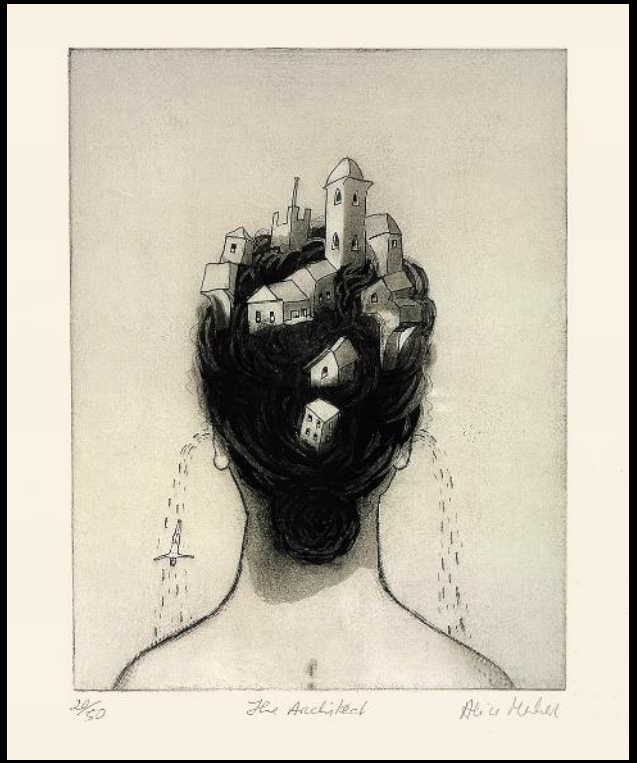
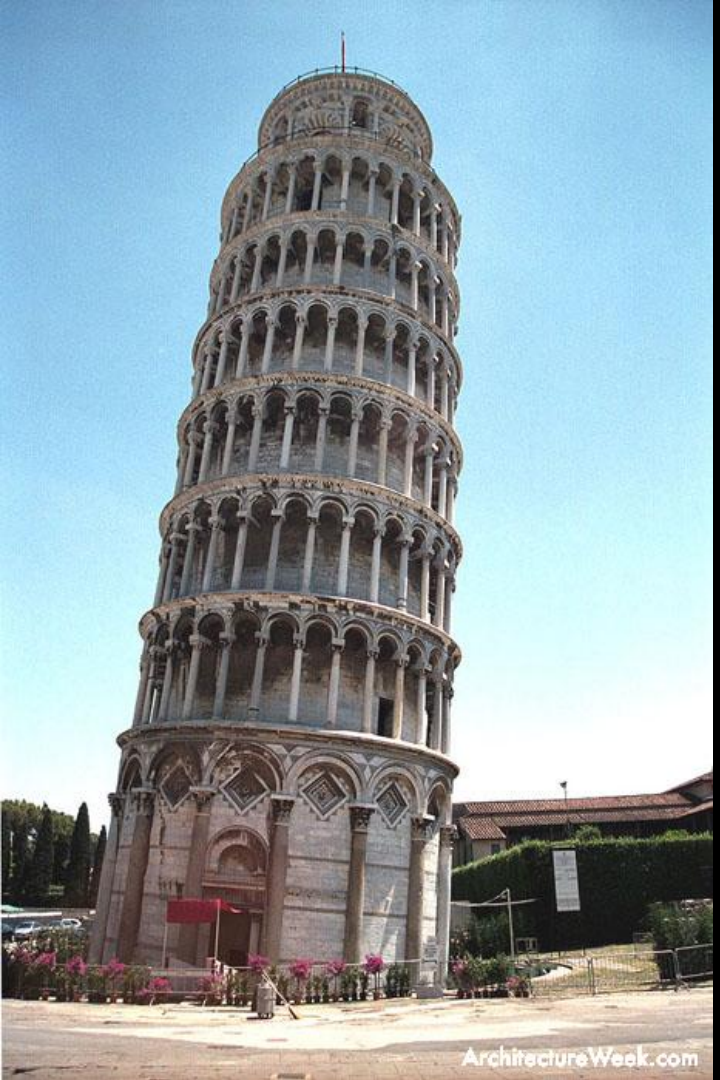
Arch 172: Building Construction 1

Soils, Surveying, Excavation & Foundations


29/50
The Architect
Alain Hebert


BOSTON.
DAYTON & WENTWORTH,



Only one building in the world is allowed to
be famous for having a bad foundation design.

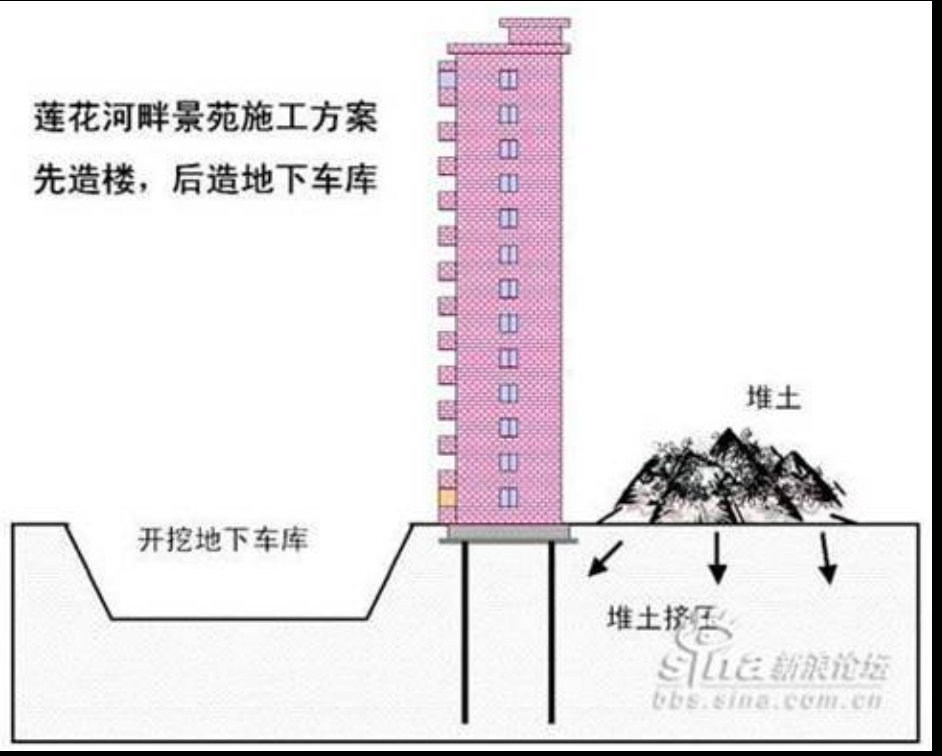
美丽的

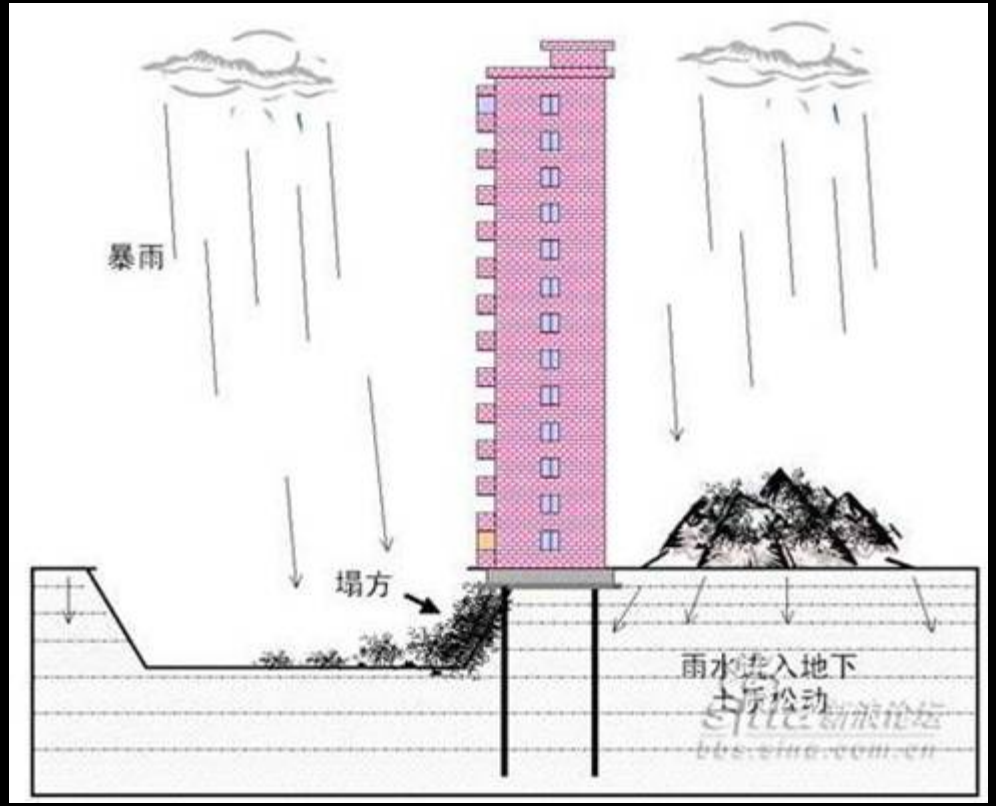
莲花河畔景苑大楼

是怎样倒塌的

莲花河畔景苑施工方案

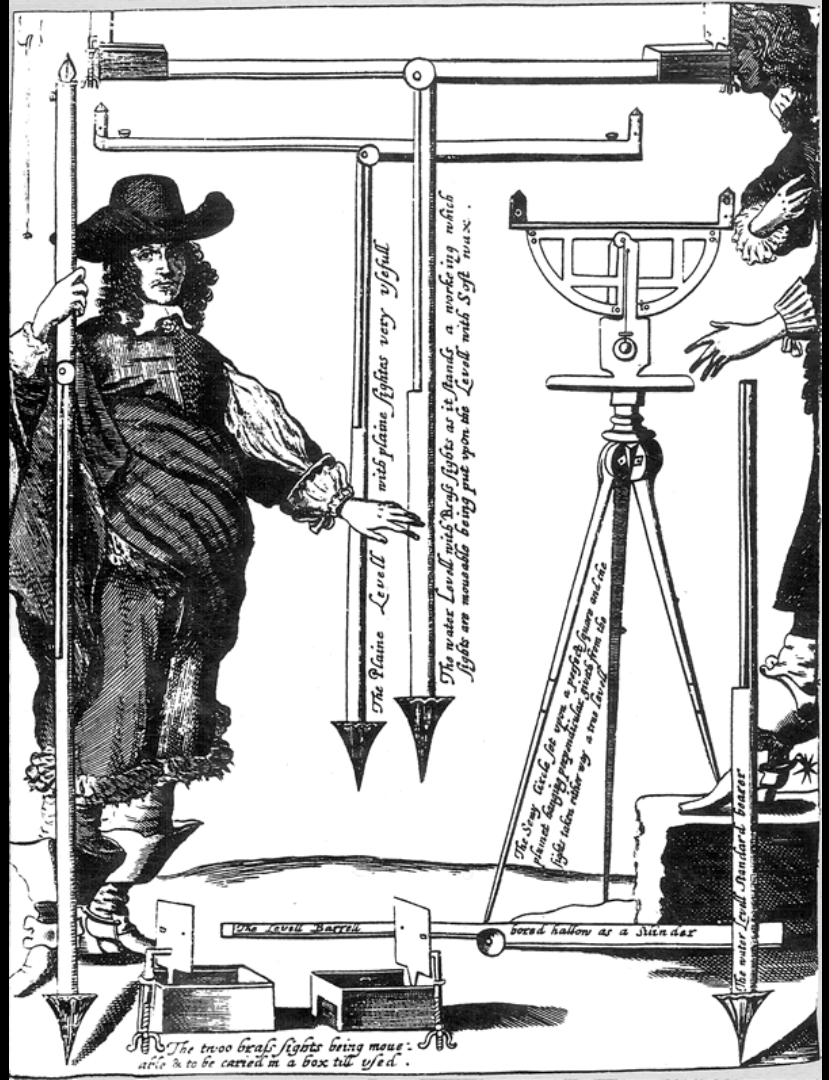
先造楼，后造地下车库





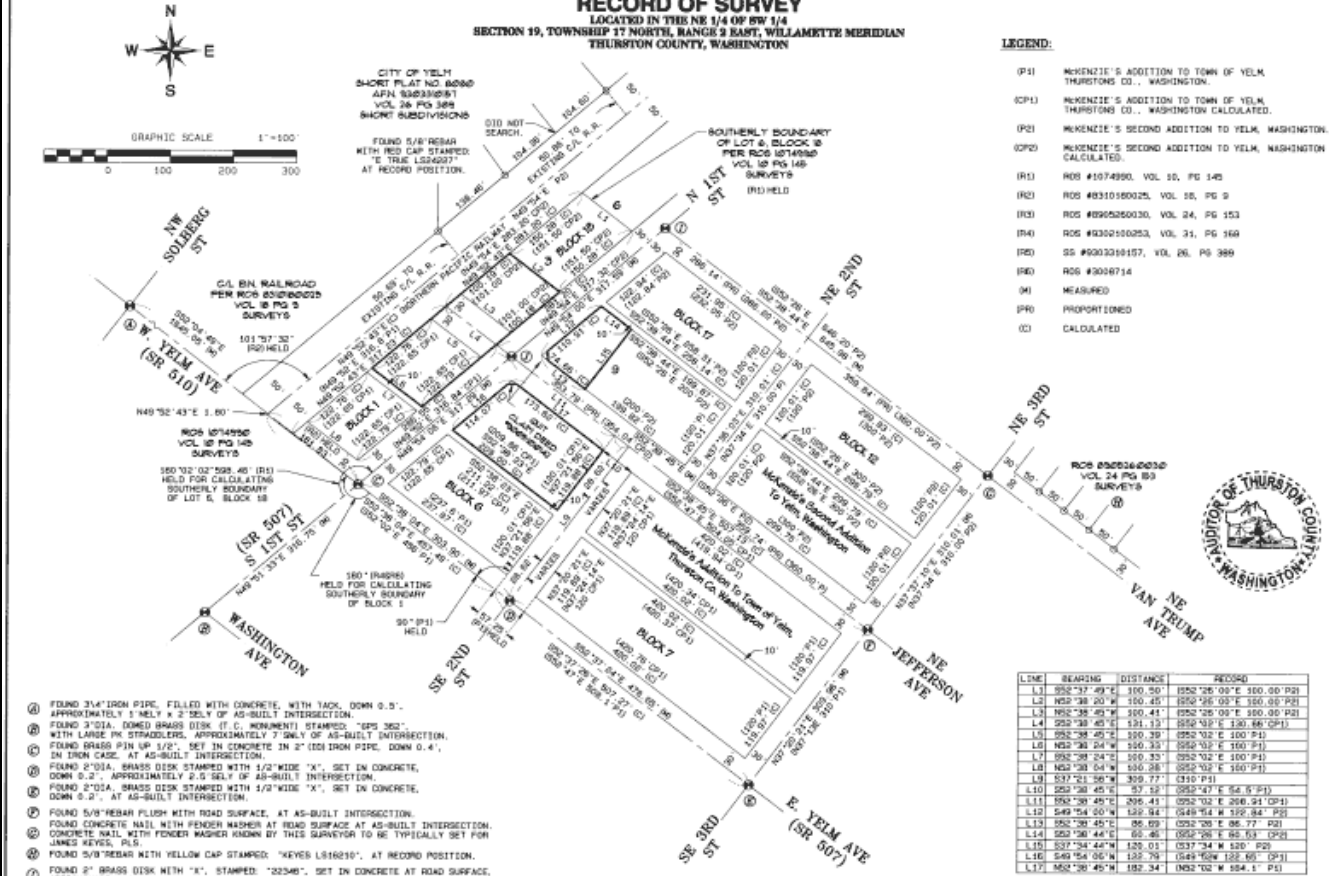
More on this one later…

Surveying


The Plaine Levell with plaine Sights is very vsefull
The water Levell with Brass Sights as it stands a working which Sights are removable being put upon the Levell with Sight vanes.
The Levell Barrell
bored hollow as a Sun dar
The two brass sights being moue: able to be carried in a box till vsed.

RECORD OF SURVEY

LOCATED IN THE NE 1/4 OF SW 1/4
SECTION 19, TOWNSHIP 17 NORTH, RANGE 2 EAST, WILLAMETTE MERIDIAN
THURSTON COUNTY, WASHINGTON



LEGEND:

(P1)	McKENZIE'S ADDITION TO TOWN OF YELM, THURSTONS CO., WASHINGTON.
(CP1)	McKENZIE'S ADDITION TO TOWN OF YELM, THURSTONS CO., WASHINGTON CALCULATED.
(P2)	McKENZIE'S SECOND ADDITION TO YELM, WASHINGTON.
(CP2)	McKENZIE'S SECOND ADDITION TO YELM, WASHINGTON CALCULATED.
(R1)	ROS #1074990, VOL 10, PG 145
(R2)	ROS #8310180025, VOL 18, PG 9
(R3)	ROS #9505260030, VOL 24, PG 153
(R4)	ROS #9302100253, VOL 31, PG 169
(R5)	SS #9303310157, VOL 26, PG 389
(R6)	ROS #3006714
(M)	MEASURED
(PR)	PROPORTIONED
(C)	CALCULATED

LINE	BEARING	DISTANCE	RECORD
L1	S52°37'49"E	100.50'	(S52°35'00"E 100.00' P2)
L2	N52°38'20"E	100.45'	(S52°35'00"E 100.00' P2)
L3	N52°38'45"E	100.41'	(S52°35'00"E 100.00' P2)
L4	S52°38'45"E	121.13'	(S52°03'E 120.66' CP1)
L5	S52°38'45"E	100.39'	(S52°02'E 100' P1)
L6	N52°38'24"W	100.33'	(S52°02'E 100' P1)
L7	S52°38'24"E	100.33'	(S52°02'E 100' P1)
L8	N52°38'04"W	100.28'	(S52°02'E 100' P1)
L9	S37°21'56"W	309.77'	(S30' P1)
L10	S52°38'45"E	57.12'	(S52°47'E 54.5' P1)
L11	S52°38'45"E	206.41'	(S52°02'E 206.91 CP1)
L12	S49°54'00"W	129.94'	(S49°54'W 129.84' P2)
L13	S52°38'45"E	86.69'	(S52°26'E 86.77' P2)
L14	S52°38'44"E	60.46'	(S52°26'E 60.53' CP2)
L15	S37°34'44"W	120.01'	(S37°34'W 120' P2)
L16	S49°54'05"W	122.79'	(S49°50W 122.65' CP1)
L17	N52°38'45"W	182.34'	(N52°02'W 184.1' P1)

Ⓐ FOUND 3\4"IRON PIPE, FILLED WITH CONCRETE, WITH TACK, DOWN 0.5'. APPROXIMATELY 5'WELY & 2'SELY OF AS-BUILT INTERSECTION.
Ⓑ FOUND 3"DIA. DOMED BRASS DISK (T.C. MONUMENT) STAMPED: "GPS 362". WITH LARGE PK STRADDLERS, APPROXIMATELY 7'SWLY OF AS-BUILT INTERSECTION.
Ⓒ FOUND BRASS PIN UP 1/2", SET IN CONCRETE IN 2"(ID) IRON PIPE, DOWN 0.4', IN IRON CASE, AT AS-BUILT INTERSECTION.
Ⓓ FOUND 2"DIA. BRASS DISK STAMPED WITH 1/2"WIDE "X", SET IN CONCRETE, DOWN 0.2', APPROXIMATELY 2.5 SELY OF AS-BUILT INTERSECTION.
Ⓔ FOUND 2"DIA. BRASS DISK STAMPED WITH 1/2"WIDE "X", SET IN CONCRETE, DOWN 0.2', AT AS-BUILT INTERSECTION.
Ⓕ FOUND 5/8"REBAR FLUSH WITH ROAD SURFACE, AT AS-BUILT INTERSECTION. FOUND CONCRETE NAIL WITH FENDER WASHER AT ROAD SURFACE AT AS-BUILT INTERSECTION.
Ⓖ CONCRETE NAIL WITH FENDER WASHER KNOWN BY THIS SURVEYOR TO BE TYPICALLY SET FOR JAMES KEYES, PLS.
Ⓗ FOUND 5/8"REBAR WITH YELLOW CAP STAMPED: "KEYES LS16210", AT RECORD POSITION.
Ⓘ FOUND 2" BRASS DISK WITH "X", STAMPED: "22346", SET IN CONCRETE AT ROAD SURFACE, APPROXIMATELY 3'SWLY OF AS-BUILT INTERSECTION.
Ⓙ FOUND 2" BRASS DISK WITH "X", STAMPED: "22346", SET IN CONCRETE AT ROAD SURFACE, AT AS-BUILT INTERSECTION.

8-28-01

SHEET ONE OF TWO

Geomatics, P.S., Inc.
Geomatics Land Surveying
104 Berry Valley Road
P.O. Box 2550, Yelm, Washington 98597-2550
360.400.LAND (5263) fax 360.400.5264
drb@geomaticslandsurveying.com

DENNIS RAY BAKER — STATE OF WASHINGTON — 20810 — REGISTERED LAND SURVEYOR
EXPIRES 11-03-01

SURVEYOR'S CERTIFICATE

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF SURVEY RECORDING ACT AT THE REQUEST OF ERLING EIRKLAND IN JUNE OF 2001.

DENNIS RAY BAKER
LS 20972 CERTIFICATE NUMBER

AUDITOR'S CERTIFICATE

FILED FOR RECORD THIS 28th DAY OF August
2001, AT THE REQUEST OF Erling Eirkland
AUDITOR'S FEE NO. 3375166?3

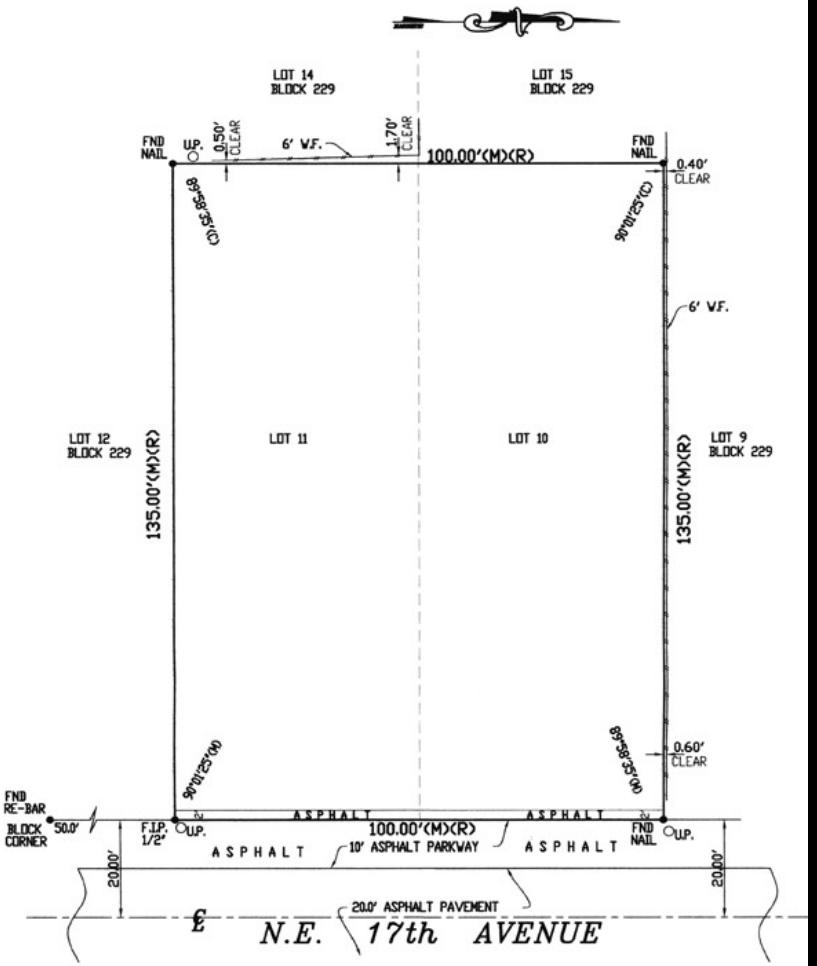
AUDITOR — COUNTY AUDITOR

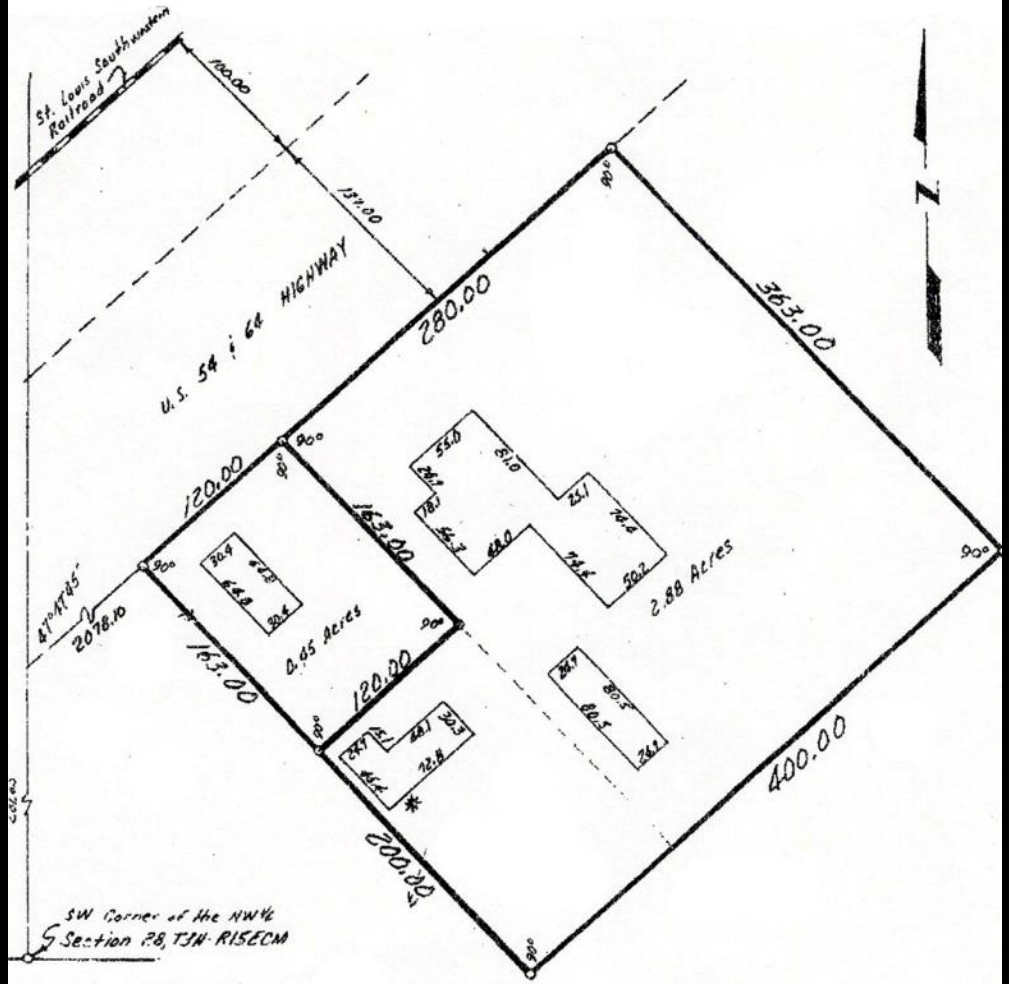
RECORD OF SURVEY
FOR: YELM COMMUNITY SCHOOLS

DRAWN BY:	DRB
CHECKED:	DRB
SCALE:	AS SHOWN
JOB NO:	1021
DATE:	AUGUST 24, 2001

PLAN OF SURVEY

SCALE: 1"=. . . . . 20'




St. Louis Southwestern Railroad
100.00
137.00
U.S. 54 & 64 HIGHWAY
280.00
363.00
120.00
163.00
47°47'45"
2078.10
0.65 Acres
120.00
163.00
2.88 Acres
400.00
200.00
SW Corner of the NW¼
Section 28, T3N-R15ECM
N

RECORD OF SURVEY

LOCATED IN THE NE 1/4 OF SW 1/4
SECTION 19, TOWNSHIP 17 NORTH, RANGE 2 EAST, WILLAMETTE MERIDIAN
THURSTON COUNTY, WASHINGTON

SURVEYOR'S NOTES:

1. BEARING DATUM: McKENZIE'S SECOND ADDITION TO YELM, WA.
2. BASES OF BEARING: BRASS DISKS AT THE INTERSECTIONS OF N 1ST ST WITH NE JEFFERSON AVE AND NE VAN TRUMP AVE.
3. METHOD OF MONUMENT LOCATION WAS BY FIELD TRAVERSE.
4. INSTRUMENT UTILIZED: GEODIMETER SYSTEM 600S DR200+.
5. THE FIELD SURVEY WAS CONDUCTED IN JUNE AND JULY, 2001.
6. THE LOT CORNERS WERE SET JULY 6, 2001.
7. THE STREET AND AVENUE NAMES ARE FROM: THE ROAD RUNNER, THURSTON COUNTY STREET ATLAS - 2002 EDITION.
8. ALL OR A PORTION OF PARCEL "A" (TAX PARCEL'S 64400100100 AND 64421800500) IS SUBJECT TO A UTILITY EASEMENT FOR SANITARY SEWER SYSTEM PURPOSES, RECORDED UNDER THURSTON COUNTY AUDITOR'S FEE NO.S: 9303160353 AND 9303160354. THE LOCATION OF SAID UTILITY EASEMENT WAS NOT DETERMINE THIS SURVEY.
9. HELD ROS #83101800025, DISTANCE OF 189.83' FROM FOUND MONUMENT AT THE INTERSECTION OF YELM AVE WITH 1ST ST. ON LINE WITH THE FOUND MONUMENT AT THE INTERSECTION OF YELM AVE WITH NW SOLBERG ST, ALONG WITH THE ANGLE OF 105°57'32" FOR THE CENTERLINE OF THE RAILROAD RIGHT OF WAY, AND THE DISTANCE OF 50' PERPENDICULAR TO AND PARALLEL WITH SAID ESTABLISHED CENTERLINE FOR RIGHT OF WAY LIMITS.
10. HELD THE BEARING FROM THE FOUND MONUMENT AT THE INTERSECTION OF YELM AVE WITH 2ND ST, PROJECTED THROUGH THE FOUND MONUMENT AT THE INTERSECTION OF YELM AVE WITH 1ST ST, AND THE DISTANCE OF 30' PERPENDICULAR TO AND PARALLEL WITH SAID ESTABLISHED BEARING FOR NORTHERLY RIGHT OF WAY/SOUTHERLY LIMITS OF BLOCK 1 OF McKENZIE'S FIRST ADDITION, AS WAS DONE FOR THE SOUTHERLY RIGHT OF WAY/NORTHERLY LIMITS OF BLOCK 2 OF McKENZIE'S FIRST ADDITION FOR ROS #9302100253(04) AND ROS #3008714(R6).
11. THIS SURVEY WAS PERFORMED TO LOCATE ALL OR A PORTION OF THE EXTERIOR BOUNDARY LINES OF THE DESCRIBED PARCEL AND DOES NOT NECESSARILY SHOW ANY OR ALL EASEMENTS, RESTRICTIONS AND/OR RESERVATIONS WHICH MAY AFFECT THIS PARCEL. GEOMATICS, P.S., INC. ASSUMES NO RESPONSIBILITY FOR ANY ENCUMBRANCES OTHER THAN THOSE SHOWN.
12. THIS SURVEY MEETS OR EXCEEDS THE STANDARDS AND GUIDELINES SET FORTH IN THE "SURVEY RECORDING ACT" CHAPTER 58.09 RCW. THE FINAL RESULTS MEETS OR EXCEEDS THE STANDARDS CONTAINED IN WAC 332-130-090.
13. THIS DRAWING IS THE PROPERTY OF GEOMATICS, P.S., INC. AND SHALL NOT BE USED FOR ANY PURPOSE WITHOUT THE WRITTEN CONSENT OF AN AUTHORIZED AGENT OF GEOMATICS, P.S., INC. GEOMATICS, P.S., INC. ACCEPTS NO RESPONSIBILITY FOR THE USE OF THIS DRAWING FOR ANY PURPOSE AFTER SIX MONTHS FROM THE RECORDING DATE.

LEGEND:

- SET 1/2"DIA. REBAR WITH ORANGE CAP STAMPED: "GEOMATICS PLS 35972" (TYPICAL REBAR)
- SET 2"PK WITH 1-1/2"WASHER STAMPED: "GEOMATICS 35972"(TYPICAL PK)
- FENCE: 6' CHAIN-LINK
- FENCE: 3' IRON PIPE
- BUILDING
- EDGE OF PAVEMENT
- ROCK RETENTION WALL
- CONCRETE
- ASPHALT
- GRAVEL LIMITS

LAND DESCRIPTION:

PARCEL A:

LOTS 1 AND 2 OF BLOCK 1, OF McKENZIE'S FIRST ADDITION TO YELM, AS RECORDED IN VOLUME 8 OF PLATS, PAGE 26; AND LOTS 1 AND 2 OF BLOCK 18, OF McKENZIE'S SECOND ADDITION TO YELM, AS RECORDED IN VOLUME 8 OF PLATS, PAGE 104. TOGETHER WITH THAT PORTION OF JEFFERSON STREET VACATED UNDER ORDINANCE NO. 65, LYING BETWEEN SAID BLOCKS.

