Ⅱ．数量計算書

Ⅱ-1　土　工　事

Ⅱ-2　舗 装 工 事

Ⅱ-3　排 水 工 事

Ⅱ-4　附帯施設工事

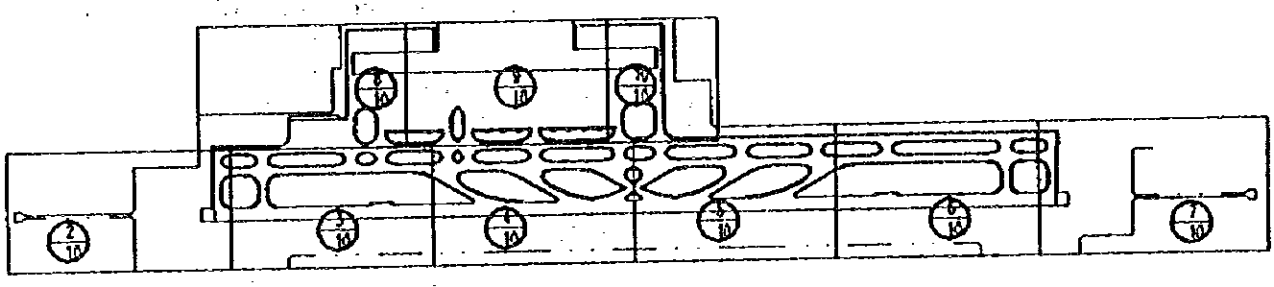
Ⅱ-1 土 工 事

QUANTITIES OF EARTH WORK

(Unit: M^3)

SUBAREA	2	3	4	5	6
fill amount in pavement area	896	14757	72481	69569	38351
cut amount in pavement area	5009	14009	320	1124	3326
fill amount in soil surface area	54164	128941	181910	201500	221580
cut amount in soil surface area	22255	23732	3616	6657	23202

SUBAREA	7	8	9	10	TOTAL
fill amount in pavement area	4086	5927	38691	11648	256406
cut amount in pavement area	890	46201	41490	23100	135469
fill amount in soil surface area	91648	79691	52376	68285	1080095
cut amount in soil surface area	14997	0	0	2	94461



district drawing of earth work subarea

1. The quantities is according to DWG1-C7.

2. The DWG1-C7 was designed according to 1:1000,40mx40m original ground surface elevation drawing surveyed by Shanghai surveying institute in Aug,1996 Shanghai elevation system of Wo Song mouth was provided.

3. Plan location of drains is detailed in DWG1-D3

4.

Earth work height in pavement area = (designed elevation - thickness of pavement structure- nominal thickness of pad layer for forced compaction + compaction settlement)-(original ground surface elevation -cut organic soil thickness)

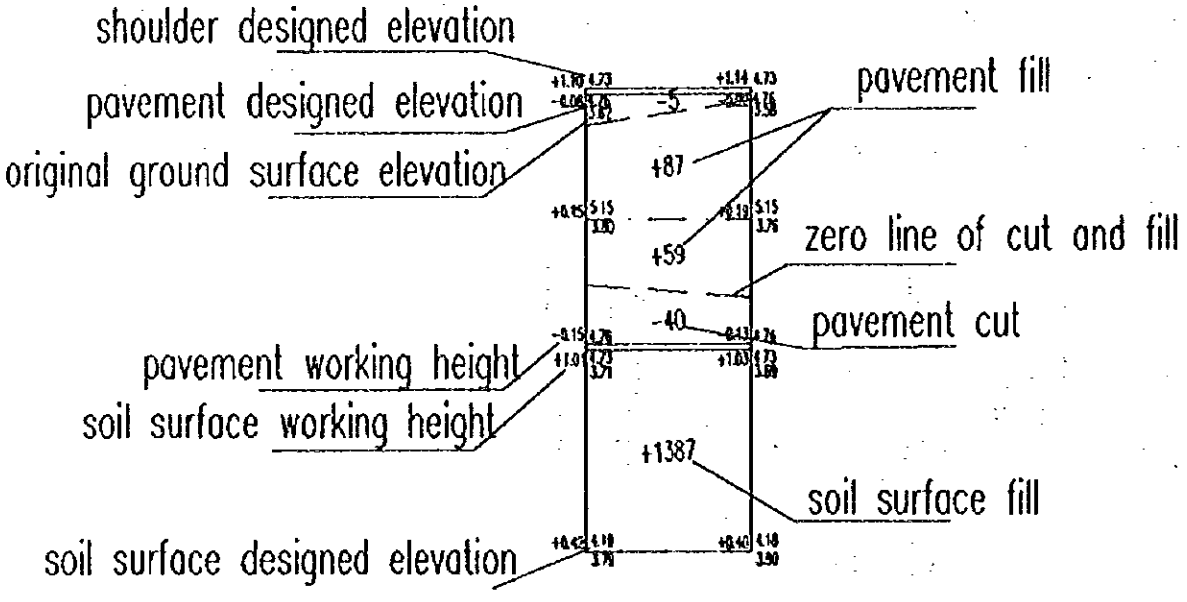
Earth work height in soil surface area=designed elevation-(original ground surface elevation -original ground surface compaction settlement)

Thickness of pavement structure is detailed in DWG1-P3

Forced compaction method shall be provided for foundation treatment for pavement area, westward from H2O6+9.5,0.80M nominal thickness of pad layer for forced compaction shall be provided with compaction settlement 0.30M on pavement area, east ward from H2O6+9.5, 1.00M nominal thickness of pad layer for forced compaction shall by provided with compaction settlement 0.35 on pavement area.

30cm organic soil shall be cut on pavement area.

Original ground surface compaction settlement on soil surface area has been determined with 0.02m according to exploration report.



5. Minus value represents cut of earthwork plus value represents fill of earth work.

6. Drainage treatment shall be not included in working height and earthwork calculation, cut amount of organic soil, cut amount of people pool, net cut of drainage system, refilling engineering amount of drainage on soil surface area are detailed in DWG1-08 ,net cut of drain system is shown in

7. Soil surface elevation shall be 3cm lower than adjacent shoulder elevation at connection place of soil surface with pavement shoulder.

8. Designed elevation in pavement area shall rely on pavement separation elevation drawing , designed elevation in soil surface area shall rely on lo pography design drawing.

Schedule of Main Quantities

Items			Units	Sections		Total	Remarks
				Maintenance Apron	Others		
Topsoil stripping			m^3	90919	457380	548299	30cm thick
Treatment of chanels	Silt displacement		m^3	22890	120893	143783	
	Steps excavation		m^3	47710	195281	242991	
	Bedding sand		m^3	11690	55220	66910	
	Earth filling		m^3	155300	542110	697410	
Treatment of covered chanels	Earth excavation		m^3	43420	110300	153720	130% of the quantity of survery
	Steps excavation		m^3	15184	40884	56068	
	Bedding sand		m^3	3952	11409	15361	
	Earth filling		m^3	54652	113236	167888	
Ram compaction	Earth Works	Excavation	m^3	68534	204935	273469	
		Filling	m^3	17389	251141	268530	
	Bedding materials	Blast-furnace slag	m^3		253390	253390	
		Debris	m^3	358117	1278648	1636765	
	Ram dropping	Area A	m^2	338688	1382787	1721475	Total area : $2011064m^2$
		Area B	m^2	17434	272155	289589	
	Additional treatment		According to the conorete measure to be used				
Shoulder filler in joint of future			m^3	2379	20840	23219	dense volume
Leveling material (stone dust)			m^3	17661	80479	98140	5cm thick

Notes:

1. In treatment of chanels and covered chanels, earth of excavation can be used as filling material.
2. Volumes of earth works are calculated with groundline drop of 35cm by ramming.

THE CALCULATION SHEET FOR QUANTITIES OF AIRFIELD GROUND TREATMENT

1. Channel treatment

It's counted and calculated according to the exploration data.

The result is as below:

Unit: m^3

Items	Maintenance Apron	Others	Total
Silt displacement	22890	120893	143783
Steps excavation	47710	195281	242991
Bedding sand	11690	55220	66910
Earth filling	155300	542110	697410

2. Covered channel treatment

It's counted and calculated according to the exploration data.

The result as below is 130% of the survey quantities:

Unit: m^3

Items	Maintenance Apron	Others	Total
Earth excavation	43420	110300	153720
Steps excavation	15184	40884	56068
Bedding sand	3952	11409	15361
Earth filling	54652	113236	167888

3. Calculating area of ground treatment works

The summary result is list as below:

Unit: m^2

Section		Area A	Area B	Total
Maintenance Apron		338688	17434	356122
Others	The west of H206*	578845	163946	742791
	The East of H206**	803942	108209	912151
Sum		1721475	289589	2011064

Note: * Thickness of bedding course is 80cm.

** Thickness of bedding course is 100cm.

4. Topsoil stripping

$V=(S_A+S_B+S_B/9-S_C)*h=(S_A+10*S_B/9-S_C)*h$

Where

S_A--Area of area A;

S_B—Area of area B;

S_C—Area of channels in limits of ground treatment works.

h—Average thickness of topsoil, 30cm.

Note: Limits of topsoil stripping is 1.0m wider than that of ground treatment.

Volume in maintenance apron:

$V=(338688+10*17434/9-54996)*0.3=90919m^3$

Volume in other area:

$V=(1382787+10*272155/9-160581)*0.3=457380m^3$

5. Earth works under bedding course

Depth of fill-excavation in any point is

$h_i=H_{di}-H_{0i}-h+0.3+0.35$

Where

H_{di}—Designed ground elevation;

H_{0i}—Original ground elevation;

h—Thickness of bedding course, 80cm or 100cm.

Amount of filling

$V_f=\Sigma(S_i*h_i)$ $(h_i>0)$

Amount of excavation

$V_e=-\Sigma(S_i*h_i)$ $(h_i<0)$

The result is as below:

Unit: m^3

Items	Maintenance Apron	Others	Total
Filling	17389	251141	268530
Excavation	68534	204935	273469

6. Bedding course

$V=\Sigma(S_{Ai}*h_i)+\Sigma(S_{Bi}*h_i)+\Sigma(S_{Si}*L_i)$

Where

S_{Ai}—Area of Area A;

S_{Bi}—Area of Area B;

h_i—Thickness of bedding course;

S_S—Additional area of slope in cross section;

L_i—Longitudinal length of slope segment, ΣL_i equals the total length of shoulders.

The result is as below:

Unit: m^3

Material	Maintenance Apron	Others	Total
Blast-furnace slag		253390	253390
Debris	358117	1278648	1636765

7. Shoulder filler in joint of future

$V=\Sigma(L_i*B_i*h_i)$

Where

L_i—Length of shoulder in joint of shoulder, m;

B_i—Width of filling area, m;

h_i—Thickness of filler, m.

The result is as below:

Other Area except Maintenance Apron

No.	B_i(m)	h_i(m)	L_i(m)	$V_i(m^3)$
1	9.5	0.48	110	501.6
2	8.5	0.48	100	408
3	8.5	0.47	50	199.75
4	8	0.55	50	220
5	9.5	0.47	209.5	935.4
6	9.5	0.55	110	574.75
7	9.5	0.47	488	2178.9
8	8.5	0.47	150	599.25
9	8	0.55	126	554.4
10	9.5	0.55	220	1149.5
11	9.5	0.48	60	273.6
12	8	0.48	50	192
13	9.5	0.55	110	574.75
14	8	0.55	100	440
15	8	0.55	126	554.4
16	9.5	0.55	220	1149.5
17	9.5	0.55	681.5	3560.8
18	8	0.55	523	2301.2
19	9.5	0.55	337	1760.8
20	9.5	0.55	180	940.5
21	9.5	0.55	339	1771.3
Sum				**20840**

Maintenance Apron

No.	B_i(m)	h_i(m)	L_i(m)	$V_i(m^3)$
1	9.5	0.50	123	584.25
2	9.5	0.50	211	1002.25
3	9.5	0.50	166.8	792.3
Sum				**2379**

8. Leveling course

$V=(S_A+7.5*S_B/9)*h$

Where

S_A—Area of area A, m^2;

S_B—Area of area B, m^2;

h—Average thickness of leveling course, 0.05m.

Note: Width of leveling in shoulder is less than that of area B, typical as 7.5m.

The result is as below:

Volume in maintenance apron:

$V=(338688+7.5*17434/9)*0.05=17661m^3$

Volume in other area:

$V=(1382787+7.5*272155/9)*0.05=80479m^3$

9. Summarizing Schedule

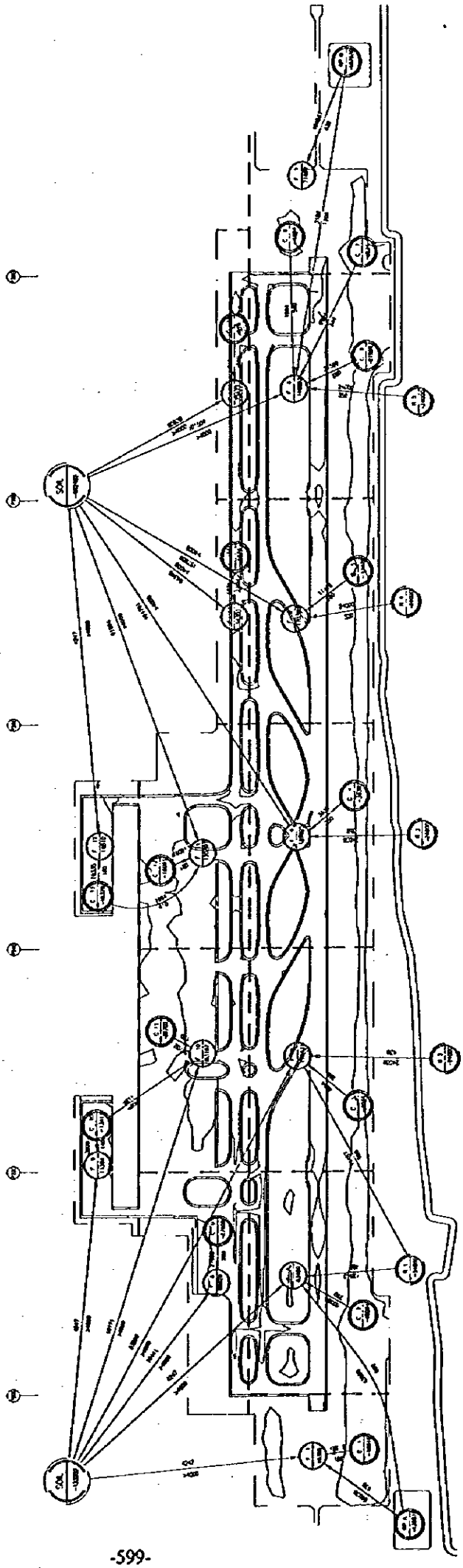


TABLE OF ENGINEERING AMOUNT OF EARTH WORK DISTRIBUTION

F NO								C NO	0~200M	200~500M	500~1000M	>4000M
F 1	48604	791	50264	41700	113898	42728	156626	C 1	18918			
										1606		
										9299		
									15021			
										21096+60039 (RP A)		
												4247
F 2	77764	5716	36095	41700	130936	49131	180069	C 2		40084		
										33570		
										9299		
									15021			
										21096	43909 (RP A)	
												4247
										1284X(R1)		
F 3	130806	40625	20736	41700	174273	94513	268786	C 3		4064		
										35563+52689 (110)	1998 (19)	
										9299		
									15021			
										21096		
												4247
										24000 (R2)	11157(R1)	89652
F 4	140338	57567	25436	41700	190640	116537	307177	C 4		3639		
										42331		
										9299		
									15021			
										21096		
												4247
										24000 (R3)		187544
F 5	130503	39879	27856	41700	182113	93543	275656	C 5		11476		
										36905		
										9299		
									15021			
										21096		
												4247
										24000 (R4)		153612
F 6	127581	22001	20565	41700	170366	70301	240669	C 6		21599		
								C 7			9924	
								C 8			1994	
										33047		
										9299		
									15021			
										21096+3185(RP B)		
												4247
										24000 (R5)		97257
F 7	70163	1329	39109	0	125663	1728	127391			1728		
										21096+104567(RP B)		

F NO								C NO	0~200M	200~500M	500~1000M	>4000M
F 8	80403	6225	1615	41700	94321	49792	144113	C 9	27809			
										54269+76(C7)		
										9299		
									15021			
										21096		
												4247
												12194
F 9	11051	343	1610	41700	14560	42146	56706	C 10	3600			
										3761		
										9299		
									15021			
										19078		
												4247
F 10	51710	31457	3907	41700	63960	82694	146654	C 11	9611			
								C 12	39707			
										31533+8103(19)		
										9299		
									15021			
										21096	7018 (19)	
												4247
												5974
F 11	89898	30409	15361	41700	121046	81232	202280	C 13	14091			
								C 14	1994			
										57160+5979(C17)		
										9299		
									15021			
										21096+1381(C17)		
												4247
												57577
F 12	13600	910	3046	41700	19143	42883	62026	C 15	16335			
										9864		
										9299		
									15021			
										7280		
												4247
F 13	46938	7413	11754	41700	67495	51337	118832	C 16	1874			
										12766		
										9299		
									15021			
										15532		
												4247
												60093
F 14	60736	11741	6494	41710	77314	56973	134287	C 17	916			
										12668		
										9305		
									15029			
										15531		
												4256
												76949
TOTAL	1080095	259406	263848	542110	1545534	875438	2420972		5324.31	1221886	21099	795655

QUANTITIES OF DITCH TREATMENT

SOIL SURFACE AREA

0 -- 5	Length	Fill	0 -- 5	Length	Fill	0 -- 5	Length	Fill	5 -- 10	Length	Fill	10 -- 15	Length	Fill
NO	(m)	3.0m³	NO	(m)	3.0m³	NO	(m)	3.0m³	NO	(m)	7.4m³	NO	(m)	14.8m³
F -- 197	240	720	F -- 285	35	105	F -- 352	63	189	E -- 104	67	495.8	D -- 4	55	814
F -- 209	160	480	F -- 286	280	840	F -- 353	48.5	145.5	E -- 105	194	1435.6	D -- 22	48	710.4
F -- 210	160	480	F -- 287	79	237	F -- 355	100	300	E -- 106	10	74	D -- 26	150	2220
F -- 211	5	15	F -- 288	272	816	F -- 357	58.5	175.5	E -- 111	150	1110	D -- 28	116	1716.8
F -- 214	195	585	F -- 290	90	270	F -- 358	100	300	E -- 112	110	814	D -- 29	152.5	2257
F -- 215	53	159	F -- 291	145	435	F -- 359	84	252	E -- 113	150	1110	D -- 35	110	1628
F -- 216	182	546	F -- 292	58	174	F -- 360	86	258	E -- 114	103	762.2	D -- 39	310	4588
F -- 217	184	552	F -- 297	70	210	F -- 361	90	270	E -- 115	130	962	D -- 40	20	296
F -- 218	31	93	F -- 298	90	270	F -- 362	92	276	E -- 116	50	370	D -- 42	540	7992
F -- 219	40	120	F -- 299	70	210	F -- 363	82	246	E -- 117	155	1147	D -- 43	548	8110.4
F -- 220	54	162	F -- 300	88	264	F -- 364	80	240	E -- 118	104.5	773.3	D -- 46	515	7622
F -- 221	70	210	F -- 301	148	444	F -- 365	78	234	E -- 119	74	547.6	TOTAL	2964.5	37954.6
F -- 222	182	546	F -- 305	36	108	F -- 367	150	450	E -- 120	52.5	388.5	15 -- 20	Length	Fill
F -- 223	182	546	F -- 306	165	495	F -- 368	70	210	E -- 121	92	680.8	NO	(m)	28.7m³
F -- 224	70	210	F -- 307	157	471	TOTAL	10590	31770	E -- 122	138	1021.2	C -- 5	1293.5	37123.45
F -- 228	100	300	F -- 308	141	423	5 -- 10	Length	Fill	E -- 123	81.5	603.1	C -- 6	1103	31656.1
F -- 229	63	189	F -- 309	57	171	NO	(m)	7.4m³	E -- 124	33	244.2	C -- 8	70.5	2023.35
F -- 230	62	186	F -- 310	109	327	E -- 55	273	2020.2	E -- 125	95	703	C -- 9	29.5	846.65
F -- 231	225	675	F -- 311	75	225	E -- 56	210	1554	E -- 127	10	74	C -- 10	152.5	4376.75
F -- 232	20	60	F -- 312	115	345	E -- 57	291	2153.4	E -- 129	70	518	C -- 11	174	4993.8
F -- 233	24	72	F -- 313	155	465	E -- 58	328	2427.2	E -- 130	158	1169.2	C -- 13	152.5	4376.75
F -- 234	208	624	F -- 314	153	459	E -- 60	225	1665	E -- 131	803	5942.2	C -- 14	47.5	1363.75
F -- 235	54	162	F -- 315	42	126	E -- 61	145	1073	E -- 132	142.5	1054.5	C -- 15	125.5	3601.85
F -- 236	5	15	F -- 316	40	120	E -- 64	155	1147	E -- 133	178.5	1320.9	C -- 16	152.5	4376.75
F -- 237	20	60	F -- 317	65	195	E -- 65	36	266.4	E -- 134	45	333	C -- 17	37.5	1076.25
F -- 238	40	120	F -- 318	20	60	E -- 66	110	814	E -- 135	132.5	980.5	C -- 18	62.5	1793.75
F -- 240	188	564	F -- 319	39	117	E -- 69	212	1568.8	E -- 136	46	340.4	C -- 19	158.5	4548.95
F -- 241	57	171	F -- 320	55	165	E -- 70	170	1258	E -- 137	80	592	TOTAL	3559.5	102157.65
F -- 243	90	270	F -- 321	149	447	E -- 71	56	414.4	E -- 138	116	858.4	20--25	Length	Fill
F -- 244	183	549	F -- 322	152	456	E -- 72	95	703	E -- 139	76.5	566.1	NO	(m)	41.2m³
F -- 245	184	552	F -- 326	83	249	E -- 74	10	74	E -- 140	182	1346.8	B -- 2	163.5	6736.2
F -- 248	87	261	F -- 327	127	381	E -- 76	75	555	E -- 141	119	880.6	B -- 3	222.5	9167
F -- 250	90	270	F -- 331	49	147	E -- 77	55	407	E -- 142	127	939.8	TOTAL	386	15903.2
F -- 253	60	180	F -- 332	170	510	E -- 79	10	74	E -- 143	141.5	1047.1	25--30	Length	Fill
F -- 254	181	543	F -- 333	123	369	E -- 86	60	444	E -- 144	133.5	987.9	NO	(m)	51.3m³
F -- 255	179	537	F -- 335	60	180	E -- 87	150	1110	E -- 145	63.5	469.9	A -- 9	60	3077
F -- 259	168	504	F -- 337	156	468	E -- 88	98	725.2	E -- 150	105	777	TOTAL	60	3077
F -- 260	55	165	F -- 339	68	204	E -- 89	55	407	E -- 151	30	222			
F -- 265	331	993	F -- 340	51	153	E -- 91	55	407	E -- 152	30	222			
F -- 266	99	297	F -- 343	60	180	E -- 93	150	1110	E -- 153	10	74			
F -- 267	64	192	F -- 344	48	144	E -- 94	53	392.2	E -- 157	580	4292			
F -- 270	40	120	F -- 345	21	63	E -- 97	150	1110	E -- 159	540	3996			
F -- 280	103	309	F -- 346	30	90	E -- 98	92.5	684.5	E -- 160	540	3996			
F -- 281	100	300	F -- 347	47	141	E -- 99	50	370	TOTAL	9863.5	72989.9			
F -- 283	111	333	F -- 348	32	96	E -- 101	95	703				TOTAL ALL	Length	Fill
F -- 284	114	342	F -- 351	20	60	E -- 102	150	1110					27024	763848

