

CITY OF ELK GROVE
STANDARD CONSTRUCTION SPECIFICATIONS
TABLE OF CONTENTS

SECTION 1 - TERMS AND DEFINITIONS

1-1	GENERAL.....	1
1-2	ABBREVIATIONS	1
1-3	DEFINITIONS.....	3

SECTION 2 - BID REQUIREMENTS AND CONDITIONS

2-1	BID FORM.....	9
2-1.01	UNIT PRICE BID	9
2-1.02	LUMP SUM BID	9
2-1.03	ALLOWANCES.....	9
2-2	PREPARATION AND SUBMISSION OF BIDS	10
2-3	EXAMINATIONS OF PLANS, SPECIFICATIONS, AND SITE OF WORK.....	10
2-4	SUBSURFACE CONDITIONS.....	11
2-5	CONTRACTORS/SUBCONTRACTORS REQUIRED TO BE LICENSED.....	11
2-6	COMPETENCY OF BIDDERS.....	11
2-7	JOINT VENTURE BIDS	12
2-8	SUBCONTRACTORS	12
2-9	ADDENDA	13
2-10	ASSIGNMENT OF ANTITRUST ACTIONS.....	13
2-11	BID GUARANTEE	13
2-12	WITHDRAWAL OF BID.....	13
2-13	PUBLIC OPENING OF BIDS.....	13
2-14	REJECTION OF BIDS	14
2-15	RELIEF OF BIDDERS	14

SECTION 3 - AWARD AND EXECUTION OF CONTRACT

3-1	AWARD OF CONTRACT	15
3-2	TIME OF AWARD	15
3-3	CONSIDERATION OF BIDS.....	15
3-4	PERFORMANCE AND PAYMENT BONDS	15
3-4.01	PERFORMANCE BOND	16
3-4.02	PAYMENT BOND.....	16
3-5	NOTIFICATION OF SURETY COMPANIES	16
3-6	RETURN OF BID GUARANTEES	16
3-7	EXECUTION OF CONTRACT	16
3-8	FAILURE TO EXECUTE CONTRACT	17
3-9	INSURANCE.....	17
3-9.01	GENERAL LIABILITY	17
3-9.02	AUTOMOBILE LIABILITY	18
3-9.03	WORKERS' COMPENSATION	18
3-9.04	EXCESS OR UMBRELLA LIABILITY.....	18

3-9.04.A	CONTRACTOR'S EQUIPMENT	18
3-9.04.B	RAILROAD PROTECTIVE LIABILITY.....	18
3-9.04.C	BUILDER'S RISK INSURANCE	19
3-9.04.D	ENVIRONMENTAL LIABILITY INSURANCE.....	20
3-9.04.E	OTHER PROVISIONS	20
3-9.05	NOTIFICATION OF ACCIDENT OR OCCURRENCE.....	22

SECTION 4 -SCOPE OF WORK

4-1	INTENT OF CONTRACT DOCUMENTS.....	23
4-2	PLANS AND SPECIFICATIONS FURNISHED.....	23
4-3	CONFORMANCE WITH CODES AND STANDARDS.....	24
4-4	SUPPLEMENTAL DRAWINGS.....	24
4-5	FIELD INSTRUCTIONS OR OTHER WRITTEN DIRECTIVES	24
4-6	DOCUMENT PRECEDENCE.....	25
4-7	REQUESTS FOR INFORMATION.....	25
4-7.01	GENERAL.....	25
4-7.02	PROCEDURE	25
4-7.03	RESPONSE	26
4-8	DELETED ITEMS	26
4-9	EXTRA WORK.....	26
4-10	USE OF COMPLETED PORTIONS	26
4-11	LANDS AND RIGHTS-OF-WAY	27
4-12	WARRANTY.....	27

SECTION 5 - CONTROL OF WORK AND MATERIALS

5-1	AUTHORITY OF CITY	28
5-2	ATTENTION AND COOPERATION OF CONTRACTOR	28
5-3	SUGGESTIONS TO CONTRACTOR	28
5-4	SEPARATE CONTRACTS.....	28
5-5	COOPERATION WITH OTHER CONTRACTORS.....	28
5-6	CONTRACTOR'S DISMISSAL OF UNSATISFACTORY EMPLOYEES	29
5-7	CONTRACTOR'S EQUIPMENT	29
5-8	CONTRACTOR'S SUBMITTALS	29
5-8.01	SUBMITTALS - GENERAL.....	29
5-8.02	RESUBMITTALS	30
5-8.03	SUBMITTALS CONTAINING PROPRIETARY INFORMATION	30
5-8.04	ELECTRICAL, INSTRUMENTATION, CONTROL, AND COMMUNICATION SYSTEMS.....	31
5-8.05	MAINTENANCE AND OPERATIONS (M&O) SUBMITTALS	31
5-9	SURVEYS.....	32
5-9.02	STREETS AND HIGHWAYS	32
5-9.03	SEWER, WATER, AND DRAINAGE FACILITIES	33
5-9.04	SURVEY MONUMENTS.....	33
5-10	RESPONSIBILITY FOR ACCURACY	33
5-11	DUTIES AND POWERS OF INSPECTORS	33
5-12	INSPECTION.....	34
5-13	QUALITY OF MATERIALS AND WORKMANSHIP	34
5-14	SUBSTITUTIONS	34

5-14.01	WRITTEN REQUEST	35
5-14.02	DOCUMENTATION.....	35
5-15	PREPARATION FOR TESTING.....	35
5-16	MATERIALS SAMPLING AND TESTING	35
5-17	APPROVAL OF MATERIALS	36
5-17.01	SOURCES OF SUPPLY	36
5-17.02	PLANT INSPECTION.....	36
5-18	PROVISIONS FOR EMERGENCIES	36
5-19	RIGHT TO RETAIN IMPERFECT WORK	37
5-20	REMOVAL OF REJECTED MATERIALS OR WORK.....	37
5-21	TEMPORARY SUSPENSION OR DELAY OF WORK	37
5-22	TERMINATION OF CONTRACT.....	37
5-22.01	REASONS FOR TERMINATION	37
5-22.01.A	CONTRACTOR BANKRUPT.....	37
5-22.01.B	COMPLETION DELAY	38
5-22.01.C	ABANDONMENT AND UNSATISFACTORY PERFORMANCE.....	38
5-22.01.D	TERMINATION OF CONTRACT FOR CONVENIENCE.....	38
5-22.02	NOTICE OF TERMINATION	38
5-22.03	PAYMENTS TO CONTRACTOR UPON TERMINATION OF CONTRACT.....	39
5-22.04	CITY COMPLETION	40
5-22.04.A	PAYMENT FOR CITY COMPLETION	40
5-22.04.B	CITY COMPLETION NOT A WAIVER OF CITY RIGHTS.....	40
5-23	TERMINATION OF UNSATISFACTORY SUBCONTRACTS	41

SECTION 6 – LEGAL RELATIONS AND RESPONSIBILITIES

6-1	COMPLIANCE WITH LAWS AND REGULATIONS	42
6-1.01	HOURS OF LABOR	42
6-1.02	PREVAILING WAGE	42
6-1.03	PAYROLL RECORDS.....	43
6-1.04	NONDISCRIMINATION.....	43
6-1.05	APPRENTICES	43
6-1.06	WORKERS' COMPENSATION.....	44
6-1.07	FAIR LABOR STANDARDS	44
6-1.08	CONTRACTORS LICENSE	44
6-1.09	USE OF PESTICIDES	44
6-1.10	REPORTING REQUIREMENTS AND SANCTIONS	44
6-1.11	SUBCONTRACTING.....	45
6-1.12	OCCUPATIONAL SAFETY AND HEALTH	45
6-2	INDEMNIFICATION	45
6-2.01	CONTRACTOR'S PERFORMANCE	45
6-2.02	NO LIMITATION OF LIABILITY FOR INDEMNIFICATION	46
6-3	CONTRACTOR'S LEGAL ADDRESS.....	46
6-4	CONTRACTOR NOT AN AGENT OF CITY.....	46
6-5	SUBSTITUTION OF SUBCONTRACTORS	46
6-6	ASSIGNMENT OF CONTRACT	47
6-7	ASSIGNMENT OF MONIES	47
6-8	PROTECTION OF CITY AGAINST PATENT CLAIMS.....	47