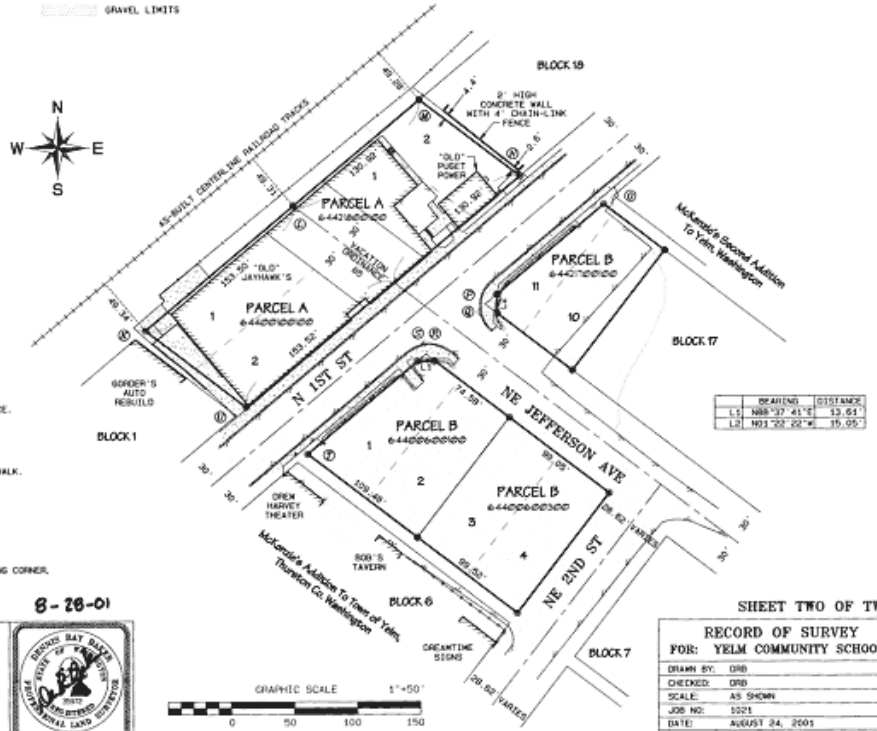
PARCEL B:

LOTS 1, 2, 3 AND 4, BLOCK 6, McKENZIE'S FIRST ADDITION AS RECORDED IN VOLUME 8 OF PLATS, PAGE 26, AND LOTS 10, 11, BLOCK 17, McKENZIES'S SECOND ADDITION AS RECORDED IN VOLUME 8 OF PLATS, PAGE 104. EXCEPT THAT PORTION OF LOTS 1 AND 11 CONVEYED TO THE TOWN OF YELM BY DEED RECORDED MAY 10, 1990 UNDER FILE NO. 9005100142.

IN THURSTON COUNTY WASHINGTON.

SUBJECT TO EASEMENTS, RESTRICTIONS AND RESERVATIONS OF RECORD.

THE ABOVE LAND DESCRIPTION WAS MODIFIED FROM THURSTON COUNTY TITLE COMPANY, ORDER NO.: 117270, ALTA COMMITMENT, SCHEDULE A, WITH THE EFFECTIVE DATE OF JULY 9, 2001 AT 8:00 A.M.



	BEARING	DISTANCE
L1	N88°37'41"E	13.61
L2	N01°22'22"W	15.05'

- Ⓐ DRILLED HOLE IN CONCRETE, SET TYPICAL PK 4.1'NELY x 8.1'SELY OF EDGE, 10.7' FROM NELY EDGE OF GORDER'S BUILDING.
- Ⓛ SET TYPICAL REBAR IN GROUND, 2.9'NWLY OF EDGE OF BUILDING, 13.0'SELY OF 8' CHAIN-LINK FENCE.
- Ⓦ SET TYPICAL REBAR IN GRAVEL, 11.2'SELY x 5.1'SWLY OF 6' CHAIN-LINK FENCE.
- Ⓐ SET TYPICAL PK IN ASPHALT, 3.4'SELY x 2.6'SWLY OF CONCRETE WALL CORNER, 5.0'NWLY OF BACK OF CONCRETE WALK.
- Ⓒ SET TYPICAL PK IN ASPHALT, 5.0'SELY OF BACK OF CONCRETE WALK.
- Ⓑ DRILLED HOLE IN CONCRETE, SET TYPICAL PK 0.2'NWLY OF BACK OF CONCRETE WALK.
- Ⓔ SET TYPICAL PK IN ASPHALT, AT TOE OF ROCK RETENTION WALL, 2.5'ELY OF BACK OF CONCRETE WALK.
- Ⓡ DRILLED HOLE IN ROCK, SET TYPICAL PK 1.6'SLY OF BACK OF CONCRETE WALK.
- Ⓢ DRILLED HOLE IN ROCK, SET TYPICAL PK 2.0'SLY OF BACK OF CONCRETE WALK.
- Ⓣ SET TYPICAL PK IN ASPHALT, 5.0'SELY OF BACK OF CONCRETE WALK.
- Ⓓ DRILLED HOLE IN CONCRETE, SET TYPICAL PK 5.2'NWLY x 2.3'SWLY OF BUILDING CORNER, 1.2'SELY OF BACK OF CONCRETE WALK.

8-28-01

Geomatics, P.S., Inc.
Geomatics Land Surveying
104 Berry Valley Road
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360.400.LAND (5263) fax 360.400.5264
drb@geomaticslandsurveying.com

DENNIS RAY BAKER — STATE OF WASHINGTON — 35972 — REGISTERED PROFESSIONAL LAND SURVEYOR — EXPIRES 11-23-01

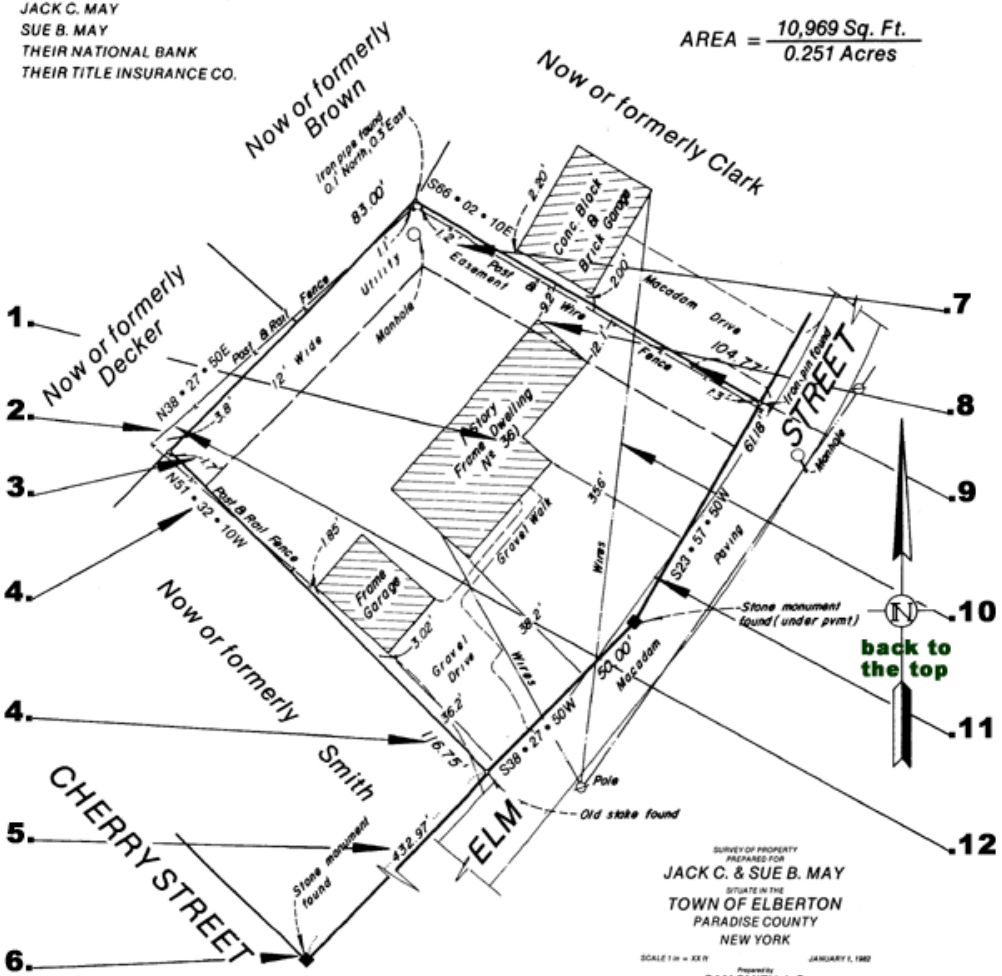
SHEET TWO OF TWO

RECORD OF SURVEY
FOR: YELM COMMUNITY SCHOOLS

DRAWN BY:	DRB
CHECKED:	DRB
SCALE:	AS SHOWN
JOB NO:	1021
DATE:	AUGUST 24, 2001
COPYRIGHT:	© 2001, GEOMATICS, P.S., INC.

Prepared for and certified only to:
JACK C. MAY
SUE B. MAY
THEIR NATIONAL BANK
THEIR TITLE INSURANCE CO.

AREA = 10,969 Sq. Ft. / 0.251 Acres



back to the top

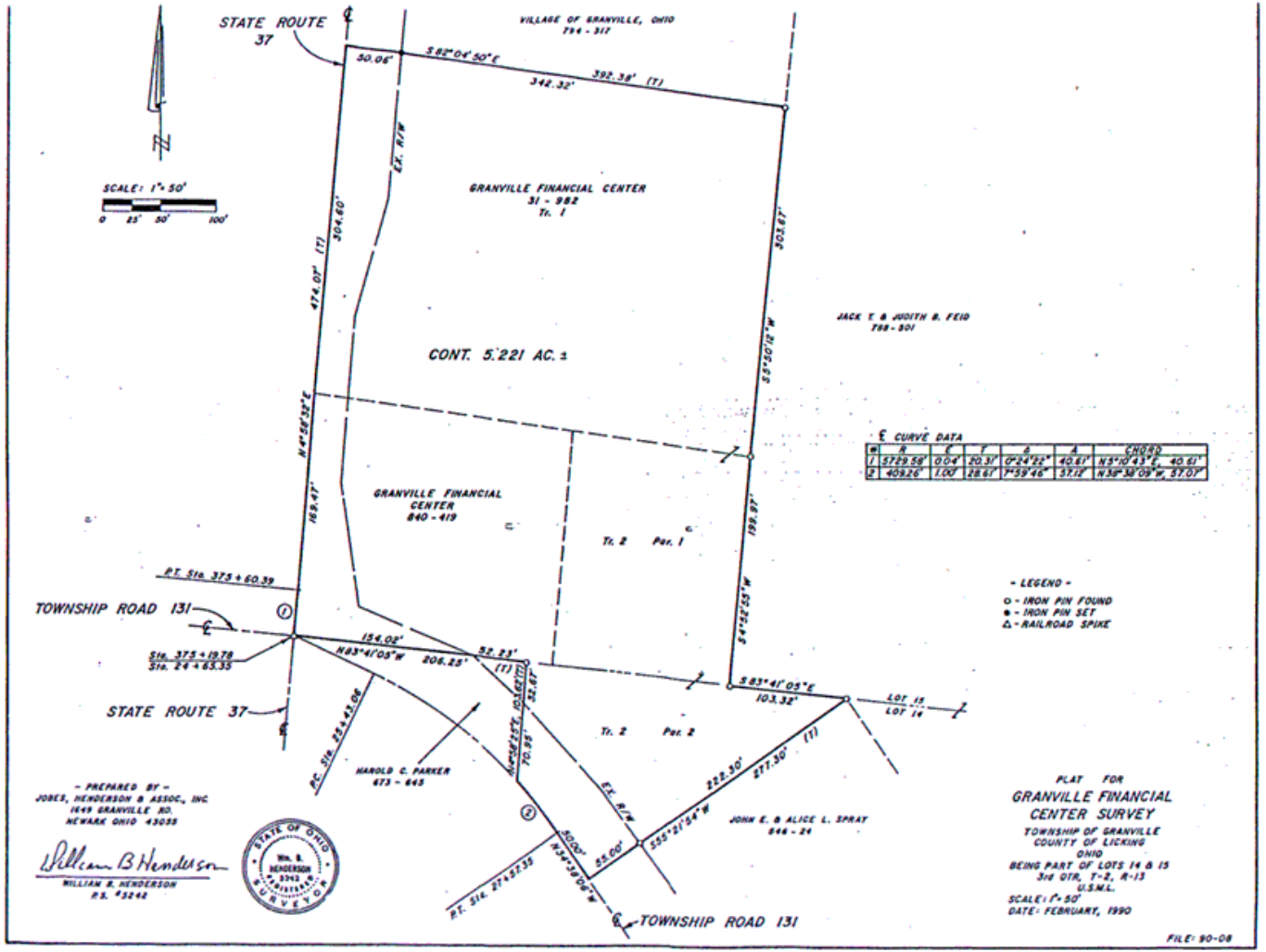
SURVEY OF PROPERTY
PREPARED FOR
JACK C. & SUE B. MAY
SITUATE IN THE
TOWN OF ELBERTON
PARADISE COUNTY
NEW YORK

SCALE 1 in = XX ft JANUARY 1, 1982

Prepared by
SAM SMITH, L.S.

Sam Smith

N.Y.S. LICENSE No. 0000


STATE ROUTE 37
VILLAGE OF GRANVILLE, OHIO
794 - 317
50.06'
S 82°04'50" E
342.32'
392.38' (T)
EX. R/W
SCALE: 1" = 50'
0 25' 50' 100'
GRANVILLE FINANCIAL CENTER
31 - 982
Tr. 1
304.60'
474.07' (T)
303.67'
JACK T. & JUDITH B. FEID
798 - 501
S 5°50'12" W
CONT. 5.221 AC. ±
N 4°56'32" E
165.47'
GRANVILLE FINANCIAL CENTER
840 - 419
Tr. 2 Par. 1
198.97'
S 4°52'25" W
℄ CURVE DATA
R L T D A CHORD
1 5729.58' 0.04 20.31' 0°24'22" 40.61' N5°10'43"E 40.61'
2 409.26' 1.00' 28.61' 4°59'46" 57.12' N3°38'09"W 57.07'
P.T. Sta. 375+60.39
TOWNSHIP ROAD 131
154.02'
N 83°41'05" W 206.25'
52.23' (T)
Sta. 375+19.78
Sta. 24+65.35
S 83°41'05" E
103.32'
LOT 15
LOT 14
STATE ROUTE 37
P.C. Sta. 23+45.06
HAROLD C. PARKER
473 - 445
N 6°18'55" E (CALC'D)
70.85'
32.67'
Tr. 2 Par. 2
222.30'
277.30' (T)
E.E. R/W
JOHN E. & ALICE L. SPRAY
846 - 24
N 5°21'54" W
55.00'
N 3°38'06" E
50.00'
P.T. Sta. 22+37.33
TOWNSHIP ROAD 131
- LEGEND -
○ - IRON PIN FOUND
● - IRON PIN SET
△ - RAILROAD SPIKE
- PREPARED BY -
JOBES, HENDERSON & ASSOC., INC.
1649 GRANVILLE RD.
NEWARK OHIO 43055
William B. Henderson
WILLIAM B. HENDERSON
P.S. #5242
STATE OF OHIO
Wm. B. HENDERSON
5242
REGISTERED
SURVEYOR
PLAT FOR
GRANVILLE FINANCIAL CENTER SURVEY
TOWNSHIP OF GRANVILLE
COUNTY OF LICKING
OHIO
BEING PART OF LOTS 14 & 15
3rd QTR. T-2, R-13
U.S.M.L.
SCALE: 1" = 50'
DATE: FEBRUARY, 1990
FILE: 90-08

Soils

….pst….wanna buy some cheap swampland in Florida?

PRESUMPTIVE SURFACE BEARING VALUES OF FOUNDATION MATERIALS

	Class of material	Tons per square foot
1.	Massive crystalline bedrock including granite, diorite, gneiss, trap rock, hard limestone and dolomite	100
2.	Foliated rock including bedded limestone, schist and slate in sound condition	40
3.	Sedimentary rock including hard shales, sandstones, and thoroughly cemented conglomerates	25
4.	Soft or broken bedrock (excluding shale), and soft limestone	10
5.	Compacted, partially cemented gravels, and sand and hardpan overlying rock	10
6.	Gravel and sand gravel mixtures	6
7.	Loose gravel, hard dry clay, compact coarse sand, and soft shales	4
8.	Loose, coarse sand and sand-gravel mixtures and compact fine sand (confined)	3
9.	Loose medium sand (confined), stiff clay	2
10.	Soft broken shale, soft clay	1.5

Note 1 ton per square foot = 9765 kg/m^2.

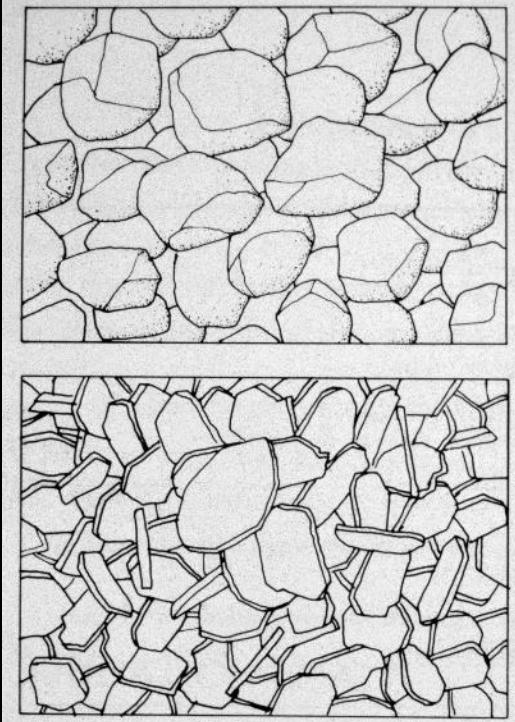


FIGURE 2.3
Silt particles (top) *are approximately equidimensional granules, while clay particles* (bottom) *are platelike and generally much smaller than silt. The clay structure shown here is* flocculated. *In some other types of clays the particles lie in parallel relationships, either more closely packed, or dispersed by electrostatic forces.*

Silt Particles

Clay Particles

Silty soil

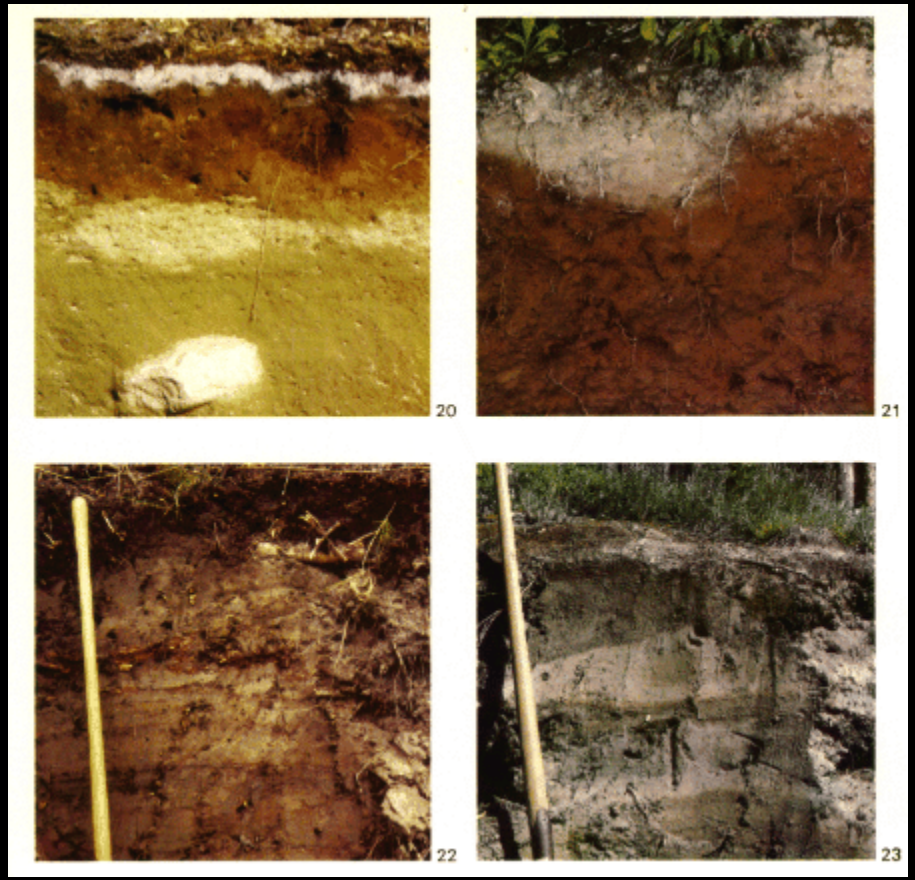
Clay soil

Sandy soil

Pea Gravel

Clean Gravel

Gravel with fines



We need to find out what the make up of the soil composition on our site is.

How do we go about doing that?

FIGURE 2.2
A soil classification chart based on the Unified Soil Classification System. The group symbols are a universal set of abbreviations for soil types, as used in Figure 2.7.

				Group Symbols	Typical Names
Coarse-grained Soils	Gravels	Clean Gravels		GW	Well-graded gravels, gravel-sand mixtures, little or no fines
				GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
		Gravels with Fines		GM	Silty gravels, poorly graded gravel-sand-silt mixtures
				GC	Clayey gravels, poorly graded gravel-sand-clay mixtures
	Sands	Clean Sands		SW	Well-graded sands, gravelly sands, little or no fines
				SP	Poorly graded sands, gravelly sands, little or no fines
		Sands with Fines		SM	Silty sands, poorly graded sand-silt mixtures
				SC	Clayey sands, poorly graded sand-clay mixtures
Fine-grained Soils	Silts and Clays	(Liquid limit greater than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
				OL	Organic silts and organic silt-clays of low plasticity
		(Liquid limit less than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity
	Highly Organic Soils			Pt	Peat and other highly organic soils

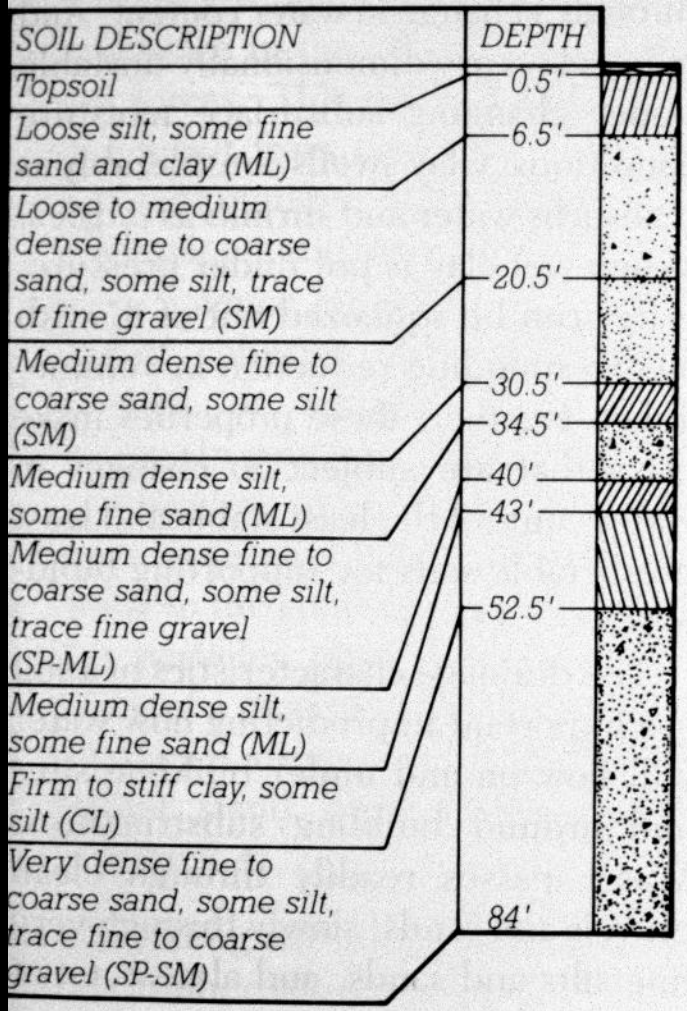


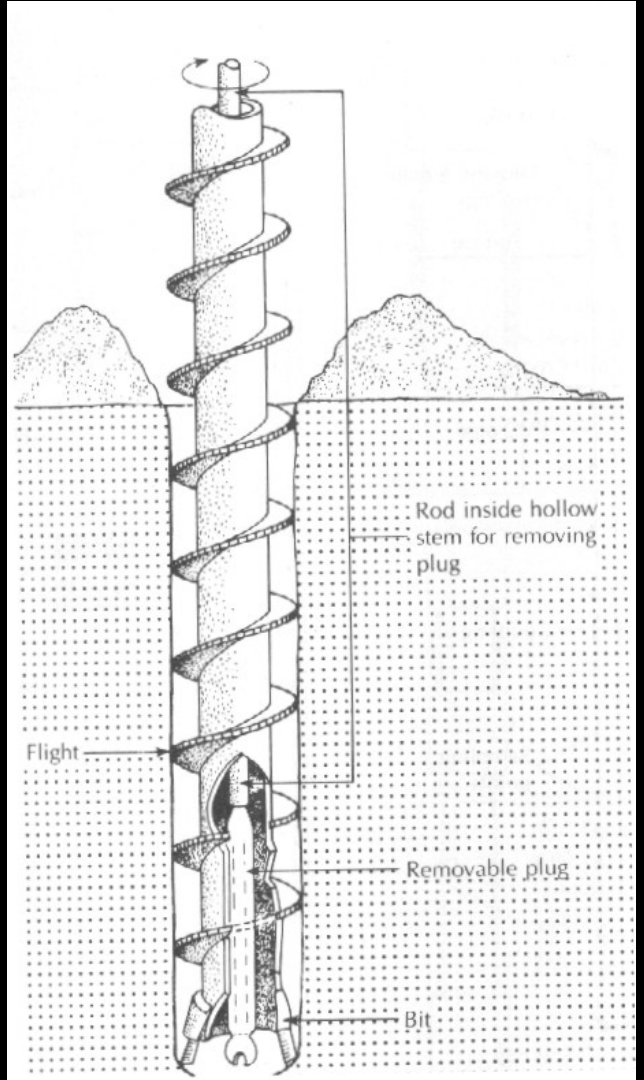
FIGURE 2.7

A typical log from a soil test boring, indicating the type of soil in each stratum and the depth in feet at which it was found. The abbreviations in parentheses refer to the Unified Soil Classification System, and are explained in Figure 2.2.

Unified Soil Classification System

Adapted from Basic Soils Engineering

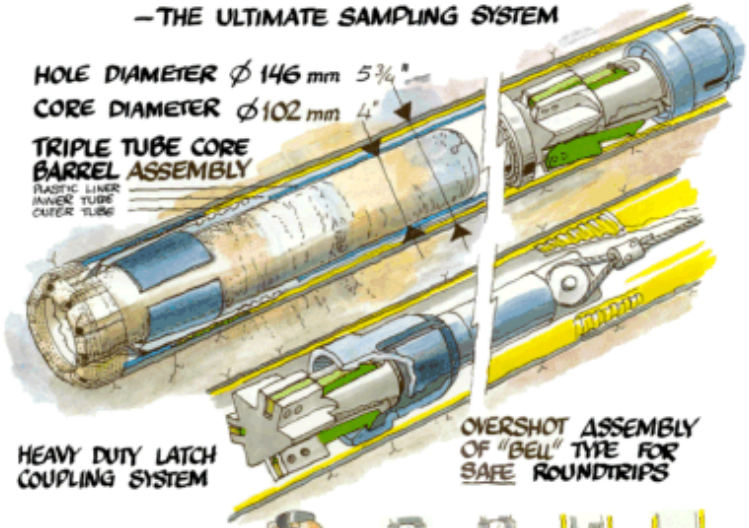
Major Divisions			Pattern	Code	Description
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (little or no fines)		GW	Well-graded gravels or gravel-sand mixtures, little or no fines
				GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
	More than half of coarse fraction is larger than No. 4-sieve size.	GRAVELS WITH FINES (appreciable amount of fines)		GM	Silty gravels, gravel-sand-silt mixtures
				GC	Clayey gravels, gravel-sand-clay mixtures
More than half of material is larger than No. 200-sieve size.	SAND AND SANDY SOILS	CLEAN SANDS (little or no fines)		SW	Well-graded sands or gravelly sands, little or no fines
				SP	Poorly graded sands or gravelly sands, little or no fines
	More than half of coarse fraction is smaller than No. 4-sieve size.	SAND WITH FINES (appreciable amount of fines)		SM	Silty sands, sand-silt mixtures
				SC	Clayey sands, sand-clay mixtures
FINE GRAINED SOILS	SILTS AND CLAYS	Liquid limit less than 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity
				OL	Organic silts and organic silt-clays of low plasticity
More than half of material is smaller than No. 200-sieve size.		Liquid limit greater than 50		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts
HIGHLY	ORGANIC	SOILS		PT	Peat and other highly organic soils

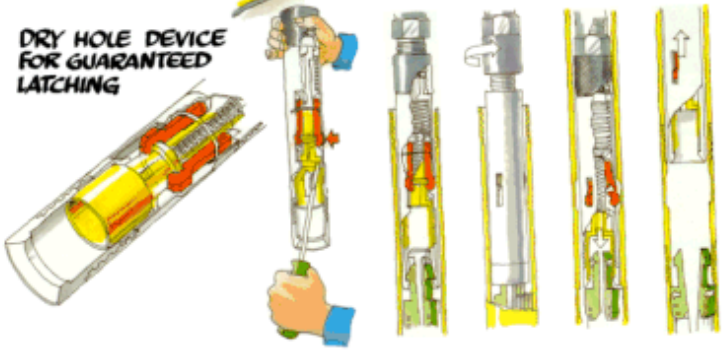

Rod inside hollow stem for removing plug
Flight
Removable plug
Bit

Geobor S

Atlas Copco

—THE ULTIMATE SAMPLING SYSTEM





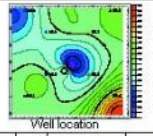
MAIN ASSEMBLIES FOR:

- CORING IN MEDIUM TO HARD FORMATIONS, METHOD I
- CORING IN SOFT FORMATIONS METHOD II
- CORING IN VERY SOFT FORMATIONS METHOD III
- CORING IN SOFT VARYING FORMATIONS METHOD IV
- SHELBY SAMPLING, METHOD V
- FULL HOLE DRILLING, METHOD VI
- PACKER TEST, METHOD VII


GREYHOUND
LINES, IN
PA
Ziploc

DRILL HOLE # *Sierra-1*

Location *Golden, Colorado*
Direction *Vertical*
Drilling Contractor *RW Drilling*
Logged By *JMD*



Date *6/1/00*
Project No. *1364-5*
Elevation *5280'*
Coordinates *X Y*
Fluid *Bariod Mud*

Depth (ft) / Depth (m)	Sample No.	Sample Type	LITHOLOGY	Degree of Weathering	RQD % (30–60) / Rock Hardness (1 3 5)	Point Load Strength	UCS	Core Recovery % (25–75)	Sampling	Sampling	Well Construction
0 / 0	S-1		Gravel and Sand: with trace of silt, gray to brown; moderate density; very wet (perched zone); GW (Vashon Advance Outwash). Occasional clay cobbles (1-4cm. in diameter) with dark brown to black organic material as stringers throughout.	42			SC				
1 / 0			Sand: with trace gravel, trace silt, fine to medium, brown; SW-SP.	36				75.0			
2 / 1	S-2		Sand and Silt: with trace clay, very fine to medium, brown; soft and very moist.	58			PT				strange drilling results
4 / 1			Gravel: with trace sand; fine sand lenses as interbeds. Organic material traces; brown. Organic odor in sand lenses.					58.0			
5 / 2	S-3		Silt: with trace sand. Soft very moist.								slowing drilling
6 / 2			Combustible gas kick.								
7 / 2			Clay and Silt					68.0			
8 / 3			Clay								
9 / 3			Gravel and Sand								

Client *RW Rock*
Project *Hillside #1*
Page 1 of 1

Acme Logging
123 Main St.
Golden, Colorado

Borehole # *02 8715*
Project #: 02-59
Project Name: Barker Establishment
Engineer: J Hines
Location: Elmine Co.

Depth	Lithology	Water Level	LNAPL/DNAPL	Sample #	Sample Type	% Recovery	Benzene (ppm) 0–1000	Toluene (ppm) 0–10000	Notes	Depth
0	FILL: Sand & gravel fill								Drilling started on a cold and windy day.	0
1	SAND: Fine to medium, trace silt and gravel			1					Reached initial water at 1.5 feet in a sandy/silty sand layer	1
2									Noticeable odor increasing.	2
3	SILTY SAND: Moist, with trace clay			2					Lab results: .7465 lead, .92 arsenic	3
4									Still drilling	4
5				3					Clay lens at 5.5 feet	5
6	CLAY: Soft, grey								DNAPL significant in this sample	6
7	GRAVEL: Trace sand, fine sands as interbeds			4					significant water in this gravel.	7
8									more notes	8
9				5					DNAPL significant in this sample	9
10									hi ho it's off to work we go	10
11	SILT: Some sand, moist			6					Silt layer showing highest Toluene concentrations	11
12									extensive	12
13				7						13
14										14
15	GRAVEL AND SAND			8					End of boring at 16 feet	15
16										16

E&B Environmental
7640 Hwy 65 Cedar, WY 87365

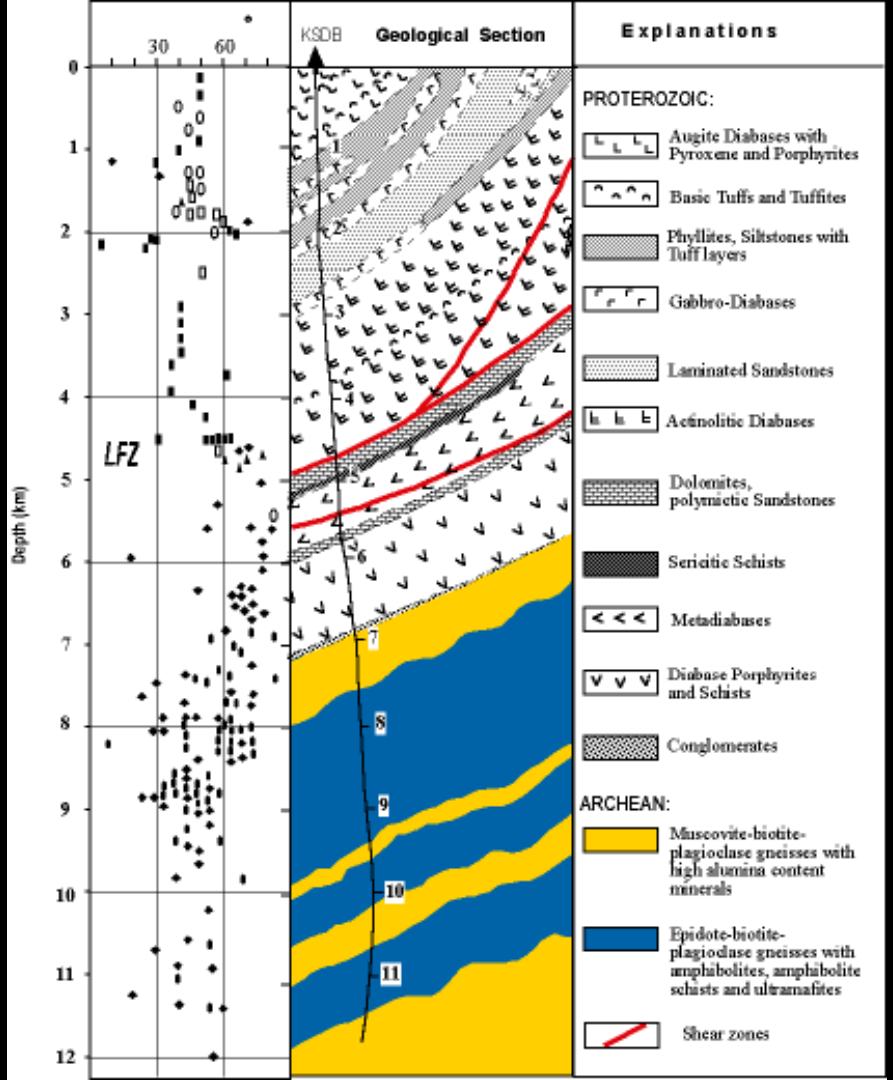
Pg 1 of 1

Great Wall Environmental, Inc.