NOTE :

1. Based on moximum dry density test of ground survey report , proportion of earth cut and fill is, oreo of pavement 1:1.3,oreo of soil surface 1:1.15.
2. Fill amount is table under compaction and cut amount is tabled in natural condition
3. Sub item explanation of earth work:

(1).Fill 1 to Fill 14 oreo and Cut 1 to Cut 15 oreo in drawing have been calculated from DWG1-C7.

(2).Refilling scope and amount of drainage on soil surface oreo ore detailed in DWG1-C8.

(3).30cm organic soil cut from pavement oreo and mud of drainage could only be filled on soil surface oreo.

(4).Soil of cutting steps in drainage treatment in pavement oreo can be refilled at original place.

(5).30M earth cut per meter of SHojiao river will be gained according to surrounding river improvement scheme of institute.

4.Statistics of engineering amount :

(1). pavement oreo 1390837 M^2. (maintenance apron oreo not included), soil surface oreo 2050239M^2.

(2).resoures of soil :

a.soil transported form out side (include sand)	795655 M^3
b.cut from ShoJiao River	120000 M^3

(3).engineering amount within field (filling has been converted into natural cut amount)

a.filling amount above natural surface in filled oreo.	1575437 M^3
b.filling for drainage	845535M^3
c.cut amount in cutting oreo	229930 M^3
d.mud cut from drainage	120893 M^3
e.steps cut of drainage	195281M^3
f.organic soil cut in pavement oreo	437298 M^3
g.cut from regulating pool	237700M^3
h.net cut for drain (refilled soil has been deducted)	284215M^3

Ⅱ-2 舗装工事

QUANTITIES OF PAVEMENT

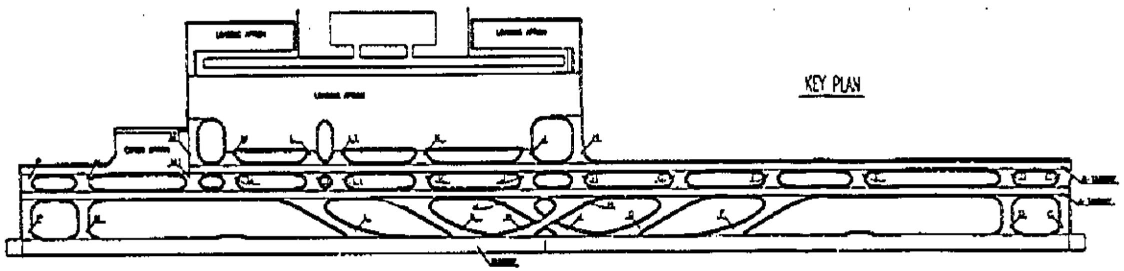
CEMENT CONCRETE AND BASE COURSE (M³)

CEMENT CONCRETE 5.0 MPa

No	ITEM \ NAME	H=46CM CONC-RETE	H=46CM BASE	H=45CM CONC-RETE	H=45CM BASE	H=42CM CONC-RETE	H=42CM BASE	H=39CM CONC-RETE	H=39CM BASE	H=37CM CONC-RETE	H=37CM BASE	H=35CM CONC-RETE	H=35CM BASE	H=32CM CONC-RETE	H=32CM BASE
1	RUNWAY	55800	55845	4800	5050	69800	69800	1903	2008	27703	25042	3400	3400	16875	16346
2	LOADING APRON			322817	323335			76614	77472					46875	46589
3	CARGO APRON			30169	30370									4155	4309
4	A-TAXIWAY			118000	117796										
5	B-TAXIWAY			119280	118380										
6	C-TAXIWAY			8884	10789										
7	D-TAXIWAY			12503	12924										
8	E-TAXIWAY			5050	5379										
9	F-TAXIWAY			3050	6779					13081	13430				
10	G-TAXIWAY			5050	5236					12863	13286				
11	H-TAXIWAY			13806	13234							12990	13263		
12	J-TAXIWAY			8313	8828							11879	12344		
13	K-TAXIWAY			8313	8830					12863	13286				
14	L-TAXIWAY			8094	8780					13081	13430				
15	L1-TAXIWAY			8024	8280										
16	M-TAXIWAY			8238	8803										
17	M1-TAXIWAY			11742	12184										
18	N-TAXIWAY			12503	12924										
19	P-TAXIWAY			10862	11381										
20	OVERRUN														
AREA TOTAL SUM (M²)		55800	55845	714644	725712	69800	69800	78517	79480	74851	78474	28389	29037	67705	71744
VOLUME TOTAL SUM(M³)		25668	30211	327490	381885	29932	37584	30622	47919	27695	42376	9930	13880	21666	38472

No	ITEM \ NAME	H=46-39CM CONC-RETE	H=46-39CM BASE	H=46-37CM CONC-RETE	H=46-37CM BASE	H=45-37CM CONC-RETE	H=45-37CM BASE	H=45-35CM CONC-RETE	H=45-35CM BASE	H=45-32CM CONC-RETE	H=45-32CM BASE	H=47-39CM CONC-RETE	H=47-39CM BASE	H=47-37CM CONC-RETE	H=47-37CM BASE	H=47-35CM CONC-RETE	H=47-35CM BASE	H=42-32CM CONC-RETE	H=42-32CM BASE	H=39-32CM CONC-RETE	H=39-32CM BASE
1	RUNWAY	1500	1500	25300	25300							750	750	4075	4075	1700	1700	33350	33350		
2	LOADING APRON									11875	11885									3800	3810
3	CARGO APRON									1380	1380										
4	A-TAXIWAY																				
5	B-TAXIWAY																				
6	C-TAXIWAY																				
7	D-TAXIWAY																				
8	E-TAXIWAY																				
9	F-TAXIWAY					2133	2370														
10	G-TAXIWAY					2133	2370														
11	H-TAXIWAY							2133	2370												
12	J-TAXIWAY							2133	2370												
13	K-TAXIWAY					2133	2370														
14	L-TAXIWAY					2133	2370														
15	L1-TAXIWAY																				
16	M-TAXIWAY																				
17	M1-TAXIWAY																				
18	N-TAXIWAY																				
19	P-TAXIWAY																				
20	OVERRUN																				
AREA TOTAL SUM (M²)		1500	1500	25300	25300	8532	9480	4266	4740	13210	13255	750	751	4075	4075	1700	1700	33350	33350	3800	3810
VOLUME TOTAL SUM(M³)		636	610	10600	13662	3466	5120	1707	2560	5088	7150	304	405	1919	2701	866	918	12340	16008	1340	2068

No	ITEM \ NAME	CEMENT CONCRETE 4.5 MPa H=26CM CONC-RETE	H=26CM BASE	H=16CM CONC-RETE	H=16CM BASE	H=12CM CONC-RETE	H=12CM BASE	PRECAST CONCRETE BLOCK CONCRETE	PRECAST CONCRETE BLOCK BASE
1	RUNWAY	48	64	8742	12988	716	784	184	244
2	LOADING APRON	8276	8866	13703	14644	4087	5388		
3	CARGO APRON	4055	4192	293	380	943	947	784	352
4	A-TAXIWAY	150	160			35740	37458		
5	B-TAXIWAY	150	160			38377	31783	2550	2726
6	C-TAXIWAY					4636	4853		
7	D-TAXIWAY					6190	6578		
8	E-TAXIWAY					2479	2942		
9	F-TAXIWAY					8478	9050		
10	G-TAXIWAY	79	84			7845	8487		
11	H-TAXIWAY					10884	11538		
12	J-TAXIWAY					8888	9374		
13	K-TAXIWAY					9850	10434		
14	L-TAXIWAY					9488	10210		
15	L1-TAXIWAY					3481	3807		
16	M-TAXIWAY					3484	3809		
17	M1-TAXIWAY					3784	4198		
18	N-TAXIWAY					6180	6578		
19	P-TAXIWAY	108	116			4686	4861		
20	OVERRUN	7580	7744						
AREA TOTAL SUM (M²)		20430	21388	33700	27012	151395	162378	3008	3324
VOLUME TOTAL SUM(M³)		5317	7080	3794	6852	18154	54858	381	1167



KEY PLAN

1. RUNWAY

UNIT: M²

CONCRETE THICKNESS (CM)	46	45	42	39	37	35	32	46-39	46-37	42-39	42-37	42-35	42-32	26	16	12	PRECAST BLOCK	TOTAL
PAVEMENT	55800	4800	69600	1903	22703	3400	16675	1500	25300	750	4075	1700	33350	48	9742	716	184	252246
BASE LAYERS	55945	5050	69600	2008	25042	3400	18346	1500	25300	750	4075	1700	33350	64	12988	784	244	260146
18CM THICK LIME, FLY ASH, AGGREGATE BASE	111890	10100	139200	4016	50084	6800	36692	3000	50600	1500	8150	3400	66700	64				492196
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	55945	5050	69600	2008	25042	3400	18346	1500	25300	750	4075	1700	33350	64				246130
16CM THICK LIME, FLY ASH, AGGREGATE BASE															12988	784	244	14016
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE															12988	784		13772
20CM THICK AGGREGATE SUBBASE																	244	244

2, LOADING APRON

UNIT: M^2

CONCRETE THICKNESS (CM)	45	39	32	45-32	39-32	26	16	12	TOTAL
PAVEMENT	322817	76614	46875	11825	3800	8279	13703	4887	488800
BASE LAYERS	323335	77472	48589	11865	3810	8866	14644	5368	493949
18CM THICK LIME, FLY ASH, AGGREGATE BASE	646670	154944	97178	23730	7620	8866			939008
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	323335	77472	48589	11865	3810	8866			473937
16CM THICK LIME, FLY ASH, AGGREGATE BASE							14644	5368	20012
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE							14644	5368	20012

3, CARGO APRON

UNIT: M^2

CONCRETE THICKNESS (CM)	45	32	45-32	26	16	12	PRECAST BLOCK	TOTAL
PAVEMENT	30168	4155	1385	4055	263	942	264	41232
BASE LAYERS	30378	4309	1390	4192	280	942	352	41843
18CM THICK LIME, FLY ASH, AGGREGATE BASE	60756	8618	2780	4192				76346
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	30378	4309	1390	4192				40269
16CM THICK LIME, FLY ASH, AGGREGATE BASE					280	942	352	1574
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE					280	942		1222
20CM THICK AGGREGATE SUBBASE							352	352

4, A-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	26	12	PRECAST BLOCK	TOTAL
PAVEMENT	116000	150	25740	0	141890
BASE LAYERS	117796	160	27456	0	145412
18CM THICK LIME, FLY ASH, AGGREGATE BASE	235592	160			235752
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	117796	160			117956
16CM THICK LIME, FLY ASH, AGGREGATE BASE			27456		27456
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE			27456		27456

5, B-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	26	12	PRECAST BLOCK	TOTAL
PAVEMENT	116290	150	29327	2558	148325
BASE LAYERS	118360	160	31293	2728	152541
18CM THICK LIME, FLY ASH, AGGREGATE BASE	236720	160			236880
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	118360	160			118520
16CM THICK LIME, FLY ASH, AGGREGATE BASE			31293	2728	34021
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE			31293		31293
20CM THICK AGGREGATE SUBBASE				2728	2728

6, C-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	12	TOTAL
PAVEMENT	9964	4628	14592
BASE LAYERS	10289	4953	15242
18CM THICK LIME, FLY ASH, AGGREGATE BASE	20578		20578
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	10289		10289
16CM THICK LIME, FLY ASH, AGGREGATE BASE		4953	4953
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE		4953	4953

7, D-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	12	TOTAL
PAVEMENT	12502	6160	18662
BASE LAYERS	12924	6578	19502
18CM THICK LIME, FLY ASH, AGGREGATE BASE	25848		25848
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	12924		12924
16CM THICK LIME, FLY ASH, AGGREGATE BASE		6578	6578
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE		6578	6578

8, E-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	12	TOTAL
PAVEMENT	5050	2470	7520
BASE LAYERS	5226	2642	7868
18CM THICK LIME, FLY ASH, AGGREGATE BASE	10452		10452
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	5226		5226
16CM THICK LIME, FLY ASH, AGGREGATE BASE		2642	2642
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE		2642	2642

9, F-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	37	45-37	12	TOTAL
PAVEMENT	5050	13091	2133	8478	28752
BASE LAYERS	5226	13430	2370	9050	30076
18CM THICK LIME, FLY ASH, AGGREGATE BASE	10452	26860	4740		42052
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	5226	13430	2370		21026
16CM THICK LIME, FLY ASH, AGGREGATE BASE				9050	9050
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE				9050	9050

10, G-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	37	45-37	26	12	TOTAL
PAVEMENT	5050	12983	2133	79	7945	28190
BASE LAYERS	5226	13286	2370	84	8482	29448
18CM THICK LIME, FLY ASH, AGGREGATE BASE	10452	26572	4740	84		41848
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	5226	13286	2370	84		20966
16CM THICK LIME, FLY ASH, AGGREGATE BASE					8482	8482
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE					8482	8482

11, H-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	35	45-35	12	TOTAL
PAVEMENT	12804	12990	2133	10694	38621
BASE LAYERS	13234	13293	2370	11536	40433
18CM THICK LIME, FLY ASH, AGGREGATE BASE	26468	26586	4740		57794
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	13234	13293	2370		28897
16CM THICK LIME, FLY ASH, AGGREGATE BASE				11536	11536
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE				11536	11536

12, J-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	35	45-35	12	TOTAL
PAVEMENT	8313	11979	2133	8666	31091
BASE LAYERS	8628	12344	2370	9374	32716
18CM THICK LIME, FLY ASH, AGGREGATE BASE	17256	24688	4740		46684
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	8628	12344	2370		23342
16CM THICK LIME, FLY ASH, AGGREGATE BASE				9374	9374
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE				9374	9374

13, K-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	37	45-37	12	TOTAL
PAVEMENT	8313	12983	2133	9659	33088
BASE LAYERS	8628	13286	2370	10434	34718
18CM THICK LIME, FLY ASH, AGGREGATE BASE	17256	26572	4740		48568
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	8628	13286	2370		24284
16CM THICK LIME, FLY ASH, AGGREGATE BASE				10434	10434
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE				10434	10434

14, L-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	37	45-37	12	TOTAL
PAVEMENT	8024	13091	2133	9469	32717
BASE LAYERS	8260	13430	2370	10210	34270
18CM THICK LIME, FLY ASH, AGGREGATE BASE	16520	26860	4740		48120
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	8260	13430	2370		24060
16CM THICK LIME, FLY ASH, AGGREGATE BASE				10210	10210
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE				10210	10210

15, L1-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	12	TOTAL
PAVEMENT	8024	3461	11485
BASE LAYERS	8260	3802	12062
18CM THICK LIME, FLY ASH, AGGREGATE BASE	16520		16520
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	8260		8260
16CM THICK LIME, FLY ASH, AGGREGATE BASE		3802	3802
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE		3802	3802

16, M-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	12	TOTAL
PAVEMENT	8239	3461	11700
BASE LAYERS	8503	3802	12305
18CM THICK LIME, FLY ASH, AGGREGATE BASE	17006		17006
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	8503		8503
16CM THICK LIME, FLY ASH, AGGREGATE BASE		3802	3802
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE		3802	3802

17, M1-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	12	TOTAL
PAVEMENT	11742	3764	15506
BASE LAYERS	12104	4105	16209
18CM THICK LIME, FLY ASH, AGGREGATE BASE	24208		24208
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	12104		12104
16CM THICK LIME, FLY ASH, AGGREGATE BASE		4105	4105
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE		4105	4105

18, N-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	12	TOTAL
PAVEMENT	12502	6160	18662
BASE LAYERS	12924	6578	19502
18CM THICK LIME, FLY ASH, AGGREGATE BASE	25848		25848
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	12924		12924
16CM THICK LIME, FLY ASH, AGGREGATE BASE		6578	6578
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE		6578	6578

19, P-TAXIWAY

UNIT: M^2

CONCRETE THICKNESS (CM)	45	26	12	TOTAL
PAVEMENT	10992	109	4668	15769
BASE LAYERS	11361	116	4981	16458
18CM THICK LIME, FLY ASH, AGGREGATE BASE	22722	116		22838
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	11361	116		11477
16CM THICK LIME, FLY ASH, AGGREGATE BASE			4981	4981
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE			4981	4981

20, OVER-RUN

UNIT: M^2

CONCRETE THICKNESS (CM)	26	TOTAL
PAVEMENT	7560	7560
BASE LAYERS	7744	7744
18CM THICK LIME, FLY ASH, AGGREGATE BASE	7744	7744
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	7744	7744

MAIN ENGINEERING AMOUNTS OF PAVEMENT ENGINEERING

UNIT: M²

	RUNWAY	LOADING APRON	CARGO APRON	A	B	C	D	E	F	G	H	J	K	L	L1	M	M1	N	P	OVERRUN	TOTAL
PAVEMENT	252246	488800	41232	141890	148325	14592	18662	7520	28752	28190	38621	31091	33088	32717	11485	11700	15506	18662	15769	7560	1386408
BASE LAYERS	260146	493949	41843	145412	152541	15242	19502	7868	30076	29448	40433	32716	34718	34270	12062	12305	16209	19502	16458	7744	1422444
18CM THICK LIME, FLY ASH, AGGREGATE BASE	492196	939008	76346	235752	236880	20578	25848	10452	42052	41848	57794	45684	48568	48120	16520	17006	24208	25848	22838	7744	2436290
18CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	246130	473937	40269	117956	118520	10289	12924	5226	21026	20966	28897	23342	24284	24060	8260	8503	12104	12924	11477	7744	1228838
16CM THICK LIME, FLY ASH, AGGREGATE BASE	14016	20012	1574	27456	34021	4953	6578	2642	9050	8482	11536	9374	10434	10210	3802	3802	4105	6578	4981	0	193606
16CM THICK LIME, FLY ASH, AGGREGATE SUBBASE	13772	20012	1222	27456	31293	4953	6578	2642	9050	8482	11536	9374	10434	10210	3802	3802	4105	6578	4981	0	190282
20CM THICK AGGREGATE SUBBASE	244	0	352	0	2728	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3324

Partial Quantities of Pavement Engineering

Item		Length (m)	No's of slab	No's
Pavement	Dummy Joint With No Slip Bar	106282		
	Dummy Joint With Slip Bar	140991		
	Key Joint With No Tie Bar	123416		
	Key Joint With Tie Bar	110742		
	Flat Joint	49421		
Shoulder	Flat Joint	47275		
	Dummy Joint	84223		
	Expansion Joint	14696		
Reinforcement slab			1134	
Pavement Light Carity				4072
Earthing				152
Anchorage				24
Fueling Supply Hydrant Well				84
Water Supply Hydrant Well				84
Anchor beam		708		
Reinforcement Slab Beside Drainage Ditch at Apron				
Single Side Reinforcement of Flat Joint		9046		

PAVEMENT GROOVING

UNIT: M^2

ORDER	POSITION	AREA
1	RUNWAY	170700
2	F -TAXIWAY	13091
3	G -TAXIWAY	12983
4	H -TAXIWAY	12990
5	J -TAXIWAY	11979
6	K -TAXIWAY	12983
7	L -TAXIWAY	13091
	TOTAL AREA	247817

Roughening by picking then following by grooving method shall be provided for concrete pavement construction on runway central portion of 40M in width ,high speed exit taxiway and conpection part of runway and high speed exit taxiway.