6-9	RESPONSIBILITY OF THE CONTRACTOR.....	47
6-10	PERMITS AND LICENSES	48
6-11	GENERAL SAFETY REQUIREMENTS.....	48
6-11.01	COMPLIANCE WITH SAFETY & HEALTH REGULATIONS.....	48
6-11.02	24-HOUR CONTACT INFORMATION.....	49
6-11.03	WORK DURING HOURS OF DARKNESS	49
6-12	PUBLIC CONVENIENCE AND SAFETY	49
6-12.01	PUBLIC CONVENIENCE.....	49
6-12.02	PEDESTRIAN AND BICYCLIST ACCESS.....	49
6-12.03	WRITTEN NOTIFICATION TO RESIDENCES AND BUSINESSES.....	50
6-12.04	ACCESS TO DRIVEWAYS, HOUSES AND BUILDINGS	50
6-12.05	PROPERTY DAMAGE.....	50
6-12.06	ERCTION OF SIGNS TO EXPEDITE PASSAGE OF VEHICLES.....	50
6-12.07	TRAFFIC OBSTRUCTIONS, DELAYS AND INCONVENIENCES	51
6-12.08	WORK ON PRIVATE PROPERTY	51
6-12.09	HAZARDOUS CONDITIONS CREATED	51
6-13	PUBLIC SAFETY AND TRAFFIC CONTROL	51
6-13.01	GENERAL.....	51
6-13.02	RESPONSIBILITY FOR SAFETY	51
6-13.03	PASSAGE OF EMERGENCY VEHICLES	51
6-13.04	FURNISHING, INSTALLING, AND MAINTAINING TRAFFIC CONTROLS	52
6-13.05	INADEQUATE TRAFFIC CONTROLS AND AFTER- HOUR MAINTENANCE AND REPAIRS	52
6-13.06	COMPETENT FLAGGERS	52
6-13.07	CONSTRUCTION SIGNS.....	52
6-13.08	TEMPORARY BRIDGING OF EXCAVATIONS AND TRENCHES.....	53
6-13.09	ENTERING AND LEAVING THE CONSTRUCTION ZONE	53
6-13.10	EXISTING TRAFFIC SIGNAL AND LIGHTING SYSTEMS, SIGNS AND PAVEMENT MARKINGS.....	54
6-13.11	BUS STOPS.....	54
6-13.12	DUST.....	54
6-13.13	REMOVAL OF SPILLAGE FROM ROADWAY	54
6-14	TRAFFIC CONTROL PLANS (TCP)	54
6-14.01	TRAFFIC PATTERN CHANGES	54
6-14.02	TRAFFIC CONTROL PLANS (TCP)	55
6-15	BARRICADING OPEN TRENCHES.....	55
6-16	EXISTING UTILITIES	55
6-16.01	GENERAL.....	55
6-16.02	MAINTENANCE AND PROTECTION	55
6-16.03	EXACT LOCATIONS UNKNOWN.....	56
6-16.04	UNDERGROUND SERVICE ALERT (USA)	56
6-16.05	DAMAGE TO EXISTING UTILITIES.....	57
6-16.06	MARKINGS.....	57
6-17	APPROVAL OF CONTRACTOR'S PLANS NO RELEASE FROM LIABILITY	58

6-18	CONTRACTOR SHALL NOT MORTGAGE EQUIPMENT	58
6-19	PROPERTY RIGHTS IN MATERIALS.....	58
6-20	EXCAVATION AND TRENCH SAFETY.....	59
6-20.01	PERMIT	59
6-20.02	SHORING, BRACING, SHIELDING AND SHEETING	59
6-21	PRESERVATION OF PROPERTY.....	59
6-22	OVERLOADING	60

SECTION 7 – PROSECUTION OF THE WORK

7-1	BEGINNING OF WORK	61
7-2	AMOUNT OF WORK UNDER CONSTRUCTION	61
7-3	PRECONSTRUCTION CONFERENCE AND PROGRESS MEETINGS.....	61
7-4	WORK TO BE PROSECUTED WITH ADEQUATE SUPERVISION, LABOR FORCE, EQUIPMENT AND METHODS	61
7-4.01	SUPERINTENDENCE	61
7-4.02	LABOR	62
7-4.03	EQUIPMENT AND METHODS.....	62
7-5	SCHEDULES.....	62
7-5.01	PROGRESS SCHEDULE	62
7-5.02	CPM SCHEDULE	63
7-5.03	THREE-WEEK ROLLING SCHEDULE.....	64
7-6	UNUSUAL SITE CONDITIONS.....	64
7-7	PURSUANCE OF WORK DURING INCLEMENT WEATHER.....	64
7-8	PEAK HOURS, HOURS OF DARKNESS, HOLIDAYS, AND WEEKENDS	65
7-8.01	ALLOWABLE TIMES AND HOURS OF WORK.....	65
7-8.02	OFF-PERIOD WORK.....	65
7-8.03	EMERGENCY REPAIRS	65
7-8.04	REVOCATION OF PERMISSION FOR OFF-PERIOD WORK	65
7-8.05	WORKING SHIFTS	65
7-8.06	LANE AND ROAD CLOSURES DURING NOVEMBER/DECEMBER HOLIDAY SEASON	66
7-9	TEMPORARY FACILITIES AND SERVICES	66
7-10	PROTECTION OF WORK, PERSONS AND PROPERTY	66
7-11	PROOF OF COMPLIANCE WITH CONTRACT	66
7-12	DELAYS	66
7-12.01	AVOIDABLE DELAYS.....	66
7-12.02	UNAVOIDABLE DELAYS	67
7-13	NOTICE OF DELAYS.....	67
7-14	CARELESS DESTRUCTION OF STAKES AND MARKS NO CAUSE FOR DELAY	68
7-15	TIME OF COMPLETION	68
7-16	EXTENSION OF TIME NOT A WAIVER	68
7-17	INCLEMENT WEATHER AND CONTRACT TIME	68
7-18	EXTENSION OF TIME	68
7-19	SUBSTANTIAL COMPLETION	69
7-20	CLEANING UP.....	69

7-21	FINAL INSPECTION AND FIELD ACCEPTANCE	69
7-22	FINAL ACCEPTANCE AND NOTICE OF	
	COMPLETION	70
7-23	RELEASE OF WARRANTY PERIOD	70

SECTION 8 – MEASUREMENT AND PAYMENT

8-1	BASIS AND MEASUREMENT OF PAYMENT	
	QUANTITIES	71
8-1.01	UNIT PRICE CONTRACTS.....	71
8-1.02	LUMP SUM OR JOB CONTRACTS	71
8-1.03	PAYMENT FOR MOBILIZATION	71
8-1.03.A	MOBILIZATION NOT A PAY ITEM.....	71
8-1.03.B	MOBILIZATION A PAY ITEM	71
8-2	SCOPE OF PAYMENT.....	72
8-2.01	GENERAL.....	72
8-2.02	UNIT PRICE CONTRACT	72
8-2.03	LUMP SUM OR JOB CONTRACT	73
8-2.04	FINAL PAY ITEMS.....	73
8-2.05	ALLOWANCES.....	73
8-2.06	PAYMENT FOR MATERIAL NOT INCORPORATED IN THE WORK	73
8-3	WORK TO BE DONE WITHOUT DIRECT PAYMENT.....	73
8-4	PAYMENT FOR USE OF COMPLETED PORTIONS OF WORK.....	73
8-5	PROGRESS PAYMENT PROCEDURES	74
8-6	INSPECTION AND PROGRESS PAYMENTS NOT A WAIVER OF CONTRACT PROVISIONS.....	74
8-7	RETENTION	74
8-7.01	RETENTION TO ENSURE PERFORMANCE.....	74
8-7.02	NON-COMPLIANCE.....	74
8-7.03	SUBSTITUTION OF SECURITIES	74
8-8	WITHHOLDINGS/DENIAL OF PROGRESS PAYMENT REQUEST	75
8-9	DEDUCTIONS FOR IMPERFECT WORK	76
8-10	LIQUIDATED DAMAGES FOR DELAY.....	76
8-11	FINAL ESTIMATE AND PAYMENT	76
8-12	FINAL PAYMENT TO TERMINATE LIABILITY OF CITY OF ELK GROVE.....	76
8-13	DISPUTED PAYMENTS.....	77