SOIL TEST BORING SYMBOLIC LOG
WITH MONITOR WELL INSTALLATION NOTES

PROJECT: Groundwater study
DATE: 6/2/95
BORING NO. B-1
ELEVATION: 696.3
BORING LOCATION: 25N 35W
METHOD OF DRILLING: 6" Hollow Stem Auger
NOTES: Clear weather, sunny, 65°
RECORD OF WATER DEPTH CHECKS: none
CAVING DEPTH: none
ARTIFICIAL FILL DEPTH: none

ELEVATION / DEPTH	SOIL SYMBOLS/ FIELD TEST DATA	USCS	Soil Description	SPT "N"	SN	M %	DO pcf	WD pcf	Hyd ppm	Well Construction	Well Description
695	7/6	CL	Topsoil:								Cement in concrete.
	5/6	SM	Sand and Silt:		1-1	42.2	89.3	127	0.8		Bentonite pellets used to seal below cap -5'.
690	4/6			9	1-2	42.5	92.2	131	19.4		
		OL	Clay and Silt:		1-3	36.9			272		Random clay and sand cuttings used as backfill.
-10					1-4	34.2	97.1	130	176		
685				17							
-15					1-5	23.5			32.5		1 foot of bentonite pellets added at 15-16 feet.
680	25/6	SC	Sand: Clayey, silty, brown, damptomoist								Bentonite seal at 15' to 16'.
	13/6			27	1-6	9.4			25.9		1 foot of bentonite pellets added at 16-17'.
-20											
675		CL	Clay: Silty, sandy, brown/reddish-brown, dampto moist, medium stiff to soft		1-7	12.4			1.4		End of well. Remainder of hole backfilled with cuttings.
-25	10/6		Claystone: Bedrock weathered								
670	12/6		Claystone: Bedrock firm								
-30											
665											



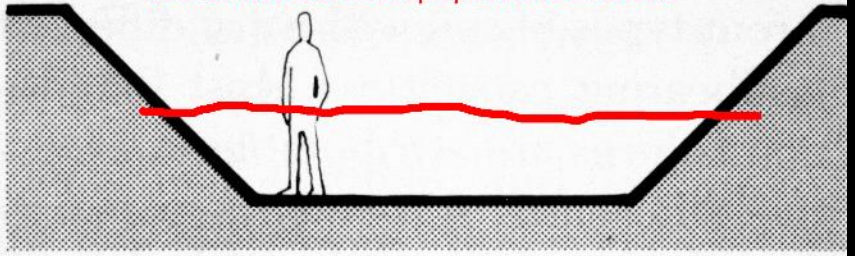
PILE TEST DATA

J1736

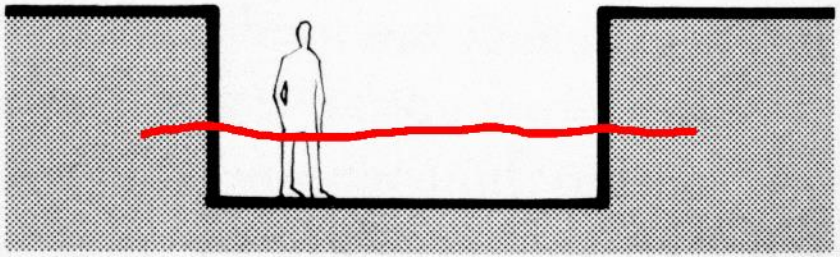
LOAD TONS	GAUGE PRESSURE (psi)	DATE: TIME	SETTLEMENT Inches	REMARKS
0	0	Dec. 5 12:30	0	
12.5	755	14:00	0.062	
25	1510	15:00	0.122	
37.5	2265	16:15	0.233	
50	3020	18:30	0.318	
62.5	3775	20:30	0.393	
75	4530	22:15	0.477	
87.5	5285	Dec. 6 00:15	0.552	
100	6040	00:20	Pressure	Line Broken
0	0	10:13	0.347	
50	3020	11:45	0.462	Reloading
62.5	3775	12:30	0.514	
75	4530	13:15	0.543	
87.5	5285	14:30	0.589	
100	6040	16:45	0.657	Settlement now less than .01"/hr.
100	6040	Dec. 7 14:30	0.702	Settlement after 200% design load in place 24 hours
75	4530	15:15	0.702	Unloading
50	3020	16:00	0.646	
25	1510	17:00	0.575	
0	0	Dec. 8 7:15	0.456	Test Complete

Excavations

excavation should never be deeper than waist height
so that if there is a cave in, people are not smothered



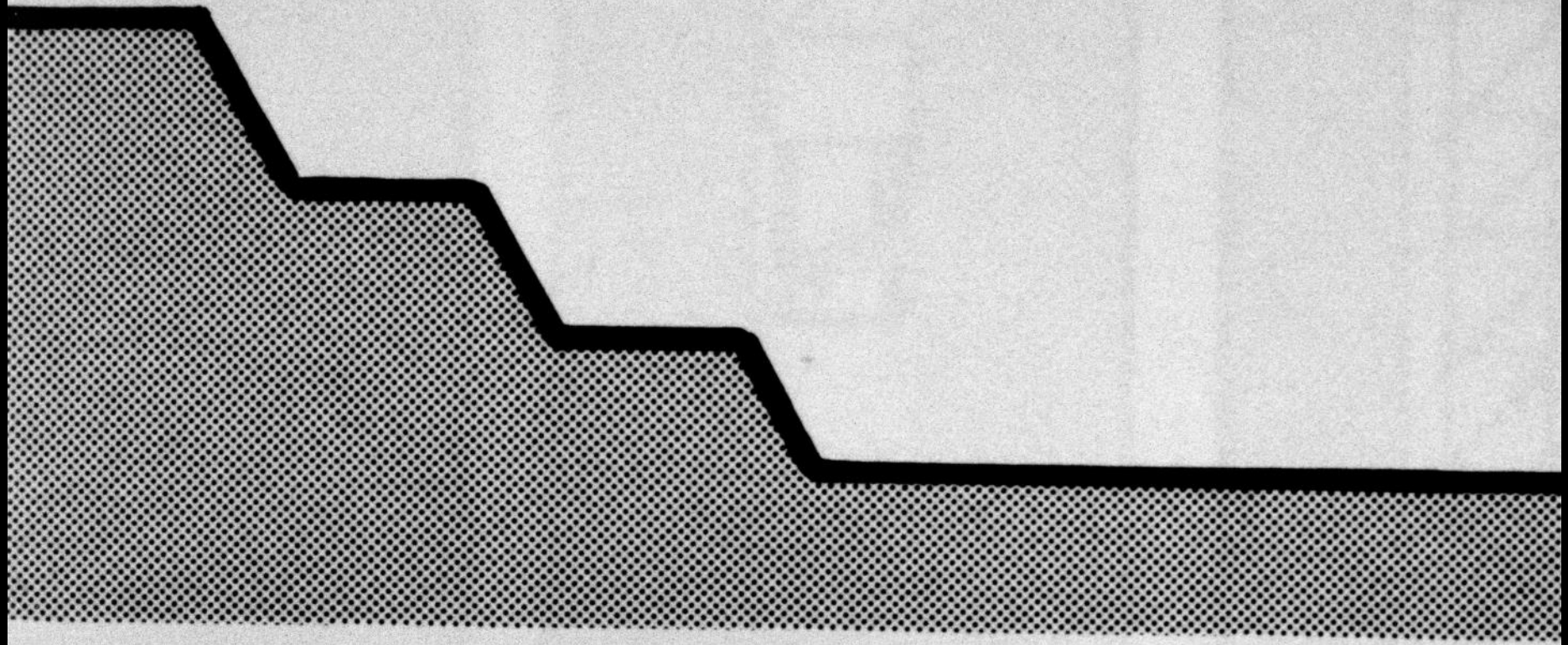
EXCAVATION IN FRICTIONAL SOIL



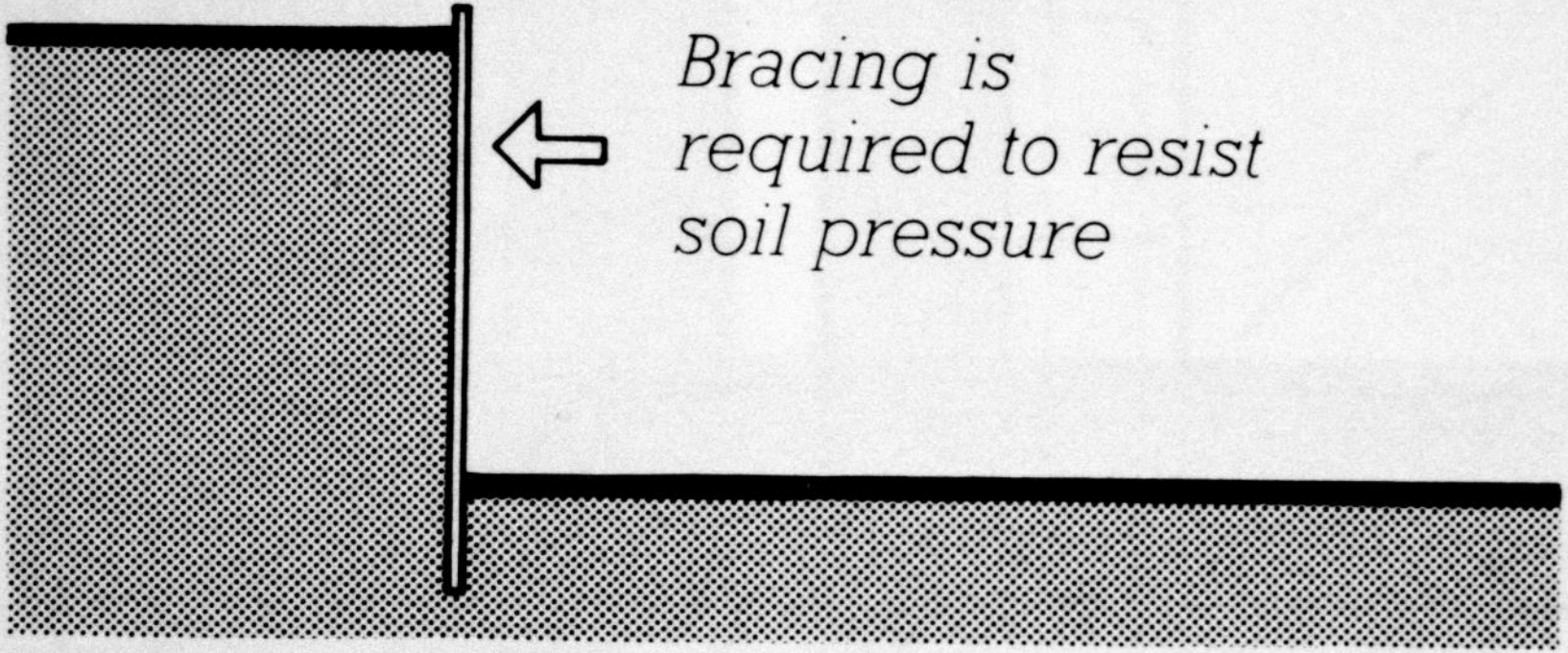
EXCAVATION IN HIGHLY COHESIVE SOIL

FIGURE 2.4

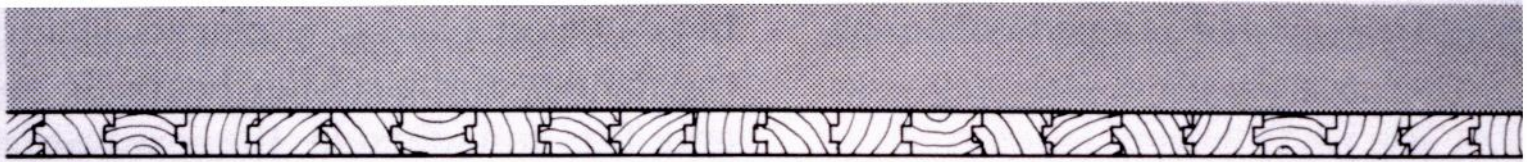
Excavations in highly cohesive and frictional soils.



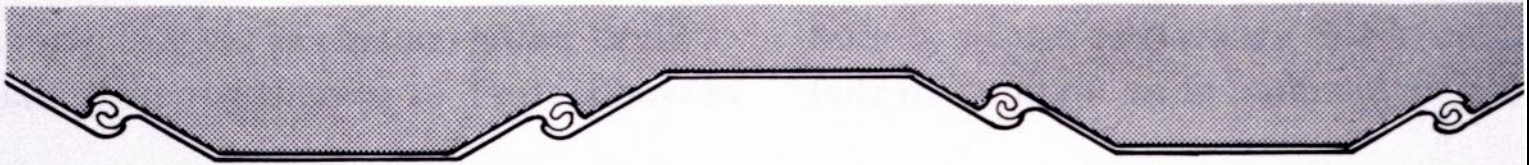
SECTION THROUGH BENCHED EXCAVATION



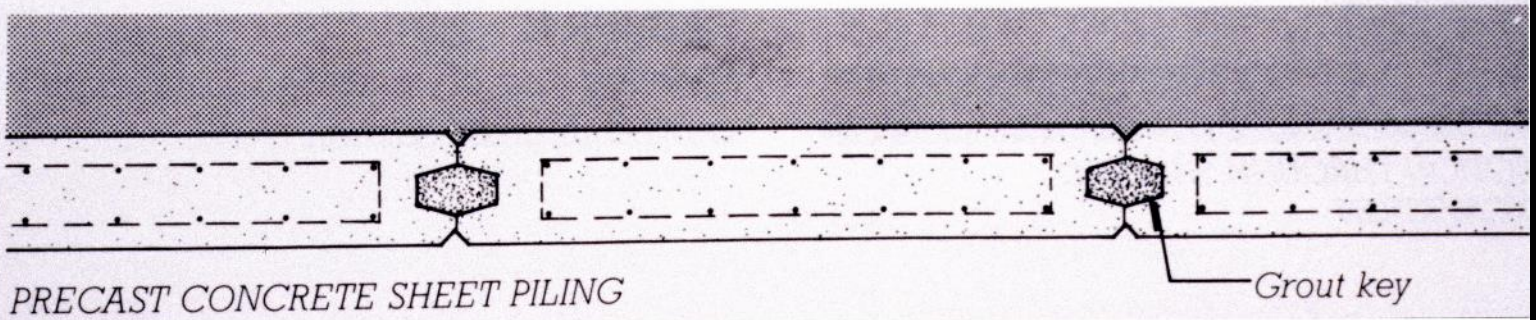
SECTION THROUGH SHEETED EXCAVATION



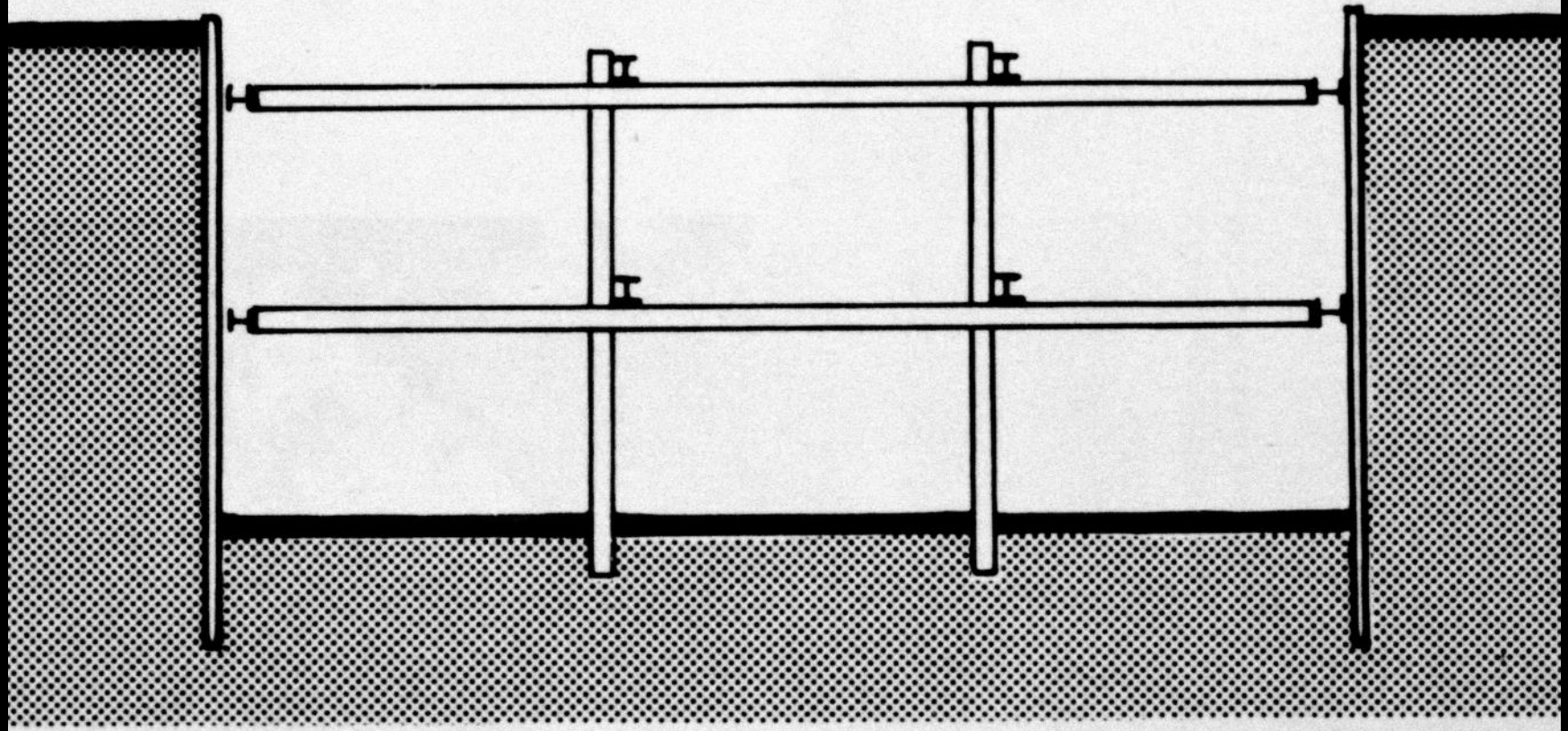
TIMBER SHEET PILING



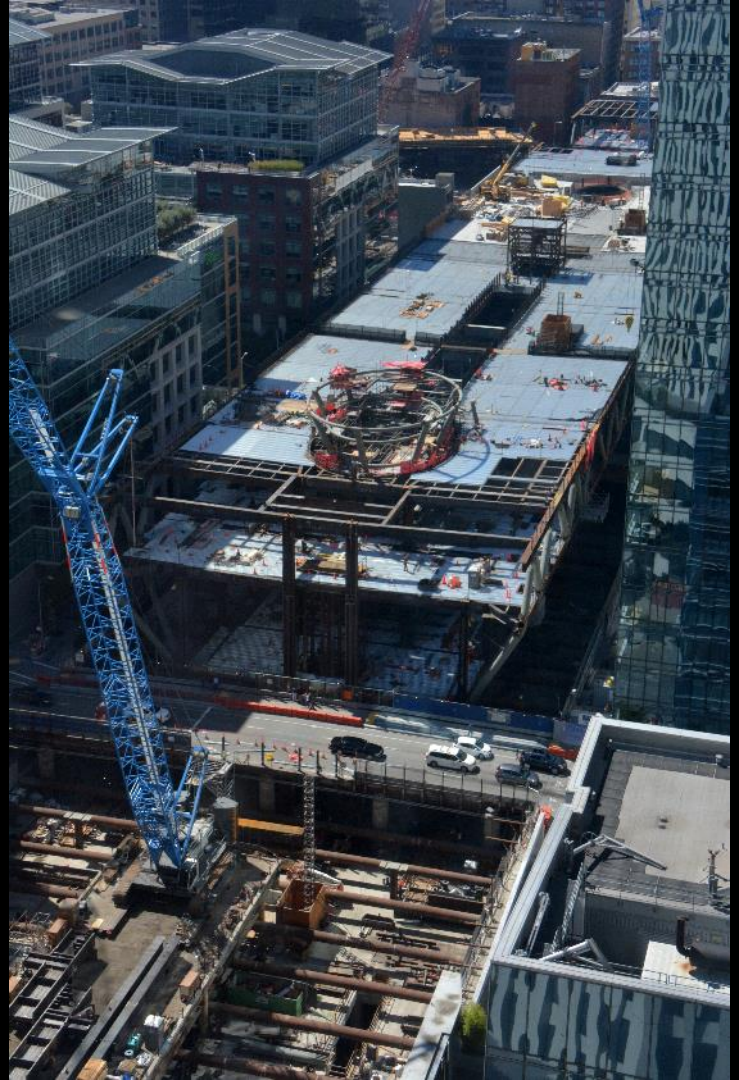
STEEL SHEET PILING



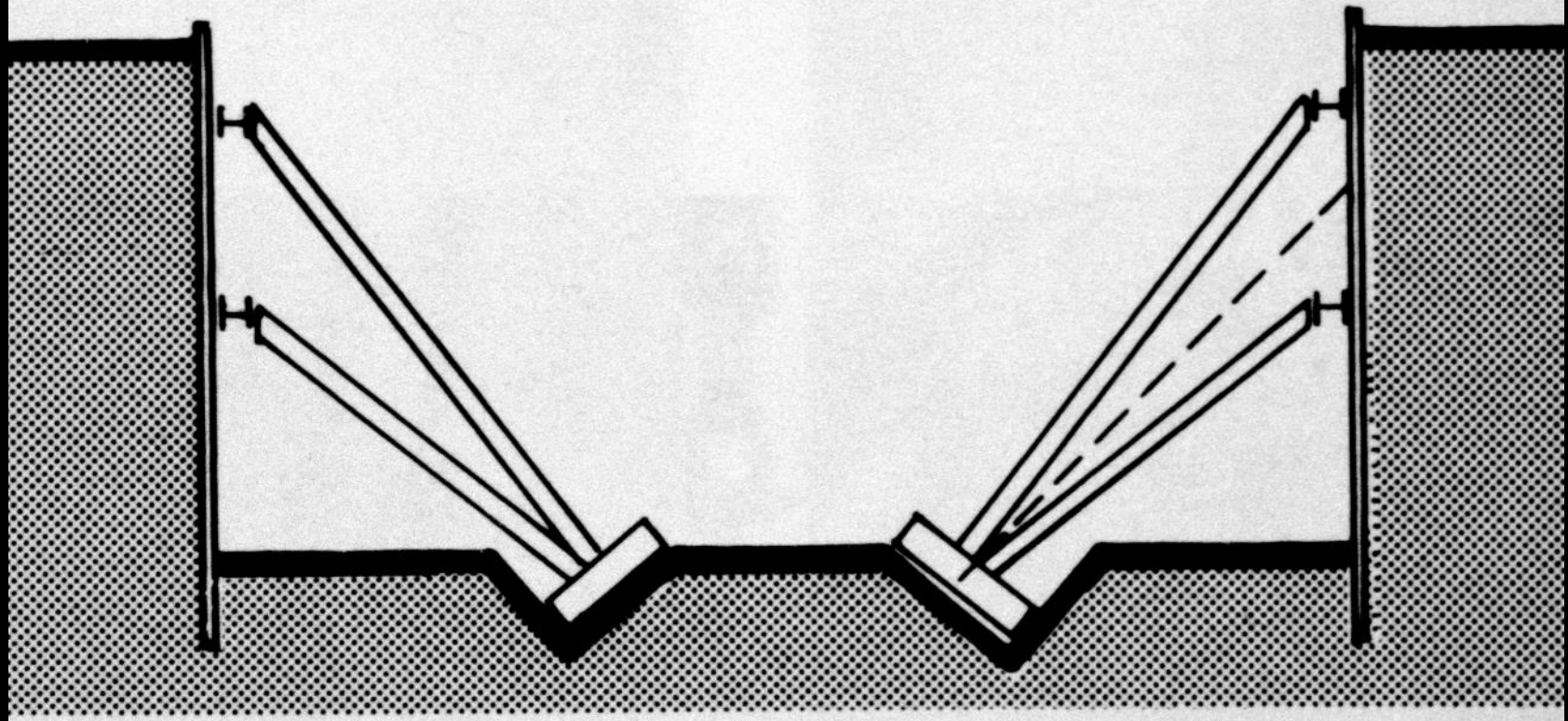
PRECAST CONCRETE SHEET PILING



CROSSLOT BRACING




5 TONS
10.9 TONS



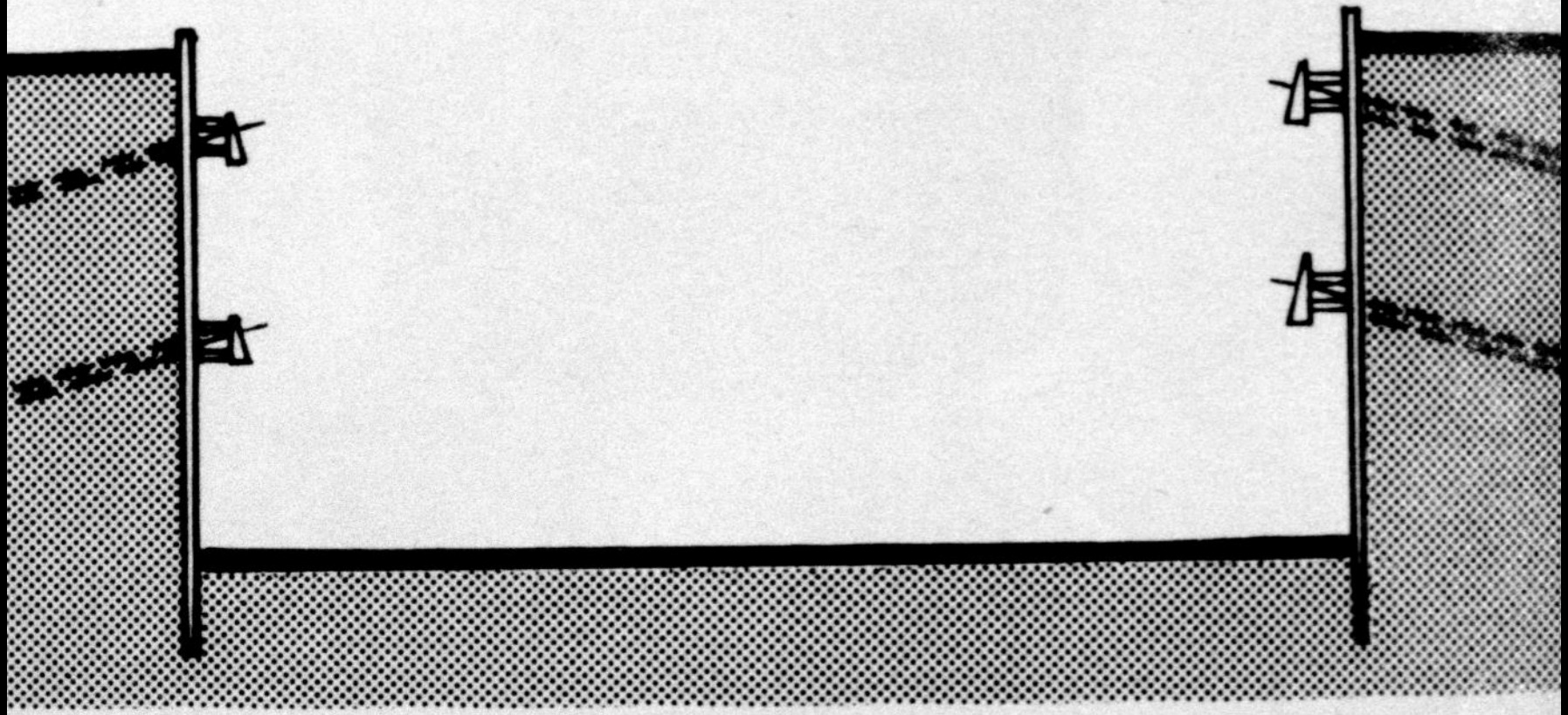
RAKERS


KOMATSU

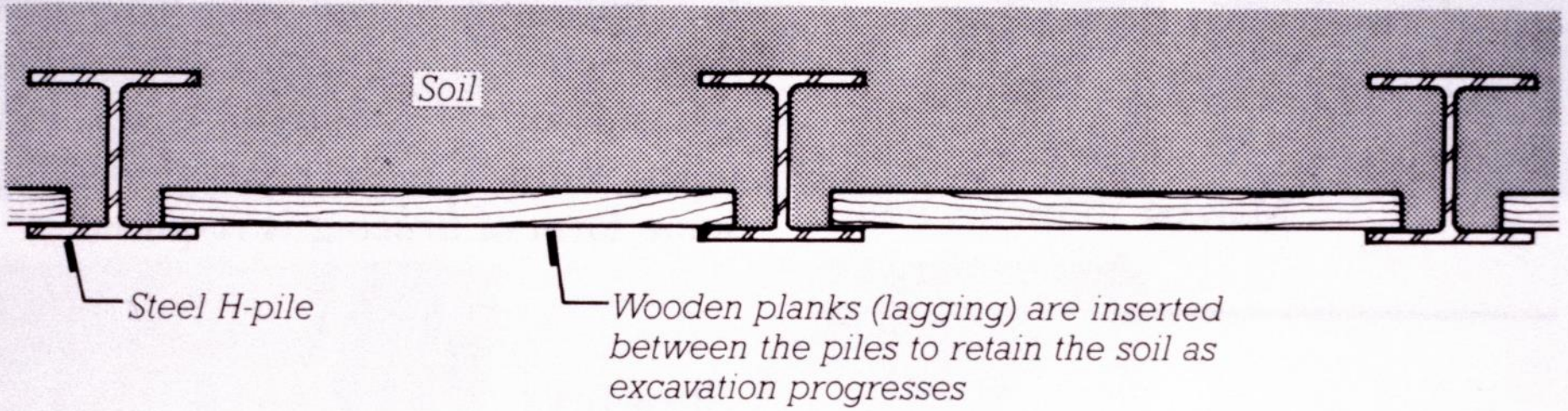

KOMATSU


ABLE


520 W 28TH ST.



TIEBACKS


Soil
Steel H-pile
Wooden planks (lagging) are inserted between the piles to retain the soil as excavation progresses

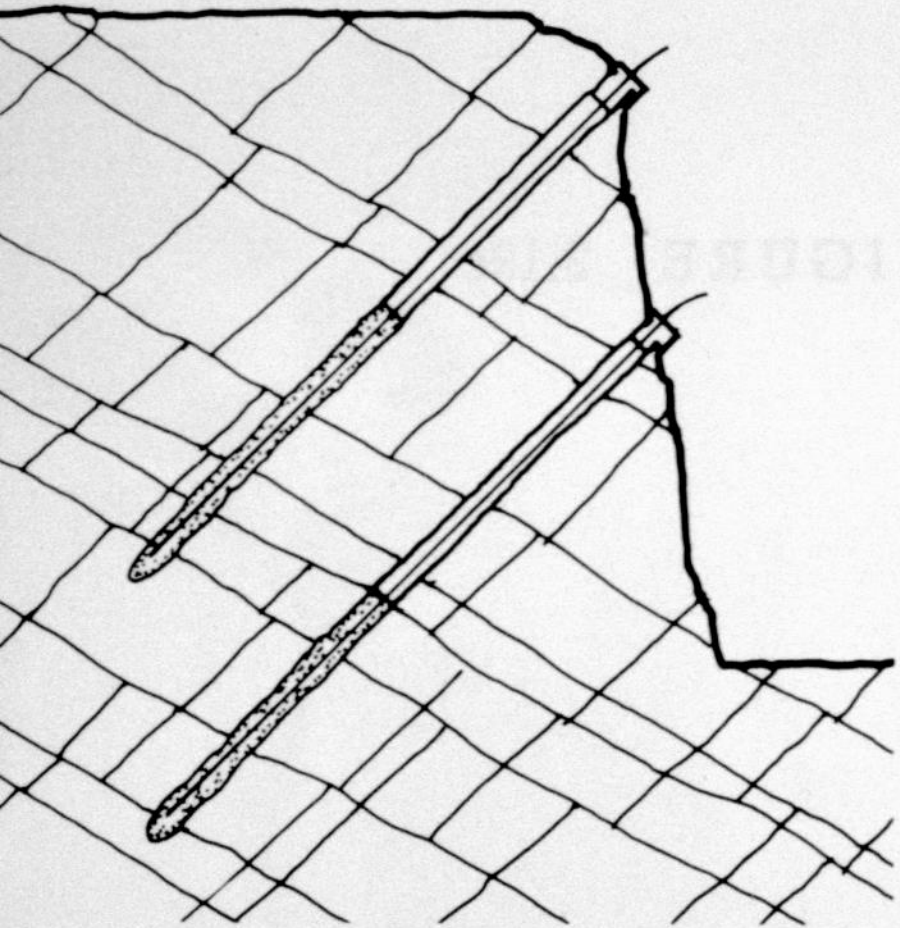
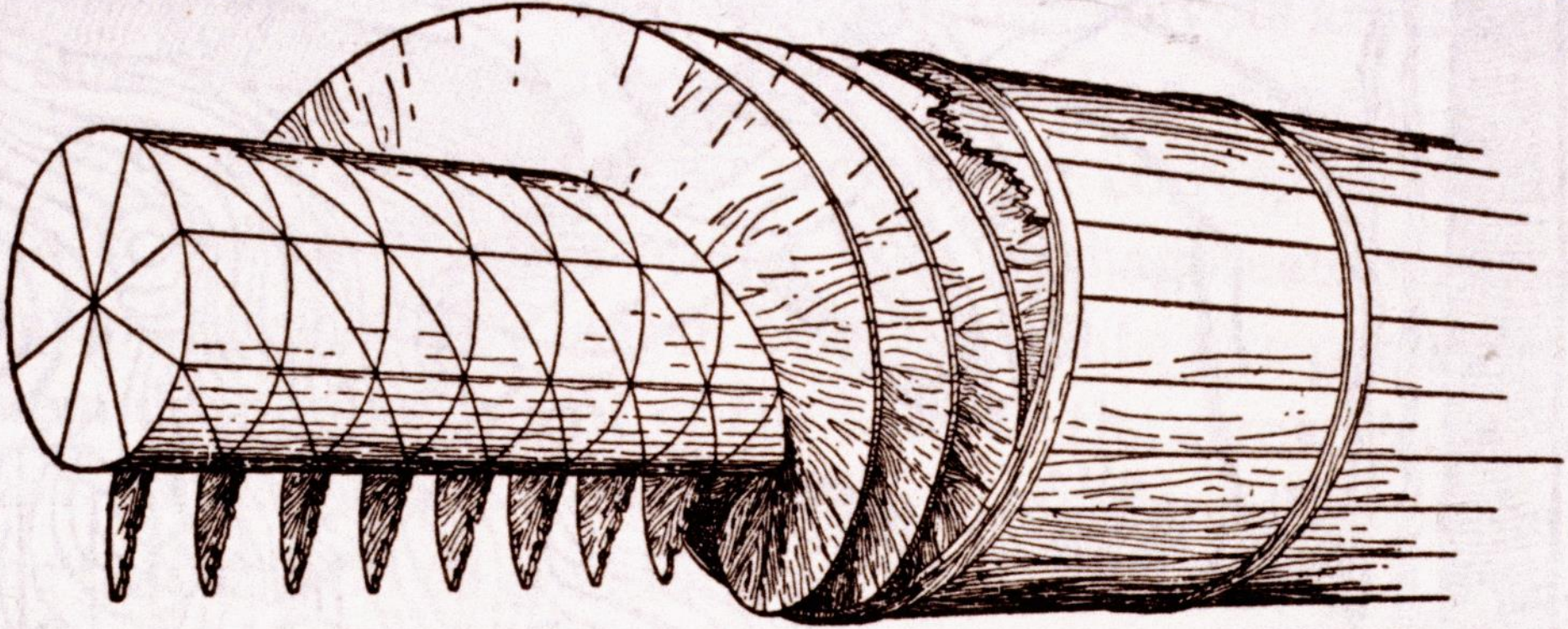


FIGURE 2.20

Rock anchors are similar to tiebacks, but are used to hold jointed rock formations in place around an excavation.