(AUTOCAD)

BRUSH FINISH

UNIT: M^2

ORDER	POSITION	AREA	ORDER	POSITION	AREA
1	RUNWAY	252062	11	H	38621
2	LOADING APRON	488800	12	J	31091
3	CARGO APRON	40968	13	K	33088
4	A	141890	14	L	32717
5	B	145767	15	L1	11485
6	C	14592	16	M	11700
7	D	18662	17	M1	15506
8	E	7520	18	N	18662
9	F	28752	19	P	15769
10	G	28190	20	OVER RUNWAY	7560
TOTAL AREA		1383402			

(AUTOCAD)

QUANTITIES OF MARKING

	MARKING NAME	COLOUR AND AREA (M^2)			REMARKS
		WHITE	YELLOW	RED	
RUNWAY	THRESHOLD MARKING		1632		30X1.7
	RUNWAY DESIGNATION		210		
	TOUCHDOWN ZONE MARKING		1350		22.5X3
	AIMING POINT MARKING		2400		60X10
	RUNWAY CENTRE LINE MARKING		1782		30X0.9
	RUNWAY CENTRE CIRCLE MARKING		67		
	RUNWAY SIDE STRIPE MARKING		5686		0.9
	OVER RUN MARKING		310		0.9
TAXIWAY	TAXI-HOLDING POSITION MARKING		290		
	TAXIWAY CENTRE LINE MARKING		3600		0.15
	TAXIWAY SIDE STRIPE MARKING		7200		0.15
	TAXIWAY INTERSECTION MARKING		360		
	TAXIWAY SHOULDER MARKING		2123		6X0.15
CARGO APRON LOADING APRON	TAXI CENTRE LINE MARKING		2940		
	AIRCRAFT STAND DESIGNATION MARKING		197		
	STOP LINE MARKING		70		
	LEAD-IN ARROW MARKING		387		
	LANE MARKING		6400		0.2
	APRON SAFETY LINE MARKING			864	0.2
	AREA TOTAL SUN (UNIT: M^2)		37004	864	

QUANTITIES FOR ANCHOR BEAM

TOTAL LENGTH (m)		708
EXCAVATION (m^3)		3370
CONCRETE (f=5.0MPa) (m^3)		1614
C15 CONCRETE (m^3)		3972
REINFORCING BAR	Φ 16 (Kg)	169920
	Φ 12 (Kg)	29028

QUANTITIES FOR EACH METER LONG OF ANCHOR BEAM

EXCAVATION (m^3)		4.76
CONCRETE (f=5.0MPa) (m^3)		2.28
C15 CONCRETE (m^3)		5.61
REINFORCING BAR	Φ 16 (Kg)	240
	Φ 12 (Kg)	41

Ⅱ-3　排水工事

STORM DRAINAGE QUANTITIES(1)

name	description of works	length	precast		in-situ	in-situ concrete		sub-base		cut	backfilling			stone masonry	gravel	brick masonry	polyvinyl board	timber board	reinforcement											fabrication of steel grating	cast steel grating	
			C45 SFRC	C30 concrete	C30 concrete	box culvert	else RC ditch/ culvert	C15 plain concrete	macadam stone bedding		C7.5 concrete	macadam stone bedding	soil						Φ8	Φ10	± 12	± 14	± 16	± 18	± 20	± 22	± 25	Φ16	Φ30	Φ35		type A	type B
		m	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^2	m	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t
A1	type 1 RC ditch	480		238.1			676.3	108.4	108.4	3952			3325				39.2		8.367	13.216	7.985	29.747										
	type 3 RC culvert	40			76.5		45.8	14.4	14.4	387			711			0.4	3.9			1.122	1.295	1.245	1.248									
	masonry ditch	2131.82								15741				4756	1586			1 475.6														
	sub-total	2651.97		238.1	76.5		722.2	122.8	122.8	20080			3484	4756	1586	0.4	43.1	475.6	9.367	14.345	9.280	31.287	1.248									
A2	type 1 RC ditch/culvert	1447.5		746.9	2.3		1441.1	337.1	337.1	14905			7963				98.9		24.713	51.078	33.713	36.643	39.339									
	type 2 RC culvert	688		465.4			1098.2	361.8	361.8	10285	5407.8	638.0	839			3.2	72.9			30.664	24.816	15.456	32.750	58.981				1.863				
	type 3 box culvert	149				115.19		158.6	158.6	7705			7989				65.7			16.874	8.991	32.144		63.116			0.378					
	masonry ditch	343.33								15236				2777	978			277.7														
	sub-total	2903.83		1212.3	2.3	115.19	2737.3	858.5	858.5	50611	5407.8	638.0	11411	2777	978	3.2	237.5	277.7	24.713	98.666	66.860	84.966	97.088	123.087			0.378	1.863				
A3	type 1 U-shape RC ditch	1340					4119.8	572.2	572.2	37585			12774				234.2		49.838	36.450	31.672	29.289	38.025		68.209		49.343					
	type 2 RC culvert	80		58.1			144.3	43.2	43.2	1398	807.1	77.8	181				9.4			3.834	2.847		13.156	8.753				0.299				
	type 2 box culvert	490				319.81		269.8	492.9	15614	4021.8	1024.4	1705				187.0			48.754	80.244		88.809	138.717	18.862	29.716		2.966				
	masonry ditch	157.33								4917				780	260			78.0														
	culvert	10			40.0		19.6			669			209	263		70.8					3.698					3.904						
	sub-total	3077.33		58.1	40.0	319.81	4283.7	1179.2	1308.3	54713	4828.9	1097.8	14869	1043	260	70.8	431.0	78.0	49.838	92.898	86.169	29.289	140.590	144.518	68.871	29.716	53.654	3.878				
A4	type 1 U-shape RC ditch	800					673.3	110.5	110.5	4360			2533	92			38.2		11.293	6.739	23.418											
A5	type 1 RC ditch	96.5		7.2	0.5		21.3	3.8	3.8	203			113				1.4		0.297	0.435	0.245	0.929										
	type 1 U-shape RC ditch	170.75					248.2	32.5	32.5	1544			785				14.8		3.188	1.777	2.020	5.403										
	type 7 RC ditch	1498	1598.2				4233.4	1499.0	889.4	17475	6508.8						785.6			143.956	86.247		121.056		321.884		224.928		6.450		19.812	19.278
	type 2 RC culvert	84.75		567.0			1.57.6	430.8	430.8	11801	5613.8	373.7	2277			9.5	87.8			33.681	20.078	56.833	34.758	63.903				7.093				
	sub-total	2749.5	1598.2	574.2	0.5		5830.7	1966.0	1366.5	31973	12122.6	373.7	3175			9.5	888.8		3.472	179.949	108.535	63.313	155.344	63.903	321.884		224.928		2.993	6.450	19.812	19.278
A6	type 1 RC ditch	788		354.0	7.5		1147.1	163.8	163.8	7785			3990	1			50.5		13.561	13.856	19.273	28.009	3.281									
	type 1 U-shape RC ditch	109.33					237.5	29.5	29.5	1698			827				13.4		3.143	1.807	1.789	5.214										
	type 2 RC culvert	170.85		122.9			383.8	97.3	97.3	2859	1799.6	145.5	577			3.4	19.8			7.741	5.020	4.970	18.669	17.411				0.470				
	type 3 RC culvert	37			12.0		47.8	12.7	12.7	481			371				3.9			0.908	1.800	1.986	0.383									
	sub-total	1105.18		476.9	19.5		1421.2	297.5	297.5	12334	1799.6	145.5	5694	1		3.4	86.4		16.704	24.310	27.482	40.180	22.153	17.411				0.470				
A7	type 2 RC ditch	287	306.5				635.6	287.2	177.3	3545	1758.2						34.1			28.250	12.396		23.666		62.877		43.552		1.143				
	type 2 RC culvert	80.05		51.7			177.2	41.3	41.3	1154	464.6	97.8	185			0.3	8.1			2.888	1.866	6.334	3.083	5.989				0.180				
	masonry ditch	536.36								3409				1161	380			116.1														
	sub-total	903.7	306.5	51.7			956.8	328.4	218.6	8108	2222.8	97.8	185	1161	380	0.3	64.3	116.1		31.238	14.464	6.334	26.909	5.989	62.877		43.552		0.180	1.143			
receiving pondage A										17994.8				3474	860			342.4														

NOTE

1.Quantities in the chart exclude wastage.

2.Quantities of "else" means the quantities of drainage intersection .

STORM DRAINAGE QUANTITIES(2)

name	description of works	length	precast		in-situ	in-situ concrete		sub-base		cut	backfilling			stone masonry	gravel	brick masonry	polyvinyl board	timber board	reinforcement												fabrication of steel grating	cast steel grating	
			C45 SFRC	C30 concrete	C30 concrete	box culvert	else RC ditch/ culvert	C15 plain concrete	macadam stone bedding		C7.5 concrete	macadam stone bedding	soil						Φ8	Φ 10	± 12	± 14	± 16	± 18	± 20	± 22	± 25	Φ 16	Φ 30	Φ 35		type A	type B
		m	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m²	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t
B1	type 1 RC ditch	488		228.2			540.9	101.2	101.2	4792			2590				30.6		7.701	11.638	7.650	26.838											
	type 3 RC culvert	45			31.5		93.8	17.0	17.0	684			416			0.2	4.1			1.474	1.567	3.071	1.478	0.898				0.898					
	masonry ditch	1888.95								21453				5075	1892			507.5															
	sub-total	2324.95		228.2	31.5		634.7	118.2	118.2	28929			3006	5075	1892	0.2	34.7	507.5	7.701	13.083	9.206	29.836	1.478	0.898				0.898					
B2	type 1 RC ditch/culvert	1427		767.8	0.8		1847.2	334.7	334.7	14918			7564				99.1		24.244	21.647	33.765	36.373	29.200										
	type 2 RC culvert	777		481.5			1724.9	374.3	374.3	11690	4158.2	904.9	2911				75.0			21.127	29.183	15.783	57.902	67.617					1.886				
	type 3 RC culvert	48			76.5		51.9	17.5	17.5	778			518				3.5			1.375	0.451	3.130	0.484	0.719				0.089					
	type 3 box culvert	93				329.7		45.6	45.6	7054			1350				14.8			4.335	2.546	9.190		18.033				0.278					
	masonry ditch	874.8								29692				4772	1121			479.2															
	else						9.2	1.5						360		2.9				0.110	0.031		0.420								1.917		
	sub-total	3111.8		1249.3	77.3	329.7	3833.7	773.1	777.1	57571	4158.2	904.9	11785	4682	1421	2.9	196.3	479.2	24.244	69.021	67.876	94.926	88.015	81.364				0.276	1.886		1.917		
B3	type 1 U-shape RC ditch	1646.85					4582.8	886.6	886.6	35188			14046				263.5		56.004	42.995	41.286	78.981	78.795		22.431		38.949						
	type 2 RC culvert	170.85		78.4			247.2	76.8	76.8	2048	861.2	87.1	329			16.3	16.2			3.868	6.277	11.838	2.139	9.475					0.250				
	type 2 box culvert	420				766.5		47.5	353.7	17631	4067.9	447.7	1047	472			156.9			41.524	21.278	28.343	81.870	105.462	16.662	21.843			2.778				
	type 3 RC culvert	20			14.6		30.5	7.8	7.8	766			147				1.9			0.688	0.517	1.295	0.484	0.719									
	masonry ditch	297								10447				1505	519			155.5															
	sub-total	2566.5		78.4	14.6	766.5	4880.0	1018.5	1325.0	66080	5049.7	539.8	15464	2027	519	16.3	438.5	155.5	56.004	90.566	69.808	70.908	169.232	115.656	39.093	21.843	38.949		3.028				
B4	type 2 RC culvert	389.8		775.9			773.4	219.4	790.4	7610	3202.3	258.1	1184			0.9	46.7			18.707	13.638			58.334	35.379				0.980				
	type 3 RC culvert	44			21.4		95.0	13.2	13.2	766			193				3.0			1.019	2.360	1.263											
	masonry ditch	2461.29								13845				5635	1641			503.5															
	sub-total	2895.19		775.9	21.4		798.4	232.6	223.6	21971	3202.3	258.1	1377	5635	1641	0.9	49.8	503.5		19.726	15.998	1.263	58.334	35.379				0.980				
B5	type 1 RC ditch	439		191.8			364.2	86.0	86.0	3060			1634				27.5		6.917	4.292	11.371	9.108										
	type 2 RC culvert	101.75		46.2			145.4	34.7	34.7	1530	689.8	73.0	185			0.2	11.0			3.077	2.381	8.408	3.950	6.371					0.240				
	type 3 RC culvert	70			13.3		33.0	7.7	7.7	204			118				1.5			0.884	0.443	0.774	0.875										
	masonry ditch	540.87								3971				1210	395			171.0															
	sub-total	1051.62		238.0	13.3		542.6	127.9	127.9	8673	689.8	73.0	1937	1210	395	0.2	39.0	171.0	6.917	8.153	14.173	13.232	4.824	6.371				0.240				
B6	masonry ditch	48								578				179			17.9															
regulating pondage B										107752				3007	756			300.7															
	total	24232.32	1886.7	4717.7	197.3	7330.9	29227.0	7366.3	6392.3	586713	40757.2	4115.8	74798	34323	10490	52.3	2700.1	2306.7	790.043	677.994	498.791	436.344	767.577	563.509	506.625	54.359	39.0078	8.212	13.444	7.593	1.917	19.887	19.278

NOTE

1.Quantities in the chart exclude wastage.

2.Quantities of "else" means the quantities of drainage intersection .

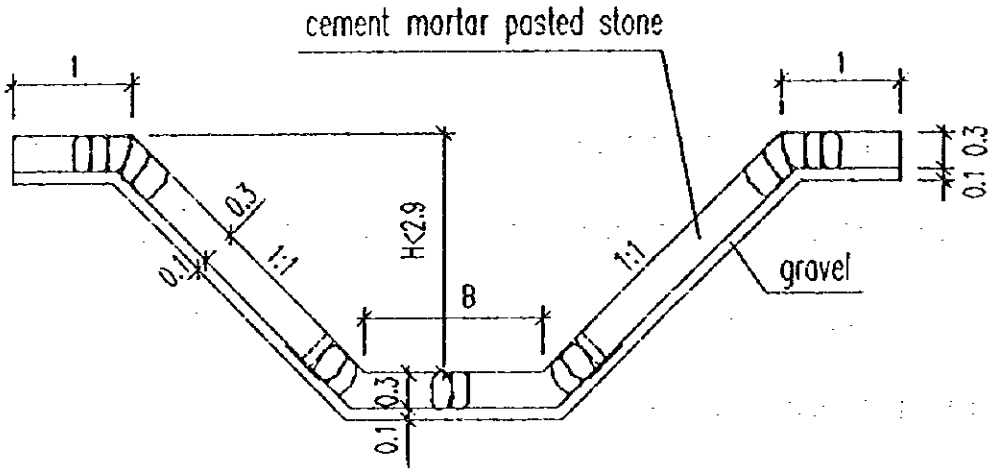
DRAINAGE ENGINEERING AMOUNT CALCULTION

CONTENTS

NOTE: ENGINEERING CALCULATION OF REINFORCEMENT OF RC DITCH/CULVERT SHOWEN IN "DWG1-D8".

1. Drainage profile works calculation books

Masonary ditch (H<2.9m)



masonary ditch cross section

Calculation formula:

cement mortar pasted stone: $(B+2.83H+2)*0.3*L$ (m^3)

Gravel : $(B+2.83H+2)*0.1*L$ (m^3)

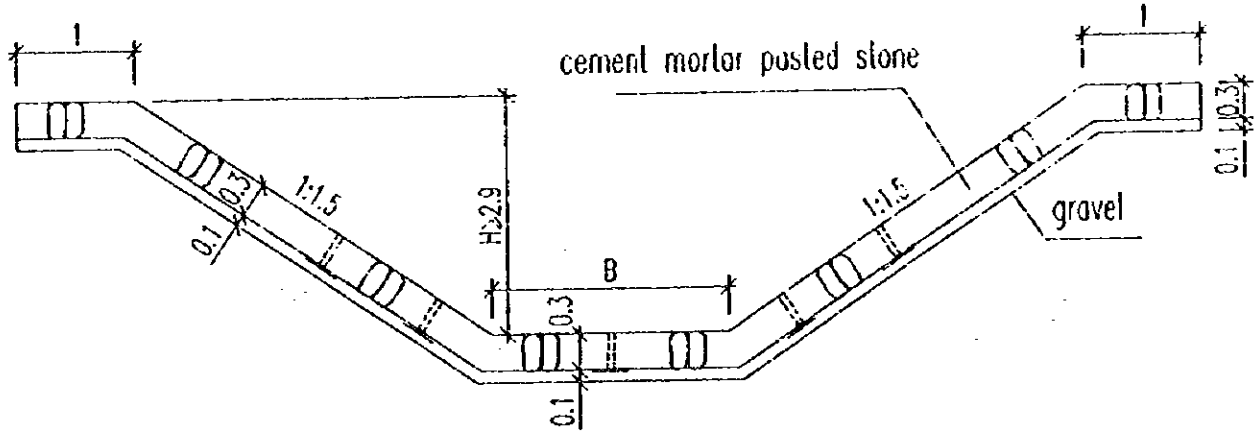
Excavation: $(B+H)*H*L$ + cement mortar pasted stone + gravel (m^3)

Polyvinyl expansion board: cement mortar pasted stone/10 (m^2)

Note :1.Unit:m.

2.B drain width,H drain average clear depth,L drain length.Meosurement shown in "Storm drainage profile".

masonary ditch(H≥2.9m)



masonary ditch cross section

Calculation formula:

cement mortar posted stone: (B+3.61H+2)*0.3*L (m^3)

Gravel: (B+3.61H+2)*0.1*L (m^3)

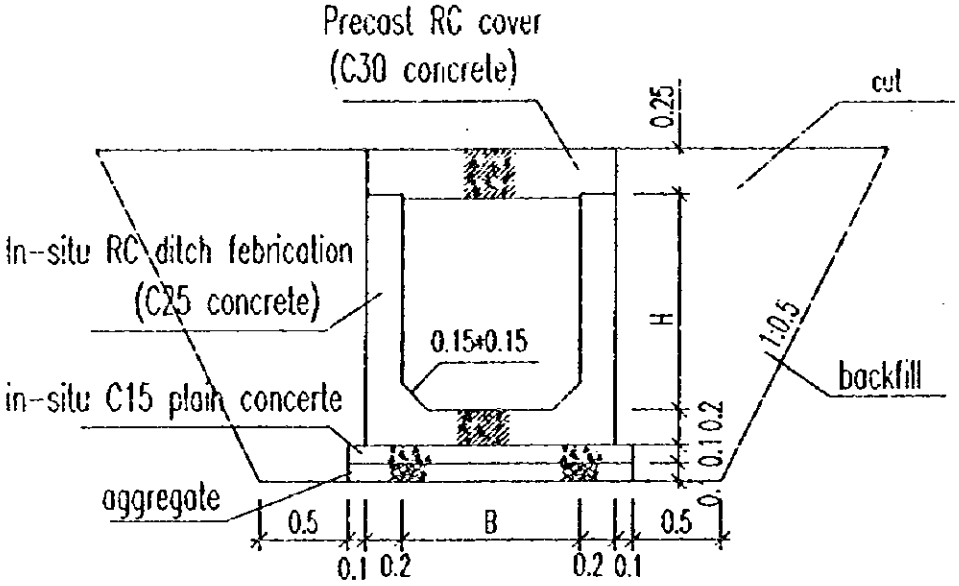
excavation: (B+1.5H)*H*L+cement mortar posted stone+ gravel (m^3)

Polyvinyl expansion board: cement mortar posted stone/10 (m^2)

Note :1.Unit:m.

