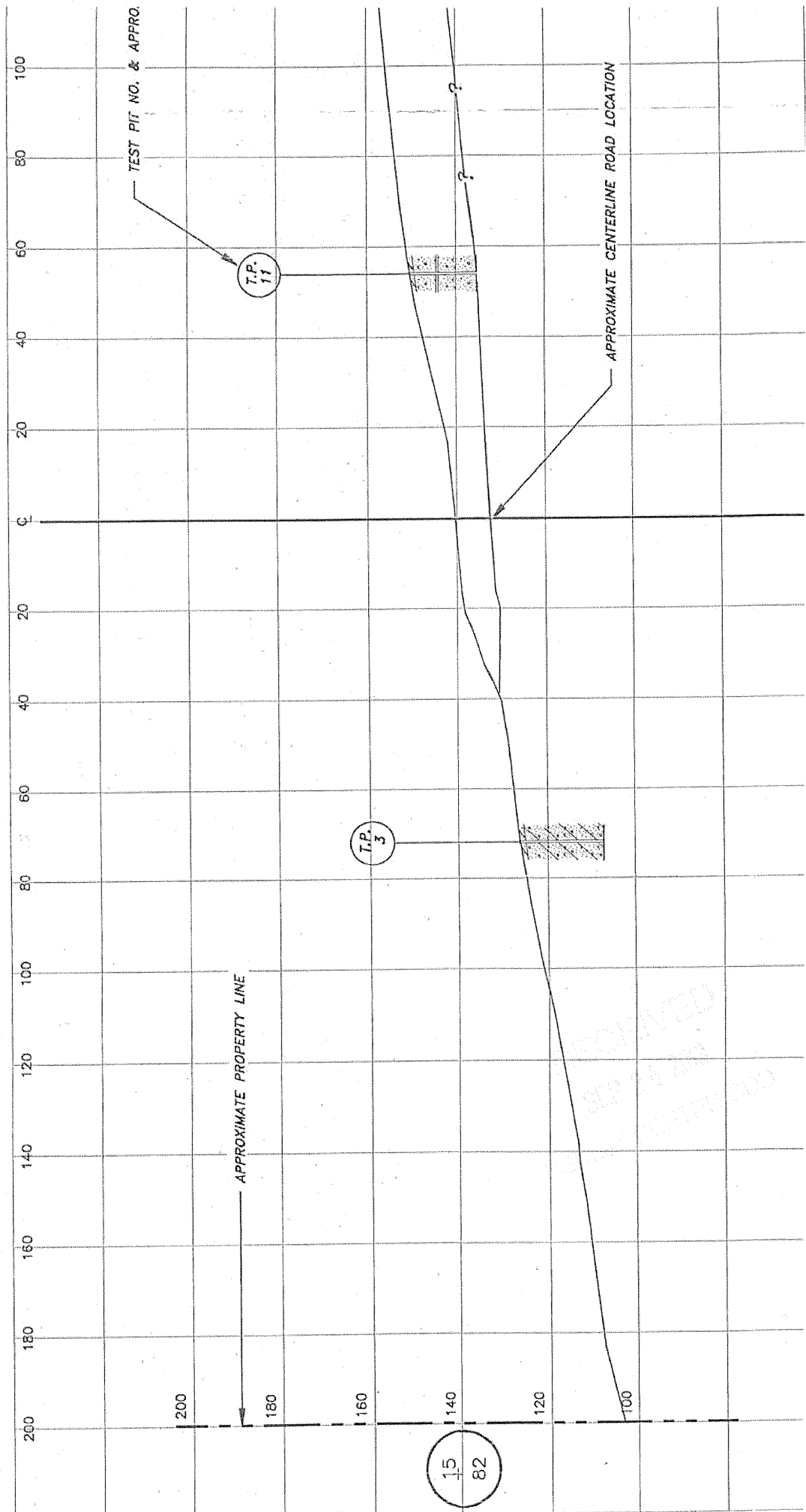
RECEIVED
JUN 24 1958
JUNEAU

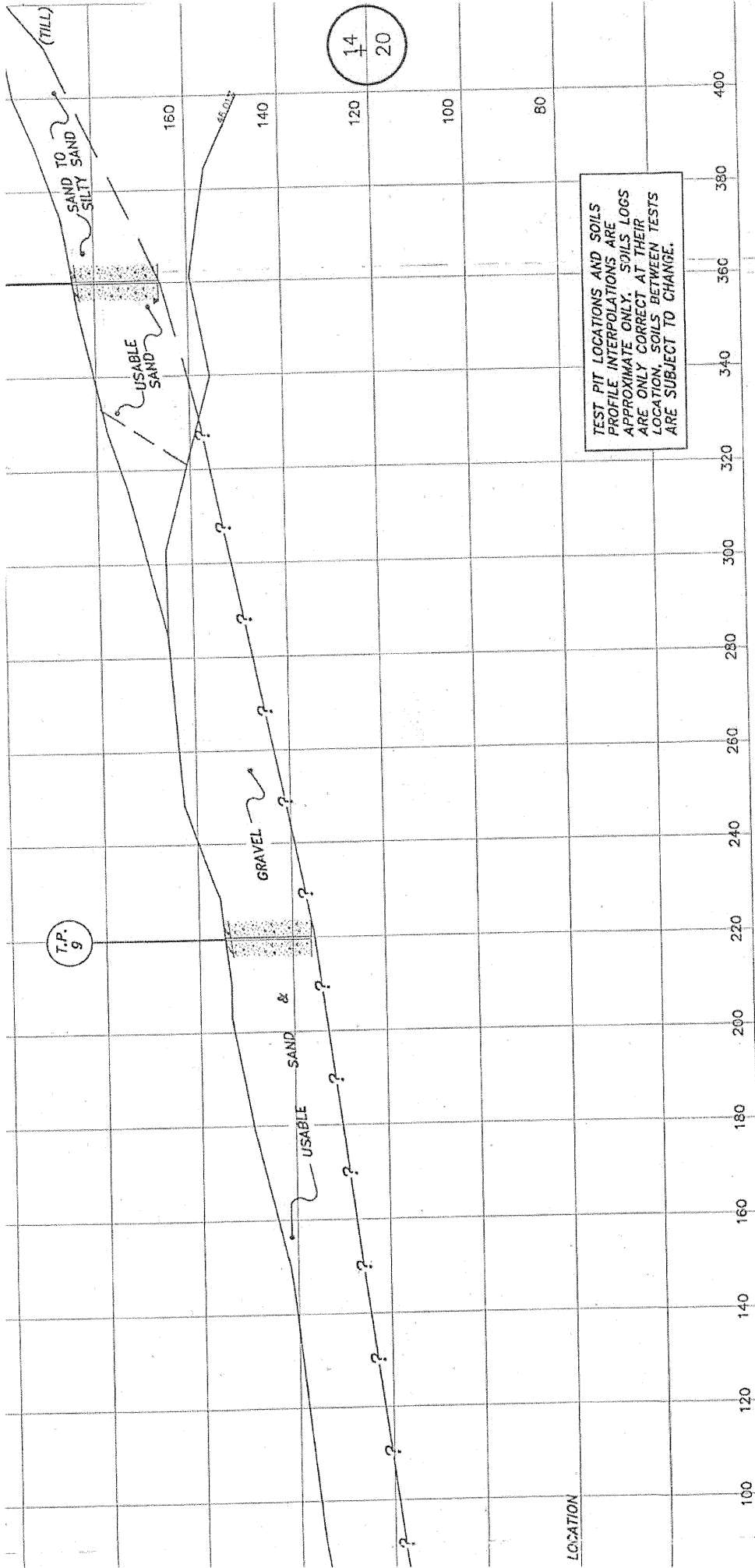


GENERALIZED CROSS SECTIONS WITH SOILS PROFILE INTERPOLATIONS

DESIGN	I.G.P.	DATE	BY	APPROVED
DRAWN	N.R.S.			
CHECK	M.A.M.			
APPROVED	M.A.M.			

DESIGN I.G.P.
 DRAWN N.R.S.
 CHECK M.A.M.
 APPROVED M.A.M.





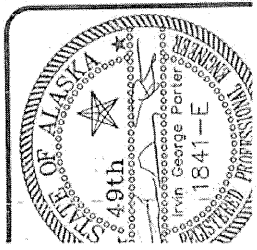
DATE: 3/7
R. & M. NO.

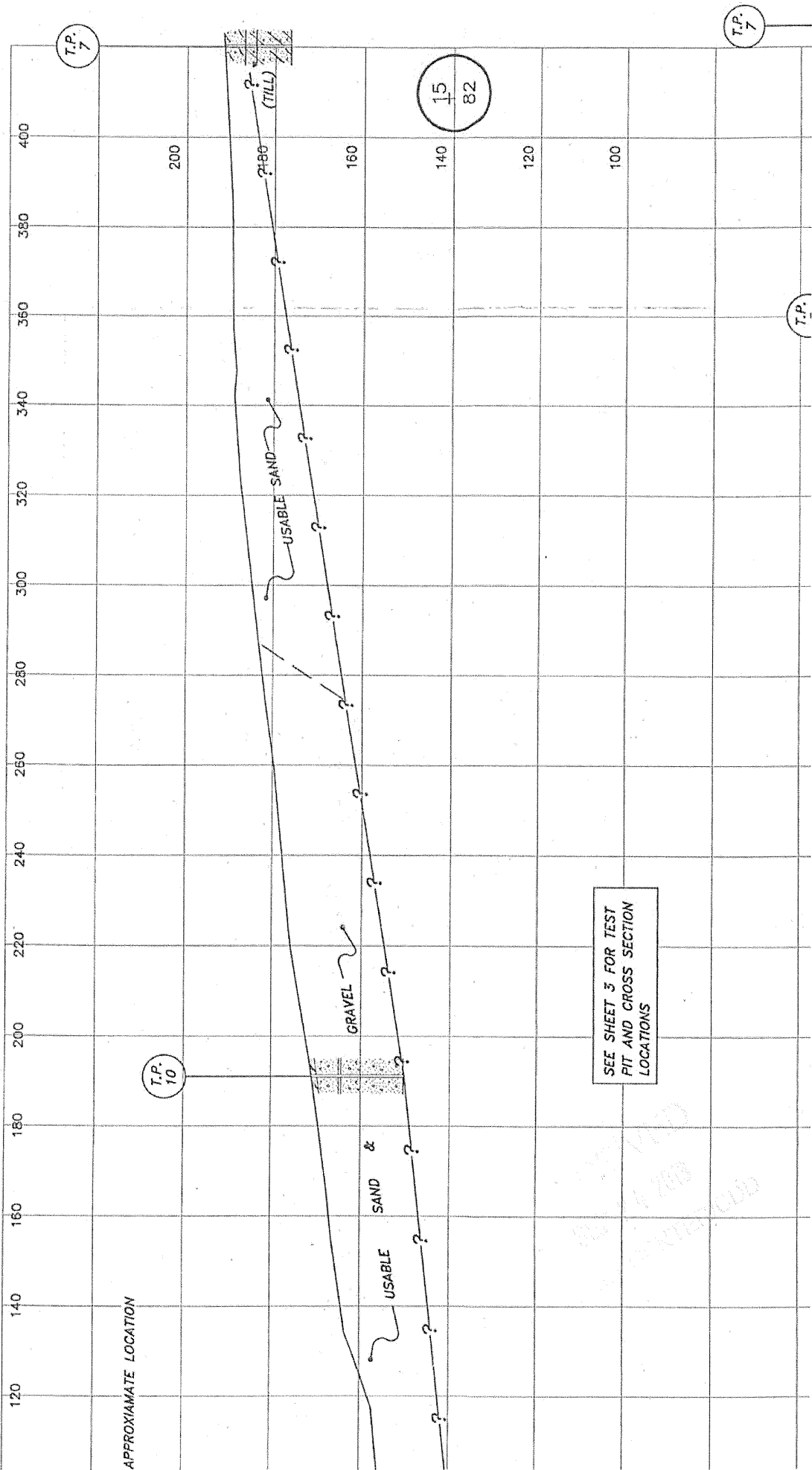
SHEET 8

CREST @ LAWSON CREEK
CONDOMINIUMS
 CONSTRUCTION IMPROVEMENT PLANS
 ALASKA
 JUNEAU

CLIENT: EMERALD DEVELOPMENT
 P.O. BOX 186
 BELLEVUE, WASHINGTON 98009

R & M ENGINEERING, INC.
 ENGINEERS
 GEOLOGISTS
 SURVEYORS





APPENDIX C:
TRAFFIC ASSESSMENT

RECEIVED
SEP 24 2008
PERMITTING DIVISION



June 7, 2013

Project #: 13662

Mr. Ron Bateman
Lumen Design Build
5201 E. Northern Lights, #15

Anchorage, AK 99508

RE: Douglas Volunteers of America Housing, Traffic Analysis

Dear Ron:

Following is my discussion concerning the traffic generation involved with the above project. My understanding is the project initial phase will include 40 condominium housing units with a potential for a second phase of another 35 units. Based upon the City and Borough of Juneau Zoning Regulations, a Traffic Impact Analysis (TIA) is required when:

1. The total daily trips generated by a development exceed 500 trips. For this 75 unit development, the total trips are estimated at 440 daily trips. Therefore **this project does not meet his criteria**
2. If the daily trips total between 250 and 500, they have the option of requiring a TIA. The first phase would total about 230 trips and therefore would not meet this limit. Since you are only committed to the first phase, **the project does not meet this criteria.**
3. If the additional trips exceed 5% of the current traffic volumes then again they could require a TIA. For the first phase the existing volume on Douglas Highway is 6,000. Since the first phase increase is only 3.8%, again **the project does not meet this criteria.**

I would suggest additional reasons why a TIA should not be required for this development:

1. Transit Service - The Douglas Highway has half hour transit service seven days per week, which will help to reduce the number of site generated vehicle trips. There will be a connecting sidewalk from the site to Douglas Highway which would encourage usage of the transit system.
2. Pedestrian/Bike Access - Douglas Highway has a bike route and a sidewalk which would encourage other than vehicle trips. The intersection of Vista Drive and Douglas Highway has two street lights and provides ample pedestrian sight distance in this area.
3. Reduce Trip Production - The focus of the development is to provide housing for low income residents or persons with disabilities/handicaps. These two categories traditionally have lower trip production rates than the general public.
4. Level of Service - The focus of the TIA is to determine the trip productions and traffic effects and then implement mitigation improvements, if necessary. The goal included in the CBJ regulations talks about achieving a Level of Service "D" or better. Currently with the Douglas

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SEP 24 2013
CITY OF JUNEAU

Highway vehicle volumes around 6,000 trips per day, the level of service is in the B/C range. The addition of the total project 440 additional daily trips would not change the level of service to the D range.

5. Minimal Peak Hour Impact - The total project generated traffic increase during the morning or evening peak hours would approximate 35 – 40 vehicles. This would average less than one additional vehicle per minute using Vista Drive during the morning or evening peak hour.

I hope the above helps to clarify the TIA status. I have included my worksheet for your review and use. Please let me know if you need any additional information.

Sincerely,
KITTELSON & ASSOCIATES, INC.

Bob Kniefel, P.E

Senior Transportation Engineer

Attachment: Douglas VOA Housing Traffic Analysis

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PERMIT CENTER/CDD

Juneau Volunteers of America Housing Douglas Island

Volumes

Group	1 bedroom	2 bedroom	3 bedroom	Total units	Daily		AM Peak Hour		PM Peak Hour	
					Trips/Unit	Daily trips	AM Trips per Unit	AM Trips	PM Trips per Unit	Total PM trips
Phase 1										
A	4	6	2	12						
B	2	8	4	14						
C	2	8	4	14						
				40	5.81	232	0.44	18	0.52	21
Phase 2				35	5.81	203	0.44	15	0.52	18
TOTAL				75	5.81	436	0.44	33	0.52	39

Trip projections

Trip rates taken from 9th edition of the ITE Trip Generation Manual for category 230 - Residential Condominium townhouses

CBJ Criteria require a TIA if the total daily trips exceed 500.