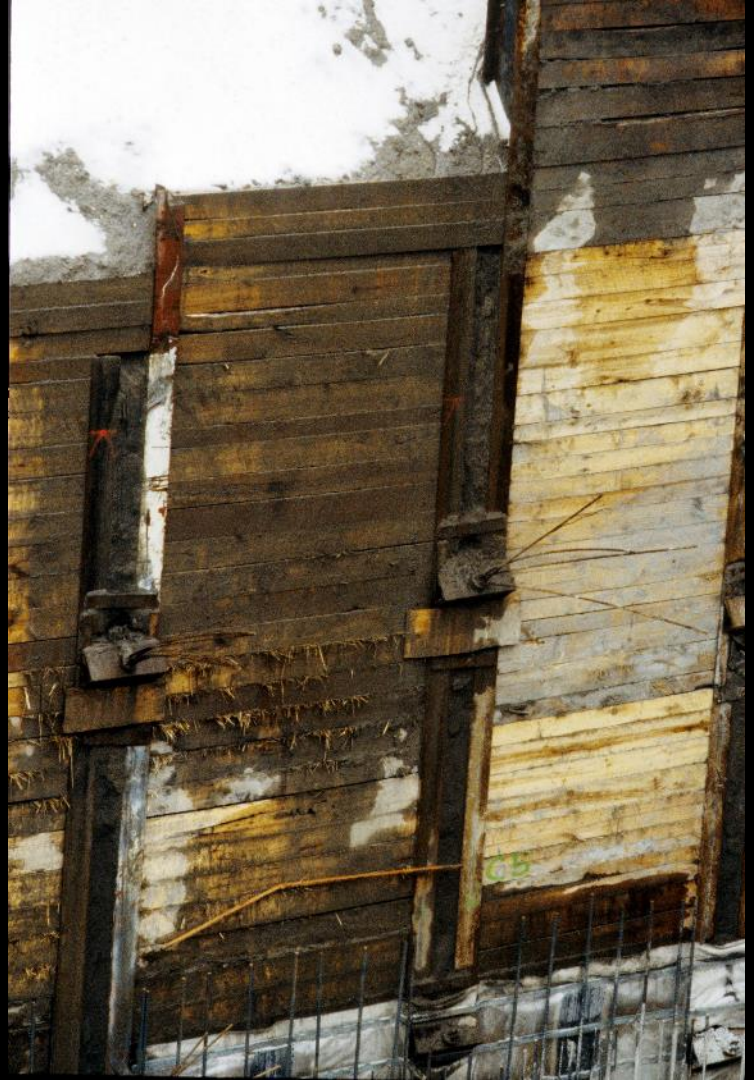


CONSTRUCTION OF THE WATER SCREW


MPCRETE


TROVER SHOP


P&H

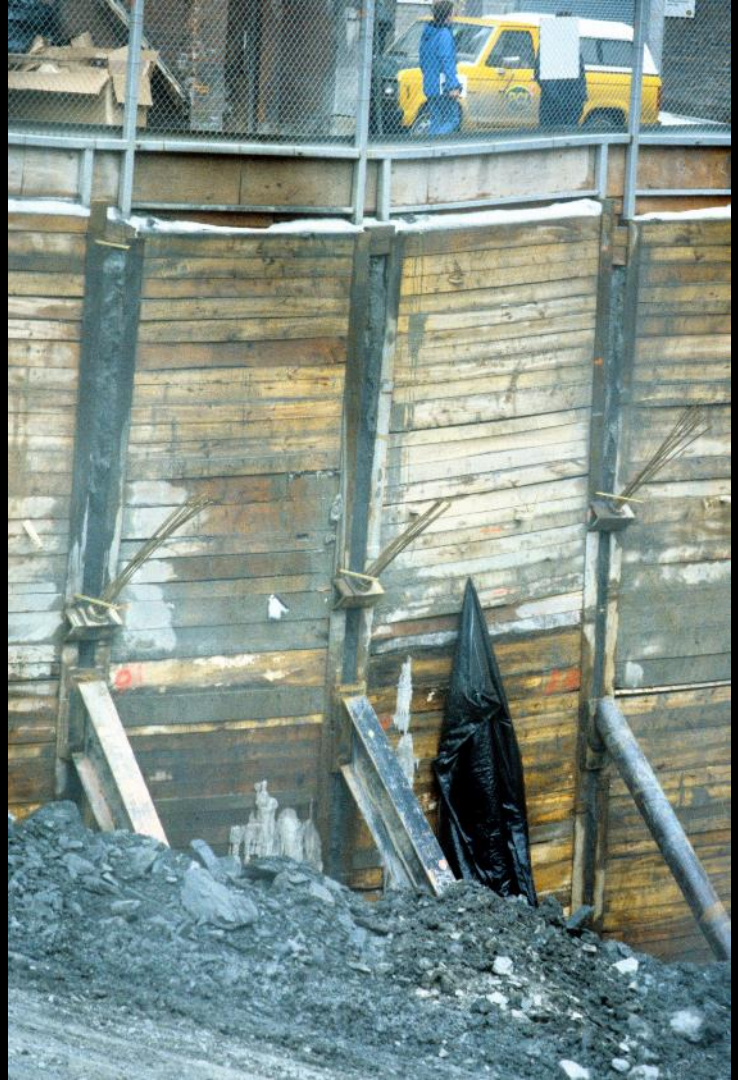



RAMP


THE ROYA


RH9 LC
YORK
YORK
INSLEY


six days straight
Canada Trust




02


Tr 506
Gr
Tr 505

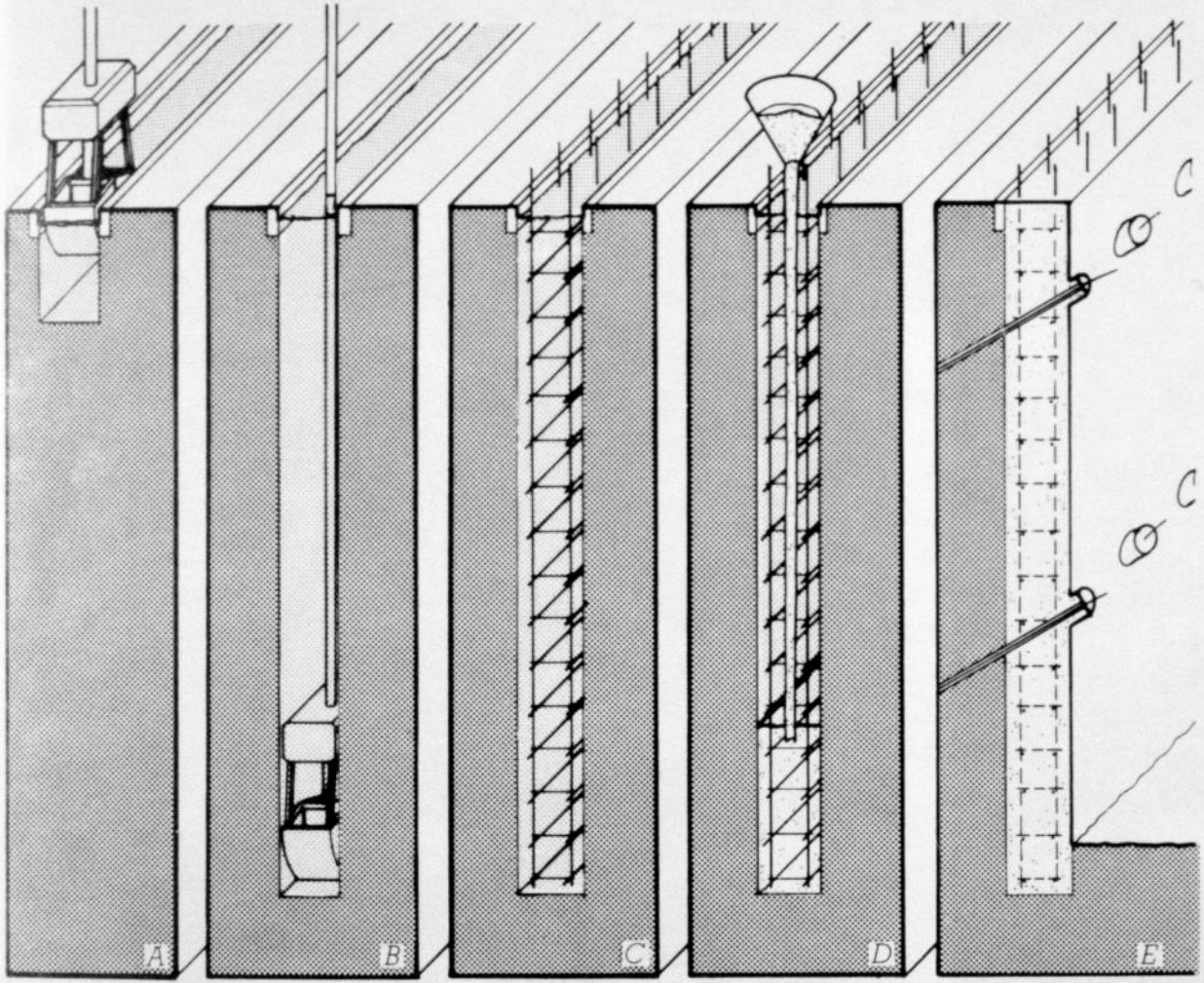


FIGURE 2.14

Steps in constructing a slurry wall. **A.** *The concrete guide walls have been installed, and the clamshell bucket begins excavating the trench through a Bentonite clay slurry.* **B.** *The trench is dug to the desired depth, with the slurry serving to prevent collapse of the walls of the trench.* **C.** *A welded cage of steel reinforcing bars is lowered into the slurry.* **D.** *The trench is concreted from the bottom up with the aid of a tremie. The displaced slurry is pumped from the trench, filtered, and stored for reuse.* **E.** *The reinforced concrete wall is tied back as excavation progresses.*


PAPD
37
NYPD
23
FDNY
343
SQ
4
E 24
L 11

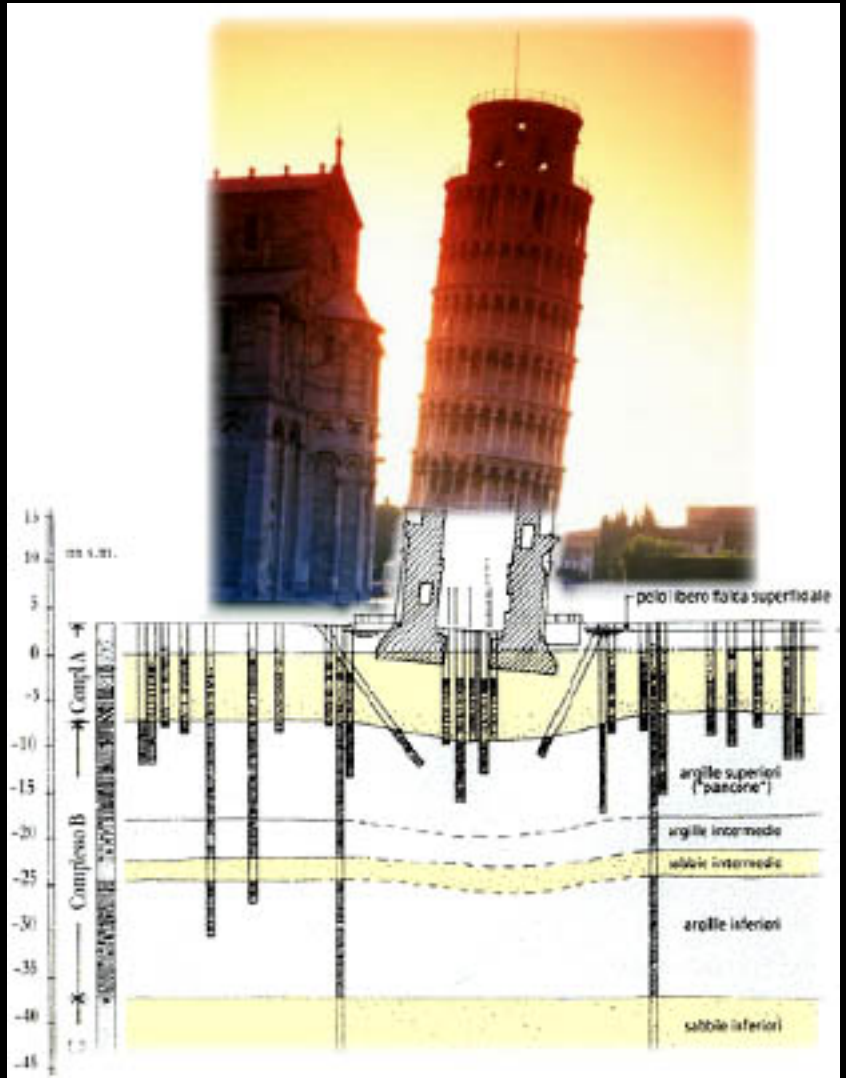

CATERPILLAR

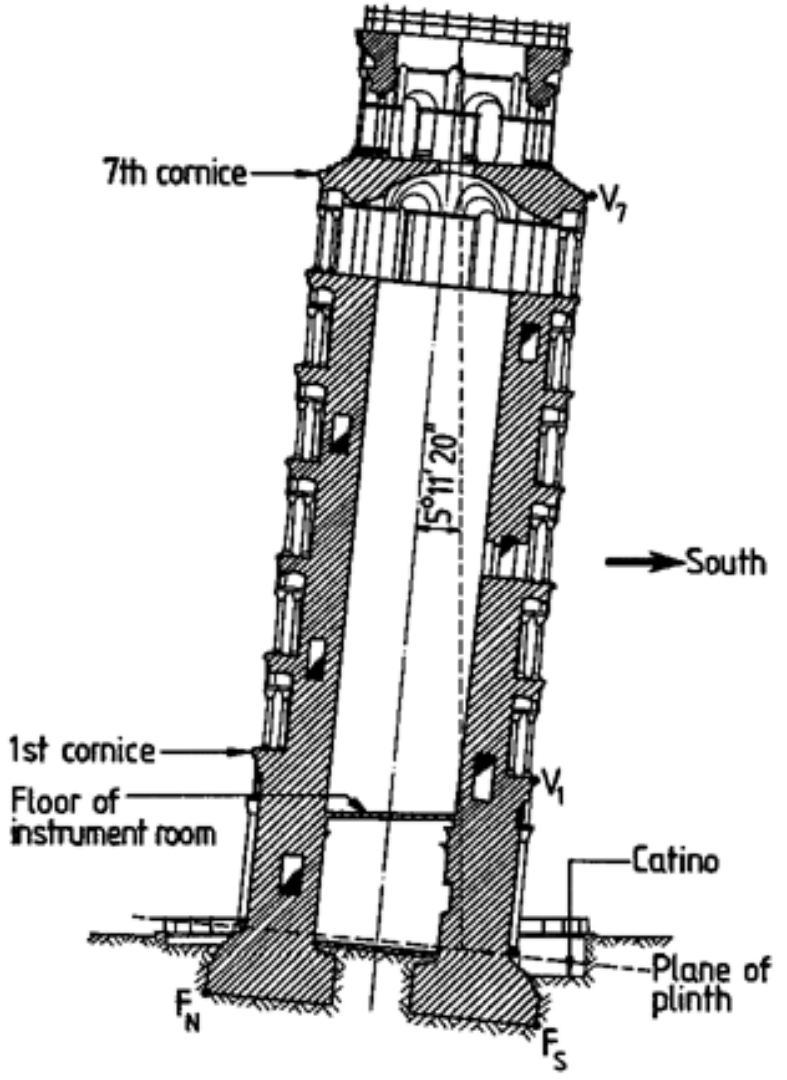

455D
JOHN DEERE

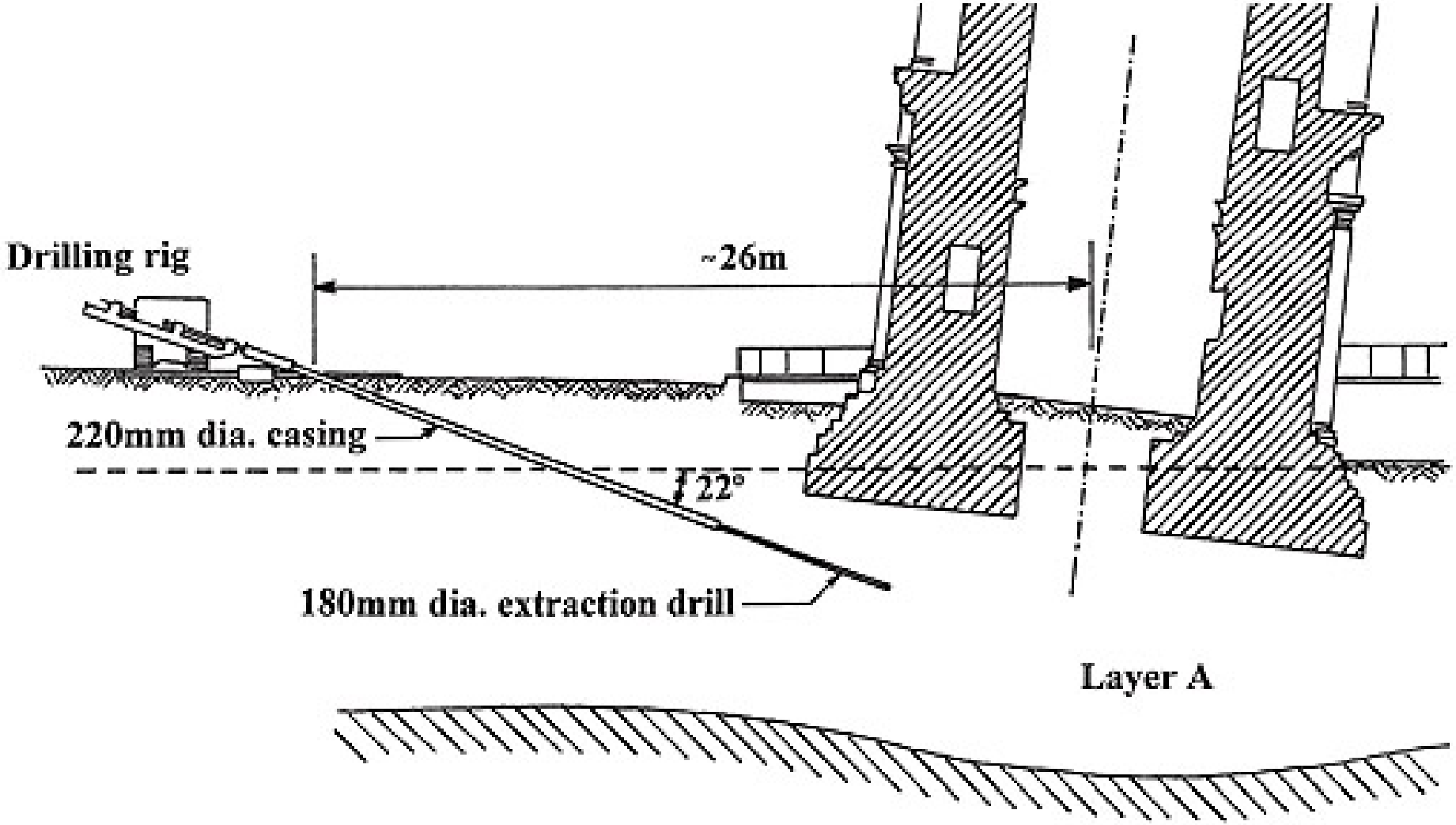

CAT

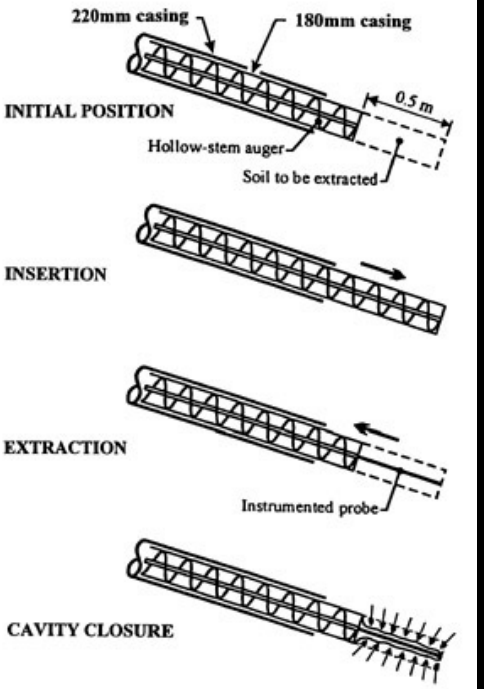
Foundations

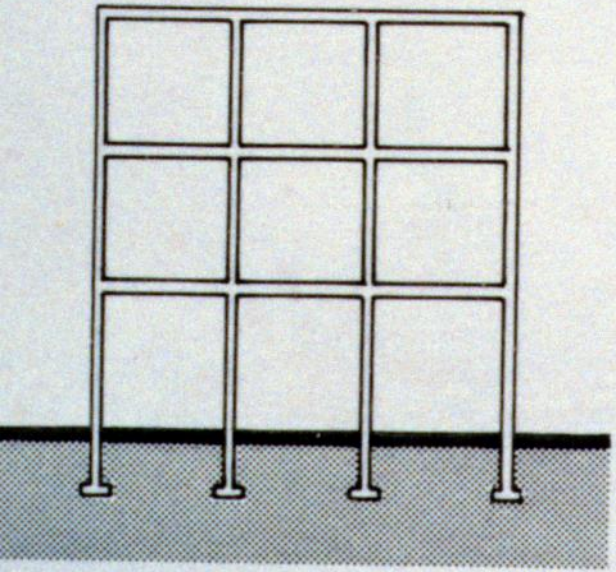
It was begun by Bonanno Pisano 1173, carried by Giovanni di Simone 1272 and fineshed by Tommaso di Andrea 1370. It is 55,80 m. high. It has 8 orders of which 6 open galleries with 180 columns and 293 steps. From the top of it Galileo Galilei experimented the gravitation 1598.


pozzi liberi falda superficiale
Complesso A
Complesso B
argille superiori ("pancone")
argille intermedie
sabbie intermedie
argille inferiori
sabbie inferiori

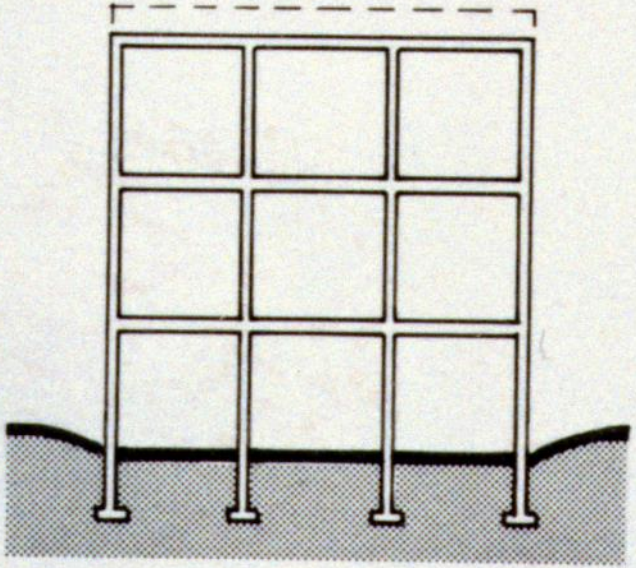

7th cornice
V_7
5°11'20"
South
1st cornice
Floor of instrument room
V_1
Catino
Plane of plinth
F_N
F_S


Drilling rig
~26m
220mm dia. casing
22°
180mm dia. extraction drill
Layer A

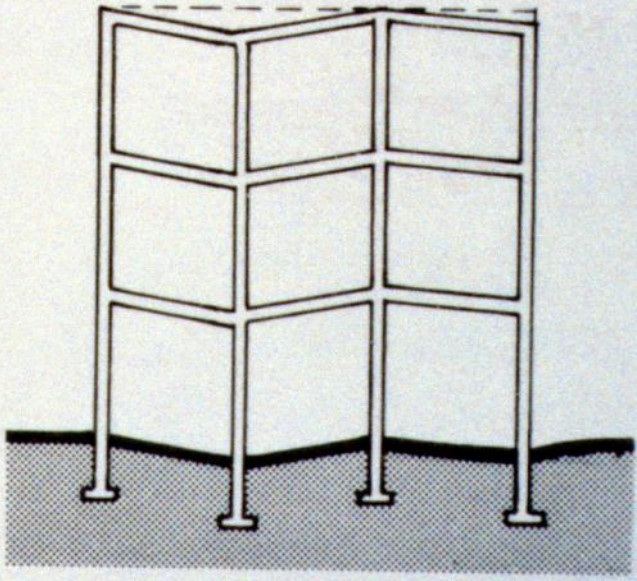

220mm casing
180mm casing
INITIAL POSITION
0.5 m
Hollow-stem auger
Soil to be extracted
INSERTION
EXTRACTION
Instrumented probe
CAVITY CLOSURE



NO SETTLEMENT



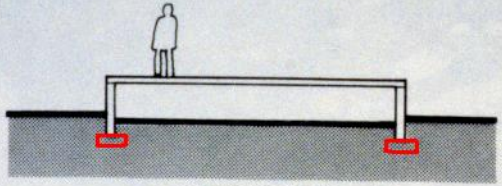
TOTAL SETTLEMENT



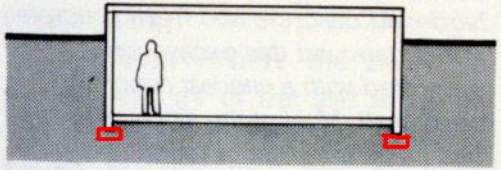
DIFFERENTIAL SETTLEMENT

Shallow Foundations

SLAB ON GRADE



CRAWLSPACE



BASEMENT

FIGURE 2.26

Three types of substructures using simple wall footings. The slab on grade is most economical under many circumstances, especially where the water table lies near the surface of the ground. A crawlspace is often used under a floor structure of wood or steel, and gives much better access to underfloor piping and wiring than a slab on grade.