2.B drain width,H drain average clear depth,L drain length.Measurement shown in "Storm drainage profile".

Type-1 RC ditch with precast cover(H<2m)



Type-1 RC ditch with precast cover
cross section

Calculation formula:

C25 concrete: $[0.2*(B+0.4)+0.4*H+0.15*0.15]*L\ (m^3)$

C15 plain concrete: $(B+0.6)*0.1*L\ (m^3)$

aggregate: $(B+0.6)*0.1*L\ (m^3)$

excavation: $[B+1.6+0.5*(H+0.65)]*(H+0.65)*L\ (m^3)$

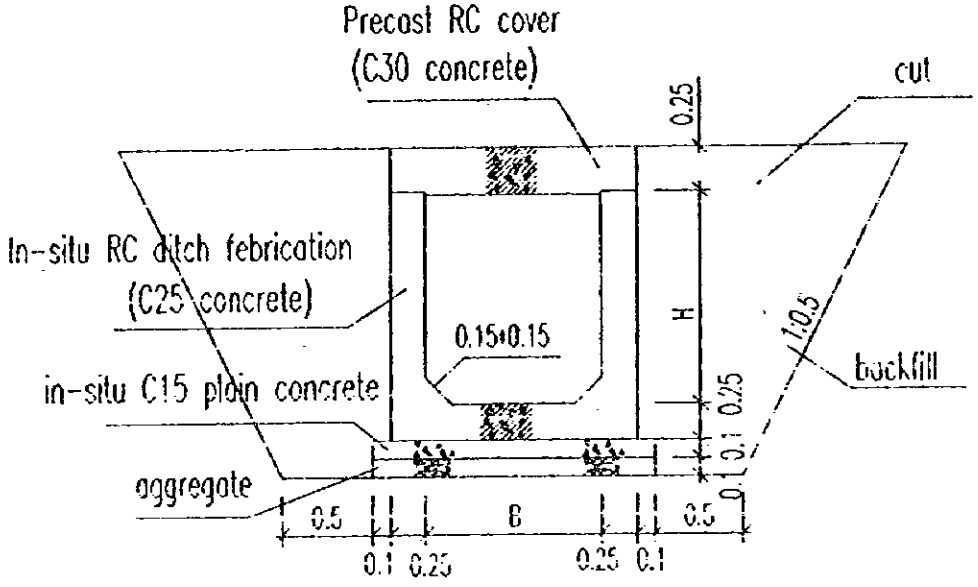
Backfill with ordinary soil: excovation−2*aggregete $-(B+0.4)*(H+0.45)*L\ (m^3)$

Polyvinyl expansion board: (C25 concrete+C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,H drain average clear depth,L drain length.Measurement shown in "Storm drainage profile".

Type-1 RC ditch with precast cover (H≥2m)



Type-1 RC ditch with precast cover
Cross section

Calculation formula:

C25 concrete: $[0.25*(B+0.5)+0.5*H+0.15*0.15]*L$ (m^3)

C15 plain concrete: $(B+0.7)*0.1*L$ (m^3)

aggregate: $(B+0.7)*0.1*L$ (m^3)

excavation: $[B+1.7+0.5*(H+0.7)]*(H+0.7)*L$ (m^3)

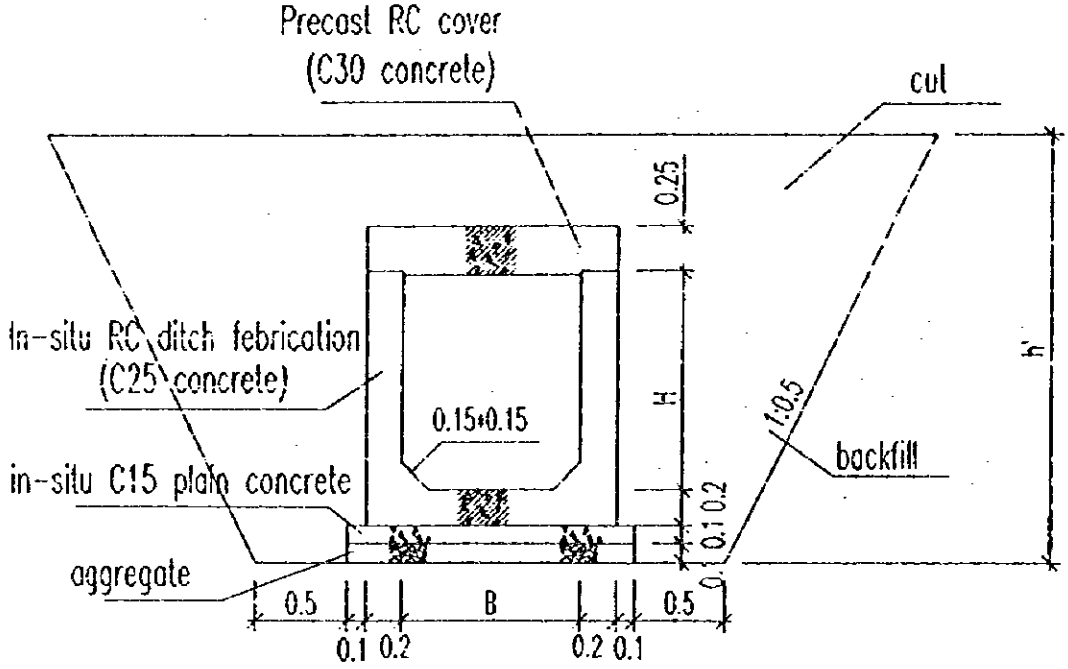
Backfill with ordinary soil: excavation-2* aggregate $-(B+0.5)*(H+0.5)*L$ (m^3)

Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,H drain average clear depth,L drain length.Measurement shown in "Storm drainage profile".

Type-1 RC ditch with precast cover (H<2m)



Type-1 RC ditch with precast cover
Cross section

Calculation formula:

C25 concretet: $[0.2*(B+0.4)+0.4*H+0.15*0.15]*L \quad (m^3)$

C15 plain concrete: $(B+0.6)*0.1*L \quad (m^3)$

aggregate: $(B+0.6)*0.1*L \quad (m^3)$

excavation: $(B+1.6+0.5*h')*h'*L \quad (m^3)$

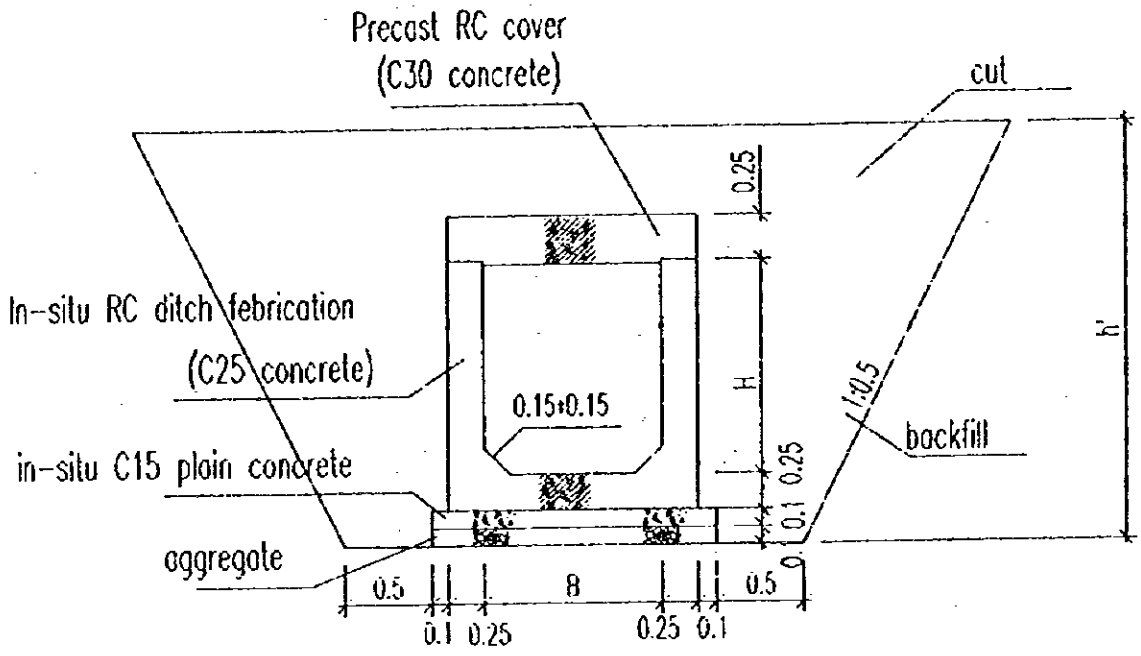
Backfill with ordinary soil: excovation-2*aggregate $-(B+0.4)*(H+0.45)*L \quad (m^3)$

Polyvinyl exponsion boord: (C25 concrete+C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,h' cutting depth,H drain average clear depth,L drain length.
Measurement shown in "Storm drainage profile".

Type-1 RC ditch with precast cover (H≥2m)



Type-1 RC ditch with precast cover
Cross section

Calculation formula:

C25 concrete: $[0.25*(B+0.5)+0.5*H+0.15*0.15]*L \quad (m^3)$

C15 plain concrete: $(B+0.7)*0.1*L \quad (m)^3$

aggregate: $(B+0.7)*0.1*L \quad (m)^3$

excavation: $[B+1.7+0.5*h']*h'*L \quad (m^3)$

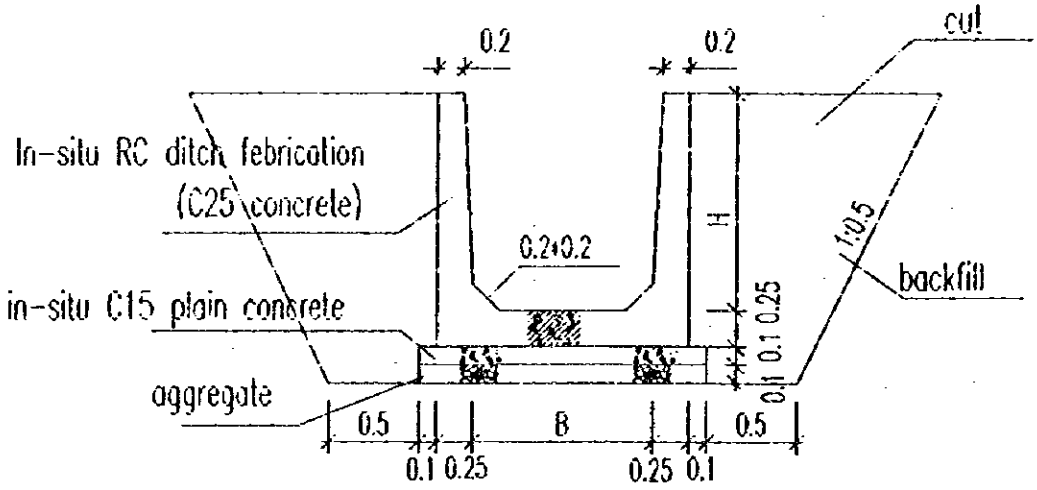
Backfill with ordinary soil: excavation−2*aggregate −(B+0.5)*(H+0.5)*L (m^3)

Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,h' cutting depth,H drain average clear depth,L drain length.
Measurement shown in "Storm drainage profile".

Type-1 U-shape RC ditch with precast cover (H<2m)



Type-1 U-shape RC ditch

Cross section

Calculation formula:

C25 concrete: $[0.25*(B+0.5)+0.45*H+0.2*0.2]*L$ (m^3)

C15 plain concrete: $(B+0.7)*0.1*L$ (m^3)

aggregate : $(B+0.7)*0.1*L$ (m^3)

Excavation: $[B+1.7+0.5*(H+0.45)]*(H+0.45)*L$ (m^3)

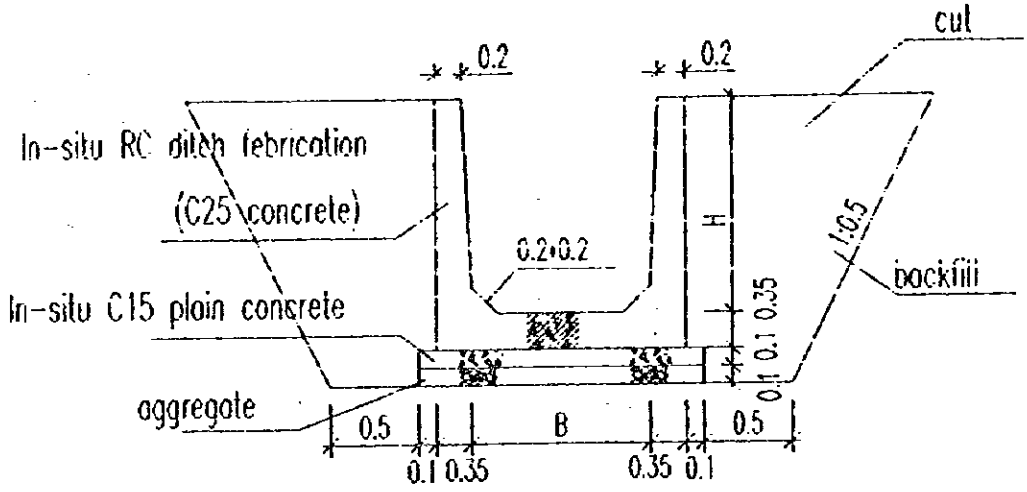
Backfill with ordinary soil: excavation-2*aggregate $-(B+0.5)*(H+0.25)*L$ (m^3)

Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,H drain average clear depth,L drain length.Measurement shown in "Storm drainage profile".

Type-1 U-shape RC ditch with precast cover (H≥2m)



Type-1 U-shape RC ditch
Cross section

Calculation formula:

C25 concrete: $[0.35*(B+0.7)+0.55*H+0.2*0.2]*L$ (m^3)

C15 plain concrete: $(B+0.9)*0.1*L$ (m^3)

aggregate: $(B+0.9)*0.1*L$ (m^3)

Excavation: $[B+1.9+0.5*(H+0.55)]*(H+0.55)*L$ (m^3)

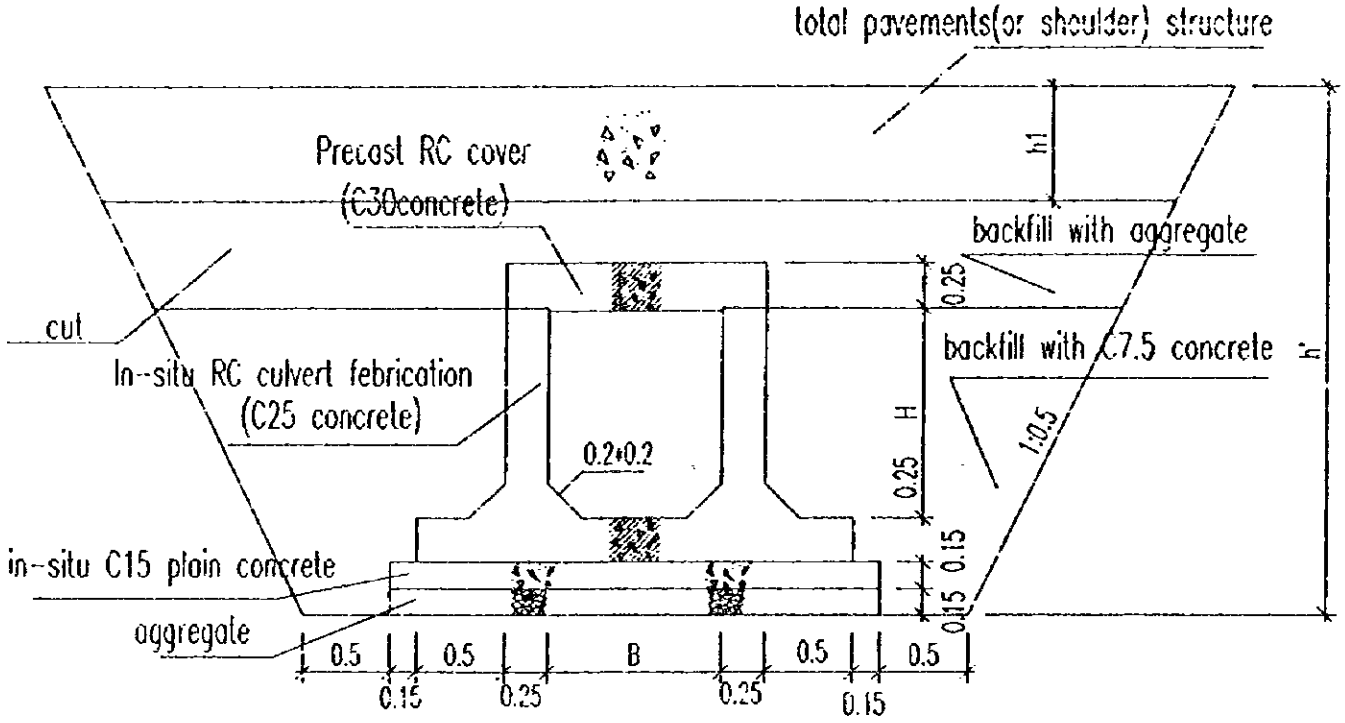
Backfill with ordinary soil. excavation−2*aggregate $-(B+0.7)*(H+0.35)*L$ (m^3)

Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,H drain average clear depth,L drain length.Measurement shown in "Storm drainage profile".

Type-2 RC culvert with precast cover (Pavements area)



Type-2 RC culvert with precast cover
Cross section

Calculation formula:

C25 concrete: $[0.25*(B+1.5)+0.5*H+2*0.2*0.2]*L \quad (m^3)$

C15 plain concrete: $(B+1.8)*0.15*L \quad (m^3)$

aggregate: $(B+1.8)*0.15*L \quad (m^3)$

Excavation: $[B+2.8+0.5*(h'-h1)]*(h'-h1)*L \quad (m^3)$

Backfill with C7.5 concrete: $\{[B+2.8+0.5*(H+0.55)]*(H+0.55)$
$-(B+0.5)*(H+0.25)-0.29\}*L-2*aggregate \quad (m^3)$

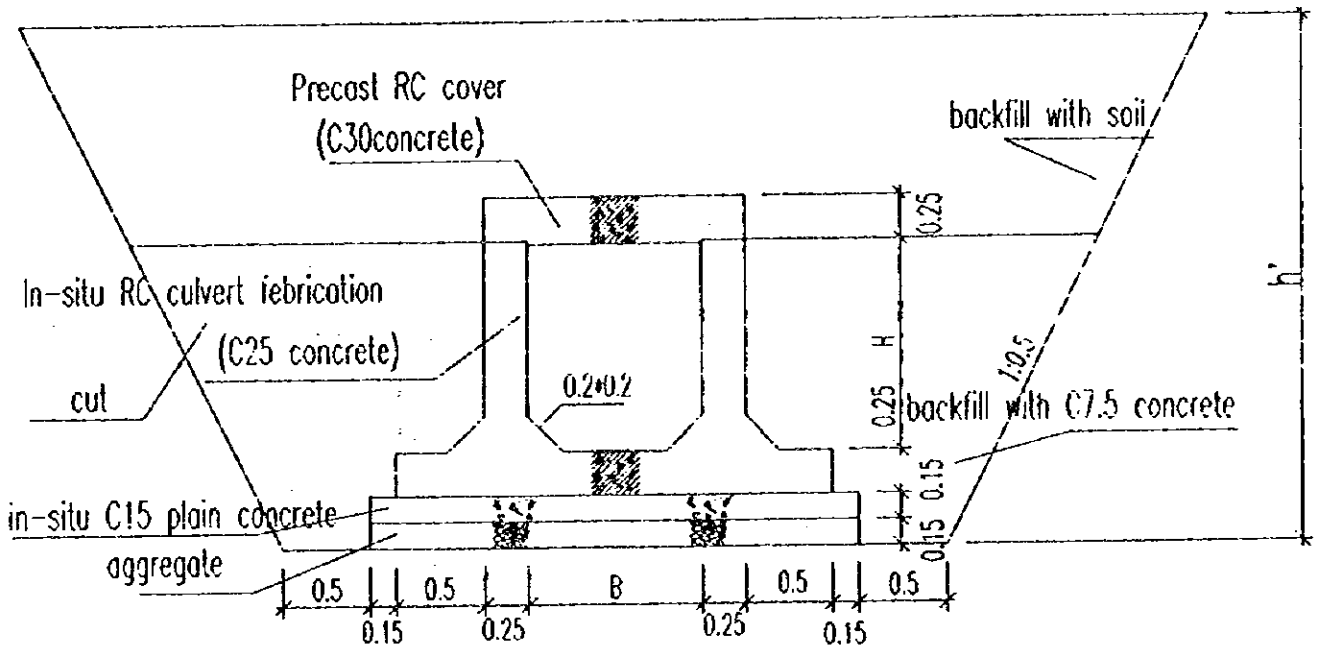
Backfill with aggregate: $\{[B+2.8+H+0.55+0.5*(h'-h1-H-0.55)]$
$*(h'-h1-H-0.55)-(B+0.5)*0.25\}*L \quad (m^3)$

Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,h' cutting depth,H drain average clear depth,H1 total pavements structure height,L drain length. Measurement shown in "Storm drainage profile".