For the total project build out of 75 units, it produces only about 440 daily trips.

For initial phase of 35 units, the total traffic is about 205 trips per day below the 250 threshold to discuss if you need a TIA.

Existing daily volume on Douglas Highway near site is 6,000 trips per day.

Phase 1 produces an increase of 3.8% below the 5% standard

Phase 2 produces an increase of 7.3%

Housing focus is on residents with low income or with 10% having handicapped along with frequent bus service along Douglas highway would show the above rates to be very conservative and probably lower in actual usage.

APPENDIX D:

HYDROLOGY AND HYDRAULIC REPORT

REC'D TO
12/24/11
11:11 AM

HYDROLOGY AND HYDRAULICS CALCULATIONS

CREST AT LAWSON CREEK DEVELOPMENT, PHASE 2

Prepared for Emerald Development

Prepared By:

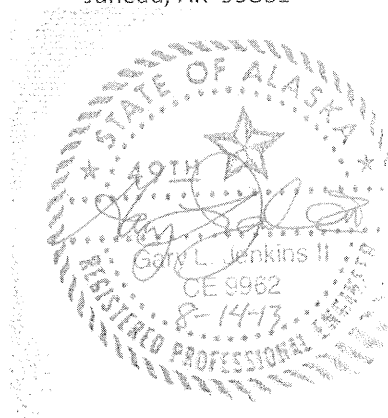
Gary Jenkins

Toner-Nordling & Associates, Inc.

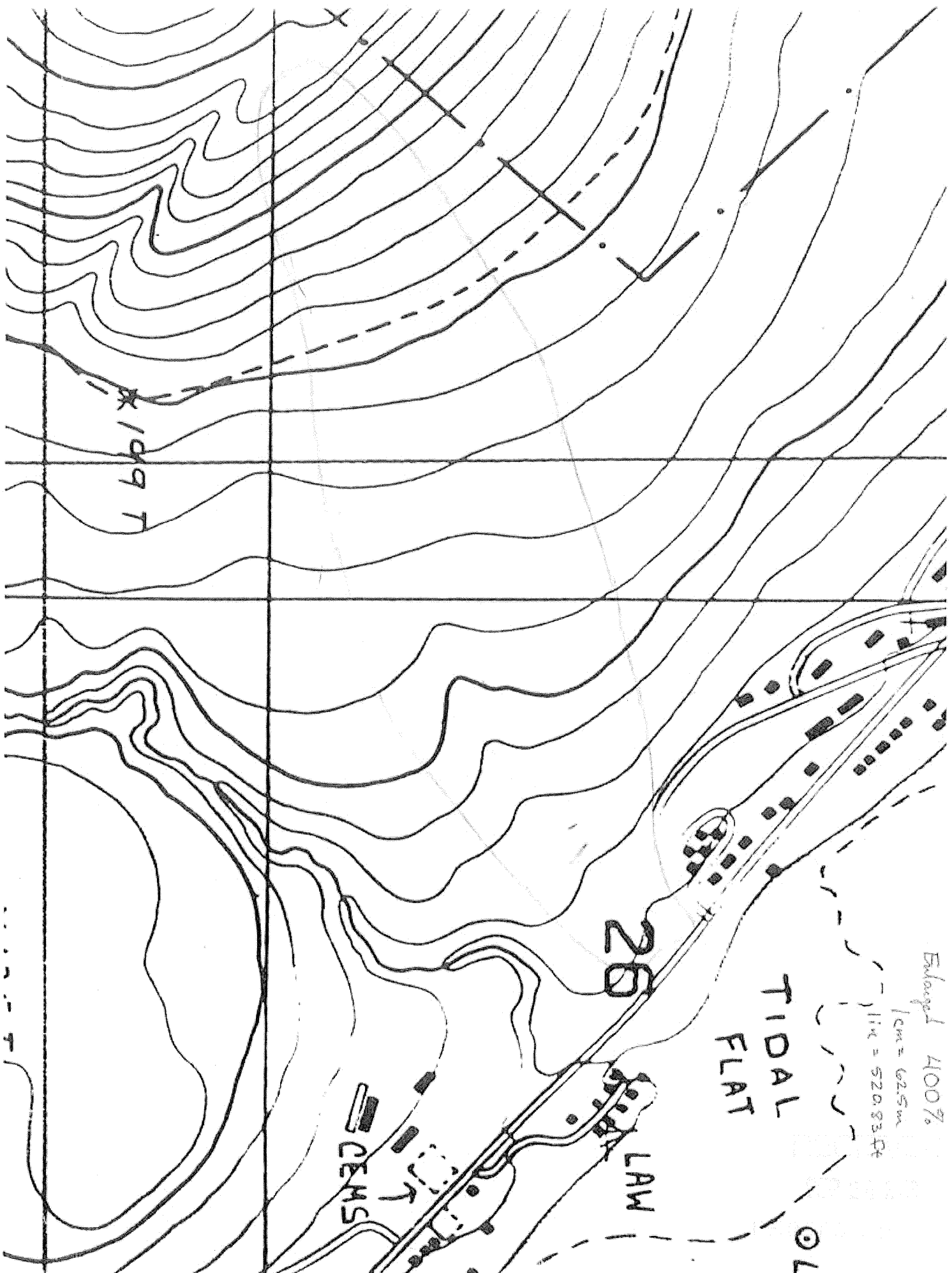
October, 1996

Reviewed By:

Gary Jenkins, PE
DOWL HKM
5368 Commercial Blvd
Juneau, AK 99801



EMERALD DEVELOPMENT
5368 COMMERCIAL BLVD
JUNEAU, AK 99801
TEL: 907-586-1234



Toner-Nordling & Associates, Inc.

2221 N. Jordan Avenue
 JUNEAU, ALASKA 99801
 (907) 789-3533
 FAX (907) 789-7854

JOB CREST AT LAWSON CREEK CONDO'S
 SHEET NO. 1 OF _____
 CALCULATED BY GLJ DATE 10/15/96
 CHECKED BY _____ DATE _____
 SCALE Hydrology Study

Area of Drainage:

Measured using Compensating Planimeter, Constant for $cm^2 \rightarrow m^2 = 3906.25$

<u>TRIAL</u>	<u>AREA (cm²)</u>
1	89.0
2	88.7
3	88.6

Ave = $\frac{266.3}{3} = 88.8 \text{ cm}^2$

Actual Area = 88.8×3906.25
 $= 346744 \text{ m}^2$

Total Area = 85.7 ac. (Conservative \rightarrow see map w/ drainage outlined in red pencil)

DRAINAGE AREA DESCRIPTION:

All undisturbed land is densely forested w/ organic soils. This will have relatively high retention. The stream bed only exists for at most the bottom 800 ft (above Douglas thuy). The stream bed has mild meanders w/ smaller grapefruit sized rocks (& smaller) for the bed. At higher water runoff rates there are many trees lying across the stream ranging in size from 1" to 12" in diameter. The stream grade could be characterized as ~~an~~ mild ^{sizably} chute & pools, though there aren't any pools, ~~of~~ just flatter areas.

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JOB _____
SHEET NO. 2 OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

AREA OF DRAINAGE TO BE DEVELOPED

From topo map @ 1" = 20' generated from survey

$$\begin{aligned} A &= (630 \times 445) + (72 \times \frac{1}{2} (320 + 220)) + (75 \times \frac{1}{2} (220 \times 155)) \\ &= 280350 + 19440 + 14063 \\ &= 313853 \text{ ft}^2 \\ &= 7.2 \text{ acres} \end{aligned}$$

Rational Method Runoff Coefficient, C:

Wooded Area = 0.30 (Unimproved - ASCE "Dsm't Const. of SD & SS", 1970)

Developed Area: 0.75 (Residential Multi-units, attached)

Analysis

All the flow from the developed area will be collected in a storm drain system which ~~outfalls into the creek just above the~~ ^{outfalls into the} ~~sub-culvert crossing Douglas Hwy.~~ ^{pipe described below}

All the runoff from the drainage above the developed area will be collected and piped underground through the development and will ~~also~~ outfall just above the cross culvert.

Therefore, the two drainage areas will be addressed ^{together} ~~separately~~ to the ~~point above the cross culvert.~~ The cross culvert will then be checked for capacity using the combined flow.

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JOB _____
SHEET NO. 3 OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Developed Area - RUNOFF

Since the flow from the developed area will reach Peak Flow long before the rest of the drainage, a precipitation rate will be used from the Alaska Hwy Drainage Manual, 50 yr. Storm.

$$i_{50} = 0.6 \text{ in/hr}$$

The Rational Method Analysis Eqn is $Q = CiA$ where Q is cfs

i is in/hr

A is ac

$$\therefore Q_{DEV} = 0.75(0.6)(7.2)$$

$$Q_{DEV} = 3.24 \text{ cfs}$$

WOODED AREA - RUNOFF

In this area, use t_c to determine the rainfall intensity.

$$L = 3911 \text{ ft}$$

$$\Delta H = 390 \text{ m} - 43 \text{ m} = 347 \text{ m} \left. \begin{array}{l} \\ \\ \end{array} \right\} S = \frac{1138}{3911} = 29\%$$

$$= 1138 \text{ ft}$$

$$\text{Ave Slope of piping through development} = \frac{90'}{630'} = 14\%$$

$t_c = t_1 + t_2$, where t_1 is t_c in undeveloped area & t_2 is in the pipes

• Estimation of n :

Wooded:	Basic $n =$	0.028	coarse gravel
		+ .03	Trees in flow, 50 yr storm
		<u>0.058</u>	

$$t_c = \frac{D}{V} = \frac{\sqrt{(3911)^2 + (1138)^2}}{2 \text{ fps}} = 2036 \text{ s} = 34 \text{ min} \Rightarrow i = 0.65 \text{ in/hr (50 yr. Storm)}$$

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JOB _____
 SHEET NO. 4 OF 10-16-76
 CALCULATED BY _____ DATE _____
 CHECKED BY _____ DATE _____
 SCALE _____

$$Q = CiA, \quad C = 0.3, \quad i = 0.65 \text{ in/hr}, \quad A = 85.7 - 7.2 = 78.5 \text{ ac}$$

$$Q = 0.3 (0.65) (78.5)$$

$$= 15.3 \text{ cfs}$$

$$Q_T = 15.3 + 3.2 = 18.5 \text{ cfs}$$

However, for a long duration storm (such as on Sept. 25, 1996) the soil becomes ~~very~~ saturated & infiltration drops to nearly zero. } Worst case scenario

In this case, a larger C is appropriate, say 0.75. So, using the data from that storm (a near 50 yr. storm) and the new C value, Q_p is:

$$\text{Storm } i = 0.17 \text{ in/hr @ airport (recorded)}$$

Due to drainage being in mountains and in the downtown Juneau area, a higher i value is assumed: say $i = 0.4 \text{ in/hr}$

$$\therefore Q_p = 0.75 (0.4) (78.5)$$

$$= 23.55 \text{ cfs}$$

Plus Q from developed area:

$$Q_{NET} = 23.55 + 3.24$$

$$Q_{NET} = 26.79 \text{ cfs}$$

$26.79 \text{ cfs} < 82.53 \text{ cfs}$, Full flow culvert capacity (see printout, p. 5)

\therefore Exist culvert is adequate

Capacity of Culvert Crossing Douglas Hwy.

Culverts -- English Units

Civil Tools for Windows
(10-16-1996, 09:54:04)

Diameter = 33 in
 Length = 100 ft
 Friction Coeff = .027
 Ent+Exit Coeff = 1.5
 Inlet Control Coeff = 2
 Inv Elev Out = 34.53 ft
 Inv Elev In = 49.53 ft
 Tailwater Elev = 34.00 ft
 Elev Increment = 1 ft

Headwater		Flowrate
ft		cfs
52.28	OC	82.53
53.28	OC	85.23
54.28	OC	87.86
55.28	OC	90.40
56.28	OC	92.88
57.28	OC	95.29
58.28	OC	97.65
59.28	OC	99.94
60.28	OC	102.19
61.28	OC	104.39
62.28	OC	106.54
63.28	OC	108.65
64.28	OC	110.72
65.28	OC	112.75
66.28	OC	114.75
67.28	OC	116.71

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 FEDERAL BUREAU OF SURVEYING

Toner-Nordling & Associates, Inc.

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FAX (907) 789-7854

JOB LAWSON CREEK CONDUITS, PH. II
SHEET NO. _____ OF _____
CALCULATED BY GLV DATE 1/29/97
CHECKED BY _____ DATE _____
SCALE _____

Determination of Pipe Size through Development

Q_{PEAK} from above developed site = 23.55 cfs

FOR 36" CPP: (see attached)

With a headwater equal to the top of pipe, $Q_{pipe} = 40.37$ cfs

The max. headwater w/o overtopping the road = 15' ±

$$Q_{pipe(15')} = 147.62 \text{ cfs}$$

Calculations for 48" CPP are attached as well.

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FEB 24 1997
HERBERT O. HANCOCK

Storm Drain Pipe SD-10

Culverts -- English Units

Civil Tools for Windows
(01-29-1997, 09:17:52)

Diameter = 36 in
 Length = 97 ft
 Friction Coeff = .01
 Ent+Exit Coeff = 1.5
 Inlet Control Coeff = 2
 Inv Elev Out = 149.03 ft
 Inv Elev In = 150 ft
 Tailwater Elev = 149.03 ft
 Elev Increment = 1 ft

Headwater ft		Flowrate cfs
153.00	OC	40.37
154.00	OC	57.53
155.00	OC	70.64
156.00	OC	81.67
157.00	OC	91.38
158.00	OC	100.15
159.00	OC	108.22
160.00	OC	115.72
161.00	OC	122.76
162.00	OC	129.43
163.00	OC	135.76
164.00	OC	141.81
165.00	OC	147.62
166.00	OC	153.20
167.00	OC	158.59
168.00	OC	163.80

$(1.7 \times Q_p) \rightarrow V = \frac{Q}{A} = \frac{40.37}{\frac{\pi(9)^2}{4}} = 5.7 \text{ fps}$

Overlapping Threshold

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Storm Drain Pipe SD-10

36" CPP

Culverts -- English Units

Civil Tools for Windows
(01-29-1997, 09:43:44)

Diameter = 36 in
Length = 97 ft
Friction Coeff = .02 ← Worst Case (see Fig. 1, attached)
Ent+Exit Coeff = 1.5
Inlet Control Coeff = 2
Inv Elev Out = 149.03 ft
Inv Elev In = 150 ft
Tailwater Elev = 149.03 ft
Elev Increment = 1 ft