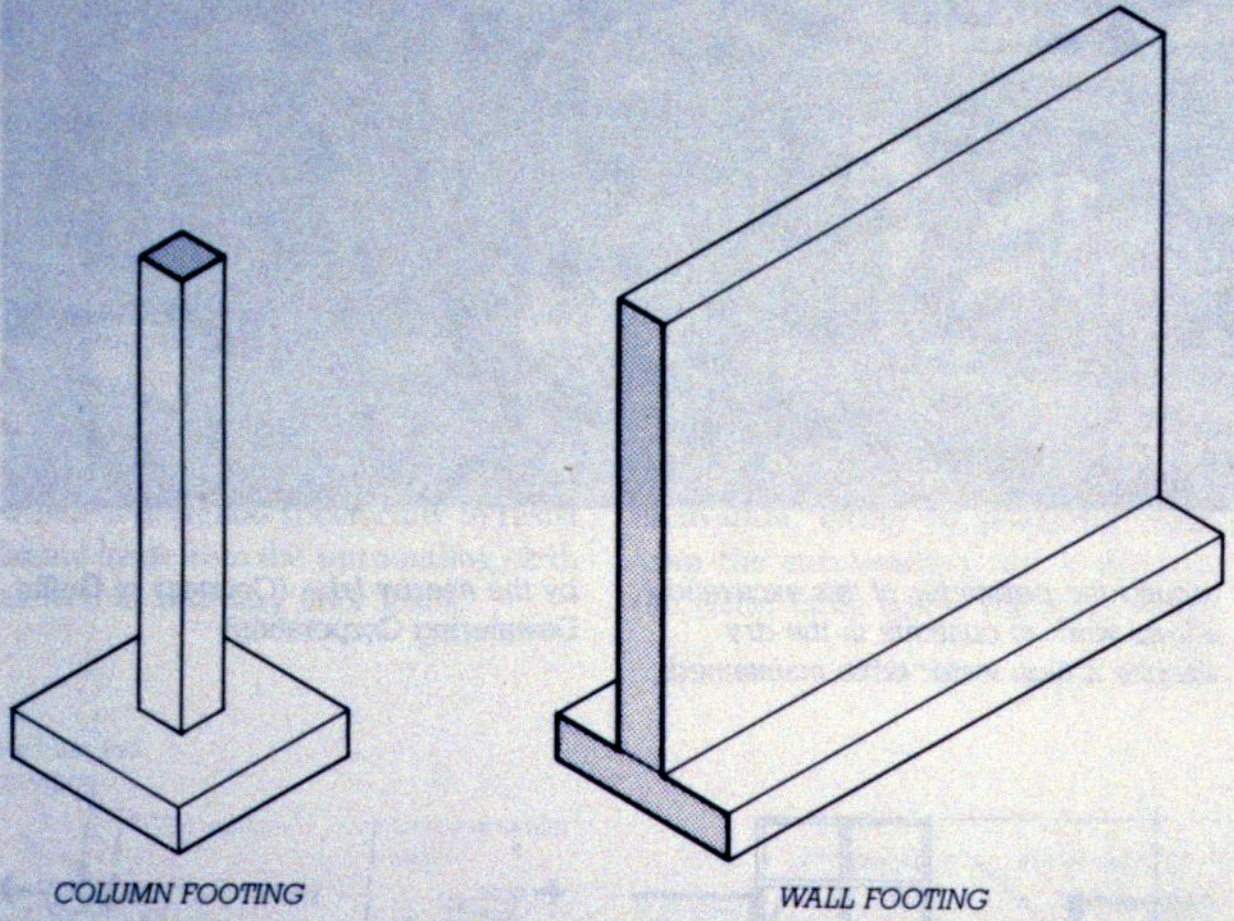
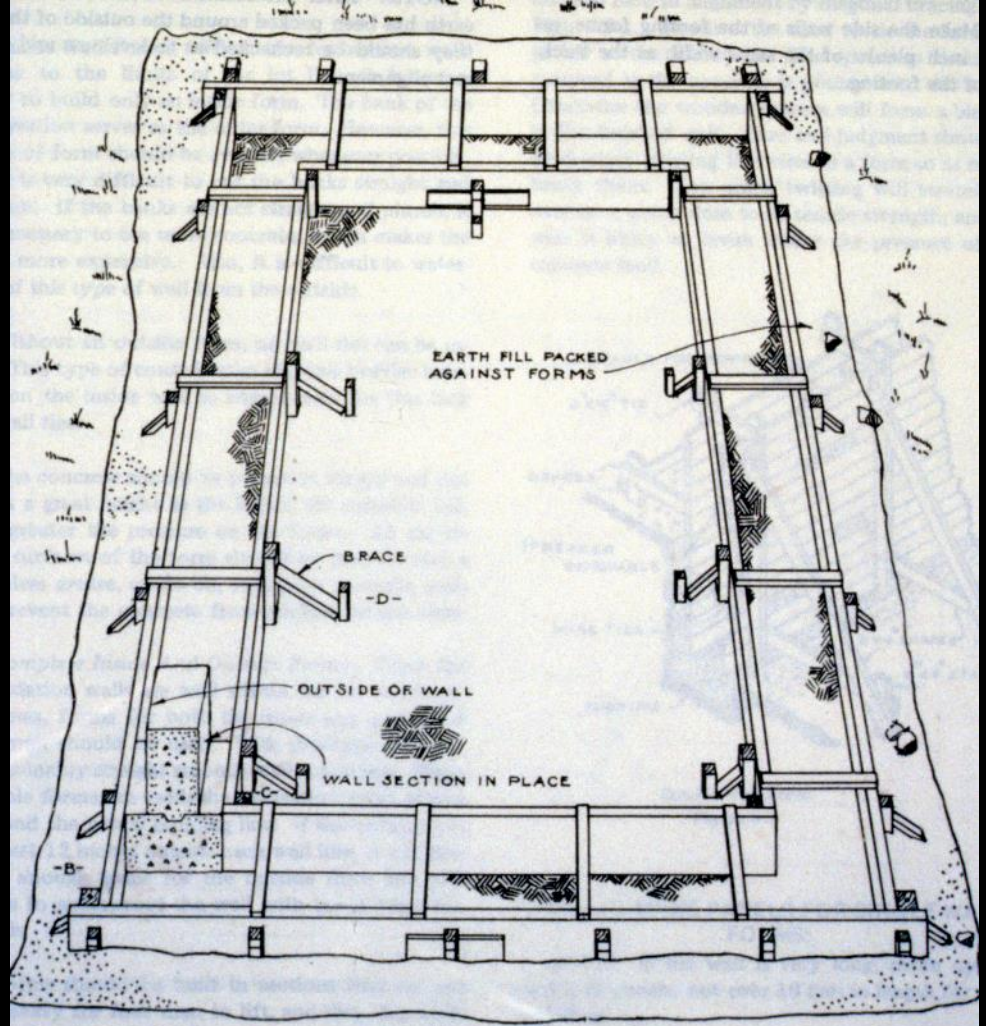
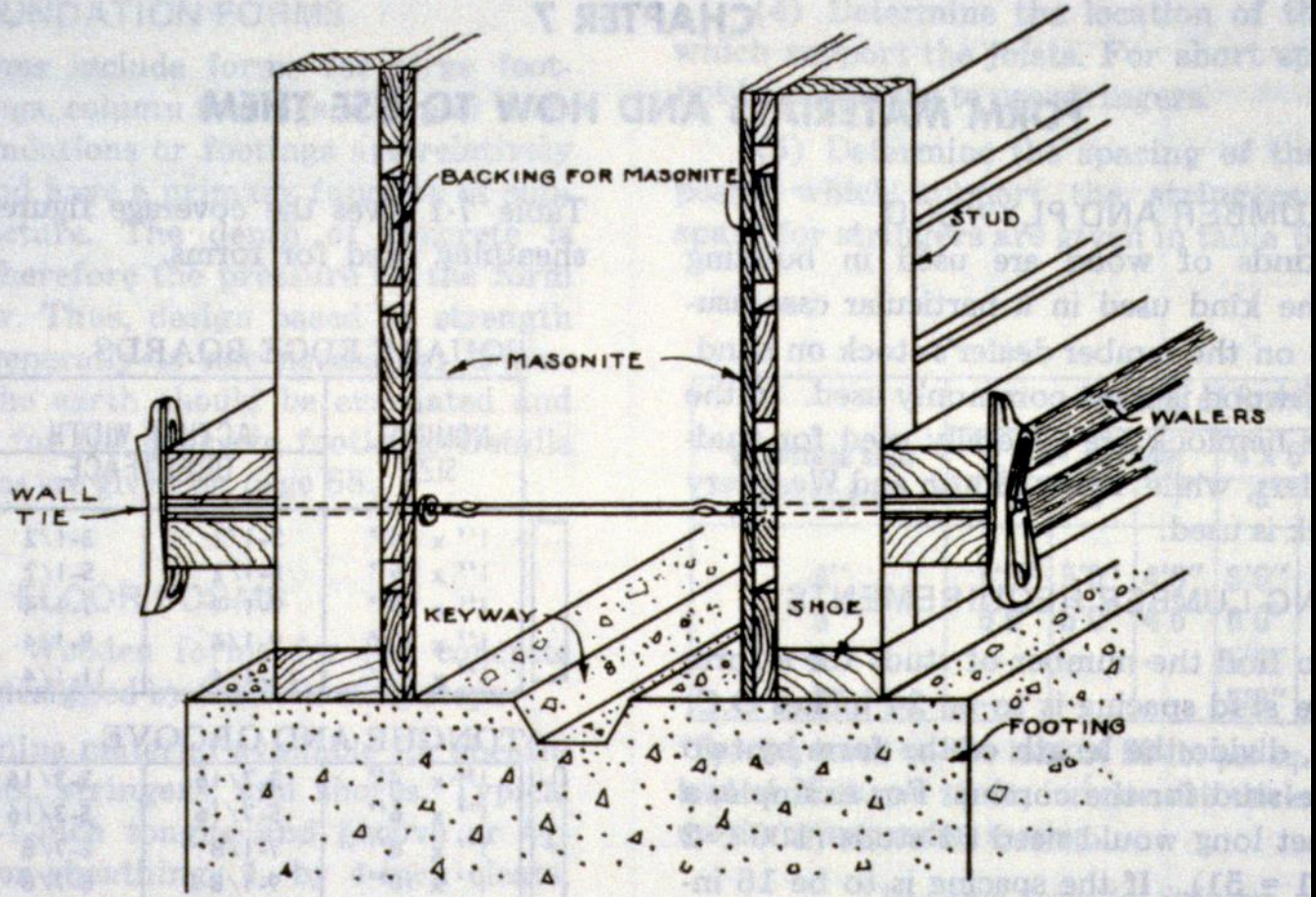


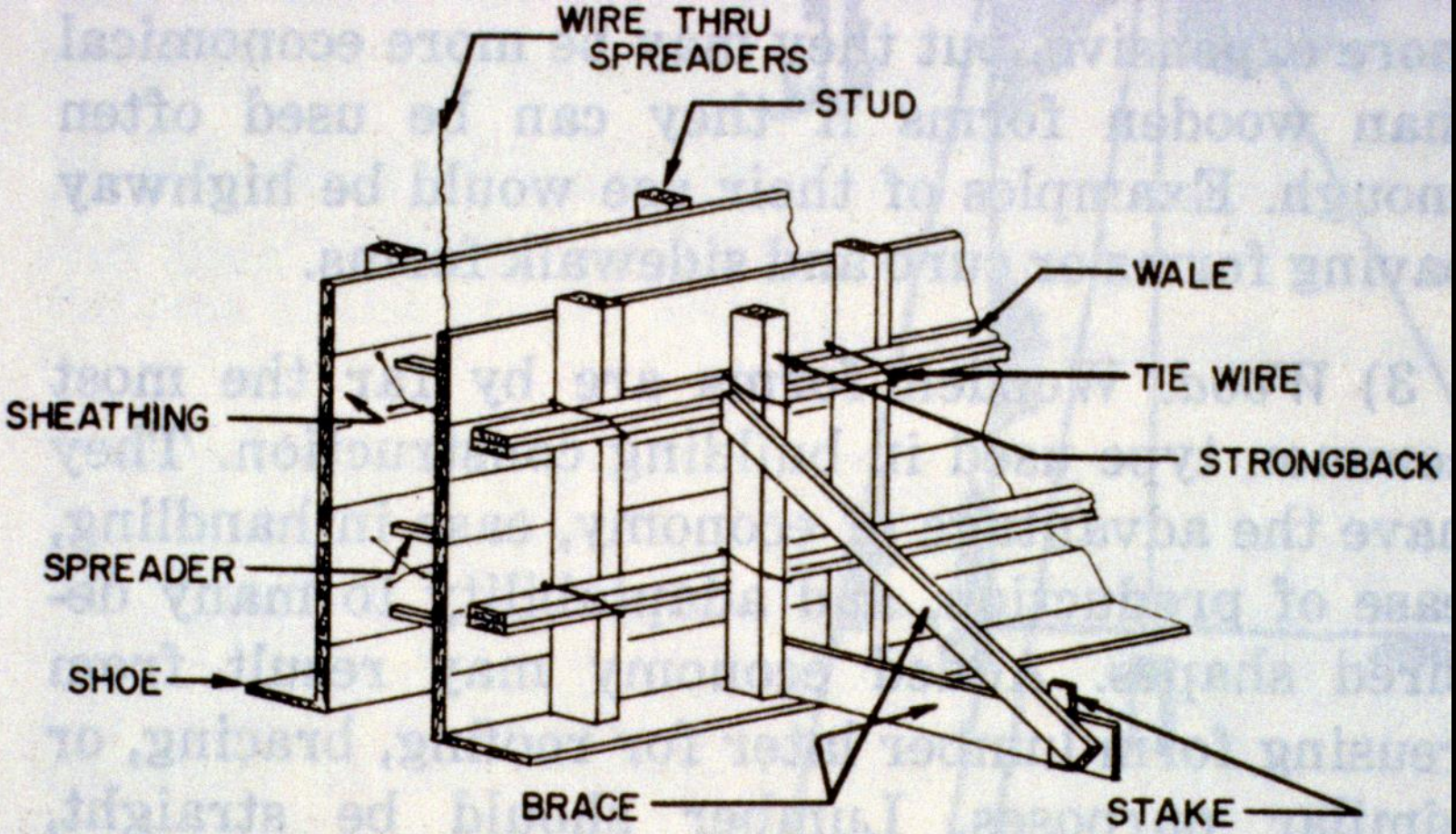
FIGURE 2.24
A column footing and a wall footing of concrete. The steel reinforcing bars have been omitted for clarity.



Footing Forms Set in Place
Figure 8-31

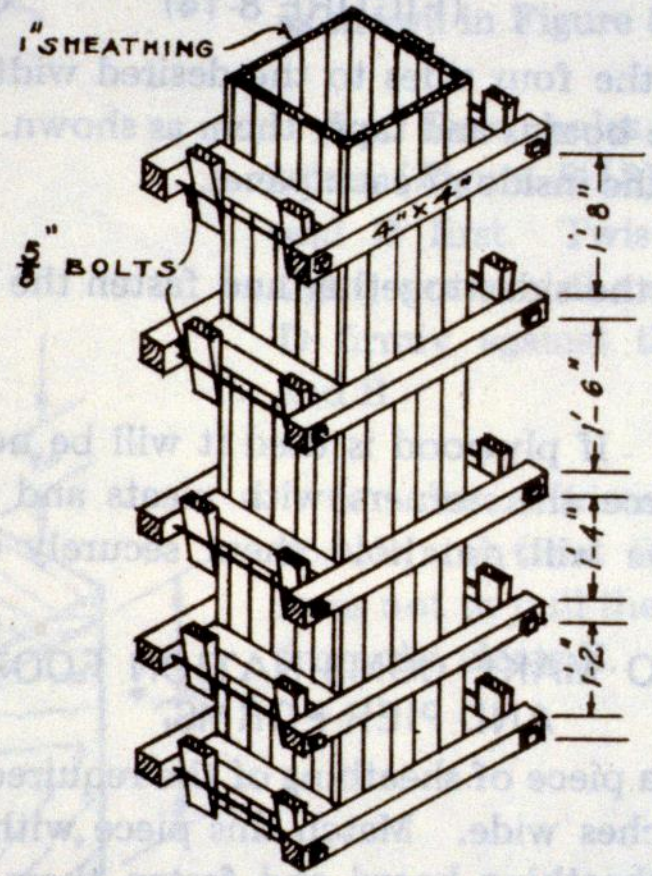


Wooden Form on Footing
Figure 7-1



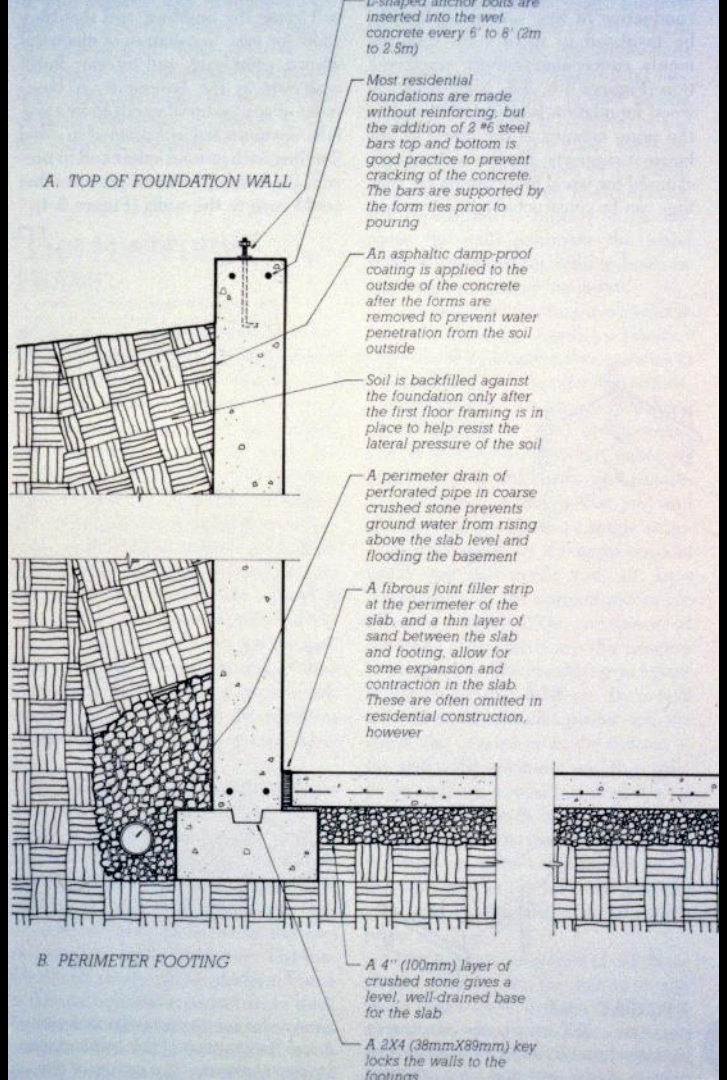
Forms for a concrete wall

Figure 6-1



Removable Pier Form

Figure 8-15



This basic foundation diagram excludes insulation and waterproofing!

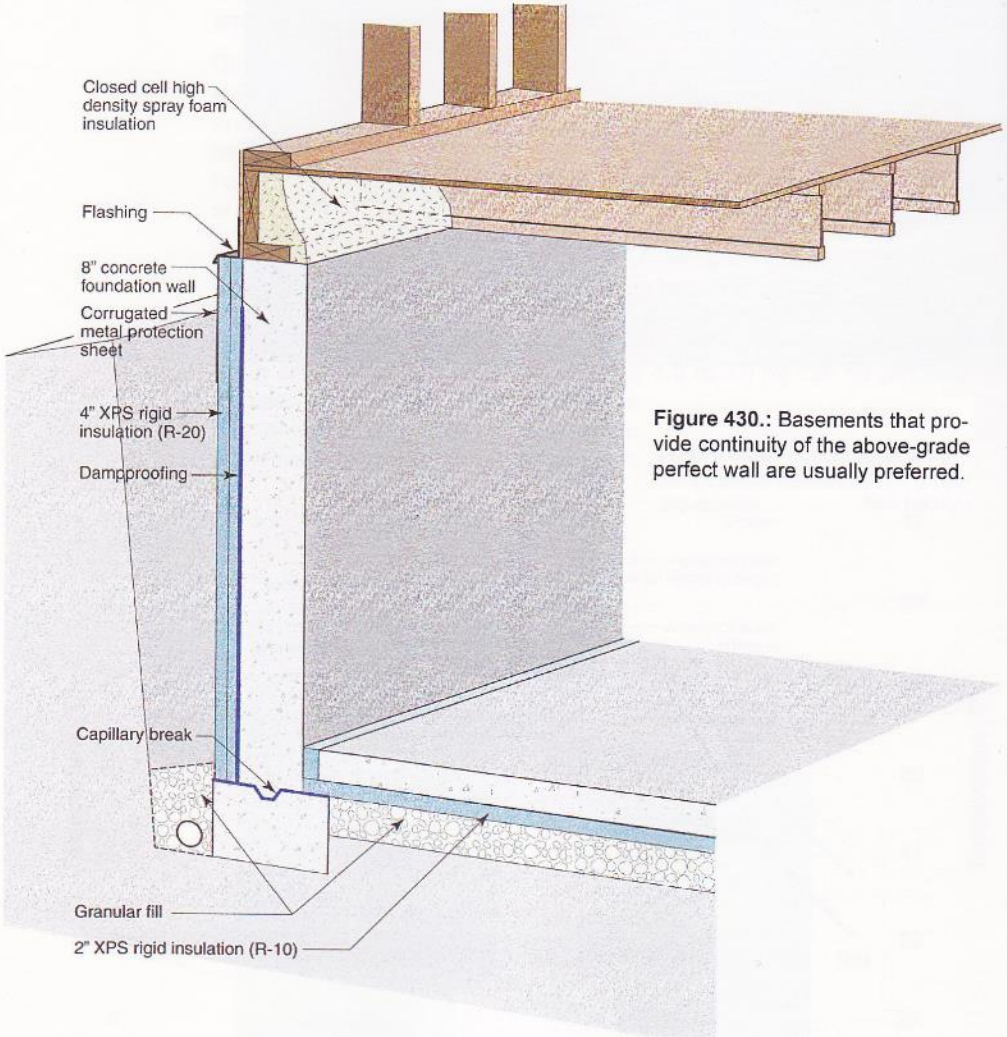


Figure 430.: Basements that provide continuity of the above-grade perfect wall are usually preferred.

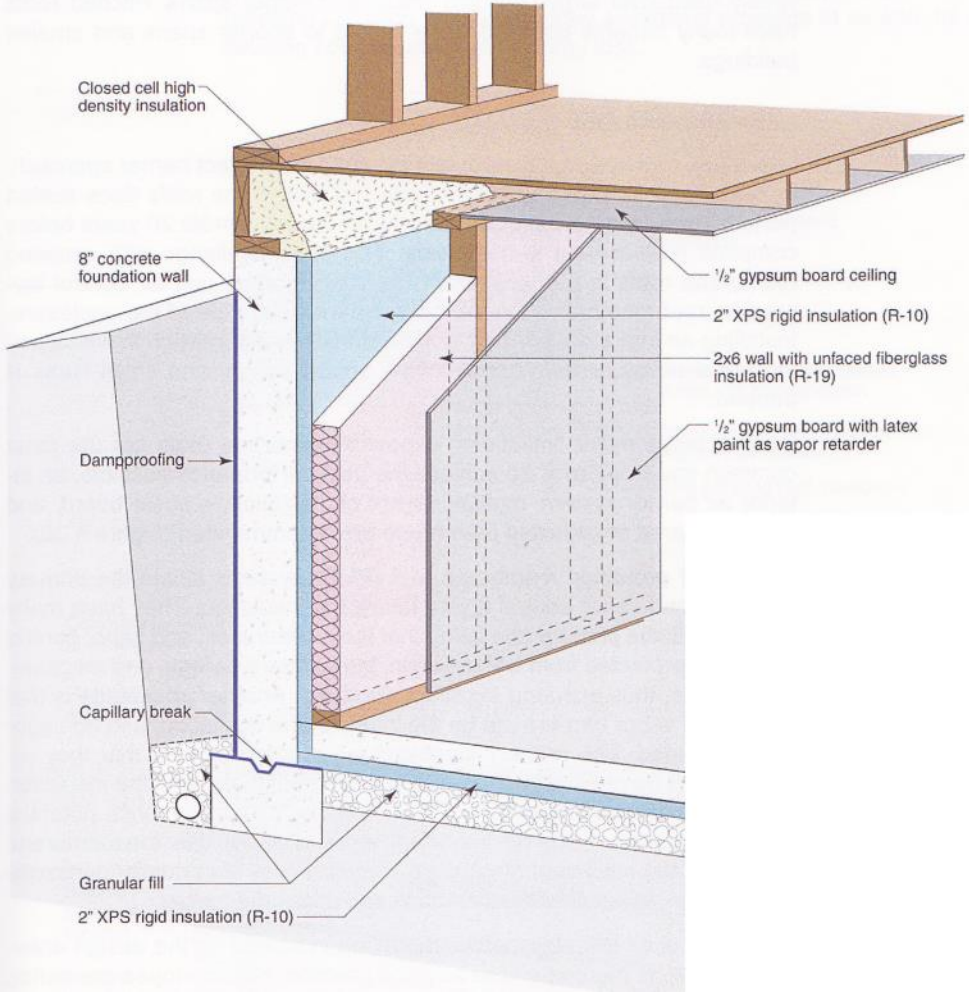
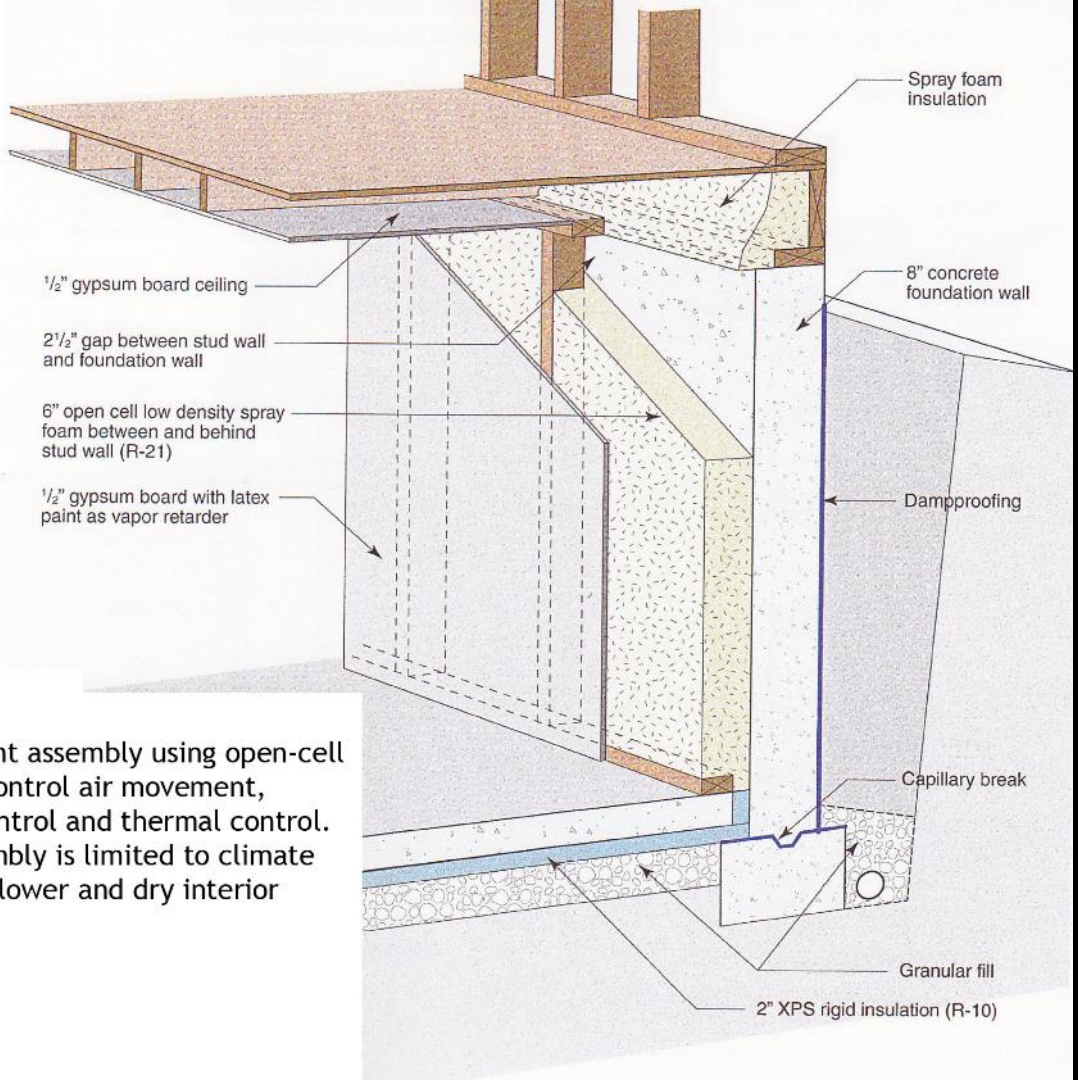


Figure 4.35: A hybrid insulation approach that can be successful in all climate zones (below the permafrost line). No interior low-permeance vapor control layer or finish should be used.



A basement assembly using open-cell foam to control air movement, vapour control and thermal control. This assembly is limited to climate zone 6 or lower and dry interior spaces.

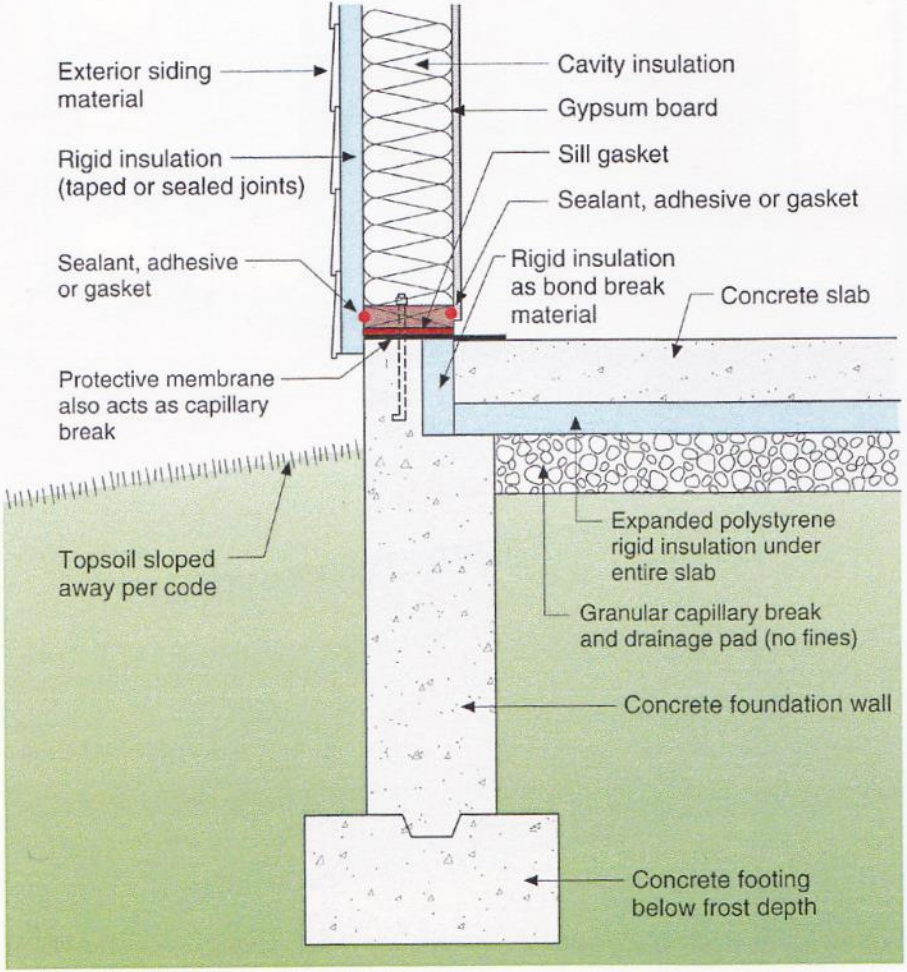
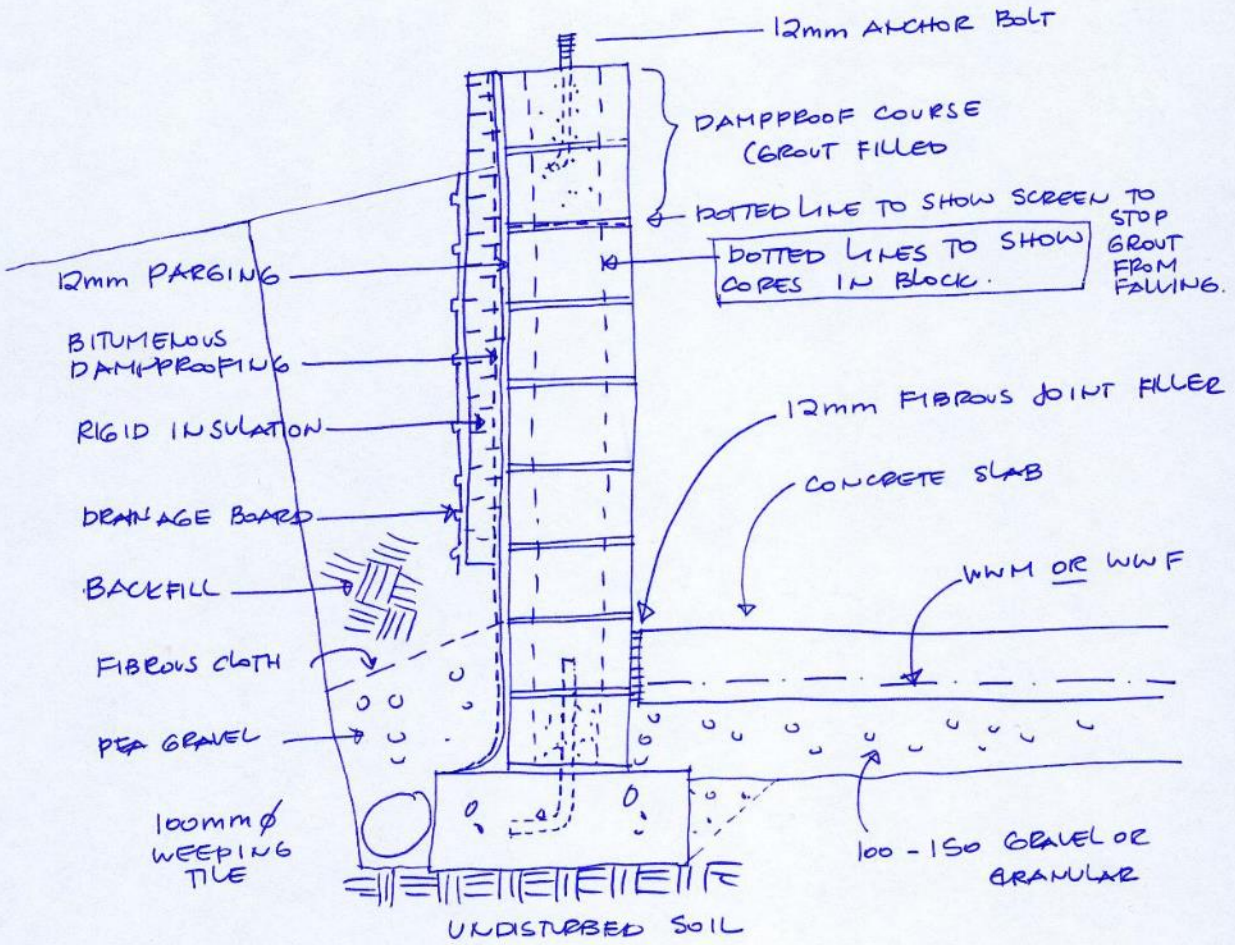


Figure 4.29: An insulated slab with a frost wall supporting a framed wall.