SECTION 9 – CHANGES AND CLAIMS

9-1	AUTHORITY FOR CHANGES	78
9-2	ORDERING OF CHANGES	78
9-3	CONSTRUCTION INCENTIVE CHANGE PROPOSAL (CICP).....	78
9-3.01	GENERAL	78
9-3.02	DESCRIPTION.....	78
9-3.03	SUBMITTAL.....	79
9-3.04	ACCEPTANCE	80
9-3.05	SHARING PROVISIONS AND FORMULA	80
9-4	CHANGES TO THE CONTRACT	80
9-5	PROSECUTION OF CHANGES TO THE CONTRACT	80
9-6	COST AND PRICING DATA.....	81

9-7	ACCESS TO RECORDS	81
9-8	PAYMENT FOR CHANGES.....	81
9-8.01	LUMP SUM PRICE	81
9-8.02	UNIT PRICES.....	81
9-8.03	FORCE ACCOUNT.....	82
9-8.03.A	LABOR	82
9-8.03.A.(1)	ACTUAL WAGES.....	82
9-8.03.A.(2)	LABOR SURCHARGE.....	82
9-8.03.A.(3)	SUBSISTENCE AND TRAVEL	82
9-8.03.B	MATERIALS.....	83
9-8.03.C	EQUIPMENT.....	83
9-8.03.D	SUBCONTRACTS	83
9-9	MARKUPS FOR CHANGED WORK	83
9-10	COMPENSABLE UNAVOIDABLE DELAYS	84
9-10.01	CONSTRUCTION EQUIPMENT	84
9-10.02	JOBSITE INDIRECT COSTS.....	84
9-10.03	MARKUP FOR COMPENSABLE UNAVOIDABLE DELAYS	85
9-10.04	DUPLICATED OVERHEAD COSTS.....	85
9-11	LIMITATIONS ON PAYMENTS FOR CHANGED WORK	85
9-12	TIME EXTENSIONS FOR CHANGES	85
9-13	EFFECT ON SURETIES OF CHANGES TO THE WORK	85
9-14	CONTRACT CHANGE ORDER (CCO).....	85
9-15	ACCEPTANCE OF ORDERS FOR CHANGES.....	85
9-16	DISPUTE REGARDING CONTRACT REQUIREMENTS	86
9-17	NOTICE OF POTENTIAL CLAIM	86
9-18	RESOLUTION OF CLAIMS	86
9-18.01	CONTRACTOR'S DUTY DURING CLAIM RESOLUTION	88
9-19	ENGINEER'S DECISION	88
9-20	ALTERNATIVE DISPUTE RESOLUTION.....	89
9-20.01	INITIATION OF MEDIATION	89
9-20.02	REQUEST FOR MEDIATION	89
9-20.03	SELECTION OF MEDIATOR.....	89
9-20.04	QUALIFICATIONS OF A MEDIATOR	89
9-20.05	VACANCIES.....	89
9-20.06	REPRESENTATION	89
9-20.07	TIME AND PLACE OF MEDIATION	90
9-20.08	IDENTIFICATION OF MATTERS IN DISPUTE.....	90
9-20.09	AUTHORITY OF MEDIATOR	90
9-20.10	PRIVACY	90
9-20.11	CONFIDENTIALITY	90
9-20.12	NO STENOGRAPHIC RECORD	91
9-20.13	TERMINATION OF MEDIATION	91
9-20.14	EXCLUSION OF LIABILITY	91
9-20.15	INTERPRETATION AND APPLICATION OF THESE MEDIATION PROVISIONS	91
9-20.16	EXPENSES	91
9-21	NO ALTERNATIVE CLAIMS PROCEDURE	91
9-22	ASSIGNMENT OF CLAIMS.....	91

SECTION 10 – ENVIRONMENTAL CONTROLS AT WORK SITE

10-1	DUST CONTROL	92
10-2	AIR POLLUTION CONTROL.....	92
10-3	BURNING.....	92
10-4	EROSION, SEDIMENT, AND WATER POLLUTION CONTROL	92
10-4.01	GENERAL.....	92
10-4.02	CITY REQUIREMENTS	92
10-4.03	REGULATIONS, ORDINANCES, PERMITS, AND SPECIFICATIONS	93
10-4.04	STORMWATER POLLUTION PREVENTION PLAN	93
10-4.05	EROSION AND SEDIMENT CONTROL PLAN.....	95
10-4.06	MINIMUM CITY REQUIREMENTS	95
10-4.07	COMPLIANCE	96
10-4.08	PAYMENT.....	96
10-5	CONTROL OF WATER IN THE WORK.....	96
10-6	NOISE CONTROL.....	97
10-7	CONTAMINATED AND HAZARDOUS MATERIALS OR ENVIRONMENTS	97
10-7.01	CONTAMINATED OR HAZARDOUS MATERIALS.....	97
10-7.02	HAZARDOUS ENVIRONMENTS	97
10-8	USE OF EXPLOSIVES	97
10-9	SANITARY REGULATIONS.....	97
10-10	CONFINED SPACES	98
10-10.01	CONTRACTOR RESPONSIBILITIES AND QUALIFICATIONS	98
10-10.02	CITY RESPONSIBILITIES FOR PERMIT CONFINED SPACES.....	98
10-10.03	EXISTING SEWERS AND STORM DRAINS.....	99
10-10.04	JOINT CITY – CONTRACTOR ENTRIES.....	99
10-11	CLEANING UP.....	99
10-12	ARCHEOLOGICAL AND CULTURAL RESOURCES	99
10-13	PROTECTION OF EXISTING TREES	100

SECTION 11 – RECORD DRAWINGS

11-1	GENERAL.....	101
11-2	RESERVED	101
11-3	AS BUILT DRAWINGS (AS BUILTS)	101

SECTION 12 – CONSTRUCTION AREA TRAFFIC CONTROL

12-1	GENERAL.....	102
12-2	FLAGGING.....	102
12-2.01	FLAGGERS.....	102
12-2.02	FLAGGING COSTS	102
12-3	TRAFFIC-HANDLING EQUIPMENT AND DEVICES	103
12-3.01	GENERAL.....	103
12-3.02	CHANGEABLE MESSAGE SIGNS (CMS)	103
12-3.02.A	MESSAGE REQUIREMENTS:	103
12-3.02.B	PLACEMENT:	104
12-3.02.C	TAMPER PROOF:	104
12-3.03	CONES.....	104
12-3.04	PORTABLE CHANNELIZERS	105
12-3.05	TELESCOPING FLAG TREES.....	105