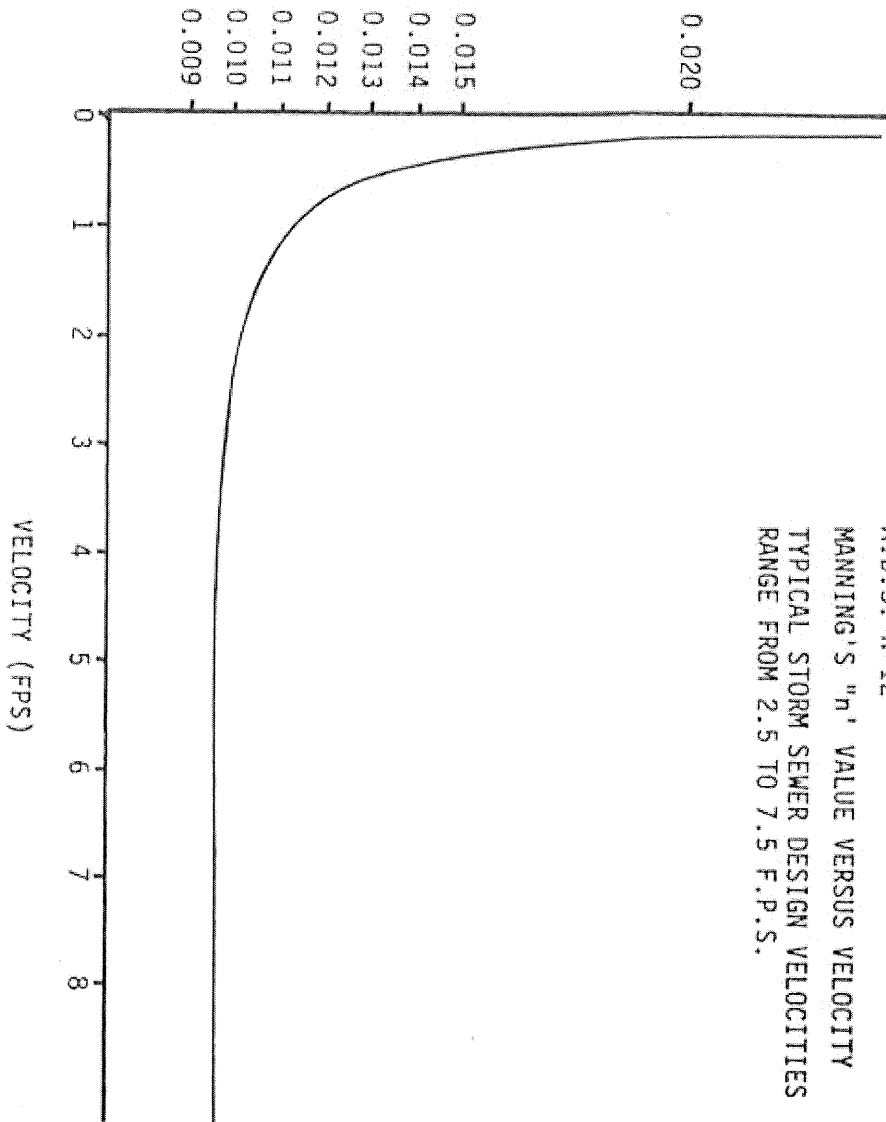
Headwater ft		Flowrate cfs
153.00	OC	31.43
154.00	OC	44.78
155.00	OC	54.99
156.00	OC	63.57
157.00	OC	71.13
158.00	OC	77.96
159.00	OC	84.24
160.00	OC	90.08
161.00	OC	95.56
162.00	OC	100.75
163.00	OC	105.68
164.00	OC	110.39
165.00	OC	114.91
166.00	OC	119.26
167.00	OC	123.45
168.00	OC	127.51

Overtopping Threshold

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11/11/97

MANNING'S COEFFICIENT OF ROUGHNESS

(n)



A.D.S. N-12
MANNING'S "n" VALUE VERSUS VELOCITY
TYPICAL STORM SEWER DESIGN VELOCITIES
RANGE FROM 2.5 TO 7.5 F.P.S.

FIGURE 1

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ST. LOUIS
MAY 19 1962

Storm Drain Pipe SD-10 (48" CPP)

Culverts -- English Units

Civil Tools for Windows
(01-29-1997, 09:18:26)

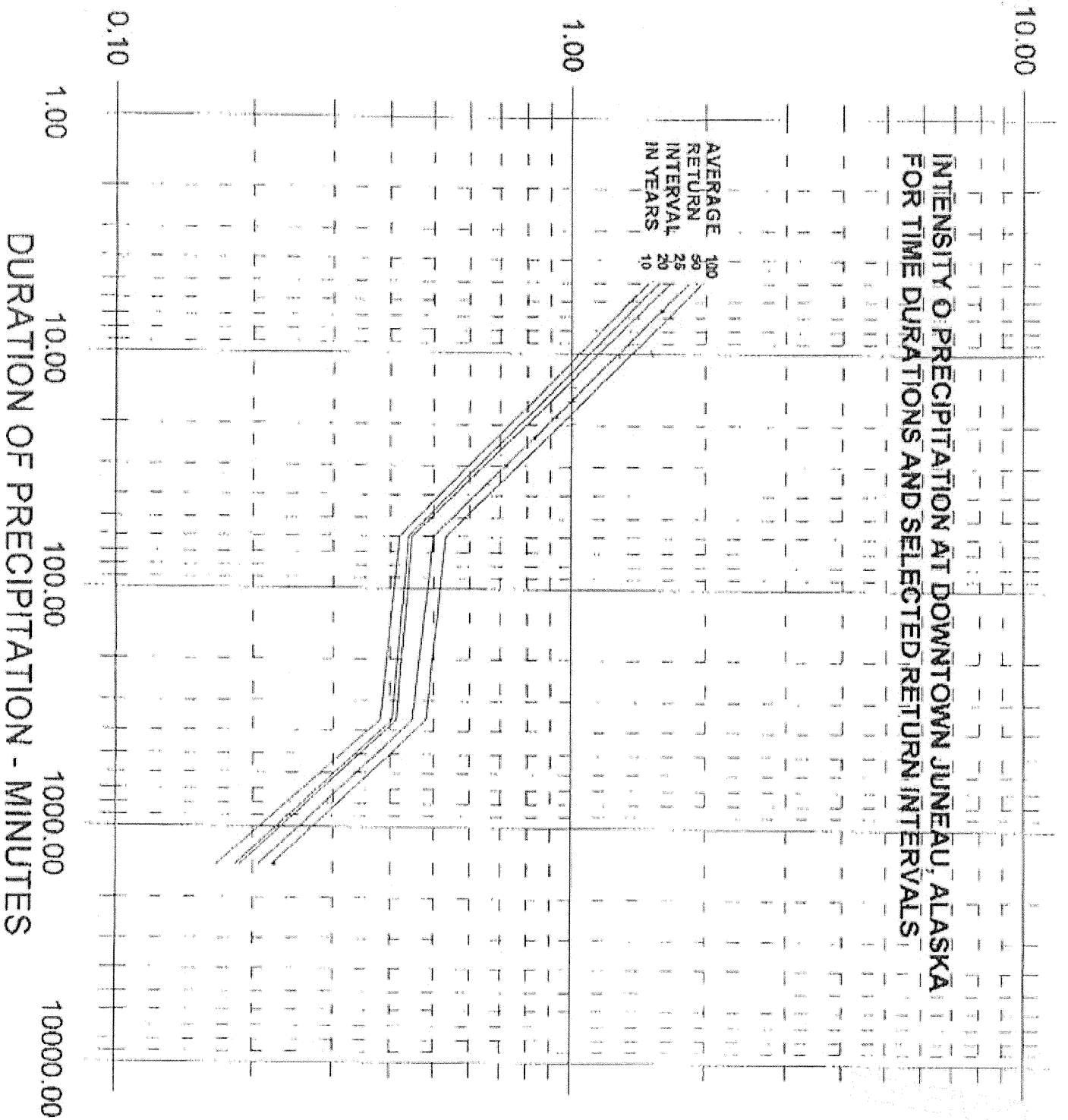
Diameter = 48 in
Length = 97 ft
Friction Coeff = .01
Ent+Exit Coeff = 1.5
Inlet Control Coeff = 2
Inv Elev Out = 149.03 ft
Inv Elev In = 150 ft
Tailwater Elev = 149.03 ft
Elev Increment = 1 ft

Headwater		Flowrate
ft		cfs
154.00	OC	74.38
155.00	OC	106.00
156.00	OC	130.16
157.00	OC	150.48
158.00	OC	168.37
159.00	OC	184.53
160.00	OC	199.39
161.00	OC	213.22
162.00	OC	226.20
163.00	OC	238.47
164.00	OC	250.15
165.00	OC	261.30
166.00	OC	271.99
167.00	OC	282.29
168.00	OC	292.21
169.00	OC	301.82

Overtopping Threshold

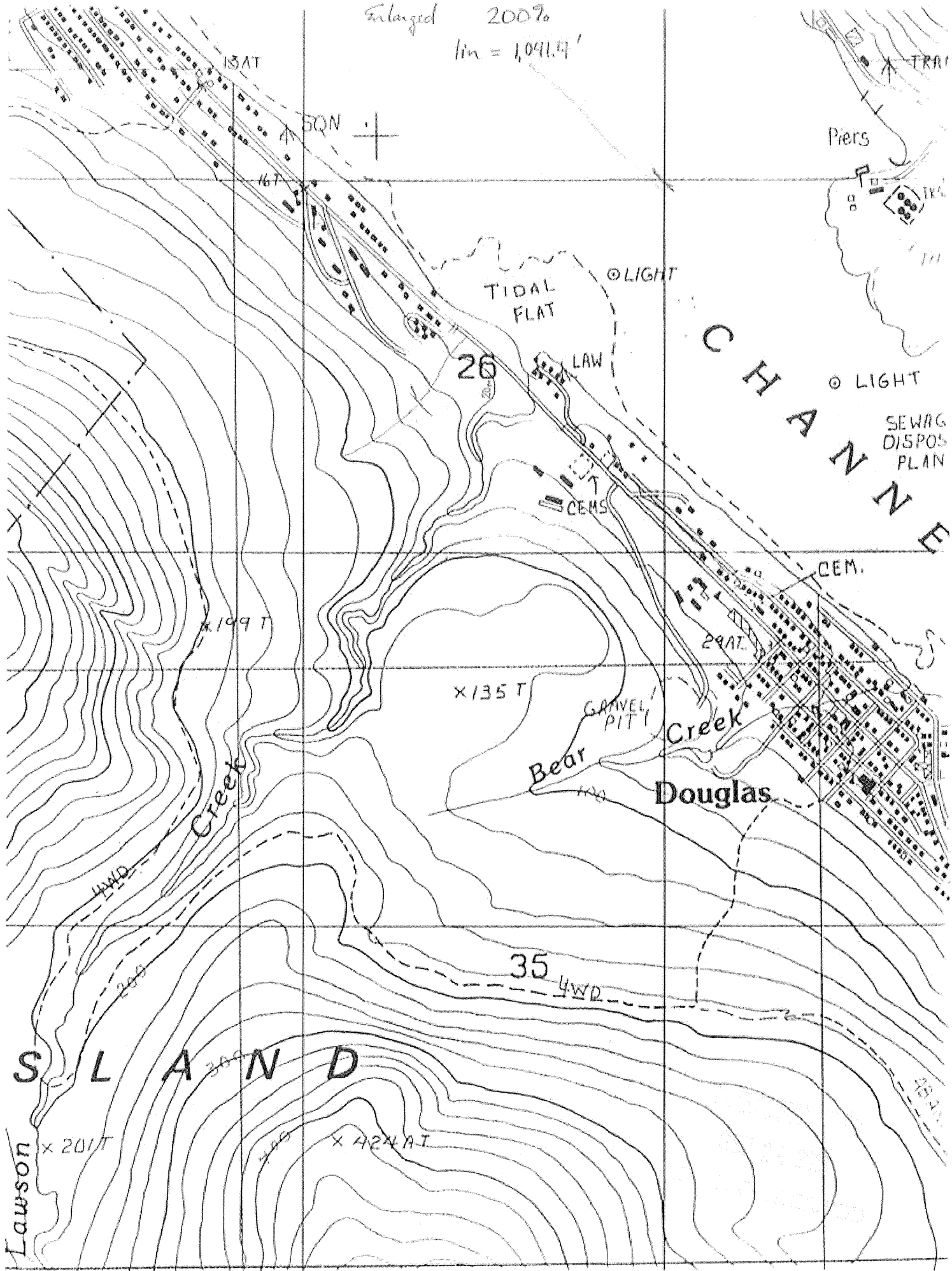
RECEIVED
SEP 14 1997
FACILITY ENGINEERING

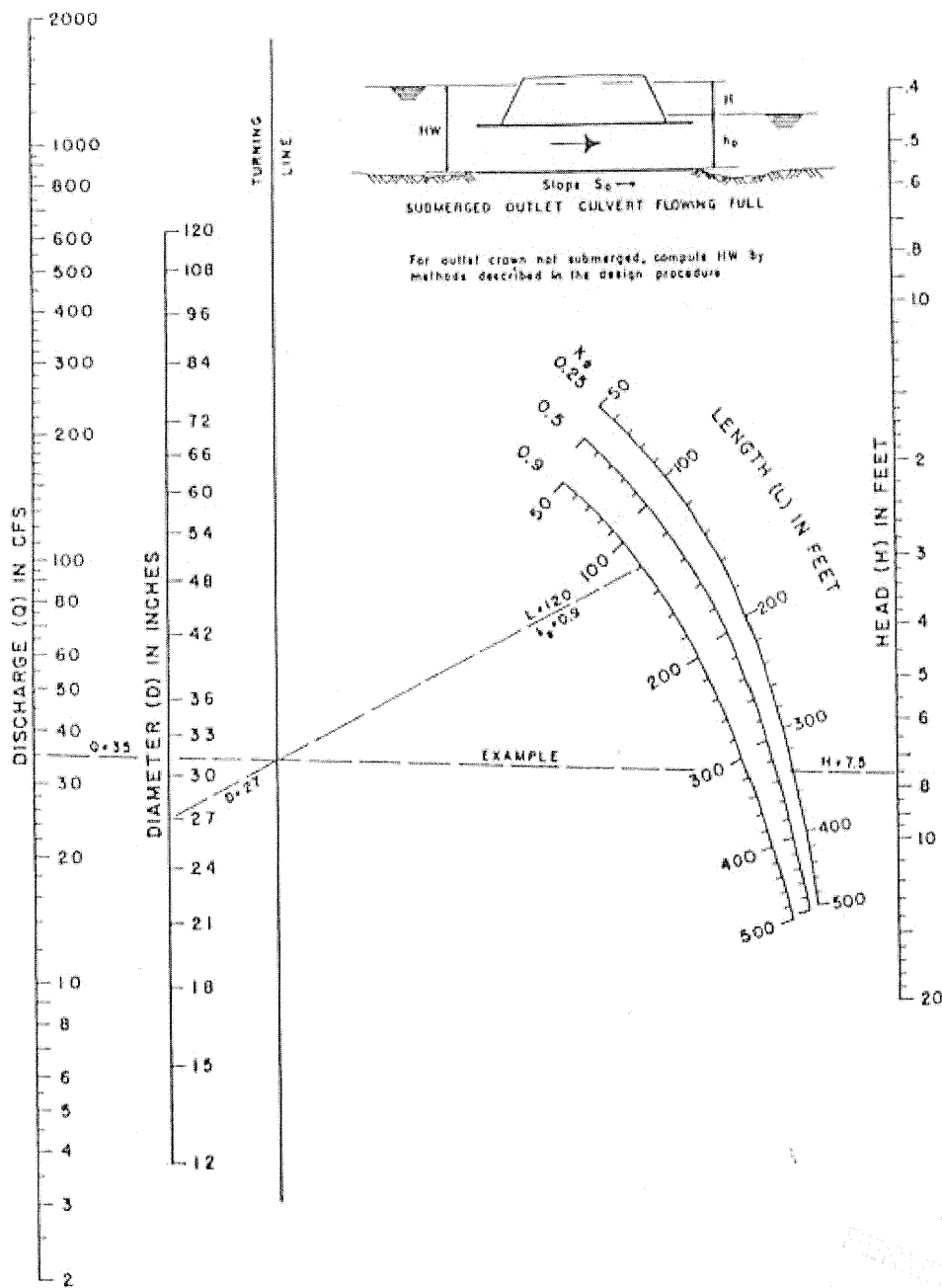
PRECIPITATION INTENSITY - INCHES PER HOUR



Enlarged 200%

1 in = 1,041.7'





HEAD FOR
STANDARD
C. M. PIPE CULVERTS
FLOWING FULL
 $n = 0.024$

Fig. 2.9.2a Head for standard corrugated metal culverts flowing full ($n = 0.024$)

App. D

HYDROLOGY AND HYDRAULICS CALCULATIONS

CREST AT LAWSON CREEK DEVELOPMENT, PHASE 2

Prepared for Emerald Development

Prepared By:

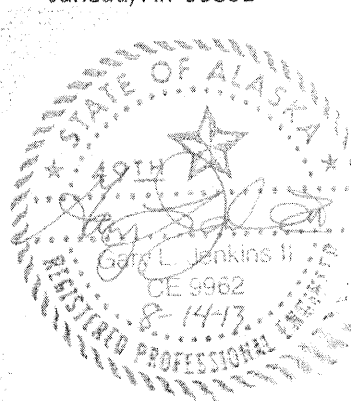
Gary Jenkins

Toner-Nordling & Associates, Inc.