12mm ANCHOR BOLT
DAMPPROOF COURSE (GROUT FILLED
DOTTED LINE TO SHOW SCREEN TO STOP GROUT FROM FALLING.
DOTTED LINES TO SHOW CORES IN BLOCK.
12mm PARGING
BITUMENOUS DAMPPROOFING
RIGID INSULATION
DRAINAGE BOARD
BACKFILL
FIBROUS CLOTH
PEA GRAVEL
100mm ø WEEPING TILE
12mm FIBROUS JOINT FILLER
CONCRETE SLAB
WWM OR WWF
100 - 150 GRAVEL OR GRANULAR
UNDISTURBED SOIL


THE DRYWALL EXPERTS

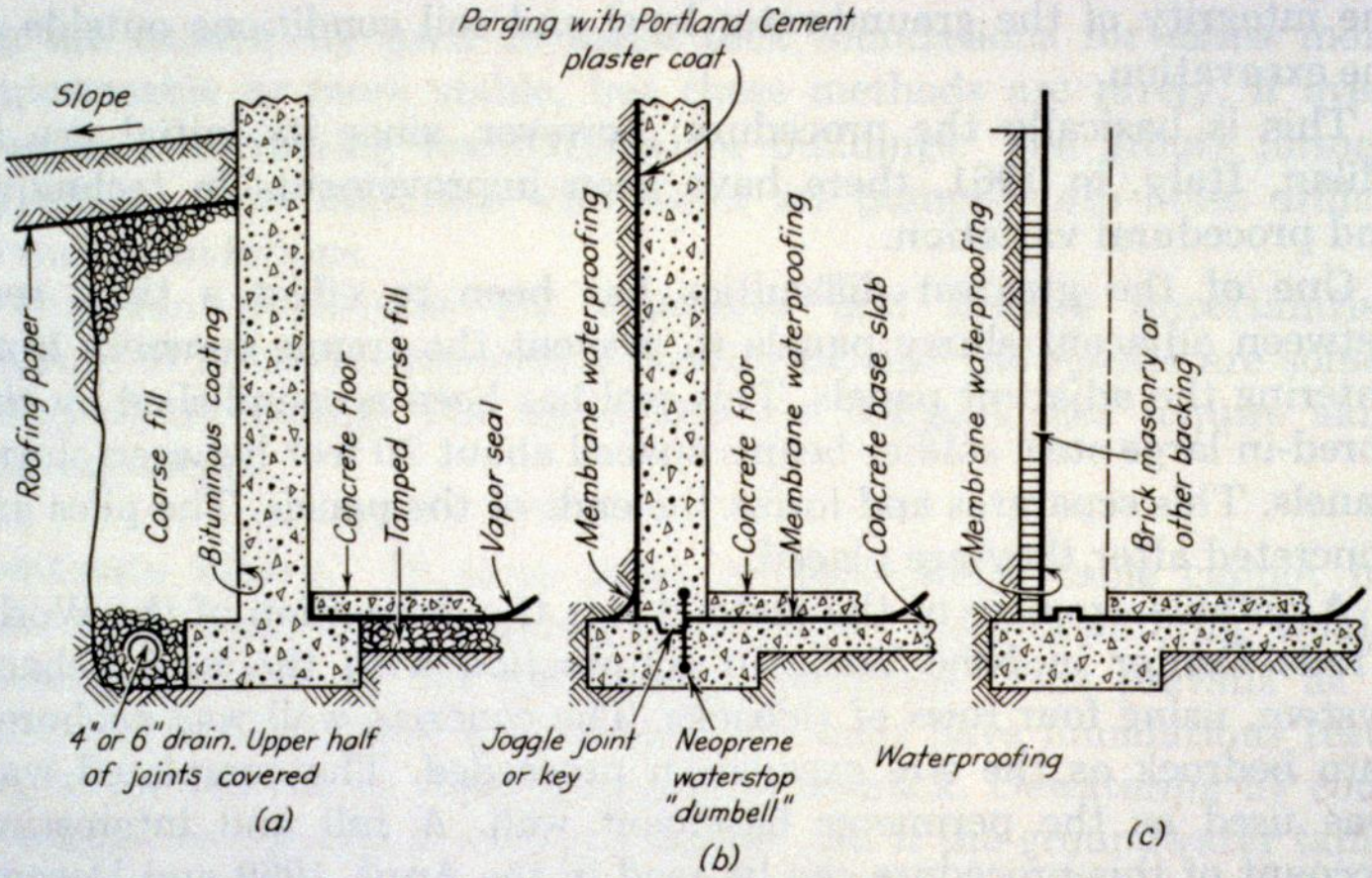
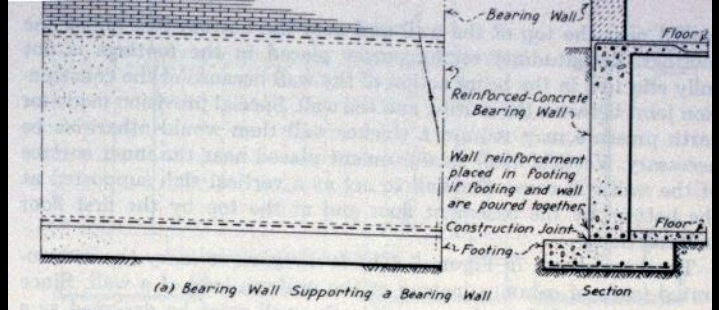
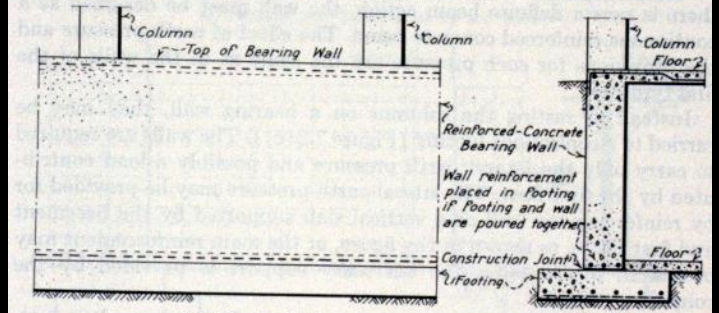


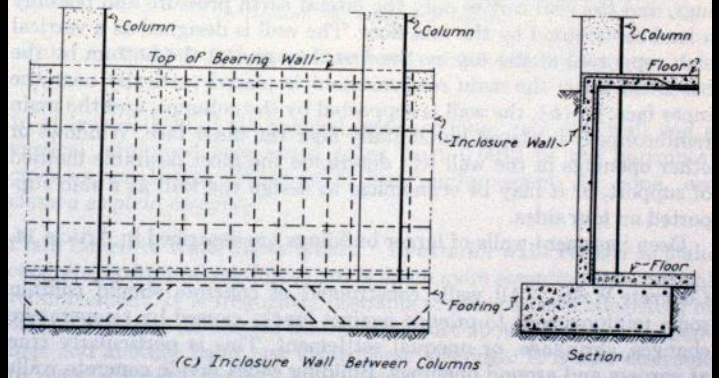
FIGURE 2.63 Dampproofing and waterproofing basements. (*a*) Dampproofing. (*b*) Outside of wall accessible. (*c*) Outside of wall inaccessible.



(a) Bearing Wall Supporting a Bearing Wall



(b) Bearing Wall Supporting Columns



(c) Inclosure Wall Between Columns

FIGURE 7.2 Reinforced concrete foundation walls.

As soon as the grade difference between the outside and the basement floor exceeds around 2.0m, you need to reinforce the concrete wall.

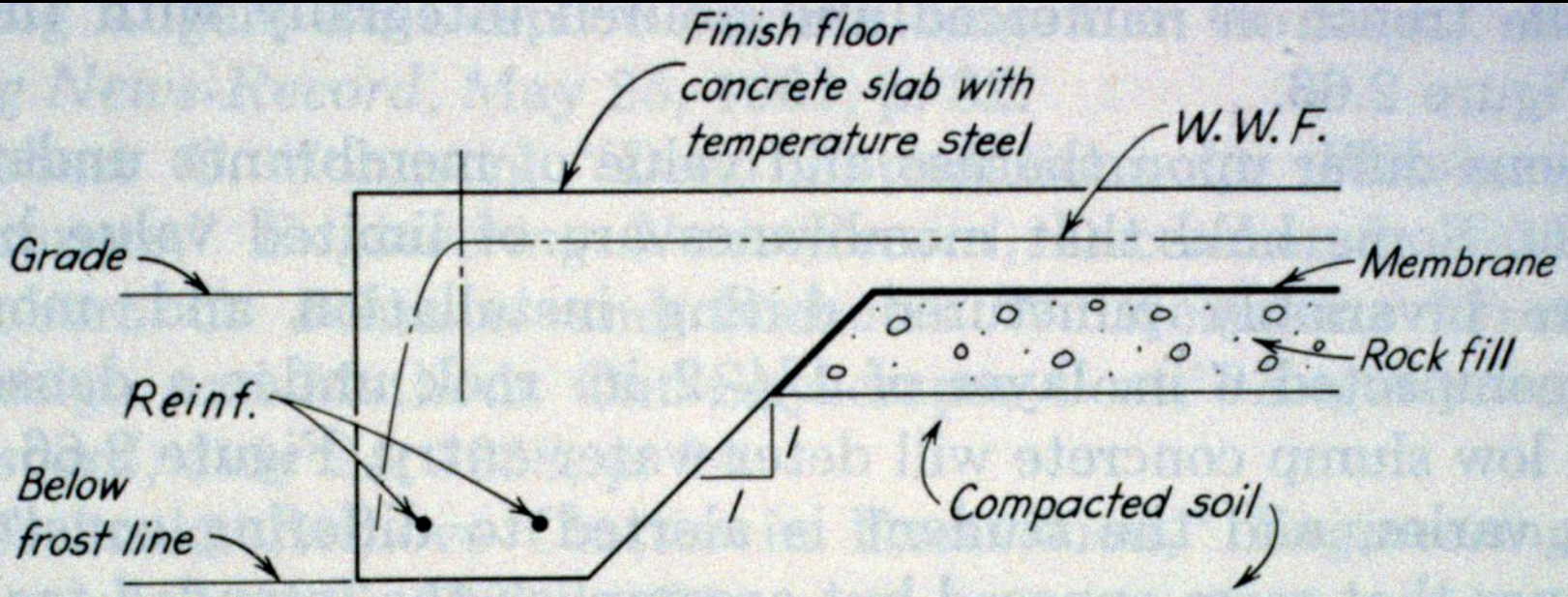
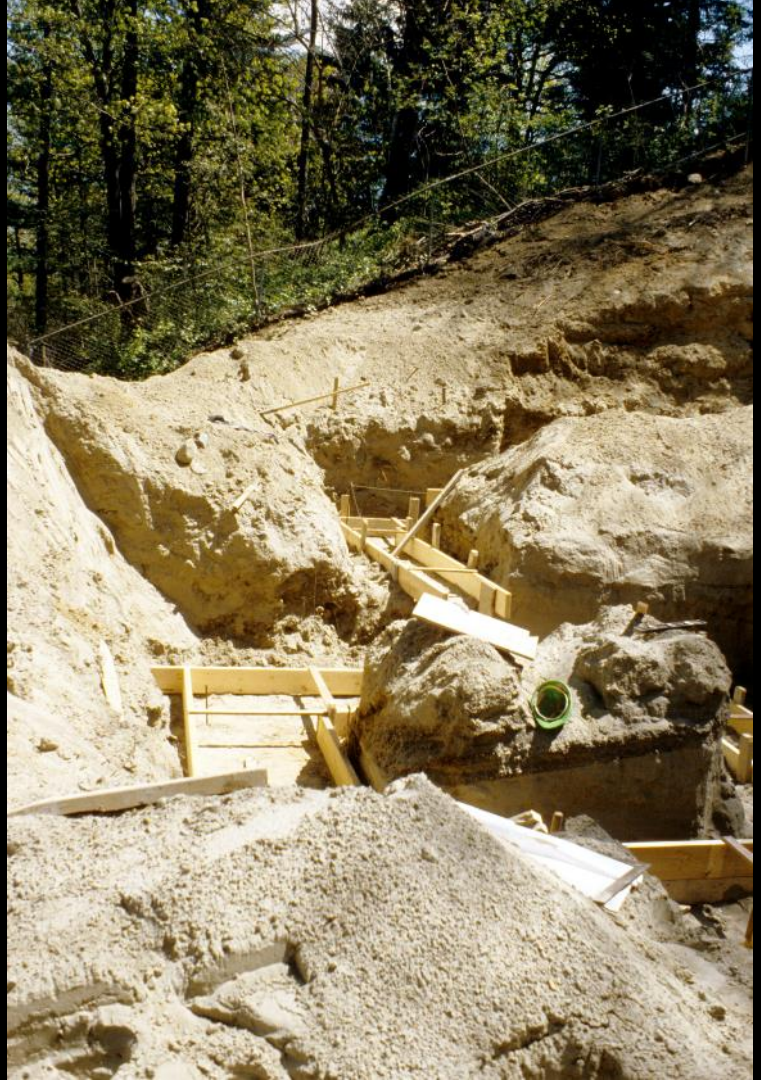
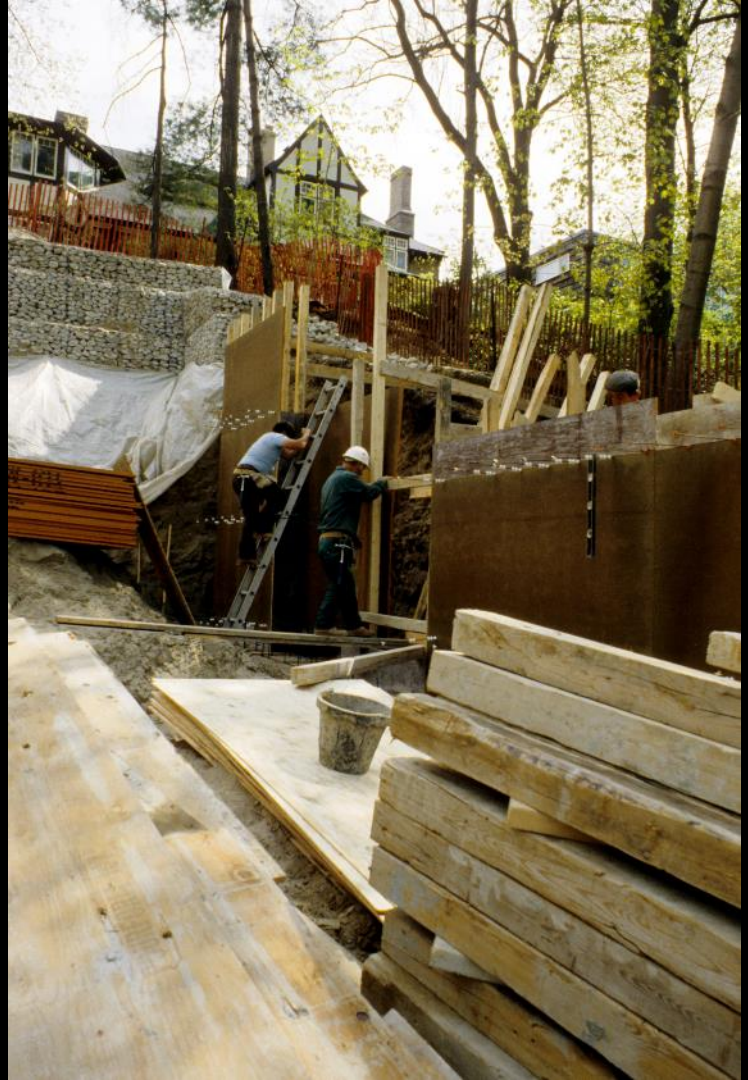
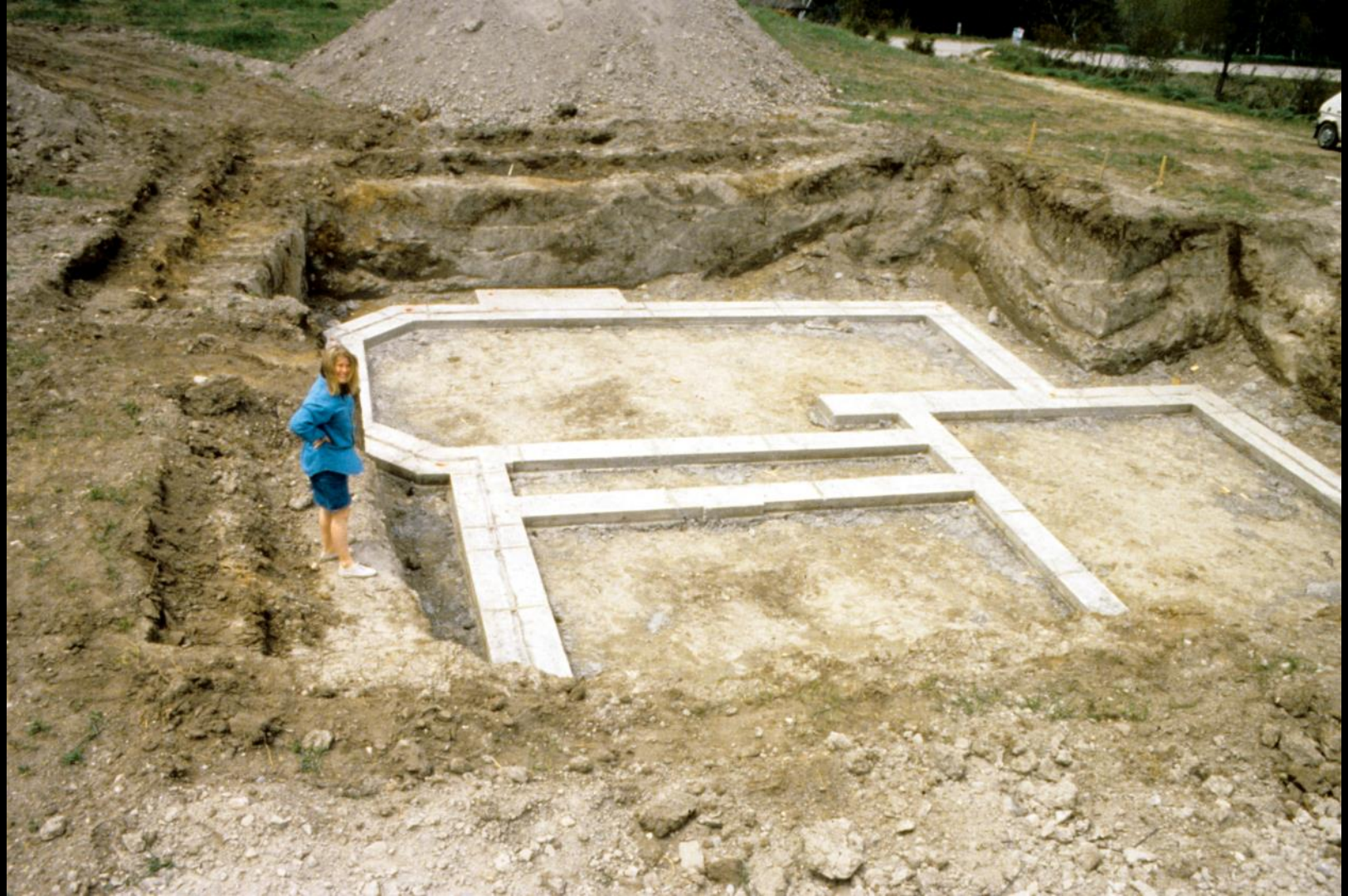


FIGURE 2.65 Thickened slabs.






FORM-107



Insulated concrete forms (ICF)

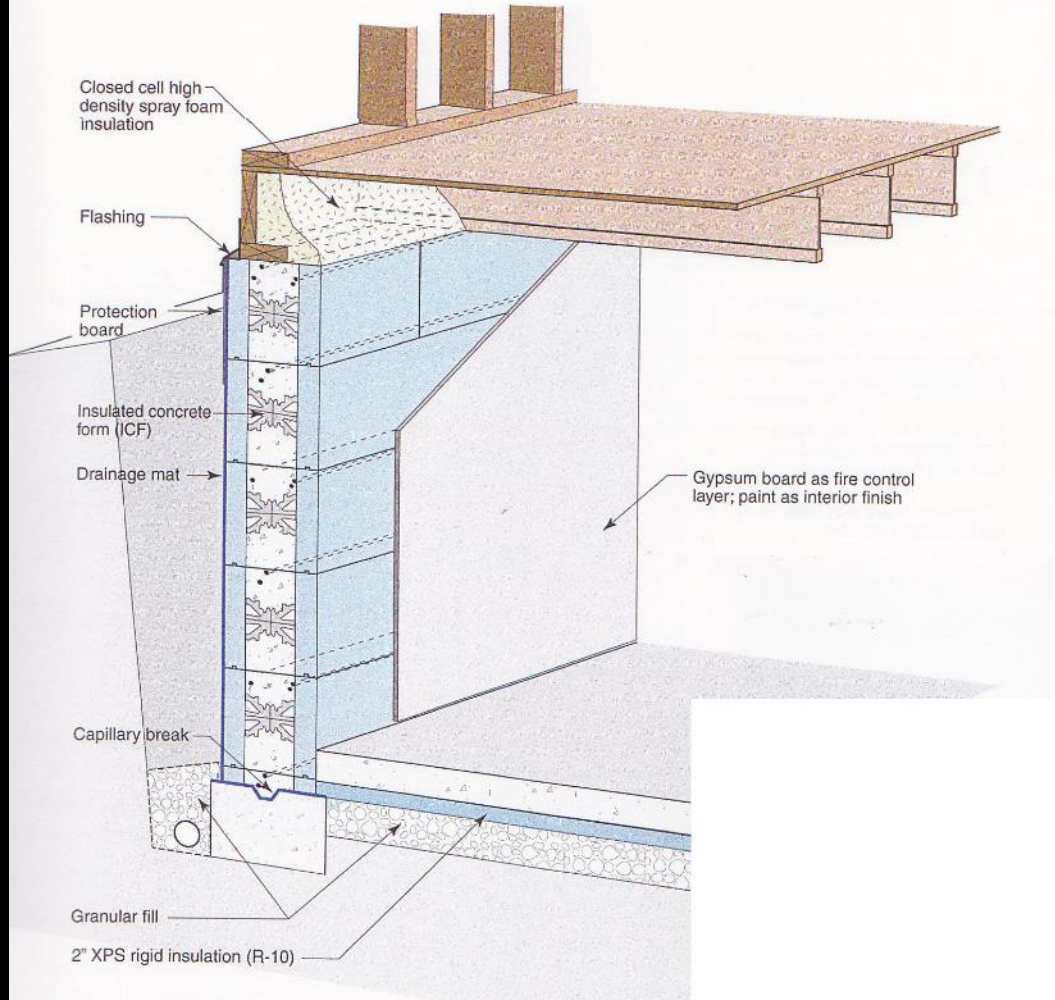
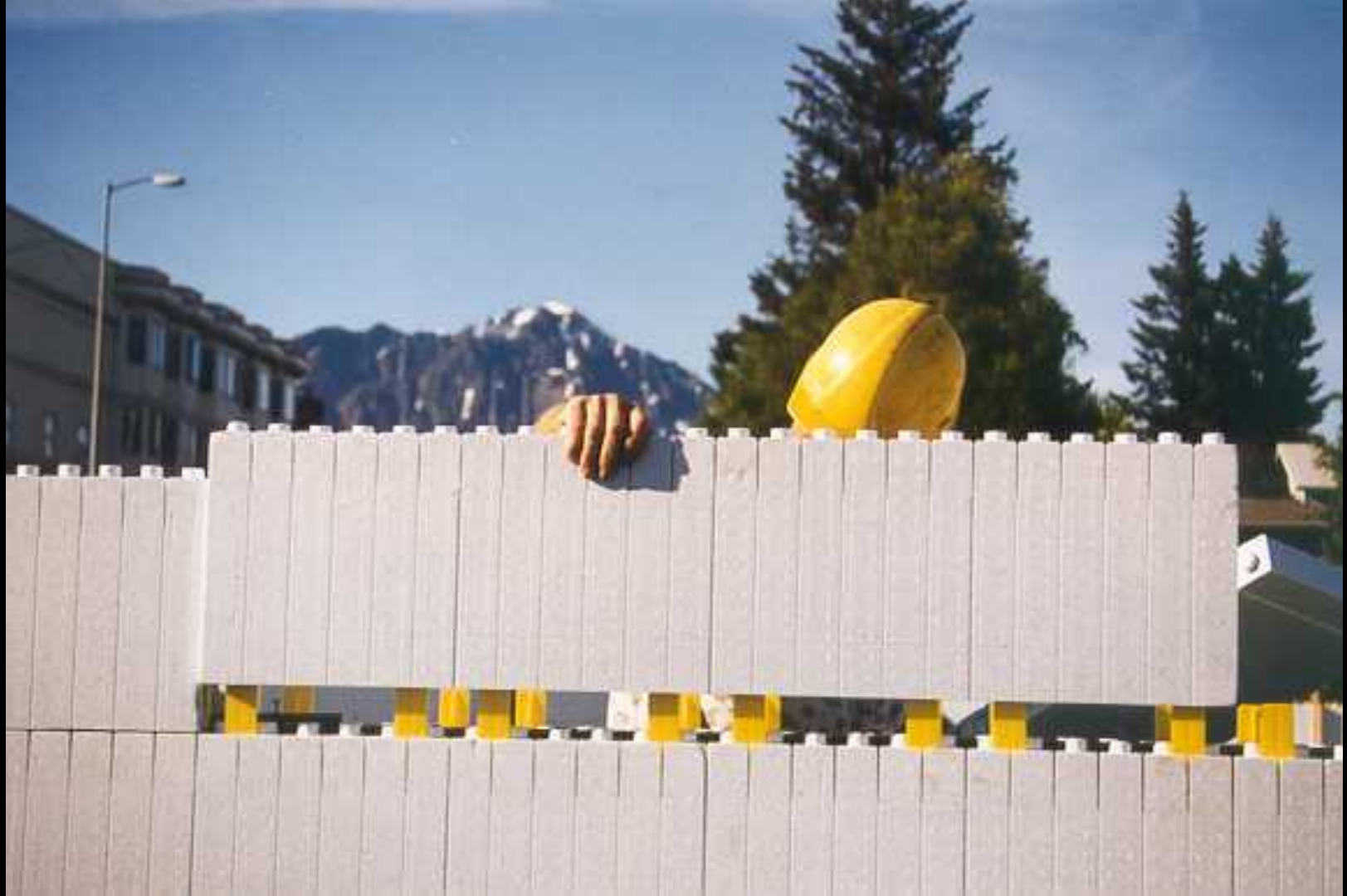


Figure 4.31: ICF Basements systems can be ideal high-performance basement enclosurese.


QUAD-LOCK




QUAD-LOCK


QUAD-LOCK

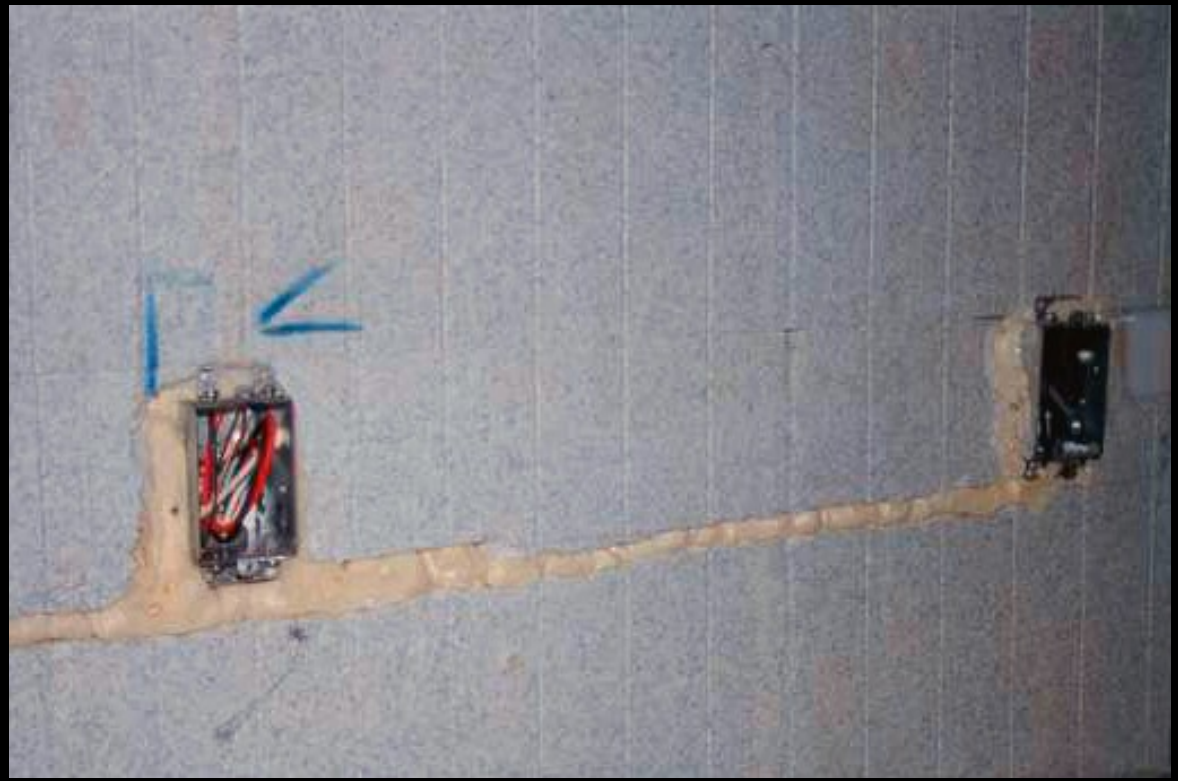

QUAD-LOCK


QUAD-LOCK
QUAD-LOCK
QUAD-LOCK


LOCK
Blue
Blue


DELTA-MS
DELTA-MS
DELTA-MS


SOPREMA

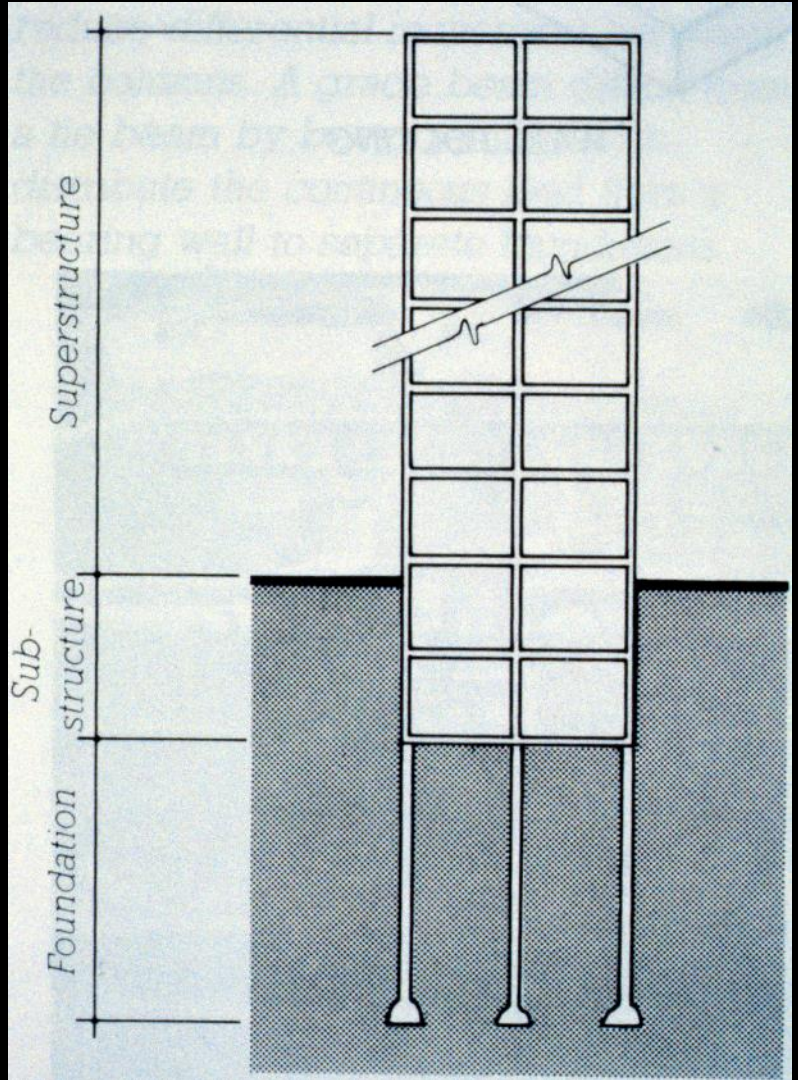


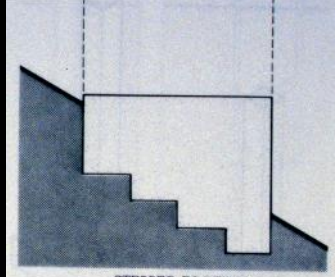

ANN
CONCRETE PUM

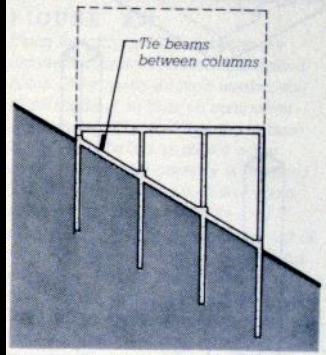

STYROSPAN
STYROSPAN
STYROSPAN


STYROSPAN

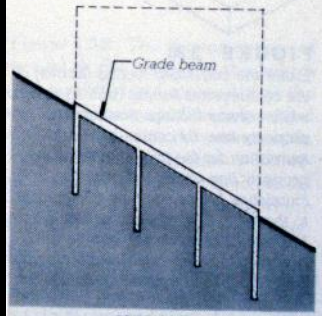
Deep Foundations for Larger Buildings




STEPPED FOOTING



TIE BEAMS



GRADE BEAM

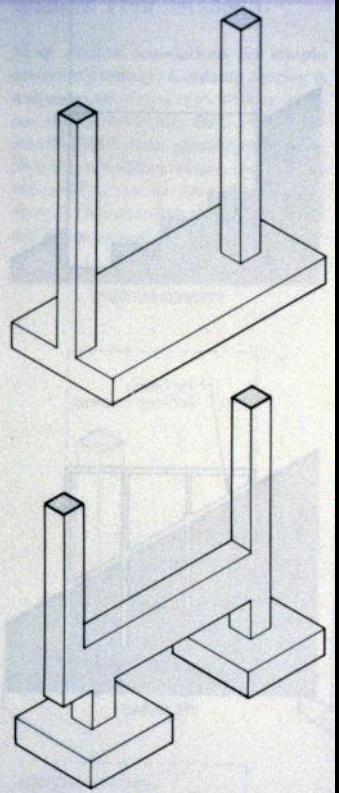


FIGURE 2.28
Either the combined footing (above) *or the cantilevered footing* (below) *is used when column footings must abut a property line. By combining the foundation for the column against the property line, at the left, with the foundation for the next interior column, to the right, in a single structural unit, a balanced footing design can be achieved. The concrete reinforcing has been omitted from these drawings for the sake of clarity.*

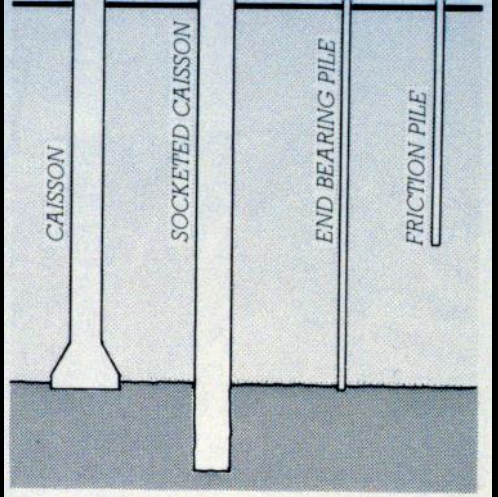


FIGURE 2.31

Deep foundations. The caissons are concrete cylinders poured into drilled holes. They reach through weaker soil (light shading) to bear on competent soil beneath. The end bearing caisson at the left is belled as shown when additional bearing capacity is required. The socketed caisson is drilled into a hard stratum and transfers its load primarily by friction between the soil or rock and the sides of the caisson. Piles are driven into the earth. The end bearing pile acts in the same way as a caisson. The friction pile derives its load-carrying capacity from friction between the soil and the sides of the pile.