12-3.06	PORTABLE FLASHING BARRICADES.....	105
12-3.07	BARRICADES	106
12-3.07.A	MATERIALS.....	106
12-3.07.B	INSTALLATION AND MAINTENANCE.....	106
12-3.07.B.(1)	CONSTRUCTION BARRICADES.....	106
12-3.07.B.(2)	PERMANENT BARRICADES.....	107
12-3.08	FLASHING ARROW SIGN (FAS).....	107
12-3.09	CONSTRUCTION AREA SIGNS.....	107
12-3.09.A	GENERAL REQUIREMENTS	107
12-3.09.B	COVERING SIGNS.....	108
12-3.09.C	CLEANING SIGNS.....	108
12-3.09.D	USED SIGNS	108
12-3.09.E	REPLACEMENT AND BACKUP SIGNS.....	108
12-3.09.F	STOPPING OR PARKING PROHIBITION (TOW-AWAY ZONE).....	108
12-3.09.G	PROTECTION, MAINTENANCE, REMOVAL, STORAGE, AND RESETTING OF SIGNS	108
12-3.09.H	MOVEMENT OF TRAFFIC SIGNS AND TRAFFIC CONTROL FACILITIES	109
12-3.09.I	"ROAD CONSTRUCTION AHEAD (C-18)" AND "END OF CONSTRUCTION (C-13)" SIGNS	109
12-3.09.J	CONTRACTOR FURNISHED SIGNS.....	109
12-3.09.K	OBSCURING VISIBILITY AND CONFLICTING WITH MEANING	109
12-3.09.L	PERMANENT CONSTRUCTION SIGNS.....	109
12-3.09.M	REMOVAL OF PERMANENT TRAFFIC CONTROL SIGNS.....	110
12-3.09.N	REGULATORY SIGN PLACEMENT AND REMOVAL	110
12-3.09.O	SIGN POSTS	111
12-4	MEASUREMENT AND PAYMENT	111

SECTION 13 -EXISTING FACILITIES

13-1	GENERAL.....	112
13-2	REMOVING EXISTING FACILITIES.....	112
13-2.01	MAILBOXES.....	112
13-2.02	SIGNS.....	113
13-2.03	SURVEY MONUMENTS.....	113
13-2.04	LANDSCAPING IMPROVEMENTS	113
13-2.05	ABANDONED UNDERGROUND FACILITIES	113
13-2.06	DRAINAGE FACILITIES	113
13-2.07	FENCES	114
13-2.08	CONCRETE.....	114
13-3	MEASUREMENT AND PAYMENT	114

SECTION 14 - RESTORATION OF SURFACES

14-1	GENERAL.....	116
14-2	PRIVATE ROADS	116
14-3	STREETS AND PARKING LOTS.....	116
14-3.01	AGGREGATE BASE	116
14-3.02	ASPHALT CONCRETE	116
14-3.03	SEAL COATS.....	117
14-3.04	SHOULDERS	117
14-3.05	CUTS IN NEW PAVEMENT.....	117

14-4	CONCRETE.....	117
14-5	PAVEMENT MARKINGS	118
14-6	TEMPORARY PAVING.....	118
14-7	MEASUREMENT AND PAYMENT	118

SECTION 15 - CLEARING AND GRUBBING

15-1	GENERAL.....	120
15-1.01	VEGETATION AND DEBRIS	120
15-1.02	TREES, SHRUBS, GROUND COVER, AND LAWNS	120
15-1.03	DISPOSAL AND SALVAGE	121
15-1.04	ABANDONMENT OF CONDUITS AND STRUCTURES.....	121
15-1.05	SILT CONTROL.....	122
15-1.06	MISCELLANEOUS	122
15-2	PAYMENT.....	122

SECTION 16 - WATER USED IN CONSTRUCTION

16-1	GENERAL.....	123
16-2	PAYMENT.....	123

SECTION 17 - DUST CONTROL

17-1	GENERAL.....	124
17-2	DUST PALLIATIVE	124
17-3	MEASUREMENT AND PAYMENT	124

SECTION 18 - EARTHWORK

18-1	GENERAL.....	125
18-2	ROADWAY EXCAVATION	125
18-2.01	GENERAL.....	125
18-2.02	UNSUITABLE ROADWAY EXCAVATION AND BACKFILL.....	125
18-2.03	SURPLUS MATERIAL	125
18-2.04	UNSUITABLE MATERIAL IN EMBANKMENTS	125
18-2.05	SUBGRADE PREPARATION`	126
18-2.05A	SUBGRADE SOILS - ROADWAY, CURB AND GUTTER, AND SIDEWALKS	127
18-2.06	MEASUREMENT AND PAYMENT	128
18-3	STRUCTURE EXCAVATION AND BACKFILL	128
18-3.01	GENERAL.....	128
18-3.02	CONTROL DENSITY BACKFILL.....	129
18-3.03	FINAL QUANTITY	129
18-3.04	MEASUREMENT AND PAYMENT	129
18-4	DITCH AND CHANNEL EXCAVATION	129
18-4.01	GENERAL.....	129
18-4.02	GRADE CONTROL - LINED CHANNELS	129
18-4.03	UNSUITABLE DITCH AND CHANNEL EXCAVATION AND BACKFILL	129
18-4.04	UNSUITABLE OR SURPLUS MATERIAL DISPOSAL	129
18-4.05	CHANNEL BACKFILL.....	130
18-4.06	CHANNEL EMBANKMENTS	130
18-4.07	PIPE ADJUSTMENTS	130
18-5	UNSUITABLE MATERIAL EXCAVATION	130
18-5.01	GENERAL.....	130
18-5.02	BACKFILL.....	131

18-5.03	GEOTEXTILE MATERIAL.....	131
18-5.04	APPROXIMATE QUANTITY	131
18-5.05	PAYMENT.....	132
18-6	IMPORTED BORROW.....	132
18-6.01	GENERAL.....	132
18-6.02	AGREEMENTS	133
18-6.03	PLACEMENT	133
18-7	SURPLUS MATERIAL DISPOSAL.....	133
18-7.01	GENERAL.....	133
18-7.02	AGREEMENT.....	133
18-7.03	PERMITS.....	133
18-7.04	PAYMENT.....	134
18-8	CLASS "C" SUBGRADE.....	134
18-8.01	GENERAL.....	134
18-8.02	PREPARATION.....	134
18-8.03	PAYMENT.....	135

SECTION 19 – TRENCH EXCAVATION, BEDDING AND BACKFILL

19-1	TRENCH EXCAVATION.....	136
19-1.01	EXPLORATORY EXCAVATION	136
19-1.02	TRENCH WIDTH	136
19-1.02A	STORM DRAIN PIPE	136
19-1.02B	SEWER PIPE.....	136
19-1.02C	WATER PIPE.....	136
19-1.03	PAVEMENT CUTTING.....	137
19-1.04	MAXIMUM LENGTH OF OPEN TRENCH.....	137
19-1.05	CONTROL OF GROUNDWATER.....	137
19-1.06	SHORING AND BRACING.....	137
19-1.07	SPECIAL FOUNDATION TREATMENT.....	138
19-1.08	EXCAVATION METHOD	139
19-1.09	PAYMENT.....	139
19-2	PIPE BEDDING AND BACKFILLING OF TRENCHES	139
19-2.01	PIPE BEDDING	139
19-2.01.A	SEWER.....	139
19-2.01.B	STORM DRAIN	140
19-2.01.C	WATER DISTRIBUTION SYSTEMS.....	140
19-2.02	INITIAL BACKFILL.....	140
19-2.02.A	STORM DRAIN	140
19-2.02.B	SEWER.....	141
19-2.02.C	WATER DISTRIBUTION SYSTEMS.....	141
19-2.03	INTERMEDIATE BACKFILL.....	141
19-2.03A	CUT OFF COLLARS.....	143
19-2.04	PAYMENT.....	143

SECTION 20 – LANDSCAPING

20-1	GENERAL.....	144
20-2	MATERIALS.....	144
20-2.01	ROOT CONTROL BARRIER.....	144
20-2.02	TOPSOIL.....	144
20-2.03	SOIL AMENDMENT.....	144
20-2.04	LIQUID GREEN DYE.....	144
20-2.05	MULCH	145
20-3	EROSION CONTROL.....	145