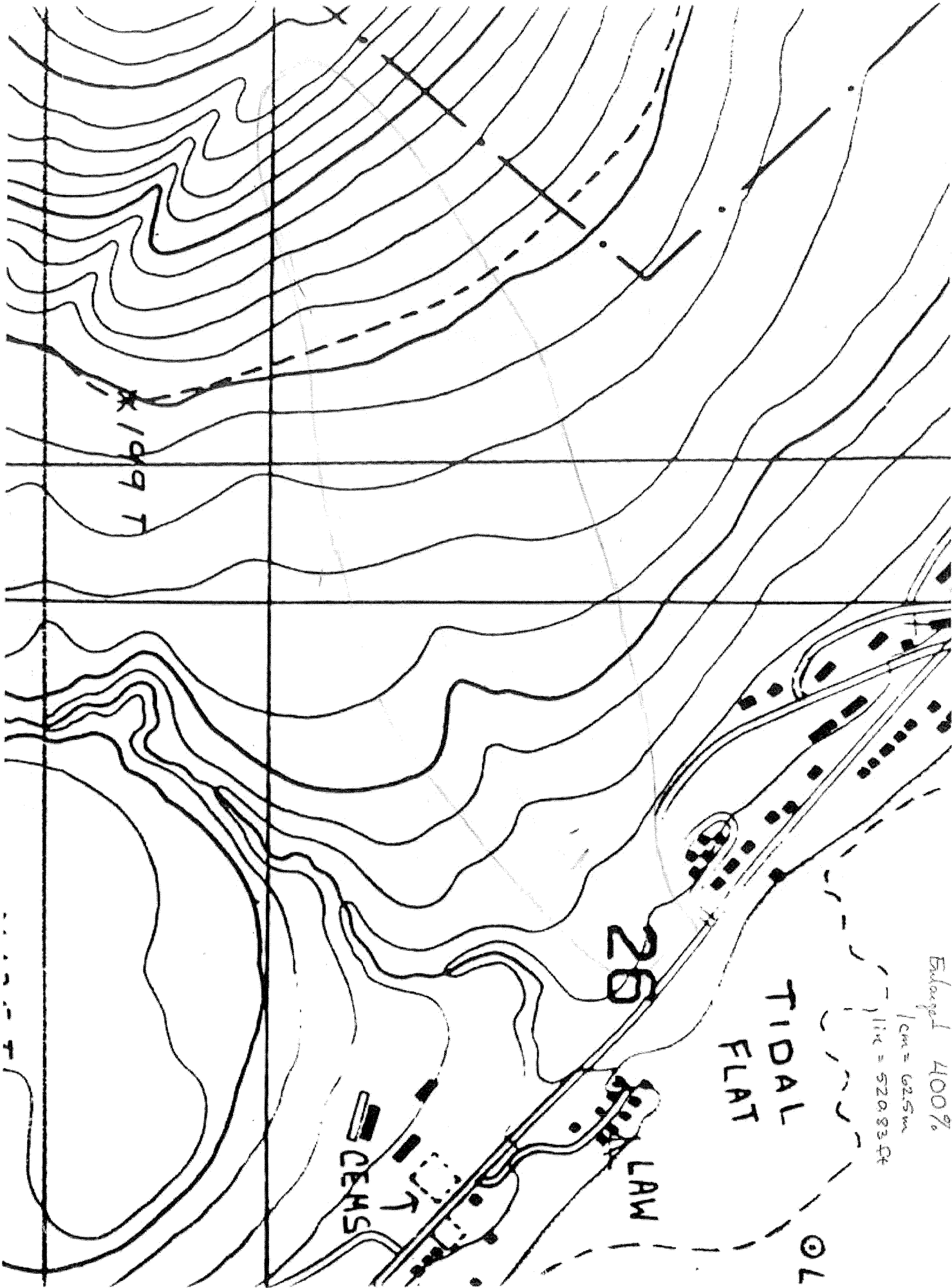
October, 1996

Reviewed By:

Gary Jenkins, PE
DOWL HKM
5368 Commercial Blvd
Juneau, AK 99801



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1997

26

TIDAL
FLAT

LAW

CEMS

Enlarged 400%
1 cm = 62.5 m
1 in = 520.83 ft

OL

Toner-Nordling & Associates, Inc.

2221 N. Jordan Avenue
 JUNEAU, ALASKA 99801
 (907) 789-3533
 FAX (907) 789-7854

JOB CREST AT LAWSON CREEK CONDO'S
 SHEET NO. 1 OF _____
 CALCULATED BY GLJ DATE 10/15/96
 CHECKED BY _____ DATE _____
 SCALE Hydrology Study

Area of Drainage:

Measured using Compensating Planimeter, Constant for $cm^2 \rightarrow m^2 = 3906.25$

<u>TRIAL</u>	<u>AREA (cm²)</u>
1	89.0
2	88.7
3	88.6

$$Ave = \frac{266.3}{3} = 88.8 \text{ cm}^2$$

$$\text{Actual Area} = 88.8 \times 3906.25 = 346744 \text{ m}^2$$

Total Area = 85.7 ac. (Conservative \rightarrow see map w/ drainage outlined in red pencil)

DRAINAGE AREA DESCRIPTION:

All undisturbed land is densely forested w/ organic soils. This will have relatively high retention. The stream bed only exists for at most the bottom 800 ft (above Douglas Hwy). The stream bed has mild meanders w/ smaller grapefruit sized rocks (& smaller) for the bed. At higher water runoff rates there are many trees lying across the stream ranging in size from 1" to 12" in diameter. The stream grade could be characterized as mild chutes & pools, though there aren't ^{sizeably} any pools, just flatter areas.

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FAX (907) 789-7854

JOB _____
SHEET NO. 2 OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

AREA OF DRAINAGE TO BE DEVELOPED

From topo map @ 1" = 20' generated from survey

$$A = (630 \times 445) + (72 \times \frac{1}{2} (320 + 220)) + (75 \times \frac{1}{2} (220 \times 155))$$

$$= 280350 + 19440 + 14063$$

$$= 313853 \text{ ft}^2$$

$$= 7.2 \text{ acres}$$

Rational Method Runoff Coefficient, C:

Wooded Area = 0.30 (Unimproved - ASCE "Dist. Cond. of SD & SS", 1970)

Developed Area: 0.75 (Residential Multi-units, attached)

Analysis

All the flow from the developed area will be collected in a storm drain system which ~~outfalls~~ ^{flows} onto the ~~culvert~~ ^{pipe described below} just above the ~~cross culvert crossing Douglas Hwy.~~

All the runoff from the drainage above the developed area will be collected and piped underground through the development and will ~~also~~ outfall just above the cross culvert.

Therefore, the two drainage areas will be addressed ^{together} ~~separately~~ to the point above the cross culvert. The cross culvert will then be checked for capacity using the ~~combined~~ flow.

Developed Area - Runoff

Since the flow from the developed area will reach Peak Flow long before the rest of the drainage, a precipitation rate will be used from the Alaska Hwy Drainage Manual, 50 yr. Storm.

$$i_{50} = 0.6 \text{ in/hr}$$

The Rational Method Analysis Egn is $Q = CiA$ where Q is cfs
 i is in/hr
 A is ac

$$\therefore Q_{DEV} = 0.75(0.6)(7.2)$$

$Q_{DEV} = 3.24 \text{ cfs}$

WOODED AREA - RUNOFF

In this area, use t_c to determine the rainfall intensity.

$$\begin{aligned} L &= 3911 \text{ ft} \\ \Delta H &= 390 \text{ m} - 43 \text{ m} = 347 \text{ m} \\ &= 1138 \text{ ft} \end{aligned} \left. \vphantom{\begin{matrix} L \\ \Delta H \end{matrix}} \right\} S = \frac{1138}{3911} = 29\%$$

Ave Slope of piping through development = $\frac{90'}{630'} = 14\%$

~~$t_c = t_1 + t_2$, where t_1 is t_c in undeveloped area & t_2 is in the pipes~~

• Estimation of n :

Wooded: Basic $n = 0.028$ coarse gravel
 $+ .03$ trees in flow, 50 yr storm

 0.058

$$t_c = \frac{Q}{V} = \frac{\sqrt{(3911)^2 + (1138)^2}}{2 \text{ fps}} = 2036 \text{ s} = 34 \text{ min} \Rightarrow i = 0.65 \text{ in/hr (50 yr. Storm)}$$

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FAX (907) 789-7854

JOB _____
SHEET NO. 4 OF 10-16-76
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

$Q = CiA$, $C = 0.3$, $i = 0.65 \text{ in/hr}$, $A = 85.7 - 7.2 = 78.5 \text{ ac}$

$Q = 0.3(0.65)(78.5)$

$= 15.3 \text{ cfs}$

$Q_T = 15.3 + 3.2 = 18.5 \text{ cfs}$

However, for a long duration storm (such as on Sept. 25, 1996) the soil becomes ~~moistly~~ saturated & infiltration drops to nearly zero. } Worst case scenario

In this case, a larger C is appropriate, say 0.75. So, using the data from that storm (a near 50 yr. storm) and the new C value, Q_p is:

Storm $i = 0.17 \text{ in/hr}$ @ airport (recorded)

Due to drainage being in mountains and in the downtown Juneau area, a higher i value is assumed: say $i = 0.4 \text{ in/hr}$

$\therefore Q_p = 0.75(0.4)(78.5)$

$= 23.55 \text{ cfs}$

Plus Q from developed area:

$Q_{NET} = 23.55 + 3.24$

$Q_{NET} = 26.79 \text{ cfs} < 82.53 \text{ cfs}$, Full flow culvert capacity (see printout, p. 5)

\therefore Exist culvert is adequate

Capacity of Culvert Crossing Douglas Hwy.

Culverts -- English Units

Civil Tools for Windows
(10-16-1986, 09:54:04)

Diameter = 33 in
 Length = 100 ft
 Friction Coeff = .027
 Ent+Exit Coeff = 1.5
 Inlet Control Coeff = 2
 Inv Elev Out = 34.53 ft
 Inv Elev In = 49.53 ft
 Tailwater Elev = 34.00 ft
 Elev Increment = 1 ft

Headwater ft		Flowrate cfs
52.28	OC	82.53
53.28	OC	85.23
54.28	OC	87.86
55.28	OC	90.40
56.28	OC	92.88
57.28	OC	95.29
58.28	OC	97.65
59.28	OC	99.94
60.28	OC	102.19
61.28	OC	104.39
62.28	OC	106.54
63.28	OC	108.65
64.28	OC	110.72
65.28	OC	112.75
66.28	OC	114.75
67.28	OC	116.71

REVIEWED
 8/27/87
 PERMIT CONTROL

Toner-Nordling & Associates, Inc.

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(907) 789-3533
FAX (907) 789-7854

JOB LAWSON CRK. CONDS, PH. III
SHEET NO. _____ OF _____
CALCULATED BY GLV DATE 1/29/97
CHECKED BY _____ DATE _____
SCALE _____

Determination of Pipe Size through Development

Q_{PEAK} from above developed site = 23.55 cfs

FOR 36" CPP: (see attached)

With a headwater equal to the top of pipe, $Q_{pipe} = 40.37$ cfs

The max. headwater w/o overtopping the road = 15'±

$$Q_{pipe(15)} = 147.62 \text{ cfs}$$

Calculations for 48" CPP are attached as well.

Storm Drain Pipe SD-10

Culverts -- English Units

Civil Tools for Windows
(01-29-1997, 09:17:52)

Diameter = 36 in
Length = 97 ft
Friction Coeff = .01
Ent+Exit Coeff = 1.5
Inlet Control Coeff = 2
Inv Elev Out = 149.03 ft
Inv Elev In = 150 ft
Tailwater Elev = 149.03 ft
Elev Increment = 1 ft

Headwater ft		Flowrate cfs	
153.00	OC	40.37	$(1.7 \times Q_p) \rightarrow V = \frac{Q}{A} = \frac{40.37}{\frac{\pi(9)^2}{4}} = 5.7 \text{ fps}$
154.00	OC	57.53	
155.00	OC	70.64	
156.00	OC	81.67	
157.00	OC	91.38	
158.00	OC	100.15	
159.00	OC	108.22	
160.00	OC	115.72	
161.00	OC	122.76	
162.00	OC	129.43	
163.00	OC	135.76	
164.00	OC	141.81	
165.00	OC	147.62	Overlapping Threshold
166.00	OC	153.20	
167.00	OC	158.59	
168.00	OC	163.80	

Storm Drain Pipe SD-10

36" CPP

Culverts -- English Units

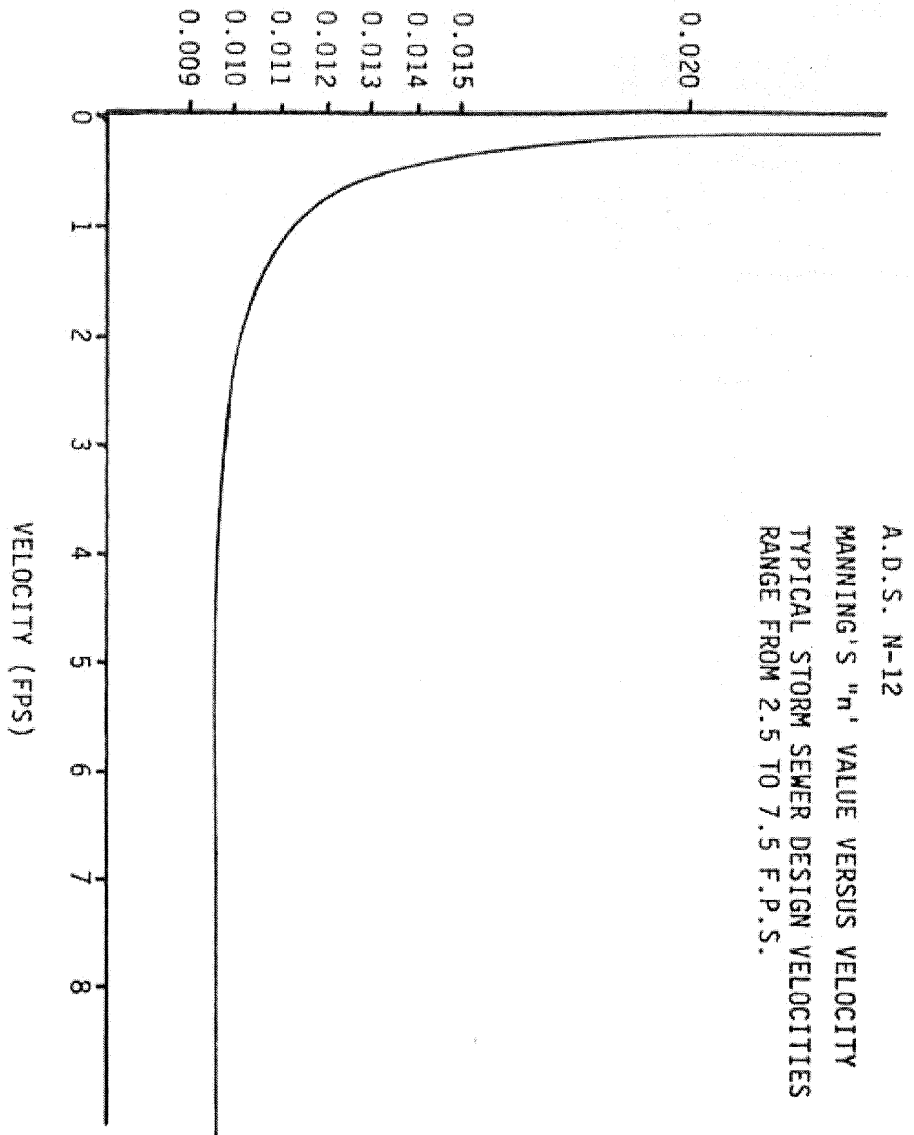
Civil Tools for Windows
(01-29-1997, 09:43:44)