Pile Foundations

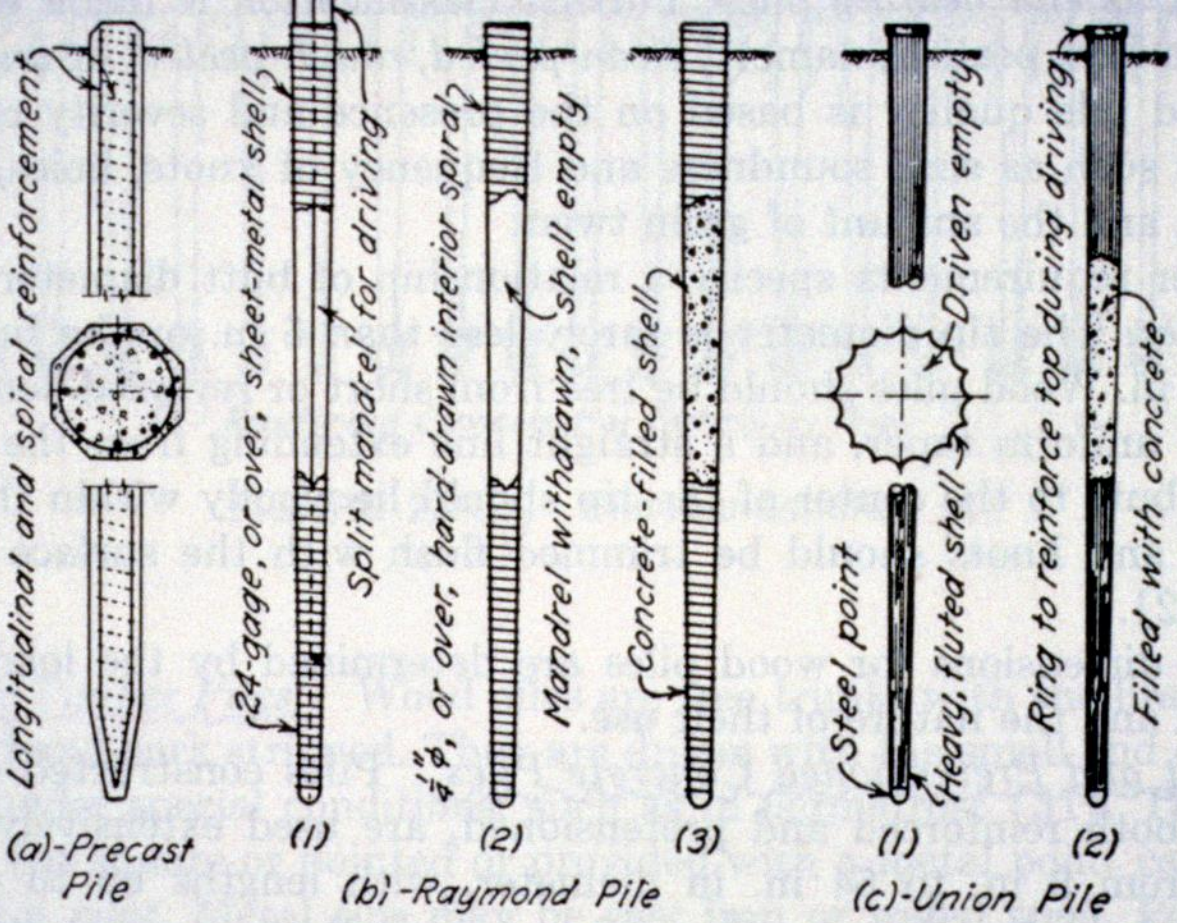
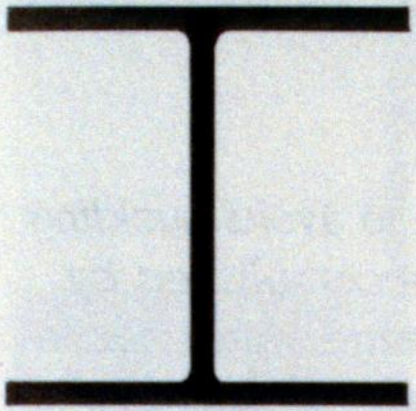
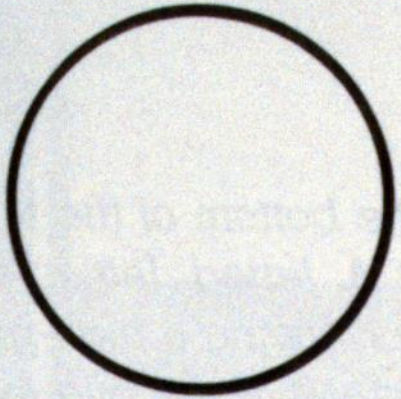


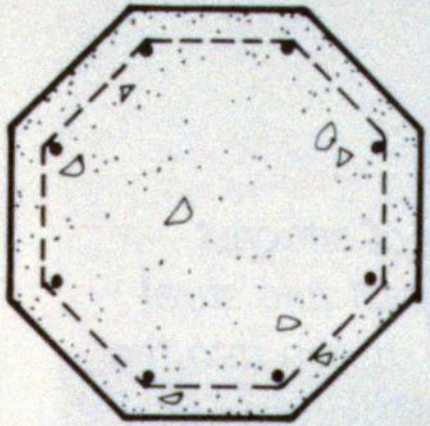
FIGURE 2.29 Precast concrete pile and cast-in-place shell piles. (*a*) Precast pile. (*b*) Raymond pile. (*c*) Union pile.



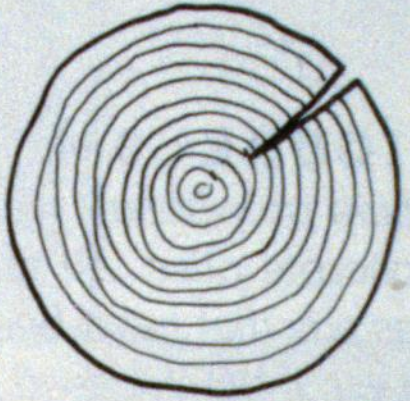
STEEL H-PILE



STEEL PIPE PILE



PRECAST
CONCRETE PILE



WOOD PILE

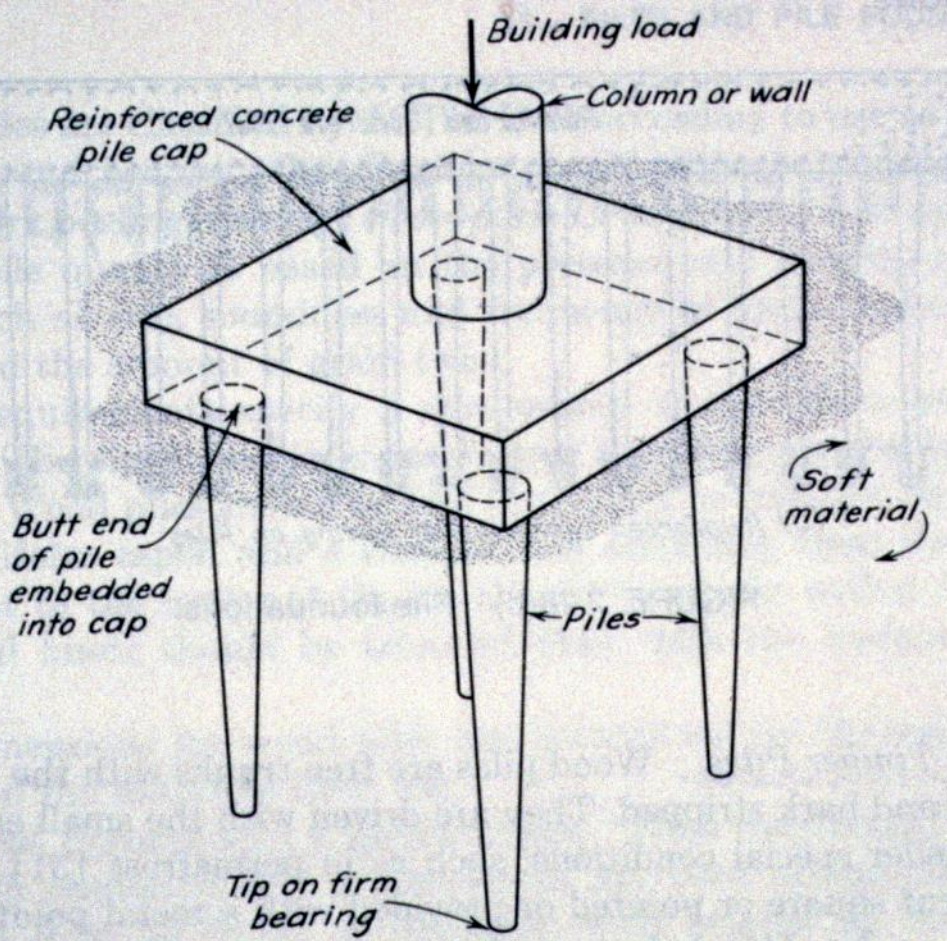


FIGURE 2.28(a)* Isolated pile foundation.

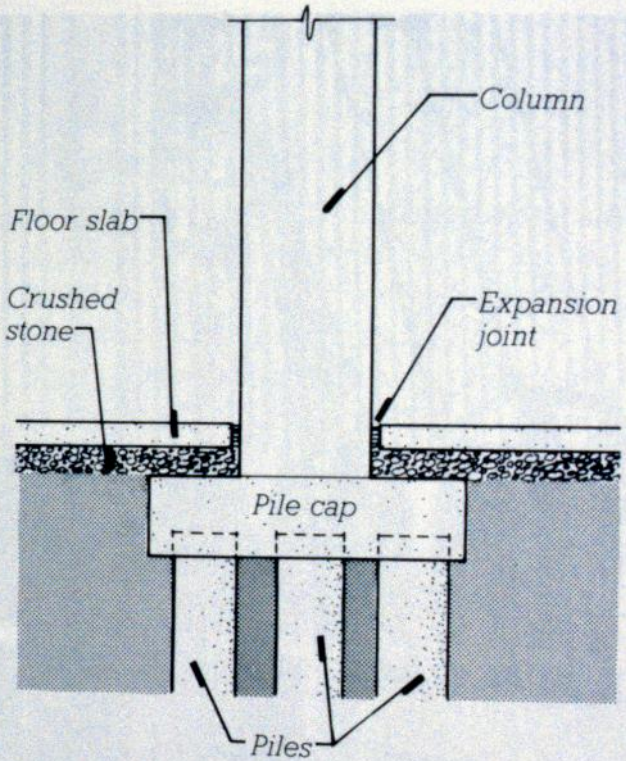
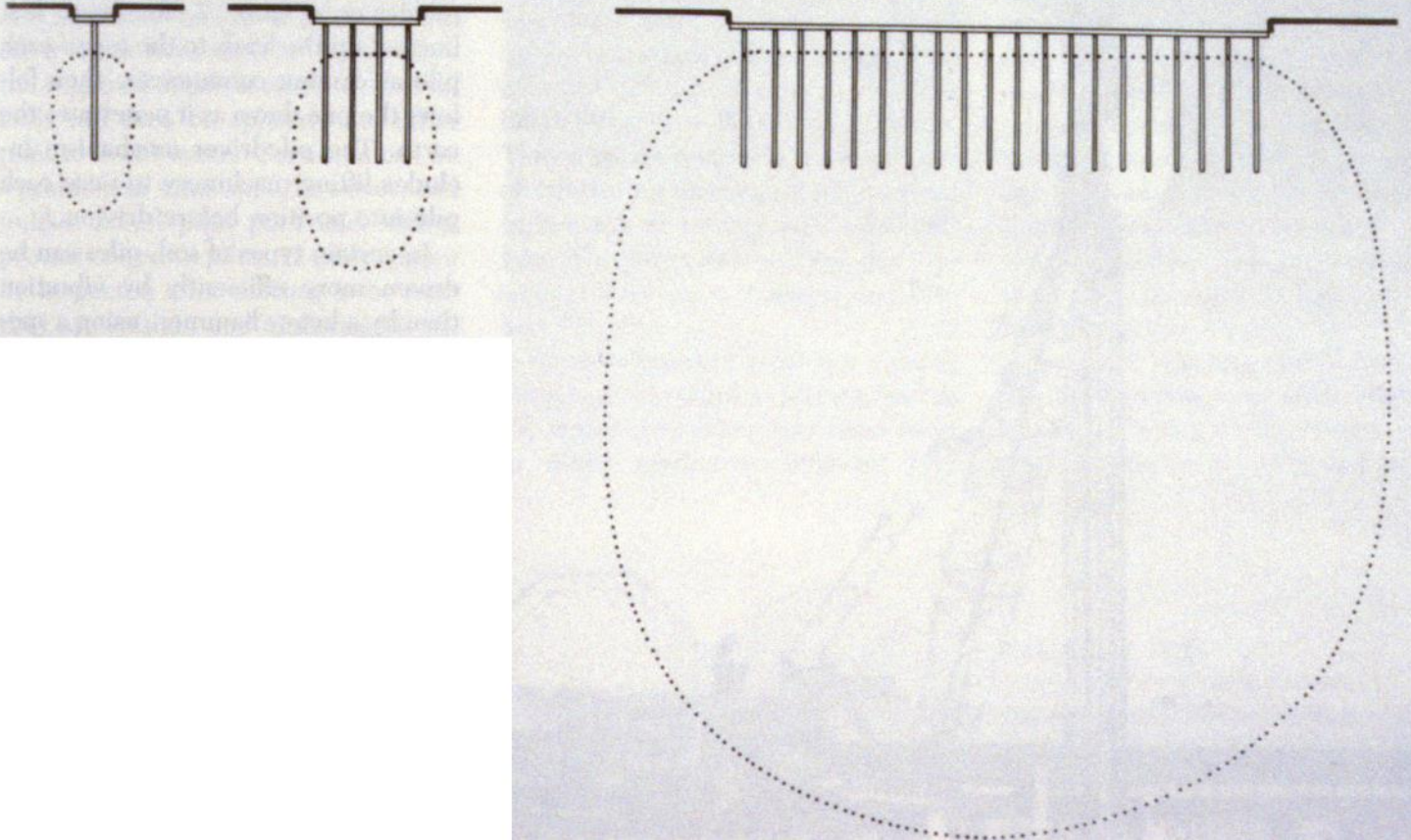


FIGURE 2.37

An elevation view of a pile cap, column, and floor slab. Where possible, the cap is poured against earth sides, as shown, for economy and for better resistance to lateral loads.

FIGURE 2.38

A single friction pile (left) *transmits its load into the earth as an equal pressure along the bulb profile indicated by the dotted line. As the size of the pile cluster increases, the piles act together to create a single, larger bulb that reaches deeper into the ground. A building with many closely spaced clusters of piles* (right) *creates a very large, deep bulb. Care must be taken on some sites to be sure that pressure bulbs do not become so large as to extend completely through a stratum of competent soil into softer or less stable material beneath.*



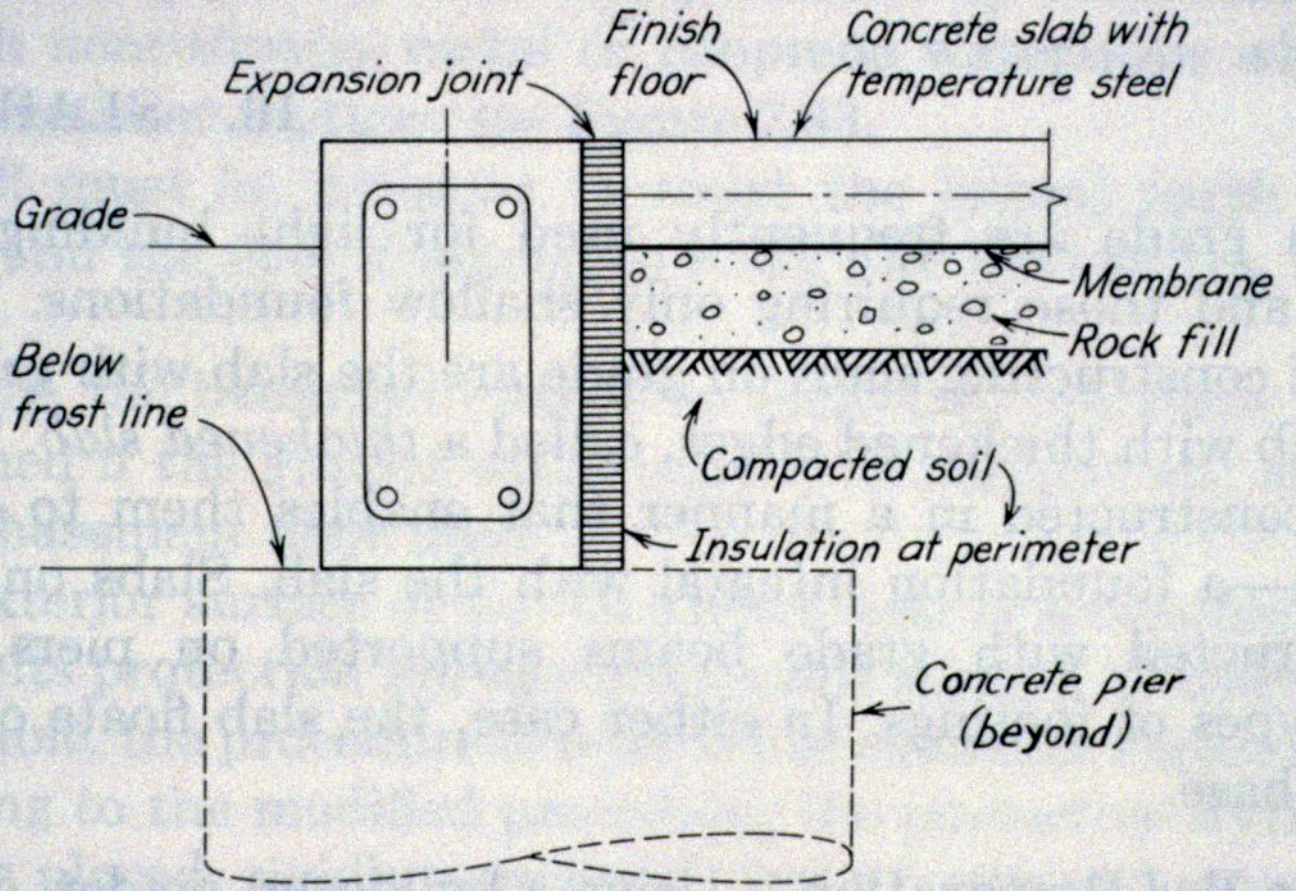
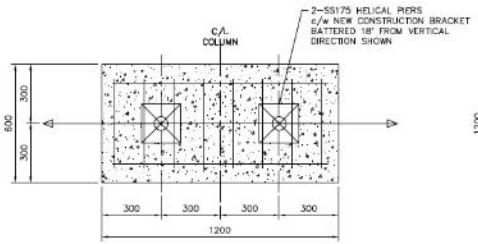
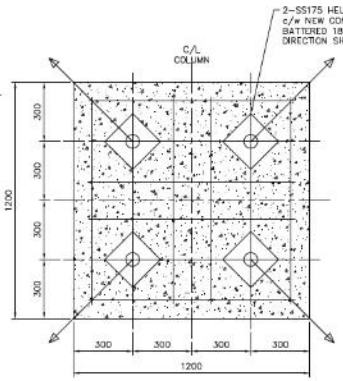


FIGURE 2.64 Grade beams.

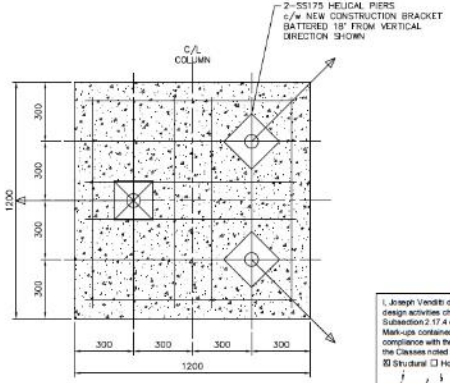

THE GRAND HOUSE
STUDENT CO-OP



PLAN



PLAN



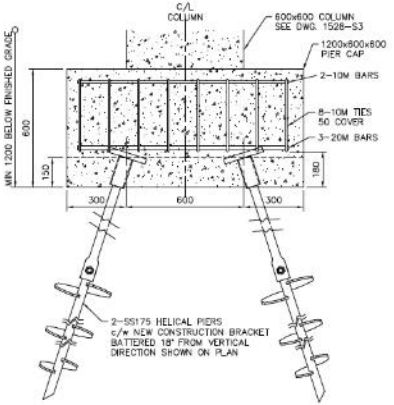
PLAN

I, Joseph Venditti declare that I have reviewed and take responsibility for the design activities checked below on behalf of a firm registered under Subsection 2.17.4 of the Ontario Building Code. These drawings and any Mark-ups contained herein are believed, to the best of my knowledge, to be in compliance with the O.B.C. I am Qualified and the Company is registered in the Classes noted below. C3 Venditti Engineering Limited BCIN 31193

☒ Structural ☐ House

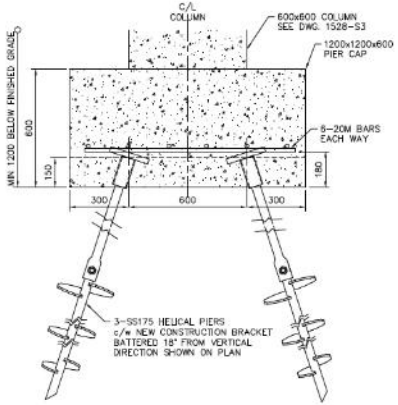
Joseph Venditti
BCIN 22510

06/15/07
Date (MM/DD/YY)



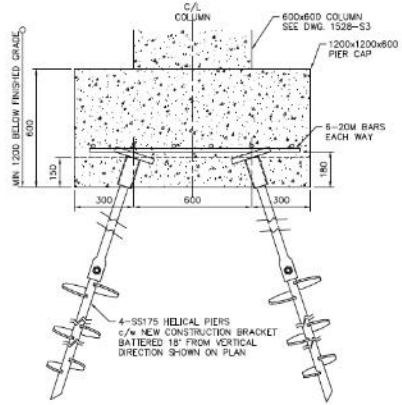
ELEVATION

PIER CAP TYPE 'PC1'
TOTAL 6 LOCATIONS
2-SS175 HELICAL PIERS PER PIER CAP



ELEVATION

PIER CAP TYPE 'PC2'
TOTAL 5 LOCATIONS
3-SS175 HELICAL PIERS PER PIER CAP



ELEVATION

PIER CAP TYPE 'PC3'
TOTAL 4 LOCATIONS
4-SS175 HELICAL PIERS PER PIER CAP

NO.	DATE	REVISION
0	06/15/07	ISSUED FOR PERMIT

LICENSED PROFESSIONAL ENGINEER
J.M. VENDITTI
48012017
06/15/07
PROVINCE OF ONTARIO

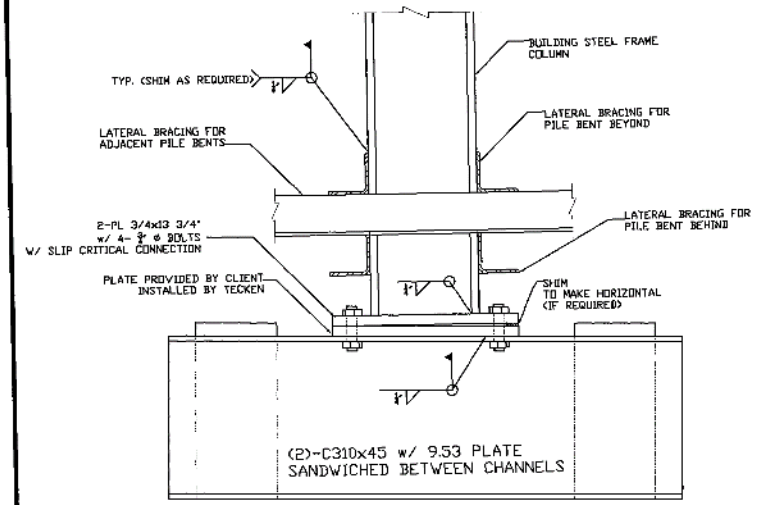
C3 VENDITTI Engineering Limited
260 Waterloo Street South, Stratford, Ontario N5B 1M5
Telephone: (519) 949-2194 Fax: (519) 949-5505
Email: joe.venditti@c3group.com

PROJECT
GRAND HOUSE STUDENT CO-OP
HELICAL PIER UNDERPINNING
Cambridge, Ontario

DRAWING
PIER CAP DETAILS

DRW'N BY TSG	SCALE: NTS
CHECKED JMV	DATE: Jun. 15, 2007
PROJECT No. 1528	DWG. No. S2


519 620-9919



BASEPLATE CONNECTION
MAX FACTORED DESIGN LOAD:
Vf= 1000 kN

LATERAL BRACING MAX FACTORED DESIGN LOADS:
Tf= 60 kN (2 L4 x 4 x 1/4")
Cf= 85 kN (2 L4 x 4 x 5/16")

Tecken Building Corp

175A Beverly St. Bay #3
Cambridge, Ontario N1R 7Y9
Tel: 519.624.9377 Fax: 519.624-6937

LICENSED PROFESSIONAL ENGINEER
B.J. WADDELL
90473372
NOV 5/07
PROVINCE OF ONTARIO
CONNECTION DESIGN ONLY

Project: THE GRAND HOUSE CAMBRIDGE, ONTARIO		Scale: NTS	1
Drawing: MICROPILE CONNECTION DETAIL		Date: OCTOBER '07	
		Drawn By: B.W.	
Location: CAMBRIDGE, ON		Project No.: 7041	

Caisson Foundations

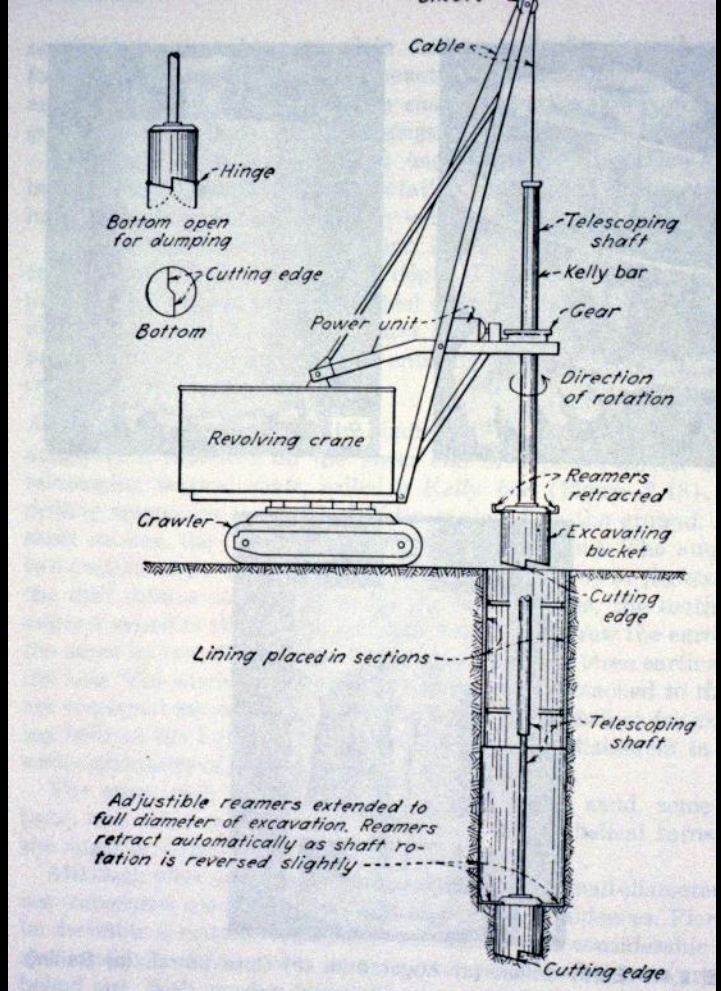
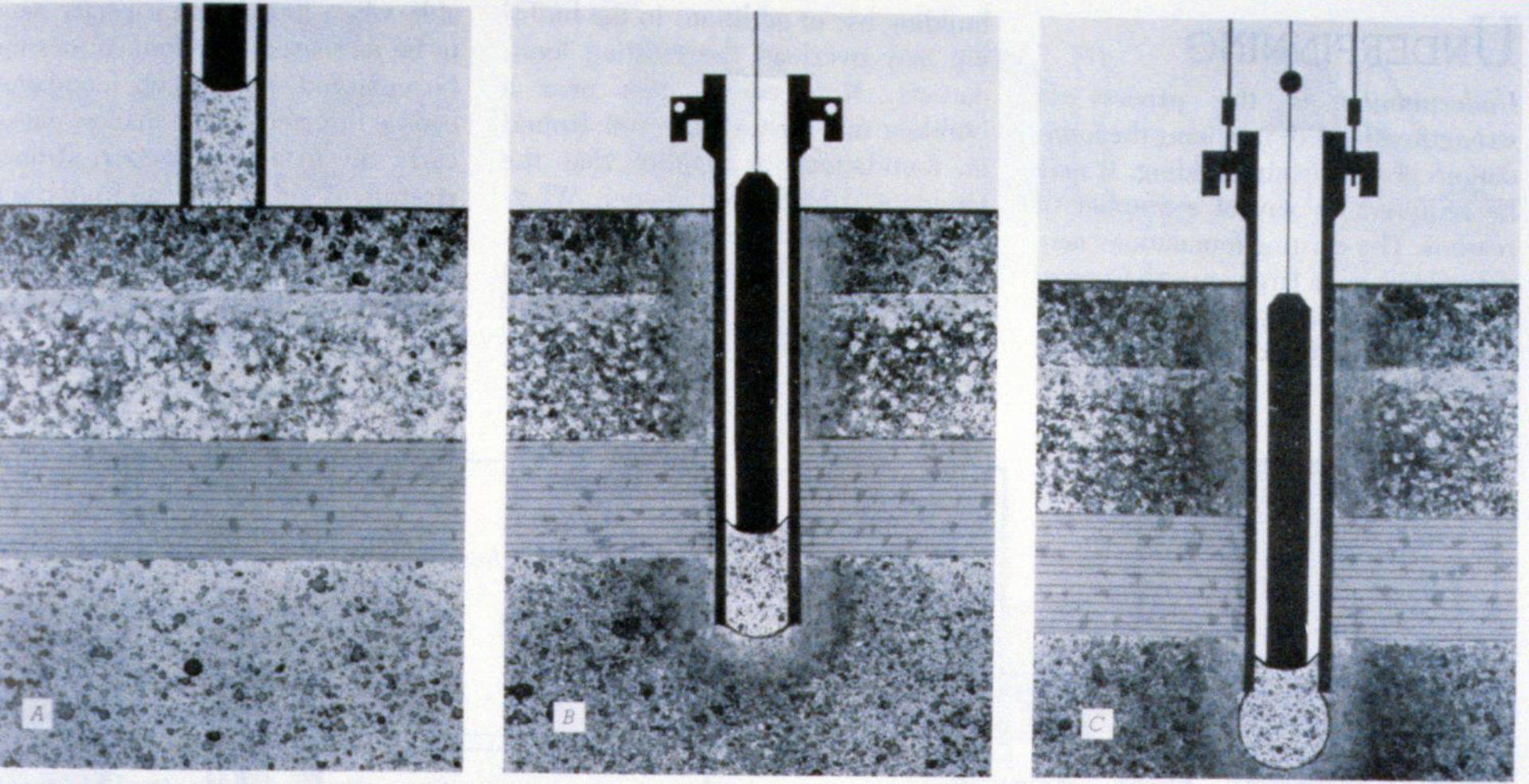
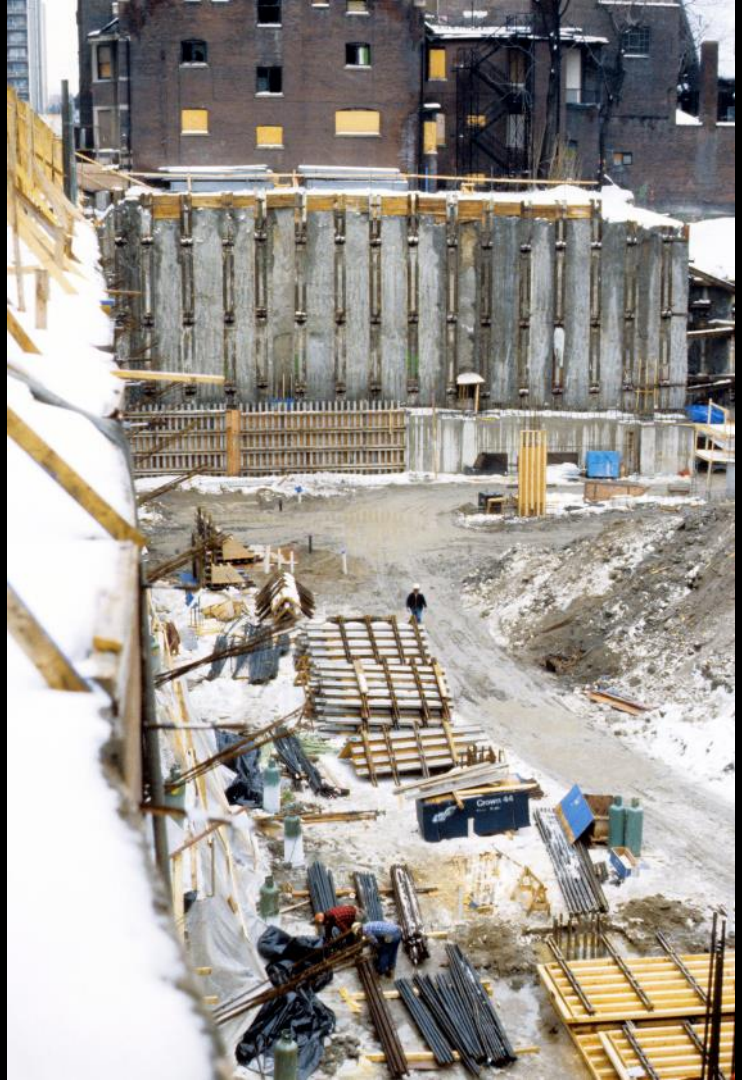


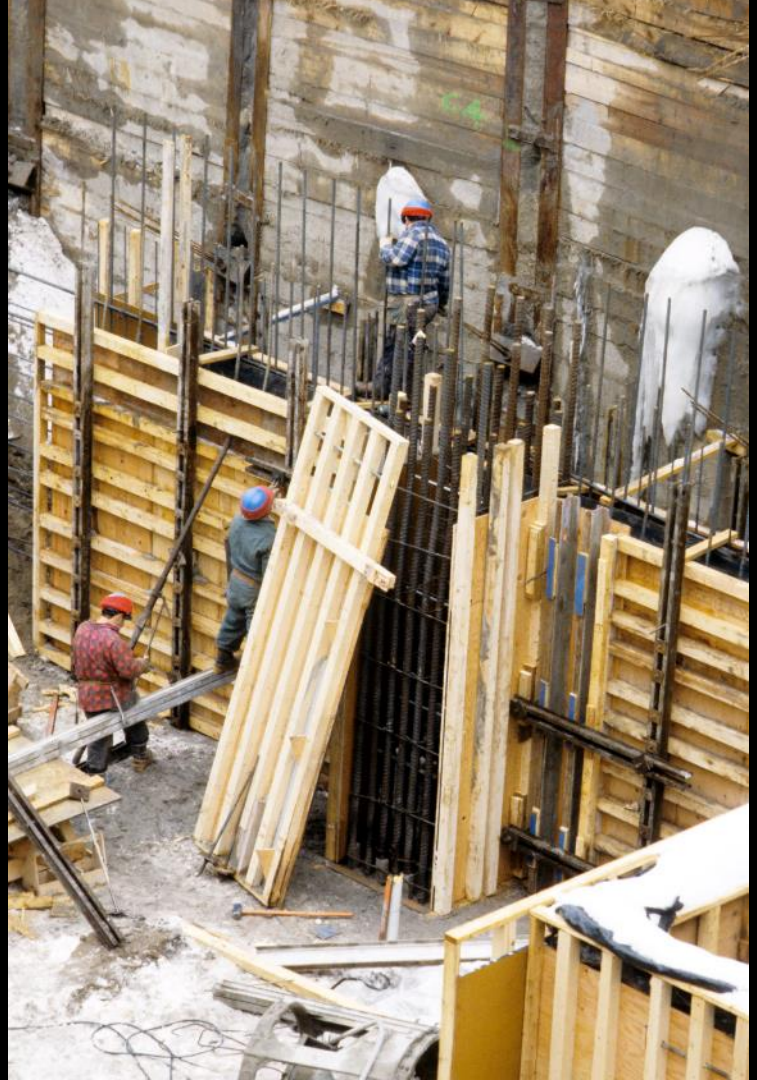
FIGURE 2.48 Well bored in clay with bucket drill.