20-3.01	SEEDING AND FERTILIZING	145
20-3.02	MEASUREMENT AND PAYMENT	146
20-4	PLANTING.....	146
20-4.01	PESTICIDES	146
20-4.02	PREPARING PLANTING AREAS.....	146
20-4.03	HEADER BOARDS.....	147
20-4.04	PLANTING.....	147
20-4.04.A	PREPARATION FOR GROUND COVERS	149
20-4.04.B	PREPARATION FOR TREES AND SHRUBS	149
20-4.04.C	PREPARATION FOR TURF.....	150
20-4.05	WATERING	151
20-4.06	PLANT REPLACEMENT.....	151
20-4.07	PLANT ESTABLISHMENT WORK	151
20-4.08	INSPECTION FOR PLANT ESTABLISHMENT WORK.....	153
20-4.09	MEASUREMENT AND PAYMENT	153
20-5	IRRIGATION SYSTEMS	153
20-5.01	MAINTAIN EXISTING WATER SUPPLY	153
20-5.02	REMOVE EXISTING PLANTS FOR TRENCHING	154
20-5.03	ELECTRICAL SERVICE FOR ELECTRIC AUTOMATIC IRRIGATION SYSTEMS	154
20-5.03.A	COMPONENTS.....	154
20-5.03.B	CONTROLLERS	154
20-5.03.C	CONTROL WIRE, ELECTRICAL CONDUIT AND PULL BOXES.....	155
20-5.03.D	TESTING	155
20-5.04	INSTALLATION.....	156
20-5.04.A	GENERAL.....	156
20-5.04.B	IRRIGATION SLEEVING	156
20-5.04.C	WATER LINE CROSSOVERS.....	157
20-5.04.D	TRENCHING AND BACKFILLING	157
20-5.05	PIPE	158
20-5.05.A	SUBSURFACE DRIPPER LINE	159
20-5.05.B	VALVES AND VALVE BOXES.....	160
20-5.05.C	QUICK COUPLING VALVE	160
20-5.05.D	BACKFLOW PREVENTERS	160
20-5.05.E	MASTER VALVE/FLOW METER ASSEMBLY	161
20-5.05.F	AIR VACUUM RELIEF VALVE	161
20-5.05.G	FLUSH VALVE.....	161
20-5.05.H	SPRINKLERS AND EMITTERS.....	162
20-5.05.I	PRESSURE TESTING.....	162
20-5.05.J	REPAIRS AND COVERAGE	163
20-5.06	MEASUREMENT AND PAYMENT	163
20-6	AS BUILT DRAWINGS AND CONTROLLER CHARTS	163

SECTION 21 – FINISHING ROADWAY

21-1	GENERAL.....	165
21-2	PAYMENT.....	165

SECTION 22 – BASE MATERIAL

22-1	GENERAL.....	166
------	--------------	-----

SECTION 23 – ASPHALT CONCRETE

23-1	GENERAL.....	167
------	--------------	-----

23-1.01	SUMMARY.....	167
23-1.02	ABBREVIATIONS	167
23-1.03	DEFINITIONS.....	167
23-1.04	SUBMITTALS	168
23-1.04.A	JOB MIX FORMULA	168
23-1.04.B	JOB MIX FORMULA RENEWAL.....	169
23-1.04.C	JOB MIX FORMULA MODIFICATION	169
23-1.04.D	QUALITY CONTROL PLAN.....	169
23-1.04.E	LIQUID ANTISTRIPE TREATMENT	170
23-1.04.F	LIME TREATMENT	170
23-1.04.G	WARM MIX TECHNOLOGY.....	170
23-1.05	QUALITY ASSURANCE.....	170
23-1.05.A	LABORATORIES	170
23-1.05.B	HOT MIX ASPHALT PLANTS.....	170
23-1.05.C	TEST METHODS.....	170
23-1.05.D	JOB MIX FORMULA VERIFICATION	172
23-1.05.E	JOB MIX FORMULA AUTHORIZATION	173
23-1.05.F	JOB MIX FORMULA RENEWAL	173
23-1.05.F	JOB MIX FORMULA MODIFICATION	174
23-1.06	QUALITY CONTROL.....	174
23-1.06.A	GENERAL.....	174
23-1.06.B	AGGREGATES	175
23-1.06.B(1)	GENERAL.....	175
23-1.06.B(2)	GRADATIONS	175
23-1.06.B(3)	LIME TREATMENTS.....	176
23-1.06.C	RECLAIMED ASPHALT PAVEMENT	176
23-1.06.D	LIQUID ANTISTRIPE TREATMENT	176
23-1.06.E	HOT ASPHALT MIXTURES.....	176
23-1.07	DISPUTE RESOLUTION	177
23-2	MIX FORMULA AND DESIGN	177
23-2.01	GENERAL.....	177
23-2.02	REQUIREMENTS	178
23-2.02.A	GENERAL.....	178
23-2.02.B	RECLAIMED ASPHALT PAVEMENT	179
23-2.02.C	HOT MIX ASPHALT TREATMENTS.....	180
23-2.02.D	WARM MIX ASPHALT TECHNOLOGY.....	180
23-3	MATERIALS.....	180
23-3.01	AGGREGATES	180
23-3.01.A	GENERAL.....	180
23-3.01.B	QUALITY	180
23-3.01.C	GRADATIONS	181
23-3.01.D	AGGREGATE LIME TREATMENTS	182
23-3.02	RECLAIMED ASPHALT PAVEMENT	182
23-3.03	ASPHALT BINDER.....	183
23-3.04	LIQUID ANTISTRIPE TREATMENT	183
23-3.05	TACK COAT	183
23-4	PRODUCTION	183
23-4.01	GENERAL.....	183
23-4.02	LIQUID ANTISTRIPE	184
23-4.03	WARM MIX ASPHALT TECHNOLOGY.....	184
23-4.04	PRODUCTION START-UP EVALUATION	184
23-5	CONSTRUCTION.....	185
23-5.01	GENERAL.....	185

23-5.02	EQUIPMENT.....	186
23-5.02.A	SPREADING EQUIPMENT	186
23-5.02.B	MATERIAL TRANSFER VEHICLE.....	187
23-5.03	SURFACE PREPARATION.....	187
23-5.04	TACK COAT	187
23-5.05	PLACEMENT	189
23-5.05.A	GENERAL.....	189
23-5.05.B	PRE-OVERLAY PREPARATION.....	190
23-5.05.C	LONGITUDINAL JOINTS.....	191
23-5.06	COMPACTION.....	192
23-5.07	SMOOTHNESS	192
23-5.08	HMA DENSITY.....	193
23-5.08.A	TEST STRIP	193
23-5.08.B	IN-PLACE DENSITY	193
23-6	ACCEPTANCE	193
23-6.01	GENERAL.....	193
23-6.02	HMA DENSITY.....	197
23-7	MEASUREMENT AND PAYMENT	198
23-7.01	MEASUREMENT.....	198
23-7.02	PAYMENT.....	198

SECTION 24 – SIDE FORMS AND HEADERS

24-1	GENERAL.....	199
24-2	FORM JOINTS	199
24-3	TIMBER SIDE FORMS	199
24-4	METAL SIDE FORMS	199
24-5	FORM MAINTENANCE	200
24-6	PAYMENT.....	200

SECTION 25 – PORTLAND CEMENT CONCRETE PAVEMENT

25-1	GENERAL.....	201
25-2	SUBGRADE.....	201
25-3	SIDE FORMS.....	201
25-4	CONCRETE CUTTING.....	201
25-5	EXPANSION JOINTS IN ALLEY PAVEMENT	201
25-6	PLACING CONCRETE PAVEMENT	201
25-7	FINISHING CONCRETE PAVEMENT	202
25-8	CURING PORTLAND CEMENT CONCRETE PAVEMENT.....	202
25-9	PROTECTION OF PAVEMENT	202
25-10	PAVEMENT DAMAGE AND REPAIR	202
25-11	MEASUREMENT.....	203
25-12	PAYMENT.....	203