Diameter = 36 in
Length = 97 ft
Friction Coeff = .02 ← Worst Case (see Fig. 1, attached)
Ent+Exit Coeff = 1.5
Inlet Control Coeff = 2
Inv Elev Out = 149.03 ft
Inv Elev In = 150 ft
Tailwater Elev = 149.03 ft
Elev Increment = 1 ft

Headwater ft		Flowrate cfs
153.00	OC	31.43
154.00	OC	44.78
155.00	OC	54.99
156.00	OC	63.57
157.00	OC	71.13
158.00	OC	77.96
159.00	OC	84.24
160.00	OC	90.08
161.00	OC	95.56
162.00	OC	100.75
163.00	OC	105.68
164.00	OC	110.39
165.00	OC	114.91
166.00	OC	119.26
167.00	OC	123.45
168.00	OC	127.51

Overlapping Threshold

MANNING'S COEFFICIENT OF ROUGHNESS
(n)



A. D. S. N-12
MANNING'S "n" VALUE VERSUS VELOCITY
TYPICAL STORM SEWER DESIGN VELOCITIES
RANGE FROM 2.5 TO 7.5 F.P.S.

FIGURE 1

Storm Drain Pipe SD-10 (48" CPP)

Culverts -- English Units

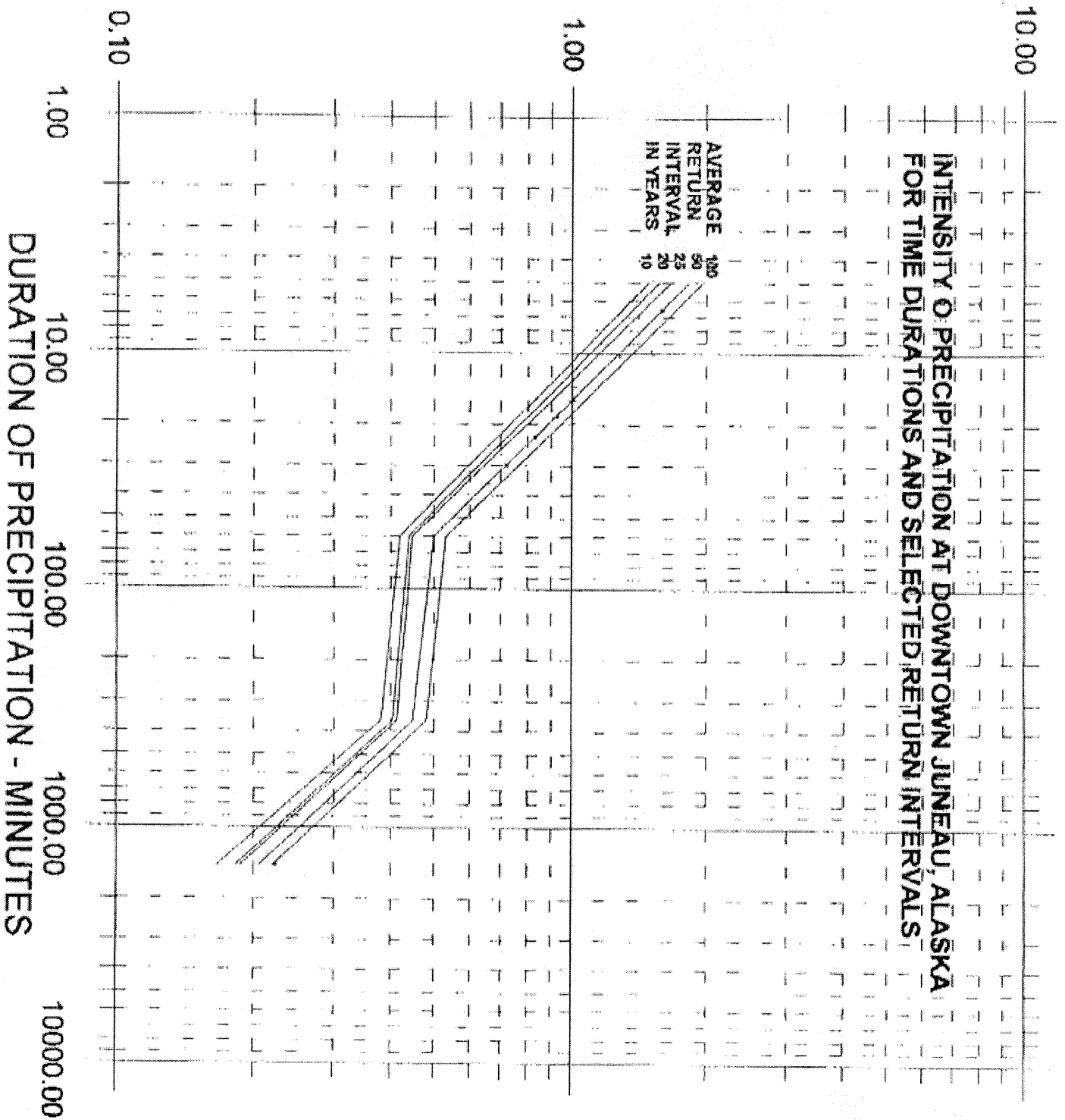
Civil Tools for Windows

(01-29-1997, 09:18:26)

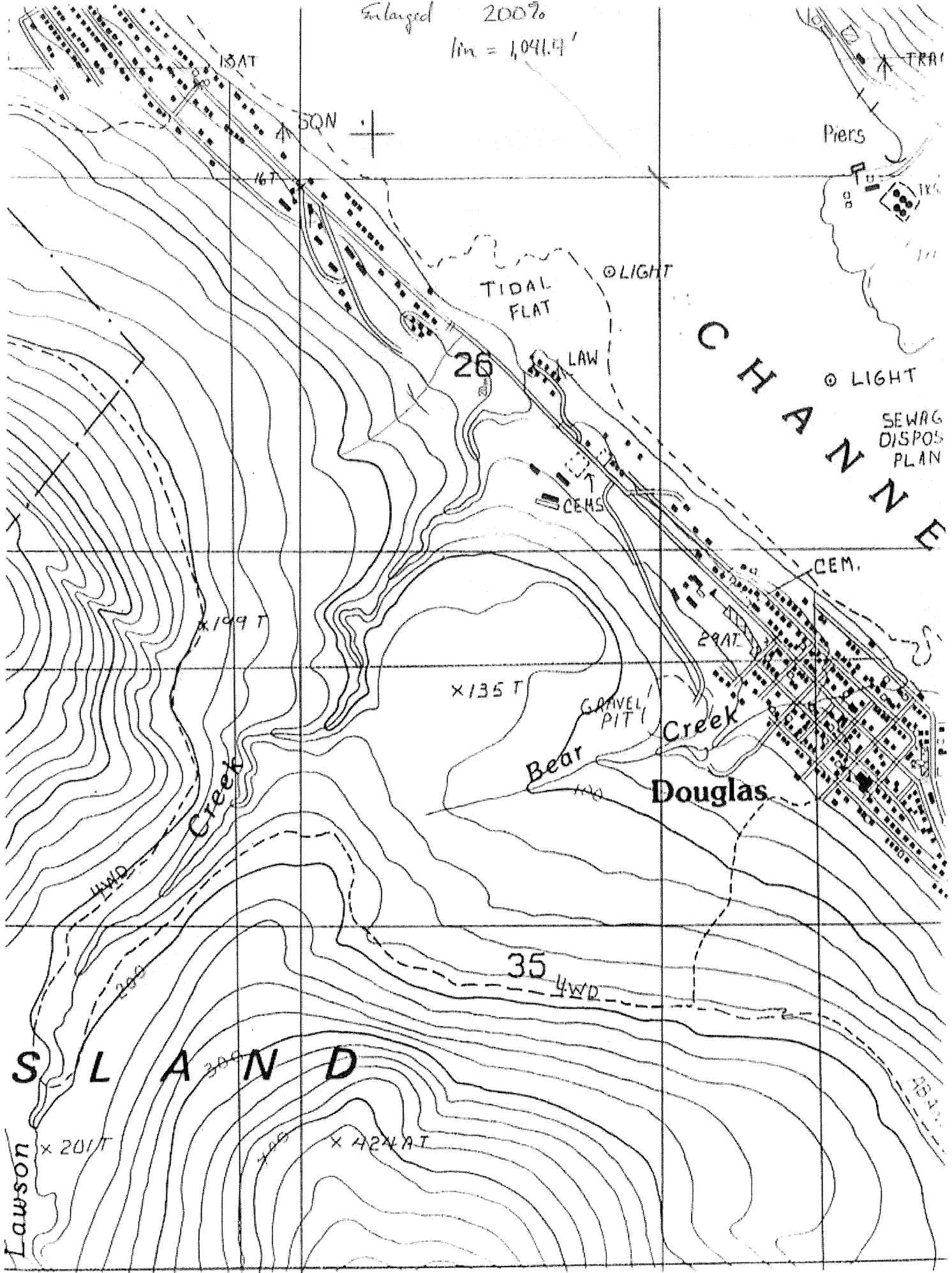
Diameter = 48 in
Length = 97 ft
Friction Coeff = .01
Ent+Exit Coeff = 1.5
Inlet Control Coeff = 2
Inv Elev Out = 149.03 ft
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Tailwater Elev = 149.03 ft
Elev Increment = 1 ft

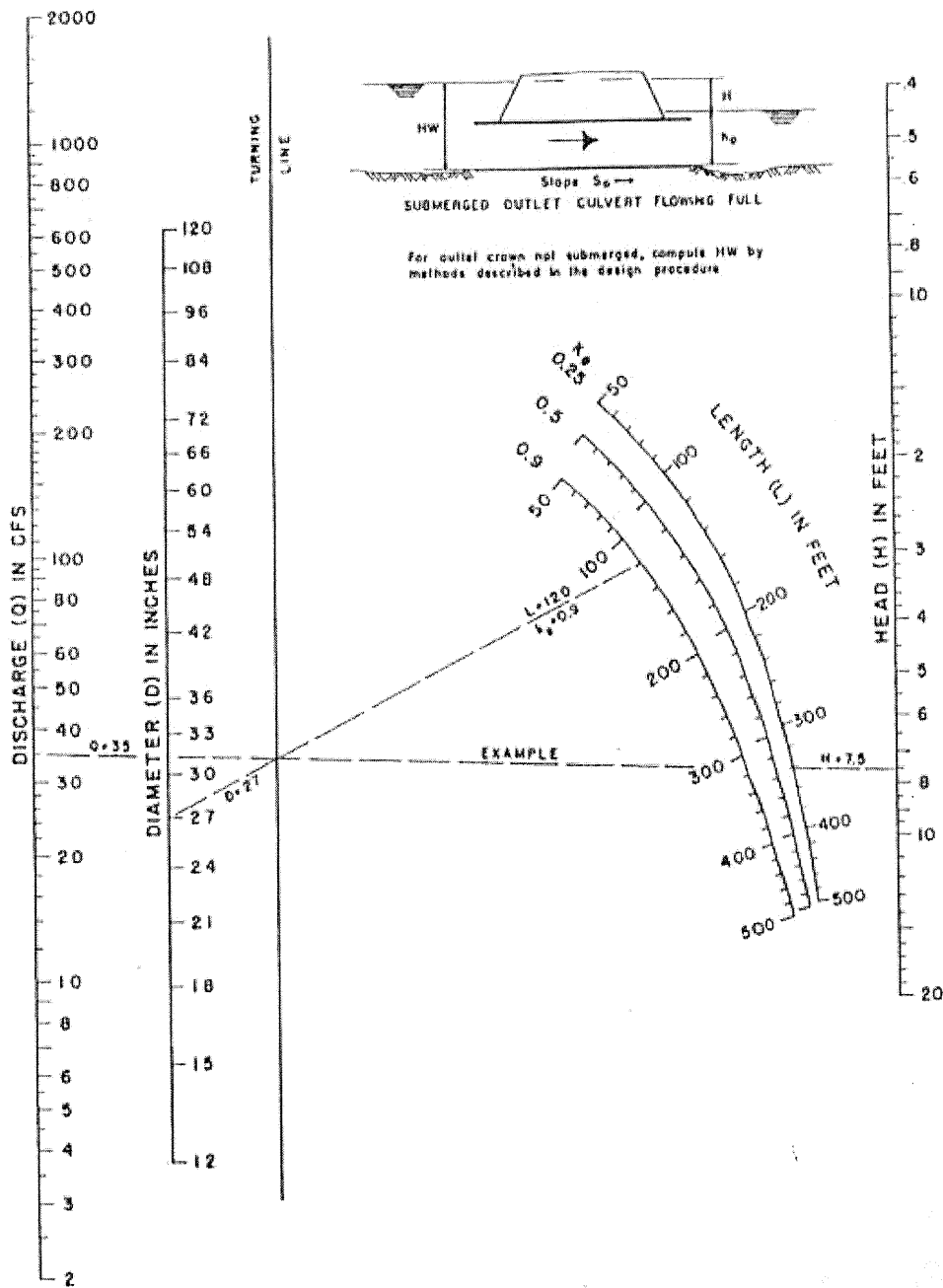
Headwater		Flowrate
ft		cfs
154.00	OC	74.38
155.00	OC	106.00
156.00	OC	130.16
157.00	OC	150.48
158.00	OC	168.37
159.00	OC	184.53
160.00	OC	199.39
161.00	OC	213.22
162.00	OC	226.20
163.00	OC	238.47
164.00	OC	250.15
165.00	OC	261.30 <i>Overtopping Threshold</i>
166.00	OC	271.99
167.00	OC	282.29
168.00	OC	292.21
169.00	OC	301.82

PRECIPITATION INTENSITY - INCHES PER HOUR



Enlarged 200%
1in = 1,041.7'