Type-2 RC culvert with precast cover (unpaved area)



Type-2 RC culvert with precast cover
Cross section

Calculation formula:

C25 concrete: $[0.25*(B+1.5)+0.5*H+2*0.2*0.2]*L \quad (m^3)$

C15 plain concrete: $(B+1.8)*0.15*L \quad (m^3)$

aggregate: $(B+1.8)*0.15*L \quad (m^3)$

Excavation: $[B+2.8+0.5*h']*h'*L \quad (m^3)$

Backfill with C7.5 concrete: $\{[B+2.8+0.5*(H+0.55)]*(H+0.55)$
$-(B+0.5)*(H+0.25)-0.29\}*L-2*\text{aggregate} \quad (m^3)$

Backfill with aggregate: $\{[B+2.8+H+0.55+0.5*(h'-H-0.55)]$
$*(h'-H-0.55)-(B+0.5)*0.25\}*L \quad (m^3)$

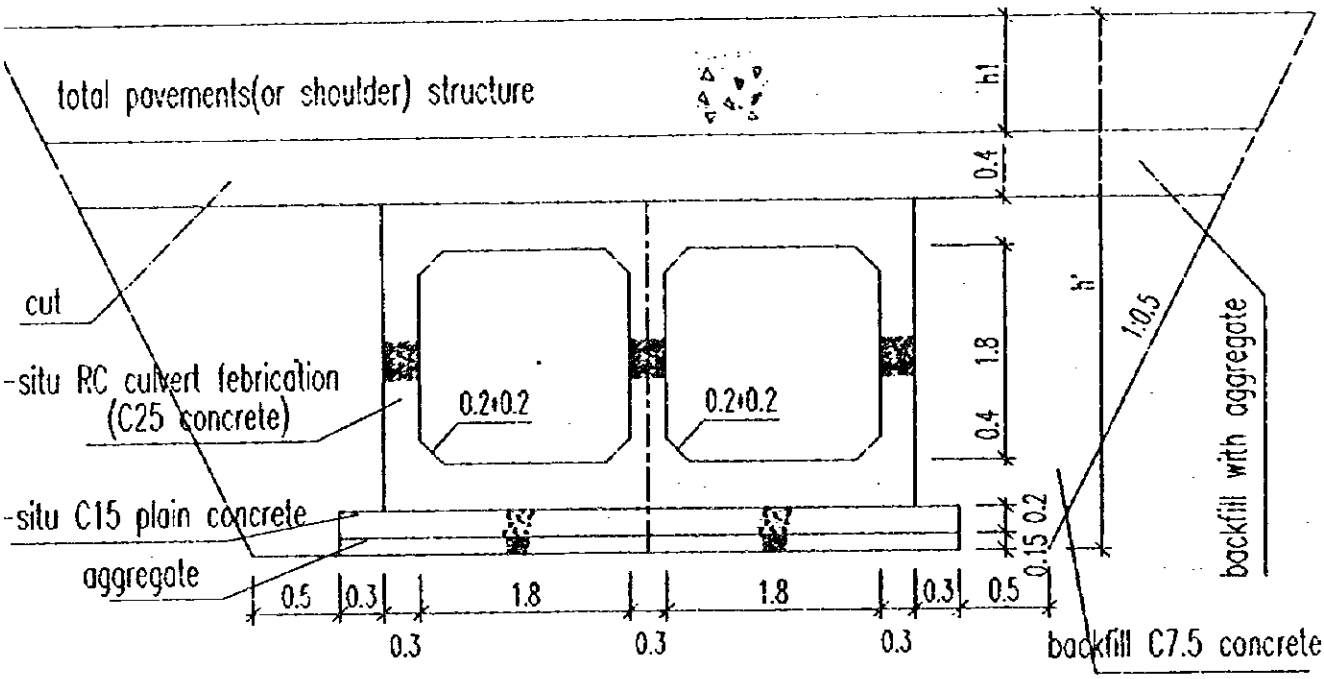
Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,h' cutting depth,H drain average clear depth,L drain length.
Measurement shown in "Storm drainage profile".

Type-2 RC box culvert (BXH=1.8X1.8)

(Pavements area)



Type-2 RC box culvert
Cross section

Calculation formula:

C25 concrete: $(0.8*4.5+0.9*1.8+4*0.2*0.2)*L=5.38*L \quad (m^3)$

C15 plain concrete: $5.1*0.2*L=1.02*L \quad (m^3)$

aggregate: $5.1*0.15*L=0.765*L \quad (m^3)$

Excavation: $[6.1+0.5*(h'-h1)]*(h'-h1)*L \quad (m^3)$

Backfill with C7.5 concrete: $[(6.1+0.5*2.95)*2.95 - 4.5*2.6-5.1*0.35]*L$
$=8.862*L \quad (m^3)$

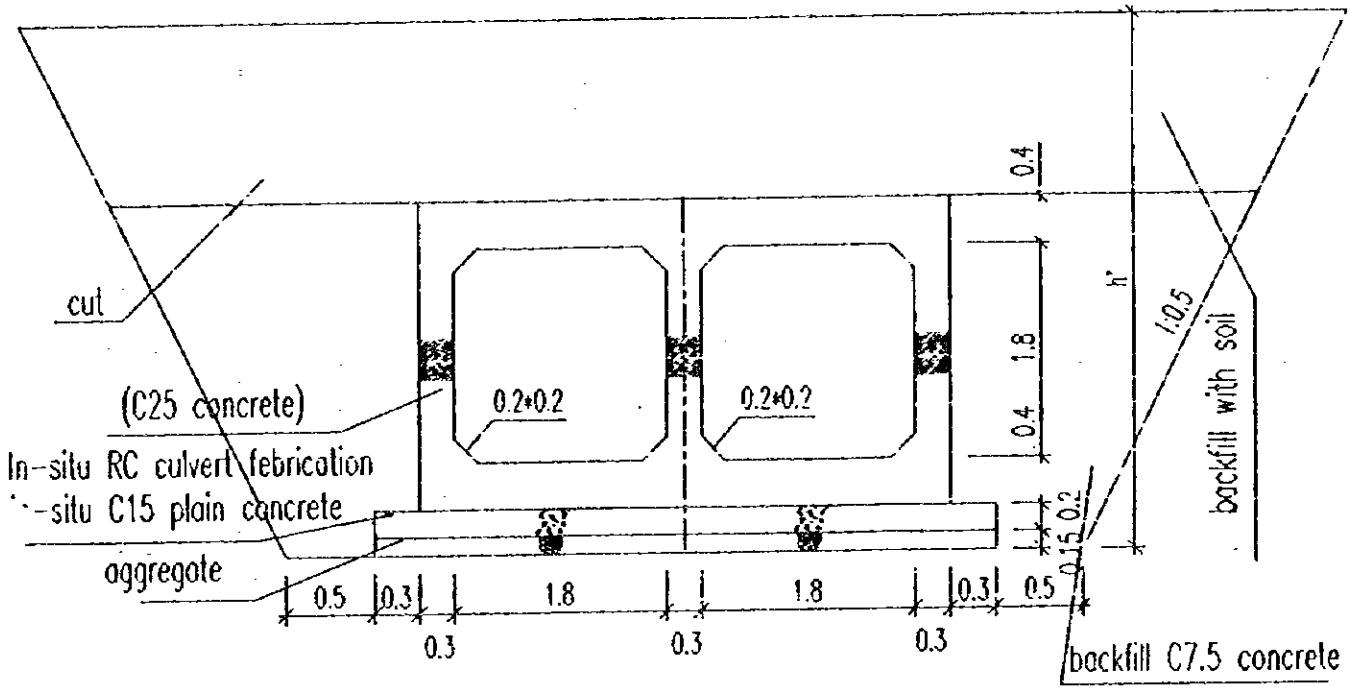
Backfill with aggregate: $[6.1+2.95+0.5*(h'-h1-2.95)]*(h'-h1-2.95)*L \quad (m^3)$

Polyvinyl expansion board: (C25 concrete+C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,h' cutting depth,H drain average clear depth,H1 total pavements structure height,L drain length. Measurement shown in "Storm drainage profile".

Type-2 RC box culvert (BXH=1.8X1.8)
(unpaved area)



Type-2 RC box culvert
Cross section

Calculation formula:

C25 concrete: $(0.8*4.5+0.9*1.8+4*0.2*0.2)*L=5.38*L \quad (m^3)$

C15 plain concrete: $5.1*0.2*L=1.02*L \quad (m^3)$

aggregate: $5.1*0.15*L=0.765*L \quad (m^3)$

Excavation: $(6.1+0.5*h')*h'*L \quad (m^3)$

Backfill with C7.5 concrete: $[(6.1+0.5*2.95)*2.95 - 4.5*2.6-5.1*0.35]*L$

$=8.862*L \quad (m^3)$

Backfill with aggregate: $[6.1+2.95+0.5*(h'-2.95)]*(h'-2.95)*L \quad (m^3)$

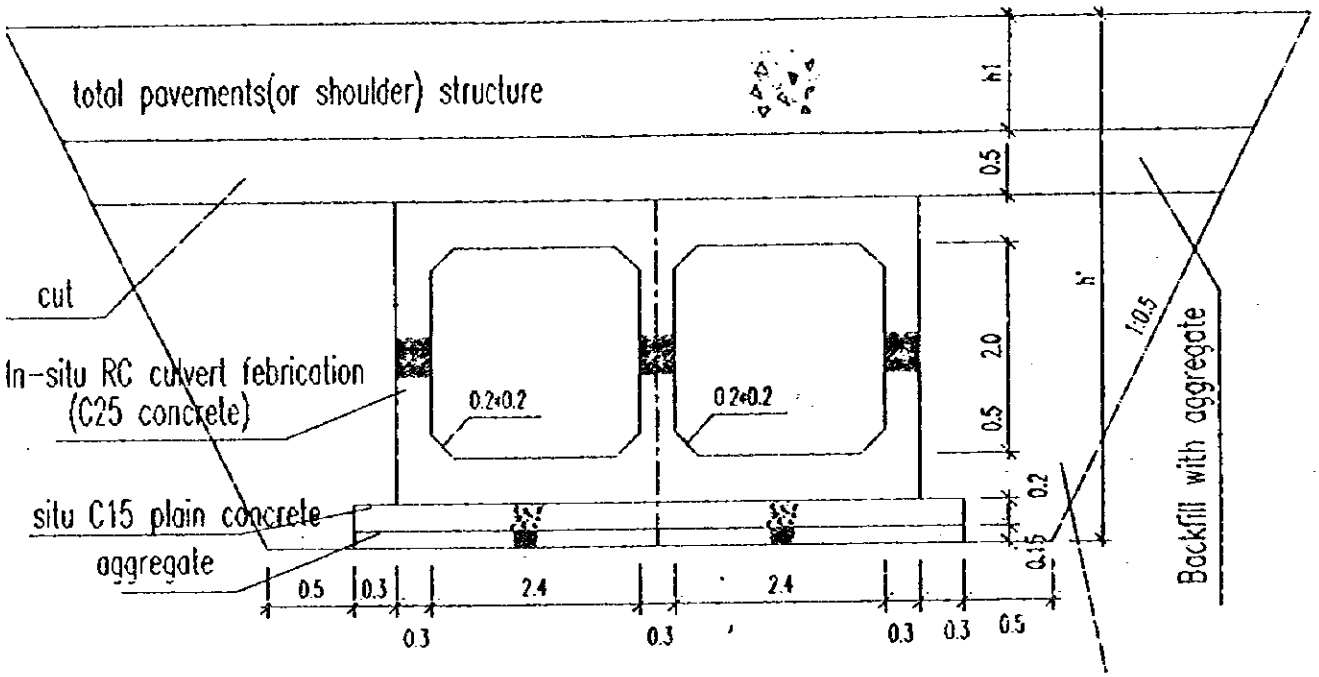
Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,h' cutting depth,H drain average clear depth,L drain length.
Measurement shown in "Storm drainage profile".

Type-2 RC box culvert (BXH=2.4X2.0)

(pavements area)



Type-2 RC box culvert Cross section

backfill with C7.5 concrete

Calculation formula:

C25 concrete: $(1.0*5.7+0.9*2+4*0.2*0.2)*L=7.66*L\ (m^3)$

C15 plain concrete: $6.3*0.2*L=1.26*L\ (m^3)$

aggregate: $6.3*0.15*L=0.945*L\ (m^3)$

Excavation: $[7.3+0.5*(h'-h1)]*(h'-h1)*L\ (m^3)$

Backfill with C7.5 concrete: $[(7.3+0.5*3.35)*3.35 - 5.7*3-6.3*0.35]*L$

$=10.762*L\ (m^3)$

Backfill with aggregate: $[7.3+3.35+0.5*(h'-h1-3.35)]*(h'-h1-3.35)*L\ (m^3)$

Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

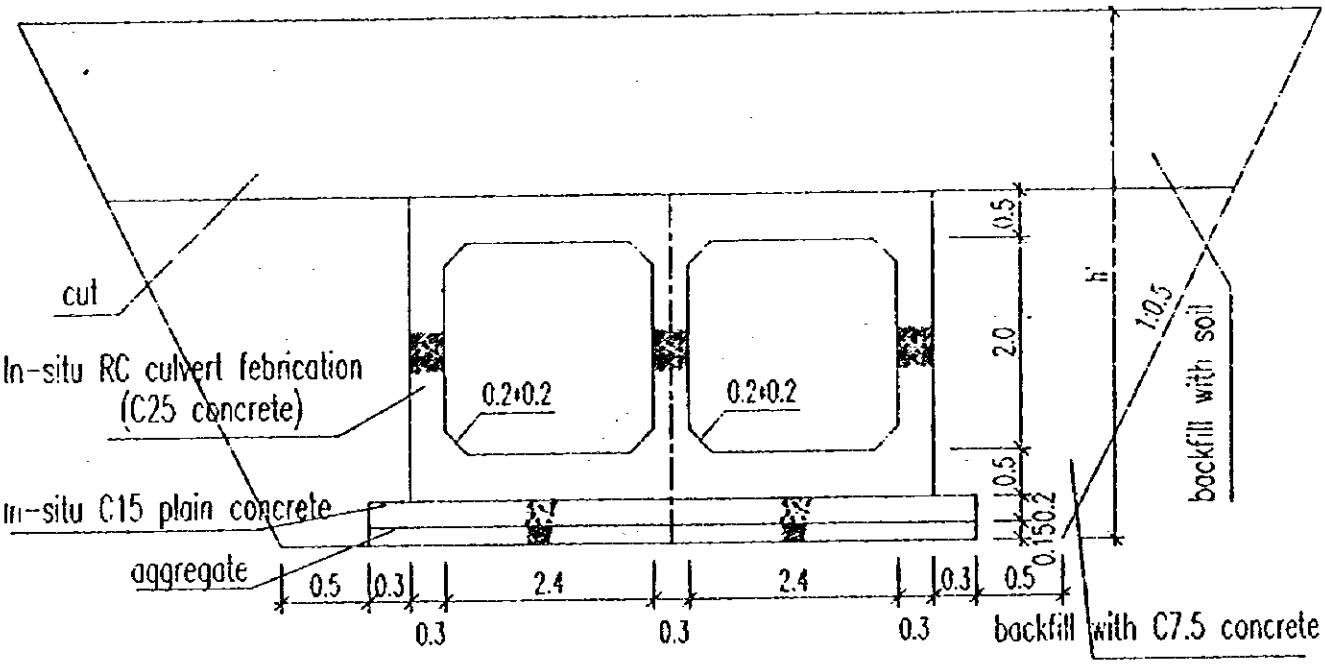
Note :1.Unit:m.

2.B drain width,h' cutting depth,H drain average clear depth,L drain length.

Measurement shown in "Storm drainage profile".

Type-2 RC box culvert (BXH=2.4X2.0)

(unpoved area)



Type-2 RC box culvert
Cross section

Calculation formula:

C25 concrete: $(1.0*5.7+0.9*2+4*0.2*0.2)*L=7.66*L \quad (m^3)$

C15 plain concrete: $6.3*0.2*L=1.26*L \ (m^3)$

aggregate: $6.3*0.15*L=0.945*L \quad (m^3)$

Excavation: $(7.3+0.5*h')*h'*L \quad (m^3)$

Backfill with C7.5 concrete: $[(7.3+0.5*3.35)*3.35 - 5.7*3-6.3*0.35]*L$
$=10.762*L \ (m^3)$

Backfill with aggregate: $[7.3+3.35+0.5*(h-3.35)]*(h'-3.35)*L \quad (m^3)$

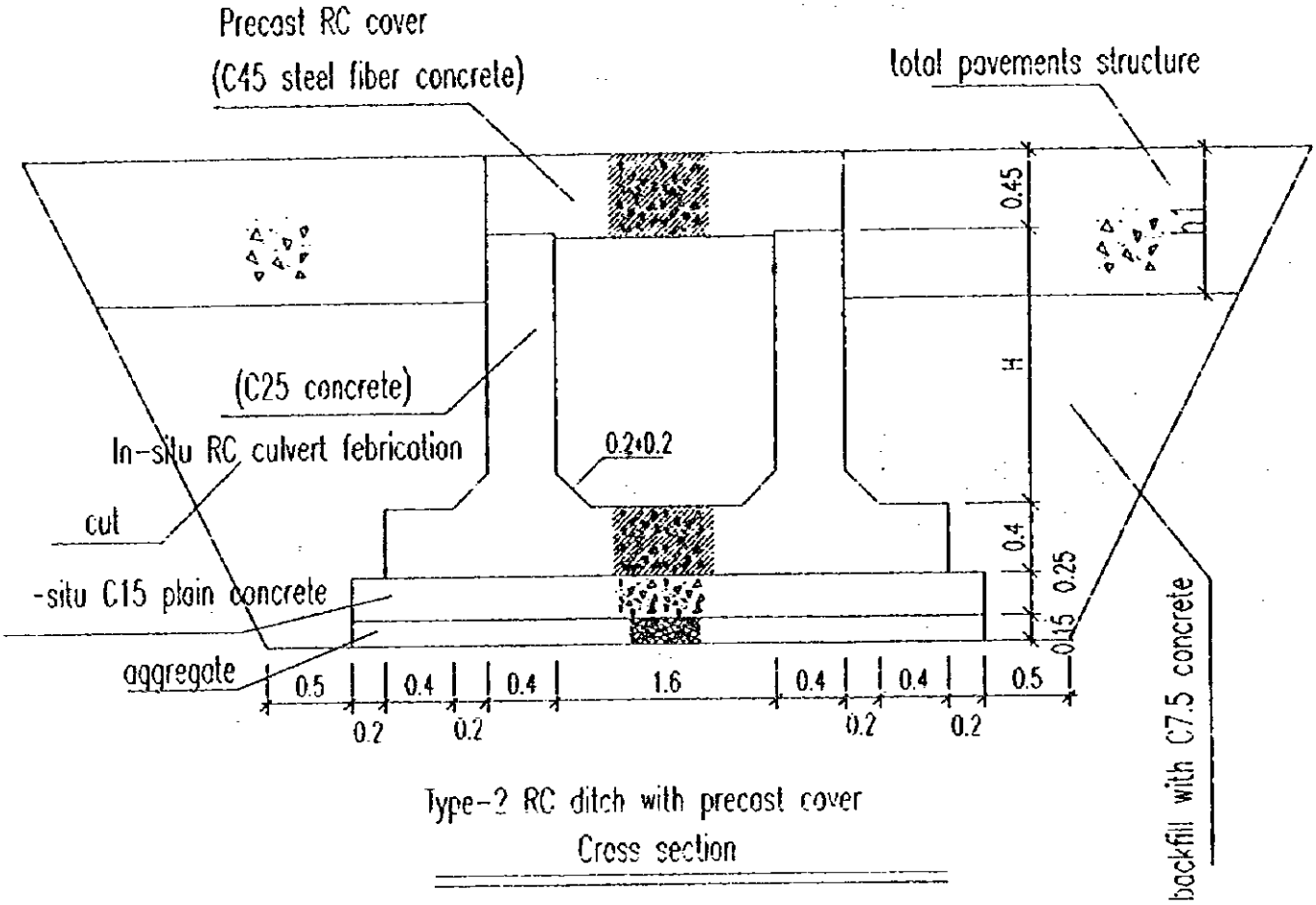
Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,h' cutting depth,H drain overage clear depth,L drain length.

Measurement shown in "Storm drainage profile".