SECTION 26 – COLD PLANE ASPHALT CONCRETE PAVEMENT

26-1	GENERAL.....	204
26-2	PAVEMENT KEY CUTTING	204
26-3	PAVEMENT PLANING	205
26-4	PLANED PAVEMENT CONFORMS	205
26-5	PAVEMENT REINFORCING FABRIC	206
26-6	MEASUREMENT.....	206
26-7	PAYMENT.....	207

SECTION 27 – CURBS, GUTTERS, SIDEWALKS, AND DRAINAGE STRUCTURES

27-1	GENERAL.....	208
27-2	FORMS	208
27-3	CONCRETE IN CURBS, GUTTERS, AND SIDEWALKS	208
27-3.01	EXPANSION JOINTS, WEAKENED PLANE JOINTS, AND SCORE MARKS.....	209
27-3.02	FINISHING CONCRETE SURFACES	209
27-3.03	CURING OF CONCRETE	209
27-3.04	ALLOWANCE FOR SIGNS IN MEDIAN AND TRAFFIC ISLANDS.....	210
27-3.05	MINOR CURB AND GUTTER AND SIDEWALK REPLACEMENT	210
27-3.06	CONCRETE TESTING.....	210
27-4	DAMAGE REPAIRS	210
27-5	SLOPE OF SIDEWALKS.....	211
27-6	CURB DOWELS AND REINFORCEMENT	211
27-7	EXTRUDED CONSTRUCTION.....	211
27-8	CURB RAMPS AND DRIVEWAYS.....	212
27-9	RECONSTRUCTION OF CURBS, GUTTER, AND SIDEWALK.....	212
27-10	RECONSTRUCTION OF CURBS, GUTTER, AND CURB AND GUTTER TO ACCOMMODATE SEWER AND STORM DRAIN SERVICE INSTALLATION AND DRIVEWAYS.....	212
27-11	CURB AND GUTTER TESTING AND TOLERANCE	212
27-12	RESERVED	213
27-13	DROP INLETS AND CATCH BASINS.....	213
27-14	MEASUREMENT	213
27-15	PAYMENT.....	214

SECTION 28 – PILING

28-1	GENERAL.....	216
------	--------------	-----

SECTION 29 – PRESTRESS CONCRETE

29-1	GENERAL.....	217
------	--------------	-----

SECTION 30 – CONCRETE STRUCTURES

30-1	GENERAL.....	218
30-2	FOOTINGS	218
30-3	FORMS	218
30-4	REMOVAL OF FORMS	219
30-5	REINFORCEMENT	219
30-6	MIXING AND TRANSPORTING.....	219
30-7	PLACING CONCRETE	219
30-7.01	GENERAL.....	219
30-7.02	PLACEMENT	220
30-7.03	VIBRATING.....	220
30-7.04	CONCRETE TESTING.....	220
30-8	BONDING.....	221
30-9	CONCRETE PLACED UNDER WATER.....	221
30-10	EXPANSION JOINTS.....	221
30-11	CONSTRUCTION JOINTS.....	221

30-12	WATERSTOPS	222
30-13	CURING	222
30-14	PROTECTING CONCRETE	222
30-15	SURFACE FINISH	222
30-15.01	GENERAL.....	222
30-15.02	SMOOTH FORM FINISH (SACKING)	223
30-15.03	ORDINARY SURFACE FINISH.....	223
30-15.04	TOLERANCE ON CONCRETE PAVING.....	223
30-16	CONCRETE REPAIR	224
30-16.01	GENERAL.....	224
30-16.02	REPLACEMENT WITH CONCRETE	224
30-16.03	MORTAR (DRY PACK)	224
30-16.04	SHOTCRETE	224
30-16.05	TOPPING.....	224
30-17	MEASUREMENT AND PAYMENT	224

SECTION 31 – REINFORCEMENT

31-1	GENERAL.....	226
31-2	MEASUREMENT AND PAYMENT	226

SECTION 32 – WATERPROOFING

32-1	GENERAL.....	227
------	--------------	-----

SECTION 33 – STEEL STRUCTURES

33-1	GENERAL.....	228
33-2	PAYMENT.....	228

SECTION 34 – SIGNS

34-1	OVERHEAD SIGN STRUCTURES.....	229
34-2	ROADSIDE SIGNS.....	229
34-2.01	SIGN PANEL FASTENING HARDWARE.....	229
34-2.02	PARK SIGNS	229
34-2.03	SIGN PANEL INSTALLATION	229
34-3	MEASUREMENT AND PAYMENT	229

SECTION 35 – TIMBER STRUCTURES

35-1	GENERAL.....	231
------	--------------	-----

SECTION 36 – CAST IN-PLACE CONCRETE PIPE (CIPCP)

36-1	GENERAL.....	232
36-2	PIPEMAKING EQUIPMENT.....	232
36-3	TRENCH EXCAVATION.....	232
36-4	SPECIAL FOUNDATION TREATMENT.....	232
36-5	CONCRETE.....	233
36-6	PLACING CONCRETE	233
36-7	START AND CLOSE SECTIONS.....	234
36-8	CONSTRUCTION JOINTS.....	234
36-9	FINISH	234
36-10	FORMS.....	235
36-11	CURING	235
36-12	FIELD QUALITY CONTROL.....	236
36-12.01	PLACEMENT TESTS.....	236
36-12.01A	REJECTION	236
36-12.02	CRACK REPAIR	237

36-13	REIMBURSEMENT FOR FIELD QUALITY CONTROL.....	238
36-14	BACKFILL.....	238
36-15	LOADING DURING CURING.....	238
36-16	MEASUREMENT AND PAYMENT	238

SECTION 37 - BORING AND JACKING

37-1	GENERAL.....	240
37-2	DIRECT JACKING REINFORCED CONCRETE PIPE	240
37-3	INSTALLATION OF CONDUCTOR PIPE	240
37-4	INSTALLING CARRIER PIPE INSIDE CONDUCTOR PIPE	240
37-5	VOIDS.....	241
37-6	TOLERANCES	241
37-7	DRY BORING UNDER CURB, GUTTER AND SIDEWALK.....	241
37-8	WET BORING OF SMALL DIAMETER PIPELINES.....	242
37-9	MEASUREMENT AND PAYMENT	242

SECTION 38 - STORM DRAIN CONSTRUCTION

38-1	GENERAL.....	243
38-2	MATERIALS.....	243
38-2A	CAUSES FOR REJECTION.....	243
38-3	EXCAVATION AND BEDDING.....	244
38-4	LAYING PIPE.....	244
38-5	STORM DRAIN INLET LATERALS	245
38-6	PIPE JOINTS	246
38-7	PROTECTIVE COVERING.....	246
38-7.01	STORM DRAIN PIPE	246
38-8	BACKFILLING PIPE TRENCHES	246
38-9	TESTING OF PIPE	246
38-9.01	TESTS FOR OBSTRUCTIONS.....	246
38-9.02	TESTS FOR LEAKAGE	246
38-9.02.A	AIR TEST FOR LEAKAGE - STORM DRAIN	247
38-9.02.A.(1)	PLUG RESTRAINT	247
38-9.02.A.(2)	RELIEF VALVE	247
38-9.02.A.(3)	EQUIPMENT.....	247
38-9.02.A.(3)(A)	PLUG DESIGN	247
38-9.02.A.(3)(B)	SINGULAR CONTROL PANEL	248
38-9.02.A.(3)(C)	EQUIPMENT CONTROLS	248
38-9.02.A.(3)(D)	SEPARATE HOSES	248
38-9.02.A.(3)(E)	PNEUMATIC PLUGS.....	248
38-9.02.A.(4)	LINE PREPARATION	248
38-9.02.A.(4)(A)	LATERALS, STUBS AND FITTINGS.....	248
38-9.02.A.(4)(B)	PIPE WETTING	248
38-9.02.A.(5)	TEST PROCEDURE	248
38-9.02.A.(5)(A)	PLUG INSTALLATION AND TESTING	248
38-9.02.A.(5)(B)	LINE PRESSURIZATION	249
38-9.02.A.(5)(C)	PRESSURE STABILIZATION	249
38-9.02.A.(5)(D)	TIMING PRESSURE LOSS	249
38-9.02.A.(5)(E)	DETERMINATION OF LINE ACCEPTANCE	249
38-9.02.A.(5)(F)	DETERMINATION OF LINE FAILURE	250
38-9.02.A.(5)(G)	LINE REPAIR OR REPLACEMENT	250