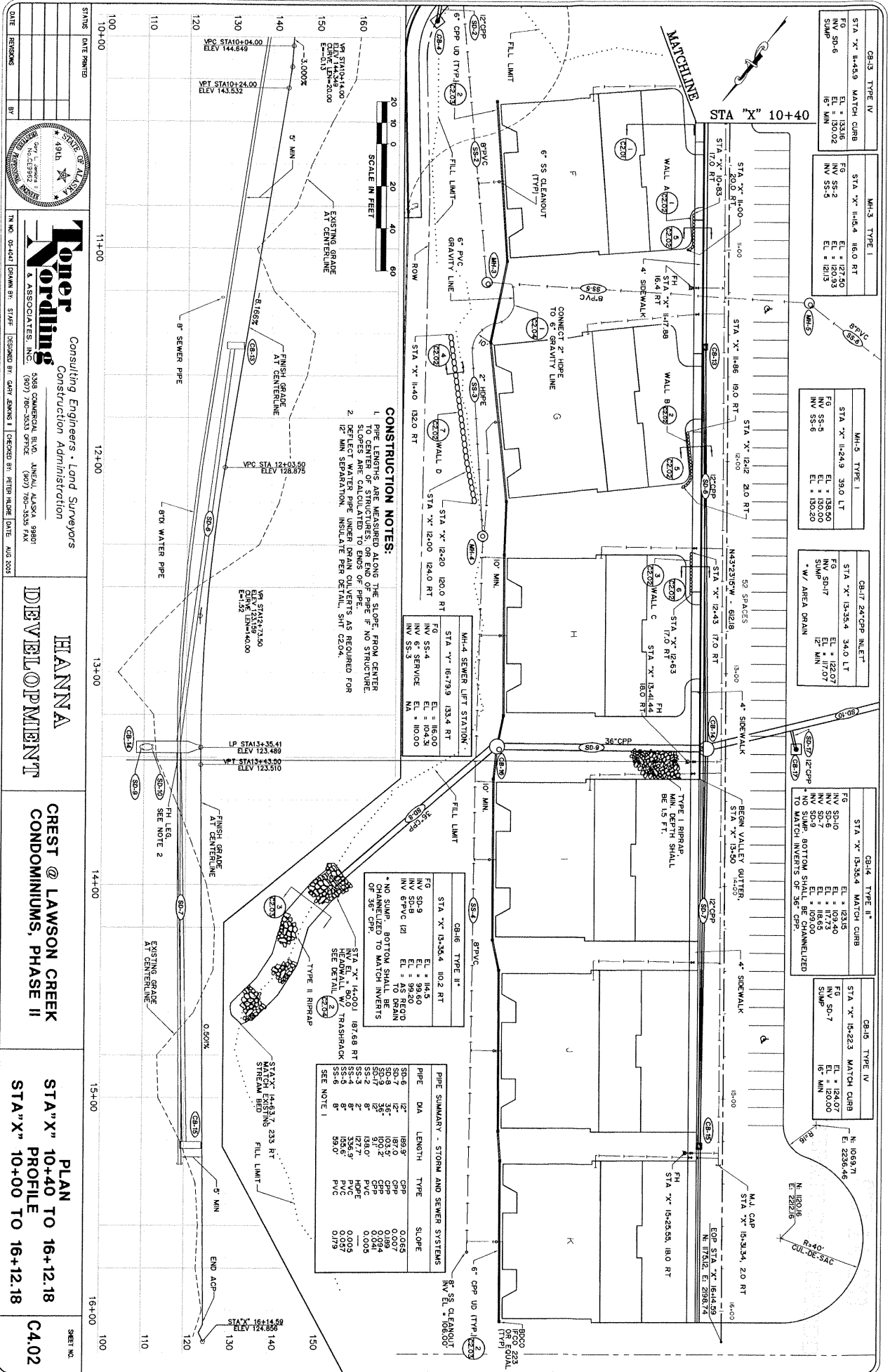
HEAD FOR
STANDARD
C. M. PIPE CULVERTS
FLOWING FULL
 $n = 0.024$

Fig. 2.9.2a Head for standard corrugated metal culverts flowing full ($n = 0.024$)

APPENDIX E:

PREVIOUS FINAL SITE PLAN (2005)

2005
2005
2005



CB13 TYPE IV
STA "X" 14+5.9 MATCH CURB
FG EL = 123.16
INV SD-6 EL = 120.02
INV SS-3 EL = 121.13

MH-3 TYPE I
STA "X" 14+5.4 16.0 RT
FG EL = 127.50
INV SS-2 EL = 120.93
INV SS-3 EL = 121.13

MH-5 TYPE I
STA "X" 14+9.9 39.0 LT
FG EL = 138.90
INV SS-5 EL = 130.00
INV SS-6 EL = 130.20

CB17 24\"/>

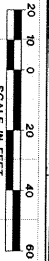
STA "X" 13+35.4 34.0 LT
FG EL = 122.07
INV SD-17 EL = 117.07
INV SS-6 EL = 120.20

CB14 TYPE II *
STA "X" 13+35.4 MATCH CURB
FG EL = 123.15
INV SD-10 EL = 109.40
INV SD-7 EL = 116.65
INV SD-9 EL = 109.00
TO MATCH INVERTS OF 36\"/>

CB16 TYPE IV
STA "X" 15+22.3 MATCH CURB
FG EL = 124.07
INV SD-7 EL = 110.00
INV SS-3 EL = 111.13

STA "X" 14+5.9 23.5 RT
FG EL = 123.16
INV SD-6 EL = 120.02
INV SS-3 EL = 121.13

STA "X" 15+25.5 18.0 RT
FG EL = 123.16
INV SD-6 EL = 120.02
INV SS-3 EL = 121.13



CONSTRUCTION NOTES:
1. THE FINISH GRADE SHALL BE DETERMINED BY THE CITY OF ANCHORAGE. NO STRUCTURE TO SLOPES ARE CALCULATED TO ENDS OF PIPE.
2. DEFLECT WATER PIPE UNDER DRAIN CULVERTS AS REQUIRED FOR 12\"/>

MH-4 SEWER LIFT STATION
STA "X" 16+79.9 15.4 RT
FG EL = 116.00
INV 6\"/>

CB16 TYPE II *
STA "X" 13+35.4 10.2 RT
FG EL = 143.5
INV SD-9 EL = 99.60
INV 6\"/>

PIPE	DA	LENGTH	TYPE	SLOPE
SD-6	12"	189.9'	CPP	0.055
SD-7	12"	187.0'	CPP	0.007
SD-9	36"	100.5'	CPP	0.094
SD-7	12"	51.0'	CPP	0.041
SD-7	12"	127.7'	HPE	0.009
SD-4	8"	336.9'	PVC	0.057
SD-6	12"	59.0'	PVC	0.019

DATE: _____ BY: _____

REVISIONS:

STATE: _____ DATE PRINTED: _____

100 110 120 130 140 150 160

Toner Engineering, Inc.
Consulting Engineers • Land Surveyors
Construction Administration

5308 COMMERCIAL BLDG. JUNEAU, ALASKA 99801
(907) 786-3533 OFFICE (907) 786-3535 FAX

TH. NO. 05-4421 DRAWN BY: STAFF DESIGNED BY: CARY JAMON | CHECKED BY: RETRO NADRE DATE: AUG 2003

SHEET NO. _____

HANNA DEVELOPMENT

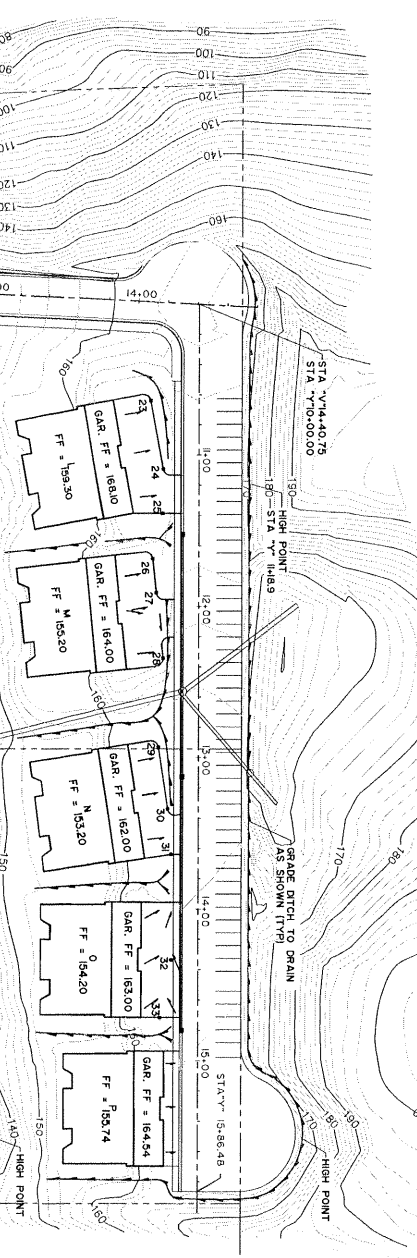
CREST @ LAWSON CREEK CONDOMINIUMS, PHASE II

PLAN STA "X" 10+00 TO 16+12.18

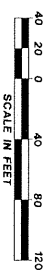
C4.02

GRADING PLAN

PT. NO.	NORTHINGS	EASTINGS	ELEVATION	DESCRIPTION
1	764.60	2617.90	141.30	PL
2	779.90	2501.99	141.50	PL
3	803.24	2374.76	141.40	PL
4	814.44	2254.32	132.60	PL
5	846.93	2234.83	132.60	PL
6	889.56	2309.50	132.60	PL
7	932.64	2328.06	132.60	PL
8	975.72	2347.77	132.60	PL
9	1018.80	2367.48	132.60	PL
10	1061.88	2387.19	132.60	PL
11	1104.96	2406.90	132.60	PL
12	1148.04	2426.61	132.60	PL
13	1191.12	2446.32	132.60	PL
14	1234.20	2466.03	132.60	PL
15	1277.28	2485.74	132.60	PL
16	1320.36	2505.45	132.60	PL
17	1363.44	2525.16	132.60	PL
18	1406.52	2544.87	132.60	PL
19	1449.60	2564.58	132.60	PL
20	1492.68	2584.29	132.60	PL
21	1535.76	2604.00	132.60	PL
22	1578.84	2623.71	132.60	PL
23	1621.92	2643.42	132.60	PL
24	1665.00	2663.13	132.60	PL
25	1708.08	2682.84	132.60	PL
26	1751.16	2702.55	132.60	PL
27	1794.24	2722.26	132.60	PL
28	1837.32	2741.97	132.60	PL
29	1880.40	2761.68	132.60	PL
30	1923.48	2781.39	132.60	PL
31	1966.56	2801.10	132.60	PL
32	2009.64	2820.81	132.60	PL
33	2052.72	2840.52	132.60	PL



- NOTES:
1. FINISH GRADE AROUND ALL BUILDINGS SHALL BE SLOPED DOWN AT 2% FOR A MINIMUM OF 5 FEET.
 2. FINISH GRADE NEXT TO BUILDINGS SHALL BE 6 INCHES BELOW THE TOP OF THE FOUNDATION WALL.
 3. SEE TYPICAL PARKING LOT SECTION ON SHEET C2.01 FOR ADDITIONAL DIMENSIONS AND FINISHES.
 4. REFER TO THE ABOVE MENSURATION PLANS, SHEETS A-6 AND A-7, FOR TYPICAL GRADING PROFILE NEXT TO BUILDINGS.
 5. SWALES BETWEEN BUILDINGS SHALL BE GRADED TO FLOW AS SHOWN.
 6. STABILIZE CUT AND FILL SLOPES WITH TOPSOIL, SEEDING AND STABILIZATION BLANKETS, AS REQUIRED BY THE EROSION AND SEDIMENT CONTROL PLAN.



STATUS DATE PERMITTED

DATE REVISIONS

BY

Toner Jordins
Consulting Engineers • Land Surveyors
Construction Administration

5285 COMMERCIAL BLDG. JUNEAU, ALASKA 99801
(907) 586-3333 OFFICE (907) 758-5853 FAX

IN NO. 04-0401 DRAWN BY: STAFF DESIGNED BY: GARY JENNIS & ASSOCIATES, INC. CHECKED BY: PETER M. DEANE DATE: AUG 2003

HANNA DEVELOPMENT

CREST @ LAWSON CREEK CONDOMINIUMS, PHASE II

SITE GRADING PLAN FINISHED CONTOURS AND HOR/VERT CONTROL

SHEET NO. **C4.04**

APPENDIX F:

APPROVED WETLAND PERMIT

APPROVED
FEB 21 2023
WETLAND PERMIT



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
REGULATORY DIVISION
P.O. BOX 22270
JUNEAU, ALASKA 99802

7/30/2013

Regulatory Division
POA-2009-1187

Mr. David Hanna
JLC Properties Inc.
P.O. Box 20834
Juneau, Alaska 99802

Dear Mr. Hanna:

This is in response to your March 27, 2013, application for a Department of the Army (DA) permit, to place fill into waters of the U.S. in association with the construction of a 40 unit housing development. It has been assigned file number POA-2009-1187, Lawson Creek which should be referred to in all future correspondence with this office. The project site is located within Section 26, T. 41 S., R. 67 E., Copper River Meridian; USGS Quad Map Juneau B-2; Latitude 58.285523° N., Longitude 134.415374° W.; located at Vista Drive, on Douglas Island, in Juneau, Alaska.

The authorized work includes the placement of fill into 0.035 acres of forested wetlands, placing 710 linear feet of perennial stream into a culvert, redirecting and filling 881 linear feet, 0.05 acres, of intermittent stream, and the placement of 50 cubic yards of riprap below the plane of the ordinary high water mark of the perennial stream to reduce water velocities and prevent erosion.

DA permit authorization is necessary because your project will involve placement of fill material into waters of the U.S. under our regulatory jurisdiction.

Based upon the information and plans you provided, we hereby verify that the work described above, which would be performed in accordance with the enclosed plan (sheets 1-8), dated 7/8/2013, is authorized by Nationwide Permit (NWP) No. 29, Residential Developments. NWP No. 29 and its associated Regional and General Conditions can be accessed at our website at: www.poa.usace.army.mil/Missions/Regulatory/Permits.aspx. Regional Condition **E** applies to your project. You must comply with all terms and conditions associated with NWP No. 29.

Further, please note General Condition 30 requires that you submit a signed certification to us once any work and required mitigation are completed. Enclosed is the form for you to complete and return to us.

This verification is valid until March 18, 2017, unless the NWP is modified, reissued, or revoked. It is incumbent upon you to remain informed of changes to the NWPs. Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

<http://www.poa.usace.army.mil/Missions/Regulatory.aspx>

Please contact me via email at Matthew.T.Brody@usace.army.mil, by mail at the address above, or by phone at (907) 790-4493, if you have questions or to request paper copies of the jurisdictional determination, regional and/or general conditions.

Sincerely,

Matthew Brody
Regulatory Specialist

Enclosures

CF:

South - Juneau

ADF&G-DH
ADNR-DMLW
ADEC
USFWS
NMFS
EPA
CBJ
Tlingit & Haida Indian Tribes
Douglass Indian Association

RECEIVED
2003
07/24/03

Enclosure



**US Army Corps of Engineers
Alaska District**

Permit Number: POA-2009-1187

Name of Permittee: David Hanna

Date of Issuance: 7/30/2013

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to Mr. Matthew Brody at the following address:

U.S. Army Corps of Engineers
Alaska District
Regulatory Division
P.O. Box 22270
Juneau, Alaska 99802

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above-referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

RECEIVED
07/31/13
15:00:00

CREST @ LAWSON CREEK CONDOMINIUMS, PHASE II

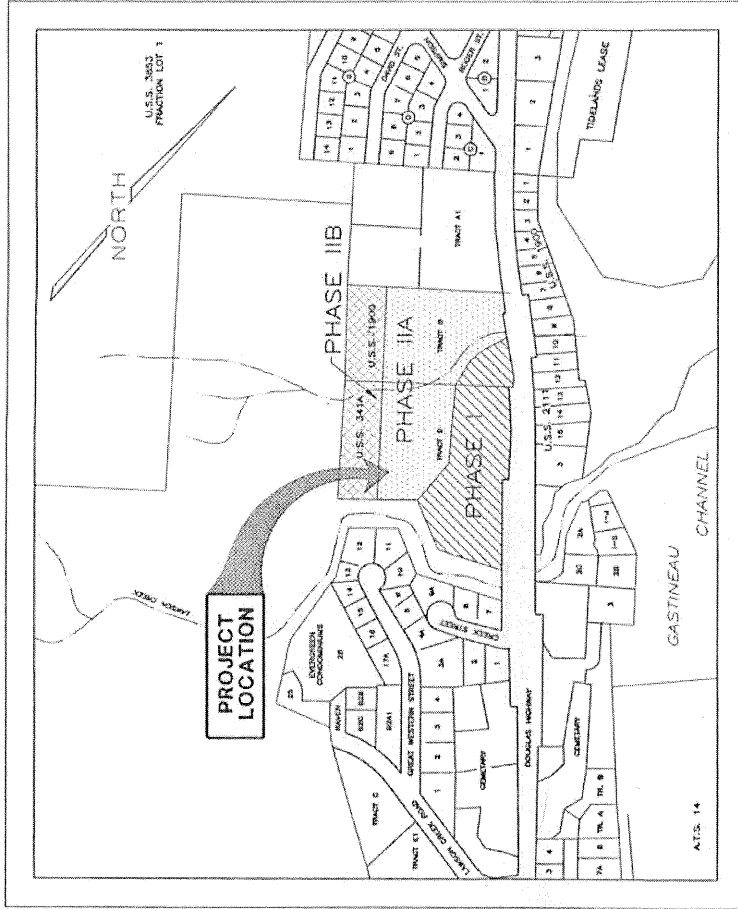
**Koner
Kordling**
& ASSOCIATES, INC.