Type-2 RC ditch with precast cover



Type-2 RC ditch with precast cover
Cross section

Calculation formula:

C25 concrete: $[0.4*3.6+0.8*H+2*0.2*0.2]*L \quad (m^3)$

C15 plain concrete: $4*0.25*L=L(m^3)$

aggregate: $4*0.15*L=0.6*L \quad (m^3)$

Excavation: $[5+0.5*(H+1.25-h1)]*(H+1.25-h1)*L \quad (m^3)$

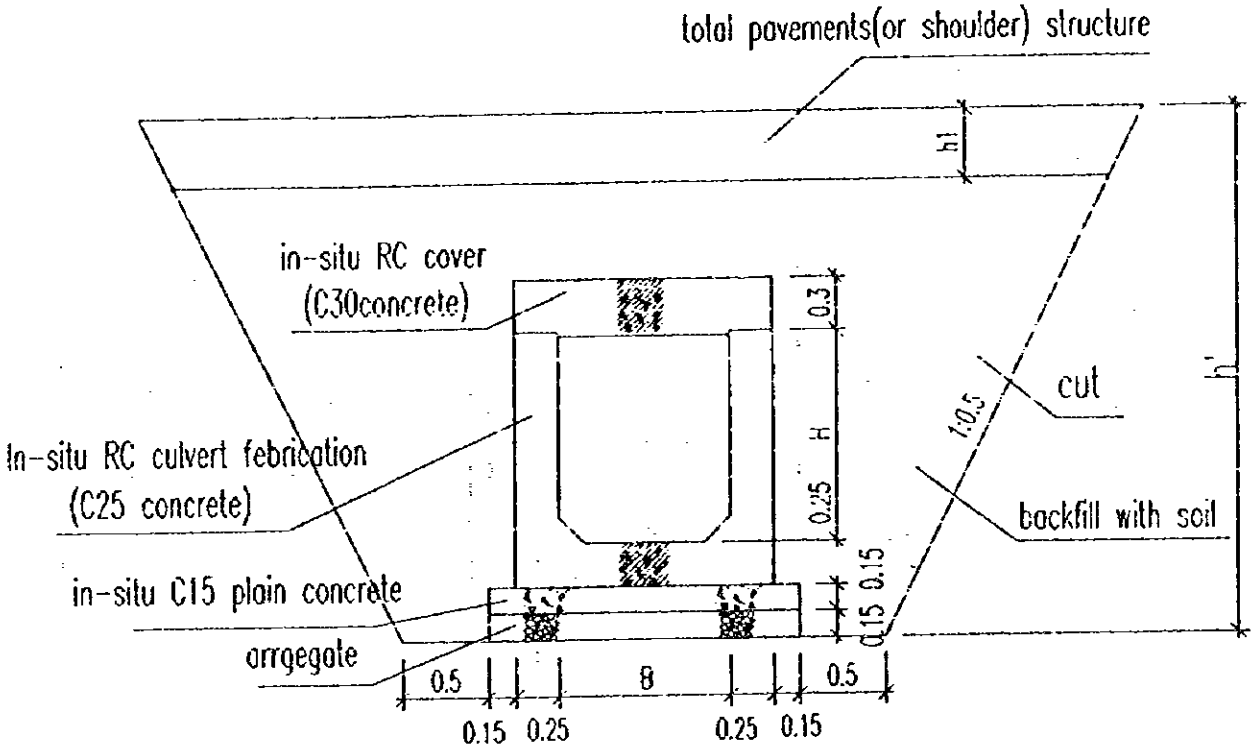
Backfill with C7.5 concrete: excavation- 1.6*C15 plain concrete-
$[(0.4*3.6+2.4*(H+0.45-h1)+0.04]*L \quad (m^3)$

Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,h' cutting depth,H drain average clear depth,H1 total pavements structure height,L drain length. Measurement shown in "Storm drainage profile".

Type-3 RC culvert with precast cover (pavements area)



Type-3 RC culvert with precast cover
Cross section

Calculation formula:

C25 concrete: $[0.25*(B+0.5)+0.5*H+0.15*0.15]*L \quad (m^3)$

C15 plain concrete: $(B+0.8)*0.15*L (m^3)$

aggregate: $(B+0.8)*0.15*L \quad (m^3)$

Excavation: $[B+1.8+0.5*(h'-h1)]*(h'-h1)*L \quad (m^3)$

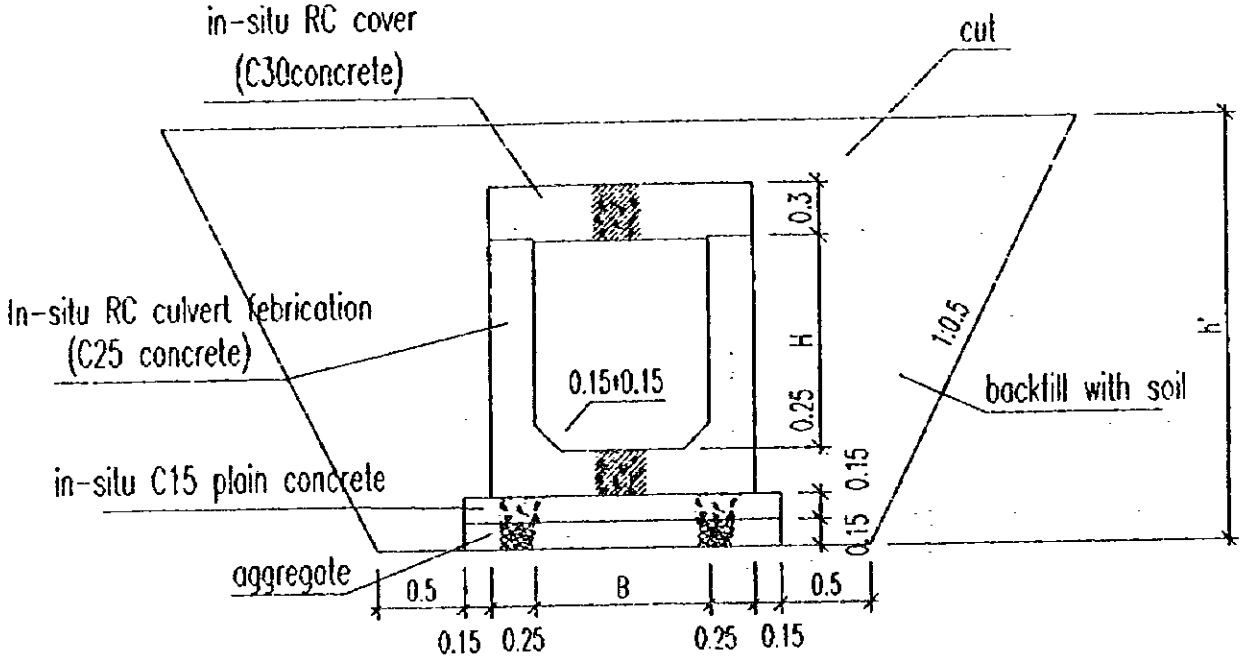
Backfill with ordinary soil: excavation-2*aggregate $-(B+0.5)*(H+0.85)*L \quad (m^3)$

Polyvinyl expansion board: (C25 concrete+C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,h' cutting depth,H drain average clear depth,H1 total pavements structure height,L drain length. Measurement shown in "Storm drainage profile".

Type-3 RC culvert with precast cover (unpaved area)



Type-3 RC culvert with precast cover
Cross section

Calculation formula:

C25 concrete: $[0.25*(B+0.5)+0.5*H+0.15*0.15]*L \quad (m^3)$

C15 plain concrete: $(B+0.8)*0.15*L \quad (m^3)$

aggregate: $(B+0.8)*0.15*L \quad (m^3)$

Excavation: $(B+1.8+0.5*h')*h'*L \quad (m^3)$

Backfill with ordinary soil: excavation-2*aggregate $-(B+0.5)*(H+0.85)*L \quad (m^3)$

Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

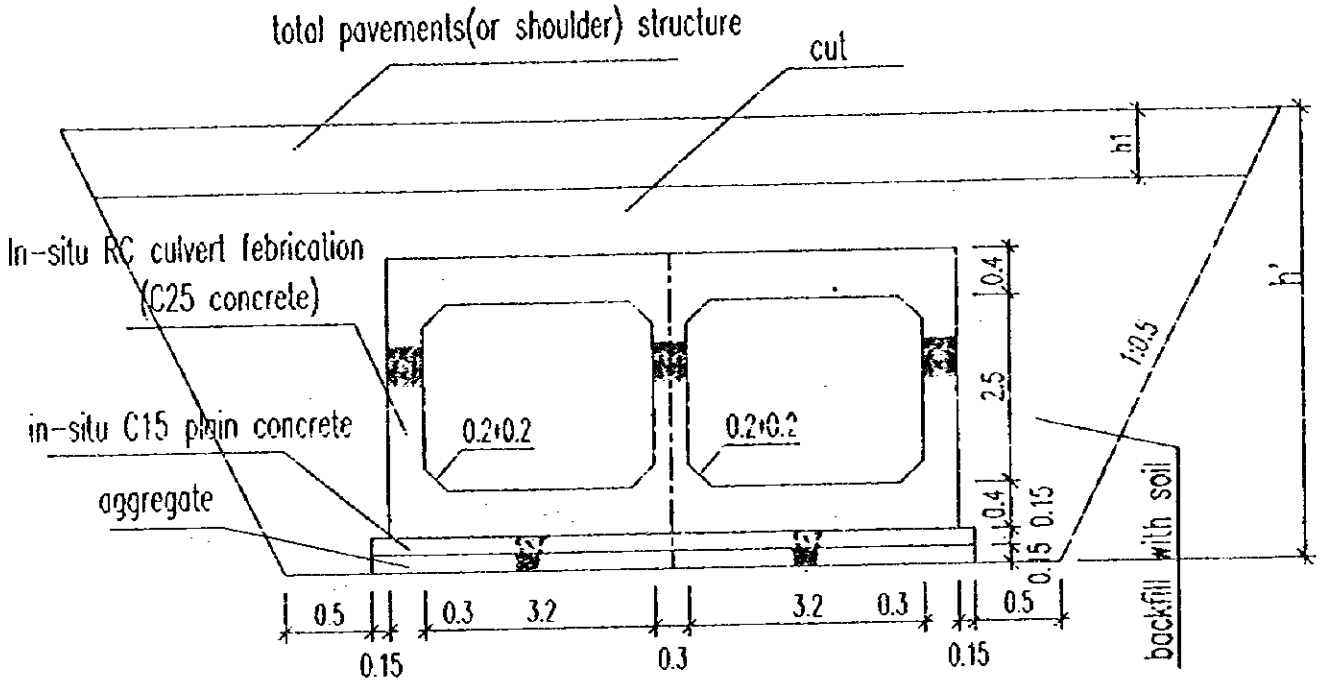
Note :1.Unit:m.

2.B drain width,Hdrain overage clear depth,L drain length.

Measurement shown in "Storm drainage profile".

Type-3 RC box culvert

(pavements area)



Type-3 RC box culvert
Cross section

Calculation formula:

C25 concrete: $(0.8*7.3+0.9*2.5+4*0.2*0.2)*L=8.25*L$ (m^3)

C15 plain concrete: $7.6*0.15*L$ (m^3)

aggregate: $7.6*0.15*L$ (m^3)

Excavation: $[8.6+0.5*(h'-h1)]*(h'-h1)*L$ (m^3)

Backfill with ordinary soil: excavation-2*aggregate-$7.3*3.3*L$ (m^3)

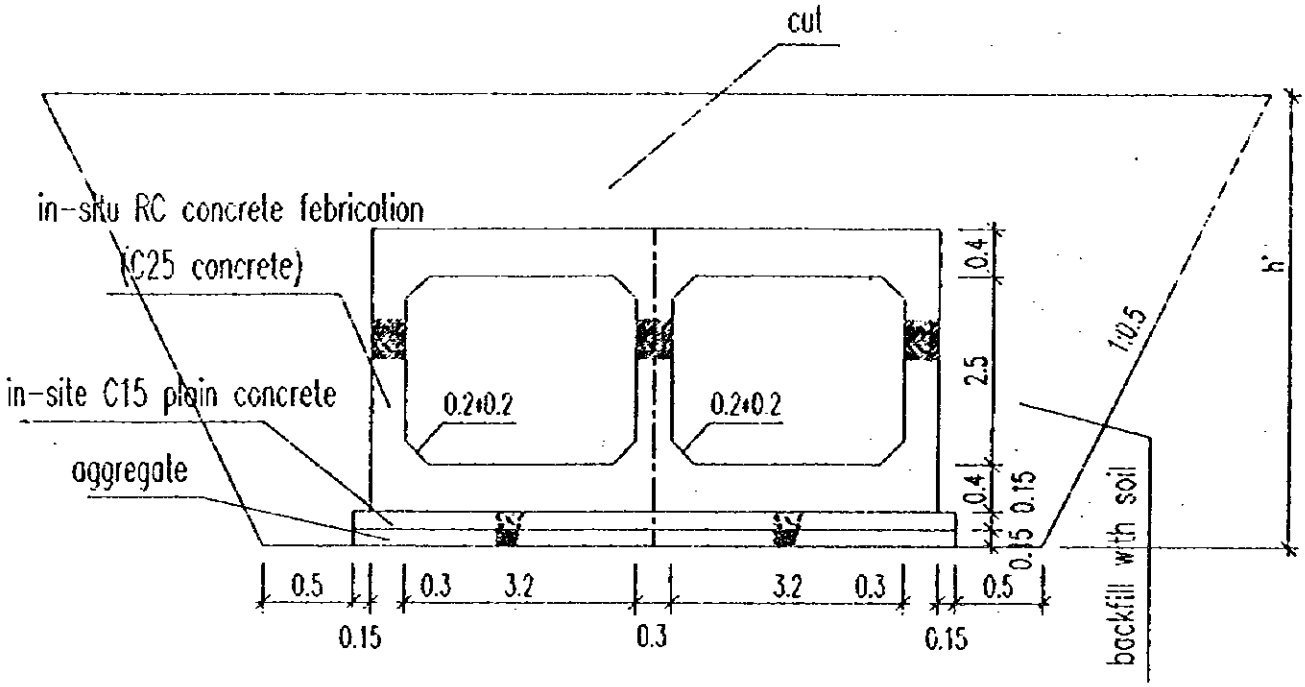
Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,Hdrain average clear depth,L drain length.

Measurement shown in "Storm drainage profile".

Type-3 RC box culvert
(unpaved area)



Type-3 RC box culvert
Cross section

Calculation formula:

C25 concrete: $(0.8*7.3+0.9*2.5+4*0.2*0.2)*L=8.25*L$ (m^3)

C15 plain concrete: $7.6*0.15*L$ (m^3)

aggregate: $7.6*0.15*L$ (m^3)

Excavation: $(8.6+0.5*h')*h'*L$ (m^3)

Backfill with ordinary soil: excavation-2*aggregate $-7.3*3.3*L$ (m^3)

Polyvinyl expansion board: (C25 concrete+ C15 plain concrete)/20 (m^2)

Note :1.Unit:m.

2.B drain width,Hdrain average clear depth,L drain length.

Measurement shown in "Storm drainage profile".

2 、 Engineering amount calculation for precast and in-situ cover(except intersection)

Calculation method： Each 0.5m ditch has a cover,then the number of covers is ditch length l/0.5;Each 1m culvert has a cover,then the number of covers is culvert length l .Number of covers times engineering amount of one cover is total amount of covers.

Calculation：

(1)、A1：

Type-1 RC ditch with precast cover：

B=1.6m,L=480m,number of cover=960。It times engineering amount of single cover equals:

ϕ8(kg)	Φ14(kg)	C30 precast concrete(m^3)
1402	11328	238.1

Type -3 RC culvert with precast cover：

B=1.6m,L=40m, number of cover=40。It times engineering amount of single cover equals:

ϕ10(kg)	Φ16(kg)	C30 in-situ concrete(m^3)
256	1037	26.5

(2)、A2：

Type-1 RC ditch with precast cover：

B=1.2m,L=34m,number of cover=68

B=1.4m,L=214m,number of cover=428

B=1.8m,L=1020m,number of cover=2040

Type -1 RC culvert with precast cover：

B=1.8m,L=170m, number of cover =170。

It times engineering amount of single cover equals:

ϕ8(kg)	ϕ10(kg)	Φ12(kg)	Φ14(kg)	Φ16(kg)	C30 precast concrete(m^3)
3944	1456	496	4533	39280	766.9

Type-2 RC culvert with precast cover：

B=1.2m,L=108m, number of cover =108。

B=1.6m,L=180m, number of cover =180。

B=1.8m,L=410m, number of cover =410。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ14(kg)	Φ16(kg)	Φ18(kg)	C30 precast concrete (m^3)
6112	1723	4664	14744	465.4

(3)、A3：

Type-2 RC culvert with precast cover：

B=1.8m,L=80m,number of cover=80。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ18(kg)	C30 precast concrete(m^3)
751	2877	58.1

(4)、A5：

Type-1 RC ditch with precast cover：

B=1.6m,L=14.5m, number of cover =29。 It times engineering amount of single cover equals:

ϕ8(kg)	Φ14(kg)	C30 precast concrete (m^3)
43	343	7.2

Type-2 RC culvert with precast cover：

B=1.6m,L=557m, number of cover =557。

B=1.8m,L=273m, number of cover =273。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ16(kg)	Φ18(kg)	C30 precast concrete(m^3)
7463	14432	9817	567.0

Type-2 RC ditch with precast cover：

B=1.6m,L=1479.5m, number of cover =2959。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ12(kg)	Φ25(kg)	C45 steel fiber concrete(m^3)
117058	24797	179079	1580.2

(5)、A6：

Type-1 RC ditch with precast cover：

B=1.4m,L=692m, number of cover =1384。

B=1.8m,L=80m, number of cover =160。

It times engineering amount of single cover equals:

ϕ8(kg)	Φ14(kg)	Φ16(kg)	C30 precast concrete(m^3)
2069	14657	2821	354.0

Type-2 RC culvert with precast cover：

B=1.8m,L=168m number of cover =168。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ18(kg)	C30 precast concrete (m^3)
1576	6042	122.0

Type-3 RC culvert with precast cover：

B=1.4m,L=20m, number of cover =20 。

B=1.6m,L=17m, number of cover =17 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ14(kg)	C30 in-situ concrete(m^3)
116	358	12.0

(6)、A7：

Type-2 RC culvert with precast cover：

B=1.6m,L=78m,number of cover =78 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ16(kg)	C30 precast concrete(m^3)
687	2021	51.7

Type-2 RC ditch with precast cover：

B=1.6m,L=287m, number of cover =574 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ12(kg)	Φ25(kg)	C45 steel fiber (m^3)
22708	4810	34738	306.5

(7)、B1：

Type-1 RC ditch with precast cover：

B=1.6m,L=460m, number of cover =920 。 It times engineering amount of single cover equals:

ϕ8(kg)	Φ14(kg)	C30 precast concrete(m^3)
1344	10856	228.2

Type-3 RC culvert with precast cover：

B=1.6m,L=20m, number of cover =20 。

B=1.8m,L=25m, number of cover =25 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ16(kg)	Φ18(kg)	C30 in-situ concrete(m^3)
296	519	899	31.5

(8)、B2：

Type-1 RC ditch with precast cover：

B=1.2m,L=40m ,number of cover =80 。

B=1.4m,L=180m ,number of cover =360 。

B=1.8m,L=968m, number of cover =1936 。

Type-1 RC culvert with precast cover：

B=1.8m,L=232m, number of cover =232 。

It times engineering amount of single cover equals:

ϕ8(kg)	ϕ10(kg)	Φ12(kg)	Φ14(kg)	Φ16(kg)	C30 precast concrete(m^3)
3700	1987	578	3813	39200	767.8

Type-2 RC culvert with precast cover :

B=1.0m,L=107m, number of cover =107 。

B=1.6m,L=180m, number of cover =180 。

B=1.8m,L=440m, number of cover =440 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ14(kg)	Φ16(kg)	Φ18(kg)	C30 precast concrete(m^3)
6324	1102	4664	15823	481

Type-3 RC culvert with precast cover :

B=1.4m,L=20m, number of cover =20 。

B=1.8m,L=20m, number of cover =20 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ14(kg)	Φ18(kg)	C30 in-situ concrete(m^3)
255	358	719	26.5

(9)、 B3 :

Type-2 RC culvert with precast cover :

B=1.2m,L=170m, number of cover =170 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ14(kg)	C30 precast concretet(m^3)
1073	2712	76.4

Type-3 RC culvert with precast cover :

B=1.8m,L=20m, number of cover =20 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ18(kg)	C30 in-situ concrete(m^3)
140	720	14.6

(10)、 B4 :

Type-2 RC culvert with precast cover :

B=1.8m,L=380m, number of cover =380 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ18(kg)	C30 precast concrete(m^3)
3565	13665	275.9

Type-3 RC culvert with precast cover :

B=1.2m,L=40m, number of cover =40 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ12(kg)	C30 in-situ concrete(m^3)
209	469	21.4

(11)、B5：

Type-1 RC ditch with precast cover：

B=1.4m,L=430m, number of cover =860 。It times engineering amount of single cover equals:

ϕ8(kg)	Φ14(kg)	C30 precast concrete(m^3)
1118	9108	191.8

Type-2 RC culvert with precast cover：

B=1.6m,L=100m, number of cover=100 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ16(kg)	C30 precast concrete(m^3)
880	2591	66.2

Type-3 RC culvert with precast cover：

B=1.6m,L=20m, number of cover =20 。

It times engineering amount of single cover equals:

ϕ10(kg)	Φ16(kg)	C30 in-situ concrete(m^3)
128	519	13.3

3 、 Calculation of tie-bar

calculation method： From "dwg1-d8",can see number of type 2 RC ditch/culvert joint. Then number of joint times number of tie-bar of each joint and weight of each tie-bar makes the total engineering amount of tie-bar. Among that, ϕ30 tie-bar weight =5.555*0.6=3.332(kg/rod); ϕ35 tie-bar weight =7.56*0.6=4.536(kg/rod).