38-9.02.A.(6) DETERMINATION OF GROUNDWATER ELEVATION AND AIR PRESSURE ADJUSTMENT	250
38-9.02.A.(6)(A) APPLICABILITY	250
38-9.02.A.(6)(B) PIPE NIPPLE INSTALLATION.....	250
38-9.02.A.(6)(C) GROUNDWATER ELEVATION.....	250
(AVERAGE VERTICAL HEIGHT, IN FEET, OF GROUNDWATER ABOVE THE INVERT OF THE STORM DRAIN PIPE TO BE TESTED) DIVIDED BY 2.31	252
38-9.02.A.(6)(E) MAXIMUM TEST PRESSURE.....	252
38-9.02.A.(6)(F) RE-SEALING OF PIPE NIPPLES.....	252
38-9.02.A.(7) TEST TIMES	252
38-9.02.A.(7)(A) TEST TIME CRITERIA.....	252
38-9.02.A.(7)(B) TEST TIME CALCULATION.....	252
38-9.02.A.(7)(C) TESTING MAIN STORM DRAINS WITH LATERAL CONNECTORS	253
38-9.02.A.(7)(D) SPECIFIED TIME TABLE.....	253
38-9.02.B HYDROSTATIC TEST FOR LEAKAGE – STORM DRAIN.....	254
38-9.02.B.(1) WATER EXFILTRATION TEST	254
38-9.03 THIS SECTION NOT USED.....	254
38-9.04 TELEVISION VIDEO INSPECTION (TVI) – STORM DRAINS.....	254
38-9.04.A SAFETY.....	255
38-9.04.B EQUIPMENT.....	255
38-9.04.B.(1) CAMERA	255
38-9.04.B.(2) LIGHTING.....	256
38-9.04.C RESERVED	256
38-9.04.D POST REHABILITATION AND NEWLY CONSTRUCTED DRAIN PIPELINES	256
38-9.04.E TVI INSPECTION REPORT AND VIDEO.....	256
38-9.04.F.(1) PROCEDURE	257
38-9.04.F.(2) TIMING.....	257
38-9.04.F.(3) RESERVED	258
38-9.04.F.(4) INITIAL SCREEN TEXT AND AUDIO INFORMATION	258
38-9.04.F.(4)(A) VIDEO INFORMATION	258
38-9.04.F.(4)(B) AUDIO INFORMATION	258
38-9.04.F.(5) RUNNING SCREEN TEXT AND ENDING SCREEN TEXT	258
38-9.04.F.(6) TVI RECORDING LABELS	259
38-9.04.G NON-CONFORMING TVI INSPECTION	259
38-9.05 LAMPING OF STORM DRAIN INLET LATERALS	259
38-9.06 PIPELINE ACCEPTANCE CRITERIA	260
38-10 RESTORATION OF SURFACES	261
38-11 MEASUREMENT AND PAYMENT	261

SECTION 39 – MANHOLES

39-1 GENERAL.....	262
39-2 PRECAST CONCRETE MANHOLES.....	262
39-2.01 PRECAST CONCRETE STORM DRAIN MANHOLES.....	262
39-3 SADDLE MANHOLES	264
39-3.01 SADDLE STORM DRAIN MANHOLES.....	264
39-4 MANHOLE TESTING.....	264

39-4.01	STORM DRAIN MANHOLES	264
39-4.02	MANHOLE PIPE ZONE BACKFILL OVER 4FT DEEP	265
39-5	ADJUST STORM DRAIN MANHOLES TO GRADE	265
39-6	RECONSTRUCT STORM DRAIN MANHOLES	266
39-7	ABANDON STORM DRAIN MANHOLES	266
39-8	MEASUREMENT AND PAYMENT	266

SECTION 40 – MISCELLANEOUS FACILITIES

40-1	RESERVED	268
------	----------------	-----

SECTION 41 – WATER DISTRIBUTION SYSTEMS

41-1	GENERAL.....	269
41-2	PAYMENT.....	269

SECTION 42 – RELOCATION AND MAINTENANCE OF UTILITY FACILITIES

42-1	RELOCATION OF UTILITY FACILITIES	270
42-2	MEASUREMENT AND PAYMENT	270

SECTION 43 – CLEANING PIPELINES

43-1	GENERAL.....	271
43-2	MEASUREMENT AND PAYMENT	271

SECTION 44 – SHOTCRETE, CAST CONCRETE CHANNEL LINING, AND GROUTED COBBLE

44-1	SHOTCRETE	272
44-1.01	DESCRIPTION.....	272
44-1.02	MATERIALS.....	272
44-1.03	PROPORTIONS.....	272
44-1.04	MIXING.....	272
44-1.05	SURFACE PREPARATION.....	272
44-1.06	PLACING	273
44-1.07	CURING AND PROTECTION	273
44-1.08	REINFORCEMENT	273
44-1.09	EXPANSION JOINTS	273
44-1.10	MEASUREMENT AND PAYMENT	273
44-2	CAST CONCRETE CHANNEL LINING	274
44-2.01	DESCRIPTION.....	274
44-2.02	MATERIALS.....	274
44-2.03	PLACEMENT AND THICKNESS.....	274
44-2.04	REINFORCEMENT	274
44-2.05	JOINTS	275
44-2.06	WEEP HOLES.....	275
44-2.07	CUTOFF WALLS.....	275
44-2.08	FINISHING	276
44-2.09	CURING AND PROTECTION	276
44-2.10	MEASUREMENT AND PAYMENT	276
44-3	GROUTED COBBLES	276
44-3.01	DESCRIPTION.....	276
44-3.02	MATERIALS AND PLACEMENT	276
44-3.03	MEASUREMENT AND PAYMENT	277

SECTION 45 – CHAIN LINK FENCE

45-1	GENERAL.....	278
45-2	MATERIALS.....	278
45-3	CONSTRUCTION.....	278

45-4	MEASUREMENT AND PAYMENT	278
SECTION 46 – SURVEY MONUMENTS		
46-1	GENERAL.....	279
46-2	MATERIALS.....	279
46-3	CONSTRUCTION.....	279
46-4	MEASUREMENT AND PAYMENT	279
SECTION 47 – RAILINGS AND BARRIERS		
47-1	GENERAL.....	281
SECTION 48 – TRAFFIC STRIPES AND PAVEMENT MARKINGS		
48-1	GENERAL.....	282
48-2	THERMOPLASTIC TRAFFIC STRIPES AND PAVEMENT MARKINGS	282
48-3	PLACEMENT	282
48-4	MEASUREMENT AND PAYMENT	282
SECTION 49 – SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS		
49-1	GENERAL.....	284
49-1.01	DEFINITIONS.....	284
49-1.02	ABBREVIATIONS	284
49-1.04	EQUIPMENT LIST AND DRAWINGS.....	284
49-1.05	ORDERING OF SIGNAL AND LIGHTING EQUIPMENT.....	285
49-1.06	MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS	285
49-1.07	SCHEDULING OF WORK	286
49-1.08	SAFETY PRECAUTIONS	286
49-1.09	INSPECTION.....	286
49-2	MATERIALS AND INSTALLATION	286
49-2.01	TRENCH EXCAVATION AND BACKFILL	286
49-2.03	FOUNDATIONS	287
49-2.04	STANDARDS, STEEL PEDESTALS AND POSTS	287
49-2.04.A	ALUMINUM AND CONCRETE STREET LIGHT STANDARDS.....	288
49-2.04.B	PLACEMENT OF STANDARDS, ENCLOSURES, POSTS AND ASSOCIATED DEVICES.....	289
49-2.04.C	FINAL LOCATION OF TRAFFIC SIGNAL POLES.....	289
49-2.05	CONDUIT	289
49-2.06	PULL BOXES.....	292
49-2.07	CONDUCTORS AND CABLES.....	293
49-2.07.A	SIGNAL INTERCONNECT CABLE	294
49-2.07.B	INTERCONNECT CABLE TESTING AFTER INSTALLATION.....	294
49-2.08	SPLICES.....	295
49-2.09	BONDING AND GROUNDING	295
49-2.10	SERVICE	295
49-2.10.A	METERED SERVICE (120/208 VOLT, 120/240 VOLT).....	296
49-2.10.B	METERED SERVICE WITH ENCAPSULATED STEP- DOWN TRANSFORMER (277/480 VOLT TO 120- 240 VOLT).....	297
49-2.11	TESTING	299