CONSULTING ENGINEERS
LAND SURVEYORS
CONSTRUCTION ADMINISTRATION

FOR
HANNA
DEVELOPMENT

APPROVED BY _____ SHEET NO.
DIRECTOR OF PUBLIC WORKS
SIGNATURE _____ DATE _____
CHIEF ENGINEER
SIGNATURE _____ DATE _____

G1.01



VICINITY MAP

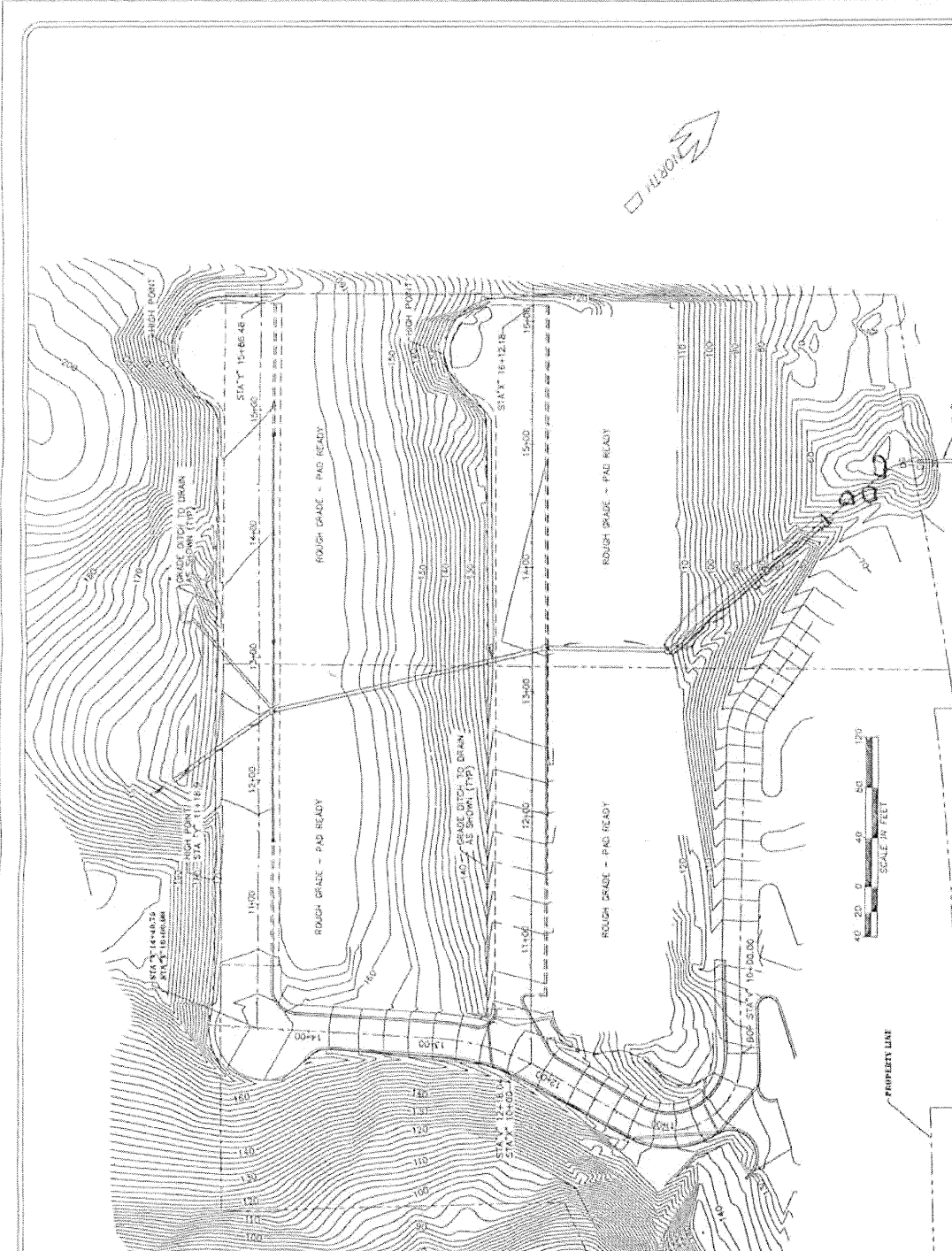
INDEX

DESCRIPTION	SHEET NO.
COVER SHEET	G1.01
LEGEND, ABBREVIATIONS, GENERAL NOTES AND CATCH BASIN FRAME AND GRATE TABLE	C1.01
TYPICAL SECTIONS ESTIMATE OF QUANTITIES	C2.01
ROCKERY WALL DETAILS	C2.02
DETAILS	C2.03-2.04
EXISTING TOPOGRAPHY AND UTILITIES	C3.01
PLAN B.O.P. TO STA "V" 14+80 STA "X" 10+00 TO 10+40 STA "Y" 10+00 TO 10+55 PROFILE B.O.P. TO STA "V" 14+80	C4.01
PLAN STA "X" 10+40 TO 10+12.18 PROFILE STA "X" 10+00 TO 10+12.18	C4.02
PLAN STA "Y" 10+55 TO "Y" 15+66.48 AND PROFILE STA "Y" 10+00 TO "Y" 15+66.48	C4.03
SITE GRADING PLAN, FINISHED CONTOURS AND HOR/VERT CONTROL	C4.04
LINE "V" CROSS SECTIONS	C5.01-5.03
LINE "X" CROSS SECTIONS	C5.04-5.06
PARKING LOT GRADING DETAIL	C6.01
EROSION CONTROL PLAN	C7.01
LANDSCAPING PLAN	C8.01

GRADING PLAN

P.L. NO.	POINTING	ELEVATION	DESCRIPTION
1	764.90	2071.80	P.L.
2	803.24	2276.78	P.L.
3	805.31	2300.15	P.L.
4	834.23	2374.83	P.L.
5	877.46	2508.14	P.L.
6	873.25	2492.58	P.L.
7	873.25	2492.58	P.L.
8	884.74	2574.65	P.L.
9	932.84	2844.77	P.L.
10	932.84	2844.77	P.L.
11	932.84	2844.77	P.L.
12	932.84	2844.77	P.L.
13	932.84	2844.77	P.L.
14	932.84	2844.77	P.L.
15	932.84	2844.77	P.L.
16	932.84	2844.77	P.L.
17	932.84	2844.77	P.L.
18	932.84	2844.77	P.L.
19	932.84	2844.77	P.L.
20	932.84	2844.77	P.L.
21	932.84	2844.77	P.L.
22	932.84	2844.77	P.L.
23	932.84	2844.77	P.L.
24	932.84	2844.77	P.L.
25	932.84	2844.77	P.L.
26	932.84	2844.77	P.L.
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28	932.84	2844.77	P.L.
29	932.84	2844.77	P.L.
30	932.84	2844.77	P.L.
31	932.84	2844.77	P.L.
32	932.84	2844.77	P.L.
33	932.84	2844.77	P.L.

- NOTES:**
1. FINISH GRADE AROUND ALL BUILDINGS SHALL BE SLOPED DOWN AT 2% FOR A MINIMUM OF 5 FEET.
 2. FINISH GRADE NEXT TO BUILDINGS SHALL BE 6 INCHES BELOW THE TOP OF THE FOUNDATION.
 3. FINISH GRADE NEXT TO DRIVE SHALL BE SHOWN ON DRIT COLOR FOR ADDITIONAL PARKING LOT GRADING INFORMATION.
 4. REFER TO THE ARCHITECTURAL PLANS, SHEETS A-6 AND A-7, FOR TYPICAL GRADING PROFILES NEXT TO BUILDINGS.
 5. SWALES BETWEEN BUILDINGS SHALL BE GRADED TO FLOW AS SHOWN.
 6. STABILIZED CUT AND FILL SLOPES WITH EROSION PROTECTION SHALL BE SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN.



FORCH KOPPIUS
A. ASSOCIATES, P.A.C.

Consulting Engineers • Land Surveyors
Construction Administration

3048 COMMERCIAL BLVD. ANCHORAGE, ALASKA 99503
(907) 780-5525 OFFICE (907) 780-3303 FAX

P.L. NO. 04-04 DRAWN BY: EMT CHECKED BY: REYB REVISION DATE: MAY 2002

HANNA DEVELOPMENT

CREST @ LAWSON CREEK CONDOMINIUMS, PHASE II

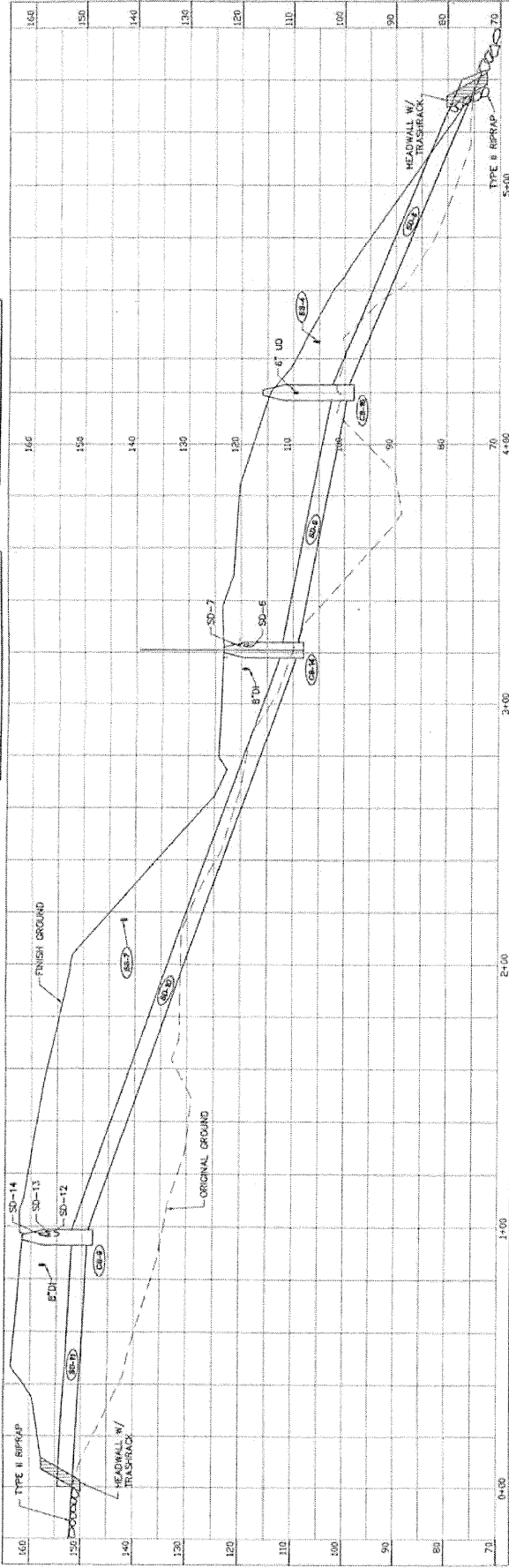
SEE PLAN
C4.04

SITE GRADING PLAN
FINISHED CONTOURS
AND HOR/VERT CONTROL

CE-9 TYPE 8		
STA. "X" 12-56.4	MATCH CURS	
FG	EL	161.46
INV SD-9	EL	149.06
INV SD-2	EL	154.43
INV SD-4	EL	156.31
INV SD-14	EL	156.31
* NO SWAMP, BOTTOM CHANNELIZE TO MATCH INVERTS OF 36" CPP		
** SEE DETAILS		

CE-4 TYPE 8*		
STA. "X" 12-55.4	MATCH CURS	
FG	EL	133.45
INV SD-6	EL	127.73
INV SD-7	EL	126.80
INV SD-10	EL	126.80
* NO SWAMP, BOTTOM CHANNELIZE TO MATCH INVERTS OF 36" CPP		

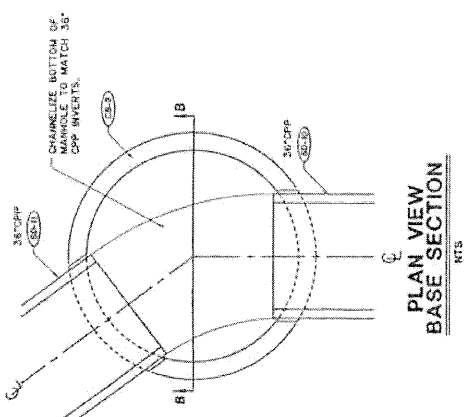
CE-4 TYPE II*		
STA. "X" 12-30.4	10.2 FT	
FG	EL	144.5
INV SD-8	EL	146.60
INV SD-6	EL	146.60
INV SD-8	EL	146.60
* NO SWAMP, BOTTOM CHANNELIZE TO MATCH INVERTS OF 36" CPP		



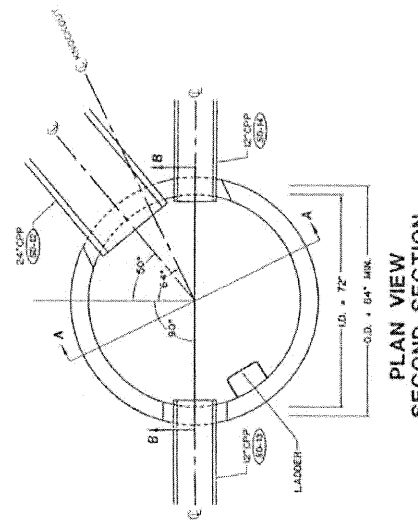
STATUS: DATE PRINTED DATE:	SHEET NO. C6.01	LIANNA DEVELOPMENT CREST @ LAWSON CREEK CONDOMINIUMS, PHASE II STORM DRAIN PROFILE	CONSULTING ENGINEERS • LAND SURVEYORS Korner Nordling Construction Administration 6356 COMMERCIAL BLVD. ANCHORAGE, ALASKA 99501 (907) 766-3533 OFFICE (907) 766-3533 FAX TITLE: DRAWN BY: DATE: CHECKED BY: PETER REUSE DATE: AUG 2006
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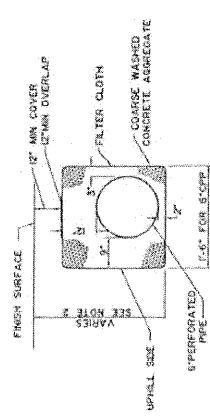
010
2008.08.20



PLAN VIEW
BASE SECTION
NTS

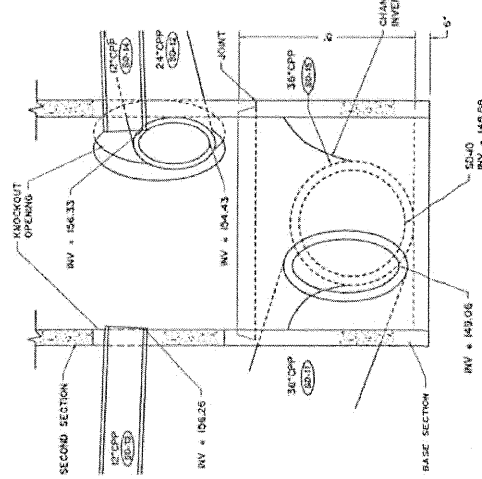


PLAN VIEW
SECOND SECTION
NTS

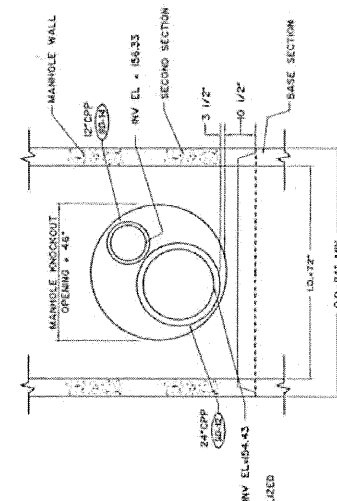


STANDARD UNDERDRAIN
NTS

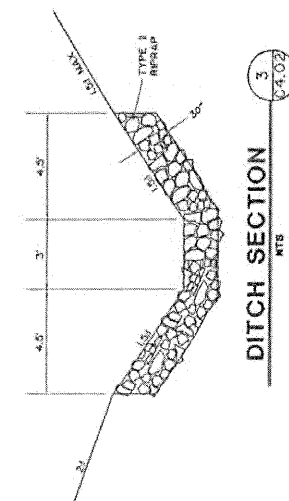
- NOTES:
- 1) THIS DETAIL TO BE USED FOR THE STOP (NO) PIPE LYING IN FRONT OF THE BUILDINGS.
 - 2) DEPTH AS REQUIRED TO CONNECT OTHER FOOTING DRAINS FROM AROUND BUILDING.
 - 3) OPENING PIPE SO PERFORATIONS ARE NOT IN THE BOTTOM 1/2 OF THE PIPE.