Calculation：

(1)、 A2：

Type-2 RC culvert with precast cover：

BxH	number of joint	number of tie-bar of each joint	ϕ30 weight(kg)
1.2x0.7	5	11	496rod*3.332 =1653
1.6x1.1	8	14	
1.8x1.4	7	17	
1.8x1.8	3	21	
1.8x2.0	7	21	

(2)、 A3：

Type-2 RC culvert with precast cover：

BxH	number of joint	number of tie-bar of each joint	ϕ30 weight(kg)
1.8x1.8	3	21	63*3.332=210

Type-2 RC box culvert with precast cover：

BxH	number of joint	number of tie-bar of each joint	ϕ30 weight(kg)
2*1.8x1.8	6	45	860*3.332=2866
2*2.4x2.0	10	59	

(3)、 A5：

Type-2 RC culvert with precast cover：

BxH	number of joint	number of tie-bar of each joint	ϕ30 weight(kg)
1.6x1.4	25	16	628*3.332=2093
1.8x1.6	12	19	

Type-2 RC ditch with precast cover：

B	number of joint	number of tie-bar of each joint	ϕ35 weight(kg)
1.6	79	18	1422*4.536=6450

(4)、 A6：

Type-2 RC culvert with precast cover：

BxH	number of joint	number of tie-bar of each joint	ϕ30weight(kg)
1.8x1.6	3	19	
1.8x2.0	4	21	141*3.332=470

(5)、A7：

Type-2 RC culvert with precast cover：

BxH	number of joint	number of tie-bar of each joint	ϕ30weight(kg)
1.6x1.4	3	16	48*3.332=160

Type-2 RC ditch with precast cover：

B	number of joint	number of tie-bar of each joint	ϕ35weight(kg)
1.6	14	18	252*4.536=1143

(6)、B2：

Type-2 RC culvert with precast cover：

BxH	number of joint	number of tie-bar of each joint	ϕ30weight(kg)
1.0x0.7	5	11	
1.6x1.1	8	14	509*3.332
1.8x1.3	9	17	=1696
1.8x1.8	3	21	
1.8x2.0	6	21	

(7)、B3：

Type-2 RC culvert with precast cover：

BxH	number of joint	number of tie-bar of each joint	ϕ30weight(kg)
1.2x1.4	7	15	105*3.332=350

Type-2 RC box culvert with precast cover：

BxH	number of joint	number of tie-bar of each joint	ϕ30weight(kg)
2*1.8x1.8	9	45	
2*2.4x2.0	7	59	818*3.332=2726

(8)、B4：

Type-2 RC culvert with precast cover：

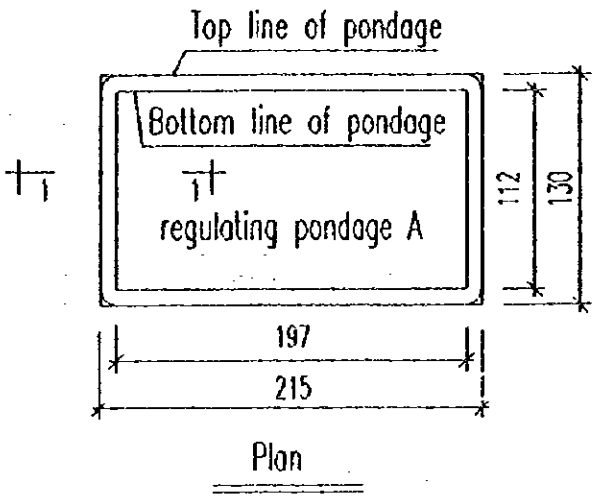
BxH	number of joint	number of tie-bar of each joint	ϕ30weight(kg)
1.8x2.0	14	21	294*3.332=980

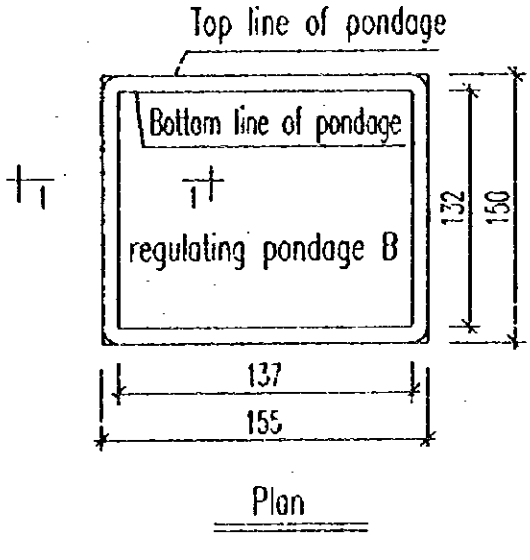
(9)、B5：

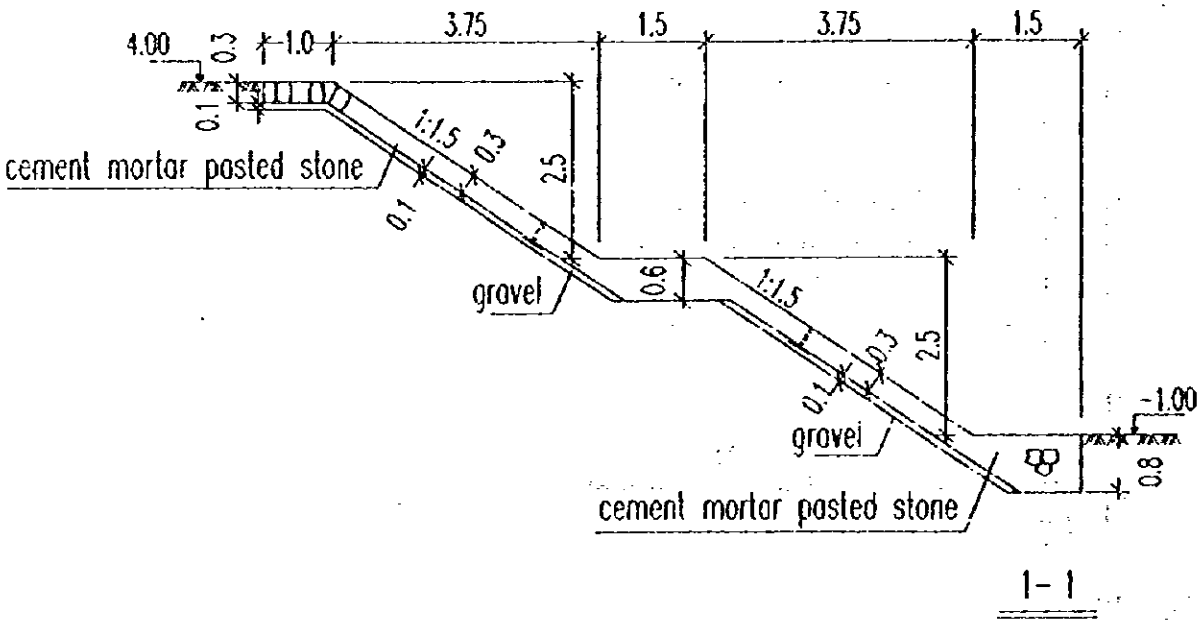
Type-2 RC culvert with precast cover：

BxH	number of joint	number of tie-bar of each joint	ϕ30weight(kg)
1.6x1.6	4	18	72*3.332=240

4.Regulating pondage works caculation books







caculation procedure:

regulating pondage A

cement mortar posted stone:

$[0.3*(1+1.81*2.5*2)+0.6*1.5+0.8*1.31)]*2*(215+130) = 3424 \quad (m^3)$

gravel : $0.1*(1+1.81*2.5*2+2.4)*2*(215+130)=860 \quad (m^3)$

excavation: $2.5/3*(215*130+207.5*122.5+\sqrt{215*130*207.5*122.5}+$

$204.5*119.5+197*112+\sqrt{204.5*119.5*197*112}) = 129948 \ (m)^3$

Polyvinyl expansion board: $3424/10=342.4 \quad (m)^2$

regulating pondage B

cement mortar posted stone:

$[0.3*(1+1.81*2.5*2)+0.6*1.5+0.8*1.31)]*2*(155+150) = 3002 \quad (m)^3$

Gravel: $0.1*(1+1.81*2.5*2+2.4)*2*(155+150)=756 \quad (m)^3$

Excavation: $2.5/3*(155*150+147.5*142.5+\sqrt{155*130*147.5*142.5}+$

$144.5*139.5+137*132+\sqrt{144.5*139.5*137*132}) = 107752 \ (m)^3$

Polyvinyl expansion board: $3002/10=300.2 \ (m)^2$

FENCE ROAD AND GATE

	Length	Area	Numbers
Steel Fence	10890 m		
Brick Fence	2092 m		
Perimeter Road And Fire Fighting Road		29666 m^2	
GSE Route		30059 m^2	
Gate (With 6m)			3
Gate (With 8m)			4

Ⅱ-4　附帯施設工事

Main Quantities of Supplement Facilities of Airfield

NO.	Items \ Materials / Quantities	Area of Road Pavement(m²)			Area of Base Course (m²)			Fence And Blast Fence	
		Fine Asphalt Concrete		Coarse Asphalt Concrete	Lime Flyash Stabilized Crushed Stone	Lime Flyash Stabilized Crushed Stone	Crushed Stone	Numbers	Length
		3CM	4CM	6CM	18CM	15CM	20CM		m
1	Perimeter Road And Fire Fighting Road	29666		29666		69915			
2	CSE Route		30059	30059	66671		33335		
3	Steel Fence								10890
4	Brick Fence								2092
5	Gate(Width 6m)							3	
6	Gate(Width 8m)							4	
7	Blast Fence								~~1198~~ 1196
	Total Area(m²)	29666	30059	59725	66671	69915	33335		
	Total Volume(m³)	890	1203	3584	12001	10487	6567		

Main Material Quantities of Supplement Facilities of Airfield

NO.	Items \ Materials / Quantities		Content	Asphalt	Cement	Lime	Flyash	Crushed Stone			Sand	Chip	Reinforce Bar and Steel Frame			Brick	Road Point
								0.5~2cm	2~4cm	0.5~5cm			<φ10	>φ10	Steel Frame		
			(m³)	(ton)	(ton)	(ton)	(ton)	(m³)	(m³)	(m³)	(m³)	(m³)	(ton)	(ton)	(ton)	(Thousand Block)	(ton)
1	Pavement	3cm Fine Asphalt Concrete	29666	178						142	957	1051					0.37
2		4cm Fine Asphalt Concrete	30059	181						144	974	1070					
3		6cm Coarse Asphalt Concrete	59725	394				537	1538		2396	1252					
4	Base Course	18cm Lime Flyash Stabilized Crushed Stone	66671			1001	1201			7801							
5		18cm Lime Flyash Stabilized Crushed Stone	69915			1047	1256			8163							
6		Tack Coat	59725	24													
7		Prime Coat	59725	48													
8		20cm Crushed Stone	33335							6667							
9	Fence	Steel Fence (m)	10890		250			95	539		379		119.7	27	157.6		
10		Brick Fence (m)	2092													1046	
11		Gate (NO'S)	7														
12	Blast Fence	Upper Structure (m)	1198											52.8	781.9		
13		Foundation C25 Concrete Foundation (m)	3460		1158					3208	1675			165.0	2.0		
14		Foundation C10 Concrete Foundation (m)	601		175					551	334						
15		Crushed Stone (m)	601							601							
Total				825	1583	2048	2457	632	2077	27277	6715	3373	119.7	217.8	941.5	1046	0.37

Quantities of Service Road of Airfield

1、Perimeter Road

Length :

L=44.25*+208+2+701.75+235.5+164+305.25+441.25+48.5+219.5+171.75+78*2+377

=3117(m)

Width :

W=5.5m

Area :

A1=L*W

=3117*5.5=17143.5(m^2)

Area of Arc

A2=π/4*(22.75^^{2} — 17.25^^{2})*7+(20^—π/4*20^^{2})*8

=1896.24(m^2)

2、Road to Approaching Lightzone

Length :

L=501.5*2=1003(m)

Width :

W=4.0m

Area :

A3=L*W

=1003*4=4012(m^2)

A4=1418*2=2836(m^2)

3、Fire Fighting Road

Length :

L=158*2+154*2+55+41+114.7

=835.7(m)

Width :

W=4.0m

Area :

A5=L*W

=835.7*4=3342.8(m^2)

Area of Arc

A6=(20^^{2} —π/4*20^^{2})*4+(16^^{2} —π/4*16^^{2})

=398.3(m^2)

Total Area :

A=A1+A2+A3+A4+A5+A6=29666(m^2)

4、GSE Road

Length :

L=219.5+209+38

=466.5(m)

Width :

W=12.0m

Area :

A7=L*W

=466.5*12=5598(m^2)

Length :

L=39+64+139+223+109.5+1720

=2294.5(m)

Width :

W=8.0m

Area :

A8=L*W

=2294.5*8=18356(m^2)

Length :

L=23.0m

Width :

W=4.0m

Area :

A9=L*W

=23*4=92(m^2)

Area of Arc

A10=(14^2 -π/4*14^2)*4+(16^2 -π/4*16^2)*3+(13^2 -π/4*13^2)+(17.25^2 -π/4*117.25^2)

=433.19(m^2)

A11=1254.8(m^2)

Total Area :

A=A7+A8+A9+A10+A11=30059(m^2)

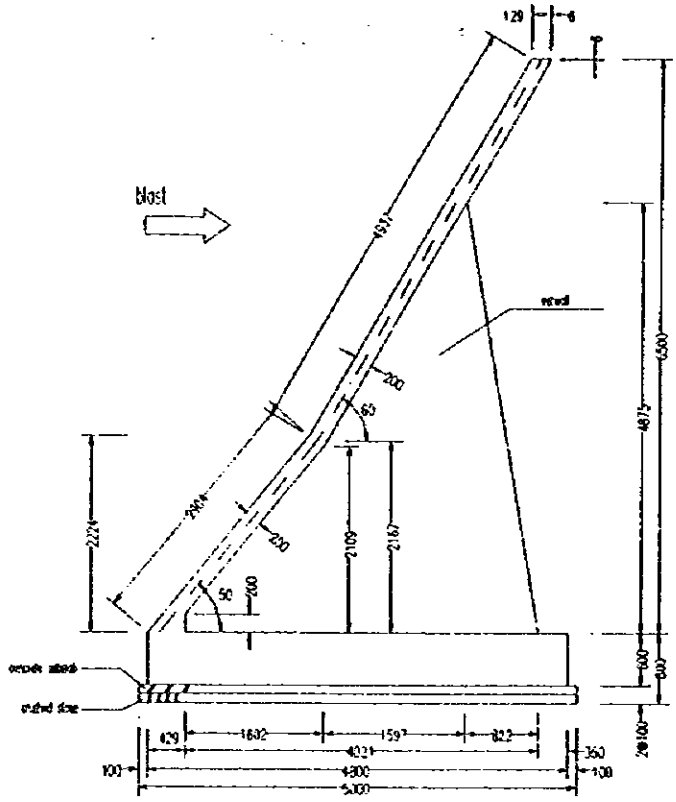
Airside Works

Quantities of Materials of Balstfence

1.general

① length of blastfence: 1196m

② section of balstfence



2.quantities of materials

1)reinforcement

① 1 block (15m)

quantities of 1 block

code	specification	length (m)	weight (kg/m)	number	weight (kg)	note
T_1	ϕ16	14.800	1.578	24	560.5	
T_2	ϕ14	6.620	1.208	85	679.7	
B_1	~	14.800	~	26	464.8	
B_2	~	4.640	~	85	476.4	
S_1	~	8.657	~	75	784.3	
S_2	~	8.953	~	75	811.1	
S_3	~	14.800	~	103	1841.5	
W_1	~	6.478	~	65	508.7	average
W_2	~	5.132	~	75	465.0	length
W_3	ϕ16	6.428	1.578	10	101.4	

ϕ16: $q_1=\Sigma(T_1 + W_3)=560.5 + 101.4=661.9$ kg

ϕ14: $q_2=\Sigma q_i= 6031.5$ kg

②length of 1196m

$q=(661.9 + 6031.5) \times 1196/15=533687$ kg $=534$ t

2)concrete

(1) C25

①wall of blastfence

$V_1=[0.2 \times (4.937 + 2.904) + 0.2 \times 0.17/2] \times 1196$

$=1896\ m^3$

②webwall of blastfence

$V_2=[0.822 \times 4.875/2 + 1.597 \times (2.109 + 4.875)/2$

$+ 1.602 \times (0.2 + 2.109)/2] \times 0.3 \times 1196/3$

$=1128\ m^3$

③foundation

V_3=0.6 × 4.8 × 1196

=3444 m^3

④ total

$V=V_1 + V_2 + V_3$

=1896 + 1128 + 3444

=6468 m^3

(2) C10 (concrete subslab)

V=0.1 × 5.0 × 1196

=598 m^3

3)crushed stone

V=0.1 × 5.0 × 1196

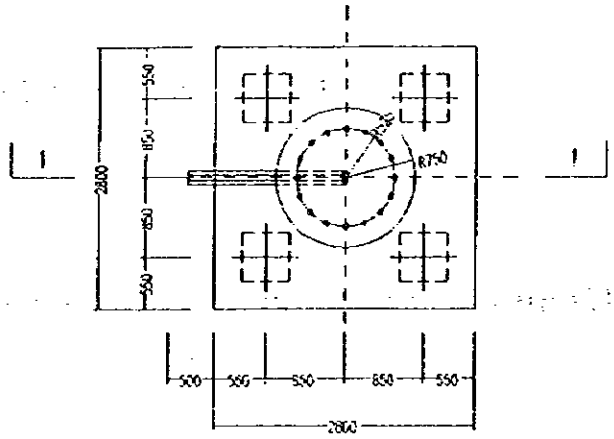
=598 m^3

Floodlighting of Airside Apron

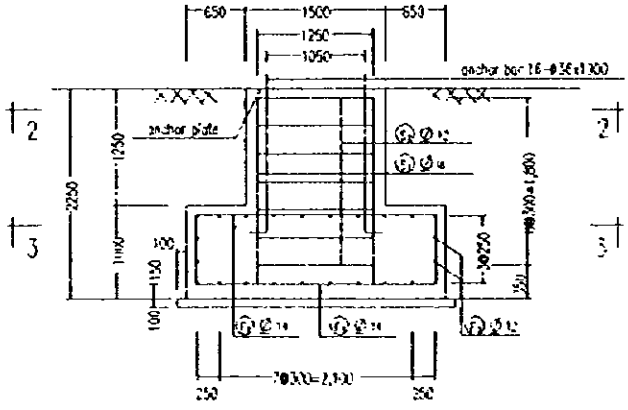
Quantities of Foundation of Tower Lighting

1.general

4 precast concrete piles are used in the foundation of one lighting tower .The following drawings indicate the size of foundation and section.



basic map



1 - 1

2. calculation of quantities of material

1) precast concrete pile (□450 × 450 × 25000)

n=4

2) footing

①reinforcement

ϕ12:

S_2: q'_1=0.888 × 4.44 × 7=27.6 kg

F_3: q'_2=0.888 × 2.626 × 8=18.7kg

q_1=27.6 + 18.7=46.3 kg

ϕ14:

F_1: q'_1=1.208 × 4.1 × 20=99.1 kg

F_2: q'_2=1.208 × 2.6 × 20=62.8 kg

q_2=99.1 + 62.8=161.9 kg

ϕ18:

S_1: q_3=1.998 × 2.2 × 24=105.5 kg

total: $\Sigma q=q_1 + q_2 + q_3$=313.7 kg

② concrete

1) C20

V=2.8 × 2.8 × 1.0 + 0.75 × 0.75 × 3.14 × 1.25

=10.0 m^3

2) C10

V=2.8 × 2.8 × 0.1

=0.78 m^3

③ anchor bolt (ϕ36 × 2100)

n=16

④ anchor plate (t=6mm)

n=1

⑤ zine-plating pipe of metal

l=1.0 × 3=3.0 m

Ⅲ. 概 算 工 事 費

上海浦東国際空港飛行区工事概算総括
作成説明書

一、概算工事費作成の範囲

上海浦東国際空港の基本設計は各工事の進捗状況に基づいて分割申請している。空港の飛行区工事は空港工事の主体工事の一つであり、上海浦東国際空港の基本設計図書のうち最初に申請する工事の一つである。上海浦東国際空港建設指揮部のコメントに基づき、分割申請する工事については概算工事費作成の関連規定に基づいて先に工事概算総括を単独で作成した。