49-3	CONTROLLER ASSEMBLIES	299
49-4	TRAFFIC SIGNAL FACES AND FITTINGS.....	299
49-4.01	VEHICLE SIGNAL FACES AND SIGNAL HEADS.....	300
49-4.02	DIRECTIONAL LOUVERS.....	300
49-4.03	BACKPLATES.....	300
49-4.04	ACCESSIBLE PEDESTRIAN SIGNALS	300
49-5	DETECTORS	300
49-5.01	VEHICLE DETECTORS	300
49-5.01.A	CONSTRUCTION MATERIALS	301
49-5.01.B	INSTALLATION DETAILS.....	301
49-5.02	OPTICOM CABLE AND DETECTORS.....	304
49-6	LIGHTING.....	305
49-6.01	LED LUMINAIRES.....	305
49-6.02	RESERVED	311
49-6.03	INTERNAL ILLUMINATED STREET NAME SIGNS.....	311
49-6.04	PHOTOELECTRIC CONTROLS.....	313
49-6.04.A	PHOTOELECTRIC UNIT	313
49-6.04.B	CONTACTORS.....	314
49-6.04.C	CONTACTOR AND TEST SWITCH HOUSING	314
49-6.04.D	WIRING	314
49-7	PROJECT-SUPPLIED EQUIPMENT	314
49-8	REMOVING AND SALVAGING ELECTRICAL EQUIPMENT.....	314
49-9	PAYMENT.....	314

SECTION 50 – CONSTRUCTION MATERIALS

50-1	PORLAND CEMENT	316
50-2	CONCRETE AGGREGATES	316
50-3	WATER FOR CONCRETE	316
50-4	PREMOULDED EXPANSION JOINT FILLER.....	316
50-5	PORLAND CEMENT CONCRETE.....	316
50-5.01	COMPOSITION	316
50-5.02	PROPORTIONING	317
50-5.03	MIXING.....	317
50-5.04	WATER CONTROL.....	318
50-6	CURING COMPOUNDS FOR CONCRETE.....	319
50-7	AGGREGATE BASES.....	319
50-8	PIT RUN BASE (GRADED)	319
50-9	COBBLES	319
50-10	GEOTEXTILE FABRIC.....	319
50-11	CEMENT-TREATED BASES	320
50-12	LIME TREATED BASE	320
50-13	SAND	320
50-13.01	RIVER SAND.....	320
50-13.02	GRADED SAND.....	320
50-14	RESERVED	321
50-15	CONTROLLED DENSITY FILL/CONTROLLED LOW STRENGTH MATERIAL	321
50-15.01	CONTROLLED DENSITY FILL (CDF)	321
50-15.02	CONTROLLED LOW STRENGTH MATERIAL (CLSM).....	322
50-15.02.A	PROPERTIES.....	322

50-15.02.B	MIXING, TRANSPORTING AND PLACING	322
50-15.02.C	BACKFILL.....	323
50-15.02.D	QUALITY CONTROL.....	323
50-16	CLEAN CRUSHED ROCK.....	323
50-17	ASPHALT BINDERS AND EMULSION.....	323
50-18	VITRIFIED CLAY PIPE (VCP)	323
50-19	SUBSURFACE DRAINS.....	323
50-20	NONREINFORCED CONCRETE PIPE (CP).....	323
50-21	REINFORCED CONCRETE PIPE, DRAINAGE (RCPD).....	324
50-22	REINFORCED CONCRETE PIPE, SEWER (RCPS)	324
50-23	DUCTILE IRON PIPE (DIP), AND CAST IRON PIPE AND DUCTILE IRON FITTINGS.....	324
50-24	POLYVINYL CHLORIDE (PVC) PIPE FOR SEWERS AND DRAINAGE	325
50-24.01	PVC PIPE FOR DRAINAGE.....	325
50-25	CORRUGATED STEEL PIPE (CSP).....	325
50-26	RIBBED STEEL PIPE (RSP).....	327
50-27	CORRUGATED ALUMINUM PIPE (CAP).....	328
50-28	FIELD ASSEMBLED PLATE CULVERT	329
50-29	HIGH DENSITY POLYETHYLENE PIPE (HDPE)	329
50-30	REINFORCING STEEL, CURB DOWELS AND TIE BARS.....	331
50-31	STORM DRAIN CASTINGS.....	331
50-32	JOINT MATERIALS FOR MANHOLES	332
50-33	FENCING - CHAIN LINK	332
50-34	LANDSCAPING MATERIALS	334
50-34.01	TOPSOIL.....	334
50-34.02	COMMERCIAL FERTILIZER	334
50-34.03	SOIL AMENDMENT	335
50-34.04	IRON SULFATE	335
50-34.05	STRAW	335
50-34.06	FIBER	335
50-34.07	MULCH	335
50-34.08	PLANTING MIX	336
50-34.09	SEED	336
50-34.09.A	TURF SEED	337
50-34.09.B	WILDFLOWER SEED FOR HYDROSEEDING	337
50-34.10	STABILIZING EMULSION	337
50-34.11	LUMBER.....	337
50-34.12	TREE STAKES AND TIES	337
50-34.13	ROOT CONTROL BARRIER	338
50-34.14	PLANTS	338
50-34.14.A	TURF.....	339
50-34.14.B	TREES	339
50-34.15	WATER.....	341
50-34.16	IRRIGATION PIPE	341
50-34.16.A	STEEL PIPE.....	341
50-34.16.B	PLASTIC PIPE	341
50-34.16.B.(1)	MAIN LINE.....	341
50-34.16.B.(2)	LATERAL LINE.....	342
50-34.17	SUBSURFACE DRIPPER LINE.....	342
50-34.18	IRRIGATION SLEEVING CONDUIT	342

50-34.19	SPRINKLERS AND EMITTERS.....	343
50-34.20	AUTOMATIC IRRIGATION CONTROLLERS	343
50-34.21	QUICK COUPLING VALVES	343
50-34.22	CONTROL VALVES	344
50-34.23	MASTER CONTROL VALVE/FLOW SENSOR ASSEMBLY	344
50-34.24	VALVE BOXES.....	344
50-34.25	BACKFLOW PREVENTERS	344
50-34.26	CONCRETE.....	345
50-34.27	FILTER ASSEMBLY UNITS.....	345
50-34.28	IPS FLEXIBLE PVC HOSE	345
50-34.29	GATE VALVES.....	345
50-34.30	AIR VACUUM RELIEF VALVE	346
50-34.31	FLUSH VALVE ASSEMBLY	346
50-34.32	UNIONS	346
50-34.33	IRRIGATION CONTROL WIRES	346
50-34.34	PULL BOXES.....	346
50-34.35	PRESSURE GAUGES	347
50-35	ENGINEERING FABRICS	347
50-36	PAINT.....	347
50-37	LIQUID ASPHALT.....	347
50-38	ASPHALTIC EMULSION	347
50-39	EPOXY	348
50-40	PAVING STONES	348
50-41	COLORED OR PATTERNED CONCRETE	349