SECTION B-B
NTS



SECTION A-A
NTS



DITCH SECTION
NTS

CATCH BASIN CB-9 DETAILS
NTS

SECTION A-A
NTS

SECTION B-B
NTS

SECTION A-A
NTS

SECTION B-B
NTS

SECTION A-A
NTS

SECTION B-B
NTS

DATE: _____ BY: _____

DATE: _____ BY: _____

DATE: _____ BY: _____

DATE: _____ BY: _____



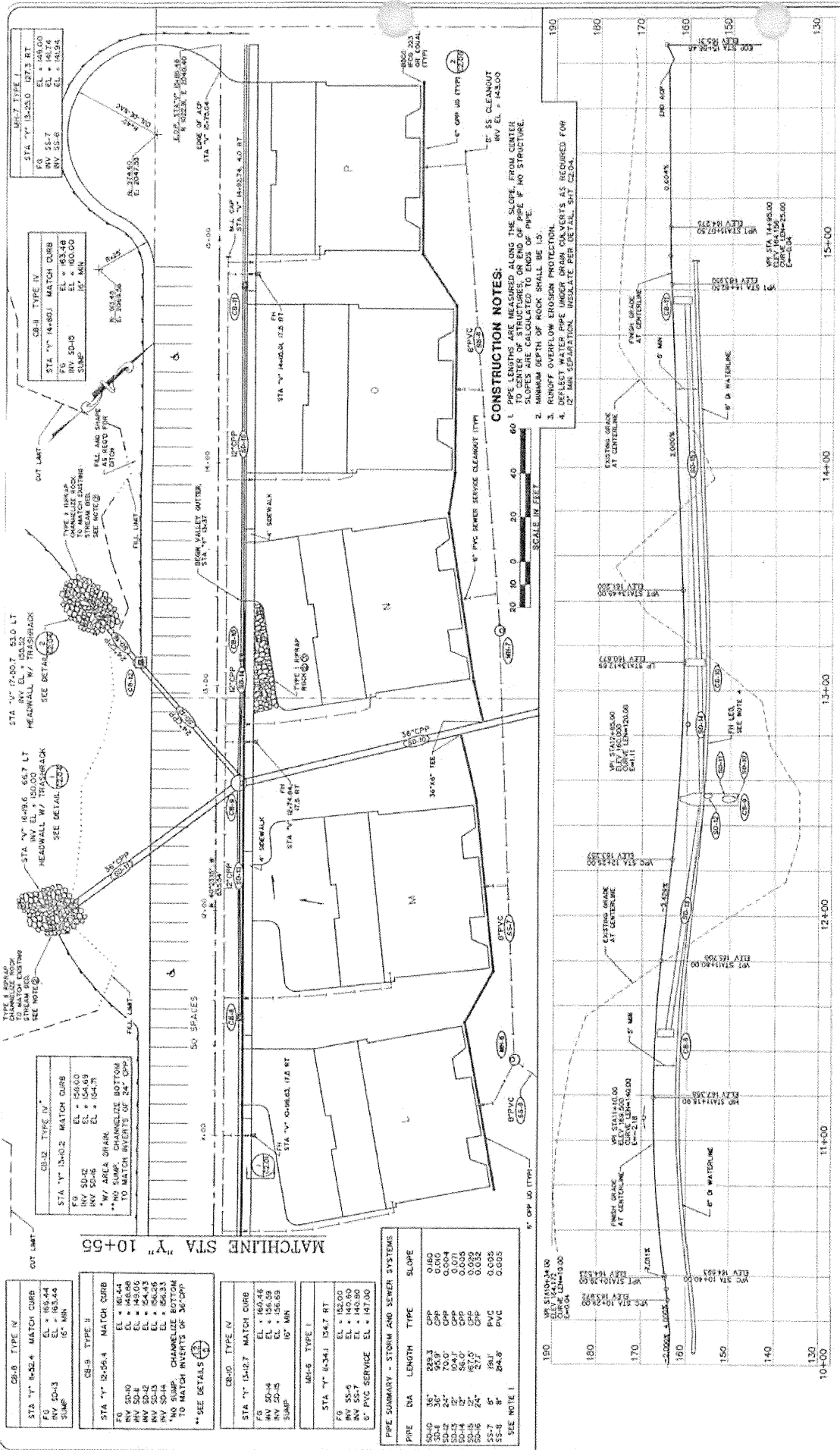
Consulting Engineers - Land Surveyors
Construction Administration
5345 COMMERCIAL BLVD. ANCHORAGE, ALASKA 99501
(907) 786-3333 OFFICE (907) 786-3335 FAX
DESIGNED BY: GARY JENNIS & CHECKED BY: PETER KORDING DATE: AUG 2008

CREST @ LAWSON CREEK
CONDOMINIUMS, PHASE II

HANNA
DEVELOPMENT

DETAILS

SHEET NO.
C2.03



CREST @ LAWSON CREEK CONDOMINIUMS, PHASE II

HANNA DEVELOPMENT

Consulting Engineers & Land Surveyors
Construction Administration

Koier Nordling
300 S. UNIVERSITY AVENUE, SUITE 400
DENVER, COLORADO 80202
(303) 733-3333 FAX (303) 733-3333

DATE PRINTED: _____ BY: _____
DATE: _____

SHEET NO. **C4.03**

PLAN **STA "Y" 10+55 TO "Y" 15+86.48**
AND PROFILE **STA "Y" 10+00 TO "Y" 15+86.48**

DRAWN BY: GARY JAMES & CHECKED BY: PETER HUME | DATE: 8/3/2000
 SCALE: 1" = 20' (PLAN) | 1" = 10' (PROFILE)

CONSTRUCTION NOTES:

- PIPE LENGTHS ARE MEASURED ALONG THE SLOPE FROM CENTER TO CENTER OF STRUCTURES OR END OF PIPE IF NO STRUCTURE.
- SLOPES ARE CALCULATED TO ENDS OF PIPE.
- MINIMUM DEPTH OF ROCK SHALL BE 12".
- ROUND OFF OVERFLOW EROSION PROTECTION.
- NO PIPE SHALL BE UNDER ANY OVERLAYS AS REQUIRED FOR 12" MIN. SEPARATION. INSURE THE PERMITS, SUT. COVER.

CONSTRUCTION NOTES:

- PIPE LENGTHS ARE MEASURED ALONG THE SLOPE FROM CENTER TO CENTER OF STRUCTURES OR END OF PIPE IF NO STRUCTURE.
- SLOPES ARE CALCULATED TO ENDS OF PIPE.
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CONSTRUCTION NOTES:

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- ROUND OFF OVERFLOW EROSION PROTECTION.
- NO PIPE SHALL BE UNDER ANY OVERLAYS AS REQUIRED FOR 12" MIN. SEPARATION. INSURE THE PERMITS, SUT. COVER.

CONSTRUCTION NOTES:

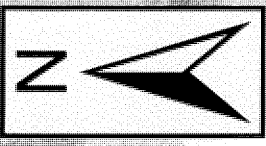
- PIPE LENGTHS ARE MEASURED ALONG THE SLOPE FROM CENTER TO CENTER OF STRUCTURES OR END OF PIPE IF NO STRUCTURE.
- SLOPES ARE CALCULATED TO ENDS OF PIPE.
- MINIMUM DEPTH OF ROCK SHALL BE 12".
- ROUND OFF OVERFLOW EROSION PROTECTION.
- NO PIPE SHALL BE UNDER ANY OVERLAYS AS REQUIRED FOR 12" MIN. SEPARATION. INSURE THE PERMITS, SUT. COVER.

CONSTRUCTION NOTES:

- PIPE LENGTHS ARE MEASURED ALONG THE SLOPE FROM CENTER TO CENTER OF STRUCTURES OR END OF PIPE IF NO STRUCTURE.
- SLOPES ARE CALCULATED TO ENDS OF PIPE.
- MINIMUM DEPTH OF ROCK SHALL BE 12".
- ROUND OFF OVERFLOW EROSION PROTECTION.
- NO PIPE SHALL BE UNDER ANY OVERLAYS AS REQUIRED FOR 12" MIN. SEPARATION. INSURE THE PERMITS, SUT. COVER.

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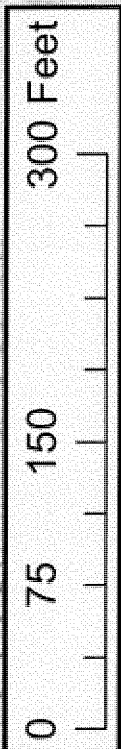
POA-2009-1187
JLC Properties



Legend

Stream

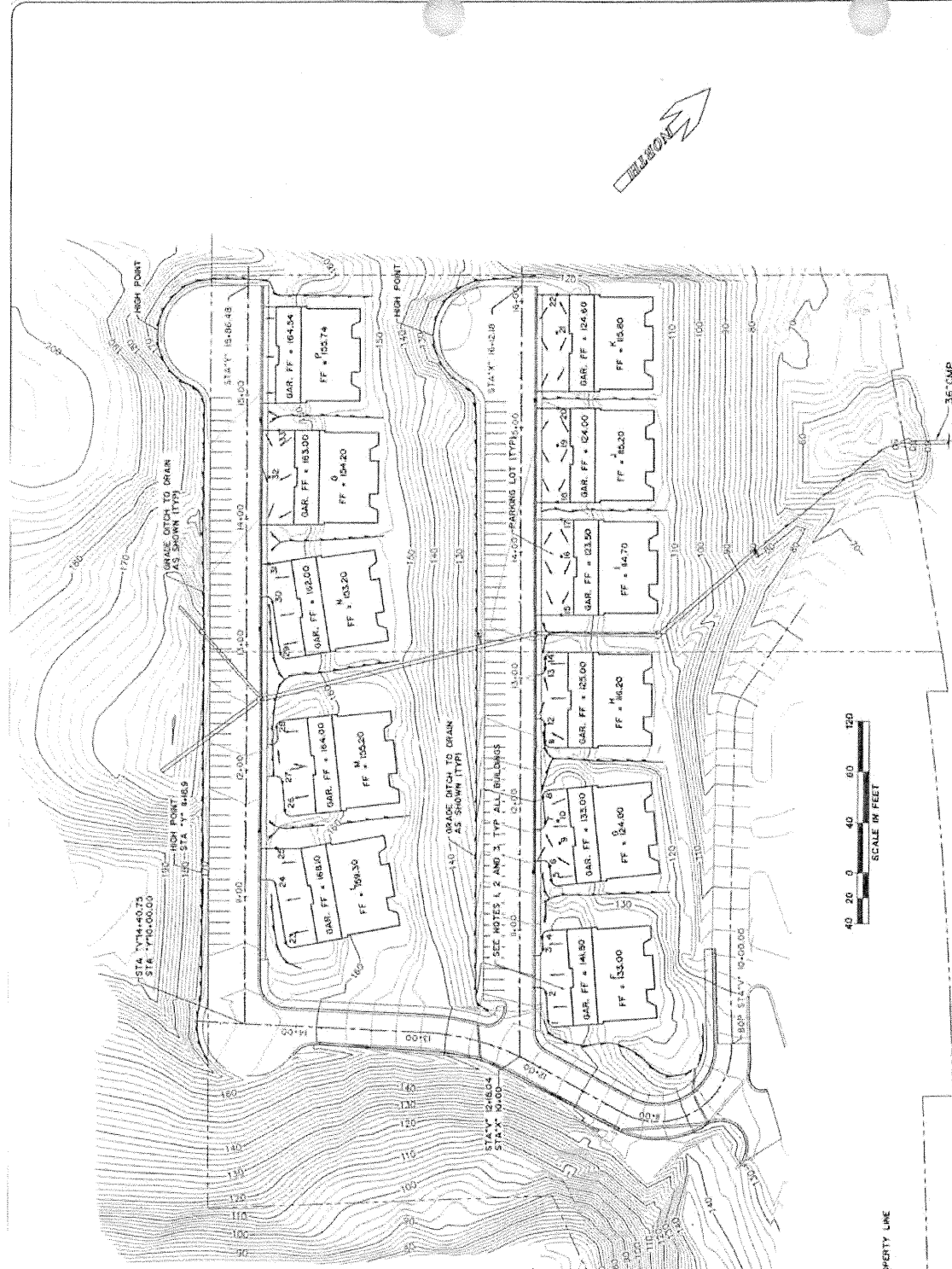
- Intermittent
- Perennial
- Stream_2
- Culvert



POA-2009-1187, JLC Properties, Lawson Creek
July 8, 2013, Page 7 of 8

PT. NO.	HORIZONTAL ELEVATION	DESCRIPTION
1	141.500	PL
2	141.500	PL
3	141.500	PL
4	141.500	PL
5	141.500	PL
6	141.500	PL
7	141.500	PL
8	141.500	PL
9	141.500	PL
10	141.500	PL
11	141.500	PL
12	141.500	PL
13	141.500	PL
14	141.500	PL
15	141.500	PL
16	141.500	PL
17	141.500	PL
18	141.500	PL
19	141.500	PL
20	141.500	PL
21	141.500	PL
22	141.500	PL
23	141.500	PL
24	141.500	PL
25	141.500	PL
26	141.500	PL
27	141.500	PL
28	141.500	PL
29	141.500	PL
30	141.500	PL
31	141.500	PL
32	141.500	PL
33	141.500	PL

- NOTES:**
1. FINISH GRADE AROUND ALL BUILDINGS SHALL BE SLOPED DOWN AT 2% FOR A MINIMUM OF 5 FEET.
 2. FINISH GRADE NEXT TO BUILDING WALL SHALL BE 1% UP TO THE TOP OF THE FOUNDATION WALL.
 3. REFER TO ARCHITECTURAL PLANS, SHEETS A-4 AND A-7, FOR TYPICAL GRADING PROFILE NEXT TO BUILDINGS.
 4. SWALES BETWEEN BUILDINGS SHALL BE GRADED TO FLOW TO STABILIZE CUT AND FILL SLOPES WITH TOPSOIL, SEEDS AND STABILIZATION BLANKETS, AS INDICATED BY THE EROSION AND SEDIMENT CONTROL PLAN.



GRADING PLAN

CREST @ LAWSON CREEK CONDOMINIUMS, PHASE II

SITE GRADING PLAN FINISHED CONTOURS AND HOR/VERT CONTROL

HANNA DEVELOPMENT

40 20 0 40 80 120
SCALE IN FEET

36 CAMP

Robert Nordling
Consulting Engineers & Land Surveyors
Construction Administration
1005 COMMERCIAL BLVD. JAMES HANNA OFFICE
(907) 760-5533 FAX
(907) 760-5533 FAX

DATE **REVISION** **BY**

DATE: 08-14-08 DRAWN BY: STAFF CHECKED BY: GARY EMMES DESIGNED BY: WETTER, JAMES DATE: AUG 2008

RECEIVED
SEP 24 2008
PROJECT CERTIFIED