A
B
C


PP
+2m
PP
+1m


TORONTO'S LARGEST & FINEST SELECTION OF
USED VEHICLES
CUSTOMER PARKING
DRIVE-IN
GLUS-DON

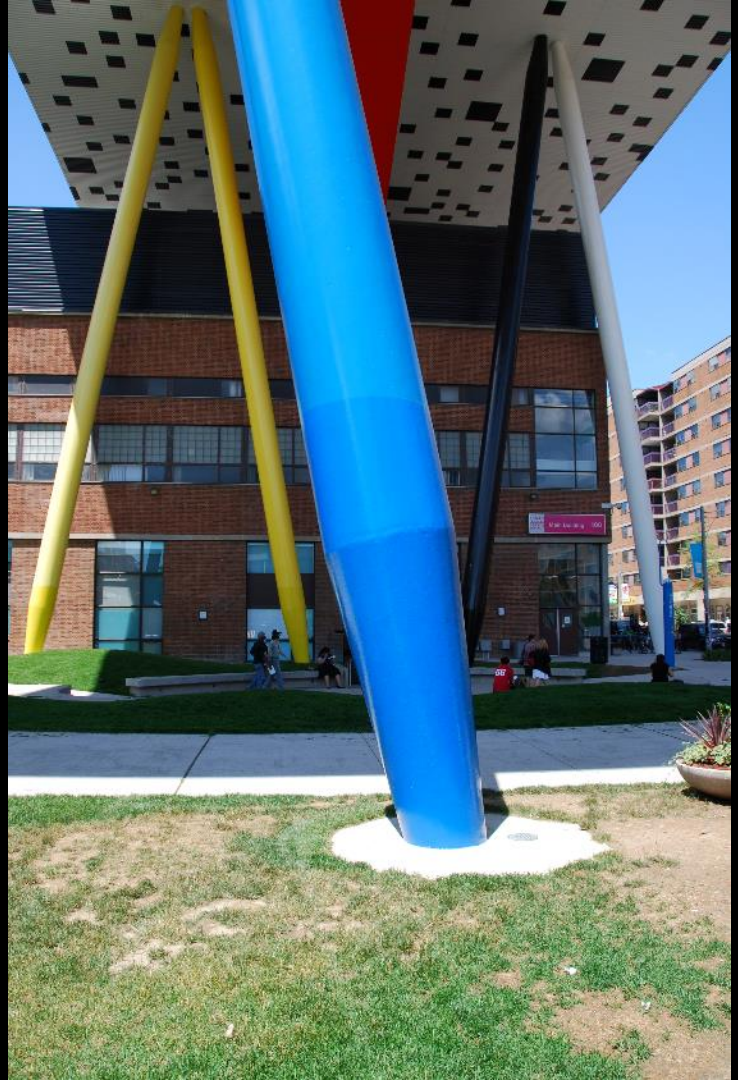


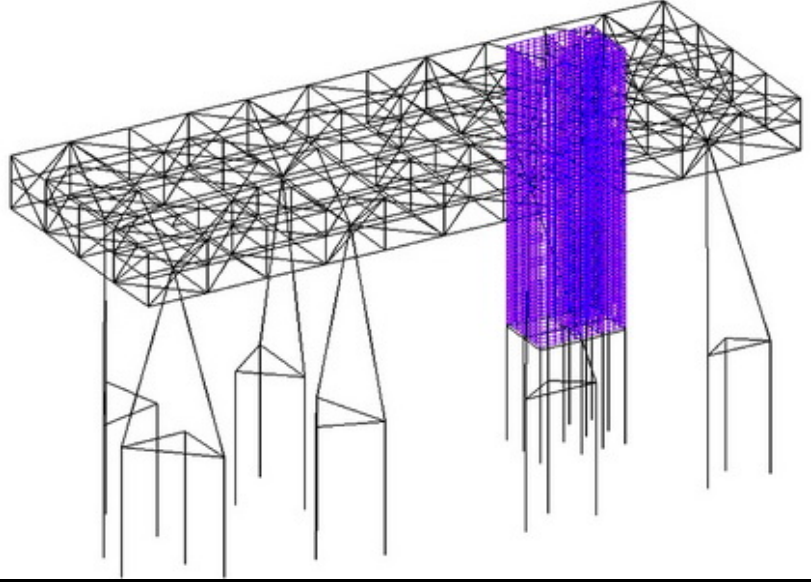


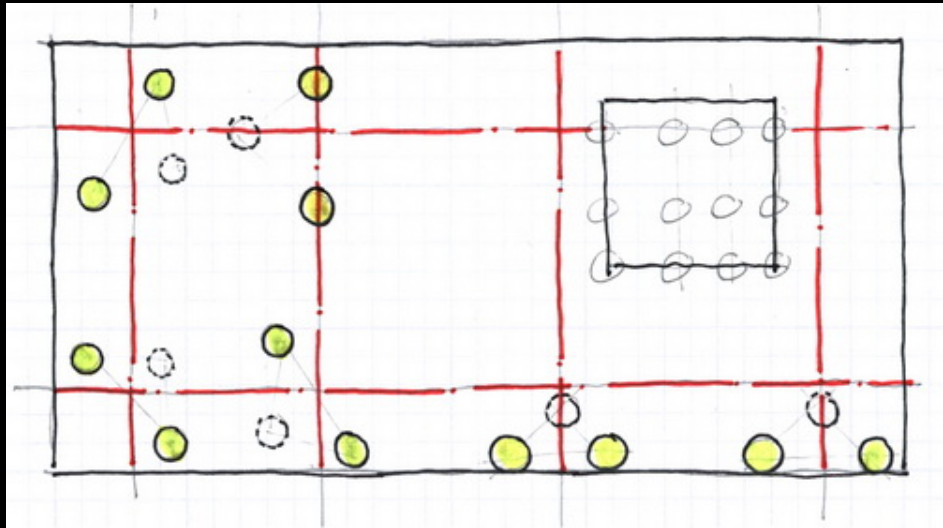

GROVE

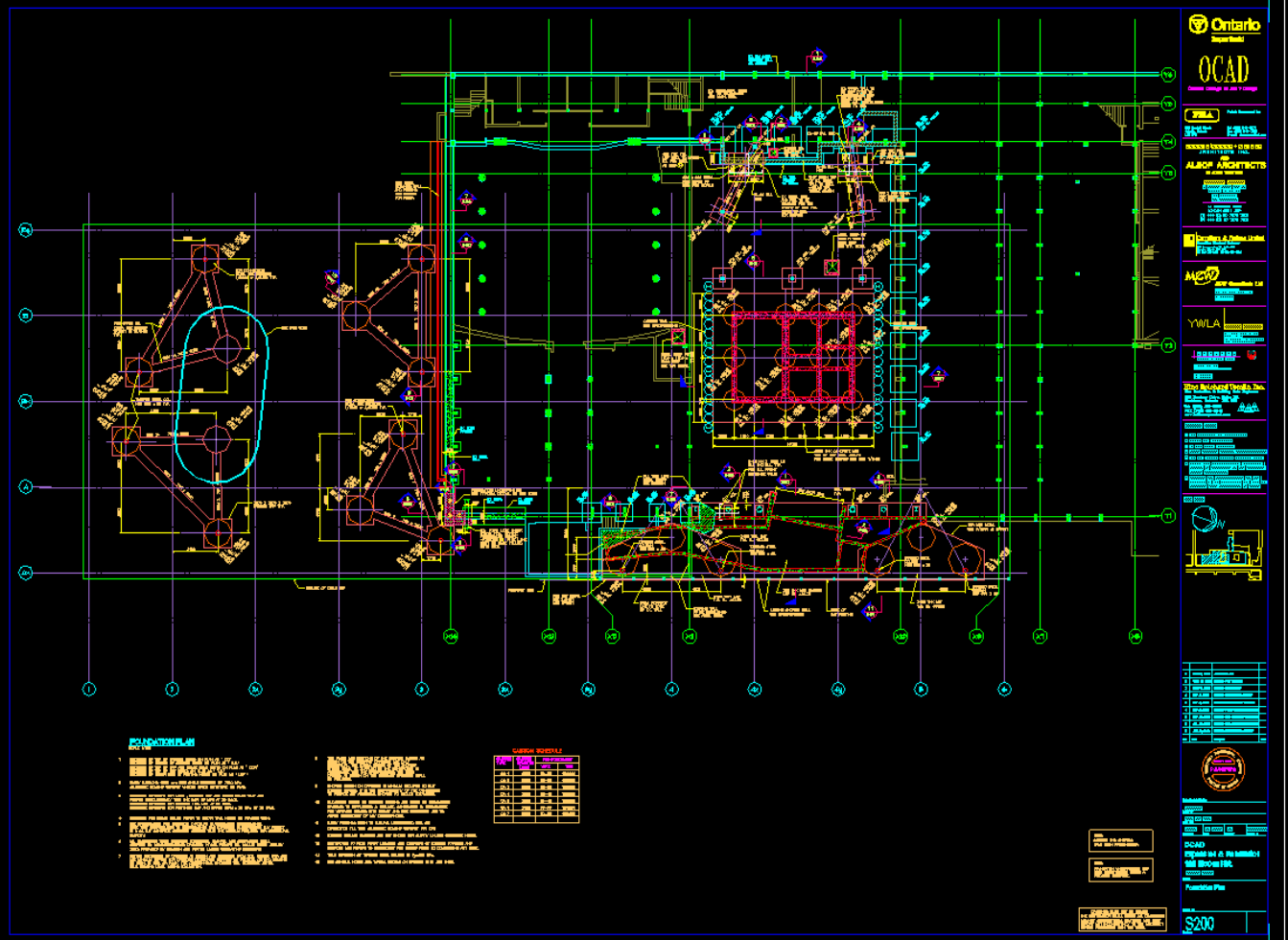

THE ROYA


MORROW
LIEBHERR








FOUNDATION PLAN
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Ontario
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ALIGN ARCHITECTS
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2003 7 10


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Raft Slabs/
Floating Foundations

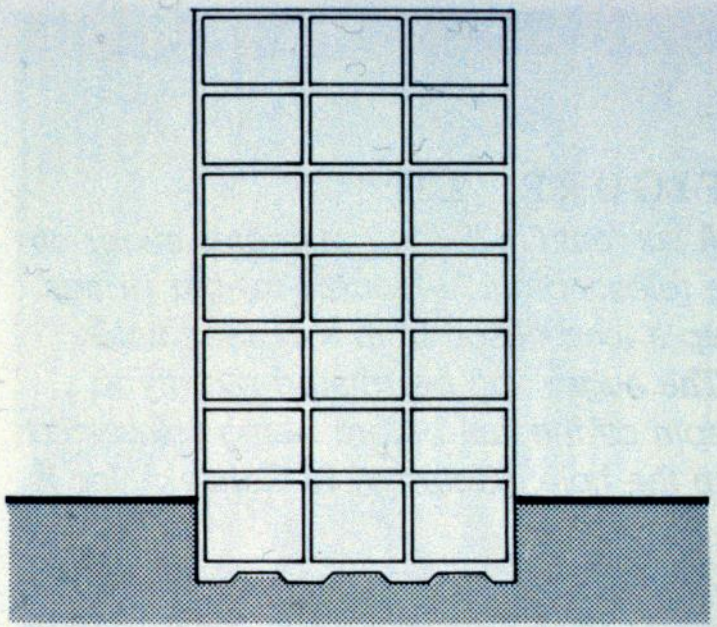

FIGURE 2.30

A cross section through a building with a floating foundation. The six stories of superstructure weigh approximately the same as the soil excavated for the substructure, so the stress in the soil beneath the building has not changed.


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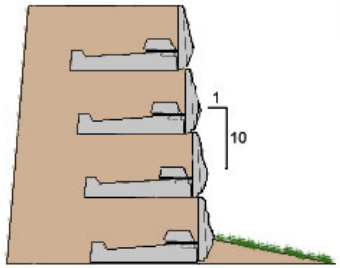
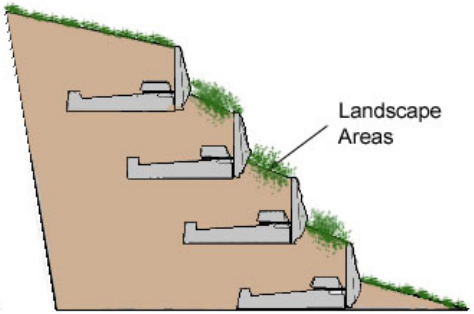
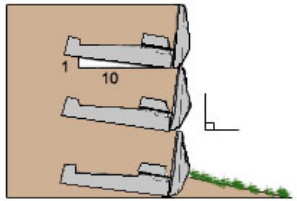


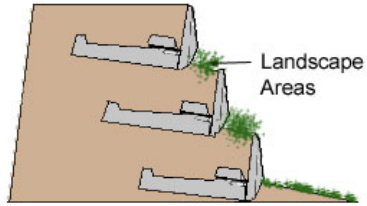
Std. 1:10 Batter Wall



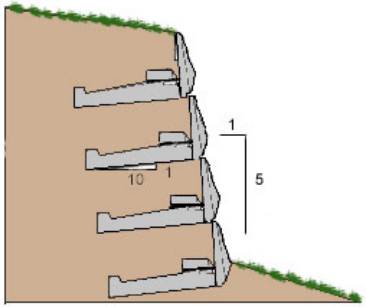
Tiered Wall of Single Stone Rows



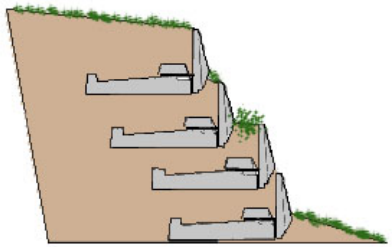
True Vertical Wall Face



Negative Batter with Offset



5V/1H Battered Wall Face



Varied Vertical & Horizontal Offsets


455D
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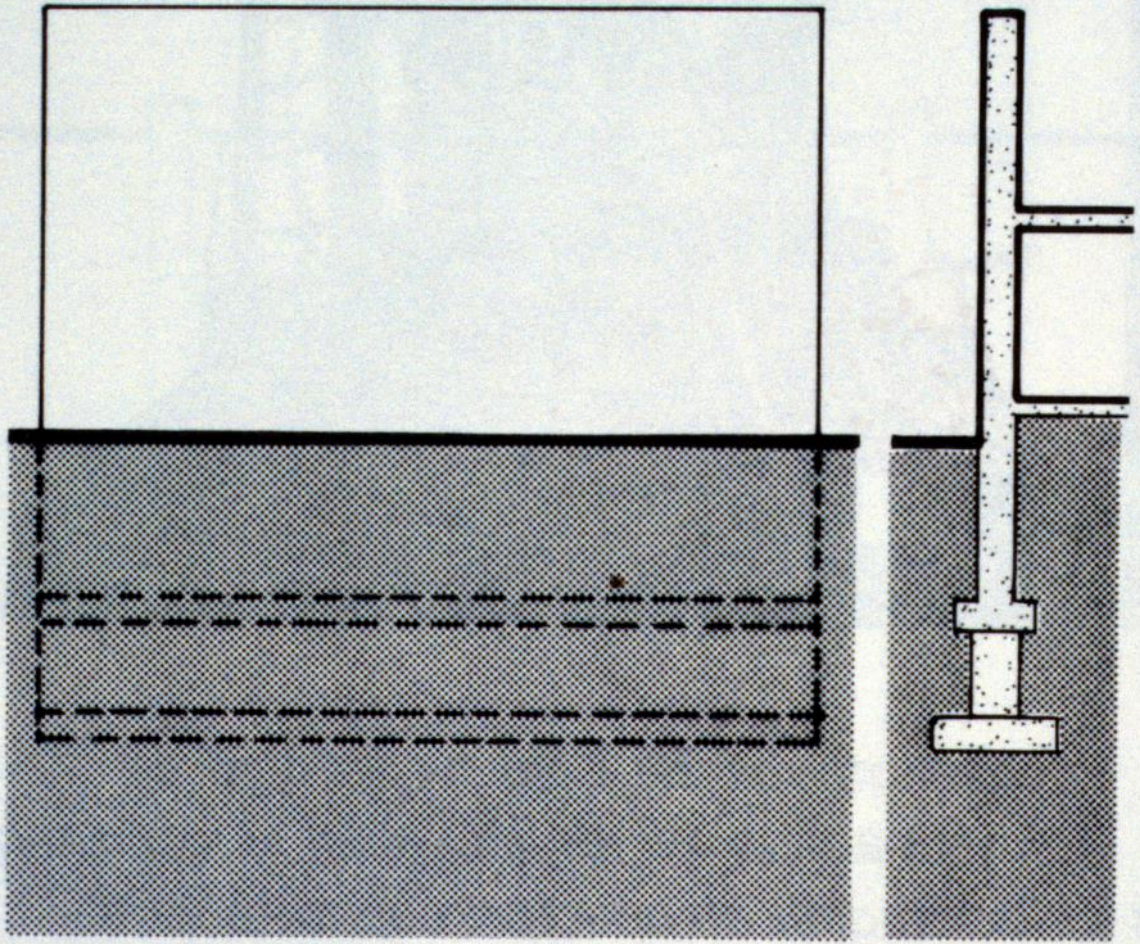
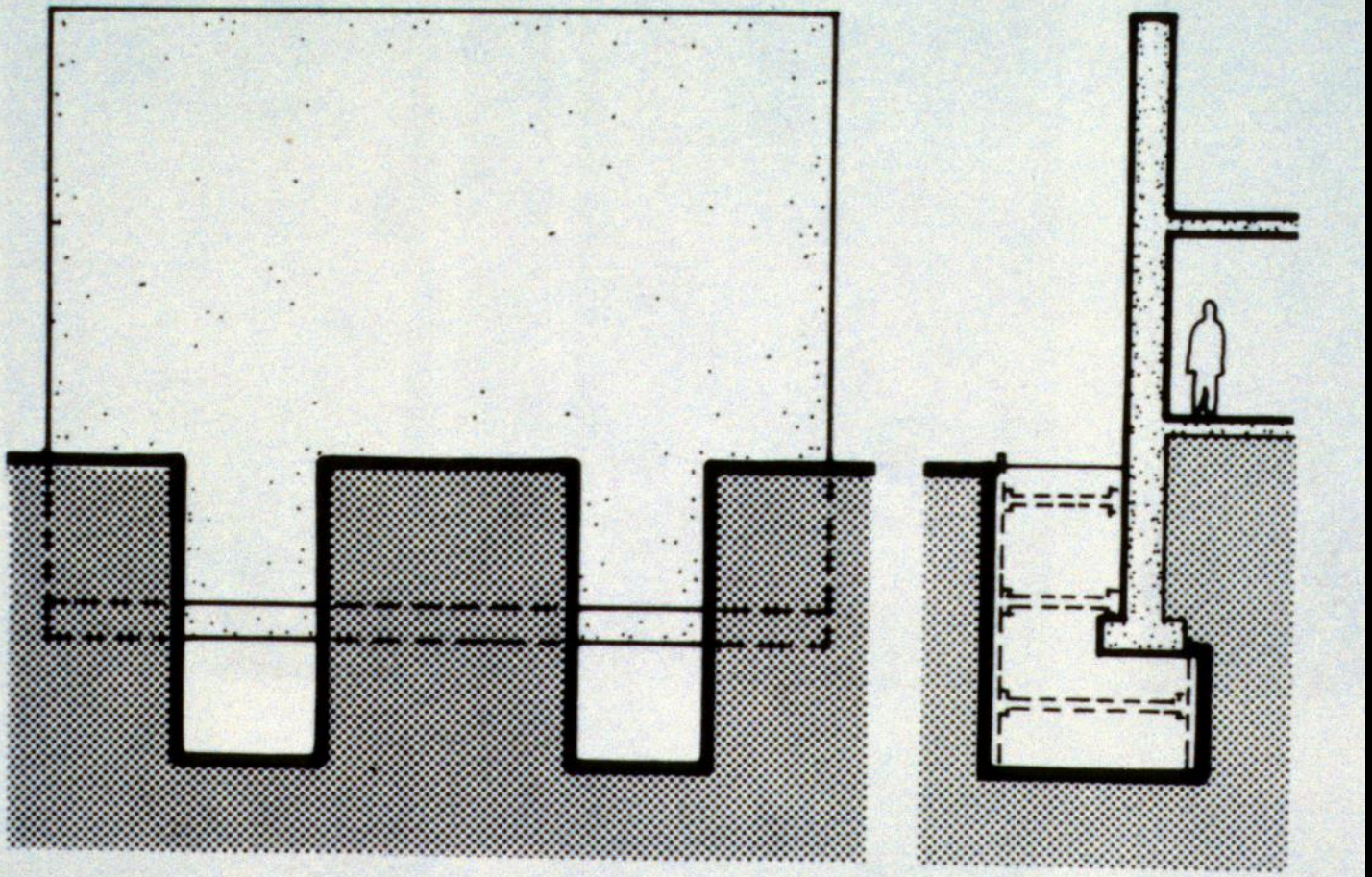
Underpinning



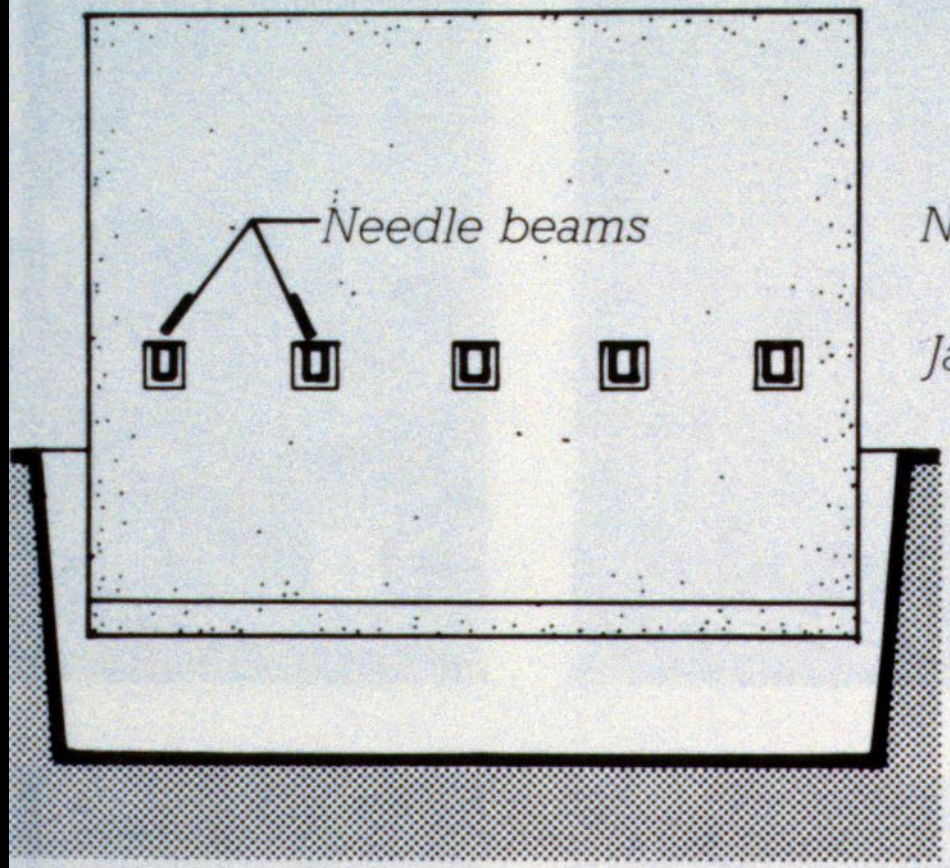
A. ELEVATION

SECTION

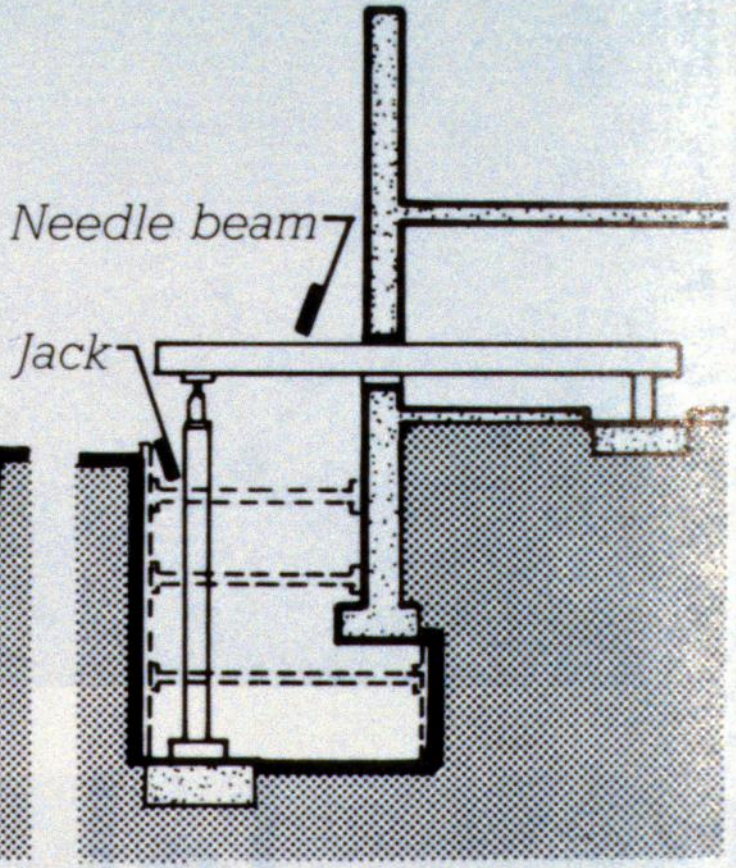


A. ELEVATION

SECTION



B. ELEVATION



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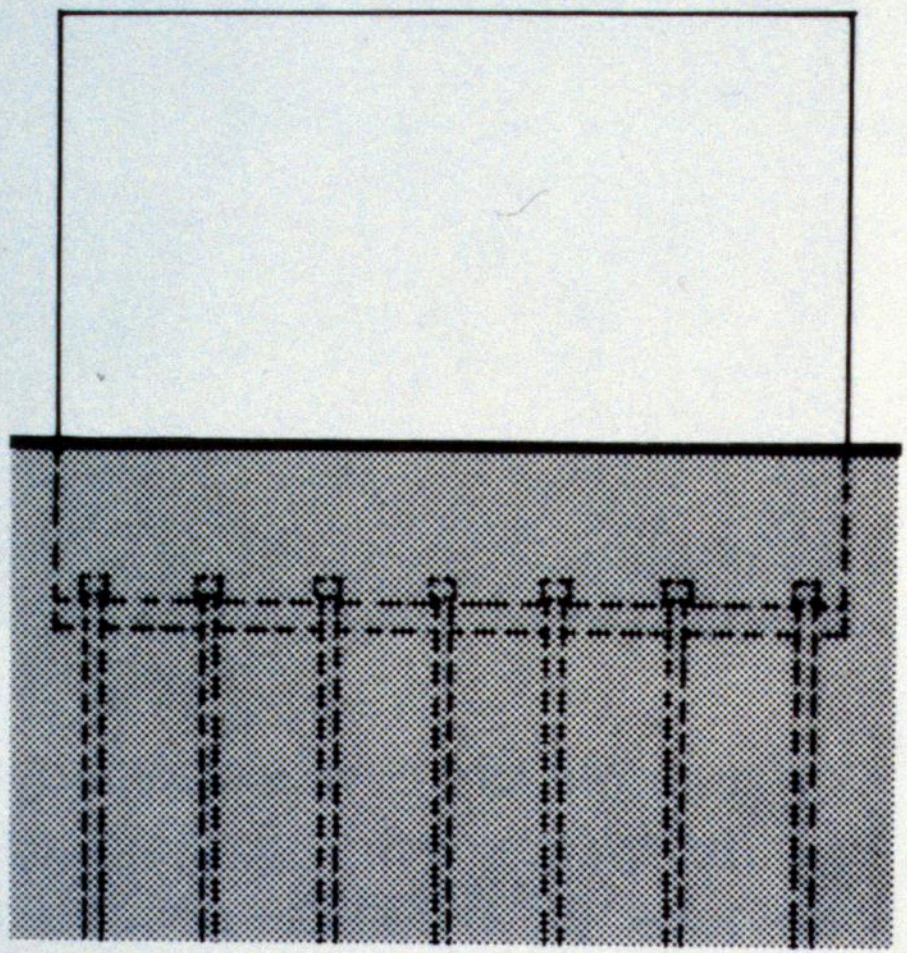
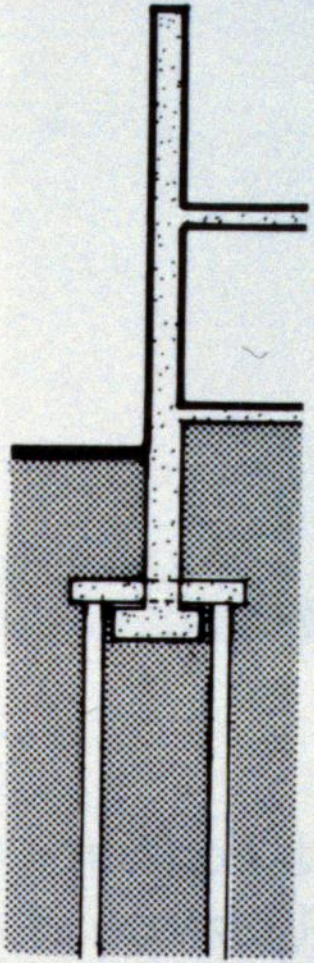


B. ELEVATION



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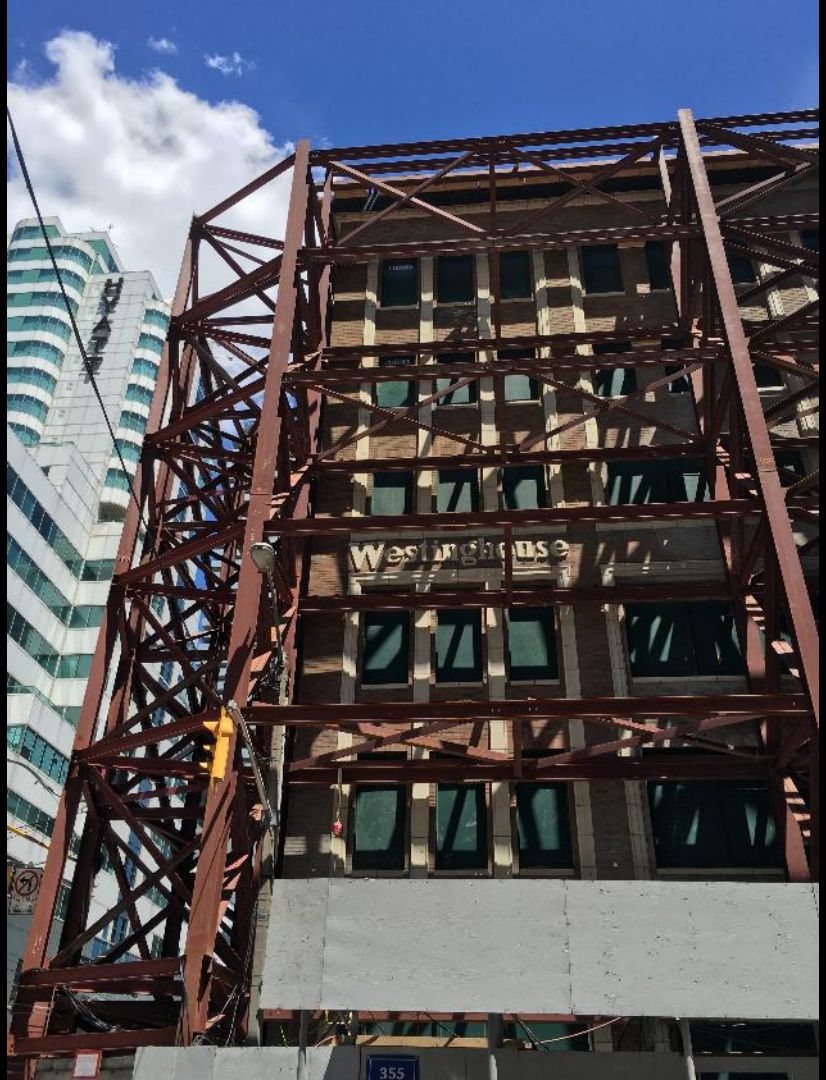
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