上海浦東国際空港の飛行区工事の概算工事費には以下の工事が含まれる。

1. 飛行区舗装施設（飛行区土工、舗装、排水、付帯施設を含む）
2. メンテナンスエプロン施設（舗装、排水を含む）
3. 飛行区雨水ポンプ場施設（南北2カ所のポンプ場を含む）
4. 飛行区舗装施設地盤改良施設（メンテナンスエプロンを含む）
5. 飛行区電源及び灯火施設（航空灯火及びエプロン照明、電源を含む）
6. 消防救難施設（飛行区消防施設と救難施設を含む）

注：給油施設については管理、予算が独立しているので、概算工事費も独自に作成する。

二、概算工事費作成の根拠

（一）工事規模の根拠

1. 国家計画委員会の上海浦東国際空港 F/S に対する認可文書。
2. 中国民用航空総局の上海浦東国際空港全体平面計画に対する認可コメント。
3. 各施設の設計仕様書
4. 各分野の基本設計図面及び図書

（二）概算工事費作成の根拠

1. 使用した積算基準

(1)建築工事については 1995 年の『上海市建築工事総合予算積算基準』を使用。
(2)建築据付工事については 1995 年の『上海市据付工事概算基本価格表』を使用。
(3)インフラ工事については 1993 年の『上海市インフラ工事予算積算基準』を使用。
(4)舗装施設、航空灯火施設の設備については 1995 年の『民間空港工事予算積算基準』を使用。
(5)通信施設の設備については郵電部全国統一据付工事積算基準の『配線工事、通信工事』を使用。

2. 積算基準割掛け基準

(1)建築工事、建築据付工事、航空灯火工事については 1993 年の『上海市建築据付工事予算積算基準工事費基準』を使用。

(2)舗装工事、インフラ工事については 1993 年の『上海市インフラ工事予算積算基準工事費基準』を使用。
(3)舗装工事、インフラ工事、建築据付工事、航空灯火施設等の割掛けについては 1996 年の『上海市建築工事費順序表』を使用。
(4)通信、航法施設の設備については郵電部の『通信建設工事費決済方法』を使用。
(5)概算工事費中の材料調整価格は全て 1996 年『上海工事費情報』第 10 期に基づいて計上している。

三、概算工事費の項目設定及び内容

概算工事費の項目設定は国家計画委員会投資(1992)382 号「大・中型基本建設プロジェクト予算編成に関する通知」に定められた工事費分類目録を根拠とし、上海市の現行の関連規定を加味して調整を行った。
今回の概算工事費総括は、空港工事の中の大型工事の総括に過ぎず、概算工事費の作成手順は以下の通りである。
(1)単体概算工事費：各分野の概算工事費は「第 1 種工事費」即ち「工事費」まで計算した（直接工事費及び間接工事費を含む）。
(2)施設別工事費総括：概算工事費の総括は「第 1 種工事費」まで計算した。
(3)飛行区工事費全体総括：全体総括には「第 1 種工事費」と「第 2 種工事費」（即ち「その他工事費」）、「第 3 種工事費」（即ち「準備費」）が含まれる。

上海浦東国際空港建設指揮部のコメントに基づき、第 2 種工事費中の一部工事費即ち「現場準備費」、「ユーティリティー費」等、第 1 種工事費の割掛け率で計算しない項目及び動的工事費については空港概算工事費全体総括の中で計上した。
(4)各工事の基本設計概算工事費と F/S 評価調整後に積算した「第 1 種工事費」の比較検討を行った。

四、説明

1. 総括表中の概算工事費は土木建築工事費、据えつけ工事費及び設備費等から成る。うち飛行区工事中の設備費は設備の積算基準価格とメーカー見積もり価格のみを計上し、設備のその他の工事費は全て据え付け工事費に含めた。

2. F/S 時の検討と対応させ、概算工事費中の輸入設備についてはドル建てで計上した。US ドルと元のレートは 1：8.3 とした。

エアサイド土工

作成説明書

一、　作成の根拠

1.　　『上海浦東空港 F/S』

2.　　浦東空港日中双方プロジェクトチームの会議議事録

二、　使用した積算基準

1.　　中国民用航空総局 1994 年 11 月 11 日公布『民間空港工事予算積算基準』（以下民航と称する）

2.　　『上海市園林建設工事予算積算基準』（以下上園と称する）

三、　単価

1.　　人件費単価

人件費は賃金と福利厚生費を含む。賃金は等級賃金により計算し、福利厚生費は等級区分をしない。このため、この概算では 93 年積算基準と同じ工事項目については、93 年積算基準と同じ等級賃金を使用する。

2.　　材料単価

『上海市インフラ工事予算積算基準』(1993)（付録）を使用。

3.　　機械使用料

『上海市インフラ工事予算積算基準』(1993)（付録）を使用。

四、人件費調整

1.　　『滬建定(94)第 046 号文』により人件費差額 2.4 元/人・日として加算

2.　　『建委(94)第 0517 号文』により施工流動手当 2.5 元/人・日を加算

五、その他

1.　　この概算工事費は飛行区未舗装区域土工にのみ適用する。

2.　　未舗装区域の盛土調達先；舗装区域表土、ヘドロ、沙脚河切土、排水溝・調整池切土、客土。

3.　　この概算工事費のうちポンプ圧送及び水替費用の基本価格はそれぞれ『上海浦東空港ポンプ圧送盛土プレロード工事実施方案』と施工業者の応札書類・コマーシャルドキュメントを参考にしている。

六、割掛け基準

上海市建設工事積算基準管理総局の 1996 年 4 月の『上海市建設工事費計算順序表』中の『93 年積算基準インフラ工事費計算順序表』を使用。

エアサイド舗装

作成説明書

一、　作成の根拠

1.　　『上海浦東空港 F/S』

2.　　浦東空港日中双方プロジェクトチームの会議議事録

二、　使用した積算基準

1.　　中国民用航空総局 1994 年 11 月 11 日公布『民間空港工事予算積算基準』（以下民航と称する）

2.　　『上海市インフラ工事予算積算基準』（以下上と称する）

3.　　「民航積算基準」又は「上海インフラ積算基準」に調整を加えたものについては「換」と標記している。

三、　単価

1.　　人件費単価

人件費は賃金と福利厚生費を含む。賃金は等級賃金により計算し、福利厚生費は等級区分をしない。このため、この概算では 93 年積算基準と同じ工事項目については、93 年積算基準と同じ等級賃金を使用する。

2.　　材料単価

(1)『上海市インフラ工事予算積算基準』(1993)（付録）を使用。

(2)材料超過輸送費は『上海市インフラ工事予算積算基準』(1993)の説明書第 7 項第 4 条を使用。

3.　　機械使用料

『上海市インフラ工事予算積算基準』(1993)（付録）を使用。

四、人件費調整

1.　　『滬建定(94)第 046 号文』により人件費差額 2.4 元/人・日として加算

2.　　『建委(94)第 0517 号文』により施工流動手当 2.5 元/人・日を加算

五、材料価格調整

1.　　材料の市場価格は 96 年第 10 期『上海工事費情報』を使用。

2.　　フライアッシュの市場価格は浦東空港指揮部の提示した 110 元/トンとする。

六、その他

1.　　グルービングの基本価格は調査により 5 元/m2 とした。

2.　　上海浦東国際空港の地盤の状況が特殊であるため、舗装スラブには補強を行う。

このため、開設費に5000万元を追加する。

七、割掛け基準

上海市建設工事積算基準管理総局の1996年4月の『上海市建設工事費計算順序表』中の『93年積算基準インフラ工事費計算順序表』を使用。

エアサイド排水

作成説明書

一、　作成の根拠

1.　　『上海浦東空港 F/S』

2.　　浦東空港日中双方プロジェクトチームの会議議事録

二、　使用した積算基準

1.　　中国民用航空総局 1994 年 11 月 11 日公布『民間空港工事予算積算基準』（以下民航と称する）

2.　　『上海市インフラ工事予算積算基準』（以下上と称する）

3.　　「民航積算基準」又は「上海インフラ積算基準」に調整を加えたものについては「換」と標記している。

三、　単価

1.　　人件費単価

人件費は賃金と福利厚生費を含む。賃金は等級賃金により計算し、福利厚生費は等級区分をしない。このため、この概算では 93 年積算基準と同じ工事項目については、93 年積算基準と同じ等級賃金を使用する。

2.　　材料単価

(1)『上海市インフラ工事予算積算基準』(1993)（付録）を使用。

(2)材料超過輸送費は『上海市インフラ工事予算積算基準』(1993)の説明書第 7 項第 4 条を使用。

3.　　機械使用料

『上海市インフラ工事予算積算基準』(1993)（付録）を使用。

四、人件費調整

1.　　『滬建定(94)第 046 号文』により人件費差額 2.4 元/人・日として加算

2.　　『建委(94)第 0517 号文』により施工流動手当 2.5 元/人・日を加算

五、材料価格調整

　　材料の市場価格は 96 年第 10 期『上海工事費情報』を使用。

六、その他

浦東空港の地下水位が非常に高いため、飛行区排水溝の工事では地盤改良と水替が必要となる。この費用は開設費として計上する。

七、割掛け基準

上海市建設工事積算基準管理総局の 1996 年 4 月の『上海市建設工事費計算順序表』中の『93 年積算基準インフラ工事費計算順序表』を使用。

エアサイド付帯工事

作成説明書

一、　作成の根拠

1.　　『上海浦東空港 F/S』

2.　　浦東空港日中双方プロジェクトチームの会議議事録

二、　使用した積算基準

1.　　中国民用航空総局 1994 年 11 月 11 日公布『民間空港工事予算積算基準』（以下民航と称する）

2.　　『上海市インフラ工事予算積算基準』（以下上と称する）

3.　　積算基準にない部分について、民間空港舗装工事の技術仕様書に基づいて作成した鉄筋網フェンス及びゲートの単価見積表については、この概算工事費の中では估と標記する。

4.　　「民航積算基準」又は「上海インフラ積算基準」に調整を加えたものについては「換」と標記している。

三、　単価

1.　　人件費単価

人件費は賃金と福利厚生費を含む。賃金は等級賃金により計算し、福利厚生費は等級区分をしない。このため、この概算では 93 年積算基準と同じ工事項目については、93 年積算基準と同じ等級賃金を使用する。

2.　　材料単価

(1)『上海市インフラ工事予算積算基準』(1993)（付録）を使用。

(2)材料超過輸送費は『上海市インフラ工事予算積算基準』(1993)の説明書第 7 項第 4 条を使用。

3.　　機械使用料

『上海市インフラ工事予算積算基準』(1993)（付録）を使用。

四、人件費調整

1.　　『滬建定(94)第 046 号文』により人件費差額 2.4 元/人・日として加算

2.　　『建委(94)第 0517 号文』により施工流動手当 2.5 元/人・日を加算

五、材料価格調整

　　材料の市場価格は 96 年第 10 期『上海工事費情報』を使用。

六、割掛け基準

上海市建設工事積算基準管理総局の 1996 年 4 月の『上海市建設工事費計算順序表』中の『93 年積算基準インフラ工事費計算順序表』を使用。

上海浦東国際空港飛行区工事概算総括表

概算総額：177,733.94 万元（うち US$1332.19 万）

技師長：
設計責任者：

チェック：
作成：

中国民航機場建設総公司
中国民航機場規劃設計研究総院

1997 年 1 月

概算説明書

一、作成範囲

1.上海浦東国際空港エアサイド地盤改良工（メンテナンスエプロン以外）

2.上海浦東国際空港エアサイド地盤改良工（メンテナンスエプロン）

二、使用した積算基準及び規定

1.『上海市インフラ工事予算積算基準』（1993年及び別添資料）

2.『民間空港工事予算積算基準』

3.『山東省建築工程総合積算基準』（1996年）（参考）

4.『上海市建築工程費計算順序表』（1996年4月）

5.『上海工事費情報』（1996年10月）

三、各項目の使用単価

1.人件費

『上海市インフラ工事予算積算基準』（1993年及び別添資料）

2.材料費

材料積算基準価格は『上海市インフラ工事予算積算基準』（1993年及び別添資料）を、材料市場価格は1996年10月の建築材料市場指導価格を使用

3.機械費

『上海市インフラ工事予算積算基準』（1993年及び別添資料）

四、その他

1.概算表中の積算基準番号の標記は次の通り

民航－『民間空港工事予算積算基準』、斉建－『山東省建築工程総合積算基準』（1996年）、S－『上海市インフラ工事予算積算基準』（1993年）、換－関連積算基準に基づく換算、估－関連積算基準に基づく独自積算

2.重錘落下マット材単価の設定

(1)鉱滓の積算基準材料単価は該当項目がないため、材料の現場搬入価格を積算基準価格とし、差額調整を行わない。

(2)山土の市場価格は実際の現場搬入価格とした。

3.重錘落下補助工事費は、打設間のマット層補充及び天日乾燥・攪拌の工事費であり、10%とする。

4.盛土の供給源は場内（或いは未舗装区域からの客土）とし、運搬距離は1kmとして計算する。

5.その他の直接工事費には3%の地盤改良案試験費が含まれている（既に発生している費用）

五、この概算は元建てとする。

BUILDING WORKS CALCULATION BOOKS

1 THE BASIS OF BUDGETING

1.1 Schematic drawing of CACC

1.2 All of documents and design program of constructor

2 THE MEANS OF BUDGETING

2.1 Construction integrated budget quotas engineering for shanghai ,1995

2.2 Architectural decoration budget quotas engineering for shanghai ,1993

2.3 Construction budget quotas for shanghai, 1993

2.4 Construction cost engineering calculation table for shanghai ,1996

2.5 (94)0597th file for Construction cost norm engineering unit for shanghai

2.6 (95)016th file for Construction cost norm engineering unit for shanghai

3 CALCULATION DESCRIPTION FOR ENGINEERING QUANTITY

3.1 Cost of earth work operations had included in unit basic price. Cost of earth work is only calculation cost of transportation(according to quotas) . Amount of earth work is equal to amount of isolated foundation times 8.04,or it is equal to amount of linear foundation times 4.48.

3.2 Amount of construction is equal to linear length of construction unit times area of section

3.3 Area of ground / roof is equal to linear length times width.

3.4 Amount of outside-wall decoration equal to linear length of outside wall times height, Amount of interior decoration is linear length of wall times height of inside-wall.

3.5 More detailed calculation rules and method is described in quotas

上海浦东国际机场场道工程概算表

工程名称：飞行区土方工程

设计号：（96）09—4

序号	工程费用名称	计算公式	概算价值（元）	备注说明
一	定额直接费	(1)+(2)+(3)	182740779.44	
(1)	人工费		9226347.56	
(2)	材料费		95154823.72	
(3)	机械费		78359608.16	
二	其他直接费	（一）*5.87%	10726883.75	
三	直接费小计	（一）+（二）	193467663.19	
四	综合间接费	（三）*10%	19346766.32	
五	费用合计	（三）+（四）	212814429.51	
六	利润	（五）*7%	14897010.07	
七	开办费	（三）*3%	5804029.90	
八	人工费调整	总工日*4.9	3076417.91	
九	土方工程调整差价		2354869.83	
十	费用总计	（五）+（六）+（七）+（八）+九	238946757.22	
十一	其他费用	(a)+(b)+(c)	890961.17	
(a)	定额编制管理费	（三）*0.09%	174120.90	
(b)	工程质量监督费	（十）*0.15%	358420.14	
(c)	行业管理费	（十）*0.15%	358420.14	
十二	税金	[（十）+（十一）]*3.22%	7722774.53	
十三	总造价	（十）+（十一）+（十二）	247560492.92	

编　制：　　校　核：　　1997年7月10日

Shanghai Pudong International Airport Project(Budgetary Estimate Of Airside Civil Works)

Item: Earth Works

Desige No.: (96)09-4

Item No.	Quota	Description Of Works	Unit	Quantity	Estimation cost(RMB) unit price	Estimation cost(RMB) total price	(RMB) Labour cost unit price	Labour cost cost	Material cost unit price	Material cost cost	Machine cost unit price	Machine cost cost	Labour day norm	Labour day amount
		Earth works												
1	CAAC1－01	Topsoil stripping	100m³	4474.88	184.90	827405.31	17.44	78054.69			167.46	749350.62	1.55	6936.06
2	CAAC1－05	Cutting reed	1000m²	379.16	300.38	113891.54	300.38	113891.54			0.00		26.70	10123.57
3	CAAC1－073	Leveling and compaction for basic facility area	1000m²	2050.24	157.73	323381.43	16.20	33213.89			141.53	290167.54	1.44	2952.35
4	CAAC1－068	Cut-Area compacting(relative density 90% or less	1000m²	1845.22	151.05	278720.48	14.63	26992.93			136.42	251727.55	1.30	2398.79
5	CAAC1－065	Embanking and compacting (relative density 90% or less)	100m³	15995.36	195.49	3126864.37	12.60	201541.54	0.73	11653.76	182.16	2913669.08	1.12	17914.80
6	CAAC1－066	Embanking and compacting (relative density 95% or more)	100m³	8754.38	243.88	2135005.69	12.60	110305.19	0.73	6378.19	230.55	2018322.31	1.12	9804.91
7	CAAC1－054	Excavation of soil including hauling to fill area by scrapers	100m³	15890.78	389.94	6196450.75	12.60	200223.83	0.38	6038.50	376.96	5990188.43	1.12	17797.67
8	CAAC1－058	Excavation of soil including hauling to fill area by dump truck	100m³	362.39	718.44	260355.47	6.08	2203.33	0.56	202.94	711.80	257949.20	0.54	195.69
9		(S=500-1000m)					0.00		0.00		0.00			
10	CAAC1－058,064	Excavation of soil including hauling to fill area by dump truck	100m³	8496.57	1138.92	9676913.50	6.08	51659.15	0.56	4758.08	1132.28	9620496.28	0.54	4588.15
11		(S=1000-5000m)					0.00		0.00		0.00			
12		Materials pumped up from Yangzi River	m³	849657.00	27.13	23051194.41	0.00		0.00		27.13	23051194.41		
13		Pump water	m³	1055.39	2.44	2575.15	0.04	42.22	0.00		2.40	2532.94		
14	S2-1-4	Sludge dredging	100m³	1208.93	1141.79	1380344.18	628.31	759582.81	0.00		513.48	620761.38	55.85	67518.74
15		Slug bedding	100m³	2662.00	8747.42	23285632.04	6.41	17063.42	8640.00	22999680.00	101.01	268888.62	0.57	1517.34
16		Debris bedding	100m³	12314.00	4776.42	58816835.88	6.41	78932.74	4669.00	57494066.00	101.01	1243837.14	0.57	7018.98
17		Middle coarse sand bedding	100m³	812.03	7437.56	6039521.85	572.64	465000.86	6796.45	5518921.29	68.47	55599.69	50.88	41316.09
18	QJ1-94E	Ram dropping	100m²	16218.00	2415.88	39180741.84	275.63	4470167.34	251.40	4077205.20	1888.85	30633369.30	24.50	397341.00
19	CAAC1－400	Planting sodding	100m²	1228.00	310.50	381294.00	110.25	135387.00	200.25	245907.00	0.00		9.80	12034.40
20	SY1-2-68	Planting grass seed	10m²	192743.90	11.67	2249321.31	11.22	2162586.56	0.45	86734.76	0.00			
21	CAAC1-206E	Chip leveling	m³	81091.00	66.77	5414330.23	3.94	319498.54	58.00	4703278.00	4.83	391553.69	0.35	28381.85
	SUB-TOTAL					182740779.44		9226347.56		95154823.72		78359608.16		627840.39
	TOTAL					182740779.44		9226347.56		95154823.72		78359608.16		627840.39

上海浦东国际机场场道工程概算表

工程名称：道面工程

设计号：（96）09—4

序号	工程费用名称	计算公式	概算价值（元）	备注说明
一	定额直接费	(1)+(2)+(3)	229082711.19	
(1)	人工费		18159451.81	
(2)	材料费		188269843.76	
(3)	机械费		22653415.62	
二	其他直接费	（一）*5.87%	13447155.15	
三	直接费小计	（一）+（二）	242529866.34	
四	综合间接费	（三）*10%	24252986.63	
五	费用合计	（三）+（四）	266782852.97	
六	利润	（五）*7%	18674799.71	
七	开办费	（三）*3%+50000000.00	57275895.99	
八	人工费调整	总工日*4.9	7550093.80	
九	调整材料差价		123169346.60	
十	费用总计	（五）+（六）+（七）+（八）+（九）	473452989.07	
十一	其他费用	(a)+(b)+(c)	1638635.85	
(a)	定额编制管理费	（三）*0.09%	218276.88	
(b)	工程质量监督费	（十）*0.15%	710179.48	
(c)	行业管理费	（十）*0.15%	710179.48	
十二	税金	[（十）+（十一）]*3.22%	15297950.32	
十三	总造价	（十）+（十一）+（十二）	490389575.24	

编　制：　　校　核：　　1996年12